NATIONAL CONFERENCE *on* SCIENCE EDUCATION

BOSTON

APRIL 3–6, 2014

VOL. 2

NSTA National Science Teachers Association

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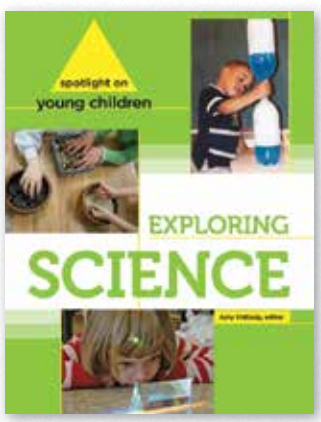

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- Teaching Every Child by Embracing Diversity
- The Science of Design: Structure and Function
- Student Learning—How Do We Know What They Know?

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NSTA National Science Teachers Association

NSTA 62nd National Conference on Science Education

Boston, Massachusetts • April 3–6, 2014

Volume 2 Friday, April 4

National Science Teachers Association
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WORKSHOP SCHEDULE

Friday April 4, 2014 • Room 153C

Inspire Scientific Minds with Technology & Manipulatives

8:00 am 3-8, Biology, Chemistry

2:00 pm 3-8, Biology, Chemistry

*Teach critical science standards with technology and manipulatives using Scientific Minds' NEW lab kits for grades 3-8, Biology, & Chemistry. Lessons are aligned to the standards of all states and the NGSS. Attendees receive door prizes, a **FREE lab kit**, and trial access to the award-winning Science Starters program!*

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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, April 4

The Boston 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.

Science and Literacy: A Symbiotic Relationship

Attention to literacy is often seen as taking time away from science. In fact, built right into the *Common Core State Standards, ELA*, literacy can and should be used to enhance the effective teaching of science. Well-designed and integrated science and literacy instruction creates a symbiosis that supports classroom practice and student achievement. The investigation of science concepts within the elementary classroom enhances the development of reading, writing, and communication skills. At the upper grades, strengthened literacy skills continue to empower all students to access the science content and communicate their understanding. This strand will address how literacy and science are in service to each other across the learning continuum.

Teaching Elementary Science with Confidence!

With limited time, resources, and opportunities to learn science, it is no wonder elementary teachers find teaching science within the school day to be challenging. There is a constant struggle to find the time for engaging students in active science experiences. We also know that simply doing a science activity does not produce a deep understanding of concepts. This strand provides opportunities for elementary teachers to enhance their content knowledge, locate resources, incorporate science and engineering practices from the *Next Generation Science Standards*, and explore classroom management strategies when teaching science.

Leading from the Classroom

Throughout their careers, teachers grow professionally and often see opportunities to improve science education. But does that mean leaving the classroom? Why can't a teacher be both a classroom teacher and leader? Effective science teachers often think that the only way to increase their impact on science education is to leave the classroom. In fact, there are myriad leadership roles that can be fulfilled as a teacher leader. This strand addresses the skills and opportunities for developing leadership capacity while continuing to serve as effective classroom teachers.

Engineering and Science: Technological Partners

Are you integrating science and engineering practices into your instruction? Are you looking for the latest cool tools to enrich your classroom? With the NRC *Framework* and the *Next Generation Science Standards* defining science and engineering as intertwined, teachers are expected to integrate both within the science curriculum. This strand explores the thoughtful, effective, and meaningful integration of technologies to increase STEM learning and understanding.

Science and Literacy: A Symbiotic Relationship

Friday, April 4

8:00–9:00 AM
Liberating Literacy Strategies for Today's Science Classroom

9:00 AM–12 Noon
Short Course: To Read or Not to Read: That Is No Longer the Question
(By Ticket: SC-10)

12:30–1:30 PM
Collaborative Editing of Student Work Online in Science and English Language Arts

2:00–3:00 PM
Bringing Primary Scientific Literature to the Classroom Through the *Journal of Emerging Investigators*

3:30–4:30 PM
Telling a Story with Data and Visuals: Critiquing and Creating Infographics in the Classroom

Teaching Elementary Science with Confidence!

Friday, April 4

8:00–9:00 AM
Using Electric Circuit Puzzles for Design and Assessment

8:00–11:15 AM
Short Course: Our Changing Earth: New England's Geologic Past (By Ticket: SC-8)

8:00 AM–12 Noon
Short Course: We're All in This Together: Cooperative Learning in the Science Classroom (By Ticket: SC-9)

9:30–10:30 AM
Doing Science the Scientific Way: It's Not as Hard as It Sounds

10:30–11:30 AM
Featured Presentation: Chrysalis: Transforming Your Teaching (Speaker: Steve Rich)

11:00 AM–12 Noon
Engineering Made Easy: *NGSS* Practices for Elementary Students

3:30–4:30 PM
Differentiating Science for Elementary Students

5:00–6:00 PM
Butterfly Gardening Using Native Plants

Leading from the Classroom

Friday, April 4

8:00–9:00 AM
Featured Presentation: The NRC *Framework* and the *NGSS*: An Opportunity for Teacher Growth and Leadership (Speaker: Arthur Eisenkraft)

Building Teacher Capacity: The Role of Science Leader-Teachers

9:00 AM–3:00 PM
Short Course: Building Capacity for Collaborative School Communities for Science Learning (By Ticket: SC-12)

9:30–10:30 AM
Science Education Fellowship Program: Supporting District Cohorts of Science Teacher Leaders

11:00 AM–12 Noon
How to Effectively Implement a Curricular Review as a Teacher Leader

Teachers Developing as Leaders: A Panel Discussion

12:30–1:30 PM
Analyzing Student Work for Language Structures That Support Conceptual Understanding

2:00–3:00 PM
Teacher Leaders in the RESTEP to STEM

3:00–6:00 PM
Short Course: Integrating Outdoor Teaching and Learning into the Boston Public Schools Science Curriculum (By Ticket: SC-15)

5:00–6:00 PM
Developing Teachers into Master Educators and Leaders: National Board Certification

Engineering and Science: Technological Partners

Friday, April 4

8:00–9:00 AM
Digitizing the Learning Experience and Taking IT Mobile

9:00 AM–12 Noon
Short Course: Sustainability and Engineering (By Ticket: SC-11)

9:30–10:30 AM
Going Beyond Data Collection—Sharing in a Science Classroom

How-To Workshop on Organizing a STEM Design Challenge Day

11:00 AM–12 Noon
Google Me This! How to Make Collaboration Work in a Wiki World

12:30–1:30 PM
Engage Students by Writing Your Own Science Book

2:00–3:00 PM
Engineering Practices in Early Childhood: Designing Mechanisms with Mech-a-Blocks

2:00–5:00 PM
Short Course: STEM in Motion: The Pasta Car Challenge! (By Ticket: SC-14)

3:30–4:30 PM
Bridging Engineering and Science

5:00–5:30 PM
Supporting Students in Optimizing Engineering Design Solutions with Modeling and Mathematics

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STORE HOURS

Wednesday	5:00 PM–8:00 PM
Thursday	7:00 AM–5:30 PM
Friday	7:00 AM–5:30 PM
Saturday	7:00 AM–5:00 PM
Sunday	7:30 AM–12 Noon

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NSTA National Science Teachers Association

Informal Science Day

Friday, April 4, 7:30 AM–4:00 PM
Ballroom West, BCEC

Packed with exciting informal science presentations and activities, Informal Science Day is intended to build awareness of the abundance of existing high-quality informal science education methods, resources, and opportunities available to enhance science teaching and learning. It is designed to offer a "town square" at which both informal and formal science educators can 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 represented include museums and science centers, media, afterschool programs, university outreach, and others that provide and/or support out-of-school science education.

Friday, April 4

7:30–9:00 AM	Science in the Community Breakfast *Sponsored in part by DuPont* (Tickets Required: M-3) *Wizard Tales: Mostly True Stories from Discovery Channel,* MythBusters*, and* Mr. Wizard's World Steven "Jake" Jacobs, Faraday Studios, Wichita, Kans. (p. 17)
9:30–10:30 AM	Breakout Sessions
11:00 AM–12 Noon	Breakout Sessions
12:30–1:30 PM	Breakout Sessions
2:00–4:00 PM	Informal Science Day Share-a-Thon (p. 100)

Meet Me in the Middle Day

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

Friday, April 4, 8:00 AM–2:00 PM
Grand Ballroom A/B, Westin Waterfront

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

Friday, April 4

8:00–9:15 AM	Bring Your Own Breakfast (BYOB) for Middle School Educators (p. 32)
9:30–10:30 AM	Concurrent Sessions*
11:00 AM–12 Noon	Concurrent Sessions*
12:30–2:00 PM	Lunch and Learn Share-a-Thon (p. 84)

* *Concurrent sessions are in Commwealth Ballrooms A and B and Grand Ballrooms C and E.*

Photo of Jason Chin courtesy of Carol Scrimgeour. See page 62 for Meet Me in the Middle Session: ***Science in 32 Pages: The Brilliant and Graceful Work of Jason Chin****.*

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*Through **Toshiba's** shared mission partnership with **NSTA**, the Toshiba/NSTA ExploraVision competition makes a vital contribution to the educational community.*

NSTA

NSTA Exemplary Science Program (ESP)

ESP: Unique Features of Programs That Meet "More Emphasis" Features in the NSES

Friday, April 4, 9:00 AM–12 Noon

Grand Ballroom D, Westin Waterfront

NSTA's Exemplary Science Programs (ESP) series identifies people and places where the reforms recommended have emerged. The exemplary include: 1) Exemplary Science in Grades PreK–4; 2) Exemplary Science in Grades 5–8; 3) Exemplary Science in Grades 9–12; 4) Exemplary Science: Best Practices in Professional Development; 5) Inquiry: The Key to Exemplary Science; 6) Exemplary Science in Informal Education Settings; 7) Exemplary Science for Resolving Societal Challenges; 8) Exemplary Programs for Building Interest in STEM Careers; and 9) Exemplary College Science Teaching.

The series was conceived by Robert E. Yager (1982–1983 NSTA President), who continues ESP searches and ways of recognizing classroom successes while also encouraging more to try!

ESP symposia are described on page 38.

Coordinators: **Robert E. Yager,** 1982–1983 NSTA President, and University of Iowa, Iowa City
Susan Koba, Retired Educator, Omaha, Neb.

Community of Excellence in Mathematics and Science
Susan Koba, Retired Educator, Omaha, Neb.

Adapting the JASON Project
Warren Phillips, Retired Educator, Halifax, Mass.

Bringing School Science to College
Sondra Akins, William Paterson University, Wayne, N.J.

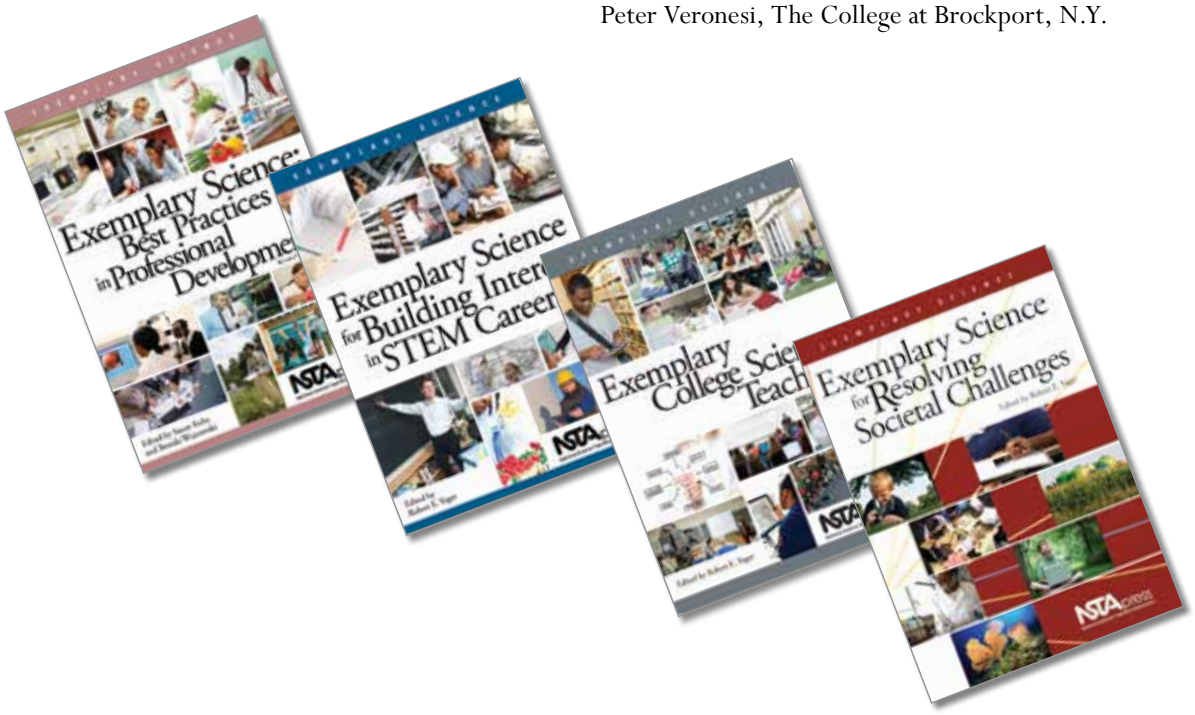
The Road to Becoming an Exemplary College Science Teacher
Katherine Follette, The University of Arizona, Tucson

Teaching Science with Pictures
Karl Spencer, The Visual Realization Program, Houston, Tex.

Developing Students' Authentic Inquiry Skills
Judith A. Scheppler, Illinois Mathematics and Science Academy®, Aurora

Why STEM? Why Now?
Brenda Wojnowski, WAI Education Solutions, Dallas, Tex.

Stop Talking, Start Listening
Peter Veronesi, The College at Brockport, N.Y.



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NSTA National Science Teachers Association

NSTA Press Sessions

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Friday, April 4

8:00–9:00 AM

Reaching the Next Stephen Hawking: Tips for Including Students with Disabilities in Advanced Science Classes

Earth Science Puzzles—Making Meaning from Data

9:30–10:30 AM

Teacher Liability—Walking on the Safer Side!

11:00 AM–12 Noon

Get the FACTs for Supporting Evidence-based Talk and Argument

Inside-Out—Enhancing Field-based Learning in Environmental Science for the Upper Elementary Classroom

12:30–1:00 PM

Beyond the Numbers: Making Sense of Statistics

12:30–1:30 PM

Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry

2:00–3:00 PM

Special Needs Students in Science

Science & Children—A Year of Inquiry

3:30–4:30 PM

Newly Designed Whole Class Inquiry Projects and Assessment in Biology, Chemistry, and Physics

The Authors' Picks! Teaching Science Through Trade Books

5:00–6:00 PM

Five E(z) Elementary Steps to Next Generation Science Teaching

Argumentation in the Science Classroom

ELEMENTARY EXTRAVAGANZA

Friday, April 4, 2014
8:00–10:00 AM • Ballroom East
Boston Convention & Exhibition Center

- **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—Win an iPad!**
- **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.

NSTA National Science Teachers Association

—Photo courtesy of David Fox

Friday, April 4

	Featured Speakers/Special Events	Featured Speakers/Special Events	Featured Speakers/Special Events	Featured Speakers/Special Events
7:00 AM				
8:00 AM	**Featured Presentation** 8:00–9:00 AM 210C, BCEC Speaker: Arthur Eisenkraft *sponsored by Shell*	**Meet Me in the Middle Day** 8:00 AM–2:00 PM Grand Ballroom A/B, Westin Waterfront	**Elementary Extravaganza** 8:00–10:00 AM Ballroom East, BCEC	**Informal Science Day** 7:30 AM–4:00 PM Ballroom West, BCEC
9:00 AM		**NSTA ESP Symposium** ESP: Unique Features of Programs That Meet "More Emphasis" Features in the NSES 9:00 AM–12 Noon Grand Ballroom D, Westin Waterfront		
10:00 AM				
11:00 AM	**Featured Presentation** 10:30–11:30 AM 210C, BCEC Speaker: Steve Rich			
12 Noon				**Informal Science Share-a-Thon** 2:00–4:00 PM Ballroom West, BCEC
1:00 PM	**SCST Marjorie Gardner Lecture** 12:30–1:30 PM Caspian, Renaissance Speaker: Mike Klymkowsky		**NSTA Chapter and District Ice Cream Social in Honor of Wendell Mohling** 1:30–2:30 PM Booth #1107, Exhibit Hall *Sponsored by GEICO*	
2:00 PM	**Featured Presentation** 2:00–3:00 PM 210C, BCEC Speaker: Joseph Acaba			
3:00 PM		**AGU Lecture** 2:00–3:00 PM 210 A/B, BCEC Speaker: Suchi Gopal		
4:00 PM	**Robert H. Carleton Lecture** 3:30–4:30 PM 210C, BCEC Speaker: John E. Penick			
5:00 PM				
6:00 PM				
7:00 PM	**NSTA Teacher Awards Gala** 6:15–8:45 PM Pacific A–E Renaissance Ticket Required (M-5)		**Special Evening Session** 6:00 PM–12 Midnight Caspian, Renaissance A Festival of Engineering, Technology, and Science Treats as Related to STEM, the NRC *Framework*, and the *NGSS*, Part II	
8:00 PM				
9:00 PM	**President's Mixer** 9:00 PM–12 Midnight Atlantic Ballroom, Renaissance			
10:00 PM				

7:00–9:00 AM Breakfasts

APAST Breakfast Meeting

(By Invitation Only) *Flagship A, Seaport*

This annual corporate-sponsored breakfast for the Association of Presidential Awardees in Science Teaching is only open to members who registered with APAST in advance. Visit *apast.org* for details.

AMSE Alice J. Moses Breakfast

(By Invitation Only) *Seaport Ballroom B, Seaport*

7:30–9:00 AM Science in the Community Breakfast

Wizard Tales: Mostly True Stories from Discovery Channel, *MythBusters,* and *Mr. Wizard's World*

(Ticket Required: $15) **M-3** *Ballroom West, BCEC*

Sponsored in part by DuPont

Steven "Jake" Jacobs *(jakesattic@aol.com),* Faraday Studios, Wichita, Kans.

Answering a key question on the minds of all informal science educators; yes, Virginia, Wizards do exist. The world has known four of them. In 1995, NSTA Life Member and former Informal Education Division Director Steve "Jake" Jacobs was named Wizard IV at the Royal Institution of Great Britain. While entertaining breakfast attendees with hilarious behind-the-scenes stories from several popular science education television series, Jake will share fascinating and inspirational messages from his Wizard predecessors; Michael Faraday, and NSTA members Hubert Alyea from Princeton, and Don Herbert, television's Mr. Wizard.

Steve "Jake" Jacobs, chief scientist for Faraday Studios, is—among other things—a science writer/researcher for Discovery Channel's MythBusters *and new series* Head Rush. *He has also served in a similar capacity for FOX* (Jake's Attic), *National Geographic TV* (Known Universe), *Nickelodeon* (Mr. Wizard's World), *FOX Sports Network* (Sports Science), *ESPN* (Holiday Sports Spectacular), *PBS, and others.*

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Thursday.

"The wizards are a strange class of kindly mortal, impelled by an almost insane impulse to seek their pleasure among smoke and vapor, soot and flame, poisons and poverty. Yet among all these evils they seem to live so sweetly that they may die if they would change places with even a King." Johann Joachim Becher, phlogistonist (1669)

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.

Science Area

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title. On page 131, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

(Bio) = Biology/Life Science
(Chem) = Chemistry/Physical Science
(Earth) = Earth/Space Science
(Env) = Environmental Science
(Gen) = Integrated/General Science
(Phys) = Physics/Physical Science

Glossary

STEM stands for Science, Technology, Engineering, and Mathematics.

Strands

The Boston 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.

Science and Literacy: A Symbiotic Relationship

Teaching Elementary Science with Confidence!

Leading from the Classroom

Engineering and Science: Technological Partners

The following icons will be used throughout this program.

NSTA Press® Sessions

PDI Professional Development Institutes

7:30–9:00 AM High School Breakfast

Implementing Classroom STEM Projects: A "Teacher at Sea"

(Ticket Required: $50) **M-2** *Lighthouse II, Seaport*

Rory Wilson *(rorywilsonis@gmail.com),* Virtual Teacher/Adventurer, Port Townsend, Wash.

Rory Wilson, recently a mathematics teacher at Bainbridge High School near Seattle, has extensive sailing and ocean experience ranging from sailing in Hawaii, Europe, Asia, and North America as well as from time aboard a Scripps research vessel in the Southern Indian Ocean during the summer of 2006. Join Rory and hear how he crossed the Pacific Ocean in a small boat built with innovative STEM projects as the first leg of an ocean circumnavigation. Learn how to implement engaging projects for students in a standards-based classroom and how to extend the classroom using available technology and open resources.

Rory Wilson is a teacher extending the classroom with ocean STEM activities aboard an innovative boat designed and built with student projects. Rory just completed a record-breaking solo ocean voyage from San Diego to Hawaii in a custom fiberglass boat that students in Colorado and Washington helped to design, fit out, and test. The boat used large power kites for wind energy, oars for rowing, and solar electronics for navigation. The 21-foot boat could surf at high speeds on large ocean waves, had a small sleeping cabin, and carried supplies and food for the 2,700-mile ocean adventure. During this 44-day solo passage, he kept in touch with students on Facebook via satellite, rowed through tropical storms near Mexico, and encountered pilot whales, flying fish, and curious seabirds.

Rory has now moved the ideas, technology, and equipment aboard a vessel that will continue on a multi-ocean circumnavigation. This extended passage is the culmination of seven years of STEM projects with middle school and high school students. Rory has a MS degree in technology, learning, and cognition with extensive graduate work in mathematics and pedagogy. His awards include the 2012 Excellence in Mathematics Education Award sponsored by the Washington State Mathematics Council and Olympic ESD 114 and the Innovative Educator of the Year Award in 2010 for student work in sustainable architecture.

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Thursday.

7:30–10:00 AM Breakfast

Next Steps Networking Forum

(By Invitation Only) *Seaport Ballroom A, Seaport*

Join your Next Step friends for breakfast and engaging dialogue. Bring best practices and experiences to share; take away inspiration, ideas, and encouragement! Visit *www.nextstepsinscience.org* for details.

8:00–8:30 AM Presentation

SESSION 1

From *XKCD* to *Infinite Jest*—Strengthening Science with Language and Vice Versa (Gen)

(Middle Level–High School) *Plaza C, Seaport*

Vin Urbanowski *(vurbanowski@aitestamford.org)* and **April Kassman,** Academy of Information Technology and Engineering, Stamford, Conn.
AITE, Stamford, Conn.

Excellent science writing often appears where you least expect it—and can be a lot of fun! Learn to find, evaluate, assign, and assess science writing to engage students to lock in concepts generating better lab reports, presentations, and papers.

8:00–9:00 AM Featured Presentation

★ **The NRC *Framework* and the *NGSS*: An Opportunity for Teacher Growth and Leadership (Gen)**

(General) *210C, BCEC*

Sponsored by Shell

Arthur Eisenkraft *(arthur.eisenkraft@umb.edu),* 2000–2001 NSTA President, and Distinguished Professor of Science Education, Professor of Physics, and Director of the Center of Science and Math in Context, UMass Boston, Mass.

Presider: Joyce Gleason, Strand Leader, Leading from the Classroom, NSTA Boston National Conference, and Educational Consultant, Bourne, Mass.

As we all look at our past successful lessons through the lens of NRC's *A Framework for K–12 Science Education* and the *NGSS,* we will better understand what makes some lessons highly effective. Identifying and implementing successful lessons and curriculum is the way in which teachers bridge research and practice. In this manner, teachers grow professionally and improve science education. Sharing these vital experiences is the path from being a teacher to becoming a teacher leader.

Arthur Eisenkraft is a distinguished professor of science education and director of the Center of Science and Math in Context (COSMIC) at the UMass Boston.

For 25 years, Arthur taught high school physics and is chair and co-creator of the Toshiba/NSTA ExploraVision Awards, involving 15,000 students annually. He is the recipient of many awards, among them the Presidential Award for Excellence in Science Teaching, the American Association of Physics Teachers Millikan Medal, the Disney Corporation's Science Teacher of the Year, and the NSTA Robert Carleton Award.

Arthur is a past president of NSTA and project director of the NSF-supported Active Physics Curriculum Project that is introducing physics instruction for the first time to all students and leading a similar effort with Active Chemistry.

8:00–9:00 AM Presentations

SESSION 1

Science Says: Science and Literacy for Students with Language-based Learning Disabilities (Gen)
(Elementary) *158, BCEC*
Stacy Miller *(stacym@mmfsnyc.org)* and **Greg Hill-Ries** *(gregh@mmfsnyc.org),* Mary McDowell Friends School, Brooklyn, N.Y.
Understanding, speaking, and writing about science are challenging for students with language-based learning disabilities. Explore strategies to support and enhance students' abilities to access and apply language.

SESSION 2

Teaching Physical Science Through Robotics and Engineering Design (Phys)
(Middle Level) *159, BCEC*
Sabrina Grossman *(sabrina.grossman@ceismc.gatech.edu)* and **Jayma Koval** *(jayma.koval@ceismc.gatech.edu),* Georgia Tech, Atlanta, Ga.
Use LEGO® robotics to integrate engineering into middle school physical science classes and meet the *NGSS* standards. Engage in inquiry activities and receive access to NSF-developed materials.

SESSION 3

Collaboration That Works: Science, Literacy, and 21st-Century Skills (Bio)
(Middle Level) *160B, BCEC*
Hallie S. Edgerly *(hallieedgerly@gmail.com)* and **Kate A. Willems** *(kwillems@adm.k12.ia.us),* Adel-DeSoto-Minburn Middle School, Adel, Iowa
Let us introduce you to a collaborative project for grade 8 students spanning science, reading, and writing courses to tell the story of fictional families affected by a genetic disorder.

SESSION 4 (two presentations)
(Middle Level/Informal Education) *161, BCEC*

School Buildings Can Teach, Too: Assessment of Direct and Indirect Teaching (Env)
Victoria A. Kazmerski *(vak1@psu.edu),* Penn State Erie, Erie, Pa.
Glenn A. McKnight *(mcknight@mtsd.org),* James S. Wilson Middle School, Erie, Pa.
Green schools can do more than save energy. Learn about how a green school teaches students about innovative and environmentally friendly features.

Watershed Wonders: Inspiring Environmental Stewardship (Env)
Bernadette M. McEvoy *(bmcevoy@miltonps.org),* Pierce Middle School, Milton, Mass.
Environmental awareness breeds environmental stewardship. Learn new ways to incorporate watershed education into your middle school curriculum. Students care when they're aware.

SESSION 5

Hands on the Sun (Earth)
(Middle Level) *162A, BCEC*
Steele W. Hill *(steele.w.hill@nasa.gov)* and **Wendy M. Van Norden** *(wendy.m.vannorden@nasa.gov),* NASA Goddard Space Flight Center, Greenbelt, Md.
Shine new learning in your classroom. Walk away with a dozen techniques/approaches (some hands on) for teaching about the Sun.

SESSION 6 (two presentations)

(High School) *162B, BCEC*

Introducing the ChemMatters Compilation Project (Chem)

Marta U. Gmurczyk, American Chemical Society, Washington, D.C.

Steven Long *(slong@rps.k12.ar.us),* Rogers High School, Rogers, Ark.

Are you looking for free, high-quality, and engaging reading materials and activities to integrate reading and chemistry? Come learn about the new *ChemMatters* compilation project, which includes past articles from *ChemMatters* with inquiry-based lesson plans correlated with the *Common Core State Standards, ELA* as well as the *Next Generation Science Standards.* The goal of this project is to help students think critically as they use engaging content to learn important chemistry concepts.

Using iTunes U in the High School Science Classroom (Chem)

Julie B. Willcott *(julie.willcott@staff.foxcroftacademy.org),* Foxcroft Academy, Dover-Foxcroft, Maine

Come hear about the development and implementation of a high school chemistry iTunes U course. Additional uses of the iPad in the science classroom will be introduced.

SESSION 7

Frisbee® Dog Physics (Phys)

(General) *205C, BCEC*

Jen Gilbert *(gilbertmediagroup@gmail.com),* DePaul University, Chicago, Ill.

Come examine an inquiry-based physics lesson using media featuring Frisbee dogs and discuss how to create the same level of engagement in your classroom.

SESSION 8

PDI **Wheelock Pathway Session: Connecting Science and Literacy in the Middle School Classroom (Gen)**

(Middle Level/Supervision) *209, BCEC*

Janet MacNeil *(janet_macneil@brookline.k12.ma.us),* Brookline (Mass.) Public Schools

Mark Goldner *(mgoldner3@gmail.com),* Heath School, Brookline, Mass.

Melissa London *(melissa_london@brookline.k12.ma.us),* Pierce School, Brookline, Mass.

We'll share a science and literacy toolkit and examples of middle school science discussions and student writing (notebooks, argument writing) that address the *NGSS* and the *CCSS ELA.*

SESSION 9

Farm-to-School Digital Stories: Integrating Science, Literacy, and Technology in Primary Classrooms (Gen)

(Elementary) *211, BCEC*

Patricia Bricker *(bricker@email.wcu.edu),* **Kelly Tracy,** and **Nancy Luke,** Western Carolina University, Cullowhee, N.C.

April Hicks, Cullowhee Valley School, Cullowhee, N.C.

Discover how educators blend hands-on investigations, writing, and digital stories through a Farm-to-School project. Leave with practical strategies for implementing similar projects.

SESSION 10

A Student Exercise in Determining the Efficiency of a Working Photovoltaic Array (Phys)

(High School) *251, BCEC*

Hughes Pack *(hpack@nmhschool.org),* Northfield Mount Hermon School, Mount Hermon, Mass.

Learn how to use real-time data from a photovoltaic array to calculate efficiency. I'll describe a related exercise using benchtop materials.

SESSION 11

The Shell Science Teaching Award: Fueling Success with Students (Gen)

(General) *252A, BCEC*

Norma Neely *(nneely@ou.edu),* University of Oklahoma, Norman

Share your passion and practice by applying for this $10,000 award. Learn from Shell awardees, finalists, and judging panel members. Door prizes—Visa gift cards!

SESSION 12 (two presentations)

(Elementary) *252B, BCEC*

Riding the Wave of the *NGSS* on a PBL Surfboard (Gen)

Catherine M. Koehler, Southern Connecticut State University, New Haven

This workshop instructs elementary teachers in the use of Problem-Based Learning to help teach engineering design.

Science and Engineering Practices—What's Art Got to Do with It? (Gen)

Catherine McCulloch *(cmcculloch@edc.org),* Education Development Center, Inc., Waltham, Mass.

Do you know what is going on in the art classroom that can help the science teacher implement the *NGSS* engineering practices and content? Come find out.

SESSION 13 (two presentations)

(Elementary) *253A, BCEC*

NARST Session: Establishing Trust via Lesson Study (Gen)

Sharon Dotger *(sdotger@syr.edu),* Syracuse University, Syracuse, N.Y.

Kevin Moquin *(fkmoquin@syr.edu),* Willowfield Elementary School, Liverpool, N.Y.

Join us as we explore how teachers and university educators built trust through lesson study to improve elementary science.

NARST Session: Young Children's Understandings of Earth's Surface Features and Changes (Earth)

Deb C. Smith *(debsmith16823@gmail.com),* Retired Educator, Bellefonte, Pa.

The NRC *Framework* recommends the core disciplinary content, crosscutting concepts, and scientific and engineering practices that students will need in the future. However, there has been little research on K–4 students' scientific ideas, especially in the Earth sciences. This presentation discusses K–4 children's ideas about Earth's surface features and changes, and suggests an early learning progression to support their progress in this area.

SESSION 14

NSTA Press® Session: Reaching the Next Stephen Hawking: Tips for Including Students with Disabilities in Advanced Science Classes (Gen)

(High School) *254A, BCEC*

Ed Linz *(coachlinz@cox.net),* Author and Education Consultant, Springfield, Va.

Mary Jane Heater, Robinson Secondary School, Fairfax, Va.

Presider: Mary Jane Heater

Join us as we focus on how to recruit and include students with disabilities into advanced science (AP, Honors) classes.

SESSION 15

(Middle Level) *255, BCEC*

If You Want Your Students to Engage with Content Using Textbooks, You've Got to Try This Strategy! (Gen)

Susan Gran *(sgran@purdue.edu),* Purdue University, West Lafayette, Ind.

Triad Summarizing is a cooperative reading strategy used to get all students to engage with and make sense of text. Great for students of all reading abilities!

SESSION 16

Integrating Reading, Writing, and Research into Biotechnology (Bio)

(Middle Level–High School) *257A, BCEC*

Jenna E. Mendell *(jennifer.mendell@bridgew.edu)* and **Meri K. Krevosky** *(mkrevosky@bridgew.edu),* Bridgewater State University, Bridgewater, Mass.

The Whale of a Mystery curriculum promotes reading, writing, communication skills, and scientific literacy in the context of a "progression of inquiry" model.

SESSION 17

Using the Flipped Class as a Stepping-Stone to a Student-centered Classroom (Bio)

(Middle Level–College) *257B, BCEC*

James Schreiner *(jschreiner@bbchs.org)* and **Tony Swafford** *(tswafford@bbchs.org),* Bradley-Bourbonnais Community High School, Bradley, Ill.

Having flipped for three years using case studies as well as problem-based and inquiry learning, we'll share our expertise on creating your own student-centered classroom.

SESSION 18

Liberating Literacy Strategies for Today's Science Classroom (Gen)

(Middle Level–High School) *258C, BCEC*

Suzanne Alberich *(salberich@mvyps.org)* and **Connie Alexander** *(calexander@mvyps.org),* Tisbury School, Vineyard Haven, Mass.

Empower and enthuse your students. Take away 10 research-based literacy strategies to help all students become more independent in accessing and learning science content.

SESSION 19

Digitizing the Learning Experience and Taking IT Mobile (Gen)

(Supervision/Administration) *259B, BCEC*

Ben Smith *(ben@edtechinnovators.com)* and **Jared Mader** *(jared@edtechinnovators.com)*, York, Pa.

Come learn how to use iPads and other mobile devices in your science classroom…and how to put your content on your students' devices.

SESSION 20

★ **Building Teacher Capacity: The Role of Science Leader-Teachers (Gen)**

(General) *260, BCEC*

Gelyn Cornell *(gelyn.cornell@aliefisd.net)* and **Monica Ibanez** *(monica.ibanez@aliefisd.net),* Alief ISD, Houston, Tex.

Joan Henington *(joan.henington@aliefisd.net),* Youngblood Intermediate School, Houston, Tex.

Learn effective systems to build and sustain a cadre of science leader-teachers with a significant impact on student learning and school improvement.

SESSION 21 (two presentations)

(High School) *261, BCEC*

Helping Students Across the Transition from Small, Student-collected Datasets to "Big Data" (Earth)

Kim A. Kastens *(kkastens@edc.org),* **Ruth A. Krumhansl,** and **Irene Baker** *(ibaker@edc.org),* Education Development Center, Inc., Waltham, Mass.

Help your students prepare for a world of "Big Data" by building on existing "small data" activities.

Performance Assessments in Earth Science (Earth)

Colleen K. Buzby *(buzbywork@gmail.com),* Antioch Community High School, Antioch, Ill.

Are your students truly gaining science reasoning skills from lab? Take examples of authentic assessments for earthquakes, water quality, mineral ID, and more that emphasize process skills over rote memorization.

SESSION 22

Preparing Today's Youth to Become Tomorrow's Computational Thinking–enabled Scientists and Engineers (Gen)

(General) *Atlantic 3, Renaissance*

Joyce Malyn-Smith *(jmalynsmith@edc.org),* Education Development Center, Inc., Waltham, Mass.

Irene Lee, Santa Fe Institute, Santa Fe, N.Mex.

Let's review what computational thinking–enabled STEM professionals know and do. We'll discuss if today's students can succeed in tomorrow's scientific enterprise.

SESSION 23

Apps in the Middle School Classroom (Gen)

(Middle Level) *Brewster, Renaissance*

Katye M. Couch and **Sally Spraker,** Girls Preparatory School, Chattanooga, Tenn.

Find out how apps, app combinations, and other creative uses of the iPad have transformed our middle school Earth and life science classrooms. Also, we will share challenges of using iPads or similar devices in the classroom.

SESSION 24 (two presentations)

(Middle Level–College) *Caspian, Renaissance*

SCST Session: Assessing the *NGSS* Performance Expectations: Teachers' Reflections on Successes and Challenges when Using Hands-On Performance Tasks (Gen)

Renee M. Clary *(rclary@geosci.msstate.edu),* Mississippi State University, Mississippi State, Miss.

Deborah L. Tucker *(deborahlt@aol.com),* Independent Science Education Consultant, Napa, Calif.

Charles L. Wax, Retired Educator, Mississippi State, Miss.

Hear from middle level teachers introduced to and trained with hands-on performance assessment tasks about both the benefits and challenges for classroom implementation.

SCST Session: Headline News: Using Current Topics to Facilitate Student Research, Argumentation, and Understanding of the Multivariate Nature of Controversies (Gen)

Renee M. Clary *(rclary@geosci.msstate.edu),* Mississippi State University, Mississippi State, Miss.

Students identify controversies, research opposing viewpoints, and argue assigned positions. Although students' primary views typically remained unchanged, they reported greater awareness of issues' multivariate nature.

SESSION 25

Using Energy to Connect Multidisciplinary Curricula (Gen)

(Elementary–High School) *Mediterranean, Renaissance*

Allison Scheff *(ascheff@bhe.mass.edu)* and **Robert F. Chen** *(bob.chen@umb.edu),* UMass Boston, Mass.

Pam Pelletier *(ppelletier@boston.k12.ma.us),* Boston (Mass.) Public Schools

Join us as we share energy connection cards to help you navigate to the best places for making connections across grade levels and disciplines.

SESSION 26

An Ice Core Classroom Investigation That Embodies the Three Dimensions of the *Next Generation Science Standards* (Earth)

(High School–College/Informal) *Pacific A/B, Renaissance*

Donna L. Young *(donna@aavso.org),* NASA/Chandra E/PO Office, Bullhead City, Ariz.

Experience a unique ice core investigation that incorporates absolute and relative dating, history, volcanoes, solar proton events, energy cycles, Earth systems, terrestrial events, and supernovas.

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SESSION 27

Teaching with Minecraft Across the Content Areas (Gen)

(Elementary–High School) *Pacific C, Renaissance*

Wayne J. Wheatley *(wwheatley@dcds.edu),* Detroit Country Day Middle School, Beverly Hills, Mich.

Many middle school students already love a game called Minecraft. Learn how you could use it to teach science, engineering, architecture, and even history!

SESSION 28

ASTE Session: A Paradigm Shift Is Underway—Are You and Your Students Ready? (Gen)

(General) *Pacific F, Renaissance*

Jeff C. Marshall *(marsha9@clemson.edu),* Clemson University, Clemson, S.C.

The *NGSS* requires a radical departure from traditional approaches. Come learn what ultimately has changed and what you can do to excel in today's new classroom.

SESSION 29

POGIL (Process-Oriented Guided Inquiry Learning) for the AP Physics Classroom (Phys)

(High School–College) *Pacific G/H, Renaissance*

Sandee J. Coats-Haan *(sandee.coatshaan@lakotaonline.com),* Lakota East High School, Liberty Township, Ohio

Structured POGIL activities replace lectures with minds-on learning to ensure that the instructor is not the only person thinking in the AP Physics classroom.

SESSION 30

Sci-Fi and STS for Literacy (Gen)

(High School) *Lighthouse I, Seaport*

James E. Hollenbeck *(jehollen@ius.edu),* Indiana University Southeast, New Albany

Science fiction uses scientific concepts with imagination, creativity, and "what if?" Come learn how we integrate science fiction in methods to teach literacy with science, technology, and society.

SESSION 31

Climate Change—STEM Project-based Inquiry Modules (Gen)

CANCELED

(Middle Level–High School) *Plaza A, Seaport*

Jaclyn F. Austin *(jaclyn_austin@hcpss.org)* and **Mary Weller** *(mary_weller@hcpss.org),* Howard County Public School System, Ellicott City, Md.

Through a National Commission on Teaching & America's Future (NCTAF) grant, schools have tackled climate change! Discover ways to integrate disciplines, engage scientists and educators, and deliver project-based STEM inquiry modules.

SESSION 32

Literacy and Inquiry with High School Science Notebooks (Gen)

(High School) *Plaza B, Seaport*

Brittany A. Stanford and **Eric W. Schwartz** *(eschwartz_56@hotmail.com),* Grace King High School, Metairie, La.

Promote organization, cooperative learning, critical thinking, literacy, and inquiry in your classroom with rigorous notebooks. See student samples from biology and physics classrooms and leave with lesson plans for your first unit!

SESSION 33

NSELA Session: Tools for Science Leaders, Part 1 (Gen)

(General) *Alcott, Westin Waterfront*

Darlene Ryan, Glenwood Elementary School, Chapel Hill, N.C.

Elizabeth A. Allan *(eallan@uco.edu),* University of Central Oklahoma, Edmond

Gail G. Hall, Vermont Dept. of Education, Montpelier

Bob Sotak *(bsotak@mac.com),* Washington Alliance for Better Schools, Edmonds

Brian Day, Everett (Wash.) Public Schools

Keri E. Randolph *(krandolph@pefchattanooga.org),* Southeast Tennessee STEM Innovation Hub, Chattanooga

Nicole Jacquay *(nicole.jacquay@sdhc.k12.fl.us),* **Michele Detwiler** *(michele.detwiler@sdhc.k12.fl.us),* and **Mindy Pearson** *(mindy.pearson@sdhc.k12.fl.us),* Hillsborough County Public Schools, Tampa, Fla.

Presider: Darlene Ryan

The various tools and strategies shared with science leaders in this session support them in their work to enhance teaching and learning in their context.

SESSION 34

Fostering and Enhancing Data Analysis and Literacy Through Visual Representation (Gen)

(Middle Level–College/Supv.) *Burroughs, Westin Waterfront*

Bill Dinkelmann *(bdinkelm@oaisd.org),* Ottawa Area Intermediate School District, Holland, Mich.

Free software tools are available to make sense of data sets. See how ArcGIS, infogr.am, and Tableau Public can be incorporated into teaching and student activities.

SESSION 35

Addressing the Unique Needs of Diverse Learners—Particularly Those with Learning Disabilities—in Introductory Biology Curricula (Bio)

(High School–College) *Faneuil, Westin Waterfront*

Abigail P. Littlefield *(alittlefield@landmark.edu),* Landmark College, Putney, Vt.

Emphasis will be placed on specific techniques to adapt the curriculum of introductory biology courses (high school and college) to better serve traditional learners and those with learning disabilities.

SESSION 36 (two presentations)

(General) *Grand Ballroom E, Westin Waterfront*

A Model to Disseminate *NGSS* Statewide (Gen)

Rayelynn Connole *(rconnole@mtech.edu),* Montana Tech, Butte

Christina Gillespie *(christina.gillespie@livingston.k12.mt.us),* East Side Intermediate School, Livingston, Mont.

Attention will be paid to a statewide dissemination model designed to deliver high-quality professional development on the *NGSS*.

Cognitive Planning for the K–8 *NGSS*: A Team Approach! (Gen)

Keith G. Palz *(kpalz@distinctiveschools.org),* Distinctive Schools, Chicago, Ill.

Take your science instruction to the next level by collaboratively focusing on the BIG picture—getting deeper into the *NGSS*.

SESSION 37

Integrating *CCSS* and *NGSS:* Building Leadership Capacity to Transform Science Teaching and Learning (Bio)

(Middle Level–High School/Supv.) *Griffin, Westin Waterfront*

Dawn O'Connor *(dawno@acoe.org),* Alameda County Office of Education, Hayward, Calif.

Let's explore a model for building distributed leadership capacity of districts to support systemic implementation of the *NGSS* and *CCSS* in science.

SESSION 38

Scaffolding Students Toward Argumentation: Strategies for Developing Literacy and Reasoning Skills (Gen)

(Elementary–High School) *Harbor Blrm. II, Westin Waterfront*

Douglas Llewellyn *(dllewellyn@sjfc.edu),* St. John Fisher College, Rochester, N.Y.

Find out how to take sensible, student-friendly steps to promote literacy and scientific reasoning skills as fostered through the *Common Core State Standards,* the NRC *Framework*, and the *NGSS*.

SESSION 39

Five Easy Pieces—From STEAM to Telescopes: A Teacher Leadership Montage (Gen)

(General) *Harbor Ballroom III, Westin Waterfront*

Steven G. Ruthford *(ruthfords@einsteinfellows.org),* Sehome High School, Bellingham, Wash.

Britta Culbertson *(brittaculbertson@gmail.com),* Einstein Fellow, NOAA Office of Education, Washington, D.C.

Joseph Isaac *(jisaac@@einsteinfellow.trianglecoalition.org),* Einstein Fellow, National Science Foundation, Arlington, Va.

Chris T. Campbell *(ccampbell@lincolnschools.org),* Simsboro High School, Ruston, La.

Using an interactive presentation style, these accomplished teacher leaders will present valuable techniques that can immediately impact student learning in your classroom, school, or district.

SESSION 40

Evidence-based Argumentation: Engaging Science Students in Boston Public Schools (Gen)

(General) *Lewis, Westin Waterfront*

Brandon Finegold *(brandon@bostondebate.org)* and **Paul E. Madden** *(paul@bostondebate.org),* Boston Debate League, Boston, Mass.

Rachel Chess and **Ivyrose Hess** *(ivyrose.hess@gmail.com),* Jeremiah E. Burke High School, Dorchester, Mass.

Learn multiple debate-style activities from evidence-based argumentation, an initiative that has improved student literacy skills in science in Boston Public Schools.

SESSION 41

Infusing Engineering into the High School Physics Curriculum (Phys)

(High School/Supervision) *Paine, Westin Waterfront*

Kristen B. Wendell *(kristen.wendell@umb.edu),* UMass Boston, Mass.

Derek van Beever, Newton South High School, Newton, Mass.

Shu-Yee Chen Freake *(chenryi@gmail.com),* Newton North High School, Newtonville, Mass.

Join us as we showcase an approach for infusing the engineering concepts of design, analysis, modeling, and systems into high school physics courses.

8:00–9:00 AM Workshops

Project-based Approach to Teaching Newton's Three Laws with Coaster Cars (Chem)
(Middle Level) *160A, BCEC*
Beth Gorak and **Mary K. Fassbender** *(mary.fassbender@franklin.k12.wi.us),* Forest Park Middle School, Franklin, Wis.
Sharon A.L. Hushek *(sharon.hushek@franklin.k12.wi.us),* Ben Franklin Elementary School, Franklin, Wis.
Test-drive new learning in your classroom. Align your curriculum to *NGSS* practices and crosscutting concepts using a project-based hands-on unit to teach Newton's three laws using wooden coaster cars.

PDI **BSCS Pathway Session: Exploring the *NGSS* Practices of Science and Engineering (Gen)**
(General) *203, BCEC*
Brooke Bourdélat-Parks *(bbparks@bscs.org)* and **Jody Bintz** *(jbintz@bscs.org),* BSCS, Colorado Springs, Colo.
This interactive session will deepen participant understanding of the science and engineering practices. The session will focus on what teachers and students are doing when using each practice in the STEM classroom. Participants will explore ideas for scaffolding these practices so that students come to understand and use each practice to make sense of scientific phenomena.

From Data Visualization to Argument—Tools for Lifelong Science Literacy (Bio)
(High School) *205A, BCEC*
Amy F. Smith *(amy.falk.smith@iamstem.ucdavis.edu)* and **Alisa Lee,** University of California, Davis
Join us and get introduced to SeeIt, a free online data visualization tool designed to help students interpret biostatistical data and write evidence-based arguments.

Creating LGBTQ-inclusive Science Learning Classrooms **(Bio)**
(General) *205B, BCEC*
Jenny Betz *(jbetz@glsen.org),* GLSEN, New York, N.Y.
Eric V. Patridge *(eric.patridge@ostem.org),* oSTEM, West Haven, Conn.
Learn about the needs/strengths of LGBTQ learners. We will then break into differentiated groups to focus on improving our practices within science classrooms.

Is That a FACT? Formative Assessment Classroom Techniques for the Elementary Science Classroom **(Gen)**
(Elementary–Middle Level) *207, BCEC*
Carolyn Mohr, Southern Illinois University, Carbondale
Tina A. Harris *(taharris79@yahoo.com),* Ball State University, Muncie, Ind.
This hands-on workshop provides teachers with toolboxes of formative assessment tools/strategies to take back to their classrooms and use. Come check out the FACTs.

Integrating Science with Core Academic Subjects in the Preschool and Elementary Classroom **(Gen)**
(Preschool–Elementary) *212, BCEC*
Katie M. Morrison *(katiem@ucds.org)* and **Deb Chickadel** *(debc@ucds.org),* University Child Development School, Seattle, Wash.
Investigate the interconnectedness of subjects and take away planning and implementation strategies to more easily incorporate science into the school day.

Designing the Future **(Gen)**
(Elementary) *213, BCEC*
Shirley Willingham *(sw6@rice.edu),* Rice University, Houston, Tex.
Children are natural engineers. Learn how to integrate design challenges into your everyday science curriculum using engineering briefs. Practice by designing and testing your own beam bridge!

NSTA Press® Session: Earth Science Puzzles—Making Meaning from Data **(Earth)**
(Middle Level–College) *253C, BCEC*
Margie Turrin *(mkt@ldeo.columbia.edu),* Lamont-Doherty Earth Observatory, Columbia University, Palisades, N.Y.
Empower your students to learn science the way scientists do—from collected evidence! Infuse Data Puzzles into your Earth and environmental science curricula.

Can You Justify That? Tricks and Tips to Easily Assess the Justifications in Students' Arguments **(Gen)**
(Middle Level) *254B, BCEC*
Amanda M. Knight *(knightam@bc.edu),* Boston College, Chestnut Hill, Mass.
Kris Grymonpré *(krigrymonpre@gmail.com),* Dever-McCormack School, Dorchester, Mass.
We will present an innovative scientific argumentation lesson and illustrate how to assess students' oral and written arguments using a checklist and "pathway to mastery."

The Little Things That Run the World: Soil Ecology in the Classroom **(Env)**
(Informal Education) *256, BCEC*
David L. Brock *(brockda@rpcs.org),* Roland Park Country School, Baltimore, Md.
Come discover the realm of the amoeba! Learn how to engage your students in field studies exploring the ecology of the microscopic world.

Using Electric Circuit Puzzles for Design and Assessment **(Phys)**
(Elementary–Middle Level) *259A, BCEC*
Cherubim Cannon and **Janice Porter** *(porter42b@aol.com),* P.S. 005 Dr. Ronald McNair, Brooklyn, N.Y.
Anja Hernandez *(anjahernandez@ccny.cuny.edu),* City College of New York, N.Y.
Joaquin Rodriguez *(jrvillage@rcr.com),* PS 41M The Greenwich Village School, New York, N.Y.
Heather-Marie Montilla *(heather@doingarttogether.org),* Doing Art Together, Inc., New York, N.Y.
Electric circuit diagrams can be challenging! Learn to make and use a 4x4 block puzzle that can represent a large variety of circuits.

Improving Observation Skills Through Dichotomous Keys **(Bio)**
(High School–College) *Atlantic 1, Renaissance*
Richard A. Grumbine *(rgrumbine@landmark.edu),* Landmark College, Putney, Vt.
In this workshop, participants will engage in a hands-on activity designed to enhance the observation skills of biology students.

Using Case Study Analysis as a Tool for Differentiating Science Instruction for Students with Special Needs **(Gen)**

(Elementary–High School) *Atlantic 2, Renaissance*

Gregory Borman, The City College of New York, N.Y.
Lionel Callender *(lcallen4@schools.nyc.gov)* and **Derek Ramdass** *(dramdas@schools.nyc.gov),* New York City Dept. of Education, Floral Park, N.Y.

Analyze a variety of case studies in small groups to help identify effective strategies for differentiating science instruction for students with disabilities.

Achieving the Goal of Literacy: Science and Literature as Partners **(Gen)**

(Middle Level–High School) *Constitution, Seaport*

Norman G. Lederman *(ledermann@iit.edu),* **Judith S. Lederman** *(ledermanj@iit.edu),* and **Selina L. Bartels** *(sbartels@hawk.iit.edu),* Illinois Institute of Technology, Chicago

Teach language arts effectively and learn how to incorporate, teach, and assess the *Common Core State Standards, ELA* into your current science curriculum. Free materials!

Enhancing Literacy and Inquiry in Science with Technology **(Gen)**

(General) *Commonwealth Ballroom C, Westin Waterfront*

Loryn N. Windwehen *(lorynw@gmail.com),* Harris Middle School, San Antonio, Tex.

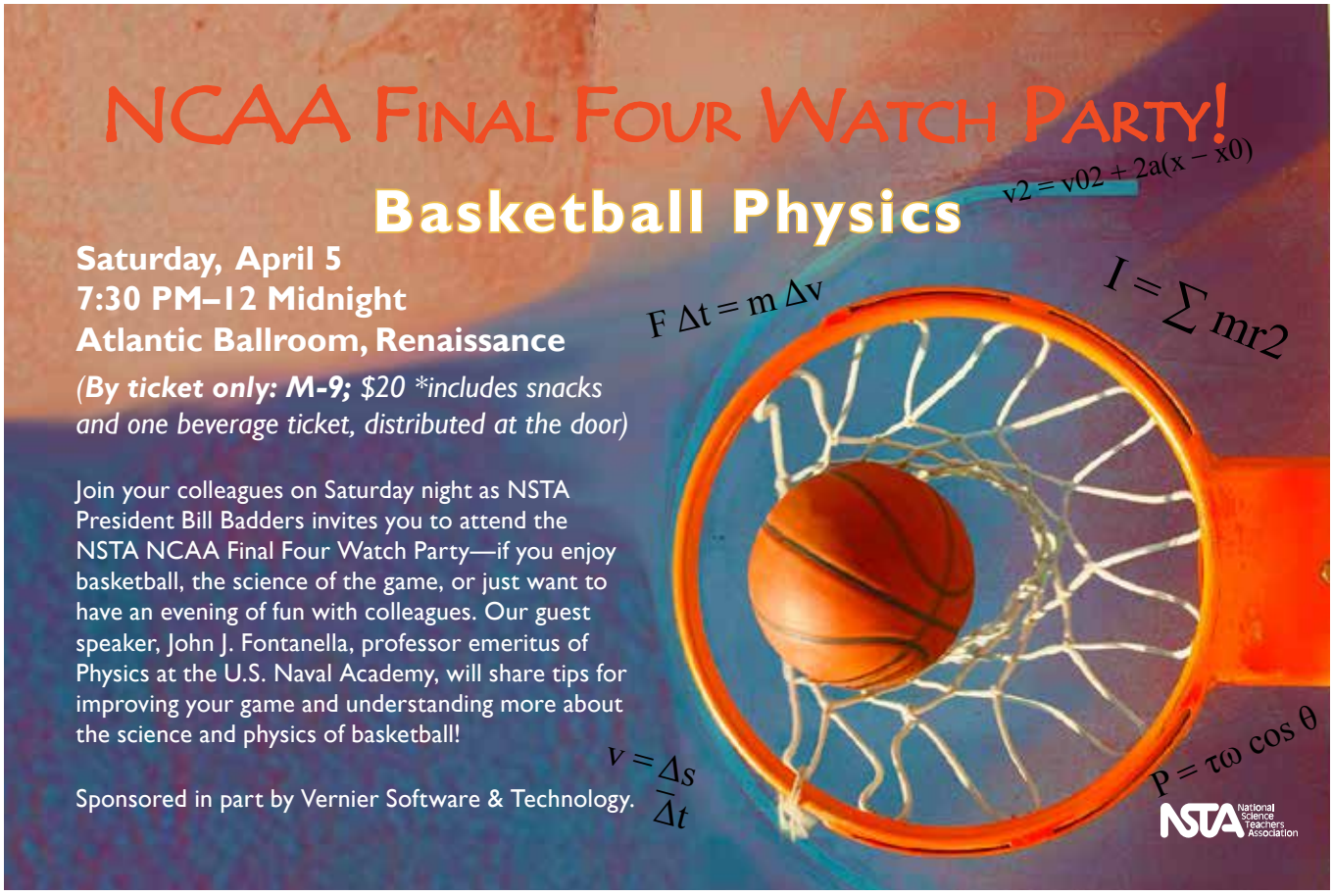
Come to this hands-on workshop to see how we can incorporate Web 2.0 and other technology resources to encourage inquiry and literacy. You're sure to love these easy-to-use sites and apps!

Effective STEM Education: Project Envisioning with Young Makers **(Gen)**

(Preschool–Middle Level) *Douglass, Westin Waterfront*

Jerry D. Valadez *(jdvscience@yahoo.com),* Fresno State University, Fresno, Calif.
Ana G. Lopez *(anaglopez4@att.net),* Central Valley Science Project, Fresno, Calif.

Discover how to foster a collaborative culture of creativity, innovation, and experimentation with cross-disciplinary projects that effectively teach STEM and science and engineering practices.



CSSS Session: Core K–12 Ideas That Support Student Understanding of the *NGSS* **(Gen)**
(Informal Education) *Harbor Ballroom I, Westin Waterfront*
Brett Moulding *(mouldingb@ogdensd.org),* Council of State Science Supervisors, Ogden, Utah
Juan-Carlos Aguilar *(jaguilar@doe.k12.ga.us),* Georgia Dept. of Education, Atlanta
Attention will be paid to illustrating how the logic progression of the disciplinary core ideas as described in the NRC *Framework* support student understanding of the *NGSS.*

DuPont Presents: Bringing Literacy and STEM Together—BLAST **(Gen)**
(Elementary) *Otis, Westin Waterfront*
Renee G. O'Leary, Holy Angels School, Newark, Del.
Peggy Vavalla, DuPont, Wilmington, Del.
BLAST for Success at School and Home (for grades 3–5) uses hands-on explorations and "fractured fairy tales" as catalysts to introduce STEM concepts to early learners. Participants will receive sample plans and materials that utilize multisensory and integrated practices that can be used immediately in the classroom.

Crystallography: A World of Wonders **(Gen)**
(Elementary–High School) *Stone, Westin Waterfront*
Claudia Rawn *(crawn@utk.edu),* University of Tennessee, Knoxville
Celebrate the International Year for Crystallography 2014 with simple crystallographic concepts explored through hands-on activities suitable for all grades.

Life Cycle of the Monarch Butterfly **(Env)**
(General) *Webster, Westin Waterfront*
Jim O'Leary *(oleary@mdsci.org)* and **Maureen Sullivan,** Maryland Science Center, Baltimore
De Cansler *(decansler@gmail.com)* and **Katie-Lyn Bunney** *(kbunney@umn.edu),* University of Minnesota, St. Paul
Examine the four stages of the Monarch butterfly with live specimens of each stage—egg, larva, pupa, and adult monarchs.

8:00–9:00 AM Exhibitor Workshop

Engineering in the *Next Generation Science Standards* **(Phys)**
(Grades 9–12) *156C, BCEC*
Sponsor: It's About Time
Cary I. Sneider, Portland State University, Portland, Ore.
The *NGSS* will break from previous documents by merging science and engineering. This workshop will illustrate how a new high school curriculum—Engineering the Future: Science, Engineering, and the Design Process—can help students develop their abilities to argue from evidence and learn core ideas about energy through engaging hands-on activities.

8:00–9:15 AM Presentation

SESSION 1
Meet Me in the Middle Session: Bring Your Own Breakfast (BYOB) for Middle School Educators **(Gen)**
(Middle Level) *Grand Ballroom A/B, Westin Waterfront*
Patty McGinnis, Arcola Intermediate School, Eagleville, Pa.
Bring your own breakfast to this networking session with middle school leaders. Roundtables will feature topics related to the *NGSS,* science literacy, and more!

8:00–9:30 AM Workshop

PDI **NGSS Pathway Session: Developing a STEM Philanthropic Plan** **(Gen)**
(General) *206 A/B, BCEC*
Mariel Milano *(mariel.milano@ocps.net)* and **Debi Pedraza** *(debi.pedraza@ocps.net),* Orange County Public Schools, Orlando, Fla.
Jo Anne Vasquez *(jvasquez@helios.org),* 1996–1997 NSTA President, and Helios Education Foundation, Phoenix, Ariz.
This session will focus on the development of a strategic plan for securing resources to launch a large-scale STEM initiative. Participants will examine the development process behind a large urban district's STEM philanthropic plan and identify ways to begin local philanthropic efforts.

8:00–9:30 AM Exhibitor Workshops

Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (Bio)
(Grades 6–12) *102A, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Animals look different, but are they really that different on the inside? Students find out firsthand with this hands-on dissection of a pig, rat, shark, and frog. It's a fascinating comparative dissection activity that features our very best Carolina's Perfect Solution vertebrate specimens. Free dissection supplies and great door prizes.

Inquiry + Nonfiction Readings = Engaged Biology and Chemistry Students (Bio)
(Grades 9–12) *102B, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Seamlessly integrate nonfiction readings and authentic technical text into your hands-on biology or chemistry curriculum. Learn how combining science inquiry with newspaper articles, book excerpts, and other real-world informational text can increase interest and foster content mastery as students critically think through claims based on evidence. The result? Scientifically literate citizens.

Captivating Digital Natives' Imaginations with STEM Visual Literacy (Gen)
(Grades K–8) *103, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Reflect on the makeup of the *Next Generation Science Standards*. Apply this knowledge and understanding to effectively integrate visual literacy to engage students of the digital age. Learn how to incorporate engaging online resources into your inquiry-based classroom instructional strategies.

Explore STEM Integration with PASCO Probeware—Free Sensor Set for Five Attendees! (Gen)
(Grades 6–12) *104A, BCEC*
Sponsor: PASCO scientific
Tom Loschiavo, PASCO scientific, Roseville, Calif.
Experience a showcase of sensor-based activities compatible with iPad, Android, Chromebook, Mac, and PC environments that engage students as they deepen their understanding of science concepts. A variety of topics in biology, chemistry, physics, Earth, environmental, and physical science will be available for demonstration. Five lucky attendees will win a 50th Anniversary Sensor Pack—a $600 value!

Transform Your Classroom and Integrate Engineering Concepts with PLTW's K–12 STEM Programs (Gen)
(Grades K–12) *104B, BCEC*
Sponsor: Project Lead The Way
Carolyn Malstrom *(cmalstrom@pltw.org),* Project Lead The Way, Indianapolis, Ind.
Hear from fellow educators about the transformative power of Project Lead The Way's activity-, project-, problem-based STEM programs. PLTW's curricula are aligned to the *Common Core State Standards* and *NGSS;* proven to improve student performance; and emphasize critical thinking, problem solving, and the engineering design process.

Biomes and Invasive Species (Bio)
(Grades 9–12) *104C, BCEC*
Sponsor: LAB-AIDS, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
How do the characteristics of a biome determine the plant and animal life found there? How do nonnative species survive to become invasive species? In this activity from the SEPUP's *Science and Global Issues: Biology* program from LAB-AIDS, students match a set of organism cards to proper climate/biome cards, then use literacy strategies to consider the impact of invasive species. Participants receive a full set of kit and print materials for later use.

College Readiness in Science: What's Ideal…and What's Real? (Bio)
(Grades K–12) *105, BCEC*
Sponsor: Pearson
Kenneth R. Miller, Brown University, Providence, R.I.
One of the stated goals of both new national education initiatives, the *CCSS* and the *NGSS*, is the preparation of all students for college and career. Given the increasingly technical nature of the workplace in the decades ahead, acquiring skills in science and mathematics will become even more important for all students, whether they move directly into careers or continue their educations at the college level.

Plate Tectonics: Continents on the Move (Earth)
(Grades 5–12) *106, BCEC*
Sponsor: Simulation Curriculum Corp.
Herb Koller *(hkoller@simcur.com),* Simulation Curriculum Corp., Minnetonka, Minn.
Join us as we use Simulation Curriculum's *The Layered Earth* to investigate continental drift and the theory of plate tectonics. Classroom-ready lessons engage students with interactive learning activities, thought-provoking exercises, and historical links while displaying a contextual and interactive model of Earth.

STEM Resources for Teaching Climate Change: Easy, Engaging, and Free (Earth)
(Grades 6–College) *107A, BCEC*
Sponsor: Howard Hughes Medical Institute
Laura Dinerman, Sherwood High School, Rockville, Md.
Mark Nielsen, Howard Hughes Medical Institute, Chevy Chase, Md.
Earth's climate is dynamic and its history is written in the rocks. This workshop will highlight free classroom resources developed by HHMI's BioInteractive website for teaching climate both in the past and present. Using our popular Earth history app, we will highlight what is known about how climate has changed in the past and how that improves our understanding of present-day climate change.

Neuroscience as a STEM Subject (Gen)
(Grades 6–College) *107B, BCEC*
Sponsor: Society for Neuroscience
Rochelle D. Schwartz-Bloom, Duke Institute for Brain Sciences, Durham, N.C.
James E. Olson, Wright State University, Dayton, Ohio
Neuroscience isn't just for biology class! Learn how you can use the science of the brain to enliven your chemistry or physics lessons. Explore relevant and engaging topics like drug addiction, neuroimaging, and the action potential; discuss teaching approaches and lesson ideas; and learn hands-on activities to take back to your classroom.

Applying *Common Core State Standards, ELA* Through Active Science Instruction (Gen)
(Grades K–5) *107C, BCEC*
Sponsor: Sangari Active Science
Ellen Mintz *(emintz621@gmail.com),* Charleston County Schools, Charleston, S.C.
The *Common Core State Standards, ELA* require students to read using informational text and write using skills encouraged through science instruction. Using a hands-on/minds-on activity, we will investigate and use the data we collect to write a claims and evidence response. Reading strategies will be used to tie our investigation to informational text.

Bats, iPads, and Citizen Science in the Classroom (Bio)
(General) *108, BCEC*
Sponsor: Wildlife Acoustics, Inc.
Sherwood Snyder *(sherwood@wildlifeacoustics.com),* Wildlife Acoustics, Inc., Concord, Mass.
Learn how to turn your iPad, iPhone, and iPod into a bat detector/recorder/analyzer for bioacoustics and Citizen Science bat classroom projects. Wildlife Acoustics will introduce the Echo Meter Touch—ultrasonic is now ultracool.

Exploring the Molecular World: Scientifically Accurate Visualization and Simulation Tools (Chem)
(Grades 7–College) *109B, BCEC*
Sponsor: Wavefunction, Inc.
Paul Price *(sales@wavefun.com),* Wavefunction, Inc., Irvine, Calif.
The 3-D visualization of modern software is uniquely suited to help students develop an intuitive grasp of the molecular basis of chemistry. Bring your laptop (Windows or Mac OS X) to this hands-on workshop and learn how to support your teaching with the powerful recent releases of *ODYSSEY* High School Chemistry and *ODYSSEY* AP Chemistry.

Teaching Astronomy During the Day and Beyond the Classroom (Earth)
(Grades 9–College) *150, BCEC*
Sponsor: Fisher Science Education
Robert Marshall *(marshallr@carnegiesciencecenter.org),* Carnegie Science Center, Pittsburgh, Pa.
Join an expert educator from the Buhl Planetarium and Observatory as you explore STEM activities and educational research opportunities to implement in your classroom. Then, investigate initiatives to continue learning outside the classroom such as observing projects and star parties, complete with an instructive hands-on telescope tutorial.

SparkFun: "Scratch"ing the Surface of Programming (Gen)
(Grades 5–12) *151A, BCEC*
Sponsor: SparkFun Electronics
Linz Craig *(linz@sparkfun.com),* SparkFun Electronics, Boulder, Colo.
Scratch™ is an open-source application developed at MIT to teach students as young as five years old to program using

drag and drop blocks. We will uncover an often overlooked feature of Scratch and integrate external sensors and inputs through our PicoBoard. We will enhance existing projects such as using light sensors to control your animation's background, sliders to control character speed, and sound to make characters jump. If you are already using Scratch, come see what new activities you can do to enhance student learning. If you've never seen Scratch before, come and play with us—we have lots to share!

Genetics: Crazy Chromosomes (Bio)
(Grades 5–12) *151B, BCEC*
Sponsor: CPO Science/School Specialty Science
Scott Eddleman and **Nathan Olsson,** CPO Science/School Specialty Science, Nashua, N.H.
This workshop uses our new Crazy Chromosomes along with our Crazy Traits set. Explore the connection between traits, chromosomes, genes, and DNA by building a model of your creature's chromosomes. Use the chromosomes to model the processes of meiosis and fertilization. Take away strategies for addressing the *NGSS* performance expectations.

Online Assessment That Informs Instruction! (Gen)
(Grades 3–6) *152, BCEC*
Sponsor: Delta Education/School Specialty Science–FOSS
Kathy Long and **Brian T. Campbell,** The Lawrence Hall of Science, University of California, Berkeley
Join developers for an introduction to the new assessment system created for FOSS 3rd Edition, including computer software (FOSSmap). Experience how formative assessment plays an integral role throughout the FOSS program. Grades 3–6 students can now take benchmark assessments online with most items automatically coded to generate useful reports.

K–8 Science with Vernier (Gen)
(Grades K–8) *153A, BCEC*
Sponsor: Vernier Software & Technology
David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Conduct a variety of experiments for elementary and middle school science using Vernier sensors with a LabQuest 2 or computer in this engaging hands-on workshop. Experience how Vernier has been incorporating the principles of the *NGSS* science and engineering practices for 33 years!

Water Quality with Vernier (Env)
(Grades 7–College) *153B, BCEC*
Sponsor: Vernier Software & Technology
Jack Randall *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Learn how to use sensors and LabQuest 2 with its Data Matrix Mode and built-in GPS to study water quality in the field. Try the new Optical DO Probe, designed to make dissolved oxygen measurements easy! See how to map your data on Google Maps using Logger *Pro* software.

Inspire Scientific Minds with Technology and Manipulatives (Gen)
(Grades 3–12) *153C, BCEC*
Sponsor: Scientific Minds
Kathy Reeves and **Angie Casteel,** Scientific Minds, Orange, Tex.
Teach critical science standards with technology and manipulatives using Scientific Minds' new lab kits for grades 3–8, biology, and chemistry. Lessons support the standards of all states and the *NGSS*. Attendees receive door prizes, a free lab kit, and trial access to the award-winning Science Starters program.

Evaluating Student Knowledge: Formative Assessments with Discovery Education Science Techbook (Gen)
(General) *154, BCEC*
Sponsor: Discovery Education
Duane Waber, Discovery Education, Silver Spring, Md.
In this workshop, we will explore different methods of formative evaluation using the Discovery Education Science Techbook. We will take a close look at the rich variety of ongoing assessment tools in the Techbook, including brief constructed responses, online assessments, student worksheets, the writing prompt builder, interactive science journals, and more.

Fun with Ward's Forensics and the *NGSS* (Chem)
(Grades 9–12) *156A, BCEC*
Sponsor: Ward's Science
Presenter to be announced
Discover how forensics fits the framework for the *Next Generation Science Standards* with a hands-on activity involving blood spatter and fingerprint evidence. You'll learn how to lead your students through inquiry-based crime solving while practicing forensic science techniques and addressing math and technology in context using math and computational thinking.

MINDSTORMS® EV3 Robotics in the Middle School Classroom—Getting Started (Gen)
(Grades 6–8) *156B, BCEC*
Sponsor: LEGO® Education
William J. Church, Profile High School, Bethlehem, N.H.
Middle school physical science + robotics = great learning experiences! Get your hands on the latest LEGO MINDSTORMS Education EV3 curriculum and resources designed to address the *Next Generation Science Standards* and cover renewable energy, thermal physics, mechanics, and light.

Fantastic Physical Science Demonstrations from Flinn Scientific (Phys)
(Grades 6–12) *258A, BCEC*
Sponsor: Flinn Scientific, Inc.
Janet Hoekenga *(jhoekenga@flinnsci.com)* and **Mike Marvel** *(mmarvel@flinnsci.com),* Flinn Scientific, Inc., Batavia, Ill.
Amaze your students with quick demonstrations that teach common physical science topics, including density, motion, force and equilibrium, rotation, waves, light and color, energy, pressure, and scientific inquiry. More than a dozen effective demonstrations will be performed. Handouts provided for all activities.

What the Heck Happened?!?! (Gen)
(Grades 6–10) *258B, BCEC*
Sponsor: Educational Innovations, Inc.
Ted Beyer, Educational Innovations, Inc., Bethel, Conn.
Discrepant events seize students' attention, and Educational Innovations has real jaw-droppers. Come explore our favorite student confusers. Door prizes and freebies!

You Be The Chemist®: Activities for Making Chemistry Fun! (Chem)
(Grades 5–8) *Pacific D/E, Renaissance*
Sponsor: The Dow Chemical Co.
Michelle Langley and **Rob Vallentine,** The Dow Chemical Co., Midland, Mich.
John Rice, Chemical Educational Foundation, Arlington, Va.
The Dow Chemical Company and Chemical Educational Foundation® (CEF), a national nonprofit organization, have partnered to introduce CEF's You Be The Chemist (YBTC) educational programs. These innovative programs introduce students to the central role of chemistry in everyday life by providing educators with inquiry-based and easy-to-use activities. Join us and engage in experiment demonstrations from CEF's in-depth lesson plan guides (take home a complimentary copy of the guide) and discuss ways to integrate similar content into your curriculum! CEF will also introduce the organization's other YBTC offerings, which include a hands-on professional development workshop for educators and an exciting academic competition for their students!

8:00–10:00 AM Workshops

PDI **AMNH Pathway Session: Analyzing and Interpreting Data Using Visualizations and Scientific Data Sets (Earth)**
(Middle Level–High School) *208, BCEC*
Dave Randle *(drandle@amnh.org)* and **Jay Holmes** *(jholmes@amnh.org),* American Museum of Natural History, New York, N.Y.
Presider: Hudson Roditi, American Museum of Natural History, New York, N.Y.
This session engages in visualizations of GRACE scientific data on ice sheets in Greenland and Antarctica to explore how climate change is affecting these regions.

8:00–10:00 AM Elementary Extravaganza

(Preschool–Elementary) *Ballroom East, BCEC*

Organizer: Linda Froschauer *(fro2@me.com),* 2006–2007 NSTA President, and Field Editor, *Science & Children,* Westport, Conn.

This Extravaganza is not to be missed! Join elementary groups of professionals for an exceptional opportunity—more than 100 presenters will provide ideas. 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, and much more will be available to participants. Come grab some coffee, enter to win prizes, and walk away with a head full of ideas and arms full of materials! Visit *bit.ly/1dhrzPk* for a complete list of Extravaganza participants or please pick up a program at the door.

Participating organizations 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.

This event is sponsored in part by Carolina Biological Supply Co.; Center for Educational Outreach, Baylor College of Medicine; Delta Education; Educational Innovations, and Science Companion.

8:00–11:15 AM Short Course

Our Changing Earth: New England's Geologic Past (SC-8)

(Elementary–Middle Level) *Tremont, Marriott Copley Place*

Tickets Required; $45

Jennifer Cross Peterson *(jenniferpeterson@hmsc.harvard.edu)* and **Arielle Ascrizzi** *(arielle_ascrizzi@harvard.edu),* Harvard Museum of Natural History, Cambridge, Mass.

David Heiser *(david.heiser@yale.edu)* and **Jim Sirch** *(james.sirch@yale.edu),* Yale Peabody Museum of Natural History, New Haven, Conn.

For description, see Volume 1, page 54.

8:00 AM–12 Noon Short Course

We're All in This Together: Cooperative Learning in the Science Classroom (SC-9)

(Grades K–8) *Boylston, Marriott Copley Place*

Tickets Required; $41

Mia Dubosarsky *(mdubosarsky@wpi.edu),* The STEM Education Center at Worcester Polytechnic Institute, Worcester, Mass.

For description, see Volume 1, page 54.

8:30–10:00 AM Exhibitor Workshop

Worm and Squirm Your Way into Behavior Labs (AP Big Ideas 1, 2, 3, 4) (Bio)

(Grades 9–College) *157B, BCEC*

Sponsor: Bio-Rad Laboratories

Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

How do genes influence behavior? Use the model organism *C. elegans* (a nematode) to answer this question in an engaging activity that compares normal and mutant worm behavior. We will explore worm taste preferences in a simple and fast chemotaxis assay, and examine the connection of our worm mutant to human diseases. Come see this great alternative to AP fruit fly behavior lab!

8:30–10:30 AM Meeting

Aerospace Programs Advisory Board Meeting

Hale, Westin Waterfront

9:00–10:30 AM Meeting

***NSTA Reports* Advisory Board Meeting**

Georges, Renaissance

9:00–11:30 AM Exhibitor Workshop

DNA Detectives: Who Killed Jose? (AP Big Ideas 3, 4) (Bio)

(Grades 10–College) *157A, BCEC*

Sponsor: Bio-Rad Laboratories

Sherri Andrews *(sherri_andrews@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

In this hands-on lab, solve a theatrical crime scene using biotechnology skills such as DNA gel electrophoresis, restriction digestion, and pipetting. Learn about the Innocence Project and how the wrongly accused can be exonerated.

9:00 AM–12 Noon NSTA ESP Symposium

ESP: Unique Features of Programs That Meet "More Emphasis" Features in the NSES (Gen)

(General) Grand Ballroom D, Westin Waterfront

The Standards offered but Four Goals/Justifications for Science in K–6 Settings, namely that all students would: 1) Experience the richness and excitement of knowing about and understanding the natural world; 2) Use appropriate scientific processes and principles in making personal decisions; 3) Engage intelligently in public discourse and debate about matters of scientific and technological concern; and 4) Increase their economic productivity through the use of the knowledge, understandings, and skills of the scientifically literate person in their careers.

The ESP series identifies people and places where the reforms recommended have emerged. The exemplars include: 1) Exemplary Science in Grades PreK–4; 2) Exemplary Science in Grades 5–8; 3) Exemplary Science in Grades 9–12; 4) Exemplary Science: Best Practices in Professional Development; 5) Inquiry: The Key to Exemplary Science; 6) Exemplary Science in Informal Education Settings; 7) Exemplary Science for Resolving Societal Challenges; 8) Exemplary Programs for Building Interest in STEM Careers; and 9) Exemplary College Science Teaching.

The series was conceived by Robert E. Yager (1982–1983 NSTA President), who continues ESP searches and ways of recognizing classroom successes while also encouraging more to try!

Coordinators:
Robert E. Yager, 1982–1983 NSTA President, and University of Iowa, Iowa City
Susan Koba, Retired Educator, Omaha, Neb.

Symposium Participants:

Community of Excellence in Mathematics and Science
Susan Koba *(koba@cox.net),* Retired Educator, Omaha, Neb.

Adapting the JASON Project
Warren Phillips *(a1science@yahoo.com),* Retired Educator, Halifax, Mass.

Bringing School Science to College
Sondra Akins *(akins@wpunj.edu),* William Paterson University, Wayne, N.J.

The Road to Becoming an Exemplary College Science Teacher
Katherine Follette *(kfollette@as.arizona.edu),* The University of Arizona, Tucson

Teaching Science with Pictures
Karl Spencer *(karl.spencer@visualrealization.com),* The Visual Realization Program, Houston, Tex.

Developing Students' Authentic Inquiry Skills
Judith A. Scheppler *(quella@imsa.edu),* Illinois Mathematics and Science Academy®, Aurora

Why STEM? Why Now?
Brenda Wojnowski *(bwojnowski@gmail.com),* WAI Education Solutions, Dallas, Tex.

Stop Talking, Start Listening
Peter Veronesi *(pverones@brockport.edu),* The College at Brockport, N.Y.

9:00 AM–12 Noon Short Courses

To Read or Not to Read: That Is No Longer the Question (SC-10)

(Upper Elementary–Middle Level) *Simmons, Marriott Copley Place*

Tickets Required; $33

Traci Wierman and **Rebecca Abbott** *(rebabbott@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

For description, see Volume 1, page 54.

Sustainability and Engineering (SC-11)

(Middle Level) *Suffolk, Marriott Copley Place*

Tickets Required; $35

Sarah Soule and **Kathryn Danielson** *(kdanielson@calacademy.org),* California Academy of Sciences, San Francisco

For description, see Volume 1, page 55.

9:00 AM–3:00 PM Short Courses

Building Capacity for Collaborative School Communities for Science Learning (SC-12)

(General) *St. Botolph, Marriott Copley Place*

Tickets Required; $36

CANCELED

Susan Mundry *(smundry@wested.org),* WestEd, Woburn, Mass.

Katherine Stiles *(kstiles@wested.org),* WestEd, Morgantown, Ind.

For description, see Volume 1, page 55.

Engineering Extravaganza! (SC-13)

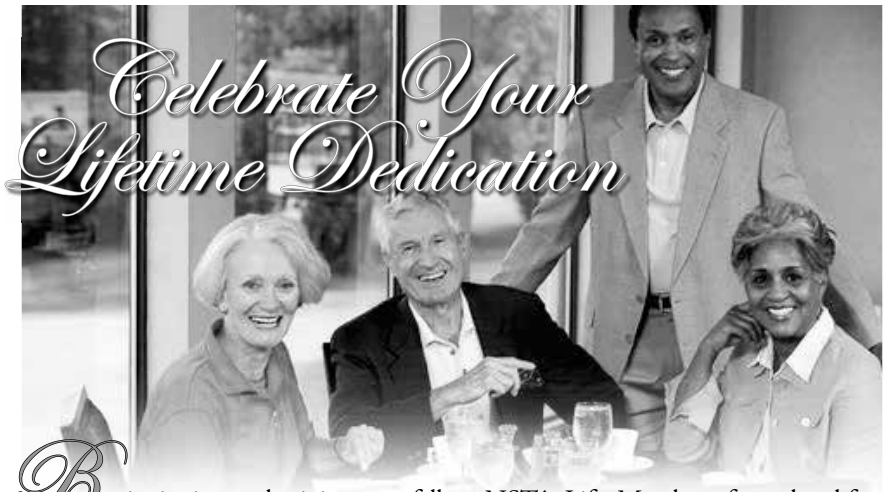
(General) *Wellesley, Marriott Copley Place*

Tickets Required $44

Cathi Cox-Boniol *(ccox@lincolnschools.org),* Lincoln Parish Schools, Ruston, La.

Missy Wooley, New Tech @ Ruston, La.

For description, see Volume 1, page 55.



By invitation only, join your fellow NSTA Life Members for a breakfast filled with memories as well as meaning. Catch up with old friends, make new ones, trade war stories, and discuss ways to share your talents and vitality with the science education community.

NSTA Life Members' Buffet Breakfast

Sunday, April 6

7:00–8:00 AM

The Westin Boston Waterfront, Douglass

Tickets are required (M-10: $50) and, if still available, must be purchased at the NSTA Registration Area by 3:00 PM on **Saturday, April 5**.

Participation is limited to NSTA life members only.

9:00 AM–5:00 PM Networking Opportunities

NSTA International Lounge

Revere, Westin Waterfront

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

9:00 AM–5:00 PM Exhibits

Exhibit Hall A, BCEC

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

9:30–10:00 AM Workshops

Meet Me in the Middle Session: Synergy Between Science and Literacy in the Classroom (Gen)

(General) *Commonwealth Ballroom B, Westin Waterfront*

Scott E. Diamond *(scott.diamond@fayette.kyschools.us),* The Learning Center at Linlee, Lexington, Ky.

We will provide practical approaches for using science and literacy to support student achievement developed during an ongoing collaboration between a science teacher and an English teacher.

Meet Me in the Middle Session: *Middleschoolchemistry.com*—Big Ideas About the Very Small (Chem)

(Middle Level) *Grand Ballroom E, Westin Waterfront*

James Kessler *(jhkessler@acs.org),* American Chemical Society, Washington, D.C.

Conduct hands-on activities from *middleschoolchemistry.com* (a free resource) to explore liquids, solids, and gases. The 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lessons and molecular animations are freely available for use in the classroom.

9:30–10:30 AM Meeting

Development Advisory Board Meeting

(By Invitation Only) *Executive Boardroom, Westin Waterfront*

9:30–10:30 AM Presentations

SESSION 1

Building Bridges Through Elementary STEM (Gen)

(Elementary) *158, BCEC*

Audrey Andrieski *(aandries@richland2.org),* North Springs Elementary School, Columbia, S.C.

Presider: Sally Catoe, North Springs Elementary School, Columbia, S.C.

If you are a primary teacher, where would you start to build a primary STEM unit?

SESSION 2

PDI **Wheelock Pathway Session: Supporting Science Talk in PreK Classrooms (Gen)**

(General) *209, BCEC*

Cindy Hoisington *(choisington@edc.org),* Education Development Center, Inc., Waltham, Mass.

Karen Worth *(kworth@wheelock.edu),* Wheelock College, Boston, Mass.

Using video vignettes, join us as we share strategies for helping preK children communicate their science observations and emerging science ideas while also supporting language development.

SESSION 3

Creating Student Videos for Climate Education (Env)

(High School) *251, BCEC*

Donna M. Cochrane, North Attleboro High School, North Attleboro, Mass.

Students use the *NGSS* and combine climate science, systems thinking, and science communications skills through media production. Using the Climate Education in an Age of Media (CAM) project at UMass Lowell and Harvard Forest LTER Schoolyard Program, Buds, Leaves & Global Warming, students learn to collect data on important long-term ecological issues and processes. They report what they have learned through media.

SESSION 4

Let's Get Physical—Come Play! (Phys)

(Preschool–Elementary) *252A, BCEC*

Juliana Texley, NSTA President-Elect, Boca Raton, Fla.

Ruth Ruud, Venice, Fla.

You can't put it off anymore. Both the *NGSS* and the *Common Core State Standards* ask that specific physical science concepts be taught in kindergarten and first and second grade. In this session, you'll see that you already have the equipment you need to make it happen. You'll move, groove, play, and sing as you learn to teach force and motion.

SESSION 5

Science Journals: Using Technology to Expand Collaboration and Sharing (Gen)

(Elementary) *252B, BCEC*

Missy Shunn-Mitchell, Utah State University, Logan

Discover how a grade 3 classroom combined traditional paper-based methods with Google Apps, Chromebooks, and iPads—to expand and share science experiences beyond their classroom walls.

SESSION 6

NARST Session: There Is Much More to Teaching Evolution Than Just Presenting the Biological Science (Bio)

(Middle Level–College/Supervision) *253A, BCEC*

Leslie S. Jones *(lesliesj@valdosta.edu),* Valdosta State University, Valdosta, Ga.

Creationist students can be far more receptive to learning about evolution if the socio-cultural controversy is explained before the biological content is addressed.

SESSION 7

NSTA Press® Session: Teacher Liability—Walking on the Safer Side! (Gen)

(General) *254A, BCEC*

Ken R. Roy *(royk@glastonburyus.org),* Glastonbury (Conn.) Public Schools

A science lab can be an unsafe place. Learn strategies to make it safer by reducing the risk of accidents and teacher liability.

SESSION 8

The Michigan Teacher Excellence Program (MiTEP) Experience: Strategies Used to Enhance Pedagogical Content Knowledge and Leadership (Earth)

(General) *254B, BCEC*

Ashley E. Miller *(aemiller@mtu.edu),* Michigan Technological University, Houghton

Expect exemplary teacher-developed, inquiry-based lessons and resources that incorporate Eisenkraft's 7E learning cycle, the *NGSS,* PLC, and lesson study strategies used to enhance pedagogical content knowledge and leadership skills.

SESSION 9 (two presentations)

(Middle Level/Informal Education) *255, BCEC*

STEM on a Budget Works! (Gen)

Brandy L. Whitney *(whitneybrandy@yahoo.com),* Ottoson Middle School, Arlington, Mass.

Hear how to establish an inquiry-based, viable, standards-focused STEM curriculum in an urban or underfunded middle school.

Engaging Teens in STEM Online: The Sparticl Challenge (Gen)

Matthew S. Loth *(mloth@tpt.org),* Twin Cities Public Television, St. Paul, Minn.

We brought the best STEM content on the web together into one huge social website built just for teens. Hear the story from year one. Sparticl is a new web and mobile service that showcases STEM content in a game-like environment, with social networking and badges as a means to achieve high-quality self-directed learning and help close the achievement gap.

SESSION 10

Out-of-This-World Experiments: Student Work on the International Space Station (Gen)

(Informal Education) *256, BCEC*

Jennifer S. Kelley *(jkelley@pps.net),* Portland (Ore.) Public Schools

Kaci Heins *(kheins@northlandprep.org),* Northland Preparatory Academy, Flagstaff, Ariz.

Discover the Student Spaceflight Experiments Program, a partnership between schools, nonprofit, and industry. Learn about the program and discover how to run a student-designed experiment on the International Space Station!

SESSION 11

Integrating Bioinformatics into Current STEM Curricula (Bio)

(High School) *257A, BCEC*

Renee Tanner *(rtanner@tctc.org),* Tri County Technology Center, Bartlesville, Okla.

Stacey Davis *(sdavis@swtech.edu),* Southwest Technology Center, Altus, Okla.

Join us as we provide instruction to secondary life science educators on how to incorporate computational biology/bioinformatics concepts and activities into current STEM curricula.

SESSION 12

Flipped Class 101: A User's Manual (Bio)
(General) *257B, BCEC*

James Schreiner *(jschreiner@bbchs.org)* and **Tony Swafford** *(tswafford@bbchs.org),* Bradley-Bourbonnais Community High School, Bradley, Ill.

Using our framework and software suggestions, you'll leave with the ability to begin flipping your classroom. Having three years' experience, we'll get you started!

SESSION 13

Doing Science the Scientific Way: It's Not as Hard as It Sounds (Gen)
(Elementary) *259A, BCEC*

Bev Marcum *(bmarcum@csuchico.edu),* California State University, Chico

Maria C. Simani *(maria.simani@ucr.edu),* University of California, Riverside

Learn how to do science the *NGSS* way in a bite-sized, confidence-building, classroom-friendly manner. This session is applicable to teachers, professional development leaders, and university instructors of future teachers.

SESSION 14

Going Beyond Data Collection—Sharing in a Science Classroom (Gen)
(General) *259B, BCEC*

Ben Smith *(ben@edtechinnovators.com)* and **Jared Mader** *(jared@edtechinnovators.com),* York, Pa.

This model lesson will demonstrate how students can collect and share data and produce a digital report. Bring your own device to participate as a student or come observe all the action.

SESSION 15

Science Education Fellowship Program: Supporting District Cohorts of Science Teacher Leaders (Gen)
(Supervision/Administration) *260, BCEC*

Arthur Eisenkraft *(eisenkraft@att.net),* 2000–2001 NSTA President, and UMass Boston, Mass.

Pam Pelletier, Boston (Mass.) Public Schools

Mika Munakata *(munakatam@mail.montclair.edu),* Montclair State University, Montclair, N.J.

Discussion centers on strategies for teacher leader cohort development through collaborative professional learning communities and individual growth plans, as well as cross-district partnerships.

SESSION 16

NASA Astrobiology: The Search for Life Beyond Earth (Earth)
(General) *261, BCEC*

Rachel Zimmerman Brachman *(rachel.zimmermanbrachman@jpl.nasa.gov),* NASA Jet Propulsion Laboratory, Pasadena, Calif.

Learn how the Astrobiology of Icy Worlds team at NASA's Jet Propulsion Laboratory searches for signs of life on icy moons of our solar system.

SESSION 17

Informal Science Day Session: Taking the Lead in Developing the STEM Education Resources of Your Community: Asset-based Partnerships Build Capacity and Increase Effectiveness (Gen)
(Informal Education) *Ballroom West/Group 1, BCEC*

Rob Robertson *(robertsonr@glsc.org),* Great Lakes Science Center, Cleveland, Ohio

Debbie K. Jackson *(d.jackson1@csuohio.edu),* Cleveland State University, Cleveland, Ohio

Hear how using asset-based relationships has enabled the Great Lakes Science Center to build its capacity as a STEM education resource for the region.

SESSION 18

Informal Science Day Session: Revolutionary Venus: Investigating the Heliocentric Solar System in the Context of the *NGSS* (Gen)
(Informal Education) *Ballroom West/Group 2, BCEC*

Brian Kruse, Astronomical Society of the Pacific, San Francisco, Calif.

Explore the evidence for the heliocentric solar system and learn how you can teach astronomy in the context of the *Next Generation Science Standards*.

SESSION 19

Informal Science Day Session: STEM-Tastic Afterschool Science! (Gen)
(Informal Education) *Ballroom West/Group 3, BCEC*

Lindsay Milner *(lindsaym@madscience.org)* and **Sharon King** *(sharonk@madscience.org),* Mad Science, Montreal, Que., Canada

Spice up the science in STEM—experience hands-on afterschool activities that entertain and educate! Walk away with resources to spark enthusiasm for science—it's elementary!

SESSION 20

Informal Science Day Session: Color and Light: Exploring Reflections at the Intersections of Art with Physical and Life Science (Phys)

(Elementary–Middle Level) *Ballroom West/Group 4, BCEC*

Lucinda Presley *(lucinda.presley@gmail.com),* ICEE Success Foundation, Palestine, Tex.

Engage your students in successful, standards-based, hands-on activities that use *NGSS* strategies to explore how physical and life science affect art experiences and survival.

SESSION 21

DNA Barcoding: Independent Research in the Classroom (Bio)

(High School–College) *Atlantic 3, Renaissance*

Jermel Watkins *(jwatkins@cshl.edu),* Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

Engage students in student-driven research by identifying plants, animals, and food sources through unique DNA barcodes.

SESSION 22

Virtually Yours: Exploratorium Teacher Institute Online Resources (Gen)

(General) *Brewster, Renaissance*

Eric P. Muller *(emuller@exploratorium.edu)* and **Paul Doherty** *(pdoherty@exploratorium.edu),* Exploratorium, San Francisco, Calif.

See what the Exploratorium has to offer teachers online. From classes, activities, content, avatars, and cool science apps, check out the Exploratorium from afar.

SESSION 23 (two presentations)

(General) *Caspian, Renaissance*

SCST Session: The Impact of Collective Group Motivation on Student Learning in a Nonmajors Biology Course (Bio)

Grant E. Gardner *(grant.gardner@mtsu.edu),* Middle Tennessee State University, Murfreesboro

This paper describes the impact of creating collaborative learning groups, heterogeneous for student motivation, on student attitudes, perceptions, content learning, and attendance.

SCST Session: Dealing with Interdisciplinary Challenges—Students' Perceptions of and Performance on Chemistry-related Biological Concepts (Bio)

Donald P. French *(dfrench@okstate.edu)* and **Lance Forshee** *(lance.forshee@okstate.edu),* Oklahoma State University, Stillwater

Traci Richardson, Stillwater High School, Stillwater, Okla.

Do students really have problems understanding biological concepts related to understanding chemistry? Is this an obstacle? Do they see value in chemistry? Come find out!

SESSION 24

The Top 5 Reasons to Stop Using the 5-Step Scientific Method (Gen)

(General) *Mediterranean, Renaissance*

Erik L. Peterson *(elpeterson@ua.edu),* The University of Alabama, Tuscaloosa

Gregory L. Macklem *(gmacklem@nd.edu),* University of Notre Dame, Ind.

Hear about distortions the classic "scientific method" produces in student understanding of genuine science—and encounter alternative ways to avoid them.

SESSION 25

Track and Explore: Hands-On Science Joins Online Field Trip Experiences for Middle School Students (Env)

(Middle Level/College) *Pacific A/B, Renaissance*

Penny Cobau-Smith *(pcobausmith@adrian.edu),* **Aubrey Quinlan** *(aquinlan@adrian.edu),* and **Brittany Basch,** Adrian College, Adrian, Mich.

Presider: Julie Sinkovitz, Adrian College, Adrian, Mich.

Adrian College education and biology students partnered with the NASCAR venue Michigan International Speedway to develop standards-based environmental and physics/math virtual field trips. This project has serviced 2,000 middle school students in just over one year.

SESSION 26

Getting Students Involved in a Virtual Science Fair with Tech Advisers (Gen)

(General) *Pacific C, Renaissance*

Robert M. Everett *(robert.everett@ucf.edu),* University of Central Florida, Orlando

Elementary, middle school, and high school teachers will learn about the Internet Science and Technology Fair (ISTF) and how it integrates STEM initiatives.

SESSION 27 (two presentations)

(General) *Pacific F, Renaissance*

ASTE Session: Transforming STEM Education—Your Classroom and Beyond (Bio)

Frederick W. Freking *(freking@usc.edu),* University of Southern California, Los Angeles

This session will provide a framework to science teachers as they strive to become leaders in their classrooms, schools, communities, and states.

ASTE Session: A Place-based Approach for Technically Integrated Science Instruction: The River Run Experience (Env)

Justin R. McFadden *(mcfad062@umn.edu),* University of Minnesota, St. Paul

Technology integration (as it can apply to an environmental science class) will be the focus of this session. Water sampling techniques using Vernier lab equipment and its use in investigating a socio-scientific issue related to a local watershed will be highlighted.

SESSION 28

Use Professional Journals to Enrich Advanced Chemistry (Chem)

(High School–College) *Pacific G/H, Renaissance*

Deanna M. Cullen *(dcullen@jce.acs.org),* Whitehall High School, Whitehall, Mich.

Engage your advanced chemistry students in the meaningful use of professional journals.

SESSION 29 (two presentations)

(General) *Constitution, Seaport*

AMSE Session: The Smarts Are There (Bio)

Sue Ford, Retired Educator, Rocky Mount, N.C.

Join this dialogue! Discover the learning fun in the *NGSS* while challenging ALL students in welcoming classroom atmospheres drenched with the feeling of "Belonging." Handouts!

AMSE Session: Using Games and Challenges to Formatively Assess Students' Conceptual Understanding in Science (Gen)

Karen D. Jacobs *(karen.d.jacobs@aliefisd.net),* Alief ISD, Houston, Tex.

Gale C. Stanford *(gale.stanford@aliefisd.net),* Holub Middle School, Houston, Tex.

Add excitement and pizzazz to your classroom by playing games and challenging your students to think on an entirely new level! This session will keep your students coming back for more!

SESSION 30

Developing Students' Scientific Practice Skills with NOVA Labs (Gen)

(Middle Level–High School) *Lighthouse I, Seaport*

Maiken C. Lilley, WGBH Educational Foundation, Boston, Mass.

Discover how you can develop your students' skills in analyzing and interpreting scientific data with NOVA Labs.

SESSION 31

Teaching Science with Case Studies (Gen)

(Middle Level–High School) *Plaza A, Seaport*

Emily Sherman, Longview School, Deerfield, N.H.

Allow students to solve real-life problems by using case studies in the classroom. Learn how to find, evaluate, and write case studies for your students.

SESSION 32

Creatively Integrate Multiple Technologies as You Connect Mathematics and Science (Gen)

(Middle Level–High School) *Plaza B, Seaport*

Tom Reardon *(tom@tomreardon.com),* Fitch High School/ Youngstown State University, Austintown, Ohio

Jeff Lukens *(jeffrey.lukens@k12.sd.us),* Roosevelt High School, Sioux Falls, S.Dak.

Collect data, model mathematically, and interpret using science standards—from both math and science teachers' perspectives. We will effectively integrate graphing calculators, data collection devices, and iPads.

SESSION 33

STEM Can Change the World: Providing Context and Connections for Tackling Global Problems (Gen)

(High School) *Plaza C, Seaport*

Kimberley Berndt *(kimberleyberndt@stmarksschool.org)* and **Lindsey Lohwater** *(lindseylohwater@stmarksschool.org),* St. Mark's School, Southborough, Mass.

Hear how we structured an advanced-level independent research program around core STEM subjects and challenged students to help solve a problem facing developing nations.

SESSION 34

NSELA Session: Tools for Science Leaders, Part 2 (Gen)

(General) *Alcott, Westin Waterfront*

Darlene Ryan, Glenwood Elementary School, Chapel Hill, N.C.

Elizabeth A. Allan *(eallan@uco.edu),* University of Central Oklahoma, Edmond

Bob Sotak *(bsotak@mac.com),* Washington Alliance for Better Schools, Edmonds

Brian Day, Everett (Wash.) Public Schools

Keri E. Randolph *(krandolph@pefchattanooga.org),* Southeast Tennessee STEM Innovation Hub, Chattanooga

Nicole Jacquay *(nicole.jacquay@sdhc.k12.fl.us),* **Michele Detwiler** *(michele.detwiler@sdhc.k12.fl.us),* and **Mindy Pearson** *(mindy.pearson@sdhc.k12.fl.us),* Hillsborough County Public Schools, Tampa, Fla.

Susan Mundry *(smundry@wested.org),* WestEd, Woburn, Mass.

Jerry D. Valadez *(jdvscience@yahoo.com),* Fresno State University, Fresno, Calif.

Presider: Darlene Ryan

The various tools and strategies shared with science leaders in this session support them in their work to enhance teaching and learning in their context.

SESSION 35

We Turned Over a New (Green) LEAF: Leading, Educating, Achieving, and Fostering Healthy, Green Schools for All (Gen)

(General) *Burroughs, Westin Waterfront*

Laurel Kohl *(kohll@easternct.edu),* Eastern Connecticut State University, Willimantic

Marjorie Drucker *(marjorie.drucker@new-haven.k12.ct.us),* Barnard Environmental Studies Magnet School, New Haven, Conn.

Peter Dart *(dartp001@hartfordschools.org),* Environmental Studies Magnet at Mary Hooker, Hartford, Conn.

Lauren Amaturo *(lamaturo@crec.org),* Two Rivers Magnet High School, Hartford, Conn.

Learn how to help green your school using the Green Ribbon Schools model—from education to healthy students and staff to resources conservation. Something for all schools—*www.ctgreenschools.org.*

SESSION 36 (two presentations)

(Middle Level) *Commonwealth Ballroom A, Westin Waterfront*

Meet Me in the Middle Session: What the *NGSS* Means to a Middle Level Teacher—Thoughts from a Member of the *NGSS* Writing Team (Gen)

Kenneth Huff *(khuff@williamsvillek12.org),* Mill Middle School, Williamsville, N.Y.

Engage in a conversation about the development of the *Next Generation Science Standards* and how they impact a middle level classroom.

Meet Me in the Middle Session: Curriculum Crosswalks: Aligning the *Common Core State Standards, Mathematics* and the *Next Generation Science Standards* (Gen)

John Milam *(jmilam@jcu.edu),* John Carroll University, University Heights, Ohio

Explore the complementary standards and practices between the *CCSS Mathematics* and the *NGSS* for middle level educators.

SESSION 37

Proficient, Exemplary, and Flexible—Technology, the *NGSS,* and My Classroom (Gen)

(Elementary–High School) *Faneuil, Westin Waterfront*

Kathleen M. Gorski, Wilbraham & Monson Academy, Wilbraham, Mass.

Caryn Meirs *(caryn.meirs@gmail.com),* Half Hollow Hills Central School District, Dix Hills, N.Y.

Presider: Barbara R. Pietrucha, Earth/Environmental Science Educator, Point Pleasant, N.J.

How will the *NGSS* inform the way I incorporate technology into the classroom? Learn what great technologies you can implement now that demonstrate the approach advocated by the *NGSS.*

SESSION 38 (two presentations)

(General) *Grand Ballroom C, Westin Waterfront*

Meet Me in the Middle Session: Science Formative Assessment: What Do Middle School Students Really Think? (Gen)

Page Keeley *(pagekeeley@gmail.com),* 2008–2009 NSTA President, Jefferson, Maine

Joyce B. Tugel *(jtugel@mmsa.org),* Maine Mathematics and Science Alliance, Augusta

Find out how a variety of formative assessment techniques can be used to promote intellectual engagement and uncover middle school students' ideas and ways of reasoning.

Meet Me in the Middle Session: The NSTA Learning Center—Free Professional Development Resources and Opportunities for Educators (Gen)

Flavio Mendez *(fmendez@nsta.org),* Senior Director, NSTA Learning Center/SciLinks, NSTA, Arlington, Va.

Looking for online resources to enhance your content knowledge and skills? With more than 10,000 resources (25% free), the NSTA Learning Center has the answers!

SESSION 39

Let's Talk Science: Using Baby Steps to Design a Districtwide Science Collaborative (Gen)

(Elementary–High School) *Griffin, Westin Waterfront*

Jean M. Roesner *(jean_roesner@maranacook.org),* Maranacook Community High School, Readfield, Maine

Katie R. Conway *(katie_conway@maranacook.org),* Readfield Elementary School, Readfield, Maine

Come learn how an overheard conversation led to a multigrade level, districtwide science collaborative, and a good friendship. Learn about funding tools, finding time, and engaging staff and students alike.

SESSION 40

The Magic of Science! Motivate and Excite Your Science Students Using Discrepant Events (Gen)

(General) *Harbor Ballroom III, Westin Waterfront*

Buzz Putnam *(dputna@wboro.org),* Whitesboro High School, Marcy, N.Y.

This fast-paced session will highlight thought-provoking, paradoxical discrepant demonstrations with music and humor that can energize any science classroom throughout the year—for all subjects/levels.

SESSION 41

Virtual Field Trips—Bring the World to Your Classroom (Gen)

(General) *Lewis, Westin Waterfront*

Marcie D. Reuer *(marcie.reuer@prrd.ab.ca),* New Brigden School, New Brigden, Alta., Canada

Take a live dive in the Pacific Ocean, watch an open heart surgery in real time, and so much more using video conference technology.

SESSION 42

Using a Tuning Protocol to Analyze Lesson Plans in a Student Teacher Seminar (Gen)

(High School–College/Supervision) *Paine, Westin Waterfront*

Marlene A. Hilkowitz *(mhilkowitz@mac.com)* and **Michele H. Lee** *(mlee@post.harvard.edu),* Temple University, Philadelphia, Pa.

This interactive session shows how secondary science and math student teachers critically analyze their lesson plans using a tuning protocol over eight weeks.

9:30–10:30 AM Workshops

NESTA Session: National Earth Science Teachers Association Geology Share-a-Thon (Earth)
(Elementary–High School) *052 A/B, BCEC*
Michelle C. Harris, Wakefield High School, Arlington, Va.
Roberta M. Johnson *(rmjohnsn@gmail.com),* NESTA, Boulder, Colo.
Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.
Sharon K. Cooper *(scooper@oceanleadership.org),* Consortium for Ocean Leadership, Washington, D.C.
Don Duggan-Haas *(ad55@cornell.edu),* PRI and Its Museum of the Earth and Its Cayuga Nature Center, Ithaca, N.Y.
Mark Francek *(mark.francek@cmich.edu),* Central Michigan University, Mount Pleasant
Laura Guertin *(paesta@psu.edu),* President-Elect, Pennsylvania Earth Science Teachers Association, University Park
Lynne Hehr *(lhehr@uark.edu),* University of Arkansas, Fayetteville
Carole J. Reesink *(cjreesink@muscanet.com),* Retired Educator, Muscatine, Iowa
Mary Shane *(shanem@interact.ccsd.net),* Advanced Technologies Academy, Las Vegas, Nev.
Judy T. Sweeney *(judytsweeney@gmail.com),* Shanghai American School, Shanghai, Peoples Republic of China
David Thesenga *(dthesenga@gmail.com)* and **Jim Town** *(james.ross.town@gmail.com),* Einstein Fellows, National Science Foundation, Arlington, Va.
Lesley Urasky *(lesleyurasky@gmail.com),* Rawlins High School, Rawlins, Wyo.
Shannon R. Vogt *(srvogt@gmail.com; svogt@nscsd.org),* North Syracuse (N.Y.) Central Schools
Jodi Wheeler-Toppen *(wheelertop@gmail.com),* Atlanta, Ga.
Join many NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!

Focus on Forests Using STEM and Project Learning Tree (Env)
(Middle Level–High School) *157C, BCEC*
Al Stenstrup *(alstenstrup@plt.org)* and **Jaclyn Stallard** *(jstallard@plt.org),* Project Learning Tree, Washington, D.C.
Discover how secondary students can explore the major issues facing forests today, including climate change, invasive species, and land management—while also connecting to STEM subjects. Take home PLT's *Focus on Forests* activity guide.

The Science of Technology: Introduction to Engineering (Phys)
(Middle Level) *159, BCEC*
Deborah K. Leach-Scampavia and **Rosie Albarran-Zeckler** *(rzeckler@scripps.edu),* The Scripps Research Institute, Jupiter, Fla.
This middle school workshop uses hands-on "engineering boards" and LEGO MINDSTORMS® NXT robotics for math fluency exercises that contribute to computational thinking and engineering applications.

Maximize Instructional Time and Student Learning: Science in Reading and Reading in Science (Gen)
(Elementary) *160A, BCEC*
Christine Royce *(caroyce@aol.com),* Shippensburg University, Shippensburg, Pa.
This workshop will model several activities that incorporate the use of trade books within science and/or reading lessons as well as provide a variety of resources for locating lessons.

DNA Is Elementary! (Bio)
(Elementary–Middle Level) *160B, BCEC*
Michelle Ventura and **Chandan Morris Robbins,** Georgia State University, Atlanta
Encounter modules built on the premise that the principles involved in understanding DNA closely parallel the concepts used by novice learners to build language arts skills.

Using Lesson Study to Engage Elementary Teachers in the *Next Generation Science Standards* (Earth)
(Elementary) *160C, BCEC*
Mark K. Mitchell *(mmitchell@air.org)* and **Gary Appel** *(gappel@air.org),* American Institute for Research, Naperville, Ill.
Focused on the *NGSS,* we will engage in lesson study to enhance content knowledge, instill science and engineering practices, and improve science teaching.

Science Beyond the Standards! (Gen)
(Elementary) *161, BCEC*
Jaymee Herrington *(jaymee.herrington@gmail.com),* K5 Science Consultant, Washington, D.C.
Betsy O'Day *(boday@hallsville.org),* Hallsville Intermediate School, Hallsville, Mo.
Now that *NGSS* is here, what does it look like for grades K–2 and 3–5? What could a lesson look like? How can I connect the pieces of the puzzle? Come pick the brains of two *NGSS* elementary team writers. Take home hands-on activities and curriculum CDs.

The Great Rock Mix-Up **(Earth)**
(Middle Level) *162A, BCEC*
Janelle Wilson *(janellewilson@gmail.com),* Lanier Middle School, Sugar Hill, Ga.
Rocks and inquiry? Yes! Learn how in this hands-on workshop. Lesson strategies and student handouts will be provided for this inquiry rock unit.

Simple to Sublime—Mathematics Turns Simple Hands-On Labs into Deep Science **(Chem)**
(Middle Level–High School) *162B, BCEC*
Mark Schlawin, Princeton Charter School, Princeton, N.J.
Participants apply mathematics to simply executed physics and chemistry labs and uncover deep and important science concepts.

A New Twist on Measuring Catalase Activity **(Bio)**
(High School) *205A, BCEC*
Pam Bryer *(pbryer@bowdoin.edu),* Bowdoin College, Brunswick, Maine
Encapsulate yeast in nontoxic sodium alginate and use the resultant spheres to measure catalase activity and perform inquiry-based experiments.

Lead Your Students on an Exploration of the Human Body by Building It from the Inside Out **(Bio)**
(Middle Level–College) *205B, BCEC*
Charles Roney, Retired Educator, Haddonfield, N.J.
Increase student interest and success by using simple hands-on methods to investigate human anatomy. We will start with the skeletal framework and build the body.

The Sounds of Music! **(Phys)**
(Elementary) *205C, BCEC*
Elise Burns and **Borislaw Bilash,** Pascack Valley Regional High School District, Montvale, N.J.
Take part in a sequence of sound- and music-related activities to engage our youngest scientists with basic physical science ideas—that cost nearly nothing and use inquiry methods.

Science Starters **(Gen)**
(Preschool–Middle Level/Informal Education) *207, BCEC*
Kristen Scopinich, Mass Audubon's Drumlin Farm Wildlife Sanctuary, Lincoln, Mass.
Engage students by beginning with science starters—guided observation activities that turn the study of elementary science content into an engaging science investigation.

Energy Literacy: A Grade 4 Energy Unit Based on the *NGSS* and Incorporating Environmental Education **(Gen)**
(Elementary) *212, BCEC*
Patty A. O'Donnell *(patty@hitchcockcenter.org)* and **Micky McKinley** *(micky@hitchcockcenter.org),* Hitchcock Center for the Environment, Amherst, Mass.
This hands-on workshop will introduce you to a two-week unit based on the new *NGSS* grade 4 energy topic, which includes energy flows, energy systems, renewable energy, and energy decisions.

Full STEAM Ahead **(Gen)**
(Elementary) *213, BCEC*
Melissa McCallihan and **Clara Buckley,** Mustard Seed School, Hoboken, N.J.
Find out how three teachers (4th, 5th, and Art) implement a multi-age STEM and art education program that inspires children to be creative scientific problem solvers.

GLOBE at Night: A Fun, Immersive, STEM-based Citizen Science Program for Students **(Earth)**
(General) *253C, BCEC*
Constance E. Walker *(cwalker@noao.edu),* National Optical Astronomy Observatory, Tucson, Ariz.
With GLOBE at Night, student-scientists measure the brightness of their backyard's night sky, collecting data for a project that might take them to city hall.

Teaching Metabolic Diseases: The Great Diseases Project—A Collaborative Approach to Real-World Science in the Classroom **(Bio)**
(High School–College) *Atlantic 1, Renaissance*
Berri H. Jacque, Tufts University School of Medicine, Boston, Mass.
Aimee Gauthier *(blsbiorules@gmail.com)* and **Kathleen Bateman** *(kbateman@boston.k12.ma.us),* Boston Latin School, Boston, Mass.
Leslie S. Schneider, Tufts University, Boston, Mass.
Come learn about our novel Metabolic Diseases curriculum for Biology II, which emphasizes critical thinking, problem solving, authentic science practices, and health literacy.

Differentiating Teacher Research Through Teacher Inquiry Groups (Gen)
(General) *Atlantic 2, Renaissance*
Deborah Roberts-Harris *(drober02@unm.edu),* University of New Mexico, Albuquerque
Teachers often dislike professional development because it is one size fits all, one time, and often does not relate to their practice. Come discover a way to personalize professional development.

Science and Literacy? That's NEWS to Us! (Gen)
(General) *Commonwealth Ballroom C, Westin Waterfront*
Billy McClune *(w.mcclune@qub.ac.uk),* Queen's University, Belfast, Northern Ireland
Evaluating claims in media reports, as *NGSS* requires, is a challenge, demanding science knowledge and literacy skill. Explore how to "use the news" to develop your students' critical abilities.

Blending the Arts with Chain Reaction STEAM Machines™ (Gen)
(General) *Douglass, Westin Waterfront*
Shawn S. Jordan *(ssjordan@alumni.purdue.edu),* Arizona State University, Mesa
Nielsen Pereira *(nielsen.pereira@wku.edu),* Western Kentucky University, Bowling Green
This hands-on workshop explores summer camps that blend chain reaction machines with music, dance, drama, and spoken word to create STEAM Machines!

CSSS Session: A Vision for Science Education: The Integration of the *NGSS* Practices in Classroom Instruction (Gen)
(General) *Harbor Ballroom I, Westin Waterfront*
Peter J. McLaren *(peter.mclaren@ride.ri.gov),* Rhode Island Dept. of Education, Providence
Brett Moulding, Council of State Science Supervisors, Ogden, Utah
This workshop is designed to highlight the importance of the science and engineering practices in developing student knowledge of science and engineering. Come engage in the use of meaningful and effective instructional strategies using these practices. We'll model instructional strategies designed to help students understand how scientific knowledge is developed.

DuPont Presents: Driving Science (Phys)
(Middle Level–High School) *Otis, Westin Waterfront*
Dot Moss *(dmoss@clemson.edu),* Clemson University, Clemson, S.C.
Presider: Peggy Vavalla *(marguerite.e.vavalla@dupont.com),* DuPont, Wilmington, Del.
Come learn how to connect science content involving laws of motion to motorsports. Join me for this hands-on workshop and investigate standards related to Newton's laws of motion in the context of real-world applications and connections to motorsports. We'll examine design processes and teaching strategies that build connections across STEM disciplines.

How-To Workshop on Organizing a STEM Design Challenge Day (Gen)
(Elementary–Middle Level) *Stone, Westin Waterfront*
Lindsey M. Polizzotti *(lindsey@cohenhillel.org)* and **Sharon Shore Taitelbaum** *(sharon@cohenhillel.org),* Cohen Hillel Academy, Marblehead, Mass.
In this hands-on workshop, discover tips and tricks for planning and hosting a STEM Design Challenge Day using the engineering design process to engage and excite students, teachers, and parents!

Life Cycle of the Monarch Butterfly (Bio)
(General) *Webster, Westin Waterfront*
Jim O'Leary *(oleary@mdsci.org)* and **Maureen Sullivan,** Maryland Science Center, Baltimore
De Cansler *(decansler@gmail.com)* and **Katie-Lyn Bunney** *(kbunney@umn.edu),* University of Minnesota, St. Paul
Examine the four stages of the Monarch butterfly with live specimens of each stage—egg, larva, pupa, and adult monarchs.

9:30–10:30 AM Exhibitor Workshop

Investigating Astronomy: A Project-based Astronomy Course Written Expressly for High School (Earth)
(Grades 6–12) *156C, BCEC*
Sponsor: It's About Time
Presenter to be announced
Learn about and experience the engaging hands-on investigations, the stunningly realistic software package, the web-based data center, and the Investigating Astronomy website to see how you can motivate your students to work as student astronomers, ask questions, use models, analyze and interpret data, and make scientific claims supported by evidence.

9:30 AM–12:30 PM Workshop

PDI

BSCS Pathway Session: Explanation and Argumentation in the Classroom *(NGSS* Practices 6 and 7) (Gen)
(General) *203, BCEC*

Jody Bintz *(jbintz@bscs.org)* and **Betty Stennett,** BSCS, Colorado Springs, Colo.

This session will deepen your understanding of *NGSS* Practices 6 and 7. Engage in an inquiry-oriented activity that utilizes tools to scaffold the construction of evidence-based explanations and engage in scientific argumentation. The session will focus on what the use of this practice looks like in the classroom and how the use of this practice can help students learning scientific concepts.

10:00–10:30 AM Presentations

SESSION 1

Meet Me in the Middle Session: Integrated Learning Communities for Science-Math-Language Arts in Middle School as a Strategy to Reach the *Next Generation Science Standards* (Gen)
(Middle Level) *Commonwealth Ballroom B, Westin Waterfront*

Beatriz Lopez *(lopezb@ltisdschools.org),* Hudson Bend Middle School, Austin, Tex.

Integrated learning communities in middle school can be the answer to teaching science—using a horizontal curricular alignment. As a science teacher, you can engage your students and colleagues to help them understand how all academic areas are interconnected, promoting holistic learning.

SESSION 2

Meet Me in the Middle Session: Adapting Resources so They Work for Your Middle Level Students(Bio)
(Middle Level) *Grand Ballroom E, Westin Waterfront*

Jaclyn Reeves-Pepin *(jreevespepin@nabt.org),* NABT, McLean, Va.

Mark Little *(mark.little@bvsd.org),* Broomfield High School, Broomfield, Colo.

Join leaders from the National Association of Biology Teachers (NABT) as they adapt award-winning resources for the middle level classroom from *The American Biology Teacher* journal.

10:00–11:00 AM Presentation

SESSION 1

CESI Session: Family Science Events—Logistics, Engaging Science, and Parent Involvement (Gen)
(Preschool–Middle Level) *211, BCEC*

Jim McDonald *(jim.mcdonald@cmich.edu),* **Jackie Swanson** *(swans1jm@cmich.edu),* **Kali Remelts** *(remel1kn@cmich.edu),* and **Jenna Orr** *(orr1jm@cmich.edu),* Central Michigan University, Mount Pleasant

Come learn how to set up Family Science events as we describe the process and demonstrate several activities.

10:00–11:30 AM Exhibitor Workshops

AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (Bio)
(Grades 6–12) *102A, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Considering the popularity of today's forensic science–based TV shows, this "real" classroom autopsy is sure to be a hit with your students. Participants learn about mammalian structure and function by dissecting a Carolina's Perfect Solution pig—while modeling the protocols of a forensic pathologist. Free materials and door prizes!

Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (Phys)
(Grades 6–12) *102B, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Catapult, float, and race your way into hands-on activities that will engage your middle school and high school students while fostering both critical-thinking and creative problem-solving skills! Join us and experience how Carolina makes it easy to incorporate STEM into your classroom. Free handouts and door prizes.

Flipping Out Over Chemistry! (Chem)
(Grades 9–12) *103, BCEC*
Sponsor: Carolina Biological Supply Co.
Jon Bergmann, Flipped Learning Network, LLC, Lake Forest, Ill.
Wish you had time to increase individual instruction and improve student understanding of key concepts? Explore a blend of digital and hands-on activities that allow students to review content as "homework" so you can devote valuable classroom time to inquiry activities, assignments, and tests. Free materials and giveaways!

Advancing *NGSS* Practices with Probeware—Free Sensor Set for Five Attendees! (Gen)
(Grades K–12) *104A, BCEC*
Sponsor: PASCO scientific
Dori Haggerty, PASCO scientific, Roseville, Calif.
Learn about the essential tools you need to integrate the *NGSS* science and engineering practices into your instruction. You'll experience how to effectively engage students in the eight practices by using PASCO probeware and SPARKvue® software on iPads. Five lucky attendees will win a 50th Anniversary Sensor Pack—a $600 value!

Engaging Students Effectively: The BIOZONE Solution (Bio)
(Grades 9–12) *104B, BCEC*
Sponsor: BIOZONE International
Richard Allan *(richard@biozone.co.nz),* BIOZONE International, Hamilton, New Zealand
BIOZONE's unique presentation of content with fabulous graphics provides an effective solution for student engagement. Find out how and why teachers of AP biology, *NGSS* biology, environmental science, and anatomy/physiology are using BIOZONE's workbooks to improve outcomes for their students. Attendees receive FREE books.

Using Climate Proxies to Learn About Earth's Climate History (Earth)
(Grades 9–12) *104C, BCEC*
Sponsor: LAB-AIDS, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
How can scientists tell what Earth's climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. Your students will analyze and graph samples of replicas of these organisms, and use this information to determine relative warm and cold periods in the past 200,000 years. This activity is from *EDC: Earth Science,* a new NSF-supported high school Earth science program from LAB-AIDS that uses an active, data-oriented approach.

The *Next Generation Science Standards:* What They Mean for Earth and Space Science (Earth)
(Grades K–12) *105, BCEC*
Sponsor: Pearson
Michael Wysession *(michael@wucore.wustl.edu),* Washington University in St. Louis, Mo.
The new *Next Generation Science Standards* represent a bold new direction for K–12 science in America, but also pose many challenges and questions. Professor Michael Wysession, a lead author of the *NGSS,* will talk about the implications for teaching, assessment, and professional development in American Earth and space science education.

Hurricanes and Typhoons: Nature on the Rampage (Earth)
(Grades 5–12) *106, BCEC*
Sponsor: Simulation Curriculum Corp.
Herb Koller *(hkoller@simcur.com),* Simulation Curriculum Corp., Minnetonka, Minn.
Join us as we use Simulation Curriculum's *The Layered Earth Meteorology* to investigate two of the most destructive storms of recent times—Hurricane Sandy and Typhoon Haiyan. With the help of classroom-ready lessons, we will trace the causes, paths, and destructive effects of these superstorms.

Math and Statistics in the Biology Classroom (Bio)
(Grades 9–College) *107A, BCEC*
Sponsor: Howard Hughes Medical Institute
Ann Brokaw, Rocky River High School, Rocky River, Ohio
Paul K. Strode, Fairview High School, Boulder, Colo.
The newly designed AP Biology course, IB Biology, the *NGSS*, *CCSS*, and many state science standards encourage the use of math and statistics to solve problems and analyze experimental data. This workshop will provide participants with free classroom-ready resources and strategies for incorporating math and statistics in their biology classroom.

***Chemistry in the Community,* 6th Edition—Reinventing Itself (Chem)**
(Grades 8–College) *107B, BCEC*
Sponsor: American Chemical Society
Michael T. Mury *(m_mury@acs.org),* American Chemical Society, Washington, D.C.
Think you know ChemCom? Think again. Want your students thinking scientifically and learning how chemistry has an important role in their everyday lives? Learn about the exciting new features in the 6th edition of this engaging and groundbreaking chemistry text. We will perform text activities, share supplemental resources, and give prizes!

Adventures into the Digital Biology Classroom: How Technology Can Revolutionize Teaching (Bio)
(Grades 5–College) *107C, BCEC*
Sponsor: Animalearn
Nicole Green, Animalearn, Jenkintown, Pa.
Tracie Treahy, Digital Frog International, Puslinch, Ont., Canada
Join Animalearn as we examine the use of animals to teach anatomy and explore how by using technology instead, we can conserve resources, eliminate harmful chemicals in our classroom, and promote habitat protection. Learning stations will be set up for attendees to try out ANATOMY IN CLAY®, Digital Frog, and a variety of other innovative science teaching tools. One participant will win a copy of Digital Frog—a $200 value!

A Revolutionary Way to Address All Your Standards with National Geographic (Gen)
(Grades 2–5) *108, BCEC*
Sponsor: National Geographic Learning
Tom Hinojosa *(tom.hinojosa@cengage.com),* National Geographic Learning, Littleton, Colo.
We'll discuss exciting ways to address the *NGSS* and literacy concerns relating to *CCSS*—all within engaging themes of science! A STEM approach utilizing National Geographic Emerging Explorers will be featured. Learn how your literacy strand infused with differentiated science materials can provide access and understanding for all your students!

What If Your STEM Program Could Talk, Walk, and Interact with Your Students—All the Way from Middle School to College? (Gen)
(Grades 8–College) *109A, BCEC*
Sponsor: Aldebaran Robotics
Mandy Dwight and **Natanel Dukan,** Aldebaran Robotics, Boston, Mass.
Come get your hands on the robot that's bringing the future into your classroom. We'll work through a *CCSS*-aligned curriculum that's bringing excitement to STEM education at all levels. Graduate from LEGO® and VEX and improve college and career readiness with a platform that's defining the future of STEM careers.

Perimeter Institute: Beyond the Atom: Remodeling Particle Physics (Phys)
(Grades 9–College) *109B, BCEC*
Sponsor: Perimeter Institute
Damian Pope *(dpope@perimeterinstitute.ca)* and **Kevin Donkers** *(kdonkers@perimeterinstitute.ca),* Perimeter Institute, Waterloo, Ont., Canada
The discovery of the Higgs boson was one of the biggest physics announcements of our generation. Join us as we explore concepts of momentum, charge, and fields being applied to modern particle physics. Beyond the Atom is a multimedia resource designed by educators in collaboration with Perimeter Institute researchers.

The STEM Design Challenge (Phys)
(Grades 4–8) *150, BCEC*
Sponsor: Fisher Science Education
Robert Marshall *(marshallr@carnegiesciencecenter.org),* Carnegie Science Center, Pittsburgh, Pa.
First, use inquiry and scientific investigations to answer testable questions about force, energy, and motion. Then, solve an energy problem using creative and realistic world processes. Finally, support your understanding with a team competition. You'll be surprised at how you reach conclusions and what tools you'll learn for your classroom.

Solar Hack Lab (Env)
(Grades 4–12) *151A, BCEC*
Sponsor: KidWind Project
Asia M. Ward *(asia@kidwind.org),* KidWind Project, St. Paul, Minn.
Discover what's inside a dollar store solar lamp, learn how it works, and then use its parts to go on a Solar Scavenger Hunt discovering how different light sources affect output.

Wind Turbine: A STEM Approach to Science Concepts (Phys)
(Grades 5–12) *151B, BCEC*
Sponsor: CPO Science/School Specialty Science
Scott Eddleman and **Nathan Olsson,** CPO Science/School Specialty Science, Nashua, N.H.
Explore energy transformations, electricity, and magnetism through hands-on experiences. Use the engineering cycle to design a working model of a wind turbine. Build, test, and revise your model so that it generates as much power as possible. Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

Engineering in Elementary Science: Designing with FOSS (Gen)
(Grades K–5) *152, BCEC*
Sponsor: Delta Education/School Specialty Science–FOSS
Brian T. Campbell and **Linda De Lucchi,** The Lawrence Hall of Science, University of California, Berkeley
FOSS modules provide students with opportunities to engage in engineering experiences to develop solutions to problems, construct and evaluate models, and use systems thinking. We'll describe and display the opportunities to design with science for K–5 students.

Advanced Physics with Vernier (Phys)
(Grades 9–College) *153A, BCEC*
Sponsor: Vernier Software & Technology
David Carter *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Get hands-on experience with our physics curriculum for College, AP, and IB physics courses. Go beyond verification labs by using inquiry techniques to emphasize the exploration of phenomena and make sense of observations. Use advanced data collection and analysis to explore quantitative relationships between variables.

Environmental and Earth Science with Vernier (Env)
(Grades 7–College) *153B, BCEC*
Sponsor: Vernier Software & Technology
Jack Randall *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Conduct a variety of environmental science and Earth science experiments using Vernier sensors with a LabQuest 2 in this engaging hands-on workshop. Experience how Vernier has been incorporating the principles of the *NGSS* science and engineering practices for 33 years!

Integrating Online Learning into the Science Classroom (Gen)
(Grades 1–10) *153C, BCEC*
Sponsor: NewPath Learning
Melissa Hughes, NewPath Learning, Victor, N.Y.
Experience NewPath's Online Learning Program, which allows teachers to assign and present ready-to-use, standards-based multimedia lessons, interactive activities, lab simulations, and assessments, as well as track and report student progress. Additionally, the program provides easy-to-use authoring tools and templates to develop customized, interactive lessons. Each participant will receive a free trial subscription.

STEMtastic Strategies (Gen)
(General) *154, BCEC*
Sponsor: Discovery Education
Cindy Moss, Discovery Education, Silver Spring, Md.
Discover compelling data about why STEM teaching and learning is critical. Experience STEM strategies that are appropriate and engaging for K–12 students as well as find out about STEM competitions and funding sources for STEM.

Building Readiness in Physical Science and the *NGSS* (Phys)
(Grades K–5) *156A, BCEC*
Sponsor: Ward's Science
Deborah Linscomb, Ward's Science, Rochester, N.Y.
Is your elementary science program building a solid foundation in physical science? We'll show you how you can with Ward's *NGSS* Activity Kits. These exclusive kits are designed to save you time in the classroom and develop conceptual understanding of heat, light, sound, and thermal and electrical energy through hands-on exploration. Win door prizes, too!

MINDSTORMS® EV3 Robotics in the Middle School Classroom—Getting Started (Gen)
(Grades 6–8) *156B, BCEC*
Sponsor: LEGO® Education
William J. Church, Profile High School, Bethlehem, N.H.
Middle school physical science + robotics = great learning experiences! Get your hands on the latest LEGO MINDSTORMS Education EV3 curriculum and resources designed to address the *Next Generation Science Standards* and cover renewable energy, thermal physics, mechanics, and light.

Morning of Inquiry—Making Inquiry Safe, Manageable, and Inspirational in Grades 6–12 (Chem)
(General) *210 A/B, BCEC*
Sponsor: Flinn Scientific, Inc.
Jamie Benigna, The Roeper School, Birmingham, Mich.
Science was developed by questioning and experimentation, so why is science often taught as a series of facts? To be literate in science, students should be comfortable with inquiry—asking questions and deriving answers. The inquiry approach to teaching science is reflected in the recent changes in national curricula like AP® and *NGSS*. Jamie will guide you through the process of integrating inquiry into your lesson plans for grades 6–12 no matter what subjects you teach. Jamie will present new inquiry activities geared around chemistry, while sharing tips and ideas to help all teachers safely manage inquiry, reduce teacher workload, build inquiry skill across grade levels, and adapt inquiry principles to other science disciplines. Handouts!

New Advanced Inquiry Labs for AP Biology from Flinn Scientific (Bio)
(Grades 9–12) *258A, BCEC*
Sponsor: Flinn Scientific, Inc.
Jennifer Sternberg *(jsternberg@flinnsci.com)* and **Irene Cesa** *(icesa@flinnsci.com),* Flinn Scientific, Inc., Batavia, Ill.
Four big ideas, more great labs! The revised AP Biology curriculum integrates scientific inquiry and reasoning through a series of student-directed, inquiry-based laboratory investigations. Join Flinn Scientific as we model the inquiry process and demonstrate activities from our new guided inquiry labs for AP Biology. We will share proven strategies for improving students' ability to generate meaningful questions, design experiments, and analyze scientific evidence. Handouts provided for all activities include alignment with the new AP Biology curriculum.

Fantastical Chemistry Demos for All Classrooms (Chem)
(General) *258B, BCEC*
Sponsor: Educational Innovations, Inc.
Bill Richey, Educational Innovations, Inc., Bethel, Conn.
These super fun and exciting chemistry demonstrations can be used by all teachers at any level to get your classroom 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!

10:00 AM–12 Noon Workshop

PDI **NGSS Pathway Session: Exploring How the *NGSS* and *CSSS Mathematics* Work Together (Gen)**

(General) *206 A/B, BCEC*

Mariel Milano *(mariel.milano@ocps.net),* Orange County Public Schools, Orlando, Fla.

Levi J. Patrick *(levi.j.patrick@gmail.com),* Oklahoma State Dept. of Education, Oklahoma City

Let's explore how to leverage the performance expectations in the *Next Generation Science Standards* to meet the rigor of the *Common Core State Standards, Mathematics* through hands-on application, problem-based learning, and modeling.

10:30–11:30 AM Exhibitor Workshop

Science, Fashion, and Fun! Genes in a Bottle™ Kit (Bio)

(Grades 6–College) *157B, BCEC*

Sponsor: Bio-Rad Laboratories

Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

Isolate your own DNA and capture your unique essence in our stylish NEW helix-shaped necklaces! From cell structure to genetics to the chemistry of life, this workshop is perfect for all education levels, integrating multiple life science standards into a single lesson.

10:30–11:30 AM Featured Presentation

Chrysalis: Transforming Your Teaching (Bio)
(Elementary) *210C, BCEC*

Steve Rich *(bflywriter@comcast.net),* NSTA Director, Professional Development, and Director, GYSTC, University of West Georgia, Carrollton @bflyguy

Presider: Michele Daigle, Central Tree Middle School, Rutland, Mass.

Elementary teachers can exude confidence using simple strategies and reliable resources. Join Steve Rich as he challenges teachers to emerge from their chrysalis and share their enthusiasm for science with students—making standards-based learning practical, informative, and fun.

As a science teacher in elementary and middle schools, Steve Rich created two outdoor classrooms that were honored with NSTA awards—the Ciba Exemplary Science Teaching Award and the Ohaus Award for Innovations in Science Teaching. He served as a science specialist for the Georgia Department of Education and is currently coordinator of the Youth Science and Technology Center at the University of West Georgia. Steve is a frequent NSTA presenter and author of the NSTA Press® books Outdoor Science: A Practical Guide *and* Bringing Outdoor Science In: Thrifty Classroom Lessons.

A National Board Certified teacher, Steve is the recipient of the Presidential Award for Excellence in Science Teaching. Currently, he serves as the NSTA Director for Professional Development. He was president of the Georgia Science Teachers Association. At present, he is working toward his doctoral degree in school improvement at the University of West Georgia, where his research focuses on teaching elementary science outdoors.

In 2013, Steve was commissioned by former First Lady Rosalynn Carter to design a butterfly garden at her home in Georgia. This garden became the beginning of the Rosalynn Carter Butterfly Trail, comprised of a dozen public gardens featuring Steve's designs for the Jimmy Carter National Historic Site.

10:30 AM–12 Noon Meeting

Next Steps Advisory Board Meeting
(By Invitation Only) *Seaport Ballroom C, Seaport*
Visit *www.nextstepsinscience.org* for details.

11:00–11:30 AM Workshop

Meet Me in the Middle Session: Everyday Engineering (Gen)
(Middle Level) *Commonwealth Ballroom A, Westin Waterfront*
Richard H. Moyer and **Susan A. Everett** *(everetts@umich.edu),* University of Michigan–Dearborn
Engage in STEM activities related to everyday engineering (ballpoint pens or life jackets) and learn how to integrate the four STEM disciplines into one lesson.

11:00 AM–12 Noon Presentations

SESSION 1

If I Do a Lab, Must I Write a Lab Report? (Gen)
(Elementary) *158, BCEC*
Sharon LaRosa *(teachingislearningtwice@gmail.com),* Swampscott (Mass.) Public Schools
Come pick up positive strategies using science notebooking and techniques to develop writing/critical-thinking skills at the elementary level. Learn 21st-century writing skills as they relate to STEM.

SESSION 2

Moving Forward with *NGSS* Crosscutting Concepts: Questions and Strategies to Elicit Student Ideas in Life Science (Bio)
(Elementary–Middle Level) *160B, BCEC*
Bethann Lavoie *(bethann.lavoie@mnsu.edu),* **Stephanie J. Zojonc** *(stephanie.zojonc@mnsu.edu),* and **Brittany Ziegler** *(brittany.ziegler@mnsu.edu),* Minnesota State University, Mankato
Take away key questions and organizational strategies that deepen understanding of *NGSS* crosscutting concepts. Integrate them when students experiment, read, observe organisms, and decode images.

SESSION 3

Sustainability, STEM, and the Built Environment (Env)
(Elementary–High School) *161, BCEC*
Tim Cole *(jtcole@vbschools.com)* and **Melani A. Loney,** Virginia Beach (Va.) City Public Schools
Join us as we demonstrate how one school division is educating students about sustainability by connecting STEM and the built environment.

SESSION 4

The Yearlong Space Epic: Immersing and Engaging Students in Science Through an Alternate Reality Game (Chem)

(General) *162B, BCEC*

Jeffrey King, Camden County Technical Schools, Pennsauken, N.J.

Explore how immersing students in a yearlong space mission increases student excitement in STEM and empowers students to solve scientific problems and make choices that can alter humanity's fate in the universe.

SESSION 5

Connecting Physical Science and Engineering Through the Design of an Underwater Robot (Phys)

(Middle Level–High School) *205C, BCEC*

Jason C. Sayres *(jason.sayres@stevens.edu),* Stevens Institute of Technology, Hoboken, N.J.

Join me for an in-depth discussion of underwater robotics projects as vehicles for teaching and connecting physical science and engineering principles, along with the unique challenges involved.

SESSION 6

PDI **Wheelock Pathway Session: Weaving Science and Literacy into the Elementary Classroom to Meet the *NGSS* and *CCSS* (Gen)**

(Elementary/Supervision) *209, BCEC*

Janet MacNeil *(janet_macneil@brookline.k12.ma.us),* Brookline (Mass.) Public Schools

Emily Leonard, Runkle School, Brookline, Mass.

Jeri Hammond *(jeri_hammond@brookline.k12.ma.us),* Driscoll School, Brookline, Mass.

We'll share our experience integrating talk, writing (notebooks and argument writing), and reading into elementary science units while meeting both the *NGSS* and the *Common Core State Standards, ELA.*

SESSION 7

STEM Project: Build and Use a Simple Colorimeter (Chem)

(High School) *251, BCEC*

Fred C. Fotsch *(ffotsch@spsmail.org),* Glendale High School, Springfield, Mo.

This STEM activity—building a colorimeter, designed to fulfill the *NGSS*—is constructed from easily obtained, inexpensive parts, and then calibrated with a TI-Nspire™ voltage probe.

SESSION 8

The NSTA Learning Center: A Tool to Develop Preservice Teachers (Gen)

(General) *252A, BCEC*

Al Byers *(abyers@nsta.org),* Acting Associate Executive Director, e-Learning and Government Partnerships, NSTA, Arlington, Va.

Flavio Mendez *(fmendez@nsta.org),* Senior Director, NSTA Learning Center/SciLinks, NSTA, Arlington, Va.

Come learn about a new online system to assist professors in creating customized e-textbooks using the Learning Center's interactive and e-print resources for their preservice teachers.

SESSION 9 (two presentations)

(Preschool–Middle Level) *252B, BCEC*

Preschool STEM Family Night: A University, Preschool, and Community Partnership (Gen)

Nicole Glen *(nglen@bridgew.edu),* **Emma Lee Hunt, Emily Tuminelli** *(emtuminelli@yahoo.com),* and **Allison Mooney,** Bridgewater State University, Bridgewater, Mass.

Preservice early childhood teachers planned and implemented a "kitchen science" preschool STEM family night. Join us as we present details of the partnership, activities, and assessment results.

Building Family STEM Literacy (Gen)

Ellen M. Streng *(streng.3@wright.edu)* and **Madison B. Gearhart,** Wright State University, Dayton, Ohio

Discover interactive exhibits, demonstrations, and family-oriented games that support STEM content, the *Next Generation Science Standards,* and the *Common Core State Standards, ELA.*

SESSION 10

NARST Session: Exploring Next Generation Curriculum Models Implementing the Vision in the NRC *Framework* and the *NGSS* (Gen)

(Elementary–High School) *253A, BCEC*

Katie Van Horne *(katievh@uw.edu),* **Elizabeth A. Wright, Nancy Vye** *(nancyvye@u.washington.edu),* and **Paul Sutton,** University of Washington, Seattle

Suzanne Reeve, Bill Palmer, and **Angie DiLoreto** *(diloretoa@bsd405.org),* Bellevue (Wash.) School District

Claudia Lemus *(clemus@fwps.org),* TAF Academy, Kent, Wash.

This session describes a range of instructional approaches and curriculum development models that can be used to support the learning goals embedded in the *NGSS.*

SESSION 11

STEM Share-a-Thon **(Gen)**

(Elementary–High School) *253B, BCEC*

Jeffrey Grant *(jgrant@csd99.org),* North High School, Downers Grove, Ill.

Kenneth Huff *(khuff@williamsvillek12.org),* Mill Middle School, Williamsville, N.Y.

Benjamin McCombs *(benjamin.mccombs@ketteringschools.org),* Van Buren Middle School, Kettering, Ohio

Terence McMahon *(terry.mcmahon@palmbeachschools.org),* Meadow Park Elementary School, West Palm Beach, Fla.

Presider: Amanda Upton *(aupton@nsta.org),* Manager, Nominations and Teacher Awards Program, NSTA, Arlington, Va.

Come learn about the latest STEM classroom initiatives by the PASCO STEM Educator award winners! They'll present their winning ideas at the elementary, middle school, and high school levels.

SESSION 12

NSTA Press® Session: Get the FACTs for Supporting Evidence-based Talk and Argument **(Gen)**

(General) *254A, BCEC*

Page Keeley *(pagekeeley@gmail.com),* 2008–2009 NSTA President, Jefferson, Maine

Joyce B. Tugel *(jtugel@mmsa.org),* Maine Mathematics and Science Alliance, Augusta

This interactive session will provide you with a collection of formative assessment classroom techniques (FACTs) that both inform instruction and support learning as students engage in evidence-based talk and argument—integral practices of the *NGSS.*

SESSION 13

Disciplinary Literacy in Middle School Science Classrooms **(Gen)**

(Middle Level) *255, BCEC*

Gregory MacDougall *(gregm@usca.edu),* University of South Carolina, Aiken

This session will explain the IQ-MS model of professional development and support designed to infuse disciplinary literacy strategies in middle science classrooms across South Carolina.

SESSION 14

Teaching About the Teen Brain: Linking Neuroscience and Health Curricula Through the Study of Addiction **(Bio)**

(Middle Level–High School) *257A, BCEC*

Elliott Gimble *(egimble@sch.ci.lexington.ma.us),* **Sarah Legge** *(slegge@sch.ci.lexington.ma.us),* and **Laura Byron** *(lbyron@sch.ci.lexington.ma.us),* Lexington High School, Lexington, Mass.

Sion Harris *(sion.harris@childrens.harvard.edu),* CeASAR Children's Hospital, Boston, Mass.

Presider: Elliott Gimble

Explore an adaptable neuroscience curriculum on adolescent brains and addiction developed by high school biology and health teachers and a specialist from Children's Hospital–Boston.

SESSION 15

Top 10 Findings in Genetics and Biotechnology **(Bio)**

(Middle Level–College) *257B, BCEC*

Neil Lamb, HudsonAlpha Institute for Biotechnology, Huntsville, Ala.

Want to include cutting-edge genetic research in your class? See the top 10 findings in genetics and biotechnology presented in student-friendly language and correlated to national standards.

SESSION 16

Google Me This! How to Make Collaboration Work in a Wiki World **(Gen)**

(General) *259B, BCEC*

Ben Smith *(ben@edtechinnovators.com)* and **Jared Mader** *(jared@edtechinnovators.com)*, York, Pa.

Join us for a behind-the-scenes look at how to create a collaborative work environment in your science classroom using web-based tools.

SESSION 17

How to Effectively Implement a Curricular Review as a Teacher Leader **(Gen)**

(General) *260, BCEC*

Jennifer Towleh *(jennifer_towleh@asl.org)* and **Janet E. Bradshaw** *(janet_bradshaw@asl.org),* American School in London, U.K.

Discussion centers on how to bring about curricular change. Engage in activities that can enable you to effectively lead meetings and discussions about curricular implementation.

SESSION 18

Keys to Success for The DuPont Challenge© Science Essay Competition (Gen)

(General) *261, BCEC*

Brian P. Short, Director, Science Education Competitions, NSTA, Arlington, Va.

Teachers whose students have previously won The DuPont Challenge will share their science essay writing tips in this panel-based discussion. How do students choose an essay topic? What are the key features of an award-winning science essay? What are common pitfalls to avoid? How much guidance do teachers need to provide? These are just some of the important issues that will be addressed so that attendees can take winning strategies back to their students, or simply help their students improve their science writing.

SESSION 19

Informal Science Day Session: Collaborate to Innovate: An Interactive Session to Develop Exciting Partnerships for Recruiting and Retaining Girls in STEM (Gen)

(Informal Education) *Ballroom West/Group 1, BCEC*

Karen A. Peterson *(kpeterson@edlabgroup.org),* EdLab Group, Lynnwood, Wash.

The National Girls Collaborative Project will share an innovative collaboration model to help educators provide high-quality activities to K–12 girls in STEM.

SESSION 20

Informal Science Day Session: Engaging Early Childhood Educators with Science: Presentation of and Findings from the Sackler Early Childhood Science Education Initiative (Gen)

(Preschool–Elementary) *Ballroom West/Group 2, BCEC*

Natalie Tahsler *(ntahsler@amnh.org),* **Jane Kloecker** *(jkloecker@amnh.org),* **Ilana April** *(iapril@amnh.org),* **Caitlin Coe** *(ccoe@amnh.org),* **Bilexis Casado** *(bcasado@amnh.og),* and **Janice Jang** *(jjang1@amnh.org),* American Museum of Natural History, New York, N.Y.

What does effective professional development look like for early childhood educators? How can museums serve as a resource for educators? The Sackler Early Childhood Science Education Initiative was a two-year professional development pilot (2011–2013), designed for early childhood educators from community centers, public schools, and independent schools. Join us as we share knowledge learned from the initiative and discuss best practices for building an effective museum/school partnership.

SESSION 21

Informal Science Day Session: *Informalscience.org:* A Newly Rebuilt Resource for Informal Educators (Gen)

(Informal Education) *Ballroom West/Group 3, BCEC*

Kalie Sacco *(ksacco@astc.org),* Association of Science-Technology Centers, Washington, D.C.

James Bell *(jbell@astc.org),* Center for Advancement of Informal Science Education, Washington, D.C.

Join staff from the Center for the Advancement of Informal Science Education (CAISE) as they introduce you to *Informalscience.org,* a newly rebuilt resource website for informal science professionals.

SESSION 22

Informal Science Day Session: Web-based Classroom Resources: How Evaluations Can Aid Program Development (Gen)

(Informal Education) *Ballroom West/Group 4, BCEC*

Jessica Sickler *(jsickler@cosi.org),* Lifelong Learning Group, Columbus, Ohio

Amy Busey *(abusey@edc.org),* Education Development Center, Inc., Waltham, Mass.

Mary Ann Wojton *(mwojton@cosi.org),* COSI, Columbus, Ohio

Evaluators and content providers will discuss how evaluations supported the development of two web-based teacher resources that are designed to connect learners to scientific data and investigative tools.

SESSION 23

Online Teaching and Learning—Not Your Parents' Classroom (Gen)

(College) *Brewster, Renaissance*

John Graves *(graves@montana.edu),* Montana State University, Bozeman

Online learning can be as good as or better than face to face. Share the experiences of a 15+ year online instructor.

SESSION 24

Globalizing Your Science Class for the 21st Century (Gen)

(Elementary–High School) *Mediterranean, Renaissance*

Kottie Christie-Blick *(kchristieblick@socsd.org),* Cottage Lane Elementary School, Blauvelt, N.Y.

Leverage the *NGSS* and *CCSS* to help students collaborate internationally on scientific issues. See what's worked in classrooms when students use science as a focal point while developing global competence.

SESSION 25

The Science Behind Advanced Coursework in High School (Gen)

(High School–College) *Pacific A/B, Renaissance*

Philip M. Sadler *(psadler@cfa.harvard.edu)* and **Gerhard Sonnert** *(gsonnert@cfa.harvard.edu),* Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

Hear evidence from our national studies measuring the impact of AP, IB, and other advanced coursework on STEM career interest and later performance in college science.

SESSION 26 (two presentations)

(General) *Pacific C, Renaissance*

Amazing Apps and Scintillating Software for Science (Gen)

James O'Keefe *(jokeefe@lesley.edu),* Lesley University, Cambridge, Mass.

James O'Keefe IV *(james.okeefe42@gmail.com),* Hingham High School, Hingham, Mass.

Join us for an overview and demonstration of the effective use of iPad apps and other educational software in teaching biology and general science.

Teaching with Screen-capture Podcasts (Gen)

Wendy Van Norden *(wvannorden@hw.com),* Harvard-Westlake School, Studio City, Calif.

Discover how to turn science lessons into short screen capture podcasts that your students can watch and take notes at their own pace.

SESSION 27

Achieving Conceptual Understanding in Stoichiometry with Cognitive Skills (Chem)

(High School–College) *Pacific D, Renaissance*

Wai S. Chan *(waisum.chan@yahoo.com),* William P. Clements High School, Sugar Land, Tex.

Frustrated in teaching stoichiometry? Join me and learn about a conceptual strategy, incorporated with educational theories, to make stoichiometry meaningful for students.

SESSION 28

An Assessment for a 21st-Century Society: The National Assessment of Educational Progress Technology and Engineering Literacy Assessment (Gen)

(General) *Pacific F, Renaissance*

William Ward *(william.ward@ed.gov),* National Center for Education Statistics, Washington, D.C.

Join the National Assessment of Educational Progress to learn about the first-ever national assessment of technology and engineering literacy.

SESSION 29

You Can Teach Science! Properties of Materials for K–5 in *NGSS* (Chem)

(Elementary/College) *Pacific G/H, Renaissance*

Martin L. Brock *(martin.brock@eku.edu),* Eastern Kentucky University, Richmond

Diane Johnson *(diane.johnson@uky.edu),* University of Kentucky, Lexington

Through teacher/university partnerships, hands-on activities aligned with the *NGSS* and engineering components have been developed and will be presented in this interactive session.

SESSION 30

AMSE Session: Leadership for the Next Generation in Science Education (Gen)

(Supervision/Administration) *Constitution, Seaport*

Sharon J. Delesbore *(sharon.delesbore@hmhco.com),* The Leadership and Learning Center, Houston, Tex.

A.I.M. to establish a successful science program with support of knowledgeable leadership willing to prepare all students for the *Next Generation Science Standards.* Participants will utilize the A.I.M. framework to establish a successful science program.

SESSION 31

Moviemaking in an iMinute **(Gen)**

(Middle Level–High School) *Lighthouse I, Seaport*

Achim Dangerfield *(achimdangerfield@berkeley.net),* B Tech Academy, Berkeley, Calif.

Create a science lesson in one minute with iMovie for iPads and iPhones. Put yourself ahead of the YouTube tutorial pack by crafting a "Hollywood-ready" lesson.

SESSION 32

★ **Teachers Developing as Leaders: A Panel Discussion** **(Gen)**

(General) *Plaza A, Seaport*

Joyce M. Gleason *(joycegle@earthlink.net),* Educational Consultant, Punta Gorda, Fla.

Christine Royce *(caroyce@aol.com),* Shippensburg University, Shippensburg, Pa.

Betsey Clifford *(betsey.clifford@gmail.com),* President, Massachusetts Association of Science Teachers, Braintree

Krishna R. Millsapp *(loyolagrl@aol.com),* Mount Carmel High School, Chicago, Ill.

Jeffrey Spencer, Vista Peak Preparatory, Aurora, Colo.

Teachers do not automatically see themselves as leaders. Exemplary young teachers will describe their experiences as developing leaders. Their personal stories will instruct and inspire.

SESSION 33

Build a Bridge and Get Over It! **(Gen)**

(Middle Level–High School) *Plaza B, Seaport*

Keith F. Sevigny *(sevik001@hartfordschools.org),* Annie Fisher STEM Magnet School, Hartford, Conn.

Jennifer G. Sevigny *(jenny.glieco@gmail.com),* Preston Plains Middle School, Preston, Conn.

Discover a novel interdisciplinary unit on bridge construction that has been implemented in urban and rural communities to emphasize an integrated STEM approach. Curriculum provided!

SESSION 34

Toying Around with the Nature of Science **(Gen)**

(Middle Level–High School) *Plaza C, Seaport*

Ellen Barnett *(eb4nd@mail.missouri.edu)* and **Deborah Hanuscin,** University of Missouri, Columbia

How could a toy help your students understand the nature of science? Come play with us! The first 20 participants will receive a toy.

SESSION 35

NSELA Session: Lead, Follow, or Get Out of the Way **(Gen)**

(Elementary/Supervision) *Alcott, Westin Waterfront*

Elizabeth Niehaus *(niehaus_p@msn.com)* and **Carol L. Jones** *(caroljones8710@yahoo.com),* Lawrence Technological University, Southfield, Mich.

Jennifer Wickersham *(wickershamj@clps.org),* Crothers Elementary School, Warren, Mich.

Presider: Paul J. Niehaus, Niehaus & Associates, Inc., South Lyon, Mich.

The only true leadership frequently comes from the classroom teacher who has a direct relationship with either the student, their parent, or the administrator. The teacher is the great facilitator of making things happen!

SESSION 36

Exploring the Science Encountered in the Young Child's World—Nurturing, Observing, Questioning, Investigating, Thinking, and Talking About Science **(Gen)**

(Preschool–Elementary/Supv.) *Burroughs, Westin Waterfront*

Donna L. Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Shawnee Mission, Kans.

Find out how to use everyday examples of science that comprise a young child's world to motivate students by creating rich, engaging instruction.

SESSION 37 (two presentations)

(Middle Level) *Commonwealth Ballroom B, Westin Waterfront*

Meet Me in the Middle Session: Practical Lessons and Demonstrations on a Budget **(Gen)**

Kathleen Brooks, Educational Consultant, Madison, Conn.

Ideas will be shared for lessons and demonstrations that help teach science concepts to middle school students using everyday lab equipment and additional inexpensive materials.

Meet Me in the Middle Session: Cheap and Cool Education Technology for the Middle School Classroom **(Gen)**

Jacob Noel-Storr *(jake@cis.rit.edu),* **Brandon Cole,** and **Colby Carll,** Rochester Institute of Technology, Rochester, N.Y.

We will present some portable, easy-to-set-up technology ideas to use in your middle level science classroom.

SESSION 38

Video Analysis as Reflective Practice (Gen)

(General) *Faneuil, Westin Waterfront*

Jessica S. Krim *(jkrim@siue.edu),* Southern Illinois University, Edwardsville

I will share results from a study based on reflective practice, in which I work with preservice educators to analyze videos of their teaching.

SESSION 39 (two presentations)

(General) *Grand Ballroom C, Westin Waterfront*

Meet Me in the Middle Session: Candy Geometry: Using Mathematical Models to Solve a Problem—Sweet! (Gen)

Mary Lou Lipscomb *(mlipsc3536@aol.com),* Retired Educator/NMLSTA Board Member, Naperville, Ill.

Liz Martinez *(lizrmartinez@gmail.com),* Illinois Mathematics and Science Academy, Aurora

Let's integrate math and science using various geometric models to calculate the volume of one Skittles® candy and compare the calculated volumes to the actual volume.

Meet Me in the Middle Session: Science in 32 Pages: The Brilliant and Graceful Work of Jason Chin (Gen)

Jason Chin, Author and Illustrator, Burlington, Vt.

Author and illustrator Jason Chin is a master at pairing stories and science in his award-winning Outstanding Science Trade Books *Redwoods, Coral Reef,* and *Island.* Jason will delight you with how he uses his bookmaking talents to present accurate views of the scientific world in a way that entertains and delights. He will discuss his process in researching, writing, and illustrating inviting and accessible science and provide a sneak peek into his forthcoming book *Gravity.*

SESSION 40

Getting at the Core of Project-based and Inquiry Science (Gen)

(Elementary–High School) *Griffin, Westin Waterfront*

Larry Weathers, Arlington (Mass.) Public Schools

Katrina Scherben *(katrina.scherben@gmail.com),* Innovate Manhattan Charter School, Bronx, N.Y.

Project-based and inquiry science lessons provide powerful opportunities for students to use evidence to explain and support scientific claims. Come learn methods that can enrich the writing in your classroom.

SESSION 41

Expanding Students' Digital Footprint Beyond Social Media (Gen)

(General) *Harbor Ballroom II, Westin Waterfront*

Robert A. White *(rwhite@bbchs.org)* and **Bill L. Sadler** *(bsadler@bbchs.org),* Bradley-Bourbonnais Community High School, Bradley, Ill.

Create awareness of digital citizenship, promoting real-time online student collaboration and using online notebooks to document scientific activities inside and outside of the classroom.

SESSION 42

Using the 5Es to Become Next Generation Ready (Gen)

(General) *Harbor Ballroom III, Westin Waterfront*

Sally Creel *(sally.creel@cobbk12.org),* Cobb County Schools, Marietta, Ga.

The *NGSS* requires more than rote learning, memorization, and fact-based learning. Learn how to effectively use the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate) to teach an *NGSS* standard. Elementary-friendly strategies incorporating the *NGSS* practices, crosscutting concepts, and literacy connections will be shared.

SESSION 43 (two presentations)

(General) *Lewis, Westin Waterfront*

Sense-of-Place Writing Templates: Connect Your Students' Past Experiences with Science AND Literacy! (Gen)

Renee M. Clary *(rclary@geosci.msstate.edu),* Mississippi State University, Mississippi State, Miss.

Reflecting and writing on their past experiences connects your students to science content—and promotes literacy skills! Free botany, geology, and meteorology writing templates provided.

Using Writing to Motivate Students to Learn Science (Gen)

Nancy G. Caukin *(nancy.caukin@mtsu.edu),* Middle Tennessee State University/Eagleville High School, Murfreesboro

Motivate students to learn science by using a science writing heuristic, a strategy that supports the *NGSS* and *CCSS.* Watch your students become scientists.

SESSION 44

Designing Professional Development and Using Technology to Support It (Gen)

(Supervision/Administration) *Paine, Westin Waterfront*

Lisa Bohn *(lbohn@astate.edu),* Arkansas State University, State University, Ark.

Elizabeth A. Allan *(eallan@uco.edu),* University of Central Oklahoma, Edmond

Patricia Shane *(pshane@unc.edu),* 2009–2010 NSTA President, and North Carolina Science Leadership Association, Chapel Hill

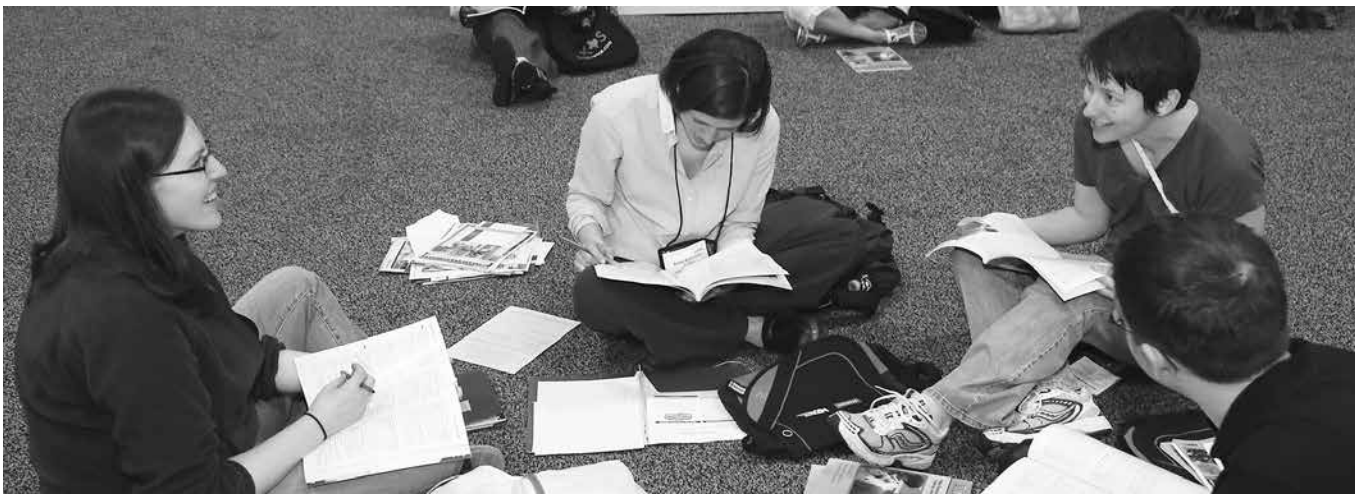
Walk away with ideas and best practices for designing and providing professional development in your school and district. We will be discussing various technologies to support the event, including cloud storage, blogs, and electronic scheduling.

11:00 AM–12 Noon Workshops

NESTA Session: National Earth Science Teachers Association Weather, Climate, and Ocean Share-a-Thon (Earth)
(Elementary–High School) *052 A/B, BCEC*

Michelle C. Harris, Wakefield High School, Arlington, Va.
Roberta M. Johnson *(rmjohnsn@gmail.com),* NESTA, Boulder, Colo.
Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.
Ileana Betancourt *(iab27@cornell.edu),* Cornell Lab of Ornithology, Ithaca, N.Y.
Lynne Cherry *(youngvoicesforplanet@gmail.com),* Young Voices on Climate Change, Thurmont, Md.
Kathleen Couchon, Narragansett High School, Narragansett, R.I.
LuAnn Dahlman *(luann.dahlman@noaa.gov),* NOAA, Mesa, Ariz.
Annette deCharon *(annette.decharon@maine.edu),* University of Maine Darling Marine Center, Walpole
Wendy DeMers *(2ydnew2@gmail.com),* E. Hynes Charter School, New Orleans, La.
Diane Duffus *(duffus@dutchessday.org),* Dutchess Day School, Millbrook, N.Y.
Don Duggan-Haas *(dad55@cornell.edu),* PRI and Its Museum of the Earth and Its Cayuga Nature Center, Ithaca, N.Y.
Lisa Gardiner, UCAR Science Education, Boulder, Colo.
Kevin Goff *(kdgoff@vims.edu),* Virginia Institute of Marine Science, Gloucester Point
Margaret Greaves *(mgreaves@bostonpublicschools.org),* Boston Latin School, Boston, Mass.
Marian Grogan *(marian_grogan@terc.edu),* **Nick Haddad** *(nick_haddad@terc.edu),* and **Tamara Shapiro Ledley** *(tamara_ledley@terc.edu),* TERC, Cambridge, Mass.
Laura Guertin *(paesta@psu.edu),* President-Elect, Pennsylvania Earth Science Teachers Association, University Park
Lynne H. Hehr *(lhehr@uark.edu),* University of Arkansas, Fayetteville
Preston Lewis *(preston.lewis@nasa.gov),* NASA Langley Research Center, Hampton, Va.
Bruce Moravchik *(bruce.moravchik@noaa.gov),* NOAA, Silver Spring, Md.
Deb Morrison *(educator.deb@gmail.com),* University of Colorado, Boulder
Andi Nelson *(anelson@adlerplanetarium.org),* Adler Planetarium, Chicago, Ill.
Ruth Paglierani *(ruthp@ssl.berkeley.edu),* University of California, Berkeley
Kristen Poppleton *(kristen@willstegerfoundation.org),* Will Steger Foundation, Minneapolis, Minn.
Carole J. Reesink *(cjreesink@muscanet.com),* Retired Educator, Muscatine, Iowa
Randy Russell *(rrussell@ucar.edu),* NCAR, Boulder, Colo.
Cassie Soeffing, Institute for Global Environmental Strategies, Arlington, Va.
Al Stenstrup *(alstenstrup@plt.org),* Project Learning Tree, Washington, D.C.
Jessica Taylor *(jessica.e.taylor@nasa.gov),* NASA Langley Research Center, Hampton, Va.
Eleanor Vallier-Talbot *(eleanor-vallier-talbot@noaa.gov),* NOAA/National Weather Service, Taunton, Mass.
Courtney White, Rainforest Alliance, New York, N.Y.

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



Follow Your (Our) Star **(Env)**
(General) *157C, BCEC*
Alice (Jill) A. Black *(ablack@missouristate.edu),* Missouri State University, Springfield
Sometimes our Sun and its functioning and uses are omitted in the study of astronomy. Engage in three hands-on activities involving the relationship of temperature and color of the Sun; sunspots; the ecliptic; sundials; scale models of the Earth, Sun, and Moon; and solar cooking.

Engineering: Integrate the 3 Ds in the *NGSS* **(Phys)**
(Elementary–Middle Level) *159, BCEC*
Karen L. Ostlund *(klostlund@utexas.edu),* NSTA Retiring President, and Retired Professor, The University of Texas at Austin
Experience a model lesson integrating the three dimensions (science and engineering practices, disciplinary ideas, and crosscutting concepts) in the *Next Generation Science Standards.*

Learning Made EEEEE-Z! **(Chem)**
(Elementary) *160A, BCEC*
Kimberly L. Trotter *(kimtrotter3@gmail.com),* Shwab Elementary School, Nashville, Tenn.
Join me as I demonstrate the 5E learning model in an engaging, exciting, exhilarating, enriching, and enhancing method. Take home a free CD of lessons.

And They All Lived Scientifically Ever After **(Gen)**
(Preschool–Elementary) *160C, BCEC*
Elizabeth Kersting-Peterson *(elizabeth.kerstingpeterson@duluth.k12.mn.us),* Piedmont Elementary School, Duluth, Minn.
In this hands-on workshop, participants use literature, common household materials, science, engineering, and inquiry to engage K–3 students in creative adventures.

Interdisciplinary Model-eliciting Activities Bring Design, Engineering Practices, and Real-World Context to the Science Classroom **(Bio)**
(Middle Level–High School) *205A, BCEC*
Melissa Dyehouse *(mdyehouse@lsi.fsu.edu),* **Adam L. Santone** *(asantone@lsi.fsu.edu),* and **Rabieh Razzouk** *(rrazzouk@lsi.fsu.edu),* Florida State University, Tallahassee
Learn to use model-eliciting activities in your classroom as your students learn to think like engineers to solve real-world problems while learning standards-based science content.

Using Climatograms to Understand Biomes **(Bio)**
(Middle Level–College) *205B, BCEC*
Thomas R. Hinckley *(thinckley@landmark.edu),* Landmark College, Putney, Vt.
This life science workshop will engage you in the construction and interpretation of climatograms that can then be integrated into a larger biomes unit.

Elementary Engineering **(Gen)**
(Elementary–Middle Level) *207, BCEC*
Elizabeth A. Strong *(libby@smartcenter.org)* and **Robert E. Strong** *(robert@smartcenter.org),* SMART-Center, Wheeling, W.Va.
Engineering in the elementary and middle school classrooms can be easier than you think. Join us as we share ideas and activities from the elementary engineering workshop.

CESI Session: Do You Have a Problem? **(Gen)**
(Elementary–Middle Level) *211, BCEC*
Melissa Sleeper *(melissa.sleeper@indianriverschools.org),* Sebastian River Middle School, Sebastian, Fla.
Come learn how to design meaningful and successful problem-based projects while students learn science content and build 21st-century skills. Leave with classroom-ready activities.

Exploring Interactions in the Sciences: Inquiry-based Investigations **(Gen)**
(Elementary) *212, BCEC*
Jane Heinze-Fry, Sandra Ryack-Bell, and **Jennifer Klein** *(jklein@mits.org),* Museum Institute for Teaching Science (MITS), Quincy, Mass.
Participate with K–5 teachers in inquiry-based, minds-on/hands-on science activities they developed for their classrooms during MITS summer institutes involving museums and science education centers.

A Way with Words: Integrating Science and Engineering in Reading **(Gen)**
(Preschool–Elementary) *213, BCEC*
Brian J. Raygor *(braygor@wcboe.org)* and **Kevin Hill** *(khill@wcboe.org),* Wicomico County Public Schools, Salisbury, Md.
Discover activities and lessons that can help you make more time for science by integrating investigations with reading. Take home a CD with resources.

NSTA Press® Session: Inside-Out—Enhancing Field-based Learning in Environmental Science for the Upper Elementary Classroom (Env)
(Elementary) *253C, BCEC*
Sarah Haines *(shaines@towson.edu)* and **Robert Blake** *(rblake@towson.edu),* Towson University, Towson, Md.
John A. Frederick *(frederic@mdsg.umd.edu),* University of Maryland, Baltimore
This workshop will not only enhance your content knowledge in the environmental sciences, but will help you in the construction and implementation of meaningful field-based learning experiences for your students.

Space Week: An Integrated Curriculum Unit for Grades 6–8 (Gen)
(Middle Level) *254B, BCEC*
Kelly Graveson *(kgraveson@douglasps.net),* Douglas High School, Douglas, Mass.
Rachel Usher *(rusher@douglas.k12.ma.us),* Douglas Intermediate Elementary School, Douglas, Mass.
Design and test a Mars lander as we share our engaging, inspiring, and award-winning unit that infuses space studies into all middle school subject areas.

Creating Meaningful Field Trip Experiences (Gen)
(Informal Education) *256, BCEC*
Dustin Axe *(dustin.axe@msichicago.org),* **Jason Dupuis** *(jason.dupuis@msichicago.org),* and **Andy North** *(andy.north@msichicago.org),* Museum of Science and Industry, Chicago, Ill.
Create a field trip experience that makes the most out of your destination. Take home resources and tips to be used in many field trip environments.

Engineering Made Easy: *NGSS* Practices for Elementary Students (Gen)
(Elementary) *259A, BCEC*
Elise K. Morgan, Museum of Science, Boston, Mass.
Incorporating science and engineering can feel like a daunting task. Join me and see firsthand that engineering challenges can be simple and engaging for all students. Work to solve a hands-on engineering challenge—help Arctic penguins survive in a hot climate. Using simple materials, we'll insulate a frozen model penguin and see how easy it is to incorporate the *NGSS* science and engineering practices into your classroom.

Using Web-based Curriculum Materials to Build Strong STEM Programs (Gen)
(General) *Atlantic 1, Renaissance*
Gregory Vogt and **Nancy Moreno** *(nmoreno@bcm.edu),* Baylor College of Medicine, Houston, Tex.
STEM subjects are often gatekeepers to future success. Access peer-reviewed online resources to build STEM knowledge, as well as curricula to prepare students for 21st-century careers.

Building Students' Understanding of Theories One Puzzle Piece at a Time (Gen)
(Elementary–High School) *Atlantic 2, Renaissance*
Juan P. Jimenez *(jjimen10@hawk.iit.edu),* **Norman G. Lederman** *(ledermann@iit.edu),* **Elana R. Jacobs** *(ejacobs1@hawk.iit.edu),* and **Megan F. Campanile** *(mfaurot@hawk.iit.edu),* Illinois Institute of Technology, Chicago
Presider: Juan P. Jimenez
By putting puzzle pieces together, we are helping students make connections to biology and nature of science. Lesson plans and activities provided.

3-D Tissue Models That Anyone Can Build (Bio)
(High School–College) *Atlantic 3, Renaissance*
Ruth L. Hutson *(ruthhutson@bluevalley.net),* Blue Valley High School, Randolph, Kans.
These activities can help educators increase their students' 3-D spatial understanding by constructing models of the four types of tissues.

Literacy Skills for Visual Scientific Text (Gen)
(Middle Level–High School) *Seaport Ballroom A, Seaport*
Jaclyn F. Austin, Naté Hall *(nate_hall@hcpss.org),* and **Mary Weller** *(mary_weller@hcpss.org),* Howard County Public School System, Ellicott City, Md.
In science, the text that students need to access can be visual such as a chart, graph, or diagram that contains essential information. In a hands-on activity, participants will explore how to help students become literate to a variety of texts in science and focus on the skill of summarization that supports the NRC *Framework*.

Using the Five-Practice Framework to Facilitate Productive Classroom Discussions (Gen)
(High School) *Seaport Ballroom B, Seaport*
Sarah Macway *(sarah.macway@mvla.net),* Mountain View High School, Mountain View, Calif.
Laura Nutter, T.C. Williams High School, Alexandria, Va.
The five-practice framework allows teachers to orchestrate rich learning and discussions around cognitively demanding tasks. Participants will engage with examples from schools across the U.S.

CSSS Session: Understanding the Student Science Performances in the *NGSS* (Gen)
(General) *Harbor Ballroom I, Westin Waterfront*
Juan-Carlos Aguilar *(jaguilar@doe.k12.ga.us),* Georgia Dept. of Education, Atlanta
Brett Moulding, Council of State Science Supervisors, Ogden, Utah
Attention will be paid to identifying and analyzing examples of student performance in a science classroom under the expectations set forth by the *NGSS*.

DuPont Presents: The Science of Packaging (Gen)
(Middle Level–High School) *Otis, Westin Waterfront*
Timothy Dalby *(tdalby@wilmingtonfriends.org),* Wilmington Friends School, Wilmington, Del.
Participants will be introduced to a brief history of polymers and how they are utilized in the packaging industry. Hands-on activities will illustrate the variables that must be considered as we design a package to preserve dry dog food.

A Mutual Relationship Between Science and Literacy (Gen)
(General) *Stone, Westin Waterfront*
Deanna Boyd *(sherrise77@gmail.com),* South Carolina Dept. of Education, Columbia
Experience a hands-on demonstration of science literacy tools, including lessons that strengthen students' communication skills, science notebooks, journaling activities, and various literacy techniques. Free materials!

11:00 AM–12 Noon Exhibitor Workshop

A Project-based Earth and Space Systems Science Program Developed by the American Geosciences Institute (Earth)

(Grades 9–12) *156C, BCEC*

Sponsor: It's About Time

Presenter to be announced

Become familiar with the latest edition of *EarthComm* and experience how its systems approach incorporates the crosscutting concepts of the *Next Generation Science Standards* as well as science and engineering practices. Also discover how the disciplinary core ideas in Earth and space science are presented in this engaging, project-based, active learning curriculum.

11:00 AM–12:30 PM Workshop

PDI **AMNH Pathway Session: Using a Web-based Graphing Tool to Analyze and Interpret Weather Data, Climate Change, and Patterns in Weather and Climate (Earth)**

(Middle Level–High School) *208, BCEC*

Dave Randle *(drandle@amnh.org)* and **Jay Holmes** *(jholmes@amnh.org),* American Museum of Natural History, New York, N.Y.

Presider: Hudson Roditi, American Museum of Natural History, New York, N.Y.

This session explores weather and climate data through an online graphing tool that simplifies data visualization so students can focus on data analysis and interpretation.

11:30 AM–12 Noon Presentation

SESSION 1

Meet Me in the Middle Session: Climate Change Curriculum to Support Argumentation in Middle School (Gen)

(Middle Level) *Commonwealth Ballroom A, Westin Waterfront*

Emily Weiss *(weisse@berkeley.edu),* The Lawrence Hall of Science, University of California, Berkeley

The GEMS Ocean Sciences Sequence for Grades 6–8 develops student argumentation skills while exploring the ocean-atmosphere connection, carbon cycle, and climate change.

12 Noon–1:00 PM Presentation

SESSION 1

CESI Session: So You Want to Be a Scientist—Where Science Meets Adventure (Gen)

(Elementary–Middle Level) *211, BCEC*

Jeanelle B. Day *(dayj@easternct.edu)* and **Susannah Richards** *(richardss@easternct.edu),* Eastern Connecticut State University, Willimantic

Pamela S. Turner *(pstrst@pacbell.net),* Author, Oakland, Calif.

Steve Swinburne *(stephen.swinburne@gmail.com),* Author, Boston, Mass.

Explore the world of science and scientists with *Scientist in the Field* authors Steve Swinburne and Pamela Turner. Learn strategies to ignite a young scientist.

12 Noon–1:30 PM Exhibitor Workshops

Hands-On Activities to Model Habitat Preference and Population Sampling (Bio)

(Grades 9–12) *102A, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Watch and learn! Create a terrestrial model to observe how pill bugs respond to habitat change. Use inquiry to develop experiments to observe the habitat preference of bess beetles and millipedes. Then investigate the advantages and disadvantages of different sampling methods to estimate population size in habitats. Door prizes!

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (Chem)

(Grades 9–12) *102B, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Hate it when a lab activity fizzles? Explore easy, engaging, safe chemistry activities that work every time—so they're sure to produce a reaction from students. Whether you're new to chemistry or feeling out of your element, you'll learn new ways to create excitement. Free materials and giveaways!

Focus and Explore Wave Energy and STEM Education K–8 (Gen)

(Grades K–8/Supervision) *103, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Focus on getting started with STEM education while effectively teaching the *Next Generation Science Standards* through inquiry-based practices instruction. Explore how to prepare your students for future careers in the 21st-century workforce and ensure effective achievement. Leave with tools to accelerate your STEM journey.

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GIVEAWAYS
LIVE PRESENTATIONS
SOCIAL MEDIA HUB
FREE HANDOUTS

- Find out what's new with NGSS@ NSTA (hint: our new NGSS@ NSTA Hub will be launching soon!) and connect with *NGSS* curators
- Hear about and sign up for upcoming webinars based around critical topics in science education
- Learn more about NSTA professional programs and how they benefit you
- Learn all about our special benefits for members, and why joining NSTA is a smart career choice
- Discover our teacher awards and how to get your students and community involved in our competitions

WE CAN'T WAIT TO MEET YOU!

NSTA National Science Teachers Association

SPARKscience: Sensor-based Science for K-8—Free Sensor Set for Five Attendees! (Gen)
(Grades K–8) *104A, BCEC*
Sponsor: PASCO scientific
Joe Todd, PASCO scientific, Roseville, Calif.
Through an interactive iPad demonstration, you'll experience how SPARKscience engages students in science and engineering practices, affording a deeper understanding of scientific concepts. Participate in investigations to experience real-time data collection with probeware and SPARKvue software. Five lucky attendees will win a 50th Anniversary Sensor Pack—a $600 value!

STEM Behind Hollywood—Adventure, Drama, and Mystery in Your Classroom (Gen)
(Grades 6–12) *104B, BCEC*
Sponsor: Texas Instruments
Jeff Lukens, Roosevelt High School, Sioux Falls, S.Dak.
Tom Reardon, Fitch High School/Youngstown State University, Austintown, Ohio
Come to this special hands-on workshop on STEM Behind Hollywood, an exciting new program from the National Academy of Sciences and Texas Instruments. Learn about disease spread and epidemiologists with "Zombie Apocalypse" or learn about astronomers, computer programmers, and Newton's law of universal gravitation with "Earth Impact." Are you into *CSI?* Then check out "Body of Evidence," an interactive lesson exploring forensic anthropology and body decay rates. Are superheroes for you? Check out "Science Friction" as a civil engineer turns evil and hijacks a city with his knowledge of road surfaces and coefficients of friction. All in all, STEM Behind Hollywood helps students with the context of the content through Hollywood theme–based stories, characters with STEM careers, and real science and math concepts all rolled into an action-packed set of lessons.

Hot Bulbs: Investigating Energy Efficiency (Phys)
(Grades 6–8) *104C, BCEC*
Sponsor: LAB-AIDS, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Why use compact fluorescent instead of incandescent bulbs? In this activity from the SEPUP's *Issues and Physical Science* program from LAB-AIDS, participants use specially designed equipment to measure the energy lost as heat by small incandescent bulbs. Energy concepts include calories, heat transfer, efficiency, and more.

The Best Test Prep Book Ever for AP Chemistry (Chem)
(Grades 9–12) *105, BCEC*
Sponsor: Pearson
Ed Waterman, Retired Educator, Fort Collins, Colo.
It concisely summarizes all the important content in the 6 Big Ideas and 117 Learning Objectives, and is greatly revised and expanded to include photoelectron spectroscopy (PES), mass spectrometry, and chromatography. It also contains hundreds of new and revised practice questions focusing on graphical and tabular data analysis and atomic-molecular representations.

Simple Programming Tools to Enhance Student Engagement (Gen)
(Grades 6–College) *106, BCEC*
Sponsor: SparkFun Electronics
Derek Runberg *(derek.runberg@sparkfun.com),* SparkFun Electronics, Boulder, Colo.
Processing is a simple, easy-to-learn open-source programming language used by artists, scientists, mathematicians, and gamers. Integrating this tool into your classroom can empower your students to create simulations, models, and data visualizations. This hands-on workshop will culminate in designing your own data collection dashboard.

How and Why Species Multiply: Free Resources for Teaching Speciation (Bio)
(Grades 6–College) *107A, BCEC*
Sponsor: Howard Hughes Medical Institute
Jason J. Crean, Lyons Township High School, Western Springs, Ill.
Keri Shingleton, Holland Hall, Tulsa, Okla.
The richness and diversity of life raises two of the most profound questions in biology: How do new species form? And why are there so many species? This workshop will introduce participants to a wide range of classroom-ready resources, from lesson plans to interactive modules and a virtual lab for teaching speciation.

Stream Ecology: Slimy Leaves for Clean Streams (Env)
(Grades 5–College) *107B, BCEC*
Sponsor: LaMotte Co.
Christina Medved, 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. Learn from the Stroud Water Research Center scientists. Takeaways and door prize!

Taking Science Practices Outside **(Env)**
(Grades K–12) *108, BCEC*
Sponsor: Mass Audubon
Jessica L. MacManus *(jmacmanus@massaudubon.org),* Mass Audubon's Wellfleet Bay Wildlife Sanctuary, South Wellfleet, Mass.
Kristen Scopinich *(kscopinich@massaudubon.org),* Mass Audubon's Drumlin Farm Wildlife Sanctuary, Lincoln, Mass.
The *NGSS* make conducting science a priority. Learn from Mass Audubon experts how to take your students outside to engage in authentic science practices while deepening content learning. Use your school's backyard for meaningful place-based learning experiences. Activities are aligned with *NGSS* and Massachusetts STE frameworks.

Perimeter Institute: Curved Space-time in the Classroom and GPS **(Phys)**
(Grades 9–College) *109B, BCEC*
Sponsor: Perimeter Institute
Damian Pope *(dpope@perimeterinstitute.ca)* and **Kevin Donkers** *(kdonkers@perimeterinstitute.ca),* Perimeter Institute, Waterloo, Ont., Canada
Bring Einstein's curved space-time model for gravity into your classroom using masking tape and balloons to explain free fall and predict time dilation, as observed in GPS calculations. The Revolutions in Science and GPS and Relativity multimedia resources were designed by educators in collaboration with Perimeter Institute researchers.

Solar Fountain **(Env)**
(Grades 4–12) *151A, BCEC*
Sponsor: KidWind Project
Asia M. Ward *(asia@kidwind.org),* KidWind Project, St. Paul, Minn.
Learn about different types of solar panels and how to hook them up in parallel and series in order to power a fountain. Also learn about Solar Thermal water heating.

Chemistry and the Atom: Fun with Atom Building Games! **(Phys)**
(Grades 5–12) *151B, BCEC*
Sponsor: CPO Science/School Specialty Science
Scott Eddleman and **Nathan Olsson,** CPO Science/School Specialty Science, Nashua, N.H.
Understanding abstract concepts about atoms can be difficult. Use our model to experience innovative games and activities that present students with opportunities to grasp atomic structure and its connection to the periodic table.

Let's Go Outside! Taking Science to the School Yard (Gen)
(Grades K–8) *152, BCEC*
Sponsor: Delta Education/School Specialty Science–FOSS
Erica Beck Spencer, The Lawrence Hall of Science, University of California, Berkeley
Dean Martin, Boston Public Schools, Dorchester, Mass.
Learn how Boston educators have led the way in implementing outdoor teaching strategies to improve teaching and learning, and how FOSS embedded outdoor activities into the new 3rd Edition program. Classroom and materials management strategies will be woven into our active outdoor experiences. Dress appropriately for going outside.

Biology with Vernier (Bio)
(Grades 9–College) *153A, BCEC*
Sponsor: Vernier Software & Technology
Colleen McDaniel *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Conduct a variety of biology experiments using Vernier sensors with a LabQuest 2 or computer in this engaging hands-on workshop. Experience how Vernier has been incorporating the principles of the *NGSS* science and engineering practices for 33 years!

Chromebook, Android, and BYOD with Vernier (Gen)
(Grades 3–College) *153B, BCEC*
Sponsor: Vernier Software & Technology
Verle Walters *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Using data-collection technology builds deeper student understanding of critical concepts in science and increases test scores. See how you can use Vernier sensors and a LabQuest 2 to support science inquiry in classrooms using Chromebook, Android, or BYOD. This technology empowers students to collaboratively collect and independently analyze their data.

STEM Certificate Program (Gen)
(Grades 1–12) *153C, BCEC*
Sponsor: STEM Certificate Program
Ayora Berry *(aberry@ptc.com),* Boston University, Boston, Mass.
Alyssa Walker, Framingham State University, Framingham, Mass.
Jordan Cox, PTC Academic Program, Needham, Mass.
Discover how Massachusetts teachers are getting trained in integrated STEM education through the STEM Certificate Program. We will share our training model that encourages Project Based Learning, differentiated assessment, and industry connections. We will then dive deep into the curriculum with a hands-on design challenge you can use in the classroom.

Busting the Myth That *Common Core State Standards* Are Difficult to Meet in Science (Gen)
(General) *154, BCEC*
Sponsor: Discovery Education
Brad Fountain, Discovery Education, Silver Spring, Md.
Learn how teachers can easily meet the *Common Core State Standards* through everyday science instruction. We will explore a vast collection of resources available from across the web and explain how to use those resources to meet the requirements of the *CCSS.*

STEM Engineering for Middle School and High School with TeacherGeek Wind Lift (Phys)
(Grades 6–12) *156A, BCEC*
Sponsor: Ward's Science
Kelly Smith *(kelly.smith@vwr.com),* Ward's Science, Rochester, N.Y.
Engage students and encourage problem solving and creative thinking with this hands-on physical science activity that addresses the crosscutting concept "cause and effect." In this "make and take" workshop, you'll build a wind lift and measure results with digital data collection. The completed machine is yours to keep and share with your students!

Machines and Mechanisms for ALL Ages **(Gen)**
(Grades K–6) *156B, BCEC*
Sponsor: LEGO® Education
Kelly Reddin, LEGO Education, Pittsburg, Kans.
From preschool to lower elementary and even through the upper elementary years, LEGO Education has simple and powered machines learning solutions for all ages. In this workshop, participants will gain hands-on experience building and completing a grade-appropriate activity using one of our machines and mechanisms platforms.

Flinn Favorite Biology Lab Activities and Games **(Bio)**
(Grades 6–12) *258A, BCEC*
Sponsor: Flinn Scientific, Inc.
Jennifer Sternberg *(jsternberg@flinnsci.com)* and **Irene Cesa** *(icesa@flinnsci.com),* Flinn Scientific, Inc., Batavia, Ill.
Students learn better and faster when they are actively involved in hands-on activities that are not only fun, but that create learning opportunities along the way. We'll share some inquiry-based labs, interactive demonstrations, and collaborative games you can use to motivate your students. We'll focus on core topics like cell biology, genetics, ecology, and more—you're sure to find a Flinn Favorite that works for you! Handouts provided for all activities.

Elementary Teacher Survival Kit **(Gen)**
(Grades K–6) *258B, BCEC*
Sponsor: Educational Innovations, Inc.
Ken Byrne and **Cathy Byrne,** Educational Innovations, Inc., Bethel, Conn.
This hands-on workshop—chock-full of easy-to-do science inquiry lessons—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!

12 Noon–2:00 PM ASTE/NSELA Luncheon

The Long-Term Impacts of Teachers: Teacher Value-Added and Student Outcomes in Adulthood

(Ticket Required: $65) **M-4** *Grand Blrm. E, Westin Waterfront*

Raj Chetty, Harvard University, Cambridge, Mass.

Many policy makers advocate increasing the quality of teaching, but there is considerable debate about the best way to measure and improve teacher quality. One method is to evaluate teachers based on their impacts on students' test scores, commonly termed the "value-added" (VA) approach. Is teacher value-added a good measure of teacher quality? Proponents argue that using VA can improve student achievement, while critics argue that test score gains are poor proxies for a teacher's true quality. Join Raj Chetty as he addresses these questions based on a study of a million children from a large urban school district from grade 4 to adulthood and discusses the implications for STEM teacher professional development.

Raj Chetty is a professor in the Economics Department at Harvard University, co-director of the Public Economics group at the National Bureau of Economic Research, and editor of the Journal of Public Economics. *His research combines empirical evidence and theory to inform the design of more effective government policies. His work on tax policy, unemployment, and education has been widely cited in media outlets and in Congressional testimony.*

Raj received his PhD from Harvard in 2003 at the age of 23 and is one of the youngest tenured professors in the university's history. He has been named one of the top economists in the world by The New York Times *and the* Economist *Magazine. He was awarded a MacArthur "Genius" Fellowship in 2012. Raj recently became one of the youngest recipients of the John Bates Clark medal, given by the American Economic Association to the best American economist under age 40.*

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Thursday.

12:15–6:30 PM NSTA Symposium

Flight of the Monarch Butterflies (SYM-1)

(Grades K–12) *Off-site (Museum of Science, Boston)*

Tickets Required: $54

Ann Hobbie *(ann.s.hobbie@gmail.com)* and **De Cansler** *(decansler@gmail.com),* University of Minnesota, St. Paul

For description, see Volume 1, page 51.

Note: Please meet your symposium leader 15 minutes prior to departure time in the Northwest Lobby of the BCEC on the Exhibit Level.

—Photo courtesy of Michelle Solensky

12:30–1:00 PM Presentations

SESSION 1

NSTA Press® Session: *Beyond the Numbers: Making Sense of Statistics* **(Gen)**

(Middle Level–College) *254A, BCEC*

Edwin P. Christmann *(edwin.christmann@sru.edu),* Slippery Rock University, Slippery Rock, Pa.

Add new learning to your classroom. Join us as we focus on the NSTA Press book *Beyond the Numbers: Making Sense of Statistics.*

SESSION 2

Teaching Science to English Language Learners (ELLs) **(Gen)**

(Elementary–High School) *Commonwealth B, Westin Waterfront*

Fabian Torres-Ardila *(fabian.torres-ardila@umb.edu),* UMass Boston, Mass.

Discussion centers on analyzing the linguistic demands that the *Next Generation Science Standards* impose on English language learners. Join me as I propose strategies to address those demands in the science classroom.

12:30–1:30 PM SCST Marjorie Gardner Lecture

Authentic Learning, Student Engagement, and Socratic Course Design (Bio)

(General) *Caspian, Renaissance*

Mike Klymkowsky *(michael.klymkowsky@colorado.edu),* University of Colorado, Boulder

When trying to make science teaching more effective, it is common to focus on pedagogical fixes. More often than not, unrealistic expectations of what can be learned in the time available are left unchanged. This is a situation that is likely to defeat or trivialize the effects of well-meaning pedagogical innovations. We have to turn a skeptical eye on the inherited, received curriculum and think in terms of combining relevant facts, useful generalizations, and overarching themes in order to help students reach the goal of being able to approach novel scenarios and to generate plausible and conceptually rigorous answers. Based on the virtual laboratories Biofundamentals™ and CLUE: Chemistry, Life, the Universe & Everything, and Teaching and Learning Biology projects, I will present some lessons learned and some hopeful strategies for course and curricular redesign leading to improved student learning.

Mike Klymkowsky is professor of Molecular, Cellular, and Developmental Biology at the University of Colorado Boulder (UC Boulder). He was named a Pew Biomedical Scholar and awarded a Basil O'Conner award from the March of Dimes.

Dr. Klymkowsky's ongoing scientific studies focus on the inductive interactions involved in early vertebrate embryonic development, with particular interest in cytoskeletal dynamics and the behavior of the neural crest. Driven by a recognition of the deficiencies in student understanding due to defects in course and curricular design, he has been involved in developing assessment methods, including the NSF-funded Biology Concept Inventory, and educational materials, including a redesigned introductory molecular biology course, Biofundamentals, and an online laboratory course (virtuallaboratory.net).

Dr. Klymkowsky is a AAAS Fellow, a recipient of a Best Should Teach Award, and a codirector of the CU Teach Science Teacher Recruitment and Certification program.

12:30–1:30 PM Presentations

SESSION 1

ICCARS: Investigating Climate Change and Remote Sensing (Env)

(Middle Level–High School) *157C, BCEC*

David F. Bydlowski *(bydlowd@resa.net),* Wayne RESA, Wayne, Mich.

ICCARS (Investigating Climate Change and Remote Sensing) is a two-year project funded by NASA and implemented by Wayne RESA. Find out how teachers in metropolitan Detroit developed instructional units using technological resources, which you can use in your classroom.

SESSION 2

Water Science for Elementary Students (Gen)

(Elementary–Middle Level) *158, BCEC*

David Purvis *(dvdprvs2@yahoo.com),* Richmond Consolidated School, Richmond, Mass.

Deepen students' understanding of science with an impressive number of activities for the elementary classroom that use water and water-based liquids.

SESSION 3

The Magnet Lab: Magnets Is What We Do! (Phys)

(Preschool–Elementary) *159, BCEC*

Carlos R. Villa *(villa@magnet.fsu.edu),* National High Magnetic Field Laboratory, Tallahassee, Fla.

If you see only one session on magnets and magnetism, get it from the pros right here. Aimed at elementary students, this session will cover magnetism completely.

SESSION 4

Adopt a Microbe: Intraterrestrials from the Deep Sea! (Bio)

(Elementary–Middle Level/Informal Ed.) *160B, BCEC*

Sharon K. Cooper *(scooper@oceanleadership.org),* Consortium for Ocean Leadership, Washington, D.C.

Come explore the deep biosphere—an entire world beneath the seafloor. There is life down there and we are just now learning about it.

SESSION 5

Genetics Gets Personal: Teaching the Ethical, Legal, and Social Issues in Personal Genetics (Bio)

(High School–College) *252A, BCEC*

Dana Waring *(dwaring@pged.med.harvard.edu)* and **Lauren Tomaselli** *(ltomaselli@pged.med.harvard.edu),* Harvard Medical School, Boston, Mass.

Explore the cutting-edge field of personal genetics and its benefits and challenges for individuals and our society through relatable lenses, including athletics and crime.

SESSION 6 (two presentations)

(Preschool–Elementary) *252B, BCEC*

The Claim-Evidence-Reason Framework in Scientific Explanation: Lessons from Field Experience (Gen)

Anicia A. Alvarez *(aalvarez@adams.edu),* Adams State University, Alamosa, Colo.

Let's focus on elements of inquiry science with sheltered instruction. Hear how preservice science teachers use the claim-evidence-reason framework for children to explain recorded data.

Strategies for Teaching in the Inclusive Elementary Science Classroom (Gen)

Heather L. Miller and **Mary R. Sawyer** *(sawyer.116@buckeyemail.osu.edu),* The Ohio State University, Columbus

Elementary teachers are required to teach science in inclusive classrooms with little support. Research-supported strategies are presented to provide tested ideas for all science learners.

SESSION 6

NARST Session: Research to Inform the Implementation of the *NGSS* (Gen)

(General) *253A, BCEC*

Deborah Hanuscin, University of Missouri, Columbia

Learn more about the research base that can inform *NGSS* implementation—in a format accessible to teachers, administrators, and the general public.

SESSION 7

Assessment of Approach, Inquiry, and Evidence in Middle School (Gen)

(Middle Level) *255, BCEC*

Margaret J. Wollner *(mwollner@avenues.org)* and **Sally Kent** *(skent@avenues.org),* Avenues: The World School, New York, N.Y.

Presider: Shabari Banerji, Avenues: The World School, New York, N.Y.

Discover methodology, materials, and work samples for assessing approaches to learning, inquiry skill development, and evidence of student learning in inquiry-based science programs.

SESSION 8

Authentic Classroom Science: Students as Scientists (Bio)

(Middle Level–High School) *257A, BCEC*

Leah Bug *(leahbug@psu.edu),* Penn State, University Park, Pa.

Jacqui Wagner *(jwagner@pennsvalley.org),* Penns Valley Area High School, Spring Mills, Pa.

Build student understanding of the complexities of science through parallel science research opportunities in the classroom, moving beyond the scientific method for deeper science knowledge.

SESSION 9

Labs for the Next Generation (Bio)

(Middle Level–College) *257B, BCEC*

Michael C. Ralph *(mralph03@gmail.com),* Olathe East High School, Olathe, Kans.

Shannon M. Ralph *(sralph81@gmail.com),* Dodge City High School, Dodge City, Kans.

Join us as we present two biology labs as they are modified to be rich inquiry experiences. Teacher's guides, lab videos, and more will be provided.

SESSION 10

Collaborative Editing of Student Work Online in Science and English Language Arts (Gen)

(Middle Level–High School) *258C, BCEC*

Tom Rawson *(rawsont@sudbury.k12.ma.us)* and **Christine Carosella** *(christine_carosella@sudbury.k12.ma.us),* Curtis Middle School, Sudbury, Mass.

Help students edit collaboratively to improve science writing using online tools for rapid response to peer and teacher feedback during the editing process.

SESSION 11

Engage Students by Writing Your Own Science Book (Gen)

(General) *259B, BCEC*

Ben Smith *(ben@edtechinnovators.com)* and **Jared Mader** *(jared@edtechinnovators.com),* York, Pa.

iBooks are easy to create. Discover how to create your own and what media elements should be included.

SESSION 12

NASA's High-Energy Vision: Chandra and the X-ray Universe (Earth)

(General) *261, BCEC*

Donna L. Young *(donna@aavso.org),* NASA/Chandra E/PO, Bullhead City, Ariz.

Discover the latest discoveries about the universe, including massive black holes, neutron stars, supernovas, star formation, colliding galaxies, X-ray binaries, and dark matter.

SESSION 13

Informal Science Day Session: Maker Corps: Cultivating Makers and Creativity (Gen)

(Informal Education) *Ballroom West/Group 1, BCEC*

Stephanie Chang *(stephanie@makered.org),* Maker Education Initiative, Oakland, Calif.

Chad Ratliff and **Ira David Socol** *(isocol@k12albemarle.org),* Albemarle County Public Schools, Charlotte, Va.

Margaret Kaufer *(mkaufer@lmstemalliance.org),* STEM Alliance of Larchmont-Mamaroneck, Larchmont, N.Y.

The Maker Education Initiative partnered with organizations nationwide to engage youth during the summer in making experiences. Engage with our host sites to discover the possibilities!

SESSION 14

Informal Science Day Session: Colors of Light (Gen)

(Informal Education) *Ballroom West/Group 3, BCEC*

Dayle Brown *(dayledavid@comcast.net),* Pegasus Productions, South Bend, Ind.

Shine new learning in your classroom. Participants will learn from the stars by their light, examine the eye's reaction to light and color, and experience the loss of color vision in the Starlab planetarium. Students will experiment with colors of light to predict true colors as well as mix primary colors of light to create white light. *Note:* Participants will meet the presenter in Ballroom West and walk as a group to the Starlab located in the Exhibit Hall.

SESSION 15

Informal Science Day Session: Using Role Models Effectively in Your STEM Program (Gen)

(Informal Education) *Ballroom West/Group 4, BCEC*

Rita Karl *(rkarl@tpt.org),* Twin Cities Public Television, St. Paul, Minn.

Nimisha Ghosh Roy *(nghoshroy@edlabgroup.org),* EdLab Group, Lynnwood, Wash.

Where can you find great role models and resources for effectively integrating them into STEM programs? This session will provide resources and explore these questions.

SESSION 16

How the Free Skate Revived Scientific Literacy in My Nonmajors Biology Course (Bio)

(High School–College) *Atlantic 3, Renaissance*

Meg Delgato *(delgato.meg@spcollege.edu),* St. Petersburg College, Tarpon Springs, Fla.

Find out how to work smarter—not harder—by using independent and collaborative strategies designed to promote and encourage scientific literacy in all students.

SESSION 17

Assessments, Research, and Scavenger Hunts, Oh My! Using QR Codes in the Science Classroom (Gen)

(General) *Brewster, Renaissance*

Elizabeth H. Clements *(elizabeth.clements@jefferson.kyschools.us),* **Martha M. Day** *(martha.day@wku.edu),* and **Les Pesterfield** *(lester.pesterfield@wku.edu),* Western Kentucky University, Bowling Green

Discover how to create and use QR codes to facilitate technology-infused instruction that fosters student engagement in your classroom.

SESSION 18

History of Science, Nature of Science, and Science Content (Gen)

(General) *Mediterranean, Renaissance*

Gregory L. Macklem *(gmacklem@nd.edu),* University of Notre Dame, Ind.

Presider: Lloyd T. Ackert, Drexel University, Philadelphia, Pa.

Attention will be paid to ways that history of science can illuminate for students the nature of science and support content teaching.

SESSION 19

The iPad Ecosystem: Peripherals That Blend Digital and Traditional Learning (Gen)

(Elementary–High School) *Pacific C, Renaissance*

Martin G. Horejsi *(martin.horejsi@umontana.edu),* The University of Montana, Missoula

Lukas Horejsi, Student, Washington Middle School, Missoula, Mont.

iPads create their own ecosystem by becoming digital hubs for peripherals content with connectivity expanding the potential within blended teaching environments. Unleash creativity and curiosity!

SESSION 20

Changing Their Idea of "Studying" into Our Idea of "Learning": The Efficacy of Interactive Online Programs (Bio)

(College) *Pacific D, Renaissance*

Leslie S. Jones *(lesliesj@valdosta.edu),* Valdosta State University, Valdosta, Ga.

Online, text-based platforms transform passive learners via automatically graded reading comprehension activities, directed practice, and quiz/test banks that improve skills and mastery of course content.

SESSION 21

Large-Scale Assessment in Engineering Courses Using Multiple Approaches (Gen)

(General) *Pacific F, Renaissance*

Niva Wengrowicz *(nivawen@mit.edu),* MIT, Cambridge, Mass.

In our session, we will discuss challenges, report on field experiences, and suggest practical approaches for coping with a variety of large-scale engineering courses assessment types.

SESSION 22

edTPA and Methods for Teaching Science Courses: Ideas for Increasing Teacher Candidate Success (Gen)

(College) *Pacific G/H, Renaissance*

Lauren D. Rentfro *(rentfrla@lewisu.edu),* Lewis University, Romeoville, Ill.

Revisions to science methods courses can better prepare preservice teachers for their future classrooms, as well state licensure assessments.

SESSION 23 (two presentations)
(General) *Constitution, Seaport*
AMSE Session: A Science Teacher's Power: Concrete Strategies for Improved Classroom Equity (Gen)
Deb Morrison *(2debmorrison@gmail.com),* University of Colorado, Boulder
Melissa Campanella *(melissa.rae.campanella@gmail.com),* Noel Community Arts School, Centennial, Colo.
As classrooms become more linguistically, racially, and economically diverse, teachers need to develop a toolbox of strategies to meet the needs of all students.

AMSE Session: Small Talk, Big Ideas! (Gen)
Veronica D. Betancourt *(veronica.betancourt@idra.org)* and **Paula Martin Johnson** *(paula.johnson@idra.org),* Intercultural Development Research Association, San Antonio, Tex.
Engage in conversational techniques promoting rich academic classroom exchanges designed to increase student opportunities for effective communication in math and science.

SESSION 24
Designing an Integrated, Student-centered STEM Curriculum (Gen)
(High School) *Lighthouse I, Seaport*
Elizabeth Helfant and **Robert B. Shaw,** Mary Institute and Saint Louis Country Day School, St. Louis, Mo.
Explore an integrated STEM curriculum that incorporates the *NGSS,* leverages technology, uses an engineering process, and has been updated to include topics like the Big Bang and the standard model of particle physics.

SESSION 25
Online, Just-in-Time Professional Development (Gen)
(High School) *Plaza B, Seaport*
Arthur Eisenkraft *(eisenkraft@att.net),* 2000–2001 NSTA President, and UMass Boston, Mass.
A new model of online professional development takes place during the school year as you teach your students. The model includes "prepare" for content background, "share" for building a learning community of teachers around specific content and lessons, and "compare" in which teachers use student data to inform instruction.

SESSION 26
Focus on Formative Assessment in the Science Classroom to Realize the Vision of the *NGSS* (Gen)
(General) *Alcott, Westin Waterfront*
Anne Tweed *(atweed@mcrel.org),* 2004–2005 NSTA President, and McREL, Denver, Colo.
Cynthia J. Long *(clong@mcrel.org),* McREL, Denver, Colo.
Learn how to use the formative assessment process, including feedback and responsive action, aligned to the *Next Generation Science Standards* to meet the needs of all students.

SESSION 27
Engaging Students in Argumentation Across Elementary, Middle School, and High School (Gen)
(General) *Burroughs, Westin Waterfront*
Pam Pelletier *(ppelletier@boston.k12.ma.us),* Boston (Mass.) Public Schools
Katherine L. McNeill *(kmcneill@bc.edu),* Boston College, Chestnut Hill, Mass.
We will discuss examples of students' written arguments across grades K–12 to illustrate how to support greater complexity in claims, evidence, and reasoning. Join us for instructional strategies, such as modeling and providing feedback, as we illustrate these strategies using video clips from a variety of classrooms.

SESSION 28
University STEM Faculty and K–8 Teachers: A Winning Partnership for STEM Education (Gen)
(Elementary–Middle Level) *Commonwealth A, Westin Waterfront*
Jonathan E.H. Wilson *(jonathan.wilson@morgan.edu)* and **Keisha Matthews,** Morgan State University, Abington, Md.
Come gain successful strategies for providing content and resources that develop confidence to effectively teach science in public and private elementary and middle schools.

SESSION 29
Spark Student Interest: Integrate Engineering into Your Science Teaching (Gen)
(Elementary–High School) *Faneuil, Westin Waterfront*
Jacqueline T. McDonnough *(jtmcdonnough@vcu.edu)* and **Rosalyn H. Hargraves** *(rhobson@vcu.edu),* Virginia Commonwealth University, Richmond
Learn how engineering can engage students, increase their understanding of science content, promote interest in STEM, and build your own product.

SESSION 30

CSSS Session: Professional Development for the *NGSS* and *CCSS ELA* in Elementary Classrooms (Gen)

(Elementary) *Grand Ballroom C, Westin Waterfront*

Samuel D. Shaw *(sam.shaw@state.sd.us),* South Dakota Dept. of Education, Pierre

Presider: Roby Johnson, Holgate Middle School, Aberdeen, S.Dak.

This workshop highlights a statewide training that focuses on how the instructional implications within the *NGSS* act as "glue" to bind the inputs (reading/listening) to the outputs (writing/speaking) through constructing explanations (using the science and engineering practices).

SESSION 31

reVisioning: A Creative Process for Teaching (Gen)

(General) *Harbor Ballroom II, Westin Waterfront*

Wendi Laurence *(wendi@create-osity.com),* Create-osity, Park City, Utah

Discover a creative process for teaching—so we can infuse our teaching with inspiration, innovation, and the passion to continue to make a difference.

SESSION 32

Photabulary That Connects! (Gen)

(General) *Harbor Ballroom III, Westin Waterfront*

Vivian Lynn Rogers *(photabulary@gmail.com),* Magnolia School, Magnolia, Tex.

Presider: Mark Rogers, Magnolia (Tex.) ISD

Do you teach bilingual, English as Second Language, at-risk, Special Education, or anyone that can't just memorize and regurgitate information? Discover vocabulary strategies that are designed for building long-term memory retention with the aid of a mini concept card and mobile devices. With text and picture apps, students create a personalized dictionary that is easy to share and use.

SESSION 33 (two presentations)

(General) *Lewis, Westin Waterfront*

Teaching Science in Literature (Gen)

Tara A. Kristoff *(tara_kristoff@yahoo.com),* Summit (Ill.) School District 104

Teachers and administrators—come learn how to incorporate science concepts within any novel, poem, or short story to enhance and maximize student learning.

Between the Lines: Discovering Science with Literature (Gen)

Stacey Klimkosky, Truro Central School, Truro, Mass.

Bryan Hirschman *(bhirschman@ccsuvt.org),* Essex High School, Essex Junction, Vt.

The best discoveries come when least expected! Using a cross-curricular approach, reading classic literature, like Henry Bestons' *The Outermost House,* leads to scientific discoveries for students of all ages.

SESSION 34

Project SEE: Science in Early Elementary (Phys)

(Preschool–Elementary/Supervision) *Quincy, Westin Waterfront*

Rosemary Geiken *(geiken@etsu.edu)* and **Gary Henson** *(hensong@etsu.edu),* East Tennessee State University, Johnson City

Join us as we share a project with K–3 teachers on teaching physics to early elementary students.

12:30–1:30 PM Workshops

NESTA Session: National Earth Science Teachers Association Earth System Science Share-a-Thon (Earth)

(Elementary–High School) *052 A/B, BCEC*

Michelle C. Harris, Wakefield High School, Arlington, Va.

Roberta M. Johnson *(rmjohnsn@gmail.com),* NESTA, Boulder, Colo.

Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.

Sharon K. Cooper *(scooper@oceanleadership.org),* Consortium for Ocean Leadership, Washington, D.C.

Marian Grogan *(marian_grogan@terc.edu),* **Nick Haddad** *(nick_haddad@terc.edu),* and **Tamara Shapiro Ledley** *(tamara_ledley@terc.edu),* TERC, Cambridge, Mass.

Laura Guertin *(paesta@psu.edu),* President-Elect, Pennsylvania Earth Science Teachers Association, University Park

Lynne H. Hehr *(lhehr@uark.edu),* University of Arkansas, Fayetteville

Michael Hubenthal *(hubenth@iris.edu),* IRIS, Washington, D.C.

Preston Lewis *(preston.lewis@nasa.gov),* NASA Langley Research Center, Hampton, Va.

Andi Nelson *(anelson@adlerplanetarium.org),* Adler Planetarium, Chicago, Ill.

Ruth Paglierani *(ruthp@ssl.berkeley.edu),* University of California, Berkeley

Gary Randolph *(randolph@globe.gov),* The GLOBE Program, Boulder, Colo.

Emily Schaller *(emily.schaller@nasa.gov),* NASA/NSERC, Palmdale, Calif.

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

Cassie Soeffing, Institute for Global Environmental Strategies, Arlington, Va.

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

Mark P. Turski *(markt@plymouth.edu),* Plymouth State University, Plymouth, N.H.

Glenn E. Van Knowe *(gevanknowe@meso.com),* MESO, Inc., Troy, N.Y.

Jodi Wheeler-Toppen *(wheelertop@gmail.com),* Atlanta, Ga.

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

S.M.I.L.E. with Physical Science (Phys)

(Elementary–Middle Level) *160A, BCEC*

Kelly S. Chaney *(kschaney@ualr.edu)* and **Michelle B. Buchanan** *(mbbuchanan@ualr.edu),* University of Arkansas at Little Rock

Come find out how Science and Math Inquiry Learning Explored (S.M.I.L.E.) can help you explore sound and light in this inquiry-based hands-on workshop.

Exciting Engineering Endeavors (Gen)

(Elementary) *160C, BCEC*

Terri G. George *(terrigeorge1@gmail.com),* McDonough, Ga.

Donna Barrett *(donna.barrett@mresa.org),* Metro RESA, Smyrna, Ga.

Come explore easy and exciting engineering experiences for the elementary level using the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) model.

Nuts About Nature (Env)

(Preschool–Elementary) *161, BCEC*

DeLene Hoffner, School in the Woods, Colorado Springs, Colo.

Experience outdoor inquiry/hands-on nature lessons, including notebooks, bird nests, Mr. Grasshead, and track making. Gain ecology concepts and management strategies from a grade 4 teacher at an environmental school.

Fly to Mercury via NASA's Discovery Mission MESSENGER! (Earth)

(Elementary–Middle Level) *162A, BCEC*

Sally J. Jensen *(sajean@roadrunner.com),* Waterville Valley Academy, Waterville Valley, N.H.

Using the "Journey Through the Solar" module, travel through the inner planets, orbit Mercury, and collect data. Take home a CD and resources.

Using the *NGSS* to Promote Understanding of Sound (Chem)

(Elementary) *162B, BCEC*

Lloyd H. Barrow *(barrowl@missouri.edu),* University of Missouri, Columbia

Help your students understand that all sounds are caused by vibrations, even musical instruments. A series of investigations helps students construct understanding as envisioned by the *NGSS.*

Climate Change and Insect-borne Diseases at the Yale Peabody Museum of Natural History (Bio)
(Middle Level–High School) *205A, BCEC*
Beth B. Hines *(beth.hines@yale.edu),* Yale Peabody Museum of Natural History, New Haven, Conn.
Christine M. Lawlor-King *(lawlor-king.cm@easthartford.org),* East Hartford High School, East Hartford, Conn.
This SEPA/NIH–funded curriculum investigates how insect-borne infectious diseases such as dengue, malaria, and leishmaniasis are shifting their ranges as climate variables change, particularly temperature and precipitation.

Using Simulations in Inquiry-based Science (Bio)
(Elementary–High School) *205B, BCEC*
Carole Johnson *(carole.johnson@vai.org),* Van Andel Institute, Grand Rapids, Mich.
Engage in a pollination simulation, generate a rich database, and then analyze and interpret the collected data. Simulation directions will be distributed.

Inquiry Stations (Phys)
(General) *205C, BCEC*
Jean H. Leach, Bethesda Elementary School, Lawrenceville, Ga.
Encounter physical science experiments requiring participants to measure and count as they set up the lab, hypothesize, observe, record, graph, and analyze data as well as reach conclusions.

Integrating English Language Arts, Math, and the *NGSS* into the Elementary and Middle School Classroom (Gen)
(Elementary–Middle Level) *207, BCEC*
Glenda S. Pepin *(gpepin@clemson.edu),* Clemson University, Greenville, S.C.
Perform an experiment and get a graphic organizer that serves as a lab debrief to check for student understanding while building writing-from-evidence skills.

Know Science? Know Engineering? Putting Science Practices and Engineering Design Together in Your Elementary Classroom (Gen)
(Elementary) *212, BCEC*
Jennifer Klein *(jklein@mits.org),* Museum Institute for Teaching Science, Quincy, Mass.
David O. Kazmer, UMass Lowell, Mass.
David S. Unger *(dunger@athm.org),* American Textile History Museum, Lowell, Mass.
Engage in activities and discussion demonstrating how science practices and engineering design can work together effectively in the classroom.

The Integrating Engineering and Literacy Project: Engaging Elementary Students in Engineering Design Challenges from Children's Literature (Gen)
(Elementary/Informal Ed) *213, BCEC*
Kristen B. Wendell *(kristen.wendell@umb.edu),* UMass Boston, Mass.
Elissa Milto *(elissa.milto@tufts.edu)* and **Mary McCormick** *(mary.mccormick@tufts.edu),* Tufts University, Medford, Mass.
At this workshop, participants will solve a hands-on engineering challenge based on a popular children's book and interact with samples of student engineering work.

Make Your Own Virtual Fieldwork Experience! (Earth)
(Middle Level–College) *251, BCEC*
Richard A. Kissel, Yale Peabody Museum of Natural History, New Haven, Conn.
Don Duggan-Haas *(dad55@cornell.edu),* PRI and Its Museum of the Earth, Ithaca, N.Y.
Bring your laptop with digital photos of an interesting site you want your students to explore. Using an electronic template, you'll create your own VFE.

NSTA Press® Session: *Picture-Perfect Science Lessons:* Using Picture Books to Guide Inquiry (Gen)
(Elementary) *253C, BCEC*
Emily Morgan *(emily@pictureperfectscience.com)* and **Karen Ansberry** *(karen@pictureperfectscience.com),* Picture-Perfect Science, LLC, Lebanon, Ohio
The authors of NSTA's best-selling *Picture-Perfect Science* series will show you how to use picture books to teach science and reading together!

Bring Nanoscience into Your Middle School Program! (Phys)
(General) *254B, BCEC*
Robert H.I. Neudel *(neudelb@albanyacademies.org)* and **Bridgett Frary,** The Albany Academies, Albany, N.Y.
Presider: Joshua I. Neudel, Gann Academy, Waltham, Mass.
Complete exciting activities introducing the power of nanotechology. Make buckyballs and complete simple science labs showing how materials behave differently on the nanoscale.

Understanding Plate Tectonics Using Actual Earthquake Location Data (Earth)
(Informal Education) 256, BCEC
Patrick McQuillan *(mcquillan@iris.edu),* IRIS, Washington, D.C.
Enhance plate tectonics lessons using actual earthquake location data. The IRIS earthquake database will be explored using software, lessons, and live map displays.

★ **Analyzing Student Work for Language Structures That Support Conceptual Understanding (Gen)**
(General) 260, BCEC
Marie B. Bacher *(mbobiasbacher@yahoo.com),* Santa Clara (Calif.) Unified School District
Join me for this interactive presentation modeling how teacher leaders can facilitate a group to analyze student work for overlapping *Next Generation Science Standards* and *Common Core State Standards, ELA.*

Informal Science Day Session: Traveling Through Time: A Short Walk Through Geologic Time (Earth)
(Middle Level/Informal Education) Ballroom West/Group 2, BCEC
Karen Maher *(kmaher@fs.fed.us),* USDA Forest Service, Mendenhall Glacier Visitor Center, Juneau, Alaska
Lauren DeMicco *(ldemicco@sssd.k12.co.us),* Steamboat Springs Middle School, Steamboat Springs, Colo.
Hands-on opportunities guide grades 5–8 teachers (and students) into a world once dominated by glacier ice. Topics covered include water cycle, weathering, and erosion, especially as caused by glaciers. Activities will range from those that can be set up and completed in a classroom setting as well as firsthand field-based experiences.

Launching the University of Memphis Early Childhood Preservice Teachers' Science Preparation Opportunities at the Children's Museum: A "Win Win" for All Science Learners (Phys)
(Elementary/College) Atlantic 1, Renaissance
Shelly L. Counsell *(slcnsell@memphis.edu),* University of Memphis, Tenn.
Felicia Peat *(felicia.peat@cmom.com),* Children's Museum of Memphis, Tenn.
In this workshop, you will actively engage in two physics workshops using a learning cycle format developed by University of Memphis EC majors in collaboration with the Children's Museum of Memphis.

Up for the Challenge! Fun Science Challenges That Build Teamwork and Engage All Students (Gen)
(Elementary–High School) Atlantic 2, Renaissance
Roy J. Whitley *(roy.whitley@del-valle.k12.tx.us),* Ojeda Middle School, Austin, Tex.
Engage students of all abilities in your class. Learn how to teach science concepts through experiential challenges using PVC pipes, marbles, Hula-Hoops®, and more.

Affordable Inquiries from a Third World Country for Your Classroom (Gen)
(Middle Level–High School) Seaport Ballroom A, Seaport
Maureen Lemke *(ml43@txstate.edu)* and **Gail Dickinson** *(dickinson@txstate.edu),* Texas State University–San Marcos
Limited budget? These field-tested lessons from a Cambodian general science course use basic materials for student inquiries on nutrition and the environment.

Teachers on the Estuary: A Taste of TOTE (Gen)
(Middle Level–High School) Seaport Ballroom B, Seaport
Joan C. Muller *(joan.muller@state.ma.us),* Waquoit Bay National Estuarine Research Reserve, Waquoit, Mass.
Come sample hands-on and web-based activities from NOAA's National Estuarine Research Reserve's Teachers on the Estuary field-based professional development program focused on coastal research.

SMART Books (Gen)
(General) Commonwealth Ballroom C, Westin Waterfront
Kelly Green *(greenkel13@verizon.net),* Howard High School of Technology, Wilmington, Del.
Sherry Geesaman, Milford Middle School, Milford, Del.
Victoria Deschere *(victoria.deschere@appo.k12.de.us),* Redding Middle School, Middletown, Del.
Explore interdisciplinary teaching strategies through the use of nonfiction trade books to enhance student literacy through writing.

Integrating the *Common Core State Standards* Through the Interdisciplinary Structure of STEM (Gen)
(General) Douglass, Westin Waterfront
Mary Lou Blanchette Smith *(msmith@windham.k12.ct.us),* **Nicole Bay** *(nbay@windham.k12.ct.us),* and **Ashley M. Welch** *(awelch@windham.k12.ct.us),* Charles H. Barrows STEM Academy, North Windham, Conn.
Kelly Doubleday *(kdoubleday@tolland.k12.ct.us),* Tolland (Conn.) Public Schools
Through a collaborative process, participants will learn the basics of the *Common Core State Standards* through the lens of STEM education.

Got the iPads, Now Let's Get "Appy"! (Gen)
(General) Harbor Ballroom I, Westin Waterfront
Beth S. Guzzetta *(bguzzetta@allendalecolumbia.org)* and **Martha Bjorklund** *(mbjorklund@allendalecolumbia.org),* Allendale Columbia School, Rochester, N.Y.
Katherine Guzzetta *(katie.guzzetta@gmail.com),* Student, Pittsford Sutherland High School, Pittsford, N.Y.
Join us as we share numerous available educational iPad apps plus other ways we integrate technology in our 1:1 program.

DuPont Presents: Portable Affordable Simple STEM (PASS) (Gen)
(Preschool–Elementary) Otis, Westin Waterfront
Renee G. O'Leary, Holy Angels School, Newark, Del.
Peggy Vavalla, DuPont, Wilmington, Del.
PASS (K–2) provides teachers with developmentally appropriate, integrated materials to introduce STEM concepts using simple multisensory elementary explorations. Walk away with sample lesson plans.

Engineer Your World: Engineering Design for High Schools (Gen)
(High School/Supervision) Stone, Westin Waterfront
Cheryl Farmer *(cheryl.farmer@mail.utexas.edu),* The University of Texas at Austin
Engineer Your World offers implementation grants to high schools seeking to establish an innovative engineering design and problem-solving course for their students.

12:30–1:30 PM Exhibitor Workshop

Project-based Learning Promotes the Development of *CCSS ELA* in the Secondary Science Classroom (Gen)
(Grades 9–12) 156C, BCEC
Sponsor: It's About Time
Presenter to be announced
Collaborating, presenting, and communicating are key 21st-century skills that are also an integral part of the *Common Core State Standards, ELA.* Explore how Active Physics, Active Chemistry, and *EarthComm* are project-based curricula that promote the development of these important skills, including writing, reading, communicating, presenting, and literacy in science.

12:30–2:00 PM Presentation

SESSION 1
Meet Me in the Middle Session: Lunch and Learn Share-a-Thon (Gen)
(General) Grand Ballroom A/B, Westin Waterfront
Organizer: **Todd F. Hoover** *(thoove2@bloomu.edu),* Bloomsburg University of Pennsylvania, Bloomsburg
The NMLSTA Share-a-Thon brings together almost 100 individuals and organizations from all over the U.S. in a flea market–style format where guests can circulate the room to meet with individual presenters who showcase and share their innovative and exciting teaching ideas geared specifically for middle level science. During the share-a-thon, participants can engage in hands-on activities, collect information and resources from national and international organizations, network with NSTA Middle Level and NMSLTA leaders, review recommended middle level science materials and resources, and more…all in a single location. All attendees will be entered into our drawing for a chance to win one of our many door prizes! Attend this session and discover invaluable resources that will engage your middle level students in exciting and inspiring science learning!

1:00–2:00 PM Workshop

CESI Session: The Life Cycle of Literacy Through Science (Bio)
(Elementary) 211, BCEC
Julie V. McGough, Valley Oak Elementary School, Fresno, Calif.
Prepare the environment, sow some seeds of thought, and dig deeper to understand living things while engaging in reading, writing, and collaborative discussions!

1:00–2:00 PM Exhibitor Workshop

Solve a Forensic Mystery Story Using Engineering and Science (Bio)
(Grades 6–9) 157B, BCEC
Sponsor: Bio-Rad Laboratories
Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.
Engage your students as they play the role of forensic scientists to solve the case of the stolen cell phones. Candy provides the crime scene evidence as they engineer a gel electrophoresis system to sort out the suspects and determine "whodunit."

1:00–2:30 PM Exhibitor Workshops

Shifting Practices to Infuse Science and Engineering Practices with the *NGSS* **(Bio)**

(Grades 5–12) *157A, BCEC*

Sponsor: Bio-Rad Laboratories

Sherri Andrews *(sherri_andrews@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

This workshop will focus on illustrating the science and engineering practices described in the *NGSS* for California and the NRC *Framework*. Explore chromatography techniques to separate pigments using paper and column chromatography.

1:00–3:00 PM Workshop

PDI **NGSS Pathway Session: Making Connections Between Engineering, Technology, Science, and Society in Your Local Community** **(Gen)**

(General) *206 A/B, BCEC*

Mariel Milano *(mariel.milano@ocps.net),* Orange County Public Schools, Orlando, Fla.

Cary I. Sneider *(csneider@pdx.edu),* Portland State University, Portland, Ore.

How are engineering, technology, and science related? Join us as we make the *NGSS* come to life and develop model service learning design challenges that leverage the needs of your local community as a vehicle to accomplish the *Next Generation Science Standards*. Participants will explore sample lessons and develop sample service-oriented design challenges that focus on the crosscutting concepts of Engineering, Technology, Science, and Society using the *STEM Lesson Essentials* unit template.

1:30–2:30 PM Social

NSTA Chapter and District Director Ice Cream Social in Honor of Wendell Mohling—Sponsored by GEICO

NSTA Booth #1107, Exhibit Hall

Enjoy complimentary Brownie Sundaes while meeting and networking with colleagues and representatives from all of NSTA's 18 Districts. Learn more about events, initiatives, and happenings in your district directly from your representatives in an informal setting. We'll have lots of goodies for everyone and we hear the GEICO gecko will be making an appearance! Please note that Brownie Sundaes are available on a first-come, first-served basis while supplies last.

1:30–3:00 PM Exhibitor Workshop

Chemical and Environmental Technology (Chem)

(Grades 9–12) *150, BCEC*

Sponsor: Fisher Science Education

Robert Marshall *(marshallr@carnegiesciencecenter.org),* Carnegie Science Center, Pittsburgh, Pa.

Following the *NGSS* model, design and interpret the results of your team's experiment in order to answer basic chemistry and environmental science questions. You will be using innovative lab equipment created to put the power in your students' hands. Then, share your data and ideas to keep the learning going.

2:00–2:30 PM Presentations

SESSION 1

AMSE Session: Science Instruction for All Students **(Gen)**

(Preschool–Middle Level) *Constitution, Seaport*

Melissa Sleeper *(melissa.sleeper@indianriverschools.org),* Sebastian River Middle School, Sebastian, Fla.

Extend learning by allowing students to creatively demonstrate understanding of science content. These activities provide students with choices that appeal to their interests and learning profiles.

SESSION 2

Formative Assessment of Process Skills in Science **(Gen)**

(Middle Level–High School) *Plaza A, Seaport*

Darrin Ellsworth *(darrin.ellsworth@act.org)* and **Mark McDermott** *(mark.mcdermott@act.org),* ACT Inc., Iowa City, Iowa

Join us as we highlight a curriculum-based plan for formative assessment of science process skills. Learn about a framework for how science inquiry should be conducted that provides opportunities to formatively assess process skills in the classroom.

SESSION 3

Increasing Minority Participation in STEM Through Autonomy Support **(Gen)**

(General) *Griffin, Westin Waterfront*

Anthony C. Derriso *(acderriso@crimson.ua.edu),* The University of Alabama, Tuscaloosa

Autonomy supportive science learning environments can help students overcome stereotypes associated with STEM fields. Learn the psychology behind the theory as well as practical steps.

2:00–2:30 PM Exhibitor Workshop

A Change of Seasons **(Earth)**

(Grades 5–8) *Booth #1457, Exhibit Hall*

Sponsor: Science First®/STARLAB®

Helmut Albrecht *(helmut.albrecht@sciencefirst.com)* and **Nathaniel Bell** *(nate.bell@sciencefirst.com),* Science First/STARLAB, Yulee, Fla.

In this in-dome workshop, we will introduce one of the Starry Night Small Dome lessons. Join us as we take a look at why we have seasons here on Earth.

2:00–3:00 PM Featured Presentation

Educator? Astronaut? You Can Do Both! **(Earth)**

(General) *210C, BCEC*

Joseph Acaba, Educator Astronaut, NASA Johnson Space Center, Houston, Tex.
@AstroAcaba

So what's it really like living and working aboard the International Space Station? Join NASA astronaut Joseph Acaba as he shares the lessons he's learned as a mission specialist and flight engineer aboard the International Space Station. He will trace the journey of four classroom teachers who made their way from the selection process, through training, and eventually into space. Hear about the evolution of NASA's Teacher in Space Program to the Educator Astronaut Program and engage in a conversation about what it takes for a classroom teacher to be competitive in the current astronaut selection process. You just might have the "Right Stuff."

It's a rare leap to go from teaching math and science to logging 138 days in space as an astronaut, but that is precisely Joseph Acaba's career trajectory. Before being selected in 2004 as a NASA astronaut candidate, Joseph taught high school science and middle school math and science.

A member of the U.S. Marine Corps Reserve, Joseph's experience includes work as a hydrogeologist in Los Angeles, primarily on Superfund sites, and as an environmental education awareness promoter in the Dominican Republic for the Peace Corps.

Completing his NASA training in 2006, astronaut Acaba was assigned to STS-119, which flew from March 15–28, 2009, to deliver the final set of solar arrays to the International Space Station. Joseph has also conducted numerous scientific research experiments while in space.

2:00–3:00 PM American Geophysical Union Lecture

Geosciences: The Nexus of Data-driven Science and Applications **(Earth)**

(General) *210 A/B, BCEC*

Suchi Gopal *(suchi@bu.edu),* Professor, of Earth and Environment and Research Professor at Pardee Center for the Study of the Longer-Range Future, Boston University, Boston, Mass.

Geosciences will become increasingly prominent in the 21st century as humanity confronts daunting challenges such as population growth, mitigating natural hazards, climate change, and accelerated resource and environmental degradation. The first step in making sense of the processes and events that shape our dynamic Earth is to observe and analyze them. Massive amounts of digital data are being collected from a growing number of satellites and sensors monitoring the Earth, atmosphere, and oceans. In addition, crowdsourcing and social media technologies are providing local and detailed observations. Geoscientists analyze this data using a variety of methods, including data visualization and modeling, statistical techniques, and machine learning algorithms to address and solve problems for resource management, environmental protection, and public health. Join Dr. Gopal as she shares her research and illustrates how geosciences can assist in analyzing disease patterns and managing natural disasters. She encourages all educators to explore and analyze sample datasets in their classrooms to foster practical problem solving for societal issues.

Suchi Gopal is a professor in the department of Earth and Environment at Boston University. Her research is multidisciplinary dealing with spatial analysis and modeling, GIS, data mining, information visualization, and artificial neural networks. Her current research projects include the development of a spatial decision analysis system on a mobile platform, assessing the impact of climate change on food security and biodiversity in Cambodia, urban land cover characterization using fuzzy sets, and mapping maternal health service delivery in Zambia. She is funded by the National Science Foundation on a GK-12 grant—GLobAl Change Initiative—Education and Research (GLACIER) focusing on outreach to middle schools in the Boston area. She holds a PhD in geography from the University of California, Santa Barbara.

2:00–3:00 PM Presentations

SESSION 1

Next Generation Science Stations (Gen)

(Elementary–Middle Level) *158, BCEC*

Halle Quezada, Eugene Field Elementary School, Chicago, Ill.

Katherine Eaton *(kathy.e.eaton@wmich.edu),* Western Michigan University, Kalamazoo

Discover how to plan and implement science stations centered around the *NGSS.* The components discussed will include assessment, portfolios, room organization, mini-lessons, and student routines. The resources will help build confidence in using stations while transitioning to the *NGSS.*

SESSION 2

Dozens of Demonstrations—Physics for All Ages (Phys)

(Elementary–Middle Level) *159, BCEC*

Fred R. Myers *(myersf@glastonburyus.org),* Glastonbury (Conn.) Public Schools

Walk away with dozens of vivid demonstrations of physics concepts that can help any teacher provide better instruction for his or her students, particularly for grades 3 and up. The demonstrations involve common and inexpensive materials. Instructional tips and clear explanations included.

SESSION 3

The Science of Service Learning: One School's Journey to Promote Science Knowledge Through Service (Env)

(General) *160A, BCEC*

Jennifer C. Williams *(jenniferwilliams@newmanschool.org)* and **Lisa J. Swenson** *(lisaswenson@newmanschool.org),* Isidore Newman School, New Orleans, La.

Presider: Susan E. Scharff, Isidore Newman School, New Orleans, La.

Find out how one school implemented science-based service learning programs that increase student understanding of coastal issues facing communities along the Gulf Coast. In these programs, students work with university scientists.

SESSION 4

Above, Through, and Beyond with SOFIA (Earth)

(General) *162A, BCEC*

David V. Black *(elementsunearthed@gmail.com),* Walden School of Liberal Arts, Provo, Utah

Study the universe as an Airborne Astronomy Ambassador with the Stratospheric Observatory for Infrared Astronomy. Find out how to apply, what you'll experience, and how students are creating a video about SOFIA and infrared astronomy.

SESSION 5 (two presentations)

(High School) *162B, BCEC*

Common Labs for All Students (Chem)

Elizabeth Potter-Nelson *(e.potter.nelson@gmail.com)* and **Colleen K. Buzby** *(buzbywork@gmail.com),* Antioch Community High School, Antioch, Ill.

What happens when you and your colleagues decide that all students need to be exposed to the same lab experiences? Come find out how we've differentiated crucial labs so that all students learn the content at the level that is right for them!

Making Biodiesel: A Problem-based Multidisciplinary Sustainability Exploration (Chem)

Sharon Geyer *(sgeyer@pomfretschool.org)* and **Brian Geyer** *(bgeyer@pomfretschool.org),* Pomfret School, Pomfret, Conn.

Pomfret School is on a collaborative, multidisciplinary journey through the production of biodiesel, including chemistry, environmental studies, the environmental club, and our Facilities Department.

SESSION 6

The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (Gen)

(General) *252A, BCEC*

Flavio Mendez *(fmendez@nsta.org),* Senior Director, NSTA Learning Center/SciLinks, NSTA, Arlington, Va.

Lost when it comes to finding online professional development resources to enhance your content knowledge and skills? With more than 10,000 resources (25% of which are free) and quality PD opportunities to assist educators with core subject content, the Learning Center has the answers! Get free resources and ICE CREAM!

SESSION 7

Connecting Science Content Using Trade Books! (Gen)

(Preschool–Elementary) *252B, BCEC*

Diana L. McMillan *(mcmillandiana@gmail.com)* and **Gail Laubenthal** *(glaubent@yahoo.com),* Austin (Tex.) ISD

Presider: Diana L. McMillan

Bringing it all together! Come learn how to use literacy to enhance your science lessons. Sample lessons provide ideas on how to integrate science, literacy, math, technology, and art!

SESSION 8

The 50 Best Physics Demos to Do Before You Die… (Phys)

(High School–College) *253A, BCEC*

Peter Hopkinson *(phopkinson@shaw.ca),* Retired Educator, Burnaby, B.C., Canada

Well, maybe not quite all 50, but we'll get to as many as we can, and they are definitely the best. Trust me, I'm a physics teacher!

SESSION 9

Award-winning Share-a-Thon Featuring NSTA Distinguished Teachers (Gen)

(General) *253B, BCEC*

Tom Lough *(mlough@murraystate.edu),* Murray State University, Murray, Ky.

Julie E. Taylor *(julie_taylor@eee.org),* Adelanto (Calif.) School District

Susan German *(sgerman@hallsville.org),* Hallsville Middle School, Hallsville, Mo.

James M. Brown *(james.brown@southcolonie.k12.ny.us),* Forest Park Elementary School, Albany, N.Y.

Shirley Sypolt *(ssypolt@hampton.k12.va.us),* Cooper Elementary Magnet School, Hampton, Va.

Paul Adams *(padams@fhsu.edu),* Fort Hays State University, Hays, Kans.

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

Ellen O'Donnell *(eodonnell@sau53.org),* Deerfield Community School, Deerfield, N.H.

Karen L. Ostlund *(klostlund@utexas.edu),* NSTA Retiring President, and Retired Professor, The University of Texas at Austin

Dwight Sieggreen, Detroit Zoological Society, Northville, Mich.

Presider: Gerry M. Madrazo Jr., 1993–1994 NSTA President, Elon, N.C.

Past winners of the NSTA Distinguished Teaching Award share their reflections, describe their science teaching approaches and experiences, and discuss their favorite projects. Handouts! Demonstrations!

SESSION 10

NSTA Press® Session: Special Needs Students in Science (Gen)

(General) *254A, BCEC*

Ed Linz *(coachlinz@cox.net),* Author and Education Consultant, Springfield, Va.

Mary Jane Heater, Robinson Secondary School, Fairfax, Va.

Let's discuss what the science teacher MUST do and what the science teacher SHOULD do! We'll share a list of mostly DO's and a few DON'T's.

SESSION 11

Discussion Strategies for Using Computer Simulations to Develop Understanding of Scientific Models (Gen)

(Middle Level) *255, BCEC*

Norman T. Price *(normprice@gmail.com),* Amherst-Pelham Regional Middle School and UMass Amherst, Mass.

Zach Holmboe *(holmboez@arps.org),* Amherst-Pelham Regional Middle School, Amherst, Mass.

Move beyond computer simulation show and tell. This set of teacher/researcher–tested discussion strategies can help you use a simulation as a "tool for asking."

SESSION 12

Simulate STEM Online Through Virtual Clinical Trials (Bio)

(Informal Education) *256, BCEC*

Lynn Lauterbach *(lynnlauterbach@gmail.com),* Loveland, Colo.

Expose high school students to science and biomedical engineering practices using free online simulations that engage them in technology while designing authentic neuroscience-based clinical trials. Also, learn about a built-in assessment notebook.

SESSION 13

Teach with the World's Most Extravagant Birds (Bio)

(Middle Level–College) *257B, BCEC*

Jennifer Fee *(jms327@cornell.edu),* Cornell Lab of Ornithology, Ithaca, N.Y.

Most every middle school and high school teacher knows about Darwin and his Galápagos finches and uses them as an example for teaching some of the concepts of evolution. But watch out finches…a more colorful bird is the new biology teacher in town! Learn how you can cover evolution and natural selection through the birds-of-paradise.

SESSION 14

Bringing Primary Scientific Literature to the Classroom Through the *Journal of Emerging Investigators* (Gen)

(Middle Level–High School) *258C, BCEC*

Rebecca K. Reh *(reh@fas.harvard.edu),* Harvard University, Boston, Mass.

Incorporate *JEI*—a journal publishing the original research of grades 6–12 students—into the classroom through journal club discussions. Find out how your students can publish!

SESSION 15

Teacher Leaders in the RESTEP to STEM (Gen)

(General) *260, BCEC*

Sharon Schleigh *(sschleig@purdue.edu)* and **Karina Longfellow,** Purdue University Calumet, Hammond, Ind.

Jennifer Stalls *(jsstalls@gmail.com),* C.M. Eppes Middle School, Greenville, N.C.

Changes to improve STEM are effective through leveraged collaborations among higher education, K–12 teachers, scientists, and funding agencies. Join us as we present a successful model of this collaboration.

SESSION 16

Explore Earthquakes! (Earth)

(Middle Level–High School/Informal Ed.) *261, BCEC*

Gary Lewis *(glewis@geosociety.org),* The Geological Society of America, Raymond, Maine

Using several inquiry-based activities, we will explore earthquakes in a way that will allow students to become actively engaged in the learning process. Free resources!

SESSION 17

Creating Professional Development e-Portfolios Using NOAA Resources (Gen)

(General) *Brewster, Renaissance*

Shannan Lewinski, The Baldwin Group, Charleston, S.C.

Atziri Ibanez, National Estuarine Research Reserve System, Silver Spring, Md.

Learn to create your own free professional development e-portfolio on Google sites. We will use the NOAA Sea Earth Atmosphere curriculum as a case study.

SESSION 18 (two presentations)

(High School–College/Informal Ed.) *Caspian, Renaissance*

SCST Session: Using Bean Beetle "Vision" to "Change" the Undergraduate Biology Student's Idea of Scientific Investigations (Bio)

Betsy Morgan *(elizabeth.r.morgan@lonestar.edu)* and **Brian R. Shmaefsky** *(brian.r.shmaefsky@lonestar.edu),* Lone Star College–Kingwood, Tex.

We will discuss our lab experiences using bean beetles to help majors and nonmajor students understand scientific investigations through inquiry.

SCST Session: Using Digital Microscopy as a Means of Teaching the Quantification of Qualitative Data (Gen)

Brian R. Shmaefsky *(brian.r.shmaefsky@lonestar.edu),* Lone Star College–Kingwood, Tex.

Learn how nonscience majors in introductory coursework used digital capture image of data to quantitate student-designed experiments having a problem-based focus.

SESSION 19

Managing Science Fairs in the Classroom (Gen)

(General) *Mediterranean, Renaissance*

JoEllen Schuleman *(missschuleman@yahoo.com),* P.S. 199 Jessie Isador Straus, New York, N.Y.

Presider: Stefi Preiss, PS 140 Nathan Straus, New York, N.Y.

Participating in the science fair is a challenge for many students. Gone are the days of home-based projects and, increasingly, the classroom teacher is left to provide the support formerly given by parents. Discover how to manage a classroom full of projects with ease.

SESSION 20

Project S.P.A.C.E.—A Case Study (Gen)

(General) *Pacific A/B, Renaissance*

Tyler J. Morales, The Franklin Institute, Philadelphia, Pa.

Join students as they take you through creating and participating in community-driven projects from the students' point-of-view rather than the teacher's point-of-view.

SESSION 21

Digital Tools for Teacher Leadership (Gen)

(General) *Pacific C, Renaissance*

Conn McQuinn, Puget Sound Educational Service District, Renton, Wash.

Social networking tools can be used to develop and enhance professional learning networks and extend the reach of teacher leaders.

SESSION 22

Beyond X and Y: Recent Discoveries About the Mechanisms Governing Sex Determination and Differentiation (Bio)

(High School–College) *Pacific D, Renaissance*

Terry Maksymowych *(tmaksymowych@ndapa.org),* Academy of Notre Dame de Namur, Villanova, Pa.

Genetics and embryology lessons should include this new information to help students understand the complexities of multifactorial and epigenetic influences on human sex development.

SESSION 23

Someday Is Not a Day of the Week: On-Time Tactics for Fighting Procrastination (Gen)

(General) *Pacific F, Renaissance*

Bonnie Nelson *(bonnie.nelson@apsva.us),* Wakefield High School, Arlington, Va.

Stacy Brasfield, Washington-Lee High School, Arlington, Va.

Hear current research and strategies to help all students overcome procrastination and promote academic achievement. Learn about the dynamics that fuel procrastination.

SESSION 24

Using the Nation's Report Card (NAEP) to Improve Science Education (Gen)

(General) *Pacific G/H, Renaissance*

Hector Ibarra, National Assessment Governing Board Member, Iowa City, Iowa

The Nation's Report Card provides information that helps teachers assess student progress and develop ways to improve science education. Get links to previously used test questions and view a snapshot of test results from Massachusetts and surrounding states. Take away a comprehensive NAEP folder along with information on how to incorporate state performance results in your classroom and school district.

SESSION 25

Collaborative Tools for Customizing STEM Instruction (Gen)

(Middle Level–High School) *Lighthouse I, Seaport*

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

Heather Leary *(heather.leary@colorado.edu),* University of Colorado, Boulder

Next generation collaboration tools enable STEM educators working together online to plan, customize, and implement innovative STEM instruction using high-quality open educational resources.

SESSION 26

Writing to Learn Science (Gen)

(Middle Level–High School) *Plaza B, Seaport*

Jennifer T. Ellis *(jennifer-t-ellis@utc.edu)* and **Lauren Ingraham,** The University of Tennessee at Chattanooga

Join us for an introduction to two teaching strategies that are ideal for use with the *Common Core State Standards* and the *NGSS*—writing to learn and the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) instructional model.

SESSION 27

NSELA Session: Disciplinary Literacy in Middle School Science Classrooms (Gen)

(Middle Level) *Alcott, Westin Waterfront*

Tom Peters *(tpeters@clemson.edu),* S^2TEM Centers SC, Clemson, S.C.

This session will explain the *Inquiring Minds: Reading to Learn and Innovate in Mathematics and Science* (IQMS) model of professional development and support designed to infuse disciplinary literacy strategies in middle science classrooms across South Carolina.

SESSION 28

CSI and *NGSS*—Coordinators and Supervisors Implementing the *NGSS* (Gen)

(Supervision/Administration) *Burroughs, Westin Waterfront*

Kelly Price *(price_kel@yahoo.com),* Forsyth County Schools, Cumming, Ga.

Interact with members of the NSTA Committee on Coordination and Supervision of Science Teaching as they share timelines, strategies, tools, and "lessons learned" through their implementation of the NRC *Framework* and the *NGSS* at the district and state levels.

SESSION 29

Research Worth Reading: 2013 Research Selected by NSTA Affiliates (Gen)

(General) *Commonwealth Ballroom B, Westin Waterfront*

Kathryn Scantlebury *(kscantle@udel.edu),* University of Delaware, Newark

Each year, the NSTA Research Committee works with NSTA affiliates to identify research that teachers should read. This session will share the identified research of 2013.

SESSION 30

Continue Changing the Equation Through Addressing Engineering and Science with Technology (Gen)

(General) *Faneuil, Westin Waterfront*

Elizabeth Niehaus *(niehaus_p@msn.com)* and **Carol L. Jones** *(caroljones8710@yahoo.com),* Lawrence Technological University, Southfield, Mich.

Michelle Kirkland, Mount Clemens (Mich.) Community School District

Presider: Paul J. Niehaus, Niehaus & Associates, Inc., South Lyon, Mich.

With the impending adoption of the *NGSS* by many states, the question remains…what technology do we purchase? Come see what we have successfully implemented with no purchasing. BYOD (bring your own device)!

SESSION 31

Reason to Write: Argumentative and Persuasive Writing in the Science Classroom (Gen)

(Middle Level–College) *Grand Ballroom D, Westin Waterfront*

Judith H. Sumner *(sumnerbotany@gmail.com),* Massachusetts Academy of Math and Science, Worcester

Argumentation and persuasion are essential *CCSS* components that can be engaging aspects of science instruction. We will explore several scientific controversies, STEM research and writing strategies, and claim/evidence/reasoning organization.

SESSION 32

High School Contributions to the Development of Presidential Early Career Awardees in Science and Engineering (PECASE) (Gen)

(General) *Harbor Ballroom II, Westin Waterfront*

John T. Almarode *(almarojt@jmu.edu),* James Madison University, Harrisonburg, Va.

Edward Crowe *(edw.crowe@gmail.com),* Woodrow Wilson National Fellowship Program, Washington, D.C.

Christopher G. Kolar *(ckolar@imsa.edu),* Illinois Mathematics and Science Academy, Aurora

Geesoo Maie Lee *(glee@apa.org),* American Psychological Association, Washington, D.C.

resider: Christopher G. Kolar

PECASE is the highest honor bestowed by the United States government on scientists and engineers in the early stages of their independent research careers.

SESSION 33

How Do We Know What They Know? Using Student Interviews to Illuminate Student Knowledge (Gen)

(General) *Harbor Ballroom III, Westin Waterfront*

Mary A. Bearkland *(mabearkl@syr.edu)* and **Sharon Dotger** *(sdotger@syr.edu),* Syracuse University, Syracuse, N.Y.

Kevin Moquin *(fkmoquin@syr.edu),* **Deb Walsh,** and **Sue Osborne** *(sosborne@liverpool.k12.ny.us),* Willowfield Elementary School, Liverpool, N.Y.

Join us to hear how interviews can be designed and used to pre-assess students' science content knowledge and lead to improved science instruction.

SESSION 32

The Best in Literature—How We Choose It, How We Use It (Gen)

(General) *Lewis, Westin Waterfront*

Suzanne Flynn, Lesley University, Cambridge, Mass.

Emily Brady, Executive Administrator and Manager, NSTA Recommends, NSTA, Arlington, Va.

NSTA Recommends has a searchable database of almost 10,000 materials and NSTA has 42 years of "The Best of the Best" in trade books. Join us to see how we evaluate, try your own hand at evaluation, and learn how to use these materials.

SESSION 33

Cycles of Inquiry Around Unit Planning, Delivery, and Student Outcomes (Gen)

(Supervision/Administration) *Quincy, Westin Waterfront*

Dan Novak, Sephali R. Thakkar *(sephali@gmail.com),* and **Fred Feraco** *(frederick.feraco@gmail.com),* Columbia Secondary School for Math, Science, & Engineering, New York, N.Y.

Presider: Sephali R. Thakkar

Our departmental collaboration encompasses an inquiry cycle that involves every tier of collaboration—from students and teachers to administrators—in order to meet instructional goals.

2:00–3:00 PM Workshops

NESTA Session: It's Elementary! Effective Approaches for Addressing the Earth Science *Next Generation Science Standards* in the Elementary Classroom (Earth)

(Preschool–Elementary) *052 A/B, BCEC*

Roberta M. Johnson *(rmjohnsn@gmail.com),* NESTA, Boulder, Colo.

Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.

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

This NESTA hands-on workshop provides exemplary lessons and strategies that prepare students for the *NGSS* performance expectations for Earth science topics in the K–5 classroom.

Using Virtual Field Experiences in Earth Science Education (Earth)

(Middle Level–High School) *157C, BCEC*

Lisa Gardiner, Spark: UCAR Science Education, Boulder, Colo.

Randy Russell *(rrussell@ucar.edu),* NCAR, Boulder, Colo.

Take students on virtual field trips and have them simulate the experiences of scientists in the field using role-playing and computer-assisted activities.

Early Bird Lessons: Practicing Early Learning Skills Using Birds (Bio)

(Preschool–Elementary) *160B, BCEC*

Kim Soper, University of Nebraska Medical Center, Omaha

Kathleen C. Murphy *(kmurphy@fontenelleforest.org),* Fontenelle Forest, Bellevue, Neb.

Discover a curriculum that encourages preschoolers to develop and practice inquiry skills and challenges them to "Eat Like A Bird," measure their wingspan, and "Build a Bird."

Writing to Learn and Learning to Write in Middle Grades Science Classrooms (Bio)

(Middle Level) *160C, BCEC*

Rose M. Pringle *(rpringle@coe.ufl.edu)* and **Jennifer C. Mesa** *(jmesa@coe.ufl.edu),* University of Florida, Gainesville

Explore and construct explanations for relationships in ecosystems. Using related samples of student writing, we will model strategies for guiding writing in science.

Starting a Robotics Club for Elementary School Students—It's Easy! (Gen)

(Elementary) *161, BCEC*

Kara Crowley *(kara.crowley@swcs.us),* Darby Woods Elementary School, Galloway, Ohio

This session will show you how easy it can be to start a Robotics Club at your elementary school!

Organelle of the Day (Bio)

(Middle Level–High School) *205A, BCEC*

Whitney C. Hagins, MassBioEd, Chelmsford, Mass.

Discover an innovative approach to teaching and learning about cell structure and function while using proper microscope technique. Digital cameras and iPads document student work. Handouts!

Perception and Performance: Investigating the Human Body (Bio)

(Elementary–High School) *205B, BCEC*

Richard A. Frazier *(rfrazier@aes.ac.in),* American Embassy School, New Delhi, India

The human body holds immediate interest for students. This workshop introduces phenomena that prove surprising for many and investigations that have no foregone conclusions.

Building Bridges Between Games and Curricula (Phys)

(Middle Level–High School) *205C, BCEC*

Erin Bardar and **Barbara MacEachern** *(barbara_maceachern@terc.edu),* EdGE at TERC, Cambridge, Mass.

George Papayannis *(gpapayannis@fenwayhs.org),* Fenway High School, Boston, Mass.

Ed Yoo *(eyoo@codmanacademy.org),* Codman Academy, Dorchester, Mass.

Leverage your students' passion for games to engage them in STEM learning. Come play games and explore activities that bridge game play and classroom physics.

Integrating Science, Mathematics, and Technology into Elementary Classroom Units (Gen)

(Elementary–Middle Level) *207, BCEC*

Rick Varner *(rvarner@bcps.org),* Deer Park Middle Magnet School, Randallstown, Md.

Ellyssa Varner *(ellyssa_varner@hcpss.org),* Bollman Bridge Elementary School, Jessup, Md.

It is no small task incorporating new standards into your existing curriculum. Join us as we share a hands-on interdisciplinary unit for the elementary classroom.

CESI Session: Engineering Is Everywhere (E2) (Phys)
(Elementary) *211, BCEC*
Julie Thomas *(julie.thomas@unl.edu),* University of Nebraska–Lincoln
E2 resources help grade 5 students make sense of engineering as applied to science and mathematics. Try hands-on activities and get access to videos and curricula.

Master Experimental Design and Science Practices (Gen)
(Elementary) *212, BCEC*
Helen Pashley, Putnam Northern Westchester BOCES, Yorktown Heights, N.Y.
Beyond steps of the scientific method, experimental design is essential to science practices. Learn easy strategies to help students understand experiments, variables, and lab reports.

Integrating Science and Engineering Learning (Gen)
(Elementary) *213, BCEC*
Cathy P. Lachapelle *(clachapelle@mos.org)* and **Kristin Sargianis** *(ksargianis@mos.org),* Museum of Science, Boston, Mass.
Join us as we demonstrate through hands-on activities that an engineering design challenge can increase students' engagement, motivation, and science content learning. Relevant research on design-based learning will be discussed.

Science Notebooks as First Drafts? Connect Science and Literacy Through the Water Cycle and Weathering and Erosion Investigations (Earth)
(Elementary) *251, BCEC*
Reeda Hart *(hartr@nku.edu)* and **Carrie Holloway** *(hollowayc2@nku.edu),* Northern Kentucky University, Highland Heights
These water cycle investigations apply the framework for science and engineering practices, disciplinary core ideas, and crosscutting concepts while addressing literacy objectives. Take home a CD.

NSTA Press® Session: *Science & Children*—A Year of Inquiry (Gen)
(Preschool–Elementary) *253C, BCEC*
Linda Froschauer *(fro2@me.com),* 2006–2007 NSTA President, and Field Editor, *Science & Children,* Westport, Conn.
The *Next Generation Science Standards* support inquiry as a teaching strategy. Learn ways to infuse components of inquiry into your curriculum.

Let's Go STEM! Part I (Gen)
(Middle Level) *254B, BCEC*
Terri Ladd *(tladd@menifeeusd.org),* Menifee Valley Middle School, Menifee, Calif.
We want to share our first-year experiences of STEM classes with you! Join us for this hands-on workshop where we will share activities that worked.

Engineering Practices in Early Childhood: Designing Mechanisms with Mech-a-Blocks (Gen)
(Preschool–Elementary) *259B, BCEC*
Travis Sloane, East Side Elementary School, New York, N.Y.
Donna Johnson *(djohnson11@schools.nyc.gov),* P.S. 021 Crispus Attucks School, Brooklyn, N.Y.
Anja Hernandez *(anjahernandez@ccny.cuny.edu),* City College of New York, N.Y.
Presider: Donna Johnson
Mech-a-Blocks are large, connectable pegboard pieces in pattern-block shapes and colors. Find out how to use them to design and test your own mechanisms!

Science Trio: *NGSS* Practices, Nature of Science, and the Habits of Mind (Gen)
(Elementary/College) *Atlantic 1, Renaissance*
Kathy Sparrow *(sparrowk@bellsouth.net)* and **George E. O'Brien** *(obrieng@fiu.edu),* Florida International University, Miami
We will share teaching approaches supportive of 16 Habits of Mind (Costa & Kallick) from our preservice and inservice science education workshops for elementary teachers. Engage in hands-on activities modeling the use of the *NGSS* practices of developing and analyzing data, constructing explanations, and engaging in argumentation from evidence—facilitative for developing the 16 Habits of Mind.

Evaluate Your Sessions Online!

This year, we're giving away a Kindle Fire HDX 7" to two lucky attendees who complete a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See Volume 1, page 17 for details.)

ASTE Session: Understanding the Relationship Between Mass, Volume, and Density by Engineering a Prototype of a Prosthetic Limb (Bio)
(Elementary) Atlantic 2, Renaissance
Nikki Rumpler *(nrumpler@plymouth.k12.in.us),* Riverside Intermediate School, Plymouth, Ind.
Brenda M. Capobianco *(bcapo@purdue.edu)* and **Chell Nyquist** *(nyquist@purdue.edu),* Purdue University, West Lafayette, Ind.
Nancy Tyrie *(ntyrie@lsc.k12.in.us),* Sunnyside Middle School, Lafayette, Ind.
Presider: Chell Nyquist
Help students develop an applied understanding of mass, volume, and density by designing, constructing, and testing a prototype of a prosthetic limb.

Nature of Science and the *NGSS* Science and Engineering Practices (Gen)
(Middle Level–High School/Inf.) Seaport Ballroom A, Seaport
Alicia Shaw *(ashaw@towson.edu)* and **Mary Stapleton** *(mkstapleton@towson.edu),* Towson University, Baltimore, Md.
Explore the *NGSS* science and engineering practices and their relationship to the nature of science using student-centered activities that are easily integrated into the classroom.

Scaffolding Instruction in the Science Classroom (Gen)
(Middle Level–High School) Seaport Ballroom B, Seaport
Mark D. Little *(mark.little@bvsd.org),* Broomfield High School, Broomfield, Colo.
Come learn techniques about scaffolding instruction as well as walk through a lab demonstrating how the lab can be scaffolded to meet student needs.

CSSS Session: The Next Generation of Science Leaders—What Does It Take to Prepare and Support Them? (Gen)
(General) Commonwealth Ballroom A, Westin Waterfront
Deborah L. Tucker *(deborahlt@aol.com),* Independent Science Education Consultant, Napa, Calif.
Participants will use essential leadership tools and resources intended to assist leaders in their efforts to implement the new vision of the science framework.

Writing to Learn Through Science Notebooks/Journals in Elementary and Secondary Classrooms (Gen)
(Elementary–High School) Commonwealth C, Westin Waterfront
Nancy K. Magnuson *(nmagnuson@fsu.edu),* Florida State University Schools, Tallahassee
Find out how students can benefit from using science notebooks in K–12 classrooms. Take home resources!

Geometry of Life: The Engineered World (Gen)
(General) Douglass, Westin Waterfront
M. Gail Jones, North Carolina State University, Raleigh
Amy R. Taylor, University of North Carolina, Wilmington
Explore the amazing shapes/sizes that make up our world. Build an icosahedral virus and a bucky ball, and explore amazing patterns in nature. Free materials!

Some of the Above: Writing Quality Multiple-Choice Questions (Gen)
(Elementary–High School) Harbor I, Westin Waterfront
Israel Solon *(isolon@ets.org),* ETS, Princeton, N.J.
Well-written multiple-choice questions can assess the higher-level skills found in the performance objectives of the *NGSS.* Test developers from Educational Testing Service will share the techniques you can use to write these questions.

DuPont Presents: Fishing Your Way to a Sustainable Future (Gen)
(Middle Level–High School) Otis, Westin Waterfront
Kim O'Byrne *(kobyrne@lcps.k12.nm.us),* Mayfield High School, Las Cruces, N.Mex.
Christa Williamson *(cwilliamson@kms.k12.mn.us),* Kerkhoven Murdock Sunburg Junior/Senior High School, Kerkhoven, Minn.
Presider: Peggy Vavalla, DuPont, Wilmington, Del.
Cast your line, set your hook, and prepare for an inquiry-based learning activity guaranteed to catch your students' attention with a new approach to teaching about sustainability.

Connecting Science, Engineering, and Literacy in an Elementary Classroom (Gen)
(Elementary/Supervision) Stone, Westin Waterfront
Katya Denisova *(kdenisova@gmail.com),* Baltimore (Md.) City Public Schools
Amanda Laurier *(alaurier@jhu.edu),* Johns Hopkins University, Baltimore, Md.
In this hands-on workshop, we will share several engaging and rigorous STEM lessons designed for grades 3–5. Funded by NSF, this work is a product of collaboration of Baltimore City Public Schools and Johns Hopkins School of Engineering.

2:00–3:00 PM Exhibitor Workshop

Project-based Learning: A Gathering of Science Educators and It's About Time (Gen)

(Grades 6–College) *156C, BCEC*

Sponsor: It's About Time

Presenter to be announced

It's About Time is excited to host a gathering of educators who teach It's About Time curricula and programs, to discuss project-based learning in middle school, high school, and college-level science classrooms. Posters and T-shirts will be given out to all participants who preregister at *www.IAT.com.*

2:00–3:00 PM Meeting

GLBT Science Teachers Annual Meeting

Hancock, Westin Waterfront

This is the annual meeting for the Gay, Lesbian, Bisexual, Transgender Science Teachers organization. You do not have to be a current member to attend.

2:00–3:30 PM Workshop

PDI **AMNH Pathway Session: Connecting Earth Science Content and the *CCSS ELA* Using Museum Resources (Earth)**

(Middle Level–High School) *208, BCEC*

Dora Kravitz *(dkravitz@amnh.org)* and **Rebecca Taylor** *(rtaylor@amnh.org),* American Museum of Natural History, New York, N.Y.

Presider: Cristina A. Trowbridge, American Museum of Natural History, New York, N.Y.

This session explores how the reading strategy paraphrasing and museum resources can support *Common Core State Standards, ELA* in reading and science content in Earth science.

2:00–3:30 PM Exhibitor Workshops

Genes and conSEQUENCES with HudsonAlpha (Bio)

(Grades 9–12) *102A, BCEC*

Sponsor: Carolina Biological Supply Co.

Jennifer Carden, HudsonAlpha Institute for Biotechnology, Huntsville, Ala.

Help your students dig into the central dogma of biology using real-world examples and modern research tools. Utilize this hands-on kit to help students master the processes involved in moving genetic information from DNA to protein and the impacts of DNA changes. This workshop is presented in partnership with Carolina Biological Supply Company.

Bring Visual Science into Grades 6–8 Classrooms—It's a Game Changer! (Gen)

(Grades 6–8) *102B, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Spark student interest by combining visual, auditory, and hands-on learning techniques. Harvey Bagshaw discusses and models how he teaches science with video and activities to support blended learning. Learn how to integrate compelling visuals and video and receive a one-year subscription to Carolina's Twig online video-based learning program!

Reflection and Application of the *NGSS:* Learning to Write to Argue with Claims and Evidence K–8 (Gen)

(Grades K–8/Supervision) *103, BCEC*

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Reflect on the makeup of the *Next Generation Science Standards*. Apply this knowledge and understanding to effectively integrate reading informational text and writing to argue through science notebooking.

SPARKvue: Sensor-based Science for Your iPad—Free Sensor Set for Five Attendees! (Gen)

(Grades K–12) *104A, BCEC*

Sponsor: PASCO scientific

Andy Spoone, PASCO scientific, Roseville, Calif.

Explore SPARKvue, data collection and analysis software for iPad, Android, Chromebook, Mac, and PC environments. SPARKvue is an integrated learning environment that combines sensor-based data collection with an intuitive set of display and analytical tools and now supports real-time data and file sharing. Experience the ideal environment for incorporating *NGSS* science and engineering practices. Five lucky attendees will win a 50th Anniversary Sensor Pack—a $600 value!

Envelope Graphic Organizers—UnFOLDing the Possibilities (Gen)

(General) *104B, BCEC*

Sponsor: Dinah-Might Adventures, LP

Nancy Wisker *(nancy@dinah.com),* Dinah Zike Academy, Comfort, Tex.

In this fast-paced, interactive session, discover how to transform basic classroom materials and manila envelopes into 3-D graphic organizers, also known as Foldables®. See the possibilities unFOLD before you and walk away with ideas ready to use on Monday that are evidence based, kinesthetic, and integrative.

Gene Expression and Cellular Differentiation (Bio)

(Grades 9–12) *104C, BCEC*

Sponsor: LAB-AIDS, Inc.

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

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

New Tools, New Insight, and New Ways of Understanding Science with Miller and Levine *Biology* (Bio)

(Grades 6–12) *105, BCEC*

Sponsor: Pearson

Kenneth R. Miller, Brown University, Providence, R.I.

Joseph Levine, Author, Concord, Mass.

Students are changing—their abilities and interests are more diverse, their learning styles are more varied, and they are "wired" into new media. Join coauthors Ken Miller and Joe Levine as they explore the teaching strategies they've put into their new *Biology* program. See how the power of new science and technology can be leveraged to bring *NGSS*-friendly instruction and exploration into your classroom and teaching lab.

Simple Programming Tools to Enhance Student Engagement **(Gen)**
(Grades 6–College) *106, BCEC*
Sponsor: SparkFun Electronics
Derek Runberg *(derek.runberg@sparkfun.com),* SparkFun Electronics, Boulder, Colo.
Processing is a simple, easy-to-learn open-source programming language used by artists, scientists, mathematicians, and gamers. Integrating this tool into your classroom can empower your students to create simulations, models, and data visualizations. This hands-on workshop will culminate in designing your own data collection dashboard.

Meet Your Inner Fish and Other Great Transitions in Evolution **(Bio)**
(Grades 6–College) *107A, BCEC*
Sponsor: Howard Hughes Medical Institute
Mark Eberhard, St. Clair High School, St. Clair, Mich.
Laura Bonetta, Howard Hughes Medical Institute, Chevy Chase, Md.
Learn about key evolutionary events in the history of life on Earth and what transitional fossils reveal about our evolutionary past. Hear about an exciting new short film from HHMI and obtain free ready-to-use resources and supplements to increase the impact of the film in the classroom.

Take a Swipe at Microbes! **(Bio)**
(Grades 7–12) *107B, BCEC*
Sponsor: LaMotte Co.
Ken Rainis, Fairport, N.Y.
Excite students with fun and safe ways to become scientific explorers of microbes in air, water, and food…and on surfaces. As scientists, they will use technology to identify the microbes that they find. As engineers, they will design methods to collect data using BioPaddles®. As mathematicians, they will quantify microbes in CFU/cm^2 units. Engage students to ponder real-world connections of microbes and life. Come microbe hunting with us and pick up takeaways!

Experience the Power of a Digital Middle School Program **(Gen)**
(Grades 6–8) *107C, BCEC*
Sponsor: Achieve3000®
Steven Weniger *(steven.weniger@achieve3000.com),* Achieve3000, Lakewood, N.J.
Experience the power of digital with differentiated levels of rich content from National Geographic. eScience3000 is tightly aligned to the *CCSS,* the *NGSS,* and STEM initiatives. See how science, literacy, and real-life experiences come together in this engaging middle school resource.

iPads in Biology—Digital Microscopy and More! **(Bio)**
(Grades 6–College) *109A, BCEC*
Sponsor: Exo Labs, Inc.
Jeff Shaver *(drjeffshaver@exolabs.com),* Exo Labs, Inc., Seattle, Wash.
Looking to transform students' learning experience in biology? Want to encourage better engagement in the classroom? Exo Labs' Focus Camera connects directly to iPads, instantly creating effective platforms for collaboration! The Focus app allows students to capture high-resolution images and videos, add labels and measurements, and easily share their discoveries.

New Technologies: What They Can Teach Us About Childhood Brain Disorders **(Bio)**
(Grades 6–College) *109B, BCEC*
Sponsor: Society for Neuroscience
Damien Fair, Oregon Health and Science University, Portland
Learn about new and exciting technologies in neuroscience from a leading expert in the field. Discover the tools and techniques that are teaching scientists about brain development, giving insight into brain disorders like autism and ADHD. Engage your students in hands-on neuroscience activities while promoting positive attitudes toward brain health!

MacGyver Windmills **(Env)**
(Grades 4–12) *151A, BCEC*
Sponsor: KidWind Project
Asia M. Ward *(asia@kidwind.org),* KidWind Project, St. Paul, Minn.
Build a windmill using materials commonly found in the classroom. Determine blade efficiency by using the wind to lift weights. Windmills are the ancient ancestors of modern wind turbines. To understand how wind turbines work, one must first understand a basic windmill.

Solving the Mystery of STEM Using Forensic Science **(Gen)**
(Grades 7–12) *151B, BCEC*
Sponsor: Frey Scientific/School Specialty Science
Lou Loftin, Consultant, Reno, Nev.
Conduct a number of STEM-focused forensic activities that link scientific investigations with analysis and investigative skills to solve multifaceted "cases" involving fingerprint, trace, DNA, and document evidence. Examine additional STEM-focused assets. See how the program software allows the integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

Science Practices: What Does Argumentation Look Like in an Elementary Classroom? **(Gen)**
(Grades K–6) *152, BCEC*
Sponsor: Delta Education/School Specialty Science–FOSS
Brian T. Campbell, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS developers to learn about the science practices within the context of the FOSS program. Experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson.

Chemistry with Vernier **(Chem)**
(Grades 9–College) *153A, BCEC*
Sponsor: Vernier Software & Technology
Elaine Nam *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Conduct a variety of chemistry experiments using Vernier sensors with a LabQuest 2 or computer in this engaging hands-on workshop. Experience how Vernier has been incorporating the principles of the *NGSS* science and engineering practices for 33 years!

iPad and Wireless Sensors with Vernier **(Gen)**
(Grades 3–College) *153B, BCEC*
Sponsor: Vernier Software & Technology
Verle Walters *(info@vernier.com),* Vernier Software & Technology, Beaverton, Ore.
Using data-collection technology builds deeper student understanding of critical concepts in science and increases test scores. See how you can use Vernier sensors, including our new Go Wireless Temp, to support science inquiry in classrooms using iPads. This technology empowers students to collaboratively collect and independently analyze their data.

Inspire Scientific Minds with Technology and Manipulatives **(Gen)**
(Grades 3–12) *153C, BCEC*
Sponsor: Scientific Minds
Kathy Reeves and **Angie Casteel,** Scientific Minds, Orange, Tex.
Teach critical science standards with technology and manipulatives using Scientific Minds' new lab kits for grades 3–8, biology, and chemistry. Lessons support the standards of all states and the *NGSS.* Attendees receive door prizes, a free lab kit, and trial access to the award-winning Science Starters program.

Hands-On Digital in the High School Science Classroom **(Gen)**
(Grades 9–12) *154, BCEC*
Sponsor: Discovery Education
Patti Duncan, Discovery Education, Lakeville, Pa.
Giving students a variety of experiences helps to make the content "stick." Learn how the resources found in the Discovery Education Science Biology, Chemistry, Earth and Space Science, and Physics Techbooks™ make it easier with engaging, interactive digital resources coupled with the all-important hands-on experience.

Life Science and the *NGSS* **(Bio)**
(Grades 6–12) *156A, BCEC*
Sponsor: Ward's Science
Patty Muscatello *(patty.muscatello@vwr.com),* Ward's Science, Rochester, N.Y.
Looking for ways to connect your favorite life science activities to the *Next Generation Science Standards* and crosscutting concepts? We'll show you how with all-new Ward's *NGSS* Activity Kits. In this hands-on workshop, you'll learn how to connect key life science concepts to the *NGSS* with easy-to-use materials and pre-organized activities.

Bring the World of Digital Learning to Your Classroom with WeDo **(Gen)**
(Grades 2–5) *156B, BCEC*
Sponsor: LEGO® Education
Kelly Reddin, LEGO Education, Pittsburg, Kans.
LEGO Education WeDo is a motivational hands-on tool that enhances learning in literacy, math, engineering, and science and demonstrates how digital technology plays an active role in students' everyday lives. Experience how this differentiated and substantial solution stimulates both the teaching and learning process, and can be applied to everyday lessons.

New Advanced Inquiry Labs for AP Chemistry from Flinn Scientific **(Chem)**
(Grades 9–12) *258A, BCEC*
Sponsor: Flinn Scientific, Inc.
Joan Berry *(jberry@flinnsci.com)* and **Mike Marvel** *(mmarvel@flinnsci.com),* Flinn Scientific, Inc., Batavia, Ill.
This interactive hands-on workshop can help you implement the revised laboratory investigations and curriculum framework for AP Chemistry! Join Flinn Scientific as we present two new guided inquiry chemistry experiments that support the integrated learning objectives and applied science practice skills your students will need for success. Pre-lab preparation and preliminary activities for each investigation have been optimized so teachers can effectively guide students and provide maximum opportunities for inquiry. Handouts provided for all activities!

Cool! Can We Do That Again?!?! **(Gen)**
(Grades 4–12) *258B, BCEC*
Sponsor: Educational Innovations, Inc.
Jeff Feidler, Educational Innovations, Inc., Bethel, Conn.
Tired of hearing "Do we have to do that?" from your students? Come check out some of the coolest activities involving color, light, and mirrors. Your students will be asking if they can do that again! Door prizes, freebies, and fun!

2:00–4:00 PM Workshop

PDI **BSCS Pathway Session: Obtaining, Evaluating, and Communicating Information in the Classroom (*NGSS* Practice 8)** **(Gen)**
(General) *203, BCEC*
Jody Bintz *(jbintz@bscs.org)* and **Anne Westbrook,** BSCS, Colorado Springs, Colo.
This session will deepen your understanding of *NGSS* Practice 8: Obtaining, Evaluating, and Communicating Information in the Classroom. Engage in an inquiry-oriented activity that requires you to learn about and use a protocol for student discourse that supports their learning of science content.

2:00–4:00 PM Informal Science Day Share-a-Thon

(Informal Education) *Ballroom West, BCEC*

Organizer: **Candace J. Lutzow-Felling** *(cjl6b@virginia.edu),* The State Arboretum of Virginia, Boyce

Melissa Ballard *(mjballard@afterschoolalliance.org),* Afterschool Alliance, Washington, D.C.
James Bell *(caise@informalscience.org)* and **Kalie Sacco** *(ksacco@astc.org),* Center for Advancement of Informal Science Education, Washington, D.C.
Tara Chudoba *(tchudoba@nyscience.org),* New York Hall of Science, Queens
Anne Pfitzner Gatling *(gatlinga@merrimack.edu),* Merrimack College, North Andover, Mass.
Janice Harvey *(jharvey@gemini.edu),* Gemini Observatory, Hilo, Hawaii
Mia Jackson *(mjackson@davidheil.com),* Foundation for Family Science & Engineering, Portland, Ore.
Debbie Jackson *(d.jackson1@csuohio.edu),* Cleveland State University, Cleveland, Ohio
Rita Karl *(rkarl@tpt.org),* Twin Cities Public Television, St. Paul, Minn.
Sharon King *(sharonk@madscience.org)* and **Lindsay Milner** *(lindsaym@madscience.org),* Mad Science, Montreal, Que., Canada
Brian Kruse *(bkruse@astrosociety.org),* Astronomical Society of the Pacific, San Francisco, Calif.
Karen Maher *(kmaher@fs.fed.us),* USDA Forest Service, Tongass National Forest, Juneau, Alaska
Eric Muller *(emuller@exploratorium.edu),* Exploratorium, San Francisco, Calif.
Jessica Sickler *(jsickler@cosi.org),* Lifelong Learning Group, Columbus, Ohio
Amanda Solarsh *(amandasolarsh@gmail.com)* and **Gina Tesoriero,** Simon Baruch Middle School MS104, Brooklyn, N.Y.
Brad Tanner, Mote Marine Laboratory, Sarasota, Fla.
Mary Ann Wojton *(mwojton@cosi.org),* COSI/Lifelong Learning Group, Columbus, Ohio
Come to the Informal Science Day Share-a-Thon, where informal science educators showcase their programs, resources, and share ideas with the science education community.

2:00–5:00 PM Short Course

STEM in Motion: The Pasta Car Challenge! (SC-14)

(Upper Elementary—Middle Level) *Tremont, Marriott Copley Place*

Ticket Required: $29

SOLD OUT

Donna Taylor *(dtaylor@nps.org),* Norwell Middle School, Whitinsville, Mass.
Kelly Graveson *(kgraveson@douglasps.net),* **Jessica Findlay** *(jfindlay@douglasps.net),* and **Rachel Usher** *(rusher@douglasps.net),* Douglas Middle School, Douglas, Mass.
For description, see Volume 1, page 55.

2:00–5:00 PM Workshop

PDI **Wheelock Pathway Session: Science and Writing: A Research-based Approach That Enhances Learning in Both Domains (Gen)**

(Elementary) *209, BCEC*

Betsy Rupp Fulwiler *(bruppfulwiler@comcast.net),* Writing in Science Partnership, Seattle, Wash.
Through video and mini-lessons, learn research-based strategies for using scaffolding to increase students' achievement, as described in the *NGSS* and *CCSS ELA.*

2:30–4:30 PM Meeting

NMLSTA Board of Directors Meeting

Executive Boardroom, Westin Waterfront

3:00–4:00 PM Presentation

SESSION 1

CESI Session: Encouraging Environmental Stewardship Through an Integrated Science, Social Studies, and Literacy Activity (Env)

(Elementary) *211, BCEC*

Cynthia C.M. Deaton *(cdeaton@g.clemson.edu),* Clemson University, Clemson, S.C.
This integrated science, social studies, and literacy lesson guides students in examining their "backyard" and developing an understanding of environmental issues.

3:00–4:00 PM Exhibitor Workshop

Ecology to Enzymes to Industry (AP Big Ideas 1, 2, 4) (Bio)

(Grades 9–College) *157B, BCEC*

Sponsor: Bio-Rad Laboratories

Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

In this inquiry-based hands-on workshop, learn to use ecological knowledge of the kingdom fungi to find and characterize novel cellobiase enzymes for application in cellulosic biofuel production. The enzyme cellobiase is easy to extract from mushrooms and a colorimetric system for assaying activity can be used to determine how pH, temperature, and concentrations affect the rate of reaction.

3:00–4:30 PM Exhibitor Workshop

Communicating Science Through Lab Notebooking (Bio)

(Grades 9–College) *157A, BCEC*

Sponsor: Bio-Rad Laboratories

Sherri Andrews *(sherri_andrews@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

Maintaining a proper lab notebook is key to communicating processes and findings to build on your results. It's also been the difference in being awarded patents. Find out what the critical elements are to good documentation practice and how to assess student notebooks using a rubric.

3:00–5:00 PM Meetings

Association for Multicultural Science Education (AMSE) Membership Meeting

Seaport Ballroom C, Seaport

International Advisory Board Meeting

Hale, Westin Waterfront

Polar Educators International Open Meeting

Paine, Westin Waterfront

This meeting is open to all—polar and non-polar. Learn what has been accomplished so far and how you can join in now!

3:00–6:00 PM Short Courses

★ **Integrating Outdoor Teaching and Learning into the Boston Public Schools Science Curriculum (SC-15)**

(Elementary) *Boylston, Marriott Copley Place*

Ticket Required: $34

CANCELED

John Sheridan *(jack.sheridan381@gmail.com)* and **Kristin Metz** *(kristinmetz@outlook.com),* Boston Schoolyard Initiative, Boston, Mass.

Dean M. Martin *(dmartin2@bostonpublicschools.org),* **Beverly Nadeau, Angela Palo, Elizabeth Hadly** *(elizabeth.b.ely@gmail.com),* **Sarah Colella** *(sarmarcolella@gmail.com),* and **Jose Rosa** *(jrosa@bostonpublicschools.org),* Boston (Mass.) Public Schools

Holly Rosa *(hollyrosa@gmail.com),* Russell Elementary School, Dorchester, Mass.

Luis J. Arroyo *(larroyo2@bostonpublicschools.org),* Taylor Elementary School, Mattapan, Mass.

Melanie LaForce, CEMSE, The University of Chicago, Ill.

For description, see Volume 1, page 56.

Back It Up: Evidence-based Argumentation (SC-16)

(Grades 4–8) *Simmons, Marriott Copley Place*

Ticket Required: $57

SOLD OUT

April Chancellor *(april.chancellor@msichicago.org),* Museum of Science and Industry, Chicago, Ill.

Susanne Hokkanen *(shokkanen@dist159.com),* Colin Powell Middle School, Matteson, Ill.

For description, see Volume 1, page 56.

3:30–4:30 PM Robert H. Carleton Lecture

Teaching with the Brain in Mind **(Gen)**

(General) *210C, BCEC*

John E. Penick *(penick@ncsu.edu),* Professor and Head Emeritus, North Carolina State University, Raleigh

With increasingly available information from neuroscience and physiology—we, teachers, can now focus more on what causes changes in the brain and brain functioning, rather than just observing behaviors from students or responses to test items. Come learn how stress, exercise, nutrition, sleep, and the environment affect brain function and learning, and how we can combine knowledge of these factors with good teaching practices to produce desired outcomes.

Professor emeritus at North Carolina State University, Raleigh, John E. Penick has been committed to science education for more than four decades. He began his teaching career as a biology and chemistry teacher at Jackson High School, an inner city high school in Miami, Florida, where he also served as science department chairperson. He later taught community college biology, served as science department chairperson in an urban high school, was a professor at three universities, and was vice president of research and development at a private company in Brazil.

Widely published, he has authored or co-authored dozens of books, including Teaching with Purpose: Closing the Research-Practice Gap. *In 2012, NSTA presented him with its most prestigious award—the Robert H. Carleton Award sponsored by the Dow Chemical Company. A former NSTA president in 2003, John has worked on numerous NSTA committees and advisory boards and served as the program and planning chairperson for the NSTA Soviet-American Conference in Moscow in 1991. He has received NSTA's Distinguished Service to Science Education Award and has twice received the association's Gustav Ohaus Award for Innovations in College Science Teaching.*

Crossing the globe, Dr. Penick has been actively involved in education projects, including teaching university faculty in Indonesia to use computer spreadsheet software; attending and evaluating local teacher workshops at multiple sites in Portugal; teaching workshops in numerous foreign universities and for ministries of education; designing and writing a proposal to create a university science education center in Venezuela; and translating science curriculum from Portuguese to English..

3:30–4:30 PM Presentations

SESSION 1

Only Math Can Save the World: Integrating Key Math Skills into Middle Grades Environmental Science **(Env)**

(Middle Level) *157C, BCEC*

Bryan Nichols *(bryanhnichols@gmail.com),* Plant City, Fla.
Roderic Ian Brame *(rodbrame@hotmail.com),* All Saints Academy, West Winter Haven, Fla.

A pair of math and science professors will present tips and activities from their graduate certificate program in middle school STEM integration.

SESSION 2 (two presentations)

(Elementary–Middle Level) *158, BCEC*

Presider: Charri A. Trembley, Kaneland Harter Middle School, Sugar Grove, Ill.

Just a Few New Twists on Old Tricks to Improve Nonfiction Literacy **(Gen)**

Kevin S. Boltz and **Charri A. Trembley** *(charri.trembley@kaneland.org),* Kaneland Harter Middle School, Sugar Grove, Ill.

CRISS stands for Creating Independence through Student-owned Strategies. Join us as we introduce CRISS strategies that can enhance old favorites to improve comprehension of nonfiction literature. We'll share how modified graphic organizers, questioning, and vocabulary strategies worked in our classrooms.

The Nature Classroom: Your Door to Integrating Science and the *Common Core State Standards* **(Gen)**

Ingrid J. Judge *(ingridjudge@yahoo.com),* Pond Cove Elementary School, Cape Elizabeth, Maine

Find out how to use field and classroom work in nature ecology study as a springboard for literacy instruction in a highly engaging unit of study.

SESSION 3

Science Fair on Steroids **(Gen)**

(Elementary–Middle Level) *161, BCEC*

Christina Hwande *(chrishwande@claytonschools.net),* Ralph M. Captain Elementary School, Clayton, Mo.
Brendan Kearney *(brendankearney@claytonschools.net),* Glenridge Elementary School, Clayton, Mo.

Presider: Christina Hwande

Make your science fair a science extravaganza! Learn how to use mentors, incorporate technology, and plan activities that will blow everyone out of the water!

National Earth Science Teachers Association Events at 2014 Boston NSTA Conference

All NESTA sessions are in the *Boston Convention & Exhibition Center, 052A/B* unless otherwise indicated

Friday, April 4

➢ 9:30 – 10:30 am	NESTA Geology Share-a-Thon
➢ 11:00 am – noon	NESTA Climate, Oceans and Atmosphere Share-a-Thon
➢ 12:30 – 1:30 pm	NESTA Earth System Science Share-a-Thon
➢ 2:00 – 3:00 pm	It's Elementary! Effective Approaches for Addressing the Earth Science Next Generation Science Standards in the Elementary Classroom
➢ 2:00 – 3:00 pm	American Geophysical Union Lecture, "*Geosciences – The Nexus of Data Driven Science and Applications", Prof. Suchi Gopal, Boston University (CC 210A/B)*
➢ 3:30 – 4:30 pm	Effective Approaches for Addressing the Next Generation Science Standards in the Earth and Space Science Classroom
➢ 6:30 – 7:00 pm	NESTA Friends of Earth Science Reception (*Boston Museum of Science*)

Saturday, April 5

➢ 8:00 – 9:00 am	NESTA Space Science Share-a-Thon
➢ 9:30 – 10:30 am	Effective Strategies for Sharing Climate Change Science and Energy Consumption Implications in the Classroom
➢ 11:00 am – noon	High-Impact Classroom Earth Science in a STEM World
➢ 12:30 – 1:30 pm	NESTA Advances in Earth and Space Science Lunchtime Lecture, "*The CLEAN Collection – Reviewed Climate And Energy Teaching Resources To Enhance Teaching",* Dr. Tamara Ledley, TERC
➢ 2:00 – 3:00 pm	Using Natural Hazards as a Hook in the Earth and Space Science Classroom
➢ 3:30 – 4:30 pm	NESTA Rock and Mineral Raffle
➢ 5:00 – 6:00 pm	NESTA Annual Membership Meeting

NESTA gratefully acknowledges co-sponsorship of our events by the following organizations:

SESSION 4

Conducting Small-Scale Microgravity Experiments in Your Classroom (Phys)

(General) *162A, BCEC*

Mark R. Malone *(mmalone@uccs.edu),* University of Colorado, Colorado Springs

Conduct microgravity investigations inside your classroom. This presentation focuses on building and using a device that incorporates a USB video camera to observe and analyze small objects in a "weightless" (microgravity) environment.

SESSION 5

Engineering + Science = Music (Phys)

(Middle Level–High School) *205C, BCEC*

Vin Urbanowski *(vurbanowski@aitestamford.org),* Academy of Information Technology and Engineering, Stamford, Conn.

Have your students tune in to class. Lead your students to design, build, and calibrate a real one-string electric guitar, deriving music theory from physics—and playing a jam.

SESSION 6

Mission to Mars: A Technological Collaborative to Inspire the Next Generation (Earth)

(Middle Level/Informal Education) *252A, BCEC*

Leslie M. Sadowski-Fugitt *(leslie.sadowski-fugitt@msichicago.org),* Museum of Science and Industry, Chicago, Ill.

Susan Evens *(susan.evens@heartland.edu),* Heartland Community College, Normal, Ill.

Rebecca Dolmon *(rdolmon@challengerillinois.org),* Challenger Learning Center, Woodstock, Ill.

Learn how the Museum of Science and Industry and its Challenger Learning Center partners developed a successful STEM program, incorporating technology into an informal learning environment.

SESSION 7 (two presentations)

(Elementary/Informal Education) *252B, BCEC*

Using Twin Texts to Engage Learners for Science (Gen)

Denise Dallmer *(dallmerd@nku.edu)* and **Kimberly P. Clayton-Code** *(codek@nku.edu),* Northern Kentucky University, Highland Heights

Children learn best when science content, processes, and literature are integrated to make science relevant. Emphasis will be placed on providing examples of twin text integration for elementary learners.

Thinking, Analyzing, and Speaking Like Scientists (Gen)

Bela F. Luis *(belaluis@shaw.ca),* University of Manitoba, Winnipeg, Canada

As in literacy, scientists read literature before embarking on investigations, they write continuously, and they present their findings for others to read and critique. Research shows that students can attain a higher level of learning if given this same opportunity. Come learn more.

SESSION 8

NSTA Press® Session: Newly Designed Whole Class Inquiry Projects and Assessment in Biology, Chemistry, and Physics (Gen)

(Middle Level–High School) *254A, BCEC*

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

Joan Gallagher-Bolos *(jgallagher-bolos@glenbrook225.org),* Glenbrook North High School, Northbrook, Ill.

By popular demand, we have designed new Whole Class Inquiry projects and assessments in the areas of biology, chemistry, and physics. Come learn about them.

SESSION 9

Students CAN Design and You CAN Enjoy It! Let's Experiment! (Gen)

(Middle Level) *255, BCEC*

Lynn Lauterbach *(lynnlauterbach@gmail.com),* Loveland, Colo.

Simple supplies of Post-it® Notes and a graphic organizer template can help you guide your students to the experimental design level. Handouts and free online support!

SESSION 10

Make Room for STEM by Flipping Your Classroom (Phys)

(Middle Level–College) *257A, BCEC*

Borislaw Bilash, Pascack Valley Regional High School District, Montvale, N.J.

Lecture becomes homework, leaving class time for learning by doing—using the engineering cycle.

SESSION 11

Sharks—The Good, the Bad, and the Toothy (Bio)

(General) *257B, BCEC*

Sharon M. Morrell *(smorrell@njaas.org),* Center for Aquatic Sciences, Camden, N.J.

Dive into how you can use your students' interest in sharks to foster excitement in a variety of science topics.

SESSION 12

Differentiating Science for Elementary Students (Chem)

(Elementary) *259A, BCEC*

Karen Weeks *(karen.weeks@jhu.edu)* and **Laura Saxton** *(lsaxton@jhu.edu),* Johns Hopkins University Center for Talented Youth, Baltimore, Md.

Using lessons from biology, chemistry, and physical science, presenters illustrate how to differentiate elementary science for mixed classes at content, process, and product levels.

SESSION 13

Bridging Engineering and Science (Phys)

(High School) *259B, BCEC*

David J. Salonia *(dsalonia@simsbury.k12.ct.us),* Simsbury High School, Simsbury, Conn.

Join me for an integrated approach to teaching statics using a truss bridge. Find out how to teach a project that applies engineering and science concepts.

SESSION 14

NASA: The Latest Discoveries from the Stratospheric Observatory for Infrared Astronomy (SOFIA) (Earth)

(Middle Level–College) *261, BCEC*

Dana E. Backman, NASA Ames Research Center, Moffett Field, Calif.

Join me for the latest findings from NASA's SOFIA airborne observatory. Free lessons and resources regarding the electromagnetic spectrum and multiwavelength astronomy.

SESSION 15

Teaching Science Content and the *NGSS* with Geotechnologies (Gen)

(Elementary–High School) *Brewster, Renaissance*

Erika S. Klose *(eklose@access.k12.wv.us),* Winfield Middle School, Winfield, W.Va.

Walk away with a series of lessons designed to teach core science knowledge through the use of geotechnologies such as GIS and GPS.

SESSION 16

Engineering and Life Sciences: Interdisciplinary Approaches Enabling Innovation at NASA Johnson Space Center (Gen)

(General) *Mediterranean, Renaissance*

Marguerite A. Sognier, The University of Texas Medical Branch at Galveston

Hear how real-life scientists and engineers work together to generate amazing technologies and innovations…and then work to produce your own technology!

SESSION 17

Science and Special Education—How to Make It Work (Gen)

(Middle Level–High School) *Constitution, Seaport*

Kathleen Brooks, Madison, Conn.

Encounter strategies for working with both special needs students and with special education teachers and paraprofessionals who do not know science.

SESSION 18

Literacy in Science and Science in Reading: A Two-Way Street (Gen)

(Middle Level–High School) *Lighthouse I, Seaport*

Diane Lapp, San Diego State University, San Diego, Calif.

A reading expert will present guidance on building student literacy in complex and discipline-based texts using video examples from an upcoming resource for science teachers.

SESSION 19

Engineering by Design (Gen)

(High School) *Plaza A, Seaport*

Ramiro Gonzalez *(rgonzalez@bostonartsacademy.org)* and **Amanda Hanna** *(ahanna@bostonartsacademy.org),* Boston Arts Academy, Boston, Mass.

Join us for this session that explores the nexus of art and science—STEAM.

SESSION 20

Sliding Classrooms: Lessons Learned Through Two Years of Practice (Gen)

(High School) *Plaza B, Seaport*

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

Come hear about some of the challenges and rewards of implementing sliding classrooms to reach every student.

SESSION 21

BioGraph: A Complex Systems Lens for Learning Introductory Biology (Bio)

(High School–College/Supervision) *Burroughs, Westin Waterfront*

Josh Sheldon *(jsheldon@mit.edu),* Massachusetts Institute of Technology, Cambridge

Melissa Holland *(mholland@medford.k12.ma.us),* Medford High School, Medford, Mass.

Amy Tom, Milton High School, Milton, Mass.

Presider: Josh Sheldon

BioGraph is a research collaboration among MIT, the University of Pennsylvania, and high school teachers to facilitate introductory biology learning through understanding of complex systems supported by computer models.

SESSION 22

Integrating Climate Change and Engineering Across the High School Curricula (Gen)

(High School/Supervision) *Commonwealth B, Westin Waterfront*

Diane Johnson *(diane.johnson@uky.edu)* and **Susan Mayo** *(susan.mayo1961@att.net),* University of Kentucky, Lexington

Discussion centers on the process, lessons learned, and products from a Math and Science Partnership grant that brought teams of teachers from eight high schools together. These teams developed and taught units of study for high school biology, physical science, and Earth science that used climate change as a context and integrated engineering design. Units will be shared!

SESSION 23

Designing and Offering Professional Development Aligned to the New Science Standards (Gen)

(General) *Faneuil, Westin Waterfront*

Joyce Bowen, Massachusetts Dept. of Elementary and Secondary Education, Malden

In this session, I will share Massachusetts' efforts and experience in designing new as well as tailoring existing professional development to help educators implement the new science standards.

SESSION 24

Teachers from the *NGSS* Writing Team: Our Journey and How Teachers Can Build on the *NGSS* Diversity and Equity Team's Work (Gen)

(General) *Grand Ballroom D, Westin Waterfront*

Emily Miller *(emilycatherine329@gmail.com),* Madison (Wis.) Metropolitan School District

Rita Januszyk *(ritajanuszyk@gmail.com),* Gower West Elementary School, Willowbrook, Ill.

Susan Cohen, Cherokee Middle School, Madison, Wis.

While we were writing the *NGSS,* we planned, implemented, and wrote case studies that highlight how diverse groups of students can meet the new science standards. We will describe our learning trajectory while writing the case studies and discuss how these case studies can inform your science instruction and increase access for diverse students.

SESSION 25

Integrated STEM Education: Findings from a National Academies Study (Gen)

(General) *Griffin, Westin Waterfront*

Greg Pearson *(gpearson@nae.edu),* National Academy of Engineering, Washington, D.C.

Presider: David Heil, Foundation for Family Science & Engineering, Portland, Ore.

Explore findings and recommendations of a report—slated for release in the summer of 2013—from the National Academy of Engineering and National Research Council on the topic of integrated K–12 STEM education. This session will review a descriptive framework for integrated STEM education and a research agenda.

SESSION 26 (two presentations)
(General) *Harbor Ballroom II, Westin Waterfront*

STEM Integration for District Leaders: Planning for Districtwide STEM Focus (Gen)

Mia Dubosarsky *(mdubosarsky@wpi.edu),* Worcester Polytechnic Institute, Worcester, Mass.

Emphasis will be placed on the need, structure, and products of a program for school and district leaders working to develop a strategic plan for STEM integration.

It Takes a Village to Raise an Engineer: Involving Local Urban Communities in an Elementary STEM Initiative (Gen)

Katya Denisova *(kdenisova@gmail.com),* Baltimore (Md.) City Public Schools

Amanda Laurier *(alaurier@jhu.edu),* Johns Hopkins University, Baltimore, Md.

Baltimore City Public Schools teamed up with Johns Hopkins University School of Engineering to engage nine elementary school communities in a rigorous STEM in-school and afterschool initiative (grades 3–5). We'll share the results of the first cycle of this NSF-funded project's implementation.

SESSION 27

Notebooking for Meaning (Gen)
(General) *Harbor Ballroom III, Westin Waterfront*

Karen Ziminski *(kziminski@boston.k12.ma.us)* and **Erin A. Hashimoto-Martell** *(ehashimoto@bostonpublicschools.org),* Boston (Mass.) Public Schools

Join us and gain an introduction to a variety of notebooking techniques that can increase student engagement and their love of learning. Students will take pride in their notebooks and, therefore, increase the level of their work.

SESSION 28 (two presentations)
(General) *Lewis, Westin Waterfront*

Using Literature as a Foundation for Teaching Science (Gen)

Pamela G. Christol, Northeastern State University, Broken Arrow, Okla.

Denise McDonald, University of Houston–Clear Lake, Houston, Tex.

A professor/reading specialist and a science education professor will present strategies for correlating and integrating literature into the teaching of science content.

Engage and Motivate Students with Trade Books: Ideas and Techniques from *Picture Perfect Science Lessons* (Gen)

Michelle Tharpe *(mtharpe2@aum.edu),* **Nicholas F. Bourke** *(nbourke@aum.edu),* and **Connie Buskist** *(cbuskist@aum.edu),* Auburn University at Montgomery, Ala.

Explore creative ways to use trade books to enhance your curriculum as we share ideas presented in Ansberry and Morgan's book, *Picture Perfect Science Lessons*.

SESSION 29

Best Practices for University-based Research Collaborations (Gen)
(Middle Level/Supervision) *Quincy, Westin Waterfront*

Tevfik Eski, Kenilworth Science and Technology School, Baton Rouge, La.

Minority middle school students conducted research with university faculty and graduate students, which was published in national scientific journals. Join us as we present best practices for research partnerships.

3:30–4:30 PM Workshops

NESTA Session: Effective Approaches for Addressing the *Next Generation Science Standards* in the Earth and Space Science Classroom (Earth)
(Elementary–High School) *052 A/B, BCEC*

Roberta M. Johnson *(rmjohnsn@gmail.com),* NESTA, Boulder, Colo.

Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.

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

This NESTA hands-on workshop highlights lessons and strategies using *NGSS* crosscutting concepts to unite core ideas and science and engineering practices for the geoscience classroom.

Energy Transformations for Kindergarten (Phys)
(Preschool–Elementary) 159, BCEC
John W. Payne, Mercer University, Lithia Springs, Ga.
Come discover energy transformation demonstrations and experiments appropriate for kindergarten and preK classes.

Conquering the Content: A Physical Science Content Workshop for Elementary Science Teachers (Chem)
(Elementary) 160A, BCEC
Andrea Smith *(andrea.smith@bvsd.org),* Boulder Valley School District, Lafayette, Colo.
Intimidated by physical science or just need a content refresher to improve your physical science instruction? Take part in hands-on physical science activities to identify common teacher misconceptions and expand your ability to accurately teach physical science concepts.

Let's Talk Science: Seeding Argumentation (Bio)
(Elementary–Middle Level) 160B, BCEC
Deena L. Gould *(DNAmartin@cox.net),* Arizona State University, Tempe
How do you begin scientific argumentation in a classroom? A framework for seeding collaborative discourse will be shared around concepts of living and growing.

Weather Through Time = Climate (Earth)
(Elementary) 160C, BCEC
Lynne H. Hehr *(lhehr@uark.edu),* University of Arkansas, Fayetteville
From an elementary perspective, explore weather around the world, make predictions about all kinds of weather happenings, and learn how weather patterns over time create climate.

Chemistry…It's a Gas, Gas, Gas! (Chem)
(High School) 162B, BCEC
Kristi G. Barber *(kristi.barber@amaisd.org)* and **Brittney Mays** *(brittney.mays@amaisd.org),* Caprock High School, Amarillo, Tex.
Discover student-centered activities designed to build comprehension of the gas laws and air pressure. Come experiment with temperature, pressure, and volume using differentiated lessons, demos, and technology. Door prizes and handouts!

Engaging Students in Developing and Using Models: Using Clay Models to Visualize Action Potentials (Bio)
(High School) 205A, BCEC
Natasha D. Capell *(capelln@unity.k12.il.us),* Unity High School, Tolono, Ill.
Barbara Hug *(bhug@illinois.edu),* University of Illinois at Urbana-Champaign, Champaign
Learn how to enhance student understanding of neuron physiology through the cooperative construction of a clay neuron model and recorded simulation of an action potential.

Using Models as Evidence in High School Biology (Bio)
(High School) 205B, BCEC
Matt Silberglitt *(msilber@wested.org),* WestEd, Oakland, Calif.
Discover how to use new models and augmented reality as evidence of structure and function in biology, incorporating science practices into biology instruction.

Fun with Energy Sources: Exciting Student-led Energy Source Activities (Gen)
(Elementary–Middle Level) 207, BCEC
Rebecca Lamb *(rlamb@need.org),* The NEED Project, Manassas, Va.
In this make-and-take workshop, engage in short, fun activities for teaching energy sources and take home an energy carnival game.

Elementary STEM Conservation Projects (Gen)
(Elementary) 212, BCEC
Donna L. Burrus *(dlburrus@fayetteacademy.com),* Fayette Academy, Somerville, Tenn.
Find out how to conduct elementary STEM projects that generate enthusiasm for science for you and your students.

Engineering Tales (Gen)
(Elementary) 213, BCEC
Keri Porter, Los Angeles Unified School District and UCLA Center X, Carson, Calif.
Experience an active *CCSS* approach linking engineering design processes with folk tales and adventure tales.

Exploring Imaging of the Scales of the Universe (Earth)

(Middle Level–High School/Informal Ed.) *251, BCEC*

Jacob Noel-Storr *(jake@cis.rit.edu),* Rochester Institute of Technology, Rochester, N.Y.

Come explore some of the latest Imaging Science data showing the scales of the universe, and learn how to access the content to deploy in your classroom!

NSTA Press® Session: The Authors' Picks! Teaching Science Through Trade Books (Gen)

(Elementary) *253C, BCEC*

Christine Royce *(caroyce@aol.com),* Shippensburg University, Shippensburg, Pa.

Emily Morgan *(emily@pictureperfectscience.com)* and **Karen Ansberry** *(karen@pictureperfectscience.com),* Picture-Perfect Science, LLC, Lebanon, Ohio

Join the authors of *Science & Children's* "Teaching Science Through Trade Books" column as they share their favorite picks for trade book–inspired lessons featured in their book.

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

(Middle Level–College/Supervision) *256, BCEC*

Alden J. Balmer *(al@docfizzix.com),* McNeil High School, Austin, Tex.

Presider: Karen L. Ostlund *(klostlund@utexas.edu),* NSTA Retiring President, and Retired Professor, The University of Texas at Austin

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

Telling a Story with Data and Visuals: Critiquing and Creating Infographics in the Classroom (Gen)

(High School/Informal Ed) *258C, BCEC*

Rob Lamb *(rlamb@psdr3.org),* Pattonville High School, Maryland Heights, Mo.

Alan Newman *(alannewm@gmail.com),* University of Missouri–St. Louis

Using technology to analyze and create infographics can hook your students and increase skills of interpretation when it comes to charts, graphs, and data tables.

POGIL (Process-Oriented Guided Inquiry Learning): The "L" Is Also for Learning Team (Gen)

(High School) *Seaport Ballroom A, Seaport*

Michelle Klein, Carrie Kaestner *(cjkessinger@cps.edu),* and **Urik Halliday** *(urhalliday@cps.edu),* Von Steuben Metropolitan Science Center, Chicago, Ill.

POGIL offers a way to foster a student-centered classroom and incorporate literacy strategies into your science lessons.

What's the Cache? Using Geocaching and EarthCaching to Educate and Excite Student About Natural and Human History (Gen)

(Middle Level–High School) *Seaport Ballroom B, Seaport*

Kathryn Buckley *(keb42@georgetown.edu),* Robert H. Adams Middle School, Holliston, Mass.

Use GPS to locate sites of scientific and historical significance in Boston while familiarizing yourself with how to use these activities with students.

Literacy in Support of Secondary Science Content (Gen)

(General) *Commonwealth Ballroom C, Westin Waterfront*

Adrienne B. Somera *(adrienne.somera@gmail.com),* Northwest Educational Service District 189, Anacortes, Wash.

Don't let content-reading strategies feel like another add-on! Learn to embed them in your existing curriculum to support deep, meaningful science learning for every student.

Survival of the Fittest: Addressing the Needs of Teachers in Their First to Fifth Years (Gen)

(General) *Douglass, Westin Waterfront*

Melissa Soulas, Page Middle School, San Antonio, Tex.

Create survival instructional kits that can help you grow as a teacher leader in science. Be guided in strategies to strengthen your reflective practices while addressing the needs of promoting a positive learning environment in the classroom.

DuPont Presents: Tracking the Spread of Infectious Diseases—Human and Animal (Gen)

(Middle Level–High School) *Otis, Westin Waterfront*

Laura Hasselquist, Chippewa Falls Senior High School, Chippewa Falls, Wis.

Presider: Peggy Vavalla, DuPont, Wilmington, Del.

Help students understand the spread of diseases in a human or animal (livestock) population through using this engaging hands-on lab. Model how health organizations trace a disease while teaching important concepts of disease transmission and exponential growth.

Meeting the *NGSS*—Climate Science and Global Change (Gen)
(Elementary–Middle Level) *Stone, Westin Waterfront*
Louise T. Huffman, Rotonda West, Fla.
Recognize the urgency to teach climate change science, but not sure where it fits the *NGSS?* Need resources? This is the workshop for you!

3:30–4:30 PM Exhibitor Workshop

Active Physics: A Project-based Program Capturing the Essence of the *NGSS* and STEM (Phys)
(Grades 9–College) *156C, BCEC*
Sponsor: It's About Time
Arthur Eisenkraft, 2000–2001 NSTA President, and UMass Boston, Mass.
Learn from the author, Dr. Arthur Eisenkraft, how this proven program implements STEM and the essence of the *Next Generation Science Standards.* Understand the benefits of the Engineering Design Cycle and learn how physicists, teachers, and science educators designed this project-driven course, recognized for the positive impact it has on students of all levels.

3:30–5:00 PM Meeting

SCST Business Meeting
Caspian, Renaissance

3:30–5:00 PM Exhibitor Workshop

Using a STEM Teaching Approach to Investigate Alternative Energy (Env)
(Grades 9–12) *150, BCEC*
Sponsor: Fisher Science Education
Robert Marshall *(marshallr@carnegiesciencecenter.org)*, Carnegie Science Center, Pittsburgh, Pa.
Continuing to explore various renewable energy sources, solar energy proves to be a vast and inexhaustible resource. It represents a clean alternative to fossil fuels, but there are other options to consider like hydrogen. Introduce the options to your students and provide the knowledge they need to consider these alternatives.

3:30–5:30 PM Workshop

PDI **NGSS Pathway Session: Using Engineering Practices to Develop Science Concepts (Gen)**
(General) *206 A/B, BCEC*
Mariel Milano *(mariel.milano@ocps.net),* Orange County Public Schools, Orlando, Fla.
Jaymee Herrington *(jaymee.herrington@gmail.com),* K5 Science Consultant, Washington, D.C.
Join *NGSS* writing team members in exploring how to use the engineering practice to develop science concepts in the classroom. Participants will engage in a hands-on unit of study and leave with ideas perfect for use in mastery of the disciplinary core ideas.

4:00–5:00 PM Meeting

NSTA Recommends Meeting
Independence Boardroom, Westin Waterfront

4:00–5:00 PM Presentation

SESSION 1
CESI Session: Using Web-based Tools to Connect Science, Literacy, and Technology in the Elementary Grades (Gen)
(Elementary) *211, BCEC*
Jeff A. Thomas *(jathomas@usi.edu),* University of Southern Indiana, Evansville
Join me as I present Web 2.0 tools and their connections to science, recent award-winning children's literature selections, and elementary learning.

4:00–5:30 PM Workshop

PDI **AMNH Pathway Session: Using *Common Core State Standards, ELA* and Museum Resources to Construct Science Explanations (Earth)**
(Middle Level–High School) *208, BCEC*
Dora Kravitz *(dkravitz@amnh.org)* and **Rebecca Taylor** *(rtaylor@amnh.org),* American Museum of Natural History, New York, N.Y.
Presider: Cristina A. Trowbridge, American Museum of Natural History, New York, N.Y.
This session explores how writing strategies, graphic organizers, and museum resources can support *CCSS ELA* in writing and science content in Earth science.

4:00–5:30 PM Exhibitor Workshop

Labs That Fit: Making Inquiry Work in Your AP Biology Classroom (Bio)
(Grades 9–12) *102A, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Looking for a seamless transition to the new curriculum? Enrich your students' experience in AP Biology with unique solutions from Carolina. This hands-on workshop introduces you to new resources designed for the revised College Board AP Biology curriculum, and gives you practical ways to introduce inquiry into your classroom.

Carolina Investigations™ for AP Chemistry (Chem)
(Grades 9–12) *102B, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Watch your whole class come alive when you bring inquiry to your classroom with new Carolina chemistry activities. Carolina's new labs help students develop essential chemistry practices, understand core chemistry concepts, and learn chemistry through inquiry per the new curriculum. Experience three different activities in this hands-on workshop. Handouts/giveaways!

Great Explorations in Math and Science for the Next Generation: The Roles of Water in Earth System, Ecosystems, and Human Activity (Gen)
(Grades K–8/Supervision) *103, BCEC*
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Investigate climate change through the evolution of the ocean and atmosphere throughout Earth's history; movement of the atmosphere and ocean through density, air, and water currents; the carbon cycle; and the ocean's relationship to climate and climate change using multiple crosscutting concepts and science and engineering practices.

SPARKscience: Sensor-based Science for High School—Free Sensor Set for Five Attendees! (Gen)
(Grades 9–12) *104A, BCEC*
Sponsor: PASCO scientific
Mike Blasberg, PASCO scientific, Roseville, Calif.
Through an interactive iPad demonstration, you'll experience how SPARKscience engages students in science and engineering practices, affording a deeper understanding of scientific concepts. Participate in investigations to experience real-time data collection with probeware and SPARKvue software. Five lucky attendees will win a 50th Anniversary Sensor Pack—a $600 value!

Chemi-Paloosa and Hands-On Activities That Will Really Get a Reaction (Chem)
(Grades 6–12) *104B, BCEC*
Sponsor: Aldon Corp.
Alex Molinich *(amolinich@aldon-chem.com),* Aldon Corp., Avon, N.Y.
Bring chemistry to life for your students with hands-on activities. The demonstrations are guaranteed to grab your students' attention and enhance their learning experience, all while teaching fundamental science concepts. This workshop includes an overview of Innovating Science's chemistry kits, including sample activities highlighting topics such as hydrogen fuel cell technology, electrochemical remediation of waste water, and others.

Comparing Earth to Other Worlds (Earth)
(Grades 9–12) *104C, BCEC*
Sponsor: LAB-AIDS, Inc.
Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.
What is it about conditions on Earth that makes it especially hospitable for life as we know it? In this activity, your students will read an excerpt from a science fiction story about Mars colonists and use a card-sort procedure to analyze the resources necessary to sustain human population on the "Red Planet." This activity is from *EDC: Earth Science,* a new NSF-supported high school Earth science program from LAB-AIDS that uses an active data-oriented approach.

Using Problem-Based Learning to Up Your *NGSS* Game (Gen)
(Grades K–12) *105, BCEC*
Sponsor: Pearson
Michael Padilla, 2005–2006 NSTA President, and Clemson University, Clemson, S.C.
One of the biggest shifts involved with the implementation of the *NGSS* is the movement to incorporate more scenario-based and Problem-Based Learning. To help prepare students for their next steps in school and beyond, students need to be doing science and seeing how it fits into their daily lives. Join Pearson author Michael Padilla as he brings Problem-Based Learning into the science classroom to help prepare students for science and technology careers of the future.

Data Collection with High-Altitude Balloons (Gen)

(Grades 6–College) *106, BCEC*

Sponsor: SparkFun Electronics

Jeff Branson *(jeff.branson@sparkfun.com),* SparkFun Electronics, Boulder, Colo.

Design and build a high-altitude balloon with SparkFun Electronics. This engaging project introduces tools for real-world science and data collection. We will build a weather balloon, add instrumentation, and launch it (tethered, for safety, of course) in Boston to characterize temperature, humidity, and pressure as a function of height.

Using Cancer to Teach Cell Biology (Bio)

(Grades 9–College) *107A, BCEC*

Sponsor: Howard Hughes Medical Institute

Ann Brokaw, Rocky River High School, Rocky River, Ohio

Robert Cooper, Pennsbury High School, Levittown, Pa.

Use the latest findings in cancer research to teach core concepts in cell biology and genetics with HHMI's free classroom resources. Cancer is a great hook to gain students' interest in genetic mutations and gene regulation, the cell cycle, and cell signaling pathways. The resources presented can be used in a blended or flipped classroom. Free DVDs and other materials will be distributed.

Engineering Design *vs.* Science Practices: A Closer Look at *NGSS* Practices (Gen)

(Grades 6–9) *107B, BCEC*

Sponsor: eCYBERMISSION

Sue Whitsett, eCYBERMISSION Outreach Manager, NSTA, Arlington, Va.

Many teachers of science feel overwhelmed by the new *Next Generation Science Standards* and their emphasis on engineering design. But there's no reason to be afraid! Many science classrooms and curricula already include engineering design ideas and implementing new ones can be easy and fun. We will discuss the differences between science practices and engineering design practices as they are laid out in the *NGSS* and we will give you a chance to work hands on with some demos that you can take back to your middle school science class. In addition, we will provide you with information about the free STEM competition eCYBERMISSION, and explain how it can help you integrate engineering design into your classroom.

Introduction to Plant Cloning and Growth Regulation (Bio)

(Grades 9–College) *107C, BCEC*

Sponsor: AquaPhoenix Education (Kemtec)

Roxane Ohl *(rohl@aquaphoenixsci.com),* AquaPhoenix Education (Kemtec), Hanover, Pa.

Discover how to effectively, economically, and confidently teach plant biotechnology topics—such as plant cloning, growth regulation, and plant cancer—in your high school or college classroom without any special equipment by using Kemtec Plant Science kits. You'll learn to make your own media and disinfect and culture plant leaves, axillary buds, and seeds in a hands-on setting using sterile technique.

Nanotechnology: Hands-On Activities for All Disciplines (Gen)

(Grades 9–College) *108, BCEC*

Sponsor: Nano-Link: Center for Nanotechnology Education

Deb Newberry *(dmnewberry2001@yahoo.com)* and **Billie Copley,** Dakota Country Technical College, Rosemount, Minn.

Taking advantage of the multidisciplinary nature and the interest by students in nanotechnology, Nano-Link has created a set of more than 20 hands-on activities. Not only do these activities include nanoscience concepts, they also include concepts from traditional science as well as biotech, photonics, and material science. This hands-on workshop will teach you how to use these activities in myriad ways and then register to get materials for your classroom at no charge.

The ABCDs of Modeling: An *NGSS* Authentic Practice of Science (Bio)

(Grades 6–College) *109B, BCEC*

Sponsor: 3D Molecular Designs

Shannon Colton *(colton@msoe.edu)* and **Gina Vogt** *(vogt@msoe.edu),* Milwaukee School of Engineering, Milwaukee, Wis.

The *NGSS* emphasize core science and engineering practices, including the practice of modeling. Your students can engage in the Art of Analysis, Build a Beast, Create a Catalyst, and the Data Dilemma using hands-on modeling activities. Observing, journaling, interpreting, testing, and revising models are just a few of the skills they will practice.

The Grid **(Env)**
(Grades 4–12) *151A, BCEC*
Sponsor: KidWind Project
Asia M. Ward *(asia@kidwind.org),* KidWind Project, St. Paul, Minn.
Work together to create a mini town that uses the power from a wind turbine to light up. Understand how to make wind turbine blades, adjusting pitch, and testing variables in order to make an efficient wind turbine.

What's the "Big Idea" in AP Biology? **(Bio)**
(Grades 7–12) *151B, BCEC*
Sponsor: Frey Scientific/School Specialty Science
Ken Rainis, Fairport, N.Y.
Explore a series of innovative, hands-on, inquiry-based lab kits designed to cover the revised AP Biology laboratory framework. Participants will be exposed to various laboratory experiences and inquiry ideas to assist students through a new set of standards for AP Biology.

Addressing Engineering Practices and Design Standards in the Middle School **(Env)**
(Grades 5–8) *152, BCEC*
Sponsor: Delta Education/School Specialty Science–FOSS
Jessica Penchos and **Virginia Reid,** The Lawrence Hall of Science, University of California, Berkeley
Explore how FOSS Middle School supports the NRC *Framework*'s engineering practices and the *NGSS* engineering design standards while engaging in hands-on activities from the newly revised FOSS Force and Motion Course. Design an air trolley to solve a problem, and take home materials and strategies to support engineering in your classroom.

The Evolution of the Animal Kingdom on Planet Earth **(Bio)**
(Grades 5–10) *153C, BCEC*
Sponsor: Shape of Life
Nancy Burnett, Shape of Life, Soquel, Calif.
Learn from the founder of the Monterey Bay Aquarium sharing one of the greatest stories every told on planet Earth: the evolution of the animal kingdom. Join Nancy Burnett as she shares her experience and *Shape of Life* short videos derived from the popular PBS series. These videos that support the *CCSS* and *NGSS* are offered to teachers for free. Hear from teacher leaders how *Shape of Life* classroom media captures students' imagination with its innovative depiction of a delicate and tenacious evolution. Visit *shapeoflife.org* for more information.

Celebrate Discovery Education's Newest Life Science Program **(Gen)**
(Grades 6–8) *154, BCEC*
Sponsor: Discovery Education
Kyle Schutt, Discovery Education, Silver Spring, Md.
Ann LaBrode, Hopedale Junior Senior High School, Hopedale, Mass.
Join us in celebrating the new life science program *From the Ground Up: The Science of Soil*. During this reception, we will share our latest FREE resources and you'll have the opportunity to hear how local teacher Ann LaBrode has started integrating new, engaging, standards-based life science modules into her middle school curriculum. Discover ways to utilize these interactive whiteboard resources and valuable digital tools to benefit your own classroom instruction. Nutrients for Life modules address soil properties, plant and soil interactions, environmental issues related to agriculture, and the role agriculture plays in feeding the world's ever-growing population. We'll have refreshments, prizes, and a lot of fun, so register early at *dlc.com/NSTAlaunchparty.*

Ward's Chemistry In-the-Bag Activities and the *NGSS* **(Chem)**
(Grades 6–12) *156A, BCEC*
Sponsor: Ward's Science
Liz Hoffman *(lisabeth.hoffman@vwr.com),* Ward's Science, Rochester, N.Y.
Fun, hands on, and mess free—Ward's Chemistry In-the-Bag activities are the ideal way to kick-start a new chemistry topic, or to reinforce key concepts at the end of a unit. Experience these Ward's Science exclusive activities in action and learn how they align to the *Next Generation Science Standards.*

MINDSTORMS® EV3 Robotics in the Middle School Classroom: Space Activity **(Earth)**
(Grades 6–8) *156B, BCEC*
Sponsor: LEGO® Education
William J. Church, Profile High School, Bethlehem, N.H.
Mission: Mars! Enable instant success with STEM through robotics—blast off with the new LEGO MINDSTORMS Education EV3 Space Challenge Set and Activity Pack! Get your hands on the new mission models and explore how these 30+ hours of classroom lessons can set your students up for STEM learning.

The Private Eye® Way to Magnify Minds! Hands-On Science, Writing, and Art to Fire Up STEM (Gen)
(General) *258B, BCEC*
Sponsor: Educational Innovations, Inc.
Kerry Ruef and **David Melody,** The Private Eye Project, Lyle, Wash.
Dandelions! Crickets! Eyeballs! Use a jeweler's loupe, everyday objects, simple questions, and thinking by analogy to go REALLY close up—and develop the essential skills of scientist, writer, and artist in all your students. Power up thinking by analogy—the core of cognition, creativity, and critical thinking—as students write, draw, and theorize in this acclaimed inquiry program. Start on Monday, use all year. Free loupes, fieldwork-in-a-bag, and lesson plans.

4:00–6:00 PM Presentation

SESSION 1
NSTA/NSELA Leadership Standards Forum: *NGSS:* Using Standards as Leverage to Build Science and Language Literacy (Gen)
(General) *Grand Ballroom A, Westin Waterfront*
Darlene Ryan, Glenwood Elementary School, Chapel Hill, N.C.
Bill Badders *(baddersb@roadrunner.com),* NSTA President, and Retired Director, Cleveland (Ohio) Metropolitan School District
Jo Anne Vasquez *(jvasquez@helios.org),* 1996–1997 NSTA President, and Helios Education Foundation, Phoenix, Ariz.
P. Sean Smith *(ssmith62@horizon-research.com),* Horizon Research, Inc., Chapel Hill, N.C.
Join other science leaders and administrators to hear the results of the 2012 National Survey of Science and Mathematics Education (Horizon Research). Learn more about our current reality of instructional minutes, instructional practices, teacher preparedness, teacher beliefs, etc. We'll have opportunities to dialog with colleagues, ask questions of the panel, and plan for next steps.

5:00–5:30 PM Presentations

SESSION 2
Students Teaching Students: An After-School Program to Engage Elementary School Kids in Active Science Discovery (Chem)
(Elementary–High School) *254B, BCEC*
Sohail Nizam *(sohailnizam14@gmail.com),* **Zoe C. Ravina** *(ravina.zoe@paideiaschool.org),* and **Connor A. Machen,** The Paideia School, Atlanta, Ga.
Walk away with a blueprint of a high school student-led program to engage after-school elementary and junior high students in active scientific learning and discovery.

SESSION 3
Supporting Students in Optimizing Engineering Design Solutions with Modeling and Mathematics (Bio)
(Elementary–Middle Level) *259B, BCEC*
David Crismond *(dcrismond@ccny.cuny.edu)* and **Laura Gellert** *(lgellert@ccny.cuny.edu),* City College of New York, N.Y.
Grades 4–6 students design models of an "energy tree" that will optimize its energy production through photosynthesis. Connections to *NGSS* engineering design and *CCSS Mathematics* are emphasized in this developmental comparison of how students use ratio-based reasoning as they optimize their trees' performances.

5:00–5:45 PM Reception

Shell Reception
(By Invitation Only) *Atlantic 1, Renaissance*

5:00–6:00 PM Presentations

SESSION 1

Building Scientific Understanding Through the Visual Arts (Gen)

(Elementary–Middle Level) *158, BCEC*

Carole L. Ware *(clware@cbe.ab.ca),* **Chelsea R. Baxter, Erick E. Noriega** *(eenoriega@cbe.ab.ca),* and **Elaine McCrady** *(kemccrady@cbe.ab.ca),* Langevin School, Calgary, Alta., Canada

The essence of science and art is discovery. This session will showcase how an arts-based integration can help students comprehend scientific theories and improve their critical-thinking skills while fostering creativity.

SESSION 2

Bring the Magic of Space to Your Classroom! (Gen)

(Elementary–Middle Level) *161, BCEC*

Diane Matthews, Center for the Advancement of Science in Space, Melbourne, Fla.

Learn how you can conduct experiments on the International Space Station. Find out about ground-based and other STEM activities that engage students in real-world activities. Discuss how to best use and integrate this newest resource in the classroom.

SESSION 3

Sliding Classrooms (Chem)

(High School) *162A, BCEC*

Maria G. Thurmond *(maria_thurmond@gwinnett.k12.ga.us)* and **Beth Feustel** *(beth_feustel@gwinnett.k12.ga.us),* Peachtree Ridge High School, Suwanee, Ga.

An entire chemistry department used large-scale differentiated instruction based on continued assessment to meet the needs of all students (Gifted, ESOL, general education, special education, and RTI students). As a result, success for all was significantly increased.

SESSION 4

A Demo a Week Makes Science Class the Peak (Chem)

(Elementary–High School) *162B, BCEC*

Vinay Dulip *(vdulip@yahoo.com),* **Julian Abrego** *(julian.abrego@ymail.com),* **Jesus Baca, Victoria Cantu, Joseph Fryer, Blaze Kinch, Edward Macias,** and **Shivam Parbhu,** Foy H. Moody High School, Corpus Christi, Tex.

Join us as we perform about 30 simple demonstrations with materials easily obtained from local stores. These demos will excite students' interest and challenge them to do higher level thinking. The demos include slime, bubbles, balloons, invisible glue, sinkers, floaters, color changes, and density. Sources for materials will be cited as well as how to get the maximum learning benefits from these demos. Handouts!

SESSION 5

Climate Change for Dummies (Env)

(Elementary–Middle Level) *252A, BCEC*

Stephanie Selznick *(sselznick71@gmail.com),* Curley K–8 School, Jamaica Plain, Mass.

See how we teach climate change to grades 4–8. Come learn something new as we share lots of simple ideas and handouts about climate change. Door prizes!

SESSION 6

Enhancing Scientific Inquiry with the iPad (Gen)

(Elementary) *252B, BCEC*

Amber L. Muscarello *(alm12@rice.edu),* Rice University, Houston, Tex.

Experience the power of allowing students the freedom to design, implement, and film their own scientific investigations. See student-made projects and receive lesson plans.

SESSION 7

NSTA Press® Session: Five E(z) Elementary Steps to Next Generation Science Teaching (Gen)

(Elementary) *254A, BCEC*

Thomas P. O'Brien *(tobrien@binghamton.edu),* Binghamton University, Binghamton, N.Y.

William Banko *(wb@phaco.com),* Knowing Science LLC, Armonk, N.Y.

Experience an engaging 5E cycle (Metric Measurement, Models, and Moon Matters) that also explores the analogy between the *NGSS,* the work of scientists, and K–5 teachers.

SESSION 8

Society's Grand Challenges for Engineering in the Science Classroom (Gen)

(Middle Level) *255, BCEC*

Amy Wendt *(wendt@engr.wisc.edu),* University of Wisconsin, Madison

Amy Schiebel *(aschiebel@edgewood.edu),* Edgewood College, Madison, Wis.

Learning activities inspired by "Grand Challenges for Engineering" themes make authentic connections from core math and science concepts to engineering solutions for societal needs.

SESSION 9

Making Sense of Science: A System for Systems Thinking (Bio)

(General) *257B, BCEC*

Cailean Cooke, Kirsten Daehler *(kdaehle@wested.org),* and **Staceylyn Machi** *(smachi@wested.org),* WestEd, Redwood City, Calif.

Discover how to define systems, a crosscutting concept in the *NGSS.* Explore systems at different scales by looking at inputs/outputs of matter and energy.

SESSION 10

★ **Developing Teachers into Master Educators and Leaders: National Board Certification (Gen)**

(General) *260, BCEC*

Lisa J. Swenson *(lisaswenson@newmanschool.org),* Isidore Newman School, New Orleans, La.

Hear from a National Board–certified teacher on how and why teachers should go through the National Board certification process, and how it can benefit them personally and professionally.

SESSION 11

Up, Up, and Away with Weather Balloons (Earth)

(Middle Level–High School) *261, BCEC*

Nathan L. Shotwell *(nshotwell@henrico.k12.va.us),* Holman Middle School, Glen Allen, Va.

See how eighth-graders launched a weather balloon 20 miles into the atmosphere and successfully recovered it. We'll discuss how you can replicate the experience with your students.

SESSION 12

How a Title 1 Middle School Became a Statewide Leader in STEM Collaborations (Gen)

(Middle Level) *Mediterranean, Renaissance*

Tevfik Eski, Kenilworth Science and Technology School, Baton Rouge, La.

Through area and regional competitions, events, and establishment of a statewide network, a Title 1 middle school became a leader in STEM collaborations.

SESSION 13

Mercury Deposition in New England: High School Students Get Their Feet Wet for Citizen Science (Gen)

(High School/Informal Ed) *Plaza A, Seaport*

Emily Sherman, Longview School, Deerfield, N.H.

Sarah Nelson *(sarah.j.nelson@maine.edu),* The University of Maine, Orono

Students and research scientists have been studying mercury deposition across watersheds using dragonflies as bioindicators. View student research findings and learn about the scientist-teacher collaboration.

SESSION 14

New Teacher Boot Camp (Gen)

(Middle Level–High School) *Plaza B, Seaport*

Ellen A. Reys *(reyse@parkhill.k12.mo.us),* Park Hill High School, Kansas City, Mo.

Get tricks for navigating your first years as a science teacher. I'll share science and life lessons as well as resources and labs I discovered during my beginning years of teaching.

SESSION 15

Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success (Gen)

(General) *Commonwealth Ballroom B, Westin Waterfront*

Donna L. Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Shawnee Mission, Kans.

Gain an overview of the components of differentiation in the K–6 science classroom, and learn ways to differentiate effectively maximizing student participation and learning. Handouts!

SESSION 16

Problem-Based Learning: A Perfect Fit for *NGSS* (Gen)

(General) *Faneuil, Westin Waterfront*

Alicia Bitler *(alicia_m_bitler@mcpsmd.org),* Gaithersburg Middle School, Gaithersburg, Md.

Let's examine how Problem-Based Learning can perfectly align with the visions of the *Next Generation Science Standards.*

SESSION 17

Changing the Face of Science: Inspiring Future STEM Professionals (Gen)

(General) *Griffin, Westin Waterfront*

Jessica L. Parsons *(jessica.parsons@woodward.edu),* Woodward Academy, College Park, Ga.

Adopt or adapt this STEM biography project to affirm diverse learners, build community, and ignite curiosity! Enduring digital citizenship and inquiry skills connect students to global STEM professionals.

5:00–6:00 PM Workshops

Introducing and Assessing Argumentation in Your Science Classroom (Earth)
(Middle Level) 157C, BCEC
Lauren Brodsky *(brodsky@berkeley.edu)* and **Megan Goss,** The Lawrence Hall of Science, University of California, Berkeley
Learn several effective approaches for integrating scientific argumentation into your classroom through reading, writing, and talking, as well as gain an introduction to a formative assessment system designed to promote progressively deeper argumentation skills and opportunities for students in the middle school classroom.

Extreme Makeover, Science Edition (Phys)
(Elementary–Middle Level) 159, BCEC
Deanna Lankford *(lankfordd@missouri.edu),* **Matt Martin, Victoria Keuth, Meghan Boyle,** and **Christina Smith,** University of Missouri, Columbia
Come rekindle the fires of science teaching and learning as we "make over" familiar activities to focus on inquiry, the *NGSS,* and stimulating student curiosity.

NASA: Inquiry Activities for Learning About Light and the EM Spectrum and Multiwavelength Astronomy (Earth)
(Middle Level–College) 160A, BCEC
Pamela K. Harman *(pharman@seti.org),* SETI Institute, Mountain View, Calif.
Experience inquiry activities for learning about visible and invisible light using simple classroom technologies. Take home standards-based lessons, colorful posters, and spectroscopic glasses.

NASA's "Reading, Writing & Rings": Using Saturn to Teach Science and Language Arts (Earth)
(Elementary) 160C, BCEC
Rachel Zimmerman Brachman *(rachel.zimmerman-brachman@jpl.nasa.gov),* NASA Jet Propulsion Laboratory, Pasadena, Calif.
Explore NASA's science and language arts curriculum that uses the Cassini mission to Saturn as inspiration for enhancing students' interest in reading, writing, and science.

BioBuilder: Ready-to-Use Classroom and Lab Curricula That Integrate Engineering into Biology (Bio)
(Middle Level–College) 205B, BCEC
Natalie Kuldell *(nkuldell@mit.edu),* MIT, Cambridge, Mass.
Rebekah Ravgiala *(rav3@comcast.net),* Tyngsborough High School, Tyngsborough, Mass.
Aaron Mathieu *(amathieu@abschools.org),* Acton-Boxborough Regional High School, Acton, Mass.
Jo-Anne Purdy *(purdyj@westboroughk12.org),* Westborough High School, Westborough, Mass.
Thomas Martinez *(thomas_martinez@glenbard.org),* Glenbard East High School, Lombard, Ill.
Anne Maxwell, Mount Saint Mary Academy, Watchung, N.J.
Orla Berry *(oberry@medfield.mec.edu),* Medfield High School, Medfield, Mass.
Lisa Woodruff *(lwoodruff@sau21.org),* Lincoln Akerman School, Hampton Falls, N.H.
Presider: Natalie Kuldell
BioBuilder connects students to current research questions and asks them to use synthetic biology to solve real-world problems through engineering, design, and biotechnology.

Hot Spot: Student Explorations of Urban Heat (Earth)
(Middle Level–High School) 205C, BCEC
Lisa Gardiner *(lisagard@ucar.edu),* Spark: UCAR Science Education, Boulder, Colo.
Randy Russell *(rrussell@ucar.edu),* NCAR, Boulder, Colo.
Join us for hands-on inquiry activities that get students exploring the science of urban heat and align with the *NGSS.*

MacGyver Science (Gen)
(Preschool–Middle Level) 207, BCEC
Linda L. Smith, NASA EPO, Pittsgrove, N.J.
Find out how discrepant events lead to science discovery in physics, Earth, and space science. Walk away with tips on classroom management, assessment, and incorporating writing into these dynamic activities.

Thinking Lab: 1 Science Teacher, 1 Art Teacher, 1 Classroom **(Env)**
(Elementary) *212, BCEC*
Shannon R. Merenstein and **Chelsea Young** *(chelsea.young@environmentalcharterschool.org),* Environmental Charter School, Pittsburgh, Pa.
At our K–3 Thinking Lab at the Environmental Charter School, we help students build connections between art, science, and design while fostering collaboration and creativity. Come find out how we do it!

Integrating the Performing Arts with Elementary Science **(Gen)**
(Preschool–Elementary) *213, BCEC*
Dona Packer *(dspacker@memphis.edu),* The University of Memphis, Tenn.
Claudia Nisbett *(cnisbett@belhaven.edu),* Belhaven University, Jackson, Miss.
Join us as we examine fiction/nonfiction books supporting science concepts. Learn songs, movements, and skits reinforcing the concepts plus receive a planning form to design new activities.

STEM and Physical Science: A Perfect Match **(Phys)**
(High School) *251, BCEC*
Tami Lunsford *(tami.lunsford@ncs.k12.de.us),* Newark Charter Junior/Senior High School, Newark, Del.
Go beyond building wooden bridges. Join me for examples of how an engineering teacher and a physical science teacher worked together to build robotic arms and more.

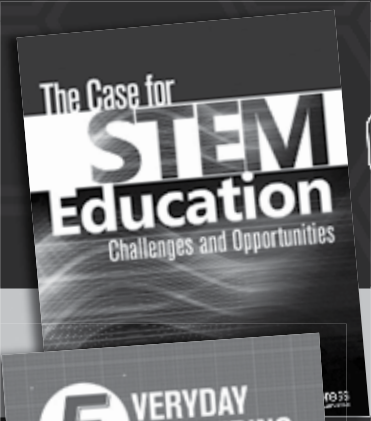
NSTA Press® Session: Argumentation in the Science Classroom **(Gen)**
(General) *253C, BCEC*
Sharon Schleigh *(ssschleig@purdue.edu; schleighs@yahoo.com),* Purdue University Calumet, Hammond, Ind.
Learn about and experience models that effectively embed argumentation in science instruction. Join us for a review of activities from the newest NSTA book on argumentation for science teachers and the research that supports it.

The Perfect Package: Tying Together STEM Education and Community-based Service Learning **(Gen)**
(Informal Education) *256, BCEC*
Mindy L. Hart *(mindy.l.hart@gmail.com)* and **Jean Trusedell** *(jtrusedell@msddecatur.k12.in.us),* The EPICS High Program at Purdue, West Lafayette, Ind.
Many schools engage in community service or service learning, but rarely are these connected to engineering or science curricula. Find out how in this engaging workshop.

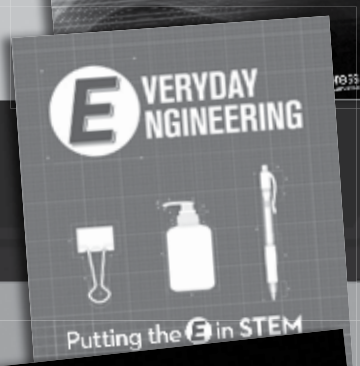
Creating Stop-Motion Videos to Illustrate Learning of Cell Processes **(Bio)**
(High School–College) *258C, BCEC*
Cynthia C.M. Deaton *(cdeaton@g.clemson.edu),* Clemson University, Clemson, S.C.
Benjamin E. Deaton *(bdeaton@andersonuniversity.edu)* and **Diana Ivankovic** *(divankovic@andersonuniversity.edu),* Anderson University, Anderson, S.C.
Presider: Diana Ivankovic
We will discuss and guide participants on how to implement stop-motion assignments to support students' illustration of biology concepts, such as cell processes.

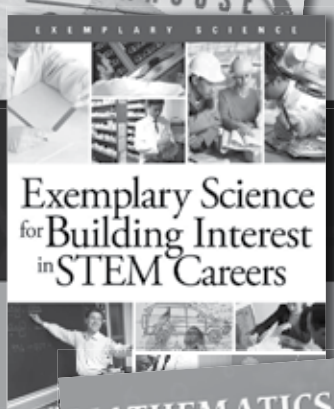
Butterfly Gardening Using Native Plants **(Env)**
(General) *259A, BCEC*
Nancy Sale *(nancysale@dadeschools.net),* Lillie C. Evans K–8 Center, Miami, Fla.
Presider: Peggy Ashbrook, Preschool Science Teacher, Alexandria, Va.
Butterfly Bonanza provides a roadmap to success for implementing a native butterfly habitat. Take home a starter kit that will enable you to immediately set up a habitat at your school. In addition, there will be door prizes and a DVD shared.

IT'S ALL ABOUT STEM

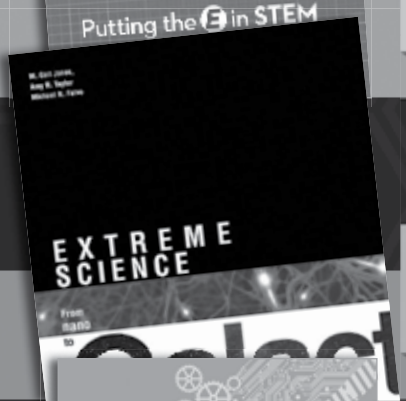


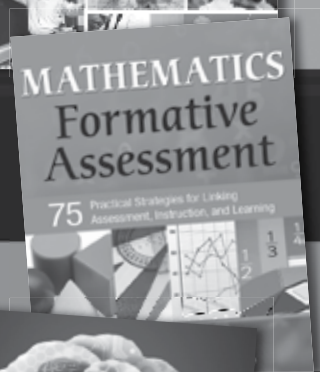
Looking for exciting STEM design challenges and activities to engage students?





Hoping to steer students toward STEM-related career fields?





Get ideas, inspiration, and much more from these books in NSTA's STEM collection.

To order or learn more, visit

www.nsta.org/store

NSTA National Science Teachers Association

Soils—More Than the Dirt Under Your Feet (Gen)
(Middle Level–High School) Seaport Ballroom A, Seaport
Emily Fuger *(efuger@soils.org),* Soil Science Society of America, Madison, Wis.
Margaret A. Holzer *(mholzer@monmouth.com),* Chatham High School, Chatham, N.J.
Julia Lieberman *(jalieberman@gmail.com),* South Middle School, Morgantown, W.Va.
Soil science is the best-kept secret to meeting Earth science, chemistry, and biology standards. In this active workshop, we will reveal this deep secret.

Supporting Literacy in Science Through "Paired Passage Prompts" (Gen)
(Middle Level) Seaport Ballroom B, Seaport
Gina Tesoriero and **Amanda Solarsh** *(asolarsh@schools.nyc.gov),* Simon Baruch Middle School MS104, Brooklyn, N.Y.
Learn strategies that support students' synthesis of nonfiction texts through a reading and writing framework that leads to deeper understanding and communication of science content.

CSSS Session: Simulations for Assessments That Integrate Practices, Core Ideas, and Crosscutting Concepts (Gen)
(Middle Level) Commonwealth Ballroom A, Westin Waterfront
Matt Silberglitt *(msilber@wested.org),* WestEd, Oakland, Calif.
See examples of simulation-based, online formative and summative science assessments that integrate the dimensions of the *NGSS.* Bring your own laptop to try the simulations.

Building Visual Literacy by Integrating Science and Math (Gen)
(Elementary–High School) Commonwealth C, Westin Waterfront
Jeff Lukens *(jeffrey.lukens@k12.sd.us),* Roosevelt High School, Sioux Falls, S.Dak.
Evaluating graphical representations of data is an essential skill for the science student. In this workshop, we'll collect data, graph it, and evaluate it.

Using NASA Real-World Engineering to Reinforce Science (Gen)
(General) Douglass, Westin Waterfront
Becky Jaramillo *(rebecca.jaramillo@nianet.org),* National Institute of Aerospace, Hampton, Va.
Use a STEM notebook and NASA missions to show students real-world relevance for classroom science.

5:00–7:00 PM Meeting/Social

APAST Business Meeting and Social
(By Invitation Only) Flagship A, Seaport
This annual Business Meeting and Social for the Association of Presidential Awardees in Science Teaching is open to all members of APAST. Visit *apast.org* for details.

5:00–7:00 PM Reception

NSTA Learning Center Reception
(By Invitation Only) Harbor Ballroom I, Westin Waterfront

5:00–7:00 PM Exhibitor Workshop

PASCO's 12th Annual Just Physics Evening Event (Phys)
(Grades K–12) 210 A/B, BCEC
Sponsor: PASCO scientific
David Maiullo, Rutgers University, Piscataway, N.J.
We invite NSTA attendees to join us for a special night to celebrate physics! This is our 12th annual Just Physics Event, and this year we're celebrating PASCO's 50th year of serving the science education community. Join us for a night of food, fun, and physics. The first 400 attendees will receive a free T-shirt and boxed lunch to enjoy during the exciting demonstration!

5:30–7:30 PM Reception

NSTA Student Chapter and Student Members Reception

Atlantic 2/3, Renaissance

No Ticket Required; open to all preservice teachers and those who work with them.

If your institution has an NSTA Student Chapter, bring examples of the work of your chapter, best practices, and stories to share with students at institutions that don't yet have an NSTA Student Chapter. If your school does not yet have an NSTA Student Chapter, come hear your future colleagues' best practices and learn about starting and running a successful chapter at your school. Refreshments and hors d'oeuvres will be served as you network with your peers.

6:15–8:45 PM NSTA Teacher Awards Gala

(Ticket Required: $80) **M-5** *Pacific A–E, Renaissance*

Hosted by Ira Flatow, 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. A limited number of tickets are available for this social event.

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Thursday.

6:30–7:00 PM Reception

NESTA Friends of Earth Science Reception

Off-site (Museum of Science, Boston)

Join us for a nice Earth and space science networking opportunity. Visit with old friends, make new ones! Awards, appetizers, and liquid refreshments, too! Visit *www.nestanet.org* for more information.

7:00–9:00 PM Social

SCST Dessert Social and Poster Session

Pacific F–H, Renaissance

9:00 PM–12 Midnight Mixer

President's Mixer

Atlantic Ballroom, Renaissance

DJ and Cash Bar

A Festival of Engineering, Technology, and Science Treats as Related to STEM, the NRC *Framework*, and the *NGSS*, Part 2

6:00 PM–12 Midnight • Caspian, Renaissance

Mitchell E. Batoff *(mbatoff@aol.com),* **Professor Emeritus, New Jersey City University, Jersey City**
Gordon D. Clark, Retired Educator, Manalapan, N.J.

This three-part program features cinematic jewels, electrifying teachers, and the creative use of video technology to inform, inspire, motivate, entertain, and provoke thought. The screenings will be interspersed with commentary, discussion, and some live demonstrations. There will be humor, wonder, and perplexity mixed with a lot of information on a wide range of topics. Pick up ideas and content that will broaden your knowledge and that you can use in your teaching. The audience will help select from this extensive and enticing menu of course excerpts:

The inspiring teaching of **Kay Toliver** in New York City's East Harlem Tech/P.S.72 • **Bill Nye** on Inventions • **Bill Hammack's** *Eight Amazing Engineering Stories* • **Richard Feynman** on *Tiny Machines* • Twin Views of the Tacoma Narrows Bridge Collapse • **Steve Spangler's** *Energy and Clarity* • **Philip Morrison** on *From Atoms to Asteroids to SETI* • **Alex Filippenko** on *The Search for Extraterrestrials*...and the role of engineering in this quest • *The Language and Grammar of Science and Engineering* • **Bassam Shakhashiri** on three dazzling chemistry demonstrations • **Paul Hewitt's** enticing physics demos • *The Bolero (Academy Award, 1973)* • **Michael DiSpezio** on *STEM Challenges for the Classroom* • Evidence from *The Search for Solutions*

Dozens of door prizes directly related to this session will be raffled off throughout the entire evening right up to 12 Midnight. Come and go, stay as long as you wish. Bring your dinner. Also, pick up a comprehensive Resource Guide relevant to the three Special Evening Sessions.

Stephen Ressler on *Understanding the World's Greatest Structures* • **Don Herbert (Mr. Wizard),** introduction to a thought-provoking hands-on activity • *The Elements Video Project* • **David P. Billington**'s popular Princeton course, "*Engineering in the Modern World*" • **Lennart Nilsson** shares the state-of-the-art technology behind films like *The Miracle of Life* • *Nineteen Types of Engineer* • Cornell's **Verne Rockcastle** on *Quantitative Meaningful Investigations, K–8* • *Extreme Engineering* • **John J. Renton** on *Earthquakes, Structures, and Engineering* • **Carl Sagan,** excerpt from *COSMOS* • **Sybil E. Hatch** on *Changing Our World: True Stories of 238 Women Engineers* • **Neil deGrasse Tyson** on *The Inexplicable Universe: Unsolved Mysteries* • *Thirty-six Devices/Inventions that Pervade Technology* • **Mario Salvadori** on *The Art of Construction: Projects and Principles for Beginning Engineers and Architects* and his work with children in the New York City School System • **Steven L. Goldman** on *Great Scientific Ideas that Changed the World* • *Project Physics' People and Particles* • *The Science of Disney Imagineering: Design and Models* • The National Academy of Engineering's *Greatest Engineering Achievements of the 20th Century* • more than a 100 choice internet sites for great video segments related to STEM

—*courtesy of Devlinhair Productions*

Friday, April 4

AMSE Alice J. Moses Breakfast
By Invitation Only
Lighthouse II, Seaport ..... 7:00–9:00 AM

APAST Breakfast Meeting
By Invitation Only
Flagship A, Seaport ..... 7:00–9:00 AM

High School Breakfast (M-2)
(Tickets Required: $50)
Seaport Ballroom B, Seaport ..... 7:30–9:00 AM

Science in the Community Breakfast (M-3)
(Sponsored in part by DuPont) (Tickets Required: $15)
Ballroom West, BCEC ..... 7:30–9:00 AM

Next Steps Networking Forum
By Invitation Only
Seaport Ballroom A, Seaport..... 7:30–10:00 AM

Aerospace Programs Advisory Board Meeting
Hale, Westin Waterfront ..... 8:30–10:30 AM

NSTA Reports Advisory Board Meeting
Georges, Renaissance..... 9:00–10:30 AM

NSTA International Lounge
Revere, Westin Waterfront..... 9:00 AM–5:00 PM

Development Advisory Board Meeting
By Invitation Only
Executive Boardroom, Westin Waterfront..... 9:30–10:30 AM

Next Steps Advisory Board Meeting
By Invitation Only
Seaport Ballroom C, Seaport..... 10:30 AM–12 Noon

ASTE/NSELA Luncheon (M-4)
(Tickets Required: $65)
Grand Ballroom E, Westin Waterfront.... 12 Noon–2:00 PM

NSTA Chapter and District Director Ice Cream Social in Honor of Wendell Mohling (*sponsored by GEICO*)
Booth #1107, Exhibit Hall, BCEC..... 1:30–2:30 PM

GLBT Science Teachers Annual Meeting
Hancock, Westin Waterfront ..... 2:00–3:00 PM

NMLSTA Board of Directors Meeting
Executive Boardroom, Westin Waterfront .... 2:30–4:30 PM

AMSE Membership Meeting
Seaport Ballroom C, Seaport..... 3:00–5:00 PM

International Advisory Board Meeting
Hale, Westin Waterfront ..... 3:00–5:00 PM

Polar Educators International Open Meeting
Paine, Westin Waterfront ..... 3:00–5:00 PM

SCST Business Meeting
Caspian, Renaissance ..... 3:30–5:00 PM

NSTA Recommends Meeting
Independence Boardroom, Westin Waterfront... 4:00–5:00 PM

Shell Reception
By Invitation Only
Atlantic 1, Renaissance ..... 5:00–5:45 PM

APAST Business Meeting and Social
By Invitation Only
Flagship A, Seaport ..... 5:00–7:00 PM

NSTA Learning Center Reception
By Invitation Only
Harbor Ballroom I, Westin Waterfront..... 5:00–7:00 PM

NSTA Student/Student Chapter Reception
Open to all preservice teachers and those who work with them
Atlantic 2/3, Renaissance..... 5:30–7:30 PM

NSTA Teacher Awards Gala (M-5)
(Tickets Required: $80)
Pacific A–E, Renaissance ..... 6:15–8:45 PM

NESTA Friends of Earth Science Reception
Off-site, Museum of Science ..... 6:30–7:00 PM

SCST Dessert Social and Poster Session
Pacific F/H, Renaissance..... 7:00–9:00 PM

President's Mixer
Atlantic Ballroom, Renaissance ..... 9:00 PM–12 Mid.

3D Molecular Designs, LLC (Booth #309)

Friday, April 4	4:00–5:30 PM	109B, BCEC	The ABCD's of Modeling: an *NGSS* Authentic Practice of Science (p. 112)

Achieve3000® (Booth #1228)

Friday, April 4	2:00–3:30 PM	107C, BCEC	Experience the Power of a Digital Middle School Program (p. 97)

Aldebaran Robotics (Booth #1528)

Friday, April 4	10:00–11:30 AM	109A, BCEC	What If Your STEM Program Could Talk, Walk, and Interact with Your Students —All the Way from Middle School to College? (p. 53)

Aldon Corp. (Booth #433)

Friday, April 4	4:00–5:30 PM	104B, BCEC	Chemi-Paloosa and Hands-On Activities That Will Really Get a Reaction (p. 111)

American Chemical Society (Booth #1220)

Friday, April 4	10:00–11:30 AM	107B, BCEC	*Chemistry in the Community*, 6th Edition—Reinventing Itself (p. 52)

Animalearn (Booth #405)

Friday, April 4	10:00–11:30 AM	107C, BCEC	Adventures Into the Digital Biology Classroom: How Technology Can Revolutionize Teaching (p. 52)

AquaPhoenix Education (Kemtec) (Booth #809)

Friday, April 4	4:00–5:30 PM	107C, BCEC	Introduction to Plant Cloning and Growth Regulation (p. 112)

Bio-Rad Laboratories (Booth #315)

Friday, April 4	8:30–10:00 AM	157B, BCEC	Worm and Squirm Your Way into Behavior Labs (AP Big Ideas 1, 2, 3, 4) (p. 37)
Friday, April 4	9:00–11:30 AM	157A, BCEC	DNA Detectives: Who Killed Jose? (AP Big Ideas 3, 4) (p. 37)
Friday, April 4	10:30–11:30 AM	157B, BCEC	Science, Fashion, and Fun! Genes in a Bottle™ Kit (p. 55)
Friday, April 4	1:00–2:00 PM	157B, BCEC	Solve a Forensic Mystery Story Using Engineering and Science (p. 84)
Friday, April 4	1:00–2:30 PM	157A, BCEC	Shifting Practices to Infuse Science and Engineering Practices with the *NGSS* (p. 85)
Friday, April 4	3:00–4:00 PM	157B, BCEC	Ecology to Enzymes to Industry (AP Big Ideas 1, 2, 4) (p. 101)
Friday, April 4	3:00–4:30 PM	157A, BCEC	Communicating Science Through Lab Notebooking (p. 101)

BIOZONE International, Ltd. (Booth #1120)

Friday, April 4	10:00–11:30 AM	104B, BCEC	Engaging Students Effectively: The BIOZONE Solution (p. 51)

Carolina Biological Supply (Booth #137)

Friday, April 4	8:00–9:30 AM	102A, BCEC	Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 33)
Friday, April 4	8:00–9:30 AM	103, BCEC	Captivating Digital Natives' Imaginations with STEM Visual Literacy (p. 33)
Friday, April 4	8:00–9:30 AM	102B, BCEC	Inquiry + Nonfiction Readings = Engaged Biology and Chemistry Students (p. 33)
Friday, April 4	10:00–11:30 AM	102A, BCEC	AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 50)
Friday, April 4	10:00–11:30 AM	102B, BCEC	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 50)

Carolina Biological Supply, cont.

Friday, April 4	10:00–11:30 AM	103, BCEC	Flipping Out Over Chemistry! (p. 51)
Friday, April 4	12 Noon–1:30 PM	102B, BCEC	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 68)
Friday, April 4	12 Noon–1:30 PM	103, BCEC	Focus and Explore Wave Energy and STEM Education K–8 (p. 68)
Friday, April 4	12 Noon–1:30 PM	102A, BCEC	Hands-On Activities to Model Habitat Preference and Population Sampling (p. 68)
Friday, April 4	2:00–3:30 PM	103, BCEC	Reflection and Application of the *NGSS:* Learning to Write to Argue with Claims and Evidence K–8 (p. 96)
Friday, April 4	2:00–3:30 PM	102A, BCEC	Genes and conSEQUENCES with HudsonAlpha (p. 96)
Friday, April 4	2:00–3:30 PM	102B, BCEC	Bring Visual Science into 6–8 Classrooms—It's a Game Changer! (p. 96)
Friday, April 4	4:00–5:30 PM	102A, BCEC	Labs That Fit: Making Inquiry Work in Your AP Biology Classroom (p. 111)
Friday, April 4	4:00–5:30 PM	102B, BCEC	Carolina Investigations™ for AP Chemistry (p. 111)
Friday, April 4	4:00–5:30 PM	103, BCEC	Great Explorations in Math and Science for the Next Generation: The Roles of Water in Earth System, Ecosystems, and Human Activity (p. 111)

CPO Science/School Specialty Science (Booth #514)

Friday, April 4	8:00–9:30 AM	151B, BCEC	Genetics: Crazy Chromosomes (p. 35)
Friday, April 4	10:00–11:30 AM	151B, BCEC	Wind Turbine: A STEM Approach to Science Concepts (p. 53)
Friday, April 4	12 Noon–1:30 PM	151B, BCEC	Chemistry and the Atom: Fun with Atom Building Games! (p. 71)

Delta Education/School Specialty Science–FOSS (Booth #415)

Friday, April 4	8:00–9:30 AM	152, BCEC	Online Assessment that Informs Instruction! (p. 35)
Friday, April 4	10:00–11:30 AM	152, BCEC	Engineering in Elementary Science: Designing with FOSS (p. 53)
Friday, April 4	12 Noon–1:30 PM	152, BCEC	Let's Go Outside! Taking Science to the School Yard (p. 72)
Friday, April 4	2:00–3:30 PM	152, BCEC	Science Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 98)
Friday, April 4	4:00–5:30 PM	152, BCEC	Addressing Engineering Practices and Design Standards at Middle School (p. 113)

Dinah-Might Adventures, LP (Booth #1131)

Friday, April 4	2:00–3:30 PM	104B, BCEC	Envelope Graphic Organizers—UnFOLDing the Possibilities (p. 96)

Discovery Education (Booth #1137)

Friday, April 4	8:00–9:30 AM	154, BCEC	Evaluating Student Knowledge: Formative Assessments with Discovery Education Science Techbook (p. 35)
Friday, April 4	10:00–11:30 AM	154, BCEC	STEMtastic Strategies (p. 54)
Friday, April 4	12 Noon–1:30 PM	154, BCEC	Busting the Myth That the *Common Core State Standards* Are Difficult to Meet in Science (p. 72)
Friday, April 4	2:00–3:30 PM	154, BCEC	Hands-On Digital in the High School Science Classroom (p. 98)
Friday, April 4	4:00–5:30 PM	154, BCEC	Celebrate Discovery Education's Newest Life Science Program (p. 113)

The Dow Chemical Co. (Booth #1351)

Friday, April 4	8:00–9:30 AM	Pacific D/E, Renaissance	You Be The Chemist®: Activities for Making Chemistry Fun! (p. 36)

eCYBERMISSION (Booth #1214)

Friday, April 4	4:00–5:30 PM	107B, BCEC	Engineering Design *vs.* Scientific Practices: A Closer Look at the *NGSS* Practices (p. 112)

Educational Innovations, Inc. (Booths #1045/#1145)

Friday, April 4	8:00–9:30 AM	258B, BCEC	What the Heck Happened?! (p. 36)
Friday, April 4	10:00–11:30 AM	258B, BCEC	Fantastical Chemistry Demos for All Classrooms (p. 54)
Friday, April 4	12 Noon–1:30 PM	258B, BCEC	Elementary Teacher Survival Kit (p. 73)
Friday, April 4	2:00–3:30 PM	258B, BCEC	Cool! Can We Do That Again?! (p. 99)
Friday, April 4	4:00–5:30 PM	258B, BCEC	The Private Eye® Way to Magnify Minds! Hands-On Science, Writing, and Art to Fire Up STEM (p. 114)

Exo Labs (Booth #558)

Friday, April 4	2:00–3:30 PM	109A, BCEC	iPads in Biology—Digital Microscopy and More! (p. 97)

Fisher Science Education (Booth #551)

Friday, April 4	8:00–9:30 AM	150, BCEC	Teaching Astronomy During the Day and Beyond the Classroom (p. 34)
Friday, April 4	10:00–11:30 AM	150, BCEC	The STEM Design Challenge (p. 53)
Friday, April 4	1:30–3:00 PM	150, BCEC	Chemical and Environmental Technology (p. 85)
Friday, April 4	3:30–5:00 PM	150, BCEC	Using a STEM Teaching Approach to Investigate Alternative Energy (p. 110)

Flinn Scientific, Inc. (Booth #109)

Friday, April 4	8:00–9:30 AM	258A, BCEC	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 36)
Friday, April 4	10:00–11:30 AM	258A, BCEC	New Advanced Inquiry Labs for AP Biology from Flinn Scientific (p. 54)
Friday, April 4	10:00–11:30 AM	210 A/B, BCEC	Morning of Inquiry—Making Inquiry Safe, Manageable, and Inspirational in Grades 6–12 (p. 54)
Friday, April 4	12 Noon–1:30 PM	258A, BCEC	Flinn Favorite Biology Lab Activities and Games (p. 73)
Friday, April 4	2:00–3:30 PM	258A, BCEC	New Advanced Inquiry Labs for AP Chemistry from Flinn Scientific (p. 99)

Frey Scientific/School Specialty Science (Booth #515)

Friday, April 4	2:00–3:30 PM	151B, BCEC	Solving the Mystery of STEM Using Forensic Science (p. 98)
Friday, April 4	4:00–5:30 PM	151B, BCEC	What's the "Big Idea" in AP Biology? (p. 113)

Howard Hughes Medical Institute (Booth #843)

Friday, April 4	8:00–9:30 AM	107A, BCEC	STEM Resources for Teaching Climate Change: Easy, Engaging, and Free (p. 34)
Friday, April 4	10:00–11:30 AM	107A, BCEC	Math and Statistics in the Biology Classroom (p. 52)
Friday, April 4	12 Noon–1:30 PM	107A, BCEC	How and Why Species Multiply: Free Resources for Teaching Speciation (p. 70)
Friday, April 4	2:00–3:30 PM	107A, BCEC	Meet Your Inner Fish and Other Great Transitions in Evolution (p. 97)
Friday, April 4	4:00–5:30 PM	107A, BCEC	Using Cancer to Teach Cell Biology (p. 112)

It's About Time (Booth #121)

Friday, April 4	8:00–9:00 AM	156C, BCEC	Engineering in the *Next Generation Science Standards* (p. 32)
Friday, April 4	9:30–10:30 AM	156C, BCEC	Investigating Astronomy: A Project-based Astronomy Course Written Expressly for High School (p. 49)
Friday, April 4	11:00 AM–12 Noon	156C, BCEC	A Project-based Earth and Space Systems Science Program Developed by the American Geosciences Institute (p. 68)
Friday, April 4	12:30–1:30 PM	156C, BCEC	Project-based Learning Promotes the Development of *CCSS ELA* in the Secondary Science Classroom (p. 84)
Friday, April 4	2:00–3:00 PM	156C, BCEC	Project-based Learning: A Gathering of Science Educators and It's About Time (p. 95)
Friday, April 4	3:30–4:30 PM	156C, BCEC	Active Physics: A Project-based Program Capturing the Essence of the *NGSS* and STEM (p. 110)

Index of Exhibitor Workshops

KidWind Project (Booth #1615)

Friday, April 4	10:00–11:30 AM	151A, BCEC	Solar Hack Lab (p. 53)
Friday, April 4	12 Noon–1:30 PM	151A, BCEC	Solar Fountain (p. 71)
Friday, April 4	2:00–3:30 PM	151A, BCEC	MacGyver Windmills (p. 98)
Friday, April 4	4:00–5:30 PM	151A, BCEC	The Grid (p. 113)

LAB-AIDS, Inc. (Booth #1245)

Friday, April 4	8:00–9:30 AM	104C, BCEC	Biomes and Invasive Species (p. 33)
Friday, April 4	10:00–11:30 AM	104C, BCEC	Using Climate Proxies to Learn about Earth's Climate History (p. 52)
Friday, April 4	12 Noon–1:30 PM	104C, BCEC	Hot Bulbs: Investigating Energy Efficiency (p. 70)
Friday, April 4	2:00–3:30 PM	104C, BCEC	Gene Expression and Cellular Differentiation (p. 96)
Friday, April 4	4:00–5:30 PM	104C, BCEC	Comparing Earth to Other Worlds (p. 111)

LaMotte Co. (Booth #526)

Friday, April 4	12 Noon–1:30 PM	107B, BCEC	Stream Ecology: Slimy Leaves for Clean Streams (p. 70)
Friday, April 4	2:00–3:30 PM	107B, BCEC	Take a Swipe at Microbes! (p. 97)

LEGO Education (Booth #644)

Friday, April 4	8:00–9:30 AM	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Getting Started (p. 36)
Friday, April 4	10:00–11:30 AM	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Getting Started (p. 54)
Friday, April 4	12 Noon–1:30 PM	156B, BCEC	Machines and Mechanisms for ALL Ages (p. 73)
Friday, April 4	2:00–3:30 PM	156B, BCEC	Bring the World of Digital Learning to Your Classroom with WeDo (p. 99)
Friday, April 4	4:00–5:30 PM	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Space Activity (p. 113)

Mass Audubon (Booth #418)

Friday, April 4	12 Noon–1:30 PM	108, BCEC	Taking Science Practices Outside (p. 71)

Nano-Link: Center for Nanotechnology Education (Booth #507)

Friday, April 4	4:00–5:30 PM	108, BCEC	Nanotechnology: Hands-On Activities for All Disciplines (p. 112)

National Geographic Learning (Booth #328)

Friday, April 4	10:00–11:30 AM	108, BCEC	A Revolutionary Way to Address All Your Standards with National Geographic (p. 52)

NewPath Learning (Booth #409)

Friday, April 4	10:00–11:30 AM	153C, BCEC	Integrating Online Learning into the Science Classroom (p. 54)

PASCO scientific (Booth #151)

Friday, April 4	8:00–9:30 AM	104A, BCEC	Explore STEM Integration with PASCO Probeware—Free Sensor Set for Five Attendees! (p. 33)
Friday, April 4	10:00–11:30 AM	104A, BCEC	Advancing *NGSS*: Practices with Probeware—Free Sensor Set for Five Attendees! (p. 51)
Friday, April 4	12 Noon–1:30 PM	104A, BCEC	SPARKscience: Sensor-based Science for K–8—Free Sensor Set for Five Attendees! (p. 70)
Friday, April 4	2:00–3:30 PM	104A, BCEC	SPARKvue: Sensor-based Science for your iPadFree Sensor Set for Five Attendees! (p. 96)

PASCO scientific, cont.

Friday, April 4	4:00–5:30 PM	104A, BCEC	SPARKscience: Sensor-based Science for High School Free Sensor Set for Five Attendees! (p. 111)
Friday, April 4	5:00–7:00 PM	210 A/B, BCEC	PASCO's 12th Annual Just Physics Evening Event (p. 120)

PBS LearningMedia (Booth #422)

Friday, April 4	2:00–3:30 PM	108, BCEC	Teaching Forensic Science with Tales from the *Poisoner's Handbook* (program changes)

Pearson (Booth #445)

Friday, April 4	8:00–9:30 AM	105, BCEC	College Readiness in Science: What's Ideal—and What's Real? (p. 33)
Friday, April 4	10:00–11:30 AM	105, BCEC	The *Next Generation Science Standards:* What They Mean for Earth and Space Science (p. 52)
Friday, April 4	12 Noon–1:30 PM	105, BCEC	The Best Test Prep Book Ever for AP Chemistry (p. 70)
Friday, April 4	2:00–3:30 PM	105, BCEC	New Tools, New Insight, and New Ways of Understanding Science with Miller and Levine *Biology* (p. 96)
Friday, April 4	4:00–5:30 PM	105, BCEC	Using Problem-Based Learning to Up Your *NGSS* Game (p. 111)

Perimeter Institute (Booth #358)

Friday, April 4	10:00–11:30 AM	109B, BCEC	Perimeter Institute: Beyond the Atom: Remodeling Particle Physics (p. 53)
Friday, April 4	12 Noon–1:30 PM	109B, BCEC	Perimeter Institute: Curved Spacetime in the Classroom and GPS (p. 71)

Project Lead The Way (Booth #1122)

Friday, April 4	8:00–9:30 AM	104B, BCEC	Transform Your Classroom and Integrate Engineering Concepts with PLTW's K–12 STEM Programs (p. 33)

Sangari Active Science (Booth #351)

Friday, April 4	8:00–9:30 AM	107C, BCEC	Applying *Common Core State Standards, ELA* Through Active Science Instruction (p. 34)

Science First®/STARLAB® (Booths #1456/#1457)

Friday, April 4	2:00–2:30 PM	Booth #1457, Exhibit Hall	A Change of Seasons (p. 86)

Scientific Minds, LLC (Booth #1443)

Friday, April 4	8:00–9:30 AM	153C, BCEC	Inspire Scientific Minds with Technology and Manipulatives (p. 35)
Friday, April 4	2:00–3:30 PM	153C, BCEC	Inspire Scientific Minds with Technology and Manipulatives (p. 98)

The Shape of Life (Booth #827)

Friday, April 4	4:00–5:30 PM	153C, BCEC	The Evolution of the Animal Kingdom on Planet Earth (p. 113)

Simulation Curriculum Corp. (Booth #1451)

Friday, April 4	8:00–9:30 AM	106, BCEC	Plate Tectonics: Continents on the Move (p. 34)
Friday, April 4	10:00–11:30 AM	106, BCEC	Hurricanes and Typhoons: Nature on the Rampage (p. 52)

Society for Neuroscience (Booth #1229)

Friday, April 4	8:00–9:30 AM	107B, BCEC	Neuroscience as a STEM Subject (p. 34)
Friday, April 4	2:00–3:30 PM	109B, BCEC	New Technologies: What They can Teach Us About Childhood Brain Disorders (p. 97)

Index of Exhibitor Workshops

SparkFun Electronics (Booth #1029)

Friday, April 4	8:00–9:30 AM	151A, BCEC	SparkFun: "Scratch"ing the Surface of Programming (p. 34)
Friday, April 4	12 Noon–1:30 PM	106, BCEC	Simple Programming Tools to Enhance Student Engagement (p. 70)
Friday, April 4	2:00–3:30 PM	106, BCEC	Simple Programming Tools to Enhance Student Engagement (p. 97)
Friday, April 4	4:00–5:30 PM	106, BCEC	Data Collection with High-Altitude Balloons (p. 112)

STEM Certificate Program (Booth #1009)

Friday, April 4	12 Noon–1:30 PM	153C, BCEC	STEM Certificate Program (p. 72)

Texas Instruments (Booth #221)

Friday, April 4	12 Noon–1:30 PM	104B, BCEC	STEM Behind Hollywood—Adventure, Drama, and Mystery in Your Classroom (p. 70)

Vernier Software & Technology (Booth #129)

Friday, April 4	8:00–9:30 AM	153A, BCEC	K–8 Science with Vernier (p. 35)
Friday, April 4	8:00–9:30 AM	153B, BCEC	Water Quality with Vernier (p. 35)
Friday, April 4	10:00–11:30 AM	153B, BCEC	Environmental and Earth Science with Vernier (p. 53)
Friday, April 4	10:00–11:30 AM	153A, BCEC	Advanced Physics with Vernier (p. 53)
Friday, April 4	12 Noon–1:30 PM	153B, BCEC	Chromebook, Android, and BYOD with Vernier (p. 72)
Friday, April 4	12 Noon–1:30 PM	153A, BCEC	Biology with Vernier (p. 72)
Friday, April 4	2:00–3:30 PM	153B, BCEC	iPad and Wireless Sensors with Vernier (p. 98)
Friday, April 4	2:00–3:30 PM	153A, BCEC	Chemistry with Vernier (p. 98)

Ward's Science (Booth #632)

Friday, April 4	8:00–9:30 AM	156A, BCEC	Fun with Ward's Forensics and the *NGSS* (p. 35)
Friday, April 4	10:00–11:30 AM	156A, BCEC	Building Readiness in Physical Science and the *NGSS* (p. 54)
Friday, April 4	12 Noon–1:30 PM	156A, BCEC	STEM Engineering for Middle School and High School with TeacherGeek Wind Lift (p. 72)
Friday, April 4	2:00–3:30 PM	156A, BCEC	Life Science and the *NGSS* (p. 98)
Friday, April 4	4:00–5:30 PM	156A, BCEC	Ward's Chemistry In-the-Bag Activities and the *NGSS* (p. 113)

Wavefunction, Inc. (Booth #1344)

Friday, April 4	8:00–9:30 AM	109B, BCEC	Exploring the Molecular World: Scientifically Accurate Visualization and Simulation Tools (p. 34)

Wildlife Acoustics, Inc. (Booth #425)

Friday, April 4	8:00–9:30 AM	108, BCEC	Bats, iPads, and Citizen Science in the Classroom (p. 34)

G = General
P = Preschool
E = Elementary
M = Middle School
H = High School
C = College
S = Supervision/Administration
I = Informal Education
R = Research
T = Teacher Preparation

Biology/Life Science

8:00–9:00 AM	G	205B, BCEC	Creating LGBTQ–inclusive Science Learning Classrooms (p. 30)
8:00–9:00 AM	M	160B, BCEC	Collaboration That Works: Science, Literacy, and 21st-Century Skills (p. 20)
8:00–9:00 AM	M–C	257B, BCEC	Using the Flipped Class as a Stepping-Stone to a Student-centered Classroom (p. 23)
8:00–9:00 AM	H–C	Atlantic 1, Renaissance	Improving Observation Skills Through Dichotomous Keys (p. 30)
8:00–9:00 AM	M–H	Griffin, Westin	Integrating *CCSS* and *NGSS:* Building Leadership Capacity to Transform Science Teaching and Learning (p. 28)
8:00–9:00 AM	M–H	257A, BCEC	Integrating Reading, Writing, and Research into Biotechnology (p. 23)
8:00–9:00 AM	H	205A, BCEC	From Data Visualization to Argument—Tools for Lifelong Science Literacy (p. 29)
8:00–9:00 AM	G	Faneuil, Westin	Addressing the Unique Needs of Diverse Learners—Particularly Those with Learning Disabilities—in Introductory Biology Curricula (p. 27)
8:00–9:30 AM	G	108, BCEC	Bats, iPads, and Citizen Science in the Classroom (p. 34)
8:00–9:30 AM	5	151B, BCEC	Genetics: Crazy Chromosomes (p. 35)
8:00–9:30 AM	6–12	102A, BCEC	Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 33)
8:00–9:30 AM	9–12	102B, BCEC	Inquiry + Nonfiction Readings = Engaged Biology and Chemistry Students (p. 33)
8:00–9:30 AM	K–12	105, BCEC	College Readiness in Science: What's Ideal—and What's Real? (p. 33)
8:00–9:30 AM	9–12	104C, BCEC	Biomes and Invasive Species (p. 33)
8:30–10:00 AM	9–C	157B, BCEC	Worm and Squirm Your Way into Behavior Labs (AP Big Ideas 1, 2, 3, 4) (p. 37)
9:00–11:30 AM	10–C	157A, BCEC	DNA Detectives: Who Killed Jose? (AP Big Ideas 3, 4) (p. 37)
9:30–10:30 AM	G	Webster, Westin	Life Cycle of the Monarch Butterfly (p. 49)
9:30–10:30 AM	G	Constitution, Seaport	AMSE Session: The Smarts Are There (p. 44)
9:30–10:30 AM	G	Caspian, Renaissance	SCST Session: The Impact of Collective Group Motivation on Student Learning in a Nonmajors Biology Course (p. 43)
9:30–10:30 AM	H–C	Caspian, Renaissance	SCST Session: Dealing with Interdisciplinary Challenges—Students' Perceptions of and Performance on Chemistry-related Biological Concepts (p. 43)
9:30–10:30 AM	E–H	Pacific F, Renaissance	ASTE Session: Transforming STEM Education—Your Classroom and Beyond (p. 44)
9:30–10:30 AM	M	Grand Ballroom E, Westin	Meet Me in the Middle Session: Adapting Resources so They Work for Your Middle Level Students (p. 50)
9:30–10:30 AM	H	257A, BCEC	Integrating Bioinformatics into Current STEM Curricula (p. 41)
9:30–10:30 AM	M	253A, BCEC	NARST Session: There Is Much More to Teaching Evolution Than Just Presenting the Biological Science (p. 41)
9:30–10:30 AM	H–C	Atlantic 3, Renaissance	DNA Barcoding: Independent Research in the Classroom (p. 43)
9:30–10:30 AM	M–C	205B, BCEC	Lead Your Students on an Exploration of the Human Body by Building It from the Inside Out (p. 48)
9:30–10:30 AM	H	205A, BCEC	A New Twist on Measuring Catalase Activity (p. 48)
9:30–10:30 AM	E–M	160B, BCEC	DNA Is Elementary! (p. 47)
9:30–10:30 AM	G	257B, BCEC	Flipped Class 101: A User's Manual (p. 42)
9:30–10:30 AM	H–C	Atlantic 1, Renaissance	Teaching Metabolic Diseases: The Great Diseases Project—A Collaborative Approach to Real-World Science in the Classroom (p. 48)
10:00–11:30 AM	9–C	107A, BCEC	Math and Statistics in the Biology Classroom (p. 52)
10:00–11:30 AM	9–12	104B, BCEC	Engaging Students Effectively: The BIOZONE Solution (p. 51)

10:00–11:30 AM	5–C	107C, BCEC	Adventures Into the Digital Biology Classroom: How Technology Can Revolutionize Teaching (p. 52)
10:00–11:30 AM	9–12	258A, BCEC	New Advanced Inquiry Labs for AP Biology from Flinn Scientific (p. 54)
10:00–11:30 AM	6–12	102A, BCEC	AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 50)
10:30–11:30 AM	6–C	157B, BCEC	Science, Fashion, and Fun! Genes in a Bottle™ Kit (p. 55)
10:30–11:30 AM	E	210C, BCEC	Chrysalis: Transforming Your Teaching (p. 56)
11:00 AM–12 Noon	M–H	205A, BCEC	Interdisciplinary Model-eliciting Activities Bring Design, Engineering Practices, and Real-World Context to the Science Classroom (p. 65)
11:00 AM–12 Noon	E–M	160B, BCEC	Moving Forward with *NGSS* Crosscutting Concepts: Questions and Strategies to Elicit Student Ideas in Life Science (p. 56)
11:00 AM–12 Noon	M–H	257A, BCEC	Teaching About the Teen Brain: Linking Neuroscience and Health Curricula Through the Study of Addiction (p. 58)
11:00 AM–12 Noon	M–C	205B, BCEC	Using Climatograms to Understand Biomes (p. 65)
11:00 AM–12 Noon	M–C	257B, BCEC	Top 10 Findings in Genetics and Biotechnology (p. 58)
11:00 AM–12 Noon	H–C	Atlantic 3, Renaissance	3-D Tissue Models That Anyone Can Build (p. 66)
12 Noon–1:30 PM	6–12	258A, BCEC	Flinn Favorite Biology Lab Activities and Games (p. 73)
12 Noon–1:30 PM	9–12	102A, BCEC	Hands-On Activities to Model Habitat Preference and Population Sampling (p. 68)
12 Noon–1:30 PM	9–C	153A, BCEC	Biology with Vernier (p. 72)
12 Noon–1:30 PM	6–C	107A, BCEC	How and Why Species Multiply: Free Resources for Teaching Speciation (p. 70)
12:30–1:30 PM	G	Caspian, Renaissance	SCST Session: Marjorie Gardner Lecture: Authentic Learning, Student Engagement, and Socratic Course Design (p. 75)
12:30–1:30 PM	E–M	160B, BCEC	Adopt a Microbe: Intraterrestrials from the Deep Sea! (p. 75)
12:30–1:30 PM	M–C	257B, BCEC	Labs for the Next Generation (p. 76)
12:30–1:30 PM	M–H	257A, BCEC	Authentic Classroom Science: Students as Scientists (p. 76)
12:30–1:30 PM	C	Pacific D, Renaissance	Changing Their Idea of "Studying" into Our Idea of "Learning": The Efficacy of Interactive Online Programs (p. 78)
12:30–1:30 PM	E–H	205B, BCEC	Using Simulations in Inquiry-based Science (p. 82)
12:30–1:30 PM	H–C	252A, BCEC	Genetics Gets Personal: Teaching the Ethical, Legal, and Social Issues in Personal Genetics (p. 76)
12:30–1:30 PM	M–H	205A, BCEC	Climate Change and Insect-borne Diseases at the Yale Peabody Museum of Natural History (p. 82)
12:30–1:30 PM	H–C	Atlantic 3, Renaissance	How the Free Skate Revived Scientific Literacy in My Nonmajors Biology Course (p. 78)
1:00–2:00 PM	E	211, BCEC	CESI Session: The Life Cycle of Literacy Through Science (p. 84)
1:00–2:00 PM	6–9	157B, BCEC	Solve a Forensic Mystery Story Using Engineering and Science (p. 84)
1:00–2:30 PM	5	157A, BCEC	Shifting Practices to Infuse Science and Engineering Practices with the *NGSS* (p. 85)
2:00–3:00 PM	C	Caspian, Renaissance	SCST Session: Using Bean Beetle "Vision" to "Change" the Undergraduate Biology Student's Idea of Scientific Investigations (p. 89)
2:00–3:00 PM	E	Atlantic 2, Renaissance	ASTE Session: Understanding the Relationship Between Mass, Volume, and Density by Engineering a Prototype of a Prosthetic Limb (p. 94)
2:00–3:00 PM	P–E	160B, BCEC	Early Bird Lessons: Practicing Early Learning Skills Using Birds (p. 92)
2:00–3:00 PM	E–H	205B, BCEC	Perception and Performance: Investigating the Human Body (p. 92)
2:00–3:00 PM	I	256, BCEC	Simulate STEM Online Through Virtual Clinical Trials (p. 88)
2:00–3:00 PM	H–C	Pacific D, Renaissance	Beyond X and Y: Recent Discoveries About the Mechanisms Governing Sex Determination and Differentiation (p. 90)
2:00–3:00 PM	M–H	205A, BCEC	Organelle of the Day (p. 92)
2:00–3:00 PM	M	160C, BCEC	Writing to Learn and Learning to Write in Middle Grades Science Classrooms (p. 92)
2:00–3:00 PM	M–C	257B, BCEC	Teach with the World's Most Extravagant Birds (p. 88)
2:00–3:30 PM	6–C	109B, BCEC	New Technologies: What They can Teach Us About Childhood Brain Disorders (p. 97)

2:00–3:30 PM	7–12	107B, BCEC	Take a Swipe at Microbes! (p. 97)
2:00–3:30 PM	9–12	102A, BCEC	Genes and conSEQUENCES with HudsonAlpha (p. 96)
2:00–3:30 PM	6–12	105, BCEC	New Tools, New Insight, and New Ways of Understanding Science with Miller and Levine *Biology* (p. 96)
2:00–3:30 PM	6–C	107A, BCEC	Meet Your Inner Fish and Other Great Transitions in Evolution (p. 97)
2:00–3:30 PM	6–12	156A, BCEC	Life Science and the *NGSS* (p. 98)
2:00–3:30 PM	9–12	104C, BCEC	Gene Expression and Cellular Differentiation (p. 96)
2:00–3:30 PM	6–C	109A, BCEC	iPads in Biology—Digital Microscopy and More! (p. 97)
3:00–4:00 PM	9–C	157B, BCEC	Ecology to Enzymes to Industry (AP Big Ideas 1, 2, 4) (p. 101)
3:00–4:30 PM	9–C	157A, BCEC	Communicating Science Through Lab Notebooking (p. 101)
3:30–4:30 PM	G	210C, BCEC	Teaching with the Brain in Mind (p. 102)
3:30–4:30 PM	H	205B, BCEC	Using Models as Evidence in High School Biology (p. 108)
3:30–4:30 PM	E–M	160B, BCEC	Let's Talk Science: Seeding Argumentation (p. 108)
3:30–4:30 PM	G	257B, BCEC	Sharks—The Good, the Bad, and the Toothy (p. 105)
3:30–4:30 PM	H–C	Burroughs, Westin	BioGraph: A Complex Systems Lens for Learning Introductory Biology (p. 106)
3:30–4:30 PM	H	205A, BCEC	Engaging Students in Developing and Using Models: Using Clay Models to Visualize Action Potentials (p. 108)
4:00–5:30 PM	7–12	151B, BCEC	What's the "Big Idea" in AP Biology? (p. 113)
4:00–5:30 PM	9–12	102A, BCEC	Labs That Fit: Making Inquiry Work in Your AP Biology Classroom (p. 111)
4:00–5:30 PM	5–10	153C, BCEC	The Evolution of the Animal Kingdom on Planet Earth (p. 113)
4:00–5:30 PM	6–C	109B, BCEC	The ABCDs of Modeling: an *NGSS* Authentic Practice of Science (p. 112)
4:00–5:30 PM	9–C	107C, BCEC	Introduction to Plant Cloning and Growth Regulation (p. 112)
4:00–5:30 PM	9–C	107A, BCEC	Using Cancer to Teach Cell Biology (p. 112)
5:00–5:30 PM	E–M	259B, BCEC	Supporting Students in Optimizing Engineering Design Solutions with Modeling and Mathematics (p. 114)
5:00–6:00 PM	G	257B, BCEC	Making Sense of Science: A System for Systems Thinking (p. 116)
5:00–6:00 PM	H–C	258C, BCEC	Creating Stop-Motion Videos to Illustrate Learning of Cell Processes (p. 118)
5:00–6:00 PM	M–C	205B, BCEC	BioBuilder: Ready-to-Use Classroom and Lab Curricula That Integrate Engineering into Biology (p. 117)

Chemistry/Physical Science

8:00–9:00 AM	H	162B, BCEC	Introducing the ChemMatters Compilation Project (p. 21)
8:00–9:00 AM	H	162B, BCEC	Using iTunes U in the High School Science Classroom (p. 21)
8:00–9:00 AM	M	160A, BCEC	Project-based Approach to Teaching Newton's Three Laws with Coaster Cars (p. 29)
8:00–9:30 AM	7–C	109B, BCEC	Exploring the Molecular World: Scientifically Accurate Visualization and Simulation Tools (p. 34)
8:00–9:30 AM	9–12	156A, BCEC	Fun with Ward's Forensics and the *NGSS* (p. 35)
8:00–9:30 AM	5–8	Pacific D/E, Renaissance	You Be The Chemist®: Activities for Making Chemistry Fun! (p. 36)
9:30–10:30 AM	M	Grand Ballroom E, Westin	Meet Me in the Middle Session: *Middleschoolchemistry.com*—Big Ideas About the Very Small (p. 40)
9:30–10:30 AM	M–H	162B, BCEC	Simple to Sublime—Mathematics Turns Simple Hands-on Labs into Deep Science (p. 48)
9:30–10:30 AM	H–C	Pacific G/H, Renaissance	Use Professional Journals to Enrich Advanced Chemistry (p. 44)
10:00–11:30 AM	8–C	107B, BCEC	*Chemistry in the Community,* 6th Edition—Reinventing Itself (p. 52)
10:00–11:30 AM	K–C	258B, BCEC	Fantastical Chemistry Demos for All Classrooms (p. 54)
10:00–11:30 AM	G	210 A/B, BCEC	Morning of Inquiry—Making Inquiry Safe, Manageable, and Inspirational in Grades 6–12 (p. 54)
10:00–11:30 AM	9–12	103, BCEC	Flipping Out Over Chemistry! (p. 51)
11:00 AM–12 Noon	H–C	Pacific D, Renaissance	Achieving Conceptual Understanding in Stoichiometry with Cognitive Skills (p. 60)
11:00 AM–12 Noon	K–5	Pacific G/H, Renaissance	You Can Teach Science! Properties of Materials for K–5 in *NGSS* (p. 60)

11:00 AM–12 Noon	G	162B, BCEC	The Yearlong Space Epic: Immersing and Engaging Students in Science Through an Alternate Reality Game (p. 57)
11:00 AM–12 Noon	E	160A, BCEC	Learning Made EEEEE-Z! (p. 65)
11:00 AM–12 Noon	H	251, BCEC	STEM Project: Build and Use a Simple Colorimeter (p. 57)
12 Noon–1:30 PM	9–12	102B, BCEC	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 68)
12 Noon–1:30 PM	9–12	105, BCEC	The Best Test Prep Book Ever for AP Chemistry (p. 70)
12:30–1:30 PM	E	162B, BCEC	Using the *NGSS* to Promote Understanding of Sound (p. 81)
1:30–3:00 PM	9–12	150, BCEC	Chemical and Environmental Technology (p. 85)
2:00–3:00 PM	H	162B, BCEC	Making Biodiesel: A Problem-based Multidisciplinary Sustainability Exploration (p. 87)
2:00–3:00 PM	H	162B, BCEC	Common Labs for All Students (p. 87)
2:00–3:30 PM	9–C	153A, BCEC	Chemistry with Vernier (p. 98)
2:00–3:30 PM	9–12	258A, BCEC	New Advanced Inquiry Labs for AP Chemistry from Flinn Scientific (p. 99)
2:00–3:30 PM	9–12	108, BCEC	Teaching Forensic Science with *Tales from the Poisoner's Handbook* (program changes)
3:30–4:30 PM	E	160A, BCEC	Conquering the Content: A Physical Science Content Workshop for Elementary Science Teachers (p. 108)
3:30–4:30 PM	H	162B, BCEC	Chemistry…It's a Gas, Gas, Gas! (p. 108)
3:30–4:30 PM	E	259A, BCEC	Differentiating Science for Elementary Students (p. 105)
4:00–5:30 PM	6–12	104B, BCEC	Chemi-Paloosa and Hands-On Activities That Will Really Get a Reaction (p. 111)
4:00–5:30 PM	6–12	156A, BCEC	Ward's Chemistry In-the-Bag Activities and the *NGSS* (p. 113)
4:00–5:30 PM	9–12	102B, BCEC	Carolina Investigations™ for AP Chemistry (p. 111)
5:00–5:30 PM	E–H	254B, BCEC	Students Teaching Students: An After-School Program to Engage Elementary School Kids in Active Science Discovery (p. 114)
5:00–6:00 PM	E–H	162B, BCEC	A Demo a Week Makes Science Class the Peak (p. 115)
5:00–6:00 PM	H	162A, BCEC	Sliding Classrooms (p. 115)

Earth/Space Science

8:00–9:00 AM	H	261, BCEC	Helping Students Across the Transition from Small, Student-collected Datasets to "Big Data" (p. 24)
8:00–9:00 AM	M–C	253C, BCEC	NSTA Press® Session: Earth Science Puzzles—Making Meaning from Data (p. 30)
8:00–9:00 AM	H–C	Pacific A/B, Renaissance	An Ice Core Classroom Investigation that Embodies the Three Dimensions of the *Next Generation Science Standards* (p. 24)
8:00–9:00 AM	E	253A, BCEC	NARST Session: Young Children's Understandings of Earth's Surface Features and Changes (p. 22)
8:00–9:00 AM	M	162A, BCEC	Hands On the Sun (p. 20)
8:00–9:00 AM	H	261, BCEC	Performance Assessments in Earth Science (p. 24)
8:00–9:30 AM	6–C	107A, BCEC	STEM Resources for Teaching Climate Change: Easy, Engaging, and Free (p. 34)
8:00–9:30 AM	9–C	150, BCEC	Teaching Astronomy During the Day and Beyond the Classroom (p. 34)
8:00–9:30 AM	5	106, BCEC	Plate Tectonics: Continents on the Move (p. 34)
8:00–10:00 AM	M–H	208, BCEC	AMNH Pathway Session: Analyzing and Interpreting Data Using Visualizations and Scientific Data Sets (p. 36)
9:30–10:30 AM	M	162A, BCEC	The Great Rock Mix-Up (p. 48)
9:30–10:30 AM	G	261, BCEC	NASA Astrobiology: The Search for Life Beyond Earth (p. 42)
9:30–10:30 AM	G	254B, BCEC	The Michigan Teacher Excellence Program (MiTEP) Experience: Strategies Used to Enhance Pedagogical Content Knowledge and Leadership (p. 41)
9:30–10:30 AM	E	160C, BCEC	Using Lesson Study to Engage Elementary Teachers in the *Next Generation Science Standards* (p. 47)

9:30–10:30 AM	E–H	052 A/B, BCEC	NESTA Session: National Earth Science Teachers Association Geology Share-a-Thon (p. 47)
9:30–10:30 AM	G	253C, BCEC	GLOBE at Night: A Fun, Immersive, STEM-based Citizen Science Program for Students (p. 48)
9:30–10:30 AM	6–12	156C, BCEC	Investigating Astronomy: A Project-based Astronomy Course Written Expressly for High School (p. 49)
10:00–11:30 AM	K–12	105, BCEC	The *Next Generation Science Standards:* What They Mean for Earth and Space Science (p. 52)
10:00–11:30 AM	5	106, BCEC	Hurricanes and Typhoons: Nature on the Rampage (p. 52)
10:00–11:30 AM	9–12	104C, BCEC	Using Climate Proxies to Learn about Earth's Climate History (p. 52)
11:00 AM–12 Noon	9–12	156C, BCEC	A Project-based Earth and Space Systems Science Program Developed by the American Geosciences Institute (p. 68)
11:00 AM–12 Noon	E–H	052 A/B, BCEC	NESTA Session: National Earth Science Teachers Association Weather, Climate, and Ocean Share-a-Thon (p. 64)
11:00 AM–12:30 PM	M–H	208, BCEC	AMNH Pathway Session: Using a Web-based Graphing Tool to Analyze and Interpret Weather Data, Climate Change, and Patterns in Weather and Climate (p. 68)
12:30–1:30 PM	I	Ballroom West/Group 2, BCEC	Informal Science Day Session: Traveling Through Time: A Short Walk Through Geologic Time (p. 83)
12:30–1:30 PM	E–H	052 A/B, BCEC	NESTA Session: National Earth Science Teachers Association Earth System Science Share-a-Thon (p. 81)
12:30–1:30 PM	M–C	251, BCEC	Make Your Own Virtual Fieldwork Experience! (p. 82)
12:30–1:30 PM	I	256, BCEC	Understanding Plate Tectonics Using Actual Earthquake Location Data (p. 83)
12:30–1:30 PM	G	261, BCEC	NASA's High-Energy Vision: Chandra and the X-ray Universe (p. 77)
12:30–1:30 PM	E–M	162A, BCEC	Fly to Mercury via NASA's Discovery Mission MESSENGER! (p. 81)
2:00–2:30 PM	5–8	Booth #1457, Exhibit Hall, BCEC	A Change of Seasons (p. 86)
2:00–3:00 PM	G	210C, BCEC	Educator? Astronaut? You Can Do Both! (p. 86)
2:00–3:00 PM	G	210 A/B, BCEC	Geosciences: The Nexus of Data-driven Science and Applications (p. 86)
2:00–3:00 PM	M–H	261, BCEC	Explore Earthquakes! (p. 89)
2:00–3:00 PM	E	251, BCEC	Science Notebooks as First Drafts? Connect Science and Literacy Through the Water Cycle and Weathering and Erosion Investigations (p. 93)
2:00–3:00 PM	P–E	052 A/B, BCEC	NESTA Session: It's Elementary! Effective Approaches for Addressing the Earth Science *Next Generation Science Standards* in the Elementary Classroom (p. 92)
2:00–3:00 PM	G	162A, BCEC	Above, Through, and Beyond with SOFIA (p. 87)
2:00–3:30 PM	M–H	208, BCEC	AMNH Pathway Session: Connecting Earth Science Content and the *CCSS ELA* Using Museum Resources (p. 95)
3:30–4:30 PM	M–C	261, BCEC	NASA: The Latest Discoveries from the Stratospheric Observatory for Infrared Astronomy, (SOFIA) (p. 105)
3:30–4:30 PM	E	160C, BCEC	Weather Through Time = Climate (p. 108)
3:30–4:30 PM	M–H	251, BCEC	Exploring Imaging of the Scales of the Universe (p. 109)
3:30–4:30 PM	E–H	052 A/B, BCEC	NESTA Session: Effective Approaches for Addressing the *Next Generation Science Standards* in the Earth and Space Science Classroom (p. 107)
3:30–4:30 PM	ME	252A, BCEC	Mission to Mars: A Technological Collaborative to Inspire the Next Generation (p. 104)
4:00–5:30 PM	M–H	208, BCEC	AMNH Pathway Session: Using *Common Core State Standards, ELA* and Museum Resources to Construct Science Explanations (p. 110)
4:00–5:30 PM	6–8	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Space Activity (p. 113)
4:00–5:30 PM	9–12	104C, BCEC	Comparing Earth to Other Worlds (p. 111)
5:00–6:00 PM	M	157C, BCEC	Introducing and Assessing Argumentation in Your Science Classroom (p. 117)

5:00–6:00 PM	E	160C, BCEC	NASA's "Reading, Writing & Rings": Using Saturn to Teach Science and Language Arts (p. 117)
5:00–6:00 PM	M–H	205C, BCEC	Hot Spot: Student Explorations of Urban Heat (p. 117)
5:00–6:00 PM	M–C	160A, BCEC	NASA: Inquiry Activities for Learning About Light and the EM Spectrum and Multiwavelength Astronomy (p. 117)
5:00–6:00 PM	M–H	261, BCEC	Up, Up, and Away with Weather Balloons (p. 116)

Environmental Science

8:00–9:00 AM	M	161, BCEC	Watershed Wonders: Inspiring Environmental Stewardship (p. 20)
8:00–9:00 AM	M	161, BCEC	School Buildings Can Teach, Too: Assessment of Direct and Indirect Teaching (p. 20)
8:00–9:00 AM	I	256, BCEC	The Little Things That Run the World: Soil Ecology in the Classroom (p. 30)
8:00–9:00 AM	G	Webster, Westin	Life Cycle of the Monarch Butterfly (p. 32)
8:00–9:30 AM	7–C	153B, BCEC	Water Quality with Vernier (p. 35)
9:30–10:30 AM	M–H	157C, BCEC	Focus on Forests Using STEM and Project Learning Tree (p. 47)
9:30–10:30 AM	H	251, BCEC	Creating Student Videos for Climate Education (p. 40)
9:30–10:30 AM	M–C	Pacific A/B, Renaissance	Track and Explore: Hands-On Science Joins Online Field Trip Experiences for Middle School Students (p. 43)
9:30–10:30 AM	G	Pacific F, Renaissance	ASTE Session: A Place-based Approach for Technically Integrated Science Instruction: The River Run Experience (p. 44)
10:00–11:30 AM	7–C	153B, BCEC	Environmental and Earth Science with Vernier (p. 53)
10:00–11:30 AM	4	151A, BCEC	Solar Hack Lab (p. 53)
11:00 AM–12 Noon	E	253C, BCEC	NSTA Press® Session: Inside-Out—Enhancing Field-based Learning in Environmental Science for the Upper Elementary Classroom (p. 66)
11:00 AM–12 Noon	G	157C, BCEC	Follow Your (Our) Star (p. 65)
11:00 AM–12 Noon	E–H	161, BCEC	Sustainability, STEM, and the Built Environment (p. 56)
12 Noon–1:30 PM	4	151A, BCEC	Solar Fountain (p. 71)
12 Noon–1:30 PM	K–12	108, BCEC	Taking Science Practices Outside (p. 71)
12 Noon–1:30 PM	5–C	107B, BCEC	Stream Ecology: Slimy Leaves for Clean Streams (p. 70)
12:30–1:30 PM	M–H	157C, BCEC	ICCARS: Investigating Climate Change and Remote Sensing (p. 75)
12:30–1:30 PM	P–E	161, BCEC	Nuts About Nature (p. 81)
2:00–3:00 PM	M–H	157C, BCEC	Using Virtual Field Experiences in Earth Science Education (p. 92)
2:00–3:00 PM	G	160A, BCEC	The Science of Service Learning: One School's Journey to Promote Science Knowledge Through Service (p. 87)
2:00–3:30 PM	4	151A, BCEC	MacGyver Windmills (p. 98)
3:00–4:00 PM	E	211, BCEC	CESI Session: Encouraging Environmental Stewardship Through an Integrated Science, Social Studies, and Literacy Activity (p. 100)
3:30–4:30 PM	G	157C, BCEC	Only Math Can Save the World: Integrating Key Math Skills into Middle Grades Environmental Science (p. 102)
3:30–5:00 PM	9–12	150, BCEC	Using a STEM Teaching Approach to Investigate Alternative Energy (p. 110)
4:00–5:30 PM	4	151A, BCEC	The Grid (p. 113)
4:00–5:30 PM	5–8	152, BCEC	Addressing Engineering Practices and Design Standards at Middle School (p. 113)
5:00–6:00 PM	E	212, BCEC	Thinking Lab: 1 Science Teacher, 1 Art Teacher, 1 Classroom (p. 118)
5:00–6:00 PM	E–M	252A, BCEC	Climate Change for Dummies (p. 115)
5:00–6:00 PM	G	259A, BCEC	Butterfly Gardening Using Native Plants (p. 118)

General Science

8:00–8:30 AM	M–H	Plaza C, Seaport	From *XKCD* to *Infinite Jest*—Strengthening Science with Language and Vice Versa (p. 18)

8:00–9:00 AM	G	210C, BCEC	The NRC *Framework* and the *NGSS*: An Opportunity for Teacher Growth and Leadership (p. 19)
8:00–9:00 AM	G	Commonwealth Ballroom C, Westin	Enhancing Literacy and Inquiry in Science with Technology (p. 31)
8:00–9:00 AM	E	213, BCEC	Designing the Future (p. 30)
8:00–9:00 AM	E	252B, BCEC	Science and Engineering Practices—What's Art Got to Do with It! (p. 22)
8:00–9:00 AM	E–H	Mediterranean, Renaissance	Using Energy to Connect Multidisciplinary Curricula (p. 24)
8:00–9:00 AM	S	259B, BCEC	Digitizing the Learning Experience and Taking IT Mobile (p. 23)
8:00–9:00 AM	E–M	207, BCEC	Is That a FACT? Formative Assessment Classroom Techniques for the Elementary Science Classroom (p. 30)
8:00–9:00 AM	G	Lewis, Westin	Evidence-based Argumentation: Engaging Science Students in Boston Public Schools (p. 28)
8:00–9:00 AM	H	Plaza B, Seaport	Literacy and Inquiry with High School Science Notebooks (p. 26)
8:00–9:00 AM	E	158, BCEC	Science Says: Science and Literacy for Students with Language-based Learning Disabilities (p. 20)
8:00–9:00 AM	E	252B, BCEC	Riding the Wave of the *NGSS* on a PBL Surfboard (p. 22)
8:00–9:00 AM	G	Grand Ballroom E, Westin	Cognitive Planning for the K–8 *NGSS:* A Team Approach! (p. 27)
8:00–9:00 AM	M–H	Plaza A, Seaport	Climate Change: STEM Project-based Inquiry Modules (p. 26)
8:00–9:00 AM	M–C	Burroughs, Westin	Fostering and Enhancing Data Analysis and Literacy Through Visual Representation (p. 27)
8:00–9:00 AM	G	260, BCEC	Building Teacher Capacity: The Role of Science Leader-Teachers (p. 24)
8:00–9:00 AM	M	255, BCEC	If You Want Your Students to Engage with Content Using Textbooks, You've Got to Try This Strategy! (p. 22)
8:00–9:00 AM	P–E	212, BCEC	Integrating Science with Core Academic Subjects in the Preschool and Elementary Classroom (p. 30)
8:00–9:00 AM	M–H	Constitution, Seaport	Achieving the Goal of Literacy: Science and Literature as Partners (p. 31)
8:00–9:00 AM	G	Harbor Ballroom III, Westin	Five Easy Pieces—From STEAM to Telescopes: A Teacher Leadership Montage (p. 28)
8:00–9:00 AM	S	Grand Ballroom E, Westin	A Model to Disseminate *NGSS* Statewide (p. 27)
8:00–9:00 AM	H	Lighthouse I, Seaport	Sci-Fi and STS for Literacy (p. 26)
8:00–9:00 AM	M	254B, BCEC	Can You Justify That? Tricks and Tips to Easily Assess the Justifications in Students' Arguments (p. 30)
8:00–9:00 AM	G	Brewster, Renaissance	Apps in the Middle School Classroom (p. 24)
8:00–9:00 AM	G	Alcott, Westin	NSELA Session: Tools for Science Leaders, Part 1 (p. 26)
8:00–9:00 AM	P–M	Douglass, Westin	Effective STEM Education: Project Envisioning with Young Makers (p. 31)
8:00–9:00 AM	E–H	Harbor Ballroom II, Westin	Scaffolding Students Toward Argumentation: Strategies for Developing Literacy and Reasoning Skills (p. 28)
8:00–9:00 AM	E	211, BCEC	Farm-to-School Digital Stories: Integrating Science, Literacy, and Technology in Primary Classrooms (p. 22)
8:00–9:00 AM	E–H	Pacific C, Renaissance	Teaching with Minecraft Across the Content Areas (p. 26)
8:00–9:00 AM	M–H	258C, BCEC	Liberating Literacy Strategies for Today's Science Classroom (p. 23)
8:00–9:00 AM	H	254A, BCEC	NSTA Press® Session: Reaching the Next Stephen Hawking: Tips for Including Students with Disabilities in Advanced Science Classes (p. 22)
8:00–9:00 AM	G	252A, BCEC	The Shell Science Teaching Award: Fueling Success with Students (p. 22)
8:00–9:00 AM	E–H	Atlantic 2, Renaissance	Using Case Study Analysis as a Tool for Differentiating Science Instruction for Students with Special Needs (p. 31)
8:00–9:00 AM	G	Atlantic 3, Renaissance	Preparing Today's Youth to Become Tomorrow's Computational Thinking–enabled Scientists and Engineers (p. 24)
8:00–9:00 AM	E	253A, BCEC	NARST Session: Establishing Trust via Lesson Study (p. 22)
8:00–9:00 AM	G	Pacific F, Renaissance	ASTE Session: A Paradigm Shift Is Underway—Are You and Your Students Ready? (p. 26)
8:00–9:00 AM	E	Otis, Westin	DuPont Presents: Bringing Literacy and STEM Together—BLAST (p. 32)
8:00–9:00 AM	M–H	Caspian, Renaissance	SCST Session: Assessing the *NGSS* Performance Expectations: Teachers' Reflections on Successes and Challenges when Using Hands-On Performance Tasks (p. 24)

8:00–9:00 AM	C	Caspian, Renaissance	SCST Session: Headline News: Using Current Topics to Facilitate Student Research, Argumentation, and Understanding of the Multivariate Nature of Controversies (p. 24)
8:00–9:00 AM	I	Harbor Ballroom I, Westin	CSSS Session: Core K–12 Ideas That Support Student Understanding of the *NGSS* (p. 32)
8:00–9:00 AM	G	203, BCEC	BSCS Pathway Session: Exploring the *NGSS* Practices of Science and Engineering (p. 29)
8:00–9:00 AM	M	209, BCEC	Wheelock Pathway Session: Connecting Science and Literacy in the Middle School Classroom (p. 21)
8:00–9:00 AM	E–H	Stone, Westin	Crystallography: A World of Wonders (p. 32)
8:00–9:15 AM	M	Grand Ballroom A/B, Westin	Meet Me in the Middle Session: Bring Your Own Breakfast (BYOB) for Middle School Educators (p. 32)
8:00–9:30 AM	5	151A, BCEC	SparkFun: "Scratch"ing the Surface of Programming (p. 34)
8:00–9:30 AM	6–C	107B, BCEC	Neuroscience as a STEM Subject (p. 34)
8:00–9:30 AM	G	206 A/B, BCEC	NGSS Pathway Session: Developing a STEM Philanthropic Plan (p. 32)
8:00–9:30 AM	3–6	152, BCEC	Online Assessment that Informs Instruction! (p. 35)
8:00–9:30 AM	6	258B, BCEC	What the Heck Happened?! (p. 36)
8:00–9:30 AM	G	154, BCEC	Evaluating Student Knowledge: Formative Assessments with Discovery Education Science Techbook (p. 35)
8:00–9:30 AM	6–8	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Getting Started (p. 36)
8:00–9:30 AM	K–5	107C, BCEC	Applying *Common Core State Standards, ELA* Through Active Science Instruction (p. 34)
8:00–9:30 AM	6–12	104A, BCEC	Explore STEM Integration with PASCO Probeware—Free Sensor Set for Five Attendees! (p. 33)
8:00–9:30 AM	K–12	104B, BCEC	Transform Your Classroom and Integrate Engineering Concepts with PLTW's K–12 STEM Programs (p. 33)
8:00–9:30 AM	3–8	153A, BCEC	K–8 Science with Vernier (p. 35)
8:00–9:30 AM	K–8	103, BCEC	Captivating Digital Natives' Imaginations with STEM Visual Literacy (p. 33)
8:00–9:30 AM	3–12	153C, BCEC	Inspire Scientific Minds with Technology and Manipulatives (p. 35)
8:00–10:00 AM	P–E	Ballroom East, BCEC	Elementary Extravaganza (p. 37)
9:30–10:00 AM	M	Commonwealth Ballroom B, Westin	Meet Me in the Middle Session: Synergy Between Science and Literacy in the Classroom (p. 40)
9:30–10:00 AM	M	Commonwealth Ballroom B, Westin	Meet Me in the Middle Session: *Middleschoolchemistry.com*—Big Ideas About the Very Small (p. 40)
9:30–10:30 AM	E–M	Stone, Westin	How-To Workshop on Organizing a STEM Design Challenge Day (p. 49)
9:30–10:30 AM	E	158, BCEC	Building Bridges Through Elementary STEM (p. 40)
9:30–10:30 AM	G	Atlantic 2, Renaissance	Differentiating Teacher Research Through Teacher Inquiry Groups (p. 49)
9:30–10:30 AM	G	Pacific C, Renaissance	Getting Students Involved in a Virtual Science Fair with Tech Advisers (p. 44)
9:30–10:30 AM	M	255, BCEC	Engaging Teens in STEM Online: The Sparticl Challenge (p. 41)
9:30–10:30 AM	S	260, BCEC	Science Education Fellowship Program: Supporting District Cohorts of Science Teacher Leaders (p. 42)
9:30–10:30 AM	P–M	207, BCEC	Science Starters (p. 48)
9:30–10:30 AM	M–H	Plaza A, Seaport	Teaching Science with Case Studies (p. 44)
9:30–10:30 AM	G	259B, BCEC	Going Beyond Data Collection—Sharing in a Science Classroom (p. 42)
9:30–10:30 AM	G	Mediterranean, Renaissance	The Top 5 Reasons to Stop Using the 5-Step Scientific Method (p. 43)
9:30–10:30 AM	E	252B, BCEC	Science Journals: Using Technology to Expand Collaboration and Sharing (p. 41)
9:30–10:30 AM	E	259A, BCEC	Doing Science the Scientific Way: It's Not as Hard as It Sounds (p. 42)
9:30–10:30 AM	G	Douglass, Westin	Blending the Arts with Chain Reaction STEAM Machines™ (p. 49)
9:30–10:30 AM	H–C	Paine, Westin	Using a Tuning Protocol to Analyze Lesson Plans in a Student Teacher Seminar (p. 46)

9:30–10:30 AM	E	212, BCEC	Energy Literacy: A Grade 4 Energy Unit Based on the *NGSS* and Incorporating Environmental Education (p. 48)
9:30–10:30 AM	G	Commonwealth Ballroom C, Westin	Science and Literacy? That's NEWS to Us! (p. 49)
9:30–10:30 AM	G	Harbor Ballroom III, Westin	The Magic of Science! Motivate and Excite Your Science Students Using Discrepant Events (p. 46)
9:30–10:30 AM	M–H	Lighthouse I, Seaport	Developing Students' Scientific Practice Skills with NOVA Labs (p. 44)
9:30–10:30 AM	G	Brewster, Renaissance	Virtually Yours: Exploratorium Teacher Institute Online Resources (p. 43)
9:30–10:30 AM	E	161, BCEC	Science Beyond the Standards! (p. 47)
9:30–10:30 AM	G	Lewis, Westin	Virtual Field Trips—Bring the World to Your Classroom (p. 46)
9:30–10:30 AM	G	Alcott, Westin	NSELA Session: Tools for Science Leaders, Part 2 (p. 45)
9:30–10:30 AM	I	256, BCEC	Out-of-This-World Experiments: Student Work on the International Space Station (p. 41)
9:30–10:30 AM	E	160A, BCEC	Maximize Instructional Time and Student Learning: Science in Reading and Reading in Science (p. 47)
9:30–10:30 AM	G	254A, BCEC	NSTA Press® Session: Teacher Liability—Walking on the Safer Side! (p. 41)
9:30–10:30 AM	H	Plaza C, Seaport	STEM Can Change the World: Providing Context and Connections for Tackling Global Problems (p. 45)
9:30–10:30 AM	M	255, BCEC	STEM on a Budget Works! (p. 41)
9:30–10:30 AM	E	213, BCEC	Full STEAM Ahead (p. 48)
9:30–10:30 AM	G	Burroughs, Westin	We Turned Over a New (Green) LEAF: Leading, Educating, Achieving, and Fostering Healthy, Green Schools for All (p. 45)
9:30–10:30 AM	E–H	Griffin, Westin	Let's Talk Science: Using Baby Steps to Design a Districtwide Science Collaborative (p. 46)
9:30–10:30 AM	G	209, BCEC	Wheelock Pathway Session: Supporting Science Talk in PreK Classrooms (p. 40)
9:30–10:30 AM	G	Harbor Ballroom I, Westin	CSSS Session: A Vision for Science Education: The Integration of the *NGSS* Practices in Classroom Instruction (p. 49)
9:30–10:30 AM	M	Grand Ballroom C, Westin	Meet Me in the Middle Session: Science Formative Assessment: What Do Middle School Students Really Think? (p. 46)
9:30–10:30 AM	M	Commonwealth Ballroom A, Westin	Meet Me in the Middle Session: What the *NGSS* Means to a Middle Level Teacher—Thoughts from a Member of the *NGSS* Writing Team (p. 45)
9:30–10:30 AM	M–H	Constitution, Seaport	AMSE Session: Using Games and Challenges to Formatively Assess Students' Conceptual Understanding in Science (p. 44)
9:30–10:30 AM	E–H	Faneuil, Westin	Proficient, Exemplary, and Flexible—Technology, the *NGSS,* and My Classroom (p. 46)
9:30–10:30 AM	G	Grand Ballroom C, Westin	Meet Me in the Middle Session: The NSTA Learning Center—Free Professional Development Resources and Opportunities for Educators (p. 46)
9:30–10:30 AM	M	Commonwealth Ballroom A, Westin	Meet Me in the Middle Session: Curriculum Crosswalks: Aligning the *Common Core State Standards, Mathematics* and the *Next Generation Science Standards* (p. 45)
9:30–10:30 AM	M–H	Plaza B, Seaport	Creatively Integrate Multiple Technologies as You Connect Mathematics and Science (p. 44)
9:30–10:30 AM	I	Ballroom West/Group 1, BCEC	Informal Science Day Session: Taking the Lead in Developing the STEM Education Resources of Your Community: Asset-based Partnerships Build Capacity and Increase Effectiveness (p. 42)
9:30–10:30 AM	I	Ballroom West/Group 3, BCEC	Informal Science Day Session: STEM-Tastic After-school Science! (p. 42)
9:30–10:30 AM	I	Ballroom West/Group 2, BCEC	Informal Science Day Session: Revolutionary Venus: Investigating the Heliocentric Solar System in the Context of the *NGSS* (p. 42)
9:30 AM–12:30 PM	G	203, BCEC	BSCS Pathway Session: Explanation and Argumentation in the Classroom *(NGSS* Practices 6 and 7) (p. 50)
10:00–10:30 AM	M	Commonwealth Ballroom B, Westin	Meet Me in the Middle Session: Integrated Learning Communities for Science-Math-Language Arts in Middle School as a Strategy to Reach the *Next Generation Science Standards* (p. 50)

10:00–11:00 AM	P–M	211, BCEC	CESI Session: Family Science Events—Logistics, Engaging Science, and Parent Involvement (p. 50)
10:00–11:30 AM	1–10	153C, BCEC	Integrating Online Learning into the Science Classroom (p. 54)
10:00–11:30 AM	6–8	156B, BCEC	MINDSTORMS® EV3 Robotics in the Middle School Classroom: Getting Started (p. 54)
10:00–11:30 AM	G	154, BCEC	STEMtastic Strategies (p. 54)
10:00–11:30 AM	2–5	108, BCEC	A Revolutionary Way to Address All Your Standards with National Geographic (p. 52)
10:00–11:30 AM	K–5	152, BCEC	Engineering in Elementary Science: Designing with FOSS (p. 53)
10:00–11:30 AM	K–12	104A, BCEC	Advancing *NGSS* Practices with Probeware—Free Sensor Set for Five Attendees! (p. 51)
10:00–11:30 AM	8–C	109A, BCEC	What If Your STEM Program Could Talk, Walk, and Interact with Your Students—All the Way from Middle School to College? (p. 53)
10:00 AM–12 Noon	G	206 A/B, BCEC	NGSS Pathway Session: Exploring How the *NGSS* and *CCSS Mathematics* Work Together (p. 55)
11:00 AM–12 Noon	E/S	209, BCEC	Wheelock Pathway Session: Weaving Science and Literacy into the Elementary Classroom to Meet the *NGSS* and *CCSS* (p. 57)
11:00 AM–12 Noon	G	Harbor Ballroom I, Westin	CSSS Session: Understanding the Student Science Performances in the *NGSS* (p. 67)
11:00 AM–12 Noon	G	252A, BCEC	The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 57)
11:00 AM–12 Noon	S	Constitution, Seaport	AMSE Session: Leadership for the Next Generation in Science Education (p. 60)
11:00 AM–12 Noon	E–M	211, BCEC	CESI Session: Do You Have a Problem? (p. 65)
11:00 AM–12 Noon	G	254A, BCEC	NSTA Press® Session: Get the FACTs for Supporting Evidence-based Talk and Argument (p. 58)
11:00 AM–12 Noon	M–H	Otis, Westin	DuPont Presents: The Science of Packaging (p. 67)
11:00 AM–12 Noon	M	Commonwealth Ballroom A, Westin	Meet Me in the Middle Session: Climate Change Curriculum to Support Argumentation in Middle School (p. 68)
11:00 AM–12 Noon	M	Commonwealth Ballroom B, Westin	Meet Me in the Middle Session: Cheap and Cool Education Technology for the Middle School Classroom (p. 61)
11:00 AM–12 Noon	E–H	253B, BCEC	STEM Share-a-Thon (p. 58)
11:00 AM–12 Noon	M	Commonwealth Ballroom A, Westin	Meet Me in the Middle Session: Everyday Engineering (p. 56)
11:00 AM–12 Noon	M–H	Plaza B, Seaport	Build a Bridge and Get Over It! (p. 61)
11:00 AM–12 Noon	E–H	Griffin, Westin	Getting at the Core of Project-based and Inquiry Science (p. 62)
11:00 AM–12 Noon	P–M	252B, BCEC	Building Family STEM Literacy (p. 57)
11:00 AM–12 Noon	I	Ballroom West/Group 1, BCEC	Informal Science Day Session: Collaborate to Innovate: An Interactive Session to Develop Exciting Partnerships for Recruiting and Retaining Girls in STEM (p. 59)
11:00 AM–12 Noon	I	Ballroom West/Group 4, BCEC	Informal Science Day Session: Web-based Classroom Resources: How Evaluations Can Aid Program Development (p. 59)
11:00 AM–12 Noon	I	Ballroom West/Group 3, BCEC	Informal Science Day Session: *Informalscience.org:* A Newly Rebuilt Resource for Informal Educators (p. 59)
11:00 AM–12 Noon	G	261, BCEC	Keys to Success for The DuPont Challenge Science Essay Competition (p. 59)
11:00 AM–12 Noon	P–E	Ballroom West/Group 2, BCEC	Informal Science Day Session: Engaging Early Childhood Educators with Science: Presentation of and Findings from the Sackler Early Childhood Science Education Initiative (p. 59)
11:00 AM–12 Noon	M–C	Lewis, Westin	Sense-of-Place Writing Templates: Connect Your Students' Past Experiences with Science AND Literacy! (p. 62)
11:00 AM–12 Noon	M–H	Plaza C, Seaport	Toying Around with the Nature of Science (p. 61)
11:00 AM–12 Noon	H	Seaport Ballroom B, Seaport	Using the Five Practices Framework to Facilitate Productive Classroom Discussions (p. 67)
11:00 AM–12 Noon	E	212, BCEC	Exploring Interactions in the Sciences: Inquiry-based Investigations (p. 65)
11:00 AM–12 Noon	I	256, BCEC	Creating Meaningful Field Trip Experiences (p. 66)
11:00 AM–12 Noon	M–H	Lighthouse I, Seaport	Moviemaking in an iMinute (p. 61)

11:00 AM–12 Noon	G	Pacific C, Renaissance	Amazing Apps and Scintillating Software for Science (p. 60)
11:00 AM–12 Noon	E–H	253A, BCEC	NARST Session: Exploring Next Generation Curriculum Models Implementing the Vision in the NRC *Framework* and the *NGSS* (p. 57)
11:00 AM–12 Noon	G	260, BCEC	How to Effectively Implement a Curricular Review as a Teacher Leader (p. 58)
11:00 AM–12 Noon	E	158, BCEC	If I Do a Lab, Must I Write a Lab Report? (p. 56)
11:00 AM–12 Noon	P–E	160C, BCEC	And They All Lived Scientifically Ever After (p. 65)
11:00 AM–12 Noon	G	Lewis, Westin	Using Writing to Motivate Students to Learn Science (p. 62)
11:00 AM–12 Noon	C	Brewster, Renaissance	Online Teaching and Learning—Not Your Parents' Classroom (p. 59)
11:00 AM–12 Noon	E/S	Alcott, Westin	NSELA Session: Lead, Follow, or Get Out of the Way (p. 61)
11:00 AM–12 Noon	E–M	207, BCEC	Elementary Engineering (p. 65)
11:00 AM–12 Noon	G	Stone, Westin	A Mutual Relationship Between Science and Literacy (p. 67)
11:00 AM–12 Noon	M	254B, BCEC	Space Week: An Integrated Curriculum Unit for Grades 6–8 (p. 66)
11:00 AM–12 Noon	H–C	Pacific A/B, Renaissance	The Science Behind Advanced Coursework in High School (p. 60)
11:00 AM–12 Noon	P–E	213, BCEC	A Way with Words: Integrating Science and Engineering in Reading (p. 65)
11:00 AM–12 Noon	G	Pacific C, Renaissance	Teaching with Screen-capture Podcasts (p. 60)
11:00 AM–12 Noon	E	259A, BCEC	Engineering Made Easy: *NGSS* Practices for Elementary Students (p. 66)
11:00 AM–12 Noon	P	252B, BCEC	Preschool STEM Family Night: A University, Preschool, and Community Partnership (p. 57)
11:00 AM–12 Noon	G	259B, BCEC	Google Me This: How to Make Collaboration Work in a Wiki World (p. 58)
11:00 AM–12 Noon	M	Commonwealth Ballroom B, Westin	Meet Me in the Middle Session: Practical Lessons and Demonstrations on a Budget (p. 61)
11:00 AM–12 Noon	G	Atlantic 1, Renaissance	Using Web-based Curriculum Materials to Build Strong STEM Programs (p. 66)
11:00 AM–12 Noon	G	Pacific F, Renaissance	An Assessment for a 21st-Century Society: The National Assessment of Educational Progress Technology and Engineering Literacy Assessment (p. 60)
11:00 AM–12 Noon	G	Faneuil, Westin	Video Analysis as Reflective Practice (p. 62)
11:00 AM–12 Noon	G	Grand Ballroom C, Westin	Meet Me in the Middle Session: Science in 32 Pages: The Brilliant and Graceful Work of Jason Chin (p. 62)
11:00 AM–12 Noon	E–H	Atlantic 2, Renaissance	Building Students' Understanding of Theories One Puzzle Piece at a Time (p. 66)
11:00 AM–12 Noon	M	Grand Ballroom C, Westin	Meet Me in the Middle Session: Candy Geometry: Using Mathematical Models to Solve a Problem—Sweet! (p. 62)
11:00 AM–12 Noon	E–H	Mediterranean, Renaissance	Globalizing Your Science Class for the 21st Century (p. 59)
11:00 AM–12 Noon	S	Paine, Westin	Designing Professional Development and Using Technology to Support It (p. 63)
11:00 AM–12 Noon	G	Harbor Ballroom III, Westin	Using the 5Es to Become Next Generation Ready (p. 62)
11:00 AM–12 Noon	M	255, BCEC	Disciplinary Literacy in Middle School Science Classrooms (p. 58)
11:00 AM–12 Noon	G	Harbor Ballroom II, Westin	Expanding Students' Digital Footprint Beyond Social Media (p. 62)
11:00 AM–12 Noon	M–H	Seaport Ballroom A, Seaport	Literacy Skills for Visual Scientific Text (p. 66)
11:00 AM–12 Noon	P–2	Burroughs, Westin	Exploring the Science Encountered in the Young Child's World—Nurturing, Observing, Questioning, Investigating, Thinking, and Talking About Science (p. 61)
11:00 AM–12 Noon	G	Plaza A, Seaport	Teachers Developing as Leaders: A Panel Discussion (p. 61)
12 Noon–1:00 PM	E–M	211, BCEC	CESI Session: So You Want to Be a Scientist—Where Science Meets Adventure (p. 68)
12 Noon–1:30 PM	6–12	104B, BCEC	STEM Behind Hollywood—Adventure, Drama, and Mystery in Your Classroom (p. 70)
12 Noon–1:30 PM	K–8	104A, BCEC	SPARKscience: Sensor-based Science for K-8—Free Sensor Set for Five Attendees! (p. 70)
12 Noon–1:30 PM	K–8	103, BCEC	Focus and Explore Wave Energy and STEM Education K–8 (p. 68)
12 Noon–1:30 PM	3–C	153B, BCEC	Chromebook, Android, and BYOD with Vernier (p. 72)
12 Noon–1:30 PM	K–6	156B, BCEC	Machines and Mechanisms for ALL Ages (p. 73)
12 Noon–1:30 PM	1–12	153C, BCEC	STEM Certificate Program (p. 70)

12 Noon–1:30 PM	K–8	152, BCEC	Let's Go Outside! Taking Science to the School Yard (p. 72)
12 Noon–1:30 PM	K–6	258B, BCEC	Elementary Teacher Survival Kit (p. 73)
12 Noon–1:30 PM	6–C	106, BCEC	Simple Programming Tools to Enhance Student Engagement (p. 70)
12 Noon–1:30 PM	G	154, BCEC	Busting the Myth that Common Core State Standards Are Difficult to Meet in Science (p. 72)
12:30–1:00 PM	E–H	Commonwealth Ballroom B, Westin	Teaching Science to English Language Learners (ELLs) (p. 74)
12:30–1:00 PM	M–C	254A, BCEC	NSTA Press® Session: *Beyond the Numbers: Making Sense of Statistics* (p. 74)
12:30–1:30 PM	G	Harbor Ballroom II, Westin	reVisioning: A Creative Process for Teaching (p. 80)
12:30–1:30 PM	H	Lighthouse I, Seaport	Designing an Integrated, Student-centered STEM Curriculum (p. 79)
12:30–1:30 PM	G	Commonwealth Ballroom C, Westin	SMART Books (p. 83)
12:30–1:30 PM	E–H	Pacific C, Renaissance	The iPad Ecosystem: Peripherals That Blend Digital and Traditional Learning (p. 78)
12:30–1:30 PM	E	212, BCEC	Know Science? Know Engineering? Putting Science Practices and Engineering Design Together in Your Elementary Classroom (p. 82)
12:30–1:30 PM	M–H	258C, BCEC	Collaborative Editing of Student Work Online in Science and English Language Arts (p. 76)
12:30–1:30 PM	E–M	207, BCEC	Integrating English Language Arts, Math, and *NGSS* into the Elementary and Middle School Classroom (p. 82)
12:30–1:30 PM	H	Stone, Westin	Engineer Your World: Engineering Design for High Schools (p. 84)
12:30–1:30 PM	G	Harbor Ballroom I, Westin	Got the iPads, Now Let's Get "Appy"! (p. 84)
12:30–1:30 PM	G	Pacific F, Renaissance	Large-scale Assessment in Engineering Courses Using Multiple Approaches (p. 78)
12:30–1:30 PM	E–H	Atlantic 2, Renaissance	Up for the Challenge! Fun Science Challenges That Build Teamwork and Engage All Students (p. 83)
12:30–1:30 PM	G	Lewis, Westin	Teaching Science in Literature (p. 80)
12:30–1:30 PM	G	Harbor Ballroom III, Westin	Photabulary That Connects! (p. 80)
12:30–1:30 PM	G	Douglass, Westin	Integrating the *Common Core State Standards* Through the Interdisciplinary Structure of STEM (p. 83)
12:30–1:30 PM	C	Pacific G/H, Renaissance	edTPA and Methods for Teaching Science Courses: Ideas for Increasing Teacher Candidate Success (p. 78)
12:30–1:30 PM	E–M	158, BCEC	Water Science for Elementary Students (p.)
12:30–1:30 PM	G	Brewster, Renaissance	Assessments, Research, and Scavenger Hunts, Oh My! Using QR Codes in the Science Classroom (p. 78)
12:30–1:30 PM	G	Burroughs, Westin	Engaging Students in Argumentation Across Elementary, Middle School, and High School (p. 79)
12:30–1:30 PM	G	260, BCEC	Analyzing Student Work for Language Structures That Support Conceptual Understanding (p. 83)
12:30–1:30 PM	E–H	Lewis, Westin	Between the Lines: Discovering Science with Literature (p. 80)
12:30–1:30 PM	E	213, BCEC	The Integrating Engineering and Literacy Project: Engaging Elementary Students in Engineering Design Challenges from Children's Literature (p. 82)
12:30–1:30 PM	H	Plaza B, Seaport	Online, Just-in-Time Professional Development (p. 79)
12:30–1:30 PM	E–H	Faneuil, Westin	Spark Student Interest: Integrate Engineering into Your Science Teaching (p. 79)
12:30–1:30 PM	M	255, BCEC	Assessment of Approach, Inquiry, and Evidence in Middle School (p. 76)
12:30–1:30 PM	G	Commonwealth Ballroom A, Westin	University STEM Faculty and K–8 Teachers: A Winning Partnership for STEM Education (p. 79)
12:30–1:30 PM	G	Alcott, Westin	Focus on Formative Assessment in the Science Classroom to Realize the Vision of the *NGSS* (p. 79)
12:30–1:30 PM	E	160C, BCEC	Exciting Engineering Endeavors (p. 81)
12:30–1:30 PM	E	252B, BCEC	The Claim-Evidence-Reason Framework in Scientific Explanation: Lessons from Field Experience (p. 76)
12:30–1:30 PM	M–H	Seaport Ballroom B, Seaport	Teachers on the Estuary: A Taste of TOTE (p. 83)
12:30–1:30 PM	G	Mediterranean, Renaissance	History of Science, Nature of Science, and Science Content (p. 78)

12:30–1:30 PM	P–E	252B, BCEC	Strategies for Teaching in the Inclusive Elementary Science Classroom (p. 76)
12:30–1:30 PM	G	259B, BCEC	Engage Students by Writing Your Own Science Book (p. 76)
12:30–1:30 PM	I	Ballroom West/Group 3, BCEC	Informal Science Day Session: Colors of Light (p. 77)
12:30–1:30 PM	I	Ballroom West/Group 1, BCEC	Informal Science Day Session: Maker Corps: Cultivating Makers and Creativity (p. 77)
12:30–1:30 PM	I	Ballroom West/Group 4, BCEC	Informal Science Day Session: Using Role Models Effectively in Your STEM Program (p. 78)
12:30–1:30 PM	9–12	156C, BCEC	Project-based Learning Promotes the Development of *CCSS ELA* in the Secondary Science Classroom (p. 84)
12:30–1:30 PM	M–H	Seaport Ballroom A, Seaport	Affordable Inquiries from a Third World Country for Your Classroom (p. 83)
12:30–1:30 PM	G	253A, BCEC	NARST Session: Research to Inform the Implementation of the *NGSS* (p. 76)
12:30–1:30 PM	P–E	Otis, Westin	DuPont Presents: Portable Affordable Simple STEM (PASS) (p. 84)
12:30–1:30 PM	G	Constitution, Seaport	AMSE Session: A Science Teacher's Power: Concrete Strategies for Improved Classroom Equity (p. 79)
12:30–1:30 PM	M–H	Constitution, Seaport	AMSE Session: Small Talk, Big Ideas! (p. 79)
12:30–1:30 PM	E	253C, BCEC	NSTA Press® Session: *Picture-Perfect Science Lessons:* Using Picture Books to Guide Inquiry (p. 82)
12:30–1:30 PM	G	Grand Ballroom C, Westin	CSSS Session: Professional Development for the NGSS and *CCSS ELA* in Elementary Classrooms (p. 80)
12:30–2:00 PM	G	Grand Ballroom A/B, Westin	Meet Me in the Middle Session: Lunch and Learn Share-a-Thon (p. 84)
1:00–3:00 PM	G	206 A/B, BCEC	NGSS Pathway Session: Making Connections Between Engineering, Technology, Science, and Society in Your Local Community (p. 85)
2:00–2:30 PM	P–M	Constitution, Seaport	AMSE Session: Science Instruction for All Students (p. 85)
2:00–2:30 PM	G	Griffin, Westin	Increasing Minority Participation in STEM Through Autonomy Support (p. 85)
2:00–2:30 PM	M–H	Plaza A, Seaport	Formative Assessment of Process Skills in Science (p. 85)
2:00–3:00 PM	G	Faneuil, Westin	Continue Changing the Equation Through Addressing Engineering and Science with Technology (p. 91)
2:00–3:00 PM	E	213, BCEC	Integrating Science and Engineering Learning (p. 93)
2:00–3:00 PM	E–M	207, BCEC	Integrating Science, Mathematics, and Technology into Elementary Classroom Units (p. 92)
2:00–3:00 PM	G	253B, BCEC	Award-winning Share-a-Thon Featuring NSTA Distinguished Teachers (p. 88)
2:00–3:00 PM	G	Douglass, Westin	Geometry of Life: The Engineered World (p. 94)
2:00–3:00 PM	G	Harbor Ballroom II, Westin	High School Contributions to the Development of Presidential Early Career Awardees in Science and Engineering (PECASE) (p. 91)
2:00–3:00 PM	E/S	Stone, Westin	Connecting Science, Engineering, and Literacy in an Elementary Classroom (p. 94)
2:00–3:00 PM	G	Harbor Ballroom III, Westin	How Do We Know What They Know? Using Student Interviews to Illuminate Student Knowledge (p. 91)
2:00–3:00 PM	S	Quincy, Westin	Cycles of Inquiry Around Unit Planning, Delivery, and Student Outcomes (p. 91)
2:00–3:00 PM	M	Alcott, Westin	NSELA Session: Disciplinary Literacy in Middle School Science Classrooms (p. 90)
2:00–3:00 PM	M	255, BCEC	Discussion Strategies for Using Computer Simulations to Develop Understanding of Scientific Models (p. 88)
2:00–3:00 PM	E–H	Harbor Ballroom I, Westin	Some of the Above: Writing Quality Multiple-Choice Questions (p. 94)
2:00–3:00 PM	G	Brewster, Renaissance	Creating Professional Development e-Portfolios Using NOAA Resources (p. 89)
2:00–3:00 PM	G	Pacific G/H, Renaissance	Using the Nation's Report Card (NAEP) to Improve Science Education (p. 90)
2:00–3:00 PM	G	Lewis, Westin	The Best in Literature—How We Choose It, How We Use It (p. 91)

2:00–3:00 PM	G	Pacific C, Renaissance	Digital Tools for Teacher Leadership (p. 89)
2:00–3:00 PM	G	Pacific A/B, Renaissance	Project S.P.A.C.E.—a Case Study (p. 89)
2:00–3:00 PM	P–E	252B, BCEC	Connecting Science Content Using Trade Books! (p. 87)
2:00–3:00 PM	G	Mediterranean, Renaissance	Managing Science Fairs in the Classroom (p. 89)
2:00–3:00 PM	E/C	Atlantic 1, Renaissance	Science Trio: *NGSS* Practices, Nature of Science, and the Habits of Mind (p. 93)
2:00–3:00 PM	S	Burroughs, Westin	CSI and *NGSS*—Coordinators and Supervisors Implementing the *NGSS* (p. 90)
2:00–3:00 PM	M–C	Grand Ballroom D, Westin	Reason to Write: Argumentative and Persuasive Writing in the Science Classroom (p. 91)
2:00–3:00 PM	G	Commonwealth Ballroom B, Westin	Research Worth Reading: 2013 Research Selected by NSTA Affiliates (p. 90)
2:00–3:00 PM	P–E	259B, BCEC	Engineering Practices in Early Childhood: Designing Mechanisms with Mech-a-Blocks (p. 93)
2:00–3:00 PM	M–H	Seaport Ballroom B, Seaport	Scaffolding Instruction in the Science Classroom (p. 94)
2:00–3:00 PM	G	254A, BCEC	NSTA Press® Session: Special Needs Students in Science (p. 88)
2:00–3:00 PM	P–E	253C, BCEC	NSTA Press® Session: *Science & Children*—A Year of Inquiry (p. 93)
2:00–3:00 PM	M–H	Lighthouse I, Seaport	Collaborative Tools for Customizing STEM Instruction (p. 90)
2:00–3:00 PM	M	254B, BCEC	Let's Go STEM! Part I (p. 93)
2:00–3:00 PM	E–H	Commonwealth Ballroom C, Westin	Writing to Learn Through Science Notebooks/Journals in Elementary and Secondary Classrooms (p. 94)
2:00–3:00 PM	E	212, BCEC	Master Experimental Design and Science Practices (p. 93)
2:00–3:00 PM	E–M	158, BCEC	Next Generation Science Stations (p. 87)
2:00–3:00 PM	M–H	258C, BCEC	Bringing Primary Scientific Literature to the Classroom Through the *Journal of Emerging Investigators* (p. 89)
2:00–3:00 PM	M–H	Plaza B, Seaport	Writing to Learn Science (p. 90)
2:00–3:00 PM	G	Commonwealth Ballroom A, Westin	CSSS Session: The Next Generation of Science Leaders—What Does It Take to Prepare and Support Them? (p. 94)
2:00–3:00 PM	H	Caspian, Renaissance	SCST Session: Using Digital Microscopy as a Means of Teaching the Quantification of Qualitative Data (p. 89)
2:00–3:00 PM	M	Seaport Ballroom A, Seaport	Nature of Science and the *NGSS* Science and Engineering Practices (p. 94)
2:00–3:00 PM	G	Pacific F, Renaissance	Someday Is Not a Day of the Week: On-Time Tactics for Fighting Procrastination (p. 90)
2:00–3:00 PM	G	252A, BCEC	The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (p. 87)
2:00–3:00 PM	G	260, BCEC	Teacher Leaders in the RESTEP to STEM (p. 89)
2:00–3:00 PM	E	161, BCEC	Starting a Robotics Club for Elementary School Students: It's Easy! (p. 92)
2:00–3:00 PM	M–H	Otis, Westin	DuPont Presents: Fishing Your Way to a Sustainable Future (p. 94)
2:00–3:00 PM	6–C	156C, BCEC	Project-based Learning: A Gathering of Science Educators and It's About Time (p. 95)
2:00–3:30 PM	K–8	103, BCEC	Reflection and Application of the *NGSS:* Learning to Write to Argue with Claims and Evidence K–8 (p. 96)
2:00–3:30 PM	6–8	102B, BCEC	Bring Visual Science into 6–8 Classrooms—It's a Game Changer! (p. 96)
2:00–3:30 PM	4	258B, BCEC	Cool! Can We Do That Again?! (p. 96)
2:00–3:30 PM	3–C	153B, BCEC	iPad and Wireless Sensors with Vernier (p. 98)
2:00–3:30 PM	K–12	104A, BCEC	SPARKvue: Sensor-based Science for your iPad—Free Sensor Set for Five Attendees! (p. 96)
2:00–3:30 PM	7–12	151B, BCEC	Solving the Mystery of STEM Using Forensic Science (p. 98)
2:00–3:30 PM	3–12	153C, BCEC	Inspire Scientific Minds with Technology and Manipulatives (p. 98)
2:00–3:30 PM	G	104B, BCEC	Envelope Graphic Organizers—UnFOLDing the Possibilities (p. 96)
2:00–3:30 PM	6–8	107C, BCEC	Experience the Power of a Digital Middle School Program (p. 97)
2:00–3:30 PM	G–5	156B, BCEC	Bring the World of Digital Learning to Your Classroom with WeDo (p. 99)
2:00–3:30 PM	9–12	154, BCEC	Hands-On Digital in the High School Science Classroom (p. 98)
2:00–3:30 PM	6–C	106, BCEC	Simple Programming Tools to Enhance Student Engagement (p. 97)

2:00–3:30 PM	K–6	152, BCEC	Science Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 98)
2:00–4:00 PM	G	203, BCEC	BSCS Pathway Session: Obtaining, Evaluating, and Communicating Information in the Classroom *(NGSS* Practice 8) (p. 99)
2:00–4:00 PM	I	Ballroom West, BCEC	Informal Science Day Share-a-Thon (p. 100)
2:00–5:00 PM	E	209, BCEC	Wheelock Pathway Session: Science and Writing: A Research-based Approach that Enhances Learning in Both Domains (p. 100)
3:30–4:30 PM	S	Harbor Ballroom II, Westin	STEM Integration for District Leaders: Planning for Districtwide STEM Focus (p. 107)
3:30–4:30 PM	G	Mediterranean, Renaissance	Engineering and Life Sciences: Interdisciplinary Approaches Enabling Innovation at NASA Johnson Space Center (p. 105)
3:30–4:30 PM	H/S	Commonwealth Ballroom B, Westin	Integrating Climate Change and Engineering Across the High School Curricula (p. 106)
3:30–4:30 PM	G	Lewis, Westin	Using Literature as a Foundation for Teaching Science (p. 107)
3:30–4:30 PM	E–M	Stone, Westin	Meeting the *NGSS*—Climate Science and Global Change (p. 110)
3:30–4:30 PM	M–H	Constitution, Seaport	Science and Special Education: How to Make It Work (p. 105)
3:30–4:30 PM	E	252B, BCEC	Thinking, Analyzing, and Speaking Like Scientists (p. 104)
3:30–4:30 PM	H/I	258C, BCEC	Telling a Story with Data and Visuals: Critiquing and Creating Infographics in the Classroom (p. 109)
3:30–4:30 PM	M	Quincy, Westin	Best Practices for University-based Research Collaborations (p. 107)
3:30–4:30 PM	E–M	207, BCEC	Fun with Energy Sources: Exciting Student-led Energy Source Activities (p. 108)
3:30–4:30 PM	E	213, BCEC	Engineering Tales (p. 108)
3:30–4:30 PM	G	Harbor Ballroom II, Westin	It Takes a Village to Raise an Engineer: Involving Local Urban Communities in an Elementary STEM Initiative (p. 107)
3:30–4:30 PM	M–H	Seaport Ballroom B, Seaport	What's the Cache? Using Geocaching and EarthCaching to Educate and Excite Student About Natural and Human History (p. 109)
3:30–4:30 PM	E–H	Brewster, Renaissance	Teaching Science Content and the *NGSS* with Geotechnologies (p. 105)
3:30–4:30 PM	E–M	158, BCEC	The Nature Classroom: Your Door to Integrating Science and the *Common Core State Standards* (p. 102)
3:30–4:30 PM	H	Plaza B, Seaport	Sliding Classrooms: Lessons Learned Through Two Years of Practice (p. 106)
3:30–4:30 PM	M–H	254A, BCEC	NSTA Press® Session: Newly Designed Whole Class Inquiry Projects and Assessment in Biology, Chemistry, and Physics (p. 104)
3:30–4:30 PM	G	Douglass, Westin	Survival of the Fittest: Addressing the Needs of Teachers in Their First to Fifth Years (p. 109)
3:30–4:30 PM	E	212, BCEC	Elementary STEM Conservation Projects (p. 108)
3:30–4:30 PM	G	Griffin, Westin	Integrated STEM Education: Findings from a National Academies Study (p. 106)
3:30–4:30 PM	G	Lewis, Westin	Engage and Motivate Students with Trade Books: Ideas and Techniques from *Picture Perfect Science Lessons* (p. 107)
3:30–4:30 PM	G	Faneuil, Westin	Designing and Offering Professional Development Aligned to the New Science Standards (p. 106)
3:30–4:30 PM	H	Seaport Ballroom A, Seaport	POGIL (Process-Oriented Guided Inquiry Learning): The "L" Is Also for Learning Team (p. 109)
3:30–4:30 PM	E	253C, BCEC	NSTA Press® Session: The Authors' Picks! Teaching Science Through Trade Books (p. 109)
3:30–4:30 PM	G	Harbor Ballroom III, Westin	Notebooking for Meaning (p. 107)
3:30–4:30 PM	E–M	158, BCEC	Just a Few New Twists on Old Tricks to Improve Nonfiction Literacy (p. 102)
3:30–4:30 PM	E	252B, BCEC	Using Twin Texts to Engage Learners for Science (p. 104)
3:30–4:30 PM	E–M	161, BCEC	Science Fair on Steroids (p. 102)
3:30–4:30 PM	M–H	Lighthouse I, Seaport	Literacy in Science and Science in Reading: A Two-Way Street (p. 105)
3:30–4:30 PM	M	255, BCEC	Students CAN Design and You CAN Enjoy It! Let's Experiment! (p. 104)

3:30–4:30 PM	H	Plaza A, Seaport	Engineering by Design (p. 105)
3:30–4:30 PM	G	Grand Ballroom D, Westin	Teachers from the *NGSS* Writing Team: Our Journey and How Teachers Can Build on the *NGSS* Diversity and Equity Team's Work (p. 106)
3:30–4:30 PM	G	Commonwealth Ballroom C, Westin	Literacy in Support of Secondary Science Content (p. 109)
3:30–4:30 PM	M–H	Otis, Westin	DuPont Presents: Tracking the Spread of Infectious Diseases—Human and Animal (p. 109)
3:30–5:30 PM	G	206 A/B, BCEC	NGSS Pathway Session: Using Engineering Practices to Develop Science Concepts (p. 110)
4:00–5:00 PM	E	211, BCEC	CESI Session: Using Web-based Tools to Connect Science, Literacy, and Technology in the Elementary Grades (p. 110)
4:00–5:30 PM	K–C	258B, BCEC	The Private Eye® Way to Magnify Minds! Hands-On Science, Writing, and Art to Fire Up STEM (p. 114)
4:00–5:30 PM	K–12	105, BCEC	Using Problem-Based Learning to Up Your *NGSS* Game (p. 111)
4:00–5:30 PM	6–C	106, BCEC	Data Collection with High-Altitude Balloons (p. 112)
4:00–5:30 PM	6–8	154, BCEC	Celebrate Discovery Education's Newest Life Science Program (p. 113)
4:00–5:30 PM	9–C	108, BCEC	Nanotechnology: Hands-On Activities for All Disciplines (p. 112)
4:00–5:30 PM	9–12	104A, BCEC	SPARKscience: Sensor-based Science for High School—Free Sensor Set for Five Attendees! (p. 111)
4:00–5:30 PM	K–8	103, BCEC	Great Explorations in Math and Science for the Next Generation: The Roles of Water in Earth System, Ecosystems, and Human Activity (p. 111)
4:00–5:30 PM	6–9	107B, BCEC	Engineering Design *vs.* Scientific Practices: A Closer Look at *NGSS* Practices (p. 112)
4:00–6:00 PM	G	Grand Ballroom A, Westin	NSTA/NSELA Leadership Standards Forum: *NGSS:* Using Standards as Leverage to Build Science and Language Literacy (p. 114)
5:00–6:00 PM	M	Commonwealth Ballroom A, Westin	CSSS Session: Simulations for Assessments That Integrate Practices, Core Ideas, and Crosscutting Concepts (p. 120)
5:00–6:00 PM	E	254A, BCEC	NSTA Press® Session: Five E(z) Elementary Steps to Next Generation Science Teaching (p. 115)
5:00–6:00 PM	P–M	207, BCEC	MacGyver Science (p. 117)
5:00–6:00 PM	E–M	161, BCEC	Bring the Magic of Space to Your Classroom! (p. 115)
5:00–6:00 PM	G	253C, BCEC	NSTA Press® Session: Argumentation in the Science Classroom (p. 118)
5:00–6:00 PM	G	260, BCEC	Developing Teachers into Master Educators and Leaders: National Board Certification (p. 116)
5:00–6:00 PM	I	256, BCEC	The Perfect Package: Tying Together STEM Education and Community-based Service Learning (p. 118)
5:00–6:00 PM	E–M	158, BCEC	Building Scientific Understanding Through the Visual Arts (p. 115)
5:00–6:00 PM	P–E	213, BCEC	Integrating the Performing Arts with Elementary Science (p. 118)
5:00–6:00 PM	E–H	Commonwealth Ballroom C, Westin	Building Visual Literacy by Integrating Science and Math (p. 120)
5:00–6:00 PM	G	Faneuil, Westin	Problem-Based Learning: A Perfect Fit for *NGSS* and *CCSS* (p. 116)
5:00–6:00 PM	M–H	Plaza B, Seaport	New Teacher Boot Camp (p. 116)
5:00–6:00 PM	G	Griffin, Westin	Changing the Face of Science: Inspiring Future STEM Professionals (p. 116)
5:00–6:00 PM	G	Commonwealth Ballroom B, Westin	Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success (p. 116)
5:00–6:00 PM	G	Douglass, Westin	Using NASA Real-World Engineering to Reinforce Science (p. 120)
5:00–6:00 PM	M–H	Seaport Ballroom A, Seaport	Soils—More Than the Dirt Under Your Feet (p. 120)
5:00–6:00 PM	H/I	Plaza A, Seaport	Mercury Deposition in New England: High School Students Get Their Feet Wet for Citizen Science (p. 116)
5:00–6:00 PM	M	Seaport Ballroom B, Seaport	Supporting Literacy in Science Through "Paired Passage Prompts" (p. 120)
5:00–6:00 PM	M	255, BCEC	Society's Grand Challenges for Engineering in the Science Classroom (p. 115)
5:00–6:00 PM	E	252B, BCEC	Enhancing Scientific Inquiry with the iPad (p. 115)
5:00–6:00 PM	G	Mediterranean, Renaissance	How a Title 1 Middle School Became a Statewide Leader in STEM Collaborations (p. 116)
6:00–11:45 PM	G	Caspian, Renaissance	A Festival of Engineering, Technology, and Science Treats as Related to STEM, the NRC *Framework,* and the *NGSS,* Part 2 (p. 122)

Physics/Physical Science

8:00–9:00 AM	9–12	156C, BCEC	Engineering in the *Next Generation Science Standards* (p. 32)
8:00–9:00 AM	E–M	259A, BCEC	Using Electric Circuit Puzzles for Design and Assessment (p. 30)
8:00–9:00 AM	H–C	Pacific G/H, Renaissance	POGIL (Process-Oriented Guided Inquiry Learning) for the AP Physics Classroom (p. 26)
8:00–9:00 AM	G	205C, BCEC	Frisbee® Dog Physics (p. 21)
8:00–9:00 AM	M	159, BCEC	Teaching Physical Science Through Robotics and Engineering Design (p. 20)
8:00–9:00 AM	H/S	Paine, Westin	Infusing Engineering into the High School Physics Curriculum (p. 28)
8:00–9:00 AM	H	251, BCEC	A Student Exercise in Determining the Efficiency of a Working Photovoltaic Array (p. 22)
8:00–9:30 AM	6–12	258A, BCEC	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 36)
9:30–10:30 AM	M–H	Otis, Westin	DuPont Presents: Driving Science (p. 49)
9:30–10:30 AM	E–M	Ballroom West/Group 4, BCEC	Informal Science Day Session: Color and Light: Exploring Reflections at the Intersections of Art with Physical and Life Science (p. 43)
9:30–10:30 AM	M	159, BCEC	Science of Technology: Introduction to Engineering (p. 47)
9:30–10:30 AM	E	205C, BCEC	The Sounds of Music! (p. 48)
9:30–10:30 AM	P–E	252A, BCEC	Let's Get Physical—Come Play! (p. 40)
10:00–11:30 AM	5	151B, BCEC	Wind Turbine: A STEM Approach to Science Concepts (p. 53)
10:00–11:30 AM	9–C	109B, BCEC	Perimeter Institute: Beyond the Atom: Remodeling Particle Physics (p. 53)
10:00–11:30 AM	6–12	102B, BCEC	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 50)
10:00–11:30 AM	9–C	153A, BCEC	Advanced Physics with Vernier (p. 53)
10:00–11:30 AM	K–5	156A, BCEC	Building Readiness in Physical Science and the *NGSS* (p. 54)
10:00–11:30 AM	4–8	150, BCEC	The STEM Design Challenge (p. 53)
11:00 AM–12 Noon	E–M	159, BCEC	Engineering: Integrate the 3 Ds in the *NGSS* (p. 65)
11:00 AM–12 Noon	M–H	205C, BCEC	Connecting Physical Science and Engineering Through the Design of an Underwater Robot (p. 57)
12 Noon–1:30 PM	6–8	104C, BCEC	Hot Bulbs: Investigating Energy Efficiency (p. 70)
12 Noon–1:30 PM	6–12	156A, BCEC	STEM Engineering for Middle School and High School with TeacherGeek Wind Lift (p. 72)
12 Noon–1:30 PM	9–C	109B, BCEC	Perimeter Institute: Curved Space-time in the Classroom and GPS (p. 71)
12 Noon–1:30 PM	5	151B, BCEC	Chemistry and the Atom: Fun with Atom Building Games! (p. 71)
12:30–1:30 PM	P–2	Quincy, Westin	Project SEE: Science in Early Elementary (p. 80)
12:30–1:30 PM	E–M	160A, BCEC	SMILE with Physical Science (p. 81)
12:30–1:30 PM	G	254B, BCEC	Bring Nanoscience into Your Middle School Program! (p. 82)
12:30–1:30 PM	P–E	159, BCEC	The Magnet Lab: Magnets Is What We Do! (p. 75)
12:30–1:30 PM	G	205C, BCEC	Inquiry Stations (p. 82)
12:30–1:30 PM	E	Atlantic 1, Renaissance	Launching the University of Memphis Early Childhood Preservice Teachers' Science Preparation Opportunities at the Children's Museum: A Win Win for All Science Learners (p. 83)
2:00–3:00 PM	H–C	253A, BCEC	The 50 Best Physics Demos to Do Before You Die… (p. 88)
2:00–3:00 PM	M–H	205C, BCEC	Building Bridges Between Games and Curriculum (p. 92)
2:00–3:00 PM	E–M	159, BCEC	Dozens of Demonstrations—Physics for All Ages (p. 87)
2:00–3:00 PM	E	211, BCEC	CESI Session: Engineering Is Everywhere (E2) (p. 93)
3:30–4:30 PM	9–C	156C, BCEC	Active Physics: A Project-based Program Capturing the Essence of the *NGSS* and STEM (p. 110)
3:30–4:30 PM	M–C	256, BCEC	Explore Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics (STEM) (p. 109)
3:30–4:30 PM	M–C	257A, BCEC	Make Room for STEM by Flipping Your Classroom (p. 105)
3:30–4:30 PM	M–H	205C, BCEC	Engineering + Science = Music (p. 104)
3:30–4:30 PM	H	259B, BCEC	Bridging Engineering and Science (p. 105)
3:30–4:30 PM	P–E	159, BCEC	Energy Transformations for Kindergarten (p. 108)

3:30–4:30 PM	G	162A, BCEC	Conducting Small-Scale Microgravity Experiments in Your Classroom (p. 104)
5:00–6:00 PM	E–M	159, BCEC	Extreme Makeover, Science Edition (p. 117)
5:00–6:00 PM	H	251, BCEC	STEM and Physical Science: A Perfect Match (p. 118)
5:00–7:00 PM	K–12	210 A/B, BCEC	PASCO's 12th Annual Just Physics Evening Event (p. 120)

Index of Participants

Notes

Notes

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