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<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 – 9:00 am</td>
<td>Integrating Chromebook™ with Vernier Technology</td>
</tr>
<tr>
<td>9:30 – 10:30 am</td>
<td>Chemistry with Vernier</td>
</tr>
<tr>
<td>11:00 am – 12:00 pm</td>
<td>Biology with Vernier</td>
</tr>
<tr>
<td>12:30 – 1:30 pm</td>
<td>Integrating Chromebook™ with Vernier Technology</td>
</tr>
<tr>
<td>2:00 – 3:00 pm</td>
<td>Integrating iPad® with Vernier Technology</td>
</tr>
<tr>
<td>3:30 – 4:30 pm</td>
<td>Physics and Physical Science with Vernier</td>
</tr>
</tbody>
</table>

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www.vernier.com  
888-VERNIER
NSTA conferences give you the confidence boost you need as a science teacher. You’ll walk away feeling inspired and motivated and bring back freebies, ideas for lesson plans, and a better understanding of topics of interest.

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NSTA 2015 Area Conference on Science Education
Raising the Stakes in Science
Kansas City, Missouri • December 3–5, 2015

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NSTA Affiliates
National Science Teachers Association
1840 Wilson Blvd.
Arlington, VA 22201-3000
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www.nsta.org

NSTA Officers, Board of Directors, Council, and Alliance of Affiliates

Thursday Daily Program
Friday Daily Program
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NSTA Affiliates
Association for Multicultural Science Education (AMSE)
Association for Science Teacher Education (ASTE)
Association of Science-Technology Centers (ASTC)
Council for Elementary Science International (CESI)
Council of State Science Supervisors (CSSS)
National Association for Research in Science Teaching (NARST)
National Middle Level Science Teachers Association (NMLSTA)
National Science Education Leadership Association (NSELA)
Society for College Science Teachers (SCST)
Welcome to Kansas City: Raising the Stakes in Science

Welcome to the NSTA Kansas City Area Conference! On behalf of the Science Teachers of Missouri, we would like to welcome you to this exciting professional opportunity at this pivotal time for science education. Science and science education are increasingly recognized as being an important component to developing a well-rounded and successful student. It is inspiring to see science education in the spotlight with new opportunities and challenges.

With the increased exposure of science education comes an increased need for science educators to deliver high-quality and engaging science instruction. The theme for this conference—Raising the Stakes in Science—reflects the important time that we are in. The release of the Next Generation Science Standards has allowed educators to develop increasingly exciting resources, lessons, and opportunities for students and teachers. The conference is organized around the following three strands:

- The Art and Craftsmanship of Teaching
- Combining Science with Agriculture
- Achieving Success with the NGSS

Educators will be able to choose from more than 300 sessions and events to meet the professional goals and needs of each individual. In addition to the hundreds of teacher-led sessions, you are invited to attend a keynote address from Jerry Glover, a National Geographic Emerging Explorer, called From Farm to Flesh—How We Transform Soil into Civilization. The conference will also feature strand speakers, short courses, exhibitor workshops, an exhibit hall filled with leading science education companies, and more.

While you are trying to choose between the many opportunities at the conference, be sure to take time to network with other educators. Before you leave the conference, we invite you to stop by the Science Teachers of Missouri booth near registration and let us know how your conference experience is going and pick up some resources for yourself. We look forward to meeting you at this exciting event.

2015 Kansas City Area Conference Committee Leaders
Mike Szydlowski, Betsy (Elizabeth) O’Day, and James L. Puckett

Kansas City Conference Committee

We at NSTA wish to express our heartfelt thanks to the members of the Science Teachers of Missouri and the Kansas Association of Teachers of Science for the many hours of time they volunteered in planning this conference.

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Science Education Consultant
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Guides Manager
Mary Coogan
Liberty North High School
Liberty, MO

Manager of Services for People with Disabilities
Homer L. Ritter
Retired Educator
Merriam, KS

Volunteers Manager
Christie Purdon
Blue Valley Schools
Overland Park, KS

Program Committee
Strand Leader: Achieving Success with the NGSS
Susan German
Hallsville Middle School
Hallsville, MO

Strand Leader: The Art and Craftsmanship of Teaching
J. Carrie Launius
STOM President
St. Louis, MO

Strand Leader: Combining Science with Agriculture
Chris Embry Mohr
Olympia High School
Stanford, IL

Program Representatives
Paul Adams
NSTA Director, District XI
Fort Hays State University
Hays, KS

Joe M. Myers
Norfolk High School
Norfolk, NE
Welcome to Kansas City and the NSTA Area Conference on Science Education. The conference planning committee has embraced my presidential theme “Developing Creative Attitudes in Science” by creating strands that will enable teachers to implement strategies while engaging students in learning science and encouraging them to be the innovators of the future. The program is built around students “doing science” and not just “memorizing science facts.”

Using the conference theme “Raising the Stakes in Science,” you will find opportunities to connect science curricula with literature, mathematics, engineering, and technology using the Next Generation Science Standards. I encourage you to take full advantage of the three strands that support the conference theme.

• The Art and Craftsmanship of Teaching—Visit with Wendy Saul as she shares her work in science and literacy and her insights on sparking curiosity and active learning in students. The strand sessions will provide educators examples of effective instruction focusing on the processes and skills of high-quality science instruction.

• Combining Science with Agriculture—Be part of the conversation with Corey Flournoy as he shares how teachers can apply agriculture into their classrooms. The strand sessions will provide educators with examples of relevant and meaningful agricultural applications for their classrooms.

• Achieving Success with the NGSS—Visit with Page Keeley as she shares her views on teaching for conceptual understanding in science and explores how it is found in standards-based systems. The strand sessions will provide strategies to move students beyond the traditional classroom using the three dimensions in the NGSS.

We are in an exciting time for science education as we enable all students to become productive citizens in today’s world. I encourage you to ask questions, brainstorm ideas, and suggest strategies for building a better future in science education while you “create connections” here in Kansas City. I look forward to being part of your conversations!

Carolyn Hayes
2015–2016 NSTA President

Sponsors and Contributors to the Kansas City Conference

NSTA, STOM, KATS, and the Kansas City Planning Committee are extremely grateful to the following companies and associations for their generous contributions to the NSTA Kansas City Area Conference on Science Education.

Sponsors

- Kansas Association of Teachers of Science
- National Geographic Learning/Cengage Learning
- Science Teachers of Missouri
- Southwest Airlines
- Texas Instruments

Contributors

- American Association of Physics Teachers and the Arkansas–Oklahoma–Kansas Section of AAPT
- American Chemical Society
- American Society for Engineering Education (ASEE)
- Arabia Steamboat Museum
- National Association of Biology Teachers (NABT)

The environment is important to science educators. These programs are recyclable and were printed on recycled paper.
The National Science Teachers Association is committed to meeting today’s environmental challenges by adopting eco-friendly practices both in our own day-to-day operations and at our conferences, workshops, and other events. In addition, we strongly encourage our contracted conference facilities to follow green practices as well. Here are some of the ways NSTA’s conference department has worked to minimize our impact on the environment:

**Conference Previews**
Gone are the days of bulky, newspaper-style advance programs. Brief conference previews allow us to be more focused in our conference content, since each preview is specific to a particular conference. As an added bonus, they are more environmentally friendly, as they dramatically reduce both our print and mailing requirements.

**Online Conference Information and Personal Scheduler**
Most of your conference arrangements can now be accomplished online (www.nsta.org/conferences). Register and make your housing reservations on the web. Program details are available to you on our website using the Session Browser/Personal Scheduler. Scheduling information on our website is up to date and more complete than that available through a printed piece.

**Final Conference Programs by E-Mail/Conference App**
All conference pre-registrants are sent an electronic version (PDF) of the final conference program by e-mail approximately two weeks prior to the conference, further reducing print and shipping requirements. Also, attendees are encouraged to use the NSTA Conference app, which provides all the tools necessary for a successful conference experience.

**Recycled Paper and Sustainable Print Services**
Conference previews and final conference programs are now printed on recycled paper. In addition, Walsworth Inc., the printer for our conference materials, is in strict compliance with all environmental laws and exceeds these standards in many areas. Wherever possible, Walsworth works to reduce and recycle waste, use reduced- or low-VOC chemicals, increase the recycled content of raw materials, and use soy- or vegetable-based inks. Walsworth has also obtained certifications with the Sustainable Forest Initiative (SFI) and the Forest Stewardship Council® (FSC) (FSC-C004755) to ensure paper products are being harvested from environmentally responsible sources.

**Environmentally Friendly Exhibition Practices**
Our conference partner, Hargrove, Inc., offers many green product options and services in the production of our conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a “reclaimer” that recycles 92% of all solvents the company uses in production of graphics, use of LP natural gas in 75–90% of show-site vehicles, and many biodegradable and recycled products such as trash bags and wastebaskets. Their green efforts are extended operationally with reductions in electricity, heating fuel, and water usage, as well as a move to 100% recyclable and biodegradable products.

**Kansas City Convention Center’s Green Practices**
The Kansas City Convention Center staff is dedicated to environmental stewardship. Green practices include:

- **Green Cleaning Program.** The center uses ionized tap water (Activeion™ Cleaning Solutions) for routine cleaning, minimizing the need for chemical-based cleaners and reducing the environmental footprint. The ionized water kills 99.9% of germs instantly.
- **Waste Reduction/Recycling.** The center has an in-house recycling program for paper and plastic. Recycle containers are placed throughout the building.
- **Water Usage.** Waterless urinals, low-flow toilets, and rain basins to catch storm water runoff help maintain water efficiency and control flooding.
- **Green Building Certification.** All remodeling and construction of new facilities at the Convention Center meet the U.S. Green Building Council’s Leadership in Energy and Environmental Design™ Silver standards, including the Grand Ballroom, which features a controllable natural lighting system and energy-efficient LED lighting effects. The latest addition of the Grand Ballroom to the Convention Center was honored as one of the top 10 green buildings in 2009.

**“Go Green” at the Kansas City Conference!**
- Recycle your conference programs in the clearly marked recycle bins located throughout the Convention Center.
- Recycle or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- In advance of the conference, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- If you prefer to bring handouts to your session, use double-sided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended online.
Meeting Location and Times
The conference hotels are Kansas City Marriott Downtown (headquarters) and Holiday Inn Kansas City Downtown—Aladdin. Conference registration, exhibits, #askNSTA Booth, NSTA Expert Lounges, exhibitor workshops, and many sessions will be located at the Kansas City Convention Center. Other sessions and events will be held at the Marriott. The conference will begin on Thursday, December 3, at 8:00 AM, and end on Saturday, December 5, at 1:30 PM.

Registration
Registration is required for participation in all conference activities and the exhibits. The lapel badge mailed to you with your confirmation, or issued to you at registration on-site, is your “ticket of admission” to the Exhibit Hall and all conference activities except those for which a separate fee is stated (short courses, etc.).

The Registration Area, located in Hall B of the Convention Center, will be open during the following hours:

- Wed., Dec. 2 5:00–7:00 PM
- Thu., Dec. 3 7:00 AM–5:00 PM
- Fri., Dec. 4 7:00 AM–5:00 PM
- Sat., Dec. 5 7:30 AM–12 Noon

If you misplace your badge or tickets, present your personal ID at the Badge Reprint Counter in the Registration Area and you will be issued replacements. Only one replacement badge will be issued.

Purchasing Ticketed Events
The Kansas City Planning Committee has scheduled a variety of ticketed events. Each of these events requires a separate fee and ticket. You may purchase tickets for these events, space permitting, in the Registration Area. See the Conference Program section (starting on page 34) for details.

Ground Transportation to/from Airport
- Kansas City International Airport (MCI) (www.flykci.com) is located 19 miles from the Convention Center. Taxi fare is approximately $45—$55 to downtown Kansas City. SuperShuttle is offering a special discounted rate for NSTA attendees of $30 round-trip, per person, shared-ride to Kansas City downtown hotels. Visit bit.ly/1KU362M to book online or call 1-800 BLUE VAN (258-3826) to book reservations with discount code 8LZ67.
- Charles B. Wheeler Downtown Airport (MKC) is located two miles from the Convention Center and services smaller aircraft. Visit www.flymkc.com for more information.

Getting Around Town
Getting around Kansas City is easy on the MAX and The Metro. Explore Kansas City’s popular destinations like the Steamboat Arabia Museum, Kansas City Zoo, Crown Center, and Union Station and Science City for starters. MAX buses operate along the Main Street corridor from the River Market in the north, through downtown, past Union Station and Crown Center, and on to the Country Club Plaza. MAX connects visitors with Kansas City. The fare is just $1.50 with free transfers to the rest of the Metro system. Visit bit.ly/1NGr0x6 for a route map. The Visit KC website has more information on getting around Kansas City (visitkc.com).

Conference Hotels
See page 9 for a list of hotels and a map of the downtown area. If you have questions or concerns regarding your housing, please contact Orchid Event Solutions (during business hours), Monday through Friday, 8:00 AM–7:00 PM CST at 877-352-6710 (toll-free) or 801-505-4611, or e-mail help@orchideventsolutions.com. After hours and on Saturday, call 801-243-4476.

Parking
Located between 12th and 13th streets, and between Central and Wyandotte streets, the primary parking garage is the Barney Allis Plaza Parking Garage, also known as the Municipal Auditorium Parking Garage. A convenient underground tunnel connects the Convention Center and the garage. Parking here costs $8, with no in-and-out privileges.
Registration, Travel, and Hotels

Airlines
NSTA has made arrangements with several major airlines and Amtrak to offer discounted fares to Kansas City conference attendees. Visit www.nsta.org/kctravel for details.

Discounted Rental Cars
The toll-free number to contact the NSTA-designated car rental company is:
Enterprise 800-593-0505 16AH230
* go to www.enterprise.com and use “16AH230” in the “Optional: Coupon, Customer or Corporate Number” box, click on “search” and enter PIN “NST.”

—Photo courtesy of Visit KC

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

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

Available for download on

- iPhone + iPad
- Android

Powered by: NSTA National Science Teachers Association

www.nsta.org/conferenceapp

Your event is 20 days away.
1. **Kansas City Marriott Downtown**  
   *(Headquarters Hotel)*  
   200 W. 12th St.

2. **Holiday Inn Kansas City Downtown–Aladdin**  
   1215 Wyandotte St.

Shuttle service will not be provided as both conference hotels are within walking distance to the Convention Center.
NSTA Exhibits

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.

The lapel badge mailed to you with your confirmation, or issued to you at registration on-site, is your “ticket of admission” to the Exhibit Hall and all conference activities. A map display of the Exhibit Hall will be on-site in Attendee Registration and in the Exhibit Hall, and maps will be accessible via our Conference app (see page 13). See page 118 for a complete list of exhibitors and contact information.

Ribbon Cutting. An opening ceremony is scheduled on Thursday at 11:00 AM at the entrance to the NSTA exhibits.

Exhibit Hall Hours. Located in Hall B, exhibits will be open for viewing during the following hours:

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Thu., Dec. 3</td>
<td>11:00 AM–5:00 PM</td>
</tr>
<tr>
<td>Fri., Dec. 4</td>
<td>9:00 AM–3:00 PM</td>
</tr>
<tr>
<td>Sat., Dec. 5</td>
<td>9:00 AM–12 Noon</td>
</tr>
</tbody>
</table>

Did you know that NSTA offers Exclusive Exhibits Hall hours? During the hours listed below, there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer.

<table>
<thead>
<tr>
<th>Day</th>
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</thead>
<tbody>
<tr>
<td>Thu., Dec. 3</td>
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<td>Fri., Dec. 4</td>
<td>1:30–3:00 PM</td>
</tr>
<tr>
<td>Sat., Dec. 5</td>
<td>10:30 AM–12 Noon</td>
</tr>
</tbody>
</table>

Lead Retrieval. NSTA exhibitors use lead retrieval, a paperless tracking system that allows them to receive fast, accurate information about conference attendees who have visited their booths. With the lead retrieval system, an exhibitor scans your badge as you visit the booth. This allows exhibitors to send information to you while the conference is still fresh in your mind.

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 119 for a complete listing of exhibitor workshops.

NSTA Science Store

Visit us at the NSTA Science Store to explore an incredible array of exclusive products and gear you’ll love! You’ll find hundreds of books that uniquely blend accurate science content with sound teaching strategies for science educators of all grade ranges and disciplines. Not only do we have books covering a wide range of topics to help you sharpen your content knowledge and hone your teaching methods, but we also carry a complete line of NSTA gear you can’t find anywhere else—such as T-shirts, mugs, and pencils. We also offer convenient free shipping when you place your order online from the store! We’ve lined up a number of unique opportunities for conference-goers:

• Exclusive author signings and meet-and-greet opportunities,
• Our latest books—The BSCS 5E Instructional Model; Earth Science Success, 2nd Edition; Reimagining the Science Department; and Teaching for Conceptual Understanding in Science—and our new children’s books from NSTA Kids, including the Next Time You See series,
• “I Love Science” and NSTA gear product lines to show your love of science and pride in teaching,
• Member discounts of 20% on NSTA Press® items and 10% on books from other publishers for all attendees, and
• Daily book and gear specials, product giveaways, and more.
#askNSTA and NSTA Expert Lounges
Visit the #askNSTA booth (#238) during exhibit hall hours Thursday, Friday, and Saturday. NSTA staff and board members will be there, and you can ask us anything! Learn how to write an article for the journals, find out how to implement the NGSS at your school, learn about the New Science Teacher Academy, ask about the Mickelson Teacher Academies held during the summer, or get information about our teacher awards (earn cash or equipment for your classroom). Not sure what you want to know? Get insider information from our exclusive mini-sessions, held in the new NSTA Expert Lounges. These tailored, small-group sessions will focus on the new NSTA Learning Center website, the NGSS, and more. Visit bit.ly/1Fv77bE for complete NSTA lounge schedules and locations.

Meet the Presidents and Board/Council
Be sure to stop by Friday from 12 Noon to 12:45 PM at the entrance to Hall B for a special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

STOM Booth
The Science Teachers of Missouri (STOM) Booth is located in Hall B. STOM’s mission is to promote the professional interests of the Missouri science education community. Stop by to meet us, get science education resources, and to join STOM. Find out what is happening in science education in Missouri!

Graduate Credit Opportunity
Kansas City conference attendees can earn one graduate-level credit in professional development through Stephens College. Visit bit.ly/1JxJ5g4 for complete details. The fee is $130. Note: Credit is by pass/fail option only.

KATS Booth
The Kansas Association of Teachers of Science (KATS) Booth is located in Hall B. The purpose of KATS is the advancement, stimulation, extension, improvement, and coordination of science teaching in all fields of science at all educational levels. Stop by for information on the benefits of becoming a member of this organization. Membership forms as well as information on KATS activities will be available.

SPECIAL OFFER FROM ARABIA STEAMBOAT MUSEUM

NSTA and Arabia Steamboat Museum welcome you to Kansas City.

Kansas City conference attendees—show your NSTA badge to receive a 10% discount on admission to the Arabia Steamboat Museum. You’ll marvel at the story of five local adventurers who unearthed 200 tons of buried treasure from a steamboat that sank in the Missouri River. The steamboat Arabia was headed to frontier settlements when it struck a tree snag and sank to the river bottom in 1856. Incredibly, the boat was excavated from beneath a Kansas cornfield 132 years later! Don’t miss the chance to see beautifully preserved cargo—including fine china, clothing, and even pickles and perfume from before the Civil War.

Visit 1856.com for more information.
Conference Resources

Help NSTA’s GREEN efforts by visiting the conference session browser to complete Kansas City session evaluations online, December 2–22, 2015. During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Registration Area. And this year, we’re giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!

To evaluate a session, attendees should follow these steps:

• Visit the conference session browser and search for part of the session title or presenter’s name using the Find Keyword search option. Note: Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.
• Once you find the session you wish to evaluate, simply click the Evaluate Session button.
• Enter badge number (if you don’t remember your badge number, click “help me find my badge number”).
• When finished evaluating the session, click the Submit Evaluation button.
• Repeat this process for each session attended.

Concurrent session presenters may also complete evaluations for their own sessions in order to track professional development credit.

Presenters and Presiders Check-In
If you are presenting or presiding at a session, please check in and pick up your pin or ribbon at the Presenters/Presiders booth in the Registration Area after you have registered for the conference and received your name badge.

Lost and Found
All lost-and-found items will be turned in at the Exhibitor Registration counter at the Convention Center.

Conference Evaluation
All conference attendees are invited to complete a conference evaluation form online at svy.mk/1O7Bjsp.

Online Session Evaluations and Tracking Professional Development

All attendees can evaluate sessions online while simultaneously tracking their professional development certification (based on clock hours).

Beginning January 5, 2016, an attendee can view his or her transcript at the NSTA Learning Center (learningcenter.nsta.org) by first logging on and then clicking “My Profile” under the Welcome. Here you’ll find a “Certificates” tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional learning experiences (online and face-to-face) for your long-term growth and professionalism.

Each attendee is responsible for tracking his or her own attendance at such events. The transcript can be printed here and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee’s individual profile.
First Aid Services
The First Aid/EMT office at the Convention Center is located just outside the glass doors of Hall D—leading toward the 3501 Rooms on the Bridge. For all emergencies, call 816-513-5110 and your call will be directed to the EMT office. Nursing mothers can stop by the registration area for inquiries about a lactation room.

The NSTA Conference App
Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience. Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, hotels, and Exhibit Hall; social media plugins; and a note-taking tool. Scan the QR code or visit www.nsta.org/conferenceapp to download the app. Please make sure to create a CrowdCompass account when logging in to be able to export any notes taken within the app. Note: The NSTA Conference app does not sync to our online Personal Scheduler.

Wi-Fi in Convention Center
Free Wi-Fi service is available in all common areas (hallways and lobby areas) of the Convention Center. It is not available in the exhibit halls. To access, connect to “KCCCEF.” No password is required.

Audiovisual Needs
NSTA will fulfill AV needs originally requested on the program proposals as long as the request is within the limits of equipment that NSTA provides. For any last-minute AV needs, presenters must arrange and pay for their own equipment. Audio Visual Production Solutions (AVPS), the designated AV company on-site, will be located in the following rooms:
  • Room 2214, Conv. Center
  • Executive Board Room, Marriott

Business Services
The Harvest Productions Business Center is located on the second level of the Convention Center, between the 2200 and the 2300 lobbies. The business center is open Monday–Friday 8:00 AM until 5:00 PM. They provide copying, printing, faxing, scanning, and computer access, as well as shipping through both UPS and FedEx for a small handling fee.

The Marriott offers guests a 24-hour self-service business center via key card access. Located in the lobby, services include computer access, faxing, copying, and computer printing.

Visit KC Information Desk
The Kansas City Convention & Visitors Association (Visit KC) has an Information Desk located in the 2200 lobby of the Convention Center. The desk will be open as follows:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wed., Dec. 2</td>
<td>5:00–7:00 PM</td>
</tr>
<tr>
<td>Thu., Dec. 3</td>
<td>9:00 AM–5:00 PM</td>
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<td>Fri., Dec. 4</td>
<td>9:00 AM–5:00 PM</td>
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<tr>
<td>Sat., Dec. 5</td>
<td>9:00 AM–12 Noon</td>
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</tbody>
</table>

Information about Kansas City’s attractions and dining opportunities are available. The staff can also assist with dining reservations.
Executive Office
David Evans, Executive Director
Michelle Butler, Executive Administrator and Manager
Shawn Crowder, Administrative Coordinator

Board Relations
Michelle Butler, Executive Administrator and Manager

Chapter Relations and Membership
Teshia Birts, Senior Director of Membership Development and Chapter Relations
Shawn Crowder, Administrative Coordinator

Development Office
Eric Dillon, Assistant Executive Director, Development
Azi Ambrishami, Development Coordinator

Next Generation Science Standards (NGSS@NSTA)
Ted Willard, Program Director
Jennifer Horak, NGSS Project Manager

Nominations and Teacher Awards Programs
Amanda Upton, Manager

Office of Communications and Legislative and Public Affairs
Jodi Peterson, Assistant Executive Director, Legislative and Public Affairs
Lauren Jonas, Assistant Executive Director, Marketing, Social Media, and e-Messaging
Tim Weber, Assistant Executive Director, Web and News
Kate Falk, Senior Manager, Public Relations
Jennifer Gulley, Marketing Manager
Korei Martin, Social Media Coordinator
Cindy Workosky, Communications Specialist

Operations Division
Moira Fathy Baker, Associate Executive Director, COO, and CFO

Business & Finance
Brian Short, Controller
Diane Cash, Accounts Payable Manager
Jodie Rozzell, Sr. Business Analyst
Gaby Bathiche, Accountant
LaKeisha Hines, Jr. Accountant

Customer Service
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Nelly Guacheta, Senior Manager, Service Central Vacant, Customer Service Coordinator
Kiara Pate, Customer Service Representative
Cindy Thomas, Fulfillment Coordinator/Claims Correspondent
LaToya Parks, Coordinator, CSR/Data Entry, Publication Sales
Kristen Reiss, Customer Service Representative, Publication Sales

Facilities and Operations
Christine Gregory, Director
Rodney Palmer, Building Engineer
Donovan Parker, Mailing Services Coordinator
Joe Harpe, Mailing Services Assistant
Shantee Young, Administrative Assistant, Operations

Human Resources
Irene Doley, Assistant Executive Director
Janine Smith, HR Benefits Manager and Generalist

Information Technology
Todd Wallace, Assistant Executive Director and CIO
Ryan Foley, Director, Systems Development
Mike Sullivan, Director, IT
Edwin Pearce, Manager, IT Support
Edward Hausknecht, Web and Database Developer
Martin Lopong, Manager, Web Development

Publications Orders/Inventory Control
Elsie Maka, Manager, Inventory and Distribution

Sales
Jason Sheldrake, Assistant Executive Director
Kimberly Hotz, Senior Manager, Exhibitor Operations
Jeffrey LeGrand, Marketing and Sales Associate
Becky Shoemaker, Advertising Production Manager
Danielle McNeill, Project Manager, NSTA Mailing List

Products Division
David Beacom, Associate Executive Director and Publisher
Rick Bounds, Assistant Executive Director, Strategic Initiatives
Emily Brady, Executive Administrator and Manager, NSTA Recommends

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Will Thomas, Director
Joseph Butera, Senior Graphic Designer
Hima Bichali, Graphic Designer

e-Products
Leisa Clark, Director/Producer
Kara Pantalena, Course Developer
Eleanore Dixon-Roche, e-Learning Multimedia Specialist

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Kate Lu, Associate Editor
Luke Towler, Editorial Assistant

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Science Scope
Inez Fugate Lifitig, Field Editor
Ken Roberts, Assistant Executive Director, Journals

The Science Teacher
Stephen C. Metz, Field Editor
Scott Stuckey, Managing Editor

Journal of College Science Teaching
Ann Cutler, Field Editor
Caroline Barnes, Managing Editor

New Products
Tyson Brown, Director

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Amanda O’Brien, Associate Editor
Donna Yudkin, Book Acquisitions Coordinator
Rachel Ledbetter, Associate Editor

NSTA Reports
Lynn Petrinjak, Editor
Debra Shapiro, Associate Editor

Printing and Production
Catherine Lorrain, Director
Jack Parker, Electronic Prepress Technician

Services Division
Al Byers, Associate Executive Director, Government Partnerships and e-Learning
Rick Bounds, Assistant Executive Director, Strategic Initiatives
Caroline Nichols, Executive Administrator and International Program Coordinator

Conferences and Meetings
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Dina Weiss, Associate Director
Linda Crossley, Assistant Director/Managing Editor
Donna Fletcher, Conference Coordinator
Beverly Shaw, Conference Administrator
Christina Dierssen, Project Editor
Kimberlyn McDonald, Registration Supervisor/ Administrative Assistant
Jasmine McCall, Database Coordinator
Marcelo Nunez, Exhibit Services Coordinator

Conference Resources • Headquarters Staff

20 NSTA Kansas City Area Conference on Science Education
NSTA Officers, Board of Directors, Council, and Alliance of Affiliates

NSTA Mission Statement

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

Officers and Board of Directors

David Evans, Executive Director
Carolyn Hayes President
Mary Gromko, President-Elect
Juliana Texley, Retiring President
Harold Pratt, Parliamentarian
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Dennis Schatz, Informal Science
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Eric Brunsell, Professional Development
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Natacia Campbell, District XII
Norma Neeley, District XIII
Julie Gutierrez, District XIV
Tim Maze, District XV
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Steven Ruthford, District XVII
Michael Bowen, District XVIII

Alliance of Affiliates

Juan-Carlos Aguilar, Chairperson, and CSSS Affiliate Representative
Robert Ferguson, AMSE Affiliate Representative
Margaret Glass, ASTC Affiliate Representative
Lisa Martin-Hansen, ASTE Affiliate Representative
James McDonald, CESI Affiliate Representative
Deborah Hanuscin, NARST Affiliate Representative
Mary Lou Lipscomb, NMLSTA Affiliate Representative
Craig Gabler, NSELA Affiliate Representative
Brian Shmaefsky, SCST Affiliate Representative
Conference Resources • Future Conferences

All cities are subject to change pending final negotiation.

National Conferences on Science Education

Nashville, Tennessee
March 31–April 3, 2016

Los Angeles, California
March 30–April 2, 2017

Atlanta, Georgia
March 15–18, 2018

St. Louis, Missouri
April 11–14, 2019

Boston, Massachusetts
March 26–29, 2020

Chicago, Illinois
April 8–11, 2021

2016 5th Annual STEM Forum & Expo hosted by NSTA
Denver, Colorado—July 27–29

Area Conferences on Science Education

2016 Area Conferences
Minneapolis, Minnesota—October 27–29
Portland, Oregon—November 10–12
Columbus, Ohio—December 1–3

2017 Area Conferences
Baltimore, Maryland—October 5–7
Milwaukee, Wisconsin—November 9–11
New Orleans, Louisiana—November 30–December 2

Share Your Ideas!

NSTA’s CONFERENCES ON SCIENCE EDUCATION

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

5th Annual STEM Forum & Expo hosted by NSTA
Denver, CO.................July 27–29

Proposal Deadline: 1/15/2016

2016 Area Conferences
Minneapolis, MN........October 27–29
Portland, OR.............November 10–12
Columbus, OH...........December 1–3

Proposal Deadline: 1/15/2016

2017 National Conference
Los Angeles, CA............March 30–April 2

Proposal Deadline: 4/15/2016

To submit a proposal, visit
www.nsta.org/conferenceproposals
Over 1,200 sessions

Network with over 10,000 educators

350+ exhibitors with cutting-edge resources

Special programming: International Day

SAVE THE DATE

NASHVILLE
MARCH 31 - APRIL 3
2016

Science: Empowering Performance

Setting the Stage: Scientific Literacy

Building the Band: Involving Community Stakeholders

Harmonizing Concepts: Integrating Instruction

Stringing It All Together: Three-Dimensional Learning

For information and updates, visit,
www.nsta.org/nashville
Is This Your First NSTA Conference?

Yes, you say? Then you are invited to attend a special session on Thursday, 8:00–9:00 AM. Learn how you can gain the most from your conference experience and have fun doing it! See page 42 for details.

NSTA Educational Trips Canceled

All Kansas City Educational Trips have been canceled. Refunds will be offered for those attendees who signed up during preregistration.

Win a round-trip Southwest travel scholarship to the NSTA Nashville conference.

Thanks to the generosity of Southwest Airlines, we’re giving away two Southwest Airlines travel scholarships for teacher participants to attend the NSTA Nashville National Conference on Science Education, March 31–April 3, 2016!

During the conference, the drawings will be held at:
- 4:00 PM, Thursday, Dec. 3
- 2:00 PM, Friday, Dec. 4

Stop by the NSTA Membership booth in the Exhibit Hall for all the details!
Help Build Students’ Interest in STEM with eCYBERMISSION in Your Classroom

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

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

Registration is Now Open for Students, Team Advisors, and Volunteers

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

**The Art and Craftsmanship of Teaching**
Examining all aspects of effective instruction, the art and craftsmanship strand will combine pedagogy, assessment, best practices, and informational feedback to increase students’ ability to reason, communicate, think critically, and appreciate science in our ever-changing global society. This strand will concentrate on the processes and skills of high-quality science instruction.

**Combining Science with Agriculture**
The United States is a world leader in agriculture (e.g., farming, ranching, fisheries, biofuels, forestry, and sustainability). This success is grounded in scientific research, technology innovations, engineering development, and mathematical modeling. Agriculture is a transdisciplinary field that requires the ability to use all STEM disciplines as evidenced by the areas of community gardening efforts, precision farming, remote sensing, climate change, genetically modified crops, forestry, food safety, water cycle and usage, soil quality, invasive species, and animal husbandry to mention only a few connections. This strand will increase participants’ understanding of the importance of agriculture in the United States and provide them with relevant and meaningful applications for the classroom.

**NGSS Achieving Success with the NGSS**
Effective science instruction integrates the three dimensions of the science and engineering practices, disciplinary core ideas, and crosscutting concepts in curriculum, instruction, and assessment. This shifts the focus in the science classroom to an environment where students are asking questions, carrying out investigations, developing models, and constructing explanations to explain phenomena and solve problems in ways that build their understanding of core ideas. This environment also allows students to work collaboratively, communicate effectively, problem solve, and make decisions. This strand is intended to provide educators and stakeholders with strategies to move students beyond the traditional classroom and prepare them to thrive in a global economy.
Combining Science with Agriculture

**Thursday, December 3**
8:00–9:00 AM  
Stimulate Student Learning with Food!

12:30–1:00 PM  
In the Cracks of the Concrete

1:00–1:30 PM  
Learning by Doing: Teaching Life Science Using School Gardens

2:00–3:00 PM  
Is All This Burning Necessary?

3:30–4:30 PM  
A Model for Seed Transmission

**Friday, December 4**
8:00–9:00 AM  
Down on the Farm(s)

9:30–10:30 AM  
Students Analyze Science and Engineering Data in the Quest for Sustainable Bioenergy

11:00 AM–12 Noon  
Breathing Soils: Measuring Soil Respiration in the Classroom

12:30–1:30 PM  
From Sun to Food

3:30–4:30 PM  
Featured Presentation: Agriculture: Traditional Science Taught in an Unexpected Applied Way  
(Speaker: Corey Flournoy)

**Saturday, December 5**
8:00–9:00 AM  
Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA

8:30–11:30 AM  
SC-4+: Meeting the CCSS and NGSS Through Outdoor Studies  
(Ticket required: $55)
Achieving Success with the NGSS

Thursday, December 3
12:30–1:30 PM
Teaching with 3-D Puzzle Boxes to Integrate NGSS’s Three Dimensions

2:00–3:00 PM
Featured Presentation: Teaching for Conceptual Understanding in Science: Building a Bridge Between Students’ (and Teachers’) Ideas and the NGSS Core Ideas (Speaker: Page Keeley)

The Modeling Method in NGSS

3:30–4:30 PM
Universal Design for Learning: An Attractive Way to Teach Magnetic Interactions
Elementary Success with NGSS: Inquiry Activities for the K–5 Classroom

Friday, December 4
8:00–9:00 AM
I Like the Sound of That!

8:30–11:30 AM
SC-2: Transitioning to NGSS Instruction (Ticket required: $35)

11:00 AM–12 Noon
Using Engineering Design for Seed Dispersal

12:30–1:30 PM
Mission HydroSci: A Virtual Environment for Teaching Water Systems and Argumentation

3:30–4:30 PM
3-D Tissue Models That Anyone Can Build

Saturday, December 5
8:00–9:00 AM
Bioplastic—Going from Synthetic to Natural Polymers

9:30–10:30 AM
All Aboard Our STEAM Train—Where Planning with Enrichment Creates Integrated Units for Our Youngest Scientists

12:30–1:00 PM
Crosscutting Concepts, Engineering Practices, and Bernoulli’s Principle

1:00–1:30 PM
STEM, NGSS, and Technology: Implementation for Middle School Classrooms

Need help navigating?

So this is your first NSTA conference and you want to make the most of the experience. Join other first-time attendees for a walk through the conference program, the conference app, and NSTA’s supporting resources, presented by the NSTA Board and Council. Learn all the opportunities that the conference can offer! You’ll also have a chance to meet your District Director. Door prizes!

First-Timer Attendee Session • Thursday, December 3, 8:00–9:00 AM
1501 B, Kansas City Convention Center
NSTA Press Sessions

NSTA Press® books offer new classroom ideas and standards-based strategies, from Earth science to nanoscience and from preK to college. Join NSTA Press authors for these sessions linked to the topics of their books.

Thursday, December 3
8:00–9:00 AM  Uncovering Students’ STEM-Related Ideas
12:30–1:30 PM  The Power of Questioning: Guiding Student Investigations
2:00–3:00 PM  Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12
3:30–4:30 PM  Outdoor Science: A Practical Guide

Friday, December 4
8:00–9:00 AM  Mastery Learning in the Science Classroom
9:30–10:30 AM  Teaching Science Through Integrating Children’s Literature and Outdoor Investigations
11:00 AM–12 Noon  Scientific Argumentation Classroom Activities
3:30–4:30 PM  What Are They Really Thinking? Connecting Concepts and Practices Through Formative Assessment

Saturday, December 5
8:00–9:00 AM  Teaching for Conceptual Understanding in Science
9:30–10:30 AM  Gardening with Children’s Books

Meetings and Social Functions

Thursday, December 3
District XI Social
Mary Lou Williams, Marriott ……………………2:00–3:00 PM
STOM Awards Banquet and Business Meeting
Truman, Marriott…………………………5:00–7:00 PM

Friday, December 4
CESI Board Meeting
Salon 4, Marriott……………………………3:00–6:00 PM
Kansas Association of Teachers of Science (KATS) Reception
Andy Kirk, Marriott…………………………4:30–6:30 PM
Equity in Science Education Roundtable
Bennie Moten, Marriott…………………………5:30–7:00 PM

Saturday, December 5
CESI Meeting: Engineering—Build a Better Mousetrap Vehicle Workshop
(By Invitation Only)
Salon 7, Marriott……………………………8:00–10:00 AM
Shell Judging Panel Meeting
(By Invitation Only)
Salon 4, Marriott……………………………8:00 AM–5:00 PM
AMSE Board Meeting
(By Invitation Only) www.amsek16.org
Salon 1, Marriott……………………………9:00 AM–12 Noon
Chemistry Day at NSTA
*Sponsored by the American Chemical Society*

**Energy as a Framework to Teach Chemistry at Multiple Levels**
*For Grades 9–12*

**Friday, December 4, 8:00 AM–5:30 PM**
2103 B, Convention Center

Energy is a crosscutting concept in all of the science disciplines. It can be used within chemistry as a framework to help students understand the properties and behavior of substances at multiple levels. The three sessions of Chemistry Day are designed to analyze, discuss, and reflect on diverse instructional strategies that actively engage students in thinking about energy transfer issues in chemistry at the macroscopic, symbolic, particulate, and atomic levels.

We will also illustrate how to diagnose and formatively assess student understanding. While these sessions can each stand alone, participants who join us for the day will experience how teachers can use different science practices (design, modeling, and argumentation) to help students develop and apply an energy lens to describe, explain, and predict chemical properties and phenomena. This Day of Chemistry has been developed by the American Chemical Society High School Chemistry Professional Development Leadership Group.

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
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<tr>
<td>8:00–10:00 AM</td>
<td>Energy in Chemistry: A Macroscopic View</td>
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<tr>
<td>11:00 AM–1:00 PM</td>
<td>Energy in Chemistry: A Particulate View</td>
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<tr>
<td>3:30–5:30 PM</td>
<td>Energy in Chemistry: An Atomic View</td>
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Middle School Chemistry Day
*Sponsored by the American Chemical Society*

**Middle School Chemistry—Big Ideas About the Very Small**

**Friday, December 4, 8:00 AM–6:00 PM**
2102 B, Convention Center

Come to one, two, or as many sessions as you like during this full day of activities and information for teaching and learning middle school chemistry. Staff from the American Chemical Society will introduce participants to the free online resource middleschoolchemistry.com. Each of the six sessions will include hands-on activities and explanations from the website that participants can easily incorporate into their teaching to support their current textbook and curriculum. Handouts of the session activities will be available for all participants.

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<thead>
<tr>
<th>Time</th>
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<tr>
<td>8:00–9:00 AM</td>
<td>Matter—Solids, Liquids, and Gases</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>Changes of State—Evaporation and Condensation</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Density—A Molecular View</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>The Periodic Table, Energy Levels, and Bonding</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>Polarity of the Water Molecule and Its Consequences</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>Chemical Change—Breaking and Making Bonds</td>
</tr>
</tbody>
</table>
The American Association of Physics Teachers offers a full day of physics content. Physics Day consists of interactive hands-on workshops and sessions covering important physics topics for today's world. Each of these workshops or sessions is organized by experienced science educators and designed to deal with hard-to-express concepts that can be immediately applied in your classroom. Physics Day in Kansas City is being organized by the Arkansas–Oklahoma–Kansas Section of the American Association of Physics Teachers.

### Flinn Workshops

- **Fantastic Physical Science Demonstrations**
  
  **Thursday, December 3, 9:30 am – 10:30 am**
  
  Kansas City Convention Center, Room 2215 C

- **Flinn Activities to Integrate STEM Education**
  
  **Thursday, December 3, 2:00 pm – 3:00 pm**
  
  Kansas City Convention Center, Room 2215 C

- **Flinn Scientific Resources Prepare Students for AP Chemistry Success**
  
  **Friday, December 4, 8:00 am – 9:00 am**
  
  Kansas City Convention Center, Room 2215 C

- **Physics Day at NSTA**

  **Sponsored by the American Association of Physics Teachers (AAPT) and the Arkansas–Oklahoma–Kansas Section of AAPT**

  Friday, December 4, 8:00 AM–6:00 PM
  
  2102 A, Convention Center

  Visit Us in Booth #319

*“Flinn is Fantastic! Your workshops are the BEST!”*  
- Amy Mealing, Davidson Fine Arts Magnet School, Augusta, GA
### Engineering Day at NSTA

**Sponsored by the American Society for Engineering Education**

**Friday, December 4, 8:00 AM–6:00 PM**  
2103 C, Convention Center

The American Society for Engineering Education (ASEE) has put together a public/private partnership to develop ways of engaging elementary, middle school, and high school students and teachers in engineering. Participants will learn about innovative, hands-on, project-based engineering activities, courses, curriculum options, events, outreach programs, professional development, and competitions designed to increase engineering and technological literacy of all students; encourage more and more diverse students to pursue engineering careers; and enable teachers to learn about and experience engineering. Presenters will share lessons learned and examples of inquiry and design activities that have been developed in partnership with K–12 science teachers for use in the classroom and in informal educational settings. The materials result from a collaboration of engineering educators and STEM professionals working with NASA, Teachengineering.org. Engineering is Elementary, and Colleges of Engineering across the nation who actively engage in K–12 engineering in collaboration with partner teachers and schools. All sessions will help teachers understand the new ETS Engineering Design portion of the Next Generation Science Standards (NGSS).

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<tr>
<th>Time</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>Introducing Engineering to Elementary School</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>ASEE’s K–12 Outreach Program, eGFI: Engineering, Go For It! and TeachEngineering.org</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Designing for Safety</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Engineering Design for High School Chemistry: Water Filters for a Developing Country</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>The Innovation Portal: Connecting Student Design and Problem-Solving Projects with Opportunities</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Feel the Heat: Design Your Own Photovoltaic Water Heater</td>
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### Biology Day at NSTA

**Sponsored by the National Association of Biology Teachers**

**Friday, December 4, 8:00 AM–6:00 PM**  
2104 B, Convention Center

The National Association of Biology Teachers (NABT) is proud to present Biology Day, a full day of informative hands-on sessions designed for biology and life science teachers at all levels. Sessions will highlight resources and tips to reinforce key concepts and science practices in the classroom for NGSS, AP Biology, and more. From quantitative skills to best-offs from fellow teachers, Biology Day in Kansas City will help you enhance your teaching and engage your students!

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>KABT Presents Training Young Scientists Share-a-Thon</td>
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<tr>
<td>9:30 AM–12 Noon</td>
<td>AP Biology Meets the NGSS with Floating Leaf Disk Lab</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Quantified Plant Behavior: An Inquiry Lab Ready for Monday</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>Tiny Bubbles, Popcorn, and More—Modeling Population Demographics</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>Scientific Argumentation and Wolf Management</td>
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</table>
All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the Kansas City conference. Sessions/events such as exhibit hall visits may not be available for online evaluation. However, these events still qualify for professional development.

**Beginning January 5, 2016, Kansas City transcripts can be accessed at the NSTA Learning Center (learning center.nsta.org) by logging on with your Kansas City Badge ID# and first clicking on “My Profile” under the “Welcome.” Here you'll find a “Certificates” tab to access your transcript. Keep this form and use it to add the following activities to your Kansas City transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.**

**First Name: __________________   Last Name: __________________  Badge ID# _____________________**

Evaluate sessions by accessing the Kansas City session browser: www.nsta.org/kcbrowser. You will need your badge number to evaluate sessions. See page 12 of the program for instructions. **Note: Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them. And don’t forget, the more sessions you attend and evaluate, the more chances you have to win an Apple iPad mini 2!**

**Sample Questions:**
1. I selected this session:
   a. for immediate classroom use.
   b. based on the reputation of the speaker.
   c. to improve my personal pedagogical knowledge/skill.
   d. to improve my science content knowledge.
2. The session met my needs.
3. The information presented was clear and well organized.
4. Safe practices were employed.
5. The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press® sessions).
6. The session should be repeated at another NSTA conference.

**Sample Responses:**
1=Strongly Agree  2=Agree  3=Neutral  4=Disagree  5=Strongly Disagree

**Thursday, December 3  8:00 AM–7:00 PM**

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We’re giving an Apple iPad mini 2 to one lucky attendee who evaluates sessions that he or she attends. The more sessions you attend and evaluate, the more chances you have to win!
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</table>

**Saturday, December 5  8:00 AM–5:00 PM**

<table>
<thead>
<tr>
<th>Start Time</th>
<th>End Time</th>
<th>Activity/Event Title</th>
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</table>
### FOSS Workshop Schedule
**Room 2209**

**8:00–9:00**
Archaear and the Three Domains: Classification of Life for Middle School

**9:30–10:30**
Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom?

**11:00–12:00**
Engage Them Early—Engineering Experiences with FOSS

**12:30–1:30**
Engineering in Elementary Science: Designing with FOSS

**2:00–3:00**
What to Look for in Science Learning Progressions—Experience FOSS Next Generation

**3:30–4:30**
Floods, Heat Waves, and Hurricanes: Analyzing Evidence for a Changing Climate

### Delta Workshop Schedule
**Room 2208**

**8:00–9:00**
Earth Science for our Next Generation of Very Young Scientists

**11:00–12:00**
Engineering Design: Will It Sink or Float?

**12:30–1:30**
High Flying Connections with Science and Literacy

**3:30–4:30**
Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism

### Frey Workshop Schedule
**Room 2209**

**9:30–10:30**
Solving the Mystery of STEM using Forensic Science

**12:30–1:30**
CPO’s Link Wind Turbine Module—A STEM Approach to Engineering and Design

### CPO Workshop Schedule
**Room 2215A**

**8:00–9:00**
CPO Science Link Chemistry Models: Fun with Atom Building and the Periodic Table

**9:30–10:30**
CPO’s new Physics AP1 Link Module: Rotational Motion with the CPO Roller Coaster

**11:00–12:00**
Genetics: Crazy Traits and CPO’s Link Learning Module

**12:30–1:30**
Building an Electric Motor the STEM Way with CPO’s Link Learning Module

**3:30–4:30**
CPO’s new Physics AP1 Link Module: Rotational Motion with the CPO Roller Coaster
Admission to NSTA short courses is by ticket only. Tickets, if still available, may be purchased at the Ticket Sales Counter in the NSTA Registration Area.

Idea Builders: Infusing Engineering Practices and Literature (SC-1)

Celeste Nicholas (celeste.nicholas@umsl.edu), University of Missouri—St. Louis
J. Carrie Launius (janetcarrie@gmail.com), STOM President, St. Louis, Mo.
Science Focus: ETS, SEP
Level: Grades 3–8
Date: Friday, December 4, 8:30–11:30 AM
Location: Salon 7, Marriott
Ticket Price: $30

In this short course, participants will solve a problem practicing engineering skills while using literature as a framework to create an idea. Participants will learn how to guide students in a student-centered engineering unit. In this project, students identify a personally relevant problem and ultimately build the solution. We introduce the use of trade books as a strategy to model science and engineering processes. Participants will receive electronic lesson plans and a bibliography of suggested trade books.


J. Carrie Launius (@janetcarrie; janetcarrie@gmail.com), STOM President, St. Louis, Mo.
Celeste Nicholas (celeste.nicholas@umsl.edu), University of Missouri—St. Louis
Scott Kratzer (scttkrtzr@gmail.com), Garrett Elementary School, Granite City, Ill.
Sara Berghoff (sberghff@hazelwoodschoools.org), James-town Elementary School, Florissant, Mo.
Nathan G. Williams (nwillims@hazelwoodschoools.org), Larimore Elementary School, St. Louis, Mo.
Paris D. Bouchard, Barrington Elementary School, Florissant, Mo.
Georgene Collier (geollier@hazelwoodschoools.org), Russell Elementary School, Hazelwood, Mo.
Science Focus: GEN, CCC
Level: Elementary
Date: Saturday, December 5, 8:30–11:30 AM
Location: Jay McShann A, Marriott
Ticket Price: $30

In this short course, participants will develop a personal connection to a scientific topic or contributions of a scientist through a PBL project surrounding a high-quality science trade book. An overarching question of “How does this person or concept relate to my own personal experiences?” will be examined and answered.

NGSS Transitioning to NGSS Instruction (SC-2)

Paul Adams (padams@fhsu.edu), Fort Hays State University, Hays, Kans.
Earl Legleiter (eagleiter@hotmail.com), Legleiter Science Consulting, Englewood, Colo.
Science Focus: GEN, NGSS
Level: Elementary–High School
Date: Friday, December 4, 8:30–11:30 AM
Location: Truman, Marriott
Ticket Price: $35

In this short course, participants will engage in one of two model activities from the perspective of either an elementary or a secondary level student. Then in an effort to develop an understanding of three-dimensional science learning, we will reflect on and discuss aspects of good science teaching evident in the model activity by identifying the disciplinary core ideas, science and engineering practices, and crosscutting concepts. The shifts in teacher knowledge and practice that is motivated by the NGSS and the Framework are substantial. Personal action plans will be developed. Participants should bring to the course the publication, Next Generation Science Standards: For States, By States, Vols. 1 and 2.
Meeting the CCSS and NGSS Through Outdoor Studies (SC-4)
Bill Klein, Western Iowa Tech Community College, Sioux City
Science Focus: LS
Level: Middle Level–College
Date: Saturday, December 5, 8:30–11:30 AM
Location: Truman B, Marriott
Ticket Price: $55

Turn the outdoors into a hands-on laboratory...where students can learn for the rest of their lives. Students learn science concepts and the inquiry process through using common organisms. The methods shared are designed to foster the type of teaching and learning proposed in STEM, as well as the CCSS and NGSS. Students need to get acquainted with things—to observe, collect, handle, become puzzled, and ask questions about them and then try to find answers to their questions. A wealth of more than 150 labs, projects, and inquiry ideas using organisms common to most environments (flies, ants, dandelions, beetles, spiders, grasses) will be presented. Students exposed to the wonder and excitement of the world found in their school yards, backyards, parks, lakes, and streams then see the connection between the study of an individual organism and themes of science. Science reading and writing activities will be presented along with numerous resource books. Take home a CD with resources.

GO BEYOND THE BOOK AND INTO THE FIELD.

Forestry Suppliers has been a leader in environmental education for more than 65 years. The natural world is our profession, and guiding future generations to environmental awareness is our passion.

That’s why we created Science Scene, a science education blog and Facebook community, where you can go to find new ideas, share in conversation, and even pick up some free resources. Science Scene also reports on new products and technology for your classroom to help generate that spark and keep students involved and inspired. Visit us today!

Visit us at NSTA Kansas City, Booth 312

Science Scene
science-scene.org | facebook.com/sciencescene

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## Alliance of Affiliates

### Thursday, December 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30–2:30 PM</td>
<td>The 3Rs—Research, Resources, and Relationships</td>
<td>2504 B, Conv. Center</td>
</tr>
</tbody>
</table>

### Saturday, December 5

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM–12 Noon</td>
<td>AMSE Board Meeting (By Invitation Only)</td>
<td>Salon 1, Marriott</td>
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<td>Visit amsek16.org for details.</td>
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</table>

## Association for Multicultural Science Education (AMSE)

*President: Robert Ferguson*

### Thursday, December 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>The Overlap Between Culturally Responsive Teaching and the NGSS</td>
<td>2504 B, Conv. Center</td>
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### Saturday, December 5

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<td>Visit amsek16.org for details.</td>
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</table>

## Association for Science Teacher Education (ASTE)

*President: Lisa Martin–Hansen*

### Thursday, December 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>Integrating Engineering into Middle School Science Classrooms</td>
<td>2503 B, Conv. Center</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>Service Learning in High School Environmental Science Classrooms</td>
<td>2503 B, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:00 PM</td>
<td>Science and Literacy: Improving Classroom Talk in Elementary Science</td>
<td>2503 B, Conv. Center</td>
</tr>
</tbody>
</table>

## Council for Elementary Science International (CESI)

*President: James T. McDonald*

### Thursday, December 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>12:30–1:30 PM</td>
<td>Elementary Science Share-a-Thon</td>
<td>1501 B, Conv. Center</td>
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</table>

### Friday, December 4

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>From Explanation to Effective Reasoning for Your Students</td>
<td>2504 A, Conv. Center</td>
</tr>
<tr>
<td>3:00–6:00 PM</td>
<td>CESI Board Meeting</td>
<td>Salon 4, Marriott</td>
</tr>
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</table>

### Saturday, December 5

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>10:00 AM–12 Noon</td>
<td>CESI Meeting: Engineering—Build a Better Mousetrap Vehicle Workshop (By Invitation Only)</td>
<td>Salon 7, Marriott</td>
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</tbody>
</table>
### National Association for Research in Science Teaching (NARST)

**President:** Mary M. Atwater

**Friday, December 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>An Instructional Model for NGSS-Focused, Socio-Scientific Issues–Based Teaching</td>
<td>2504 B, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>Crafting a Coherent Conceptual Storyline: Lessons About Lesson Design</td>
<td>2504 B, Conv. Center</td>
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</table>

### National Middle Level Science Teachers Association (NMLSTA)

**President:** Diana Cost

**Thursday, December 3**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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<tbody>
<tr>
<td>12:30–1:30 PM</td>
<td>The Magic of Rube Goldberg and the NGSS</td>
<td>2503 A, Conv. Center</td>
</tr>
</tbody>
</table>

### National Science Education Leadership Association (NSELA)

**President:** Elizabeth Mulkerrin

**Friday, December 4**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Tools for Science Leaders, Part 1</td>
<td>2504 B, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Tools for Science Leaders, Part 2</td>
<td>2504 B, Conv. Center</td>
</tr>
</tbody>
</table>
# Three Dimensions of the Next Generation Science Standards (NGSS)

## Science and Engineering Practices

| SEP1  | Asking Questions and Defining Problems |
| SEP2  | Developing and Using Models            |
| SEP3  | Planning and Carrying Out Investigations |
| SEP4  | Analyzing and Interpreting Data        |
| SEP5  | Using Mathematics and Computational Thinking |
| SEP6  | Constructing Explanations and Designing Solutions |
| SEP7  | Engaging in Argument from Evidence     |
| SEP8  | Obtaining, Evaluating, and Communicating Information |

## Crosscutting Concepts

| CCC1  | Patterns                       |
| CCC2  | Cause and Effect: Mechanism and Explanation |
| CCC3  | Scale, Proportion, and Quantity  |
| CCC4  | Systems and System Models      |
| CCC5  | Energy and Matter: Flows, Cycles, and Conservation |
| CCC6  | Structure and Function        |
| CCC7  | Stability and Change          |

## Disciplinary Core Ideas

### Disciplinary Core Ideas in Physical Science

<table>
<thead>
<tr>
<th>PS1: Matter and Its Interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1.B: Chemical Reactions</td>
</tr>
<tr>
<td>PS1.C: Nuclear Processes</td>
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</table>

<table>
<thead>
<tr>
<th>PS2: Motion and Stability: Forces and Interactions</th>
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</thead>
<tbody>
<tr>
<td>PS2.A: Forces and Motion</td>
</tr>
<tr>
<td>PS2.B: Types of Interactions</td>
</tr>
<tr>
<td>PS2.C: Stability and Instability in Physical Systems</td>
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<table>
<thead>
<tr>
<th>PS3: Energy</th>
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<tbody>
<tr>
<td>PS3.A: Definitions of Energy</td>
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<tr>
<td>PS3.B: Conservation of Energy and Energy Transfer</td>
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<tr>
<td>PS3.C: Relationship Between Energy and Forces</td>
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<tr>
<td>PS3.D: Energy in Chemical Processes and Everyday Life</td>
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<thead>
<tr>
<th>PS4: Waves and Their Applications in Technologies for Information Transfer</th>
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<tbody>
<tr>
<td>PS4.A: Wave Properties</td>
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<tr>
<td>PS4.B: Electromagnetic Radiation</td>
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<tr>
<td>PS4.C: Information Technologies and Instrumentation</td>
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</tbody>
</table>

### Disciplinary Core Ideas in Life Science

<table>
<thead>
<tr>
<th>LS1: From Molecules to Organisms: Structures and Processes</th>
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<tbody>
<tr>
<td>LS1.A: Structure and Function</td>
</tr>
<tr>
<td>LS1.B: Growth and Development of Organisms</td>
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<tr>
<td>LS1.D: Information Processing</td>
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<table>
<thead>
<tr>
<th>LS2: Ecosystems: Interactions, Energy, and Dynamics</th>
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</thead>
<tbody>
<tr>
<td>LS2.A: Interdependent Relationships in Ecosystems</td>
</tr>
<tr>
<td>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</td>
</tr>
<tr>
<td>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</td>
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<tr>
<td>LS2.D: Social Interactions and Group Behavior</td>
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<tr>
<th>LS3: Heredity: Inheritance and Variation of Traits</th>
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<tbody>
<tr>
<td>LS3.A: Inheritance of Traits</td>
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<tr>
<td>LS3.B: Variation of Traits</td>
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<tr>
<th>LS4: Biological Evolution: Unity and Diversity</th>
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<tbody>
<tr>
<td>LS4.A: Evidence of Common Ancestry and Diversity</td>
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<tr>
<td>LS4.B: Natural Selection</td>
</tr>
<tr>
<td>LS4.C: Adaptation</td>
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<tr>
<td>LS4.D: Biodiversity and Humans</td>
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### Disciplinary Core Ideas in Earth and Space Science

<table>
<thead>
<tr>
<th>ESS1: Earth's Place in the Universe</th>
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<tbody>
<tr>
<td>ESS1.A: The Universe and Its Stars</td>
</tr>
<tr>
<td>ESS1.B: Earth and the Solar System</td>
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<tr>
<td>ESS1.C: The History of Planet Earth</td>
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<table>
<thead>
<tr>
<th>ESS2: Earth's Systems</th>
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</thead>
<tbody>
<tr>
<td>ESS2.A: Earth Materials and Systems</td>
</tr>
<tr>
<td>ESS2.B: Plate Tectonics and Large-Scale System Interactions</td>
</tr>
<tr>
<td>ESS2.C: The Roles of Water in Earth's Surface Processes</td>
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<tr>
<td>ESS2.D: Weather and Climate</td>
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<tr>
<td>ESS2.E: Biogeology</td>
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<tr>
<th>ESS3: Earth and Human Activity</th>
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<tbody>
<tr>
<td>ESS3.A: Natural Resources</td>
</tr>
<tr>
<td>ESS3.B: Natural Hazards</td>
</tr>
<tr>
<td>ESS3.C: Human Impacts on Earth Systems</td>
</tr>
<tr>
<td>ESS3.D: Global Climate Change</td>
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</table>

### Disciplinary Core Ideas in Engineering, Technology, and the Application of Science

<table>
<thead>
<tr>
<th>ETS1: Engineering Design</th>
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<tbody>
<tr>
<td>ETS1.A: Defining and Delimiting an Engineering Problem</td>
</tr>
<tr>
<td>ETS1.B: Developing Possible Solutions</td>
</tr>
<tr>
<td>ETS1.C: Optimizing the Design Solution</td>
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<table>
<thead>
<tr>
<th>ETS2: Links Among Engineering, Technology, Science, and Society</th>
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<tbody>
<tr>
<td>ETS2.A: Interdependence of Science, Engineering, and Technology</td>
</tr>
<tr>
<td>ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World</td>
</tr>
</tbody>
</table>

38 NSTA Kansas City Area Conference on Science Education
Visit NSTA’s SCIENCE STORE

Exhibit Hall B, Kansas City Convention Center

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- Fun NSTA-branded gear—unique hats, shirts, mugs, collectible pins, and more
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STORE HOURS

Wednesday 4:00 PM–7:00 PM
Thursday 7:30 AM–5:30 PM
Friday 7:30 AM–5:30 PM
Saturday 8:00 AM–12:30 PM
EVERY LAST DROP is an interactive exhibit at Kansas City’s Science Center, Science City exploring water and our relationship to it. The exhibit—packed full of interactive elements—covers three vital topics: What Is Water?; Water & Life; and In Tapped Out, how we use water and why we should conserve it.
8:00–8:30 AM Presentations

Simulate STEM Online Through Virtual Clinical Trials
(Grades 9–College) 2215 B, Convention Center
Science Focus: LS, SEP
Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, Colo.
Expose high school students to science and biomedical engineering practices and careers using free online simulations that engage students in technology while designing authentic neuroscience-based clinical trials. Built-in assessment notebook!

Grant Writing for the Classroom Teacher
(General) 2502 A, Convention Center
Science Focus: GEN, NGSS
James Calaway (jcalaway@fidnet.com), Grant Evaluator/Educational Consultant, Lawton, Okla.
Get the tools to assist in grant writing for needed money for classroom teachers or entire districts. I have a 30-year track record of helping thousands of teachers and administrators find money.

ASTE Session: Integrating Engineering into Middle School Science Classrooms
(Grades 6–8) 2503 B, Convention Center
Science Focus: ETS
Gillian Roehrig (roehr013@umn.edu), University of Minnesota, Minneapolis
Emily Dare (eadare@mtu.edu) and Joshua Ellis (ellisj@mtu.edu), Michigan Technological University, Houghton
EngrTEAMS stands for Engineering to Transform the Education of Analysis, Measurement, and Science. Join us as we share examples of engineering integration from this large NSF project that uses authentic engineering contexts and design challenges to promote science learning.

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 on the Science Focus line for each session listing. On page 124, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS</td>
<td>Life Science</td>
</tr>
<tr>
<td>PS</td>
<td>Physical Science</td>
</tr>
<tr>
<td>ESS</td>
<td>Earth and Space Science</td>
</tr>
<tr>
<td>ETS</td>
<td>Engineering, Technology, and the Application of Science</td>
</tr>
<tr>
<td>GEN</td>
<td>General Science Education</td>
</tr>
<tr>
<td>INF</td>
<td>Informal Science Education</td>
</tr>
</tbody>
</table>

NGSS
See page 38 for a complete list of the NGSS codes used in this program.

Strands
The Kansas City Conference Committee has planned the conference around the following three 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 26.

A+ The Art and Craftsmanship of Teaching

Combining Science with Agriculture

NGSS Achieving Success with the NGSS

The following icon will be used throughout this program.

NSTA Press sessions
8:00–9:00 AM  Presentations

Teaching Argumentation in an Introductory ESL Science Classroom
(Grades 7–12)  1501 C, Convention Center
Science Focus: GEN, NGSS
Patrick Baldwin (@MistaBaldwinME; pbaldwin@maine207.org), Maine East High School, Park Ridge, Ill.
Come see how an introductory high school ESL science class created an atmosphere in which argument and disagreement were accepted and praised in class.

Teach Engineering Principles on the Cheap with Concrete
(Grades 9–12)  2101, Convention Center
Science Focus: ETS, CCC2, CCC6, SEP1, SEP3, SEP4, SEP8
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Gissel McDonald (mcdonaldg@usd230.org), Spring Hill High School, Spring Hill, Kans.
Solidify new learning in your classroom by teaching engineering with concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. NGSS correlations shared.

Into the Woods: Meaningful Field Experiences to Take Science Instruction to the Next Level
(Grades 1–5)  2504 A, Convention Center
Science Focus: GEN
Stephanie Williams (@JTSNDixa; stephaniewilliams@nixaschools.net) and Susan Hansche (@mrshansche; susan-hansche@nixaschools.net), John Thomas School of Discovery, Nixa, Mo.
It’s no fairy tale! Learn to expand science units into cross-curricular projects culminating in opportunities for students to apply their newly acquired expertise beyond the classroom.

AMSE Session: The Overlap Between Culturally Responsive Teaching and the NGSS
(Grades K–12)  2504 B, Convention Center
Science Focus: GEN, NGSS
Melissa Campanella (melissa.rae.campanella@gmail.com), Noel Community Arts School, Denver, Colo.
Robert Ferguson (r.l.ferguson1@csuohio.edu), AMSE President, and Cleveland State University, Cleveland, Ohio
Join us for a refresher on Culturally Responsive Teaching (CRT) and for an interesting look at the overlap between CRT and the NGSS.

So We’re Retired…What Can We Do Now?
(General)  2505 A, Convention Center
Science Focus: GEN
J. Carrie Launius (@janetcarrie; janetcarrie@gmail.com), STOM President, St. Louis, Mo.
Suzanne Flynn, Lesley University and Cambridge College, Cambridge, Mass.
The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join us to explore avenues to pursue in science education.

Insect Investigations
(Grades 6–12)  3501 D, Convention Center
Science Focus: LS, SEP
Ellen Barnett (eb4nd@mail.missouri.edu), University of Missouri–Columbia
Get the buzz on insect investigations that engage students in science practices and teach core life science ideas. We will do one investigation and discuss ideas and resources for others.

8:00–9:00 AM  Hands-On Workshops

Welcome to Your First NSTA Conference
(General)  1501 B, Convention Center
Science Focus: GEN
NSTA Board and Council
This session is for conference first-timers and those who haven’t come for a while. You’ll explore the program, the conference app, and NSTA’s supporting resources. The program is long and the opportunities amazing! Join us for tips on navigating. You’ll also have a chance to meet your District Director, plus there will be door prizes!

Students’ Cloud Observations On-Line: A Hands-On Science Project for the Classroom
(Grades K–7)  2102 A, Convention Center
Science Focus: ESS
Preston Lewis (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.
Engage students in making cloud and weather observations for NASA with S’COOL. While reporting, your students gain better understanding through reading and writing!
Linking Inquiry and Content Through Children’s Literature
(Grades K–5) 2102 B, Convention Center
Science Focus: GEN, CCC1, CCC2
Gina Oles (goles@bssd.net), Stephanie Dean, and Ryan Bohannan, Cordill-Mason Elementary School, Blue Springs, Mo.
Having K–5 students listen to informational read-alouds in the early grades helps lay the necessary foundation for students’ reading and understanding of increasingly complex texts on their own in subsequent grades. We will share examples of infusing the language arts block with rich age-appropriate content knowledge and vocabulary in science.

Spelling Success (with NGSS) in an Earth and Space Science Learning Lab
(Grades 6–12) 2103 B, Convention Center
Science Focus: ESS, ETS, CCC, SEP
Barry Fried (bfriedfab4@optonline.net), Retired Principal and STEM Advisor, East Meadow, N.Y.
Honora Dash (hdash@schools.nyc.gov), Edward R. Murrow High School, Brooklyn, N.Y.
Learn how implementation of the three dimensions of the NGSS in a science classroom promotes an exciting and collaborative learning culture using a multidisciplinary approach with real-world applications. This approach provides authentic problem-based experiences to make science relevant by blending creativity, innovation, and inquiry to foster a deeper science understanding.

Celebrating 40 Years!
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Science and Engineering Practices in the Chemistry Classroom
(Grades 9–College) 2104 B, Convention Center
Science Focus: PS, SEP
Michael Mury (m_mury@acs.org), American Chemical Society, Washington, D.C.
With the NGSS, incorporation of science and engineering practices is vital. Come learn how to integrate these practices into lessons.

STEMming the Zombie Tide
(Grades 6–12) 2502 B, Convention Center
Science Focus: GEN
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District
Use the “Zombie Craze” to make STEM become “un-dead” in your science classroom! Make sure to bring your brains to this hands-on session.

NSTA Press® Session: Uncovering Students’ STEM-Related Ideas
(Grades 3–College) 2505 B, Convention Center
Science Focus: ETS, SEP
Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
Explore a variety of formative assessment probes and techniques that link science to the T, E, and M in STEM.

Stimulate Student Learning with Food!
(Grades 7–12) 3501 A, Convention Center
Science Focus: GEN
Laurie Hayes (lhayes@cart.org), The Center for Advanced Research and Technology, Clovis, Calif.
Susan Hartley (susan.mumford.hartley@hotmail.com), Hinkley High School, Aurora, Colo.
Create an appetite for science using food to teach science standards and integrate CCSS principles. Join us for a hands-on learning experience plus handouts and door prizes!

Hovercrafts and Newton’s Laws
(Grades 7–12) 3501 B, Convention Center
Science Focus: ETS, PS
Marsha Tyson (mtyson@cpsk12.org), Muriel Battle High School, Columbia, Mo.
Help your students understand a world without friction as well as confront student misconceptions about Newton’s laws through hands-on experiences with hovercrafts, which can be small, medium, or large and fit any budget. Use a variety of hovercrafts and make one with everyday materials.

8:00–9:00 AM Exhibitor Workshops

Gas Exchange
(Grades 6–8) 2204, Convention Center
Science Focus: LS1
Sponsor: LAB-AIDS®, Inc.
Bill Gipperich, Deer Creek Middle School, Edmond, Okla.
Students have many misconceptions about respiration. In this activity from the SEPUP middle level life science program, use an acid-base indicator to determine the relative amount of CO₂ gas in a sample of your exhaled breath. We’ll then consider differences in individual response, explore qualitative vs. quantitative measures, and examine the structure of the lungs and their role in the process of respiration.

STEM: Investigating Touch-Screen Devices
(Grades K–8) 2206, Convention Center
Science Focus: GEN
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Have you wondered how a touch-screen device works? Join the Smithsonian and Carolina to investigate static electricity and capacitive touchscreens. Design a prototype stylus and then test and evaluate your design with other participants. Walk away with material and a STEM experience to share in your classroom next week!

Earth Science for Our Next Generation of Very Young Scientists
(Grades K–2) 2208, Convention Center
Science Focus: ESS
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, FOSS, Midway, Ky.
Teaching science to early elementary students can be challenging. Delta Education will help make it easier by using Delta
Science Modules and their corresponding content readers. In this workshop, we will cover weather, sky, sunshine, and shadows and the connections to the NGSS performance expectations.

Archaea and the Three Domains: Classification of Life for Middle School  
(Grades 6–8)  
2209, Convention Center  
Science Focus: LS  
Sponsor: Delta Education/School Specialty Science–FOSS  
Virginia Reid and Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley  
Are you most like *E. coli* bacteria, Yellowstone extremophile archaea, or bread mold? Explore cell structures and current classification. Take home a set of student materials, overview instructional strategies for reading and science practices, and preview online activities and NGSS connections in the revised FOSS Diversity of Life Course.

CPO’s Link™ Chemistry Models: Fun with Atom Building and the Periodic Table  
(Grades 6–12)  
2215 A, Convention Center  
Science Focus: PS  
Sponsor: CPO Science/School Specialty Science  
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.  
CPO’s new Link Chemistry Models module is a STEM- and NGSS-based approach that lets students experience innovative activities to learn atomic structure and the periodic table. We’ll use an experience-based learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity.

8:30–9:00 AM  Presentations

Implementing Successful Labs in the Elementary Classroom  
(Grades K–6)  
1501 A, Convention Center  
Science Focus: GEN, SEP3  
Kellen Conroy (@ConroyKellen; kconroy@esu1.org), Educational Service Unit #1, Wakefield, Neb.  
Explore and investigate instructional strategies for implementing successful science labs and investigations in elementary science classrooms.

Flipping the Classroom: Use Technology to Create More Classroom Time  
(Grades 9–College)  
2215 B, Convention Center  
Science Focus: GEN  
Hannah Nandor (@nandorscience; hnandor@cpsk12.org), Muriel Battle High School, Columbia, Mo.  
Learn the why and how of using a flipped approach to maximize time in a science classroom.

Preparing You and Your Students for Totality  
(General)  
2502 A, Convention Center  
Science Focus: ESS, INF  
Charles Fulco (@totality2017; saros61@gmail.com), Port Chester (N.Y.) Public Schools  
On August 21, 2017, a total solar eclipse will be visible from the Kansas City area and across the country. Learn how to prepare for, observe, and record this rare and awe-inspiring event while incorporating STEM, CCSS, and other standards into lessons for a never-to-be-forgotten celestial spectacle!

ASTE Session: Service Learning in High School Environmental Science Classrooms  
(Grades 9–12)  
2503 B, Convention Center  
Science Focus: ESS, SEP  
Gillian Roehrig (roehr013@umn.edu), University of Minnesota, Minneapolis  
Devarati Bhattacharya (devarati@umn.edu), STEM Education Center, St. Paul, Minn.  
We’ll share strategies and examples for engaging high school students in service learning projects that connect science and agricultural issues in the Minnesota River Basin.
9:15–10:30 AM General Session

From Farm to Flesh—How We Transform Soil into Civilization

(General) The Great Hall (3501 E–H), Conv. Center
Science Focus: ETS

Speaker sponsored by National Geographic Learning/Cengage Learning

Jerry Glover (@jerry_d_glover), National Geographic Emerging Explorer, Washington, D.C.

Presider and Introduction: Carolyn Hayes, NSTA President, and Retired Educator, Greenwood, Ind.

Platform Guests: Jerry Glover, Carolyn Hayes, Juliana Texley, NSTA Retiring President, and Science Writer/Instruction, Boca Raton, Fla.; Mary Gromko, NSTA President-Elect, Colorado Springs, Colo.; David Evans, NSTA Executive Director, Arlington, Va.; Paul Adams, NSTA Director, District XI, and Fort Hays State University, Hays, Kans.; Mike Szydlowski, Chair, NSTA Kansas City Area Conference, President-Elect, Science Teachers of Missouri (STOM); and Columbia (Mo.) Public Schools; Betsy O’Day, Local Arrangements Coordinator, NSTA Kansas City Area Conference, and Retired Educator, Hamilton, Mo.; J. Carrie Launius, President, Science Teachers of Missouri (STOM), St. Louis; Brian Cole, President, Kansas Association of Teachers of Science (KATS), and Sabetha High School, Sabetha, Kans.

Join Jerry Glover, agricultural ecologist and National Geographic Emerging Explorer, for a discussion on sustainable farming and food security. Humans have harnessed vast swaths of the planet, replacing whole ecosystems with plants that take much more than they give to crucial natural systems—billions of acres of annual grain crops. Agriculture is now the largest ecosystem in the world, with its soils providing nearly all the nutrients that sustain our growing population. Why does this world beneath our feet matter so much? “When we lose the health of our soil through erosion or degradation,” says Jerry, “crucial nutrients are no longer carried up to plants and passed on to humans. Studying this helps us see how crops of the future could be farmed with less effort, more nutritional value, and at the high yields we’ll need to feed a planet of seven to nine billion hungry people.”

9:30–10:30 AM Exhibitor Workshops

Detecting the Silent Killer: Clinical Detection of Diabetes

(Grades 9–College) 2202, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.

Tom Cynkar and Maria Dayton, Edvotek Inc., Washington, D.C.

More than 380 million people worldwide are afflicted by diabetes, a disease that causes high blood sugar. Due to genetic predisposition and high-calorie/low-activity lifestyles, that number continues to grow. Without early treatment, diabetes causes severe medical complications. In this exploration, you will diagnose diabetes using simulated urinalysis and ELISA tests. Receive a free gift for attending!

Modeling Convection Currents and Plate Motion

(Grades 6–8) 2204, Convention Center
Science Focus: ESS2
Sponsor: LAB-AIDS®, Inc.

Bill Gipperich, Deer Creek Middle School, Edmond, Okla.

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

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher

(Grades 9–12) 2206, Convention Center
Science Focus: PS
Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that are sure to produce a reaction from your 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!
Solving the Mystery of STEM Using Forensic Science
(Grades 6–12) 2208, Convention Center
Science Focus: GEN
Sponsor: Frey Scientific/School Specialty Science
Kathleen Mills, Rosharon, Tex.
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 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?
(Grades K–5) 2209, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science–FOSS
Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS Next Generation program developers to learn about science practices within the context of active investigations. Experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson. Find out about transitioning to FOSS Next Generation.

Plate Tectonics: Continents on the Move
(Grades 6–12) 2210, Convention Center
Science Focus: ESS2.B
Sponsor: Simulation Curriculum Corp.
Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.
Join us as we use Simulation Curriculum’s Layered Earth Geology to investigate continental drift and the theory of plate tectonics. Classroom-ready STEM and NGSS lessons engage students with interactive simulations and learning activities, thought-provoking exercises, and historical links while displaying a contextual and interactive model of Earth.

Demystifying the NGSS with STEMscopes
(General) 2211, Convention Center
Science Focus: GEN, NGSS
Sponsor: Accelerate Learning–STEMscopes
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning–STEMscopes, Houston, Tex.
There’s no doubt the NGSS are more rigorous and complex than past standards. But with an understanding of how the NGSS are aligned, implemented, and assessed, teachers can be successful in changing aspects of their instructional practices. STEMscopes lessons guide students to achievement based on the standards and effective instructional strategies.

CPO’s New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster
(Grades 6–12) 2215 A, Convention Center
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Use CPO Science’s Roller Coaster and DataCollector to analyze how mass, radius, and shape affect the linear speed of objects on a ramp. Learn how to evaluate qualitative and quantitative investigations in rotational motion and when each type of investigation is best for your students in an AP1 physics classroom.

Fantastic Physical Science Demonstrations from Flinn Scientific
(Grades 7–12) 2215 C, Convention Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Janet Hoekenga, 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!
Thursday, 11:00–11:05 AM

11:00–11:05 AM  Ribbon Cutting Ceremony/Exhibits Opening

NSTA Exhibits Entrance (Hall B), Convention Center

Presider: Carolyn Hayes, NSTA President, and Retired Educator, Greenwood, Ind.

Welcoming Remarks: Mike Szydlowski, Chair, NSTA Kansas City Area Conference; President-Elect, Science Teachers of Missouri (STOM); and Columbia (Mo.) Public Schools

Special Guests: Juliana Texley, NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.; Mary Gromko, NSTA President-Elect, Colorado Springs, Colo.; J. Carrie Launius, President, Science Teachers of Missouri (STOM), St. Louis; Brian Cole, President, Kansas Association of Teachers of Science (KATS), and Sabetha High School, Sabetha, Kans.; Paul Adams, NSTA Director, District XI, and Fort Hays State University, Hays, Kans.; Betsy O’Day, Program Coordinator, NSTA Kansas City Area Conference, and Hallsville Intermediate School, Hallsville, Mo.; Jim Puckett, Local Arrangements Coordinator, NSTA Kansas City Area Conference and Retired Educator, Hamilton, Mo.; David Evans, NSTA Executive Director, Arlington, Va.; Jason Sheldrake, Assistant Executive Director, Sales, NSTA, Arlington, Va.

Musical Entertainment: Grandview High School Jazz Combo

11:00 AM–12 Noon  Exhibitor Workshops

Using the Polymerase Chain Reaction to Identify GM Foods
(Grades 9–College)  2202, Convention Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Maria Dayton and Tom Cynkar, Edvotek Inc., Washington, D.C.
For centuries, selective breeding and conventional hybridization were used to produce desirable qualities in food crops. Today, genetic engineering directly manipulates the DNA, quickly producing these traits. Due to controversy, some companies removed GM ingredients from their foods. In this workshop, snack food DNA is extracted and analyzed using PCR and electrophoresis. Receive a free gift for attending!

Calling All Carbons
(Grades 9–12)  2204, Convention Center
Science Focus: ESS, LS1
Sponsor: LAB-AIDS®, Inc.
Jennifer Boldt, Solon High School, Solon, Iowa
The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. Join us to learn about and model different carbon transfer processes.

Constructing and Crossing Cell Membranes
(Grades 5–College)  2205, Convention Center
Sponsor: 3D Molecular Designs
Tim Herman (herman@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Hook high school biology and chemistry students with models that demonstrate the chemical and physical properties of water and the membranes that separate cells from the surrounding environment. Use hands-on teaching tools to explore diffusion, osmosis, and the transmembrane proteins that facilitate the transport of ions across the cell membrane.
Hands-On Science with Classroom Critters  
(Grades K–12) 2206, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
**Carolina Teaching Partner**
Add action and excitement to your science class with live organisms! Discover simple hands-on activities featuring pill/sow bugs, termites, bessbugs, and butterflies. Learn about care and handling, as well as easy ways to introduce inquiry into your labs. Free product samples and literature.

“Hard” Doesn’t Mean ‘Bad’  
(Grades 6–9) 2207, Convention Center
Science Focus: GEN
Sponsor: Army Educational Outreach Program
**Cheryl Long,** eCYBERMISSION Outreach Specialist, NSTA, Arlington, Va.
Help your students learn that challenges and even failure can be productive if handled properly. Also, hear about the free online STEM competition eCYBERMISSION and discover how you and your students can participate.

**WORKSHOPS in 2205 ~ BOOTH at #205**

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Description</th>
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<tbody>
<tr>
<td>Thursday</td>
<td>11:00 AM–NOON</td>
<td>Constructing and Crossing Cell Membranes</td>
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<tr>
<td>Thursday</td>
<td>12:30 PM–1:30 PM</td>
<td>Of All The Nerve!</td>
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<tr>
<td>Thursday</td>
<td>2:00 PM–3:00 PM</td>
<td>Genes, Schemes and Molecular Machines</td>
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<td>Friday</td>
<td>8:00 AM–9:00 AM</td>
<td>Lights, Camera, Enzymes in Action!</td>
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<td>Friday</td>
<td>11:00 AM–NOON</td>
<td>Let’s Get Helical</td>
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<tr>
<td>Friday</td>
<td>12:30 PM–1:30 PM</td>
<td>Double (Helix) Trouble: Maintaining Fidelity in DNA Replication</td>
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Engage Them Early: Engineering Experiences with FOSS  
(Grades K–5)  2209, Convention Center  
Science Focus: PS, SEP  
Sponsor: Delta Education/School Specialty Science–FOSS  
Laurence Malone, Linda De Lucchi, and Diana Velez,  
The Lawrence Hall of Science, University of California, Berkeley  
Join FOSS Program developers as we illustrate a coherent sequence of experiences that develop core physical science concepts while engaging young minds in challenging science and engineering practices and developing academic language. We’ll use examples from kindergarten and second-grade FOSS modules. Find out about transitioning to FOSS Next Generation.

Engineering Design Process in the STEM Classroom  
(General)  2211, Convention Center  
Science Focus: ETS1, PS1, CCC4, SEP2, SEP3, SEP4, SEP7  
Sponsor: Accelerate Learning–STEMscopes  
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning–STEMscopes, Houston, Tex.  
The “E” in STEM is about using the engineering design process (EDP) to solve problems. Use the EDP to innovate a solution to design and build a barge. Join us for this interactive, engaging, and hands-on workshop involving consensus and collaboration.

Genetics: Crazy Traits and CPO’s Link™ Learning Module  
(Grades 6–12)  2215 A, Convention Center  
Science Focus: LS  
Sponsor: CPO Science/School Specialty Science  
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.  
CPO’s new Crazy Traits Link learning module uses STEM- and NGSS-based strategies in a real-time tablet-based learning environment to teach genetics. Concepts like traits, alleles, phenotypes, genotypes, and heredity will come alive as you create crazy creatures with a unique kit, and study probability, adaptation, dominance, and recession.

Thursday, 11:00 AM–12 Noon

11:00 AM–12:15 PM  Exhibitor Workshop  
Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country  
(Grades 9–College)  2201, Convention Center  
Science Focus: LS  
Sponsor: Bio-Rad Laboratories  
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.  
Disease can spread like wildfire through populations. In this hands-on workshop, you will become an epidemiologist and track diseases like Ebola, bird flu, SARS, and HIV to name a few. See if you can track down patient zero.

11:05 AM–5:00 PM  Exhibits  
Hall B, Convention Center  
Did you know that NSTA offers Exclusive Exhibits Hall hours today from 11:05 AM to 12:30 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

11:30 AM–12 Noon  Exhibitor Workshop  
The Change of Seasons  
(Grades 5–8)  Booth #311, Exhibit Hall  
Science Focus: ESS, SEP  
Sponsor: Science First®/STARLAB®  
Helmut Albrecht, Science First/STARLAB, Yulee, Fla.  
Using the immersive learning technology of the portable dome and one of the lessons of Starry Night, we will demonstrate that the seasons are not generated by the difference in the Earth–Sun distance but by the imaginary axis of Earth, which doesn’t stand straight.
12:30–1:00 PM  Presentations

It’s All Matter with Matter Tag
(Grades 6–9)  1501 A, Convention Center
Science Focus: PS
Amy Manhart (amanhart@tcsd.org), Jackson Hole Middle School, Jackson, Wyo.
Presider: Josephine Reno (pigletreno@yahoo.com), Central Middle School, Kansas City, Kans.
High-engagement Matter Tag physically teaches the concepts of the states of matter and phase changes of matter. Great for English language learners...and kids love it!

ASTE Session: Science and Literacy: Improving Classroom Talk in Elementary Science
(Grades P–6)  2503 B, Convention Center
Science Focus: GEN, SEP7, SEP8
Matthew Benus (mabenus@indiana.edu), Indiana University Northwest, Gary
Discussion centers on identifying and sharing best practices based on whole-class dialogue patterns studied during science instruction by watching proficient elementary classrooms using argument-based inquiry approaches.

In the Cracks of the Concrete
(Grades 8–College)  3501 A, Convention Center
Science Focus: ESS, SEP3
Joy Barnes-Johnson (@drbjchem1; drjoybjohnson@gmail.com), Princeton High School, Princeton, N.J.
Hear how an Earth science unit on composting resulted in amazing discoveries for a combined ELL/special education classroom.

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

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

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

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

• WE’RE GIVING AWAY
An APPLE IPAD MINI 2 WI-FI TABLET

• CONFERENCE APP

Scan QR code below to access our NSTA Conference App.
Thursday, 12:30–1:30 PM  

**12:30–1:30 PM  Presentations**  

**Leadership Pathways for Exemplary K–12 STEM Teachers**  
(General)  
Science Focus: GEN  
Marilyn Suiter (#PAEMST; info@paemst.org), National Science Foundation, Arlington, Va.  

Learn more about teacher leadership programs at the National Science Foundation. Get inspired to make a leadership difference in STEM education.

**The NGSS@NSTA Hub**  
(General)  
Science Focus: GEN, NGSS  
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.  

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

**Using NGSS with Early Childhood Learners**  
(Grades K–2)  
Science Focus: GEN, NGSS  
Abha Singh (a-singh@wiu.edu), Western Illinois University, Macomb  

Discover how to use the NGSS with early childhood learners. The pedagogy required to implement the three-dimensional learning will be demonstrated.

**Do You Need a New Science Lab?**  
(Grades 6–12)  
Science Focus: GEN  
Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio  

Come learn how to win a Shell Science Lab Makeover ($20,000 value) for your school. You will have an opportunity to actually begin to complete the application and have your questions answered. The Shell Science Lab Challenge invites middle school and high school science teachers (grades 6–12) in the U.S. and Canada (with special attention to urban and underrepresented groups) to illustrate replicable approaches to science lab instruction using limited school and laboratory resources.

**NSTA Press® Session: The Power of Questioning: Guiding Student Investigations**  
(Grades P–5)  
Science Focus: GEN, SEP1  
Lisa Nyberg (@docnyberg; lnyberg@csufresno.edu), California State University, Fresno  

Let students’ questions guide the inquiry while integrating collaborative conversations, reading of informational text, and writing. Find out how to use engaging questioning strategies to foster powerful practices, depth of knowledge, and communication of science concepts that teach the CCSS and science standards!
**12:30–1:30 PM Hands-On Workshops**

**CESI Session: Elementary Science Share-a-Thon**  
(Grades P–8)  
1501 B, Convention Center  
Science Focus: GEN  
Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), CESI President, and Central Michigan University, Mount Pleasant  
Julie Thomas (julie.thomas@unl.edu), University of Nebraska–Lincoln  
Karen Ostlund (klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin  
Come see a variety of elementary science ideas that can be integrated with other subjects presented by CESI members. Walk away with handouts to implement in your classroom.

**Taking STEM Outside**  
(Grades K–8)  
2102 A, Convention Center  
Science Focus: GEN, INF, SEP  
Laura Downey (@KansasEE; ldowney@kacee.org), Kansas Association for Conservation and Environmental Education (KACEE), Manhattan  
In addition to hitting STEM benchmarks, learn how outdoor and placed-based science lessons can enhance students’ knowledge of trees, forests, and the environment around them.

**Amusement Park Physics**  
(Grades 4–8)  
2102 B, Convention Center  
Science Focus: ETS, PS, SEP  
Shanna Hall-David (shanna.david@hsv-k12.org), Hampton Cove Middle School, Owens Cross Roads, Ala.  
Hold on for the ride of your life! Make a marble roller coaster using everyday supplies that can be found in any classroom. Have your class rolling and coasting through physics as we examine roller coaster design and how Newton’s laws affect riders.

**No Answer Key! Becoming a Mentor-Scholar with the NGSS Science Practices**  
(Grades 6–12)  
2103, Convention Center  
Science Focus: ESS, SEP  
Mary Colson (@MnMColson; mcolson@moorheadschools.org), NSTA Director, District IX, and Moorhead (Minn.) Public Schools  
Russell Colson (@geowriter; colson@mnstate.edu), Minnesota State University Moorhead  
To engage students in the NGSS science practices, we teachers must charge into the unknown—like scientists—without an answer key. Join us in discussing how to transform two inquiry labs into open-ended scientific research experiences.

**What Does Success with the NGSS SOUND Like?**  
(Grades K–2)  
2104 B, Convention Center  
Science Focus: PS4.A  
Maria Yaksic (maria.yaksic@slps.org), Mallinckrodt Academy of Gifted Instruction, St. Louis, Mo.  
Stephanie Sams (stephanie.sams@slps.org), Ames Visual and Performing Arts Elementary School, St. Louis, Mo.  
How can we produce sound? What medium is the best transmitter of sound? How can we amplify sound? Engage in NGSS-focused lessons to hear more!

**NMLSTA Session: The Magic of Rube Goldberg and the NGSS**  
(Grades 4–8)  
2503 A, Convention Center  
Science Focus: ETS1, PS2, CCC2, CCC3, SEP1, SEP2, SEP3, SEP6, SEP8  
Diana Cost (dcost@glcps.org), NMLSTA President, and Global Learning Charter Public School, New Bedford, Mass.  
Ashley Burnett (dolphinzdreamer@gmail.com), Global Learning Charter Public School, New Bedford, Mass.  
Tinker with how to use Rube Goldberg devices to engage all learners in using engineering, CCSS, and science to solve real-world problems.

**NGSS Teaching with 3-D Puzzle Boxes to Integrate NGSS’s Three Dimensions**  
(General)  
3501 C, Convention Center  
Science Focus: ESS2, ETS1, LS1, LS4, PS1, CCC1, CCC2, SEP  
Daniel Bergman (@ShockerSciEd; dannyjbergman@gmail.com), Wichita State University, Wichita, Kans.  
Learn how to use simple toy blocks and handmade boxes to promote multiple science/engineering practices, cross-cutting concepts, and disciplinary core ideas applicable to multiple subjects.

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**Evaluate Your Sessions Online!**

This year, we’re giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See pages 12 and 51 for details.)
12:30–1:30 PM  Exhibitor Workshops

Case of the Missing Records  
(Grades 7–College)  
2202, Convention Center  
Science Focus: LS  
Sponsor: Edvotek, Inc.  
Tom Cynkar and Maria Dayton, Edvotek Inc., Washington, D.C.
Explore genetic diversity using forensic science! Your students become crime scene investigators as they analyze biological evidence using DNA fingerprinting, a technique that identifies people via genetic differences. Gel electrophoresis is used to create DNA fingerprints from crime scene and suspect samples. A match between samples suggests which suspect committed the crime. Receive a free gift for attending!

Making Critical Thinking More Than Just a Cliché Using Three-Dimensional Learning  
(Grades 6–8)  
2203, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Activate Learning  
Marilyn Schmidt, Activate Learning, Aurora, Colo.
Come engage in a sequence of investigations where middle school students experience phenomena, construct explanations, and argue from evidence. Teach students to think like scientists as they apply a claim, evidence, and reasoning framework to make sense of investigations.

Prospecting for Mineral Ore  
(Grades 9–12)  
2204, Convention Center  
Science Focus: ESS3  
Sponsor: LAB-AIDS®, Inc.  
Jennifer Boldt, Solon High School, Solon, Iowa
How do geologists look for mineral ore? In this activity from EDC Earth Science, we will search for a layer of rock that contains a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems—gathering data to decide where the deposit is located.

Of All the Nerve!  
(Grades 9–College)  
2205, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: MSOE Center for BioMolecular Modeling  
Tim Herman (herman@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Join us in constructing a neuronal synapse model—complete with sodium-potassium pump and calcium, sodium, and potassium channels! Explore the role of these ions in action potential generation and neurotransmitter release. Visualize how drugs target and interact with these channels using models produced with 3D printing technology. Handouts!

High-Flying Connections with Science and Literacy  
(Grades 3–5)  
2208, Convention Center  
Science Focus: ETS1  
Sponsor: Delta Education/School Specialty Science  
Kathy Armstrong, FOSS, Midway, Ky.
Learn how your students can experience the enjoyment of learning science using the Flight and Rocketry Delta Science Module and its connection to the NGSS performance expectation 3–5-ETS1-1, 2, 3 (Engineering Design). See how our content readers are excellent literacy resources that can help to extend the learning experience.

Engineering in Elementary Science: Designing with FOSS  
(Grades 3–5)  
2209, Convention Center  
Science Focus: ETS  
Sponsor: Delta Education/School Specialty Science—FOSS  
Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
FOSS modules provide students with opportunities to engage in engineering experiences to develop solutions to problems using science knowledge and systems thinking. We’ll describe and display the opportunities to design with science for grades 3–5 with new FOSS modules. Find out about transitioning to FOSS Next Generation.

CPO’s Link™ Wind Turbine Learning Module: A STEM Approach to Engineering and Design  
(Grades 6–12)  
2215 A, Convention Center  
Science Focus: ETS  
Sponsor: CPO Science/School Specialty Science  
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
CPO’s new Link Wind Turbine learning module lets students learn in a tablet-based learning environment and engineer a wind turbine. Students build, test, and revise their designs. Link uses STEM activities and an NGSS approach to give students an understanding of how to apply the engineering cycle in science class.
12:30–2:30 PM  Presentation

Alliance of Affiliates Session: The 3Rs—Research, Resources, and Relationships
(General)  2504 B, Convention Center
Science Focus: GEN, NGSS
Elizabeth Allan (eallan@uco.edu), University of Central Oklahoma, Edmond
Deborah Hanuscin (@DHanuscin; hanuscind@missouri.edu), University of Missouri—Columbia
Come connect with NSTA affiliates to learn about research and resources and form relationships to support your work in science education.

1:00–1:30 PM  Presentations

Bringing Science to Life by Creating a Wax Museum
(Grades 3–5)  1501 A, Convention Center
Science Focus: ETS2.B
Warren Soper (wsoper@wolves.k12.mo.us), Reeds Spring Elementary School, Reeds Spring, Mo.
Presider: Josephine Reno (pigletreno@yahoo.com), Central Middle School, Kansas City, Kans.
Students research, write scripts, construct costumes, and build props in order to portray little known scientists and their amazing contributions in a living “wax museum.”

Save the Drama for Your Mama!
(General)  2101, Convention Center
Science Focus: GEN
Deketa Cobb, Educational Consultant, Snellville, Ga.
Keep student drama on the stage and out of your classrooms! Here are some strategies and tools to significantly reduce classroom drama and discipline issues.

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials
(Grades 9–12)  2215 B, Convention Center
Science Focus: PS, CCC, SEP
Marta Gmurczyk (@m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.
Discover how we developed inquiry lesson plans that are focused on the NGSS and CCSS and are based on successful past ChemMatters articles.

1:30–2:30 PM  Presentation

Learning by Doing: Teaching Life Science Using School Gardens
(Grades K–5)  3501 A, Convention Center
Science Focus: ESS1.B, LS1, LS2
Heather McCullar (@McCullarHeather; heather1818@gmail.com), Benton STEM Elementary School, Columbia, Mo.
Nurture the budding scientists in your classroom. Hear how a STEM school designed outdoor garden learning experiences to help students learn and apply life science concepts.

Reading Informational Text in the Science Classroom to Construct Explanatory Models
(Grades 6–8)  3501 B, Convention Center
Science Focus: GEN, SEP2, SEP6, SEP7, SEP8
Katherine McIntyre (kemcintyre@cps.edu), John B. Drake Elementary School, Chicago, Ill.
Mon-Lin Monica Ko (mlko@uic.edu), University of Illinois at Chicago
Find out how to teach students to read and comprehend informational text in order to construct explanatory models grounded in textual evidence.
2:00–2:30 PM  Presentation

AP Physics 1 and 2: Inquiry-Based Learning
(Grades 12)  2215 B, Convention Center
Science Focus: PS, SEP1, SEP3, SEP4
Connie Wells (cwells@pembrokehill.org), Pembroke Hill School, Kansas City, Mo.

Receive an overview of the new AP Physics 1 and 2 courses, with methods any physics teacher can use to foster inquiry-based learning. Handouts of activities and experiments to help students develop critical thinking and reasoning skills will be provided.

2:00–3:00 PM  Networking Opportunity

District XI Social

Mary Lou Williams, Marriott

Take a break and drop by for refreshments with other members of NSTA District XI—Kansas, Missouri, and Nebraska.

2:00–3:00 PM  Featured Presentation

Teaching for Conceptual Understanding in Science: Building a Bridge Between Students’ (and Teachers’) Ideas and the NGSS Core Ideas
(General)  2105, Convention Center
Science Focus: GEN, NGSS

Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and Science Consultant/Writer, The Keeley Group, Fort Myers, Fla.

Presider: Susan German, Strand Leader, Achieving Success with the NGSS, and Hallsville Middle School, Hallsville, Mo.

A primary goal of science education is teaching for conceptual understanding. K–12 students (and teachers) hold strongly held ideas about the natural world as they actively try to make sense of their every day and instructional experiences. Teaching for conceptual understanding begins with identifying the ideas students bring to their learning and using them to build a bridge between where the student is and the scientific ideas we want students (and teachers) to know and be able to use. Join Page to explore what this means in a standards-based system where test scores are often equated with student learning.

Page Keeley is an award-winning author and recognized expert in the areas of science, mathematics, and STEM diagnostic and formative assessment. A former middle school science teacher, Page has received the Presidential Award for Excellence in Secondary Science Teaching as well as the Milken National Distinguished Educator Award. She consults with school districts and organizations throughout the United States and internationally to build teachers’ capacity to use formative assessment effectively as well as provides instructional coaching and guidance on linking formative assessment, inquiry, and engineering; and linking the NGSS science practices with CCSS, ELA.

Page is the primary author of the Uncovering Student Ideas in Science series and the Formative Assessment–75 Practical Strategies Linking Assessment, Instruction, and Learning series (the “FACTs books”). She is a former NSTA president and the 2013 recipient of the National Science Education Leadership Association’s award for Outstanding Leadership in Science Education.
2:00–3:00 PM Presentations

Engineering with Sound Science
(Grades 4–8) 1501 A, Convention Center
Science Focus: ETS1, PS3, PS4, CCC5, SEP
Patricia Lucido (@plucido4405; plucido4405@gmail.com), Targeted Connections, Lee’s Summit, Mo.
Cheryl Malm (cgmalm@nwmissouri.edu), Northwest Missouri State University, Maryville
Elementary-level sound units can have a focus on engineering design. A variety of sound device constructions, iPad apps, and sensor probes will be explored.

NGSS Pioneers: The SEEDS Project
(Grades 6–College) 1501 C, Convention Center
Science Focus: GEN, NGSS
Gary Andersen (ggandersen@fhsu.edu; garyontheprairie@gmail.com), MidAmerica Nazarene University, Hays, Kans.
Brandon Gillette (@astro2111; astro2111@gmail.com), Kansas City Kansas Public Schools
SEEDS stands for Students Engaged in Exploring and Designing Solutions. Benefit from two years of implementation experiences from 48 middle school and high school teachers. We’re sharing NGSS lessons and student work/video from our classrooms.

The AMS DataStreme Project: The NGSS in Action
(General) 2502 A, Convention Center
Science Focus: ESS
James Brey (@AMSeducation; brey@ametsoc.org), American Meteorological Society, Washington, D.C.
Bring the NGSS to life by using real-time, real-world environmental data. The AMS DataStreme Project will show you how.
Discover the NGSS: An Interactive Exploration of the Next Generation Science Standards  
(Grades K–12)  
2502 B, Convention Center  
Science Focus: ETS, CCC1, CCC2  
Leisa Clark (lclark@nsta.org), Director/Producer, e-Products, NSTA, Arlington, Va.  
Come learn how to put the pieces of the NGSS together with help from NSTA's interactive e-book on the standards, Discover the NGSS: Primer and Unit Planner. The first 25 attendees receive free copies of this Enhanced E-book.

CAEP Elementary Standards: A First Look  
(Grade)  
2504 A, Convention Center  
Science Focus: GEN  
Bill Badders (@badders; baddersb@roadrunner.com), 2013–2014 NSTA President, Cleveland Heights, Ohio  
The Council for the Accreditation of Educator Preparation (CAEP) is, for the first time, developing standards for elementary teacher preparation. The first draft of those standards is now available. This session will introduce those standards and provide time for review and feedback.

How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions  
(Grades K–12)  
2505 A, Convention Center  
Science Focus: GEN, SEP1  
Amanda Upton (aupton@nsta.org), Manager, Nominations and Teacher Award Programs, NSTA, Arlington, Va.  
Hear from NSTA how various competitions can help bring STEM and NGSS into the classroom, and give students and teachers a chance to earn prizes.

Is All This Burning Necessary?  
(Grades 9–12)  
3501 A, Convention Center  
Ruth Hutson (ruthhuson@bluevalley.net), Blue Valley High School, Randolph, Kans.  
By collecting local data and comparing to long-term databases, students gain appreciation of their communities and understand the need for responsible land management practices.

Revolutionize Your Science Curriculum with Picture-Perfect Lessons  
(Grades K–6)  
2102 B, Convention Center  
Science Focus: ETS, CCC1, CCC2  
Rose Jones, Boone Elementary School, Kansas City, Mo.  
Picture-Perfect lessons have brought about a transformation in the way teachers in our district teach science as well as instill confidence in their abilities to teach it. Learn how to captivate students through a fictional text and activities and then explain the science behind the activity with a nonfiction text. See lessons being taught and hear testimonies from teachers of how Picture-Perfect lessons have changed the way they teach science.

NASA: Inquiry Activities for Learning About Light and the EM Spectrum and Multiwavelength Astronomy  
(Grades 6–12)  
2103 B, Convention Center  
Science Focus: ESS, PS, SEP2  
Pamela 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 spectroscopes.
iPad—Realize Its Full Potential in Your Classroom!  
(Grades 7–College)  
2103 C, Convention Center  
Science Focus: PS4  
Gregory Dodd (gbdodd@gmail.com), Retired Educator,  
Pennsboro, W.Va.  
Come learn how to redesign your science classroom to  
make it truly digital and meet NGSS HS-PS4: Waves and  
Their Applications in Technologies for Information Transfer.  
Handouts!

Chapter Books at the Crossroads of the NGSS and CCSS  
(Grades 6–9)  
2104 B, Convention Center  
Science Focus: GEN  
Christine Anne Royce (@caroyce; caroyce@aol.com),  
Shippensburg University, Shippensburg, Pa.  
Examine different chapter book units that can help to inte-  
grate the components of the NGSS and elements of the CCSS.

Let’s Get Physical—From Force and Friction to Water  
and Weather  
(Grades P–3)  
2503 A, Convention Center  
Science Focus: PS  
Ruth Ruud (ruudruth61@gmail.com), Cleveland State Uni-  
versity, Cleveland, Ohio  
Juliana Texley (jtexley@att.net), NSTA Retiring President,  
and Science Writer/Instructor, Boca Raton, Fl.  
Don’t look now, but the CCSS asks that you teach physical  
sciences as early as kindergarten, and the NGSS have very  
specific goals for early primary. No more procrastinating!  
The good news is that you have your equipment. Come get  
easy activities, lit basics, and teacher background so that you  
can start right away!

NSTA Press® Session: Argument-Driven Inquiry in Biology  
and Chemistry: Lab Investigations for Grades 9–12  
(Grades 9–12)  
2505 B, Convention Center  
Science Focus: LS, PS, SEP  
Patrick Enderle (patrick.enderleidi@gmail.com), Georgia  
State University, Atlanta  
Jonathon Grooms (@drjongrooms; jgrooms@gwu.edu),  
The George Washington University, Washington, D.C.  
Victor Sampson, The University of Texas at Austin  
Argument-driven inquiry is an innovative approach  
to laboratory instruction. Receive a brief overview of  
argument-driven inquiry and learn how it can be used to  
address both the NGSS and CCSS ELA.

A+ Hot Dog Soup and Other Creative “Recipes” for  
Teaching Cell Division  
(Grades 9–College)  
3501 B, Convention Center  
Science Focus: LS1.B, LS3, CCC6, SEP2, SEP4  
Carol Robertson (crobertson.fulton@gmail.com), Fulton High  
School, Fulton, Mo.  
Serve up new learning in your classroom by incorporating  
creative “recipes” that ensure increased student success in  
learning cell division. Join me for this 5E (Engage, Explore,  
Explain, Elaborate, and Evaluate) approach that incorporates  
fun catch phrases, analogies, models, and activities for teach-  
ing mitosis and meiosis.

The Modeling Method in NGSS  
(Grades 6–12)  
3501 C, Convention Center  
Science Focus: PS2.A, SEP  
Earl Legleiter (elegleiter@hotmail.com), Legleiter Science  
Consulting, Englewood, Colo.  
Engage in NGSS teaching and learning by developing and using  
models, which is the fundamental pedagogical approach  
used in the Modeling™ method of science instruction.
2:00–3:00 PM  Exhibitor Workshops

**Teaching STEM Using Agarose Gel Electrophoresis**  
(Grades 6–College)  
2202, Convention Center

Science Focus: LS  
Sponsor: Edvotek, Inc.

**Tom Cynkar** and **Maria Dayton**, Edvotek Inc., Washington, D.C.

Explore four hot topics in biotechnology using gel electrophoresis—DNA Fingerprinting, Paternity Testing, Medical Diagnostics, and GM Organisms. Brightly colored dyes simulate DNA fragments, eliminating post-electrophoresis staining and saving valuable classroom time! Results are analyzed using a semi-logarithmic plot, which fosters critical-thinking skills and STEM learning techniques. Receive a free gift for attending!

**The Extraordinary Odyssey: An Expedition Through the Human Body**  
(Grades K–8)  
2203, Convention Center

Science Focus: LS  
Sponsor: Nasco

**Lainna Callentine** (lcallentine@hotmail.com), Sciexperience.com, Plainfield, Ill.

Hands-on exploration is key to science education. This dynamic workshop will arm you with new ideas for the classroom. Explore the many mysteries of the heart and the life-giving river that courses through the many tributaries in our body. In this interactive hands-on lab, you will hold actual lungs. Dive into the chambers of the heart and listen to its muscular melody.

**Reclaiming the Metal**  
(Grades 6–8)  
2204, Convention Center

Science Focus: PS1  
Sponsor: LAB-AIDS®, Inc.

**Bill Gipperich**, Deer Creek Middle School, Edmond, Okla.

In this activity from the SEPU middle level physical science program, participants role-play a scenario involving pretreatment of copper containing liquid wastes from computer circuit board manufacture. We will examine trade-offs of metal replacement and chemical precipitation, techniques actually used in industrial applications, and in so doing, come to understand the science behind complex environmental issues.

**Genes, Schemes, and Molecular Machines**  
(Grades 6–College)  
2205, Convention Center


Sponsor: 3D Molecular Designs

**Tim Herman** (herman@msoe.edu) and **Gina Vogt** (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Through modeling, an authentic practice of science, students learn by both using and constructing models. Use several different hands-on teaching tools, including one that demonstrates how basic principles of chemistry drive the folding of proteins into their compact globular shapes—each capable of performing a different specific function.

**Bring Visual Science into K–5 Classrooms—It’s a Game Changer!**  
(Grades K–5)  
2206, Convention Center

Science Focus: GEN

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 videos and activities to support blended learning. Learn how to integrate compelling visuals and video and receive a one-year subscription to Carolina’s Tigtag online video-based learning program!

**Human Anatomy Lab—Building from the Inside Out**  
(Grades 8–College)  
2207, Convention Center

Science Focus: LS

Sponsor: ANATOMY IN CLAY® Learning System

**Chuck Roney**, Retired High School Teacher, Haddonfield, N.J.

Get introduced to a new method of learning anatomy and physiology. We will discuss how to teach skeletal, muscular, and other body systems in a powerful, kinesthetic way using clay. This approach is a perfect fit to help integrate NGSS and STEM practices into your classroom. Come build your muscles in clay!
Solving the Mystery of STEM Using Forensic Science
(Grades 6–12) 2208, Convention Center
Science Focus: GEN
Sponsor: Frey Scientific/School Specialty Science
Kathleen Mills, Rosharon, Tex.
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 integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

What to Look for in Science Learning Progressions:
Experience FOSS Next Generation
(Grades K–5) 2209, Convention Center
Science Focus: PS
Sponsor: Delta Education/School Specialty Science–FOSS
Kathy Long and Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
Are you looking for coherent curricular direction in your elementary science program? Join FOSS curriculum developers to investigate learning progressions in grades K–5 using physical science modules from the new FOSS Next Generation program. Find out about transitioning to the newly released FOSS program modules.

Stellar Evolution Made Easy
(Grades 6–12) 2210, Convention Center
Science Focus: ESS1.A
Sponsor: Simulation Curriculum Corp.
Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.
Where do stars come from? What happens during their life cycle? How do we know a star is dying? Where are stellar graveyards? Join us as we answer these and other questions using Simulation Curriculum’s award-winning Starry Night lessons and learn how to access a free classroom-ready lesson.

ANATOMY IN CLAY®
LEARNING SYSTEM
Stop by our booth #418
For your chance to WIN a FREE MANIKEN® Lab Station!
Workshops Available

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Thursday, 2:00–3:00 PM

**Building an Electric Motor the STEM Way with CPO’s Link™ Learning Module**
(Grades 6–12) 2215 A, Convention Center
Science Focus: ETS
Sponsor: CPO Science/School Specialty Science

**Erik Benton,** CPO Science/School Specialty Science, Nashua, N.H.

CPO’s new Link Electric Motor learning module is a STEM-and NGSS-based learning approach to electromagnets, permanent magnets, commutators, and induction in a real-time tablet-based learning environment using hands-on equipment. The engineering cycle, observation, measurement, and experimentation are used to design and build electric motors with student-based activities.

**Flinn Activities to Integrate STEM Education**
(Grades 7–12) 2215 C, Convention Center
Science Focus: GEN
Sponsor: Flinn Scientific, Inc.

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

This hands-on workshop will help you integrate STEM inquiry and design principles into your science curriculum. Join Flinn Scientific in a “build-it-yourself” lab project that can actively engage students and increase their understanding of concepts that cut across scientific disciplines. Interactive demonstrations highlight inquiry skills and reasoning based on the evidence. Handouts for all activities!

**3:30–4:30 PM Presentations**

**“Grow Our Own” Food and Scientists**
(Grades 6–12) 1501 C, Convention Center
Science Focus: GEN, NGSS

**Chris Embry Mohr** (chrisembry.mohr@olympia.org), Olympia High School, Stanford, Ill.

Growing vegetables, fish, and scientists by investigating aquaponics is the focus of the “GROW OUR OWN” project where students grow their awareness for food into enthusiasm for STEM.

**Cars: A Fun and Relevant Way to Teach Science Concepts**
(Grades 8–12) 2215 B, Convention Center
Science Focus: GEN, NGSS

**Andrew Nydam,** Polymer Ambassador, Olympia, Wash.

**Sherri Rukes** (sherri.ruces@d128.org), Libertyville High School, Libertyville, Ill.

Rev up student interest and understanding of STEM with labs and demonstrations that relate automobiles to science concepts. We’ll include correlations to the CCSS.
Science Comes Alive in Stories, Video, and E-Books—Integrating STEM, Literacy, Creativity, and Media (Grades P–2) 2502 A, Convention Center  
Science Focus: LS1.B, LS2, CCC1, CCC6  
Susie Vanderlip (@MonarchSpeaker; susie@storyofchester.com), Monarch Butterfly Citizen Scientist, Orange, Calif.  
Hear about the Butterfly Life Cycle science for K–2 using storybooks, photography, and video from a monarch butterfly citizen scientist. Have your young students experience life science in their own backyard.

NASA’s “Eyes on the Solar System”: Bringing Planets into Your Classroom (Grades 3–12) 2502 B, Convention Center  
Science Focus: ESS1.B, CCC3, CCC4, SEP2, SEP4  
Rachel Zimmerman Brachman (@RachelZBrachman; rachel.zimmerman-brachman@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.  
Bring the solar system to your classroom using this free online tool from NASA. Explore planets, spacecraft, and more!

Engaging and Nurturing the Curiosity of Young Children with Everyday Science That Surrounds Them (Grades P–3) 2503 B, Convention Center  
Science Focus: GEN, NGSS  
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.  
Find out how to use everyday examples of science that comprise a young child’s world to create rich and engaging instruction and to motivate students. Come learn how to get your students to observe, question, investigate, think, and talk about science.

Use Fun, Interactive Online Games to Teach STEM in the Context of Substance Abuse (Grades 6–8) 2504 A, Convention Center  
Science Focus: LS  
Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, Colo.  
Learn about free online games that provide simulations and visualizations to teach standards-based science practices in a problem-based scenario involving the science behind substance abuse and body systems.
An Ice Core Classroom Investigation That Connects the Three Dimensions of NGSS with CCSS
(Grades 9—College) 2504 B, Convention Center
Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz.
Experience a unique STEM open-ended investigation that incorporates absolute and relative dating, history, volcanoes, solar proton events, energy cycles, Earth systems, terrestrial events, and supernovas.

Science and Engineering Practices Share Session
(Grades 9–12) 2505 A, Convention Center
Science Focus: GEN, SEP
Bev DeVore-Wedding (@bdevore; bdevorewedding@gmail.com), NSTA Director, High School Science Teaching, and University of Nebraska—Lincoln
Come to this share session for a smorgasbord of lessons, activities, and ideas covering all disciplines springboarding from the science and engineering practices of the NGSS.

3:30–4:30 PM Hands-On Workshops
Practice Scientific Argumentation Through Gaming and Social Media
(Grades 5—College) 2102 B, Convention Center
Science Focus: LS3, CCC2, SEP7
Amber Rowland (@arowland1313; amber.rowland@ku.edu), James Ellis (@jayhawkellis; jdellis@ku.edu), and Marilyn Ault (mault@ku.edu), The University of Kansas, Lawrence
Jeremy Mohn (@JeremyMohn; jmohn@bluevalleyk12.org), Blue Valley Northwest High School, Shawnee Mission, Kans.
Lisa Ball (@lball@usd497.org), Lawrence High School, Lawrence, Kans.
Julie Schwarting (@msschwarting; jaschwar@usd497.org), Lawrence Free State High School, Lawrence, Kans.
Come play with us! Through social media and gaming, we support the practice of scientific argumentation and facilitate student learning through discourse. You can, too!

NASA Brings You Newton’s Laws of Motion
(Grades 6–10) 2103 B, Convention Center
David Beier (david.beier@barstowschool.org), The Barstow School, Kansas City, Mo.
Come experience 25 hands-on stations designed to enhance students’ understanding of Newton’s laws—presented by a NASA Astrophysics Ambassador. Lots of free NASA materials at end of workshop.

Universal Design for Learning: An Attractive Way to Teach Magnetic Interactions
(Grades 3–5) 2103C, Convention Center
Science Focus: PS2, SEP2
Deborah Hanuscin (@DHanuscin; hanuscind@missouri.edu), Kelsey Gillstrom (kekgs4@mail.missouri.edu), and Kathryn Arnone (kan74@mail.missouri.edu), University of Missouri—Columbia
Tracy Hager (tracyhager1@yahoo.com), Shepard Boulevard Elementary School, Columbia, Mo.
Betsy O’Day (boday@hallsville.org), Program Coordinator, NSTA Kansas City Area Conference, and Hallsville Intermediate School, Hallsville, Mo.
Come experience how Universal Design for Learning can enhance opportunities for ALL students to learn about magnetic forces and interactions as emphasized in the NGSS.

Implementing NGSS One Project at a Time
(Grades 6—College) 2104 B, Convention Center
Science Focus: GEN, NGSS
Carol Williamson (cwilliamson@ku.edu), Laurie Cleavinger (cleavingerl@ku.edu), and Vivian Choong (v463c451@ku.edu), The University of Kansas, Lawrence
Andrew Taylor (and.taylor07@gmail.com), Seaman USD 345, Topeka, Kans.
Cassie Absher (cassieabsher@gmail.com), Kansas City Kansas Public Schools
Timothy Ellis (ellistim@usd437.net), Washburn Rural High School, Topeka, Kans.
Project Based Learning implements the heart and soul of science learning as described in the NGSS. UKanTeach instructors, students, and alumni will share dynamic PBL unit plans that richly integrate the three dimensions of the NGSS.
NGSS: A Model for the Engineering Design Process  
(Grades 4–8)  
2503 A, Convention Center  
Science Focus: ETS1  
Karen Ostlund (klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin  
Experience a model for the engineering design process developed to articulate the three dimensions of the NGSS.

NSTA Press® Session: Outdoor Science: A Practical Guide  
(Grades K–8)  
2505 B, Convention Center  
Science Focus: ETS  
Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Douglasville  
Explore STEM in the schoolyard with NSTA Press books, and find out how birds and students can “engineer” with sticks and stems. Free seeds!

A Model for Seed Transmission  
(Grades 8–12)  
3501 A, Convention Center  
Science Focus: LS, CCC1, CCC2, CCC6, SEP4, SEP5, SEP6  
Jacklyn Bonneau (bonneau@wpi.edu), Massachusetts Academy of Math & Science at WPI, Worcester  
Provide fertile learning opportunities for your grades 8–12 students. Seeds are a way we continue growing crops; let’s explore with activities using data analysis to understand nature’s ways of distributing these buds of life.

3:30–4:30 PM Exhibitor Workshops

The Drunken Worms: Exploring Gene Function with C. elegans  
(Grades 9–College)  
2202, Convention Center  
Science Focus: LS  
Sponsor: Edvotek, Inc.  
Tom Cynkar and Maria Dayton, Edvotek Inc., Washington, D.C.  
Model organisms allow us to study fundamental questions in biology that are difficult to study in humans. In this workshop, you will learn how to culture the nematode C. elegans in your classroom. Next, explore how mutations affect alcohol metabolism using a simple locomotion assay. Data is collected and analyzed using statistics. Receive a free gift for attending!

Comparative Vertebrate Anatomy with Carolina’s Perfect Solution® Specimens  
(Grades 6–12)  
2206, Convention Center  
Science Focus: LS  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Explore animal diversity by comparing and contrasting anatomical adaptations of the pig, rat, dogfish, and frog. Participants use dissection to identify characteristics of these popular vertebrates. This is an excellent comparative activity featuring our very best Carolina’s Perfect Solution specimens. Free dissection supplies and great door prizes.

Elementary Success with NGSS: Inquiry Activities for the K–5 Classroom  
(Grades K–5)  
3501 C, Convention Center  
Science Focus: GEN, SEP1, SEP3  
Mary Jean Lynch (mlynch@noctrl.edu) and John Zenchak (jjzenchak@noctrl.edu), North Central College, Naperville, Ill.  
NGSS and inquiry-based approaches emphasize learning through problem solving. Learn an inquiry-based approach to science teaching and learning with activities that specifically address the NGSS guidelines.

Useful Apps for a Science Classroom with 1:1 Technology  
(Grades 6–12)  
3501 F, Convention Center  
Science Focus: GEN, SEP8  
Rachel Tinsley (rtinsley@cpsk12.org), Muriel Battle High School, Columbia, Mo.  
Pamela Close (@comobio), Hickman High School, Columbia, Mo.  
Learn to use Nearpod, Showbie, Google Drive, and Google Forms with your students. BYOD!

Create Your Own NASA Portal to NGSS with NASA Wavelength  
(General)  
3501 G, Convention Center  
Science Focus: ESS, PS1, PS2  
Liz Burck (lizburck@gmail.com), Institute for Global Environmental Strategies, Arlington, Va.  
Bring your laptop or tablet and create your own “bundles” of NGSS-focused NASA science lessons using NASA’s Wavelength website.
Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism
(Grades 3–5) 2208, Convention Center
Science Focus: PS2.B
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, FOSS, Midway, Ky.
Argumentation is an important component of the science reform movement. Learn how to help students conduct investigations using claims and defend them with evidence, and to construct explanations doing activities using magnets and electromagnetism. The activities in this workshop relate to the NGSS performance expectation 3-PS2-3, Motion and Stability: Forces and Interactions.

Floods, Heat Waves, and Hurricanes: Analyzing Evidence for a Changing Climate
(Grades 6–8) 2209, Convention Center
Science Focus: ESS, SEP
Sponsor: Delta Education/School Specialty Science—FOSS
Virginia Reid and Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
What is the current scientific evidence for climate change? Engage in hands-on activities and multimedia from the newly revised FOSS Weather and Water Course for Middle School to explore causes and implications of climate change and identify connections to NGSS science and engineering practices. New program features will be shown.

CPO’s New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster
(Grades 6–12) 2215 A, Convention Center
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Use CPO Science’s Roller Coaster and DataCollector to analyze how mass, radius, and shape affect the linear speed of objects on a ramp. Learn how to evaluate qualitative and quantitative investigations in rotational motion and when each type of investigation is best for your students in an AP1 Physics classroom.

3:30–5:00 PM  Exhibitor Workshop
Effortlessly Integrate Inquiry with Glowing Bacteria
(AP Big Idea 3)
(Grades 9—College) 2201, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
How comfortable do your students feel about engaging in inquiry? Join us to learn new ways to advance inquiry in the classroom—from guided to open inquiry—by establishing a strategy that integrates essential and real-world science practices that can encourage students to direct the scientific investigation. From generating scientifically reasonable questions to developing the procedure for interpreting the data, the glowing bacteria from pGLO™ will lead the way.

4:00–4:30 PM  Presentation
Why Girls? Why STEM?
(Grades P–8) 1501 A, Convention Center
Science Focus: INF, SEP1, SEP3, SEP6, SEP8
Kaitlyn Hood (@Kate_Hood; kaitlynhood@gsksmo.org), Girl Scouts of NE Kansas & NW Missouri, Kansas City, Mo.
Girls can change the world—and if they change the world by leading the STEM workforce, that is even better!

5:00–7:00 PM  Networking Opportunity
STOM Awards Banquet and Business Meeting
Truman, Marriott
Eight out of ten schools that try STEMscopes buy it because their teachers love it! Built on a digital platform, enhanced by print, and brought to life in hands-on kits, STEMscopes PreK-12 is an all-in-one STEM solution for 1-to-1, blended learning, and traditional classrooms. Three available formats—STEMscopes K-12 for non-NGSS schools, STEMscopes NGSS, and STEMscopes Early Explorer for early childhood programs—there’s a solution to meet your STEM needs.

STEMpreview.com
Keeping watch over Kansas City at Penn Valley Park, the Scout, a 16-foot bronze statue, depicts a Sioux scout on horseback.
8:00–8:30 AM Presentation

Kinesthetic Learning...from a STEM Viewpoint
(Grades 6–College) 3501G, Convention Center
Science Focus: GEN
Darrell Walker, Perquimans County Middle School, Winfall, N.C.
Get your students in tune with STEM concepts through team-created body movements by using selected music and lyrics to help boost student achievement.

8:00–8:30 AM Presentations

STEMazing Lessons for Middle School
(Grades 5–8) 1501 A, Convention Center
Science Focus: ESS2, ETS1, PS1.B, PS2.A, PS3, CCC, SEP1, SEP3, SEP4
Chris Herald (chrish@usd383.org) and Duke Harmon (@dukeharmon; dukeh@usd383.org), Manhattan High School, East Campus, Manhattan, Kans.
Hear how we integrate each aspect of STEM into a lesson for grades 5–8—NGSS focused. Lessons on solar energy, plants, robots, rockets, and more.

Using Project-Based Instruction to Teach the Standards
(Grades 6–12) 1501 C, Convention Center
Science Focus: GEN, NGSS
Laurie Cleavinger (cleavingerl@ku.edu), The University of Kansas, Lawrence
Compare and contrast project-based instruction with “doing projects.” Discussion centers on the essential components of PBI as well as how PBI addresses the NGSS. Participants will begin to construct a project for their students as they brainstorm possible driving questions that can be used to teach the standards.

AAPT Session: 30 Demos in 60 Minutes for Elementary and Middle School
(Grades 3–8) 2102 A, Convention Center
Science Focus: PS1, PS2, PS3, SEP3
Wendy Adams (wendy.adams@unco.edu), University of Northern Colorado, Greeley
Hear about 30 dynamic demonstrations that can engage students in the wonder of science. Receive tips on the setup, materials, procedure, and underlying science concepts.

NABT Session: KABT Presents Training Young Scientists Share-a-Thon
(Grades 6–12) 2104 B, Convention Center
Science Focus: LS
Andrew Ising, Olathe North High School, Olathe, Kans. Presider: Jaclyn Reeves-Pepin, National Association of Biology Teachers (NABT), Reston, Va.
Join members from the Kansas Association of Biology Teachers (KABT) as they share some of their favorite labs and techniques to implement the NGSS in their classrooms.

Understanding Climate Change and Climate Change Models
(Grades 9–12) 2215 B, Convention Center
Science Focus: ESS3.D, SEP1, SEP2, SEP3, SEP4, SEP5, SEP7
Ruth Hutson (ruthhutson@bluevalley.net), Blue Valley High School, Randolph, Kans.
By collecting local data and comparing it to long-term databases, satellite data, Google Earth, and computer climate models like EdGCM, my students understand climate change with raised awareness.

NARST Session: An Instructional Model for NGSS-Focused, Socio-Scientific Issues–Based Teaching
(Grades 9–12) 2504 B, Convention Center
Science Focus: GEN, SEP2
Troy Sadler (@ReSTEMInst; sadlert@missouri.edu) and Patricia Friedrichsen (friedrichsenP@missouri.edu), University of Missouri–Columbia
Kerri Graham (kgraham@cpsk12.org), Rock Bridge High School, Columbia, Mo.
Attention will be paid to a model for science teaching that makes use of real-world socio-scientific issues and addresses key aspects of the NGSS such as modeling practices.
Exploring the Science and Engineering Practices  
(General) 2505 A, Convention Center  
Science Focus: GEN, SEP  
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.  
Come explore science and engineering practices (such as constructing explanations and developing models) that are central to the vision of education described in the Framework and the NGSS.

NSTA Press® Session: Mastery Learning in the Science Classroom  
(Grades K–12) 2505 B, Convention Center  
Science Focus: GEN  
Kelly Morgan Dempewolf (@kmorgan_sci_ed; kellymdempewolf@gmail.com), Kansas State Dept. of Education, Topeka  
Join the author of the NSTA Press® book, Mastery Learning in the Science Classroom, as she shares how it is possible to have student-paced mastery learning classrooms where all students succeed from.

Rewind! Designing Successful Science Lessons in Elementary  
(Grades K–6) 3501 B, Convention Center  
Science Focus: LS2, PS  
Garrett Lowder (@garrettlowder; garrettlowder@nixaschools.net), Paula Armknecht (paulaarmknecht@nixaschools.net), and Jennifer Goins, John Thomas School of Discovery, Nixa, Mo.  
Are K–6 students learning what they need to be learning and how do we know they “get it”? Find out how to design lessons with targeted effective assessments in mind.

I Like the Sound of That!  
(Grades P–2) 3501 C, Convention Center  
Science Focus: PS  
Nancy Smith (@Wiggleworm7; nsmithe@olatheschools.org), Bentwood Elementary School, Overland Park, Kans.  
Let’s explore fun and meaningful learning activities that actively involve primary learners as they build an understanding of sound and vibration concepts.

8:00–9:00 AM Hands-On Workshop  
NESTA Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards  
(Grades 6–College) 1501 B, Convention Center  
Science Focus: ESS  
Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
NESTA members will share a variety of strategies to enhance your studies of weather and weather hazards to help implement NGSS and network your school.

ACS Middle Level Session: Matter—Solids, Liquids, and Gases  
(Grades 6–8) 2102 B, Convention Center  
Science Focus: PS1.A  
James Kessler (jhkessler@acs.org), American Chemical Society, Washington, D.C.  
Explore solids, liquids, and gases through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

ASEE Session: Introducing Engineering to Elementary School  
(Grades K–5) 2103 C, Convention Center  
Science Focus: ETS, SEP  
Bruce Wellman (bwellman@olatheschools.org), Olathe Northwest High School, Olathe, Kans.  
Engineering is natural in elementary. Learn about tools such as the Engineering is Elementary® program and other ways to introduce engineering in K–5.

“Seeing” the Invisible: Making the EMS Spectrum Concrete  
(Grades 7–10) 2502 A, Convention Center  
Science Focus: PS3  
Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University, Shippensburg, Pa.  
How do we “see” something that exists but is not visible? Walk away with concrete ways to explore the EMS that engage participants.

Engineering Is Everywhere  
(Grades K–8) 2502 B, Convention Center  
Science Focus: ETS  
Patty Dailey, Science Pioneers, Kansas City, Mo.  
You are already doing engineering with students. Learn the engineering design process and a variety of challenges to involve and inspire all students in STEM.
Crosscutting Concepts Go to S’COOL  
(Grades K–5)  2504 A, Convention Center  
Science Focus: ESS, CCC1, CCC2, CCC3, CCC4, CCC5  
**Ollie Bogdon** (obogdon@aol.com), University of Saint Mary, Leavenworth, Kans.  
Students’ Cloud Observations On-Line (S’COOL) provides great crosscutting opportunities. Explore how your students can work with NASA through this free web-based resource.

Down on the Farm(s)  
(Grades 8–12)  3501 A, Convention Center  
Science Focus: ESS3.C, LS2.C, CCC  
**Peggy Welch** (peggywelch851@gmail.com), Retired Educator, Lexington, Ky.  
How do farmers face the dilemma of producing food people demand while make a profit to keep their family farm instead of selling out to developers? Engage your students in a problem-based activity in which students research and analyze data for human population and number of farms to investigate dynamic relationships between urban sprawl and farmland.

How MEMTA Can Change Your Classroom!  
(Grades 3–5)  3501 D, Convention Center  
Science Focus: GEN, NGSS  
**Melodee Knopp** (melodee.knopp@me.com), R.V. Haderlein Elementary School, Girard, Kans.  
**Julie Bruckner** (julie.r.bruckner@k12.sd.us), Wessington Springs Elementary School, Wessington Springs, S.Dak.  
Mickelson ExxonMobil Teachers Academy (MEMTA) is premier professional development! Find out how it changed our grades 3–5 lessons as students discover their own learning through hands-on experiments. **Note:** Hands-on activities available to the first 24 participants.

Hot Topics Workshop: Nuclear Energy  
(Grades 9–12)  3501 E, Convention Center  
Science Focus: ESS, PS  
**Kathleen Dwyer**, MRH High School, Maplewood, Mo.  
Activate your nuclear knowledge! Use marble nuclei to model isotopes, radioactive decay, and fragmentation. Learn how these processes are used to create usable energy.

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**Visit us at booth #521.**

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**In partnership with the United States Patent and Trademark Office**
Investigating Pollinators in the Schoolyard
(Grades 5–12)   3501 F, Convention Center
Teresa Woods (tmwoods2@fhsu.edu), Fort Hays State University, Hays, Kans.
Grow a sense of wonder, curiosity, critical thinking, and evidence-based problem solving in your students. Hear about an inquiry module developed by the Botanical Society of America’s Planting Science program that includes field investigations of pollinators.

8:00–9:00 AM   Exhibitor Workshops

Integrating Chromebook with Vernier Technology
(Grades 3–12)   2202, Convention Center
Science Focus: GEN
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with Chromebook and Vernier technology, including LabQuest Mini. Experiments such as Boyle’s Law, Grip Strength Comparison, and Ball Toss will be conducted.

Integrating Literacy and Science—The Wow Factor
(Grades P–5)   2203, Convention Center
Science Focus: GEN, NGSS
Sponsor: Activate Learning
Lynn Weber and Marilyn Schmidt, Activate Learning, Aurora, Colo.
Come engage in a hands-on investigation where your students explore, read, write, talk, and think critically about science. Address reading, writing, and math through science investigations. Create data tables and argue from evidence as you give your students a reason to write beyond just “fill in the blank.”

pH Scale and Math Modeling
(Grades 9–12)   2204, Convention Center
Science Focus: PS1
Sponsor: LAB-AIDS®, Inc.
Presenter to be announced
What does pH actually measure? In this investigation, you will measure pH indirectly using indicators and absorption using the Lab-Master. Using their data, participants generate a graph of absorbance vs. pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from The Natural Approach to Chemistry program.

Lights, Camera…Enzymes in Action!
(Grades 6–College)   2205, Convention Center
Science Focus: ETS1, LS1.A, PS1, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman (herman@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Using 3-D physical representations, students discover that proteins are linear sequences of amino acids that spontaneously fold into complex shapes following basic principles of chemistry. This hands-on workshop explores a variety of models of enzymes to introduce the concepts of substrate, active site, specificity, and competitive/noncompetitive inhibition.

Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs
(Grades 6–12)   2206, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your instruction of mammalian structure and function with a real classroom autopsy! Participants dissect a Carolina’s Perfect Solution pig by modeling the protocols of a forensic pathologist. Free materials and door prizes!
Getting Started with Classroom Robotics and Programming  
(Grades 6–9)  
2207, Convention Center  
Science Focus: GEN  
Sponsor: Pitsco Education  
Alan Kirby (akirby@pitsco.com), Pitsco Education, Pittsburg, Kans.  
A revolutionary new robotics building system, TETRIX® PRIME teaches STEM concepts through Project Based Learning that meet CCSS and NGSS without the construction complexities inherent in other systems. Engineered to be simple and intuitive, it enables students to bring their robots to life quickly and easily. Join us and get hands-on with the TETRIX PRIME building system paired with Arduino.

Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics!  
(Grades 9–College)  
2208, Convention Center  
Science Focus: LS, PS  
Sponsor: PASCO scientific  
Jason Lee, East Georgia State College–Statesboro  
Use PASCO’s new Wireless Spectrometer and free Spectrometry software to perform introductory spectroscopy experiments for chemistry, biology, and physics on computers and iPads. In this hands-on workshop, you’ll analyze emission spectra, absorbance/transmittance spectra, solution concentration data, and reaction kinetics data.

The Making of the Fittest: Natural Selection and Adaptation—Rock Pocket Mouse  
(Grades 6–12)  
2209, Convention Center  
Sponsor: HHMI BioInteractive  
Sherri Story, Kings Fork High School, Suffolk, Va.  
A complete story, from ecosystem to molecules, rock pocket mice show how random changes in the genome can take many paths to the same adaptation—a colored coat that hides them from predators. We will watch the 10-minute film and discuss how to integrate this story into your course.

National Geographic Explorers: Ideal Role Models of STEM  
(Grades 3–12)  
2210, Convention Center  
Science Focus: ETS1.A, ETS1.B, SEP1, SEP3, SEP4, SEP8  
Sponsor: National Geographic Learning  
Tom Hinojosa, National Geographic Learning/Cengage Learning, Littleton, Colo.  
See how National Geographic provides your students with exciting examples of an integration of disciplines that removes the traditional barriers between Science, Technology, Engineering, and Mathematics, and instead focuses on innovation and the applied process of addressing questions and designing solutions to complex contextual problems using current tools and technologies.

Active Physics and Active Chemistry: Leading Project-Based High School Physics and Chemistry Programs Capturing the Essence of the NGSS and STEM  
(Grades 9–12)  
2215 A, Convention Center  
Science Focus: PS  
Sponsor: It’s About Time  
Learn from author Arthur Eisenkraft how you can implement STEM and NGSS in your chemistry, physics, and/or physical science classroom with Active Chemistry and Active Physics. Learn how physicists, chemists, chemical engineers, and science educators collaborated to design innovative project-driven curricula that are now demonstrating significant success in engaging all students and increasing student performance. New resources include robust Active Chemistry and Active Physics 24/7 online communities for teachers.

Flinn Scientific Resources Prepare Students for AP Chemistry Success  
(Grades 9–12)  
2215 C, Convention Center  
Science Focus: PS  
Sponsor: Flinn Scientific, Inc.  
Mike Frazier, Flinn Scientific, Inc., Batavia, Ill.  
Join Flinn Scientific for resources and strategies to help students succeed on the AP Chemistry exam. Prepare students for the first day of class with FlinnPREP™, a new online review of foundational chemistry concepts. Learn how easy it is to teach the integrated learning objectives and applied science skills using Flinn’s AP Chemistry Kits, including Flinn’s free-response questions before the exam. Handouts!
8:00–9:30 AM Exhibitor Workshops

**How to Use Pop Culture Science in Your Classes**  
(Grades 9–College)  
2201, Convention Center  
Science Focus: GEN  
Sponsor: Bio-Rad Laboratories  
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.  

Use popular science to engage high school and college students and increase science literacy in your classroom. See how popular movies and TV shows connect to real-world discoveries and issues. Then learn how to incorporate pop culture, literary practices, and a fun hands-on lab to increase student involvement and understanding.

8:00–10:00 AM Hands-On Workshop

**ACS Session One: Energy in Chemistry: A Macroscopic View**  
(Grades 9–12)  
2103 B, Convention Center  
Science Focus: PS, CCC  
Marta Gmurczyk, American Chemical Society, Washington, D.C.  

Engage in “design activities” that can help students meaningfully understand energy transfer between systems with different temperatures by designing devices with specific properties and testing these properties. These activities have been developed to deepen students’ conceptual understanding about energy, heat, and temperature in macroscopic systems.

8:30–11:30 AM Short Courses

**Idea Builders: Infusing Engineering Practices and Literature (SC-1)**  
(Grades 3–8)  
Ticket Required; $30  
Salon 7, Marriott  
Science Focus: ETS, SEP  
Celeste Nicholas (celeste.nicholas@gmail.com), University of Missouri–St. Louis  
J. Carrie Launius (janetcarrie@gmail.com), STOM President, St. Louis, Mo.  
For description, see page 34.

**Transitioning to NGSS Instruction (SC-2)**  
(Grades 3–High School)  
Ticket Required; $35  
Truman, Marriott  
Science Focus: GEN, NGSS  
Paul Adams (padams@fhsu.edu), NSTA Director, District XI, and Fort Hays State University, Hays, Kans.  
Earl Legleiter (egleleiter@hotmail.com), Legleiter Science Consulting, Englewood, Colo.  
For description, see page 34.

9:00 AM–3:00 PM Exhibits

Hall B, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 1:30 to 3:00 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.
9:30–10:30 AM  Featured Presentation

Fostering an Insatiable Curiosity: Planning for the Future

(General) 2105, Convention Center
Science Focus: GEN

Wendy Saul (@DrWendySaul; saulw@umsl.edu), Allen B. and Helen S. Shopmaker Professor of Education, University of Missouri–St. Louis
Presider: J. Carrie Launius, Strand Leader, The Art and Craftsmanship of Teaching, and STOM President, St. Louis, Mo.

How might we inspire and enable students to connect what they learn to their lives? What does research and best practice tell us about engaging young people as thinking and caring individuals, community members, and global citizens? Join Dr. Wendy Saul as she shares her insights on sparking curiosity and active learning in your students.

Since 1997, Wendy Saul has served as the Allen B. and Helen S. Shopmaker Professor of Education at the University of Missouri–St. Louis. In this role, she teaches classes in teacher research and science-related literacy and also works with a local not-for-profit, Springboard, bringing enrichment programs into underserved local schools. She received her PhD in Curriculum and Instruction from the University of Wisconsin and for 18 years, before moving to Missouri, taught literacy courses at the University of Maryland–Baltimore County.

Wendy Saul’s work in science and literacy began with a book Vital Connections: Children, Science and Books based on a conference held at the Library of Congress in 1985. Since 1990, she has had continuing funding from the National Science Foundation to explore how science and language might be better integrated in a variety of environments including elementary and secondary schools and libraries. She is an AAAS Fellow and continues to serve on the AAAS–Subaru Science Book Award Committee. Her most recent book, Front-Page Science: Engaging Teens in Science Literacy has been listed as an NSTA best-seller. Other books include Science Workshop, Beyond the Science Kit, and Crossing Borders to Science and Literacy Instruction.

In addition to her work around science and literacy, Wendy also serves as the Board Chair and volunteer Executive Director of the International Book Bank, an organization that sends ship container loads of brand new books to countries in the developing world. She also volunteers as a literacy specialist in Liberia and has also done similar work in Lithuania, Azerbaijan, Kosovo, and Ecuador.

9:30–10:30 AM  Presentations

Cross-Curricular Collaboration Using NGSS and CCSS
(Grades 9–12) 1501 C, Convention Center
Science Focus: GEN, SEP1, SEP7
Elizabeth Phillips (hphillips@bentonvillek12.org) and Lisa Baker (lbaker@bentonvillek12.org), Bentonville High School, Bentonville, Ark.
Tara Pfeil (tpfeil@bentonvillek12.org), Bentonville (Ark.) School District
Learn how to set up cross-curricular units that incorporate close reading, discussion, and writing strategies that all tie together with NGSS-level labs and activities.

AAPT Session: 30 Demos in 60 Minutes for High School
(Grades 9–12) 2102 A, Convention Center
Science Focus: PS1, PS2, PS3, SEP3, SEP4
Wendy Adams (wendy.adams@unco.edu), University of Northern Colorado, Greeley
Join me for 30 dynamic demonstrations that are sure to engage students in the wonder of science. Leave with tips on the setup, materials, procedure, and underlying science concepts.

Engineer Your World: Integrating Engineering Design, Computational Thinking, and 21st-Century Skills
(Grades 9–12) 2215 B, Convention Center
Science Focus: ETS, CCC1, SEP
Cheryl Farmer (cheryl.farmer@mail.utexas.edu), The University of Texas at Austin
Hear about an innovative, research-based engineering curriculum that meets the NGSS for engineering, fosters computational thinking, and supports the development of 21st-century skills.

NARST Session: Crafting a Coherent Conceptual Storyline: Lessons About Lesson Design
(General) 2504 B, Convention Center
Science Focus: GEN, NGSS
Deborah Hanuscin (@DHanuscin; hanuscind@missouri.edu), Kathryn Arnone (@AnnieArnone13; kam7t4@mail.missouri.edu), and Delinda Van Garderen (vangarderend@missouri.edu), University of Missouri–Columbia
Translating subject matter knowledge into lessons that students can understand is difficult! Learn how to craft coherent conceptual storylines to scaffold students’ developing science understandings.
**Designing Solutions to Feed the World’s Growing Population**  
(Grades 6–12) 2505 A, Convention Center  
Science Focus: GEN, NGSS  
**Chris Embry Mohr** (chrisembry.mohr@olympia.org), Olympia High School, Stanford, Ill.  
Explore strategies for increasing student engagement by making simple changes to existing lab activities by integrating NGSS with the science of producing food and fiber.

**STEM Meets Technical Text: A Recipe for Growing Our Future Makers**  
(Grades K–6/College) 3501 G, Convention Center  
Science Focus: GEN, CCC5, SEP2  
**Beth Walizer** (bwalizer@fhsu.edu) and **Sarah Rhodes** (serhodes@fhsu.edu), Fort Hays State University, Hays, Kans.  
Attention will be paid to integrating STEM within literacy. Technical and twin texts will be used to integrate STEM, inspire children, and enhance creativity.

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**9:30–10:30 AM  Hands-On Workshops**

**NESTA Shares: Innovative Ways to Teach About Climate and Climate Change**  
(Grades 6–College) 1501 B, Convention Center  
Science Focus: ESS  
**Michael Passow** (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
NESTA members will share strategies to enhance your studies of climate, climate change, and human impact to help implement NGSS and state curricular standards.

**Electricity Made Simple**  
(Grades 6–12) 2502 A, Convention Center  
Science Focus: PS3.B  
**Lawrence Scheckel** (lscheckel@charter.net), Retired Educator, Tomah, Wis.  
Power up your knowledge of circuits. This hands-on workshop is for those who know very little about basic electricity and need ideas on how to teach simple electrical circuits. Lots of handouts!

**20 in 20: The Next Chapter**  
(Grades 7–12) 2502 B, Convention Center  
Science Focus: LS  
**Whitney Hagins** (belahill@aol.com), Massachusetts Biotechnology Education Foundation, Chelmsford  
Make your biology course more inquiry based and student centered! Here are some new, exciting 20-minute activities to engage students in hands-on learning.

**NESTA Shares: Innovative Ways to Teach About Climate and Climate Change**  
(Grades 6–College) 1501 B, Convention Center  
Science Focus: ESS  
**Michael Passow** (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.  
NESTA members will share strategies to enhance your studies of climate, climate change, and human impact to help implement NGSS and state curricular standards.

**Engineering for Kindergarten? Yes!**  
(Kindergarten) 2503 A, Convention Center  
Science Focus: ETS1, SEP  
**Eeva Burns** (drburns@bighollow.us), Big Hollow Middle School, Ingleside, Ill.  
Let’s complete a variety of engineering projects specifically designed for kindergartners and the NGSS.

**Flipping for NGSS: Differentiated Lessons to Stretch All Learners**  
(Grades 6–8) 2504 A, Convention Center  
Science Focus: LS1  
**Tonya Sharp** (@sharpscience1; tonya.sharp@sjsd.k12.mo.us) and **Carla Johnson** (@carlajohnson78; carla.johnson@sjsd.k12.mo.us), Spring Garden Middle School, St. Joseph, Mo.  
Come explore strategies for differentiation as you implement the NGSS. Learn to create video resources and assessment tasks that ensure success for all learners.
NSTA Press® Session: Teaching Science Through Integrating Children’s Literature and Outdoor Investigations
(Grades K–5) 2505 B, Convention Center
Science Focus: GEN
Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University, Shippensburg, Pa.
Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Douglasville
Engage in lessons that combine investigations in outdoor science topics with paired children’s literature to enhance the topic and integrate other discipline areas.

Students Analyze Science and Engineering Data in the Quest for Sustainable Bioenergy
(Grades 8–College) 3501 A, Convention Center
Science Focus: ESS, ETS, LS, CCC2, CCC4, CCC5, SEP4, SEP5, SEP6, SEP7
John Greenler (@GLBioenergy; jgreenler@glbrc.wisc.edu), Great Lakes and Bioenergy Research Center, Madison, Wis.
Leith Nye (@GLBioenergy; leith.nye@wisc.edu), University of Wisconsin–Madison
Joyce Parker (@GLBioenergy; parker13@msu.edu), Michigan State University, East Lansing
Data nuggets from research on different biofuel crops (switchgrass, etc.) can be analyzed by students to consider the complexities of sustainable energy systems.
Selecting and Using the Best in Trade Books
(General) 3501 D, Convention Center
Science Focus: GEN
Juliana Texley (jtexley@att.net), NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.
Suzanne Flynn (suzannemflynn@earthlink.net), Lesley University and Cambridge College, Cambridge, Mass.
Come learn about the two systems by which NSTA identifies good and great science books for learning. Get a chance to judge the books and explore ways to use them. Find out how NSTA provides reviews of science materials, NSTA Recommends, and the Children’s Book Council Outstanding Trade Book competition. Door prizes—books, of course!

Turning Traditional Labs into Ones That Reflect the NGSS
(Grades 9–12) 3501 E, Convention Center
Jacklyn Bonneau (bonneau@wpi.edu), Massachusetts Academy of Math & Science at WPI, Worcester
Let’s look at a traditional lab done in chemistry and change it—making it an NGSS-compliant lab BEYOND having kids write their own procedure.

Extreme Makeover: Redesigning Laboratory Activities!
(General) 3501 F, Convention Center
Science Focus: GEN, SEP
Deanna Lankford and the MU-NSTA Student Chapter, University of Missouri–Columbia
Let’s “makeover” familiar activities to focus on science and engineering practices and stimulate students’ curiosity!

9:30–10:30 AM  Exhibitor Workshops

Chemistry with Vernier
(Grades 8–College) 2202, Convention Center
Science Focus: PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, you will use various digital tools, including some of our wireless options, to conduct experiments from our popular chemistry lab books. Use LabQuest Mini with a computer or LabQuest 2 as a stand-alone device. Learn about data collection options for iPad, Chromebook, and BYOD environments.

The Extraordinary Odyssey: An Expedition Through the Human Body
(Grades K–8) 2203, Convention Center
Science Focus: LS
Sponsor: Nasco
Lainna Callentine (lcallentine@hotmail.com), Sciexperience.com, Plainfield, Ill.
Hands-on exploration is key to science education. This dynamic workshop will arm you with new ideas for the classroom. Explore the many mysteries of the heart and the life-giving river that courses through the many tributaries in our body. In this interactive hands-on lab, you will hold actual lungs. Dive into the chambers of the heart and listen to its muscular melody.

Chemical Formula and Amino Acids
(Grades 9–12) 2204, Convention Center
Science Focus: PS1
Sponsor: LAB-AIDS®, Inc.
Presenter to be announced
What is the difference between subscripts and coefficients? What does “balancing” a chemical equation mean? Many students have trouble with these concepts. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for intuitive lessons for all students to master the formula, gaining a deeper understanding of chemistry.

They Come in Pairs: Using Socks to Identify and Address Student Misconceptions About Chromosomes
(Grades 6–12) 2206, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Understanding the stages of meiosis and addressing student misconceptions about chromosome behavior has always been a challenge. What if those concepts were as easy to understand as folding laundry? This workshop digs into how to identify and address these misconceptions using ChromoSocks. This session is presented in partnership with HudsonAlpha. Door prizes!
NexGenReady: Interactive Online NGSS Modules for Grades 3–8
(Grades 3–8) 2207, Convention Center
Science Focus: GEN, NGSS
Sponsor: NexGenReady Science
James Shymansky (julieann17ph@yahoo.com), Interactive Learning Online, Solon, Iowa
Get your grades 3–8 students excited about NGSS disciplinary core ideas with an online library of “NexGenReady” modules that can be viewed in English and Spanish with a simple touch of the screen! NGR provides instant student feedback and valuable diagnostics for you. Receive a “30-30-30” free trial at the workshop. While not required, you are encouraged to bring your iPhone, notebook, or laptop to get online!

Adapting Traditional Biology Labs to Sensor Technology
(Grades 9–College) 2208, Convention Center
Science Focus: LS
Sponsor: PASCO scientific
Jason Lee, East Georgia State College–Statesboro
Conduct hands-on inquiry investigations on enzyme activity and cellular respiration using PASCO sensors and SPARKvue software. See how sensors can transform tedious qualitative labs into short data-driven learning experiences for standards-based labs for grades 9–12 general, AP, and IB courses.

Exploring a Genetic Trait with Sticklebacks
(Grades 9–12) 2209, Convention Center
Sponsor: HHMI BioInteractive
Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, Ind.
Develop a rich and relevant lesson about genetic inheritance by using a short film, lab activity, and virtual lab. Emphasis will be placed on collecting and analyzing data to determine the type of inheritance. Participants are encouraged to bring a laptop, although it is not mandatory.

Pluto: New Horizons
(Grades 6–12) 2210, Convention Center
Science Focus: ESS1.B
Sponsor: Simulation Curriculum Corp.
Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.
Using Simulation Curriculum’s award-winning interactive Starry Night, let’s learn about Pluto and other denizens of the Kuiper Belt. On the Big Screen, we’ll watch the New Horizons space probe approach Pluto and its moon Charon and examine how the probe’s findings add to our knowledge of this dwarf planet.

Zombie Apocalypse!
(Grades 6–12) 2211, Convention Center
Science Focus: GEN, NGSS
Sponsor: Texas Instruments, Inc.
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
An airborne contagion! A devastating pandemic! What are we going to do? Scenario-based lessons are a great way to engage students and present concepts in context. STEM Behind Hollywood (www.STEMhollywood.com) is a free program from TI and The Science & Entertainment Exchange.

Engineering in the NGSS: Grades 9–12
(Grades 9–12) 2215 A, Convention Center
Science Focus: GEN, SEP
Sponsor: It’s About Time
Cary Sneider, Portland State University, Portland, Ore.
The NGSS breaks from previous documents by including science and engineering standards. This workshop, led by Cary Sneider, NGSS writing team leader, will illustrate how an innovative, project-based high school curriculum—Engineering the Future: Science, Technology, 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 and it can help you create your NGSS/STEM classroom.

Cool! Can We Do That Again?!
(Grades 2–8) 2215 C, Convention Center
Science Focus: PS1, PS4, SEP1
Sponsor: Educational Innovations, Inc.
Jeffrey Feidler, Consultant, Wilmington, Del.
Tired of hearing “Do we have to do that!?” from your students? Come check out some of the coolest activities involving polymers, color, and light. Your students will be asking if they can do that again—and again! Door prizes, freebies, and fun!
9:30 AM–12 Noon  Hands-On Workshop

NABT Session: AP Biology Meets the NGSS with Floating Leaf Disk Lab
(Grades 10–College)  2104 B, Convention Center
Science Focus: LS1.C, SEP
Brad Williamson, The University of Kansas, Lawrence
Camden Burton (@camdenburton; ccburton11@gmail.com), Summit Public School: Sierra, Seattle, Wash.
Pamela Close (@comobio), Hickman High School, Columbia, Mo.
Kelly Kluthe, Wyandotte High School, Kansas City, Kans.

Studying photosynthesis through the floating leaf disk method provides an engaging context that encourages and promotes student-led investigations. Explore the technique itself as well as investigate different strategies to promote effective student research questions, build data analysis and presentation skills, incorporate peer review, and develop skills in scientific argumentation.

11:00 AM–12 Noon  Presentations

Polymers: New Twists on Old Favorites
(Grades 7–12)  1501 A, Convention Center
Science Focus: PS1.A, CCC2, CCC6, SEP5, SEP6
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Gissel McDonald (mcdonaldg@usd230.org), Spring Hill High School, Spring Hill, Kans.

Enhance and deepen science and math concepts taught in traditionally “fun” polymer labs. Add more scientific processes to make them inquiry based. Take home a CD of information.

NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science
(Grades 6–College)  1501 B, Convention Center
Science Focus: ESS
Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

NESTA members will share exemplary educational websites, including the Center for International Earth Science Information Network, to help implement the NGSS and state curricular standards programs.

Engaging Writing Success: Incorporating Today’s Global Issues
(Grades 6–12)  1501 C, Convention Center
Science Focus: GEN
Linda Linnen (lslinnen@aol.com), Retired Teacher, Aurora, Colo.

Leave with a plethora of strategies to engage middle school and high school teachers in presenting today’s global issues. Writing models and rubrics included.

NSELA Session: Tools for Science Leaders, Part 1
(General)  2504 B, Convention Center
Science Focus: GEN
Elizabeth Mulkerrin (@nsela; elizabethm@omahazoo.com), NSELA President, and Omaha's Henry Doorly Zoo and Aquarium, Omaha, Neb.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.
The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators
(General) 2505 A, Convention Center
Science Focus: GEN

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

John Putnam (jputnam@nsta.org), Assistant Executive Director, Services, NSTA, Arlington, Va.

Alexandra Wakely (awakely@nsta.org), Administrative Coordinator, Services, NSTA, Arlington, Va.

Lost when it comes to finding online professional development resources to enhance your content knowledge and skills? With more than 11,000 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!

Science, Art, and Innovation
(Grades 4–8) 3501 B, Convention Center
Science Focus: ETS1, PS3.B, SEP7,
Patricia Lucido (@plucido4405; plucido4405@gmail.com), Targeted Connections, Lee’s Summit, Mo.
Nicole Riegel (nriegel@growstem.org), SySTEMic Innovations, Excelsior Springs, Mo.

Make things happen! Discover how the design and prototyping of electric circuit contraptions foster content knowledge, creativity, and productive talk.

Coral Reefs: Fragile Wonders Under Threat
(Grades 6–12) 3501 G, Convention Center
Science Focus: ESS, LS, PS
Lindsay Knippenberg (lindsayknippenberg@mgsd.k12.nc.us), Mooresville High School, Mooresville, N.C.

Coral reefs are a unique and stunning global treasure, but these fragile ecosystems are under increasing threat from pollution, harmful fishing practices, and ocean acidification. Even areas far from coasts can impact marine health. Incorporate coral reefs into your existing curriculum—biology, chemistry, climate studies, art, and more—using lesson plans, demos, labs, activities, and multimedia from the National Oceanic and Atmospheric Administration.

11:00 AM–12 Noon Hands-On Workshops

AAPT Session: Moving Your Students into Motion Using Modeling
(Grades 9–12) 2102 A, Convention Center
Science Focus: PS
Jon Anderson (jpanderson@isd12.org), Centennial High School, Circle Pines, Minn.
Experience “modeling” instruction and find out how this powerful instructional method can help you and your students see motion from a new perspective!

ACS Middle Level Session: Density—a Molecular View
(Grades 6–8) 2102 B, Convention Center
Science Focus: PS1.A
James Kessler (jhkessler@acs.org), American Chemical Society, Washington, D.C.
Explore the density of different materials through hands-on activities and molecular models from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

ASEE Session: Designing for Safety
(Grades 5–8) 2103 C, Convention Center
Jackie Foos (jfoos@ou.edu) and Susan Walden (@chemdocmommy; susan.walden@ou.edu), The University of Oklahoma, Norman
Use the engineering design process to build a safe car and develop a conceptual understanding of the relationship between velocity and the dangers of collisions.

Could It Be This Cheap? Modeling Phenomena via Budget-Friendly Labs
(Grades 7–12) 2502 A, Convention Center
Science Focus: GEN, NGSS
Ginna Myers, Eureka Union School District, Granite Bay, Calif.
Facilitate student understanding of the process by which scientific models are created and (repeatedly) revised using budget-friendly materials. Who says cheap can’t be good?
STEM Behind Medicine: Curing Type 1 Diabetes
(Grades 9–College) 2502 B, Convention Center
Science Focus: LS
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District
What once was “pie in the sky” is becoming more real by the day. Top researchers are making strides in the treatment and cure of Type 1 diabetes. We’ll look at the heroics of today’s research scientists.

A Progression of Learning Through the NGSS: K–8 Weather
(Grades K–8) 2503 A, Convention Center
Science Focus: ETS1, ESS2.D, CCC, SEP
Eeva Burns (eevaburns@gmail.com), Big Hollow Middle School, Ingleside, Ill.
Use weather as a vehicle to move from grades K to 8 by using NGSS disciplinary core ideas and incorporating engineering practices and crosscutting concepts.

CESI Session: From Explanation to Effective Reasoning for Your Students
(Grades K–8) 2504 A, Convention Center
Science Focus: GEN, SEP
Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), CESI President, and Central Michigan University, Mount Pleasant
Julie Thomas (julie.thomas@unl.edu), University of Nebraska–Lincoln
We will cover how to connect the NGSS to CCSS by including purposeful strategies to enhance students’ reasoning. Handouts!

Breathing Soils: Measuring Soil Respiration in the Classroom
(Grades 6–12) 3501 A, Convention Center
Terry Woodford-Thomas (tthomas@danforthcenter.org) and Sandra Arango-Caro (sarango-caro@danforthcenter.org), Donald Danforth Plant Science Center, St. Louis, Mo.
Dig deeper into understanding living things by measuring soil respiration in the classroom focusing on its important role in the carbon cycle, climate change, and agricultural productivity.

NGSS Using Engineering Design for Seed Dispersal
(Grades 4–10) 3501 C, Convention Center
Science Focus: SEP, LS, ETS
Lloyd Barrow (barrowl@missouri.edu), University of Missouri–Columbia
Emphasis will be placed on how teachers can use engineering design and science practices in their plants unit. Frequent student and teacher misconceptions will be addressed.

Linking Science and Literacy for Improved Student Outcomes
(Grades K–6) 3501 D, Convention Center
Science Focus: GEN
Bill Badders (@baddersb; baddersb@roadrunner.com), 2013–2014 NSTA President, Cleveland Heights, Ohio
Come explore strategies for linking science and literacy that support students’ abilities to read, write, and discuss in the context of science and inquiry-based learning using fiction and nonfiction texts. Hands-on examples of how science supports literacy and literacy supports science will be used.

Hands-On Standards: Having Your Curriculum Meet the NGSS, CCSS, and More
(Grades 9–12) 3501 E, Convention Center
Science Focus: ETS, SEP3, SEP4, SEP5, SEP7
Cheryl Farmer (cheryl.farmer@mail.utexas.edu), The University of Texas at Austin
Engage in activities from a project-based engineering curriculum, explore meeting multiple sets of standards, and discuss opportunities to make such connections within your own curricula.
Put the “E” in STEM!

(Grades 7–College) 3501 F, Convention Center

Science Focus: ETS1

**Gregory Dodd** (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.

Learn how to include engineering in your science classroom and meet the NGSS engineering design practice. Handouts!

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**11:00 AM–12 Noon Exhibitor Workshops**

**Biology with Vernier**

(Grades 8–College) 2202, Convention Center

Science Focus: LS, SEP

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, you will use various digital tools, including some of our wireless options, to conduct experiments from our popular biology lab books. Use LabQuest Mini with a computer or LabQuest 2 as a stand-alone device. Learn about data collection options for iPad, Chromebook, and BYOD environments.

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All our curricula are produced through the rigorous, iterative, research-based cycles established by the National Science Foundation development process.

Visit us at iat.com or at Booth #131
Environmental Study: A Real-World Investigation
(Grades 10–College) 2203, Convention Center
Science Focus: ESS, CCC
Sponsor: Fisher Science Education
How do real environmentalists determine water quality? Use field tools, laboratory equipment, and chemistry to investigate a real-world water quality case study. Convince your students by showing the power of hands-on data collection and the story it will uncover.

What Is a Species?
(Grades 9–12) 2204, Convention Center
Science Focus: LS4
Sponsor: LAB-AIDS®, Inc.
Dawn Posekany, Solon High School, Solon, Iowa
In this activity from the SEPUP high school biology program, learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. We will then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

Let’s Get Helical
(Grades 6–College) 2205, Convention Center
Sponsor: 3D Molecular Designs
Tim Herman (herman@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
DNA can be viewed as a macromolecule or a source of genetic information. Explore both features with two interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. Examine the mutation that leads to sickle cell disease and the regulation of fetal and adult hemoglobin expression.

Creating to Understand: Come Build Your Muscles in Clay!
(Grades 8–College) 2207, Convention Center
Science Focus: LS
Sponsor: ANATOMY IN CLAY® Learning System
Chuck Roney, Retired High School Teacher, Haddonfield, N.J.
Get introduced to a new method of learning anatomy and physiology. We will discuss how to teach skeletal, muscular, and other body systems in a powerful kinesthetic way using clay! Learn how to build your muscles in clay and engage your students with immediate hands-on learning while following NGSS and STEM practices.

Physics with PASCO scientific—Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics
(Grades 9–College) 2208, Convention Center
Science Focus: PS
Sponsor: PASCO scientific
Jason Lee, East Georgia State College–Statesboro
Get hands on with the most sophisticated and flexible physics software available today—PASCO Capstone—with advanced physics analysis features, including video analysis. See how using PASCO probeware, software, and equipment can enhance your physics demonstrations and labs.

Modeling and the Double Helix
(Grades 8–12) 2209, Convention Center
Science Focus: LS1.A, LS1.D, CCC6, SEP2
Sponsor: HHMI BioInteractive
Karen Lucci, Hopewell Valley Central High School, Pennington, N.J.
Based on the short film The Double Helix, students in middle school and high school can use resources available at BioInteractive.org to construct an understanding of how the structure of DNA was determined and how modeling can be used to explain structure and predict functions.

MiniOne™ Electrophoresis: Revolutionizing Biotechnology in Real Time
(Grades 7–College) 2210, Convention Center
Science Focus: LS
Sponsor: The MiniOne Electrophoresis
Richard Chan (info@theminione.com) The MiniOne Electrophoresis, San Diego, Calif.
Do an electrophoresis experiment in 30 minutes with the MiniOne! Watch DNA migrate and receive instant feedback to supplement lecture and facilitate learning. The MiniOne
offers more hands-on experience for students and less prep 
time for you. Please bring your smartphone and be ready to 
take a picture of your results.

FUNdamentals of Energy Education 
(Grades 4–9) 2211, Convention Center 
Science Focus: PS3, CCC5 
Sponsor: UNI Fabulous Resources for Energy Education 
Patricia Higby (patricia.higby@uni.edu), University of 
Northern Iowa, Cedar Falls 
Birgitta Meade, Luther College, Decorah, Iowa 
Discover how the UNI Fabulous Resources for Energy Educa-
tion program can help you feel more comfortable teaching 
about energy, work, and power using simple kits you can buy 
or build yourself. Use real-world weather, wind, and solar 
energy data to make and test predictions, draw graphs, and 
do calculations.

Debunking the Myths of Project-Based Learning— 
Yes, We CAN! 
(Grades 6–12) 2215 A, Convention Center 
Science Focus: GEN, NGSS 
Sponsor: It’s About Time 
Amanda Wilson, It’s About Time, Mount Kisco, N.Y. 
Gary Curts, STEM Implementation Specialist/Retired 
Educator, Dublin, Ohio 
Skeptical of Project-Based Learning? Concerned about the 
time and resources required? Join us in debunking the myths 
of PBL. We will explore how common concerns are just 
myths and how PBL can be the teaching style that works for 
you and your students.

Observing and Inferring in the Science Classroom: 
New Tips and Tools from Dinah Zike’s Notebooking 
Central 
(General) 2215 C, Convention Center 
Science Focus: GEN 
Sponsor: Dinah.com 
Nancy Wisker, Nancy Wisker Consulting, LLC, Colum-
bia, Tenn. 
Leave with new Notebooking Central templates for class-
room (and real life) observations and inference to help 
students learn to see and think like scientists. Build a mini-
notebook of ideas and applications ready to use on Monday. 
Join us for brain-engaging, research-based interactive activi-
ties for observation and inference.

11:00 AM–12:15 PM  Exhibitor Workshop 
Investigate Photosynthesis and Cellular Respiration 
with Algae Beads 
(Grades 9–College) 2201, Convention Center 
Science Focus: LS 
Sponsor: Bio-Rad Laboratories 
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Labora-
tories, Hercules, Calif. 
Learn how algae can be used in authentic inquiry investiga-
tions to study both photosynthesis and cellular respiration 
(AP Biology Big Idea 2; Labs 5 and 6). Use encapsulated algae 
beads in a colorimetric assay to examine the consumption and 
release of CO2 that occurs during photosynthesis and cellular 
respiration with qualitative and quantitative measurements. 
Learn how to extend this experiment into an open or guided 
inquiry investigation.

11:00 AM–1:00 PM  Hands-On Workshop 
ACS Session Two: Energy in Chemistry: A Particulate 
View 
(Grades 9–12) 2103 B, Convention Center 
Science Focus: PS, CCC 
Marta Gmurczyk, American Chemical Society, Wash-
tington, D.C. 
Engage in “modeling activities” that can help students better 
understand energy transfer during physical and chemical 
processes by building and analyzing particulate models of 
matter. These activities are designed to deepen students’ 
conceptual understanding of how the kinetic and potential 
energy of particles change during phase changes and in 
chemical reactions, and how this information can be used 
to analyze changes in our surroundings.

11:30 AM–12 Noon  Exhibitor Workshop 
The Solid Earth 
(Grades 5–8) Booth #311, Exhibit Hall 
Science Focus: ESS 
Sponsor: Science First®/STARLAB® 
Helmut Albrecht, Science First/STARLAB, Yulee, Fla. 
Using the immersive learning environment of the portable 
dome and a lesson from the Earth science software The Layered 
Earth, we will discuss topics such as Earth’s interior layers and 
surface features.
12 Noon–12:45 PM  Special Session
Meet the Presidents and Board/Council  
(General) NSTA Exhibits (Hall B) Entrance, Conv. Center  
Science Focus: GEN  
Be sure to stop by for this special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

12:30–1:00 PM  Presentation
Project SOAR: Creating a Science Curriculum That Soars to New Heights Through the Use of Understanding by Design  
(Grades K–5) 2215 B, Convention Center  
Science Focus: ETS2.A, PS2, CCC6, SEP  
Jennifer Beasley (@profbeasley, jgbeasley@uark.edu) and Cathy Wissehr (cwissehr@uark.edu), University of Arkansas, Fayetteville  
Bridgette Fincher (bfincher@pittstate.edu), Pittsburg State University, Pittsburg, Kans.

Creating STEM-focused units for the elementary classroom requires planning with the end in mind. Learn how Understanding by Design can help with the NGSS.

12:30–1:30 PM  Presentations
Modeling NGSS Crosscutting Concepts with Aligned Topics  
(Grades 7–12) 1501 A, Convention Center  
Science Focus: GEN, CCC  
Carol Engelmann (cengelmann@unomaha.edu), University of Nebraska Omaha  
Mark Klawiter (mfklawit@mtu.edu), Michigan Technological University, Houghton  
Jenelle Hopkins (jhopkins@interact.ccsd.net), Shadow Ridge High School, Las Vegas, Nev.

Join us as we address the NGSS crosscutting concepts with science activities developed and teacher tested through Michigan Teacher Excellence Program (MiTEP) and STEM Pre-service Teacher Academic Learning Community Program.

Makerspace: A Place for Students to Learn and Create Instead of Consume and Regurgitate  
(Grades 7–12) 1501 C, Convention Center  
Science Focus: ETS  
Jayne Jones (jjones@usd404.org) and Delaina Brown (dbrown@usd404.org), Riverton High School, Riverton, Kans.

Hear how two rural schools, a language arts teacher/media specialist, and two science teachers created a virtual Makerspace for students to research and make models on a green topic of their choosing.
**NSELA Session: Tools for Science Leaders, Part 2**  
(General)  
2504 B, Convention Center  
Science Focus: GEN  
Elizabeth Mulkerrin (@nsela; elizabethm@omahazoo.com), NSELA President, and Omaha’s Henry Doorly Zoo and Aquarium, Omaha, Neb.  
Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.  

Authors Needed! Publish Your Teaching Ideas in an NSTA Journal  
(General)  
2505 A, Convention Center  
Science Focus: GEN  
Ken Roberts (ken_i@nstaaa.org), Assistant Executive Director, Journals, NSTA, Arlington, Va.  
Meet with NSTA journal editors to learn how to successfully prepare and submit an article for publication.  

**50 Labs You Can Do on a Small Budget**  
(Grades 9–College)  
3501 B, Convention Center  
Science Focus: PS, SEP3, SEP4  
Theodore Koehn (tedkoehn66@yahoo.com), Metropolitan Community College, Omaha, Neb.  
This presentation will share 25 chemistry and 25 physics labs using inexpensive materials. All shown equipment will be given away.  

**Mission HydroSci: A Virtual Environment for Teaching Water Systems and Argumentation**  
(Grades 6–8)  
3501 C, Convention Center  
Science Focus: ESS2.C, SEP7  
Troy Sadler (@ReSTEMInst; sadlert@missouri.edu), University of Missouri–Columbia  
Get an in-depth look at Mission HydroSci, a 3-D virtual environment for engaging middle school learners in exploration of water systems.
NASA's Goldstone Apple Valley Radio Telescope (GAVRT) Project
(Grades 4–College) 3501 D, Convention Center
Science Focus: ESS
Shannon McConnell, NASA Jet Propulsion Laboratory, Pasadena, Calif.
Join NASA's GAVRT Student Program. See how students can team up with NASA scientists and collect data while operating a 34-meter radio telescope from your classroom computer.

Physical Structures, Plants, and Everyday Tools: Helping Children Understand the Impact of Science and the Essential Integration of All STEM Disciplines
(Grades P–6) 3501 G, Convention Center
Science Focus: ETS, LS, CCC, SEP
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.
Discover strategies to actively engage elementary students by growing plants, constructing physical structures (bridges, ramps, etc.), and exploring everyday objects and tools. Handouts!

12:30–1:30 PM  Hands-On Workshops

NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources
(General) 1501 B, Convention Center
Science Focus: ESS
Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.
NESTA members share examples of grade-appropriate classroom-ready activities to address NGSS concepts about minerals, rocks, and natural resources.

AAPT Session: Physics on the Cheap
(Grades 9–12) 2102 A, Convention Center
Science Focus: PS
Jon Anderson (jpanderson@isd12.org), Centennial High School, Circle Pines, Minn.
Emphasis will be placed on making and using equipment for teaching physics. In this make-and-take session, you will assemble inexpensive physics equipment for demonstrations, classroom labs, or both!

ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding
(Grades 6–8) 2102 B, Convention Center
Science Focus: PS1.A
James Kessler (jhkessler@acs.org), American Chemical Society, Washington, D.C.
Explore the periodic table and bonding through a card game, molecular model animations, and videos of chemical reactions from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

ASEE Session: Engineering Design for High School Chemistry: Water Filters for a Developing Country
(Grades 9–12) 2103 C, Convention Center
Science Focus: ETS, PS, SEP
Bruce Wellman (bwellmanow@olatheschools.org), Olathe Northwest High School, Olathe, Kans.
Explore a human-centered engineering design project that integrates into high school chemistry classes. Leave with resources for teaching a design process.

NABT Session: Quantified Plant Behavior: An Inquiry Lab Ready for Monday
(Grades 6–College) 2104 B, Convention Center
Science Focus: LS, SEP
Michael Ralph (@ralph0305; mralphoe@olatheschools.com), Olathe East High School, Olathe, Kans.
Shannon Ralph (@sralph81; ralph.shannon@usd443.org), Dodge City High School, Dodge City, Kans.
Learn how to use wild plants to cover plant physiology, behavior, and homeostasis. Inquiry-based methods will cover new NGSS content while building lab skills.

NASA Astrobiology: The Search for Life Beyond Earth
(Grades 5–College) 2502 A, Convention Center
Science Focus: ESS1.A, ESS1.B, CCC4, SEP2, SEP4
Rachel Zimmerman Brachman (@RachelZBrachman; rachel.zimmerman-brachman@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.
Astrobioologists seek answers to the fundamental question, “Are we alone?” Learn how astrobiologists at NASA’s Jet Propulsion Laboratory search for signs of life on icy moons of our solar system.
Food Chains: Using Field Surveys That Give Real Numbers
(Grades 6–8)  2503 A, Convention Center
Science Focus: LS, SEP3
Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.
Roy “Jack” Tison (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, Ill.
Experience three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

Feeding Our Feathered Friends
(Grades K–8)  2504 A, Convention Center
Science Focus: GEN
Lindsay Glasner (@BirdSleuth; lig27@cornell.edu) and Barbara Jacobs-Smith (barbara.jacobs-smith@breckschool.org), The Cornell Lab of Ornithology, Ithaca, N.Y.
Come get your free window bird feeder and discover how to use it to attract birds and student interest!

From Sun to Food
(Grades 2–6)  3501 A, Convention Center
Science Focus: ESS, LS
Skyler Wiseman (skylerb@wustl.edu), Washington University in St. Louis, Mo.
How do we help our students understand that everything we eat can be traced back to the Sun? This hands-on workshop helps teachers scaffold the concepts from photosynthesis (with ping-pong ball atoms) through trophic levels of energy. Lots of handouts and ideas!

Think-Connect-Act: A 3-D Learning Model for Teaching the Academic Vocabulary Students Need to Succeed
(Grades 3–12)  3501 F, Convention Center
Science Focus: GEN, SEP7
Joanne Billingsley (@joannebillingsl; jbillingsley@satx.rr.com) Billingsley Education, San Antonio, Tex.
Use imagery, music, and communication to enhance science literacy by creating visual, 3-D vocabulary lessons. Practice proven strategies for building a language-rich interactive science classroom.

12:30–1:30 PM  Exhibitor Workshops
Integrating Chromebook with Vernier Technology
(Grades 3–12)  2202, Convention Center
Science Focus: GEN, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data helps students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with Chromebook and Vernier technology, including LabQuest Mini. Experiments such as Boyle’s Law, Grip Strength Comparison, and Ball Toss will be conducted.

Cell Differentiation and Gene Expression
(Grades 9–12)  2204, Convention Center
Science Focus: LS1
Sponsor: LAB-AIDS®, Inc.
Dawn Posekany, Solon High School, Solon, Iowa
Students often have trouble conceptualizing how selective gene expression works. In this workshop, we will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the Science and Global Issues: Biology program from SEPLP and LAB-AIDS.

Double (Helix) Trouble: Maintaining Fidelity in DNA Replication
(Grades 6–College)  2205, Convention Center
Science Focus: ETS1.B, LS1.A, LS3, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman (herman@msoe.edu) and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
DNA replication is an essential process to ensure that accurate genetic information is passed down to future generations. We will explore this process using an interactive representation of the replication fork that simulates the process of DNA synthesis and 3-D models of the critical proteins that keep it in check.
Modeling and Storytelling: A Means to Understanding Enzyme Regulation
(Grades 9–12) 2209, Convention Center
Science Focus: LS1.A, SEP2
Sponsor: HHMI BioInteractive
Sherri Story, Kings Fork High School, Suffolk, Va.
Investigate the relationship between protein structure and function by modeling the unregulated BCR-ABL kinase found in chronic myeloid leukemia. Use online interactives, clay modeling, storytelling, whiteboarding, and graph analysis to explore the action of the anti-leukemia drug, Gleevec. Learn the “I Squared” strategy to analyze a variety of graphed data.

The Secrets to Successful PBL
(Grades 3–12) 2211, Convention Center
Science Focus: PS2.C, CCC4, SEP2, SEP3
Sponsor: Accelerate Learning–STEMscopes
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning–STEMscopes, Houston, Tex.
Project Based Learning can be challenging the first time you implement it. Come experience an engaging hands-on PBL that reveals the strategies for seamless facilitation. Allow your students the autonomy to solve problems that interest them and see high levels of engagement that lead to high levels of learning.

EarthComm, a Project-Based High School Earth Science Curriculum—Developed by the American Geosciences Institute—with an Authentic NGSS Approach
(Grades 9–12) 2215 A, Convention Center
Science Focus: ESS
Sponsor: It’s About Time
Amanda Wilson, It’s About Time, Mount Kisco, N.Y.
Become familiar with the newest edition of EarthComm and experience how its systems approach incorporates the NGSS into its instructional model. Discover how this Project-Based Learning approach—that has the engineering design cycle embedded—can help you fully implement the NGSS into your classroom. Learn why school districts coast to coast use EarthComm to engage students, help them develop meaning, and succeed in Earth science.

1:00–1:30 PM Presentation
Integrating Science and Literacy Through STEM for Early Childhood Learners
(Grades P–2) 2215 B, Convention Center
Science Focus: GEN
Abha Singh (a-singh@wiu.edu) and Megan Lyons (@lyonqueen99; mn-lyons@wiu.edu), Western Illinois University, Macomb
Emphasis will be placed on how science-literacy integration can be implemented using STEM. Early childhood teachers will learn to practice those techniques.

2:00–3:00 PM Exhibitor Workshops
The GMO Debate Rages On!
(Grades 9–College) 2201, Convention Center
Science Focus: PS
Sponsor: Bio-Rad Laboratories
Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Are GM crops a good thing? Do you feel that genetic modifications create frankenfoods or do they help produce safe food to feed the ever-expanding world population? Do all countries have the same GM food-labeling requirements? Learn more about GMOs, how to test for the presence of GM content in foods, join a debate, and learn how to bring this experience to your classroom.

Integrating iPad with Vernier Technology
(Grades 3–12) 2202, Convention Center
Science Focus: GEN, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data helps students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with iPads and Vernier technology, including our new Go Wireless Link. Experiments such as Boyle’s Law and Grip Strength Comparison will be conducted.
Using the Classic Chemistry Demonstration to Engage Students  
(Grades 7–College) 2203, Convention Center  
Science Focus: PS  
Sponsor: South Dakota State University  
Matthew Miller (matt.miller@sdstate.edu), South Dakota State University, Brookings  
The Department of Chemistry and Biochemistry at South Dakota State University offers an online MS degree in chemistry for teachers. Join us as we briefly provide details of the program and spend most of the time showing safe demonstrations that engage students in the classroom using the concepts of notice and wonder.

Energy Flow Through an Ecosystem  
(Grades 9–12) 2204, Convention Center  
Science Focus: LS2, LS3, LS4  
Sponsor: LAB-AIDS®, Inc.  
Dawn Posekany, Solon High School, Solon, Iowa  
Join us as we use an interactive card sort with organism cards and ecosystem events to predict the effect of different events on the food web and ecosystem. We then construct an energy pyramid to examine how much energy is stored at each level of a food web.

Engineering Design for Grades K–2  
(Grades K–2) 2206, Convention Center  
Science Focus: ETS1  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Students in K–2 can ask questions, make observations, and gather information to define a simple problem and solve it with a new or improved object or tool. We’ll cover NGSS K–2-ETS1-1 and K–2-ETS1-2 (Engineering Design) and provide lesson examples and strategies for engineering design in K–2 classrooms in this hands-on workshop.

Student Collaboration in the Science Classroom  
(Grades 6–9) 2207, Convention Center  
Science Focus: GEN, SEP7, SEP8  
Sponsor: Army Educational Outreach Program  
Get ideas on how to improve group work in your classroom and how working in teams can make your students better scientists and engineers. Also, hear about the free online STEM competition eCYBERMISSION and how you and your students can participate.

Bake for Good: Kids Learn-Bake-Share Program  
(Grades 4–7) 2208, Convention Center  
Science Focus: GEN  
Sponsor: King Arthur Flour  
Nate Sandel (nathan.sandel@kingarthurflour.com), King Arthur Flour  
Bake for Good: Kids Learn-Bake-Share Program visits schools to teach kids how to bake yeast bread from scratch. Kids take ingredients home to bake two delicious loaves; they donate one and enjoy the other. We’ll share how the program uses science and math, provides an opportunity for service learning, and teaches baking skills. Door prizes!

Explore Virtual Labs from BioInteractive  
(Grades 9–12) 2209, Convention Center  
Science Focus: LS, SEP4  
Sponsor: HHMI BioInteractive  
Sherry Annee, Brebeuf Jesuit Preparatory School, Indianapolis, Ind.  
Explore free online virtual labs and supplemental resources that investigate topics such as ELISA, PCR, DNA sequencing, BLAST, phylogenetic analysis, and data collection. Participants are encouraged to bring a laptop, although it is not mandatory.

Weather and Climate Change—Are We Doomed?  
(Grades 6–12) 2210, Convention Center  
Science Focus: ESS2.D, ESS3.D  
Sponsor: Simulation Curriculum Corp.  
Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.  
Join us as we use Simulation Curriculum’s Layered Earth Meteorology to investigate weather and climate using STEM and NGSS-ready lessons. This interactive model of Earth and thought-provoking exercises allow students to distinguish between weather and climate and study climate change and its effect on our planet.

A Matter of Life and Death  
(Grades 6–12) 2211, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Texas Instruments, Inc.  
Jeffrey Lukens, Sioux Falls (S.Dak.) School District  
Disease affects all of us. Learning the science and math behind the mechanisms, treatments, and the STEM careers involved is a powerful way to engage students and put context around the concepts students are required to learn. STEM Behind Health (www.STEMbehindHealth.com) is a free program from TI and Sanford Research.
Project-Based Inquiry Science™ (PBIS): Creating “Coherence and Science Storylines” for Middle School Science (Grades 6–8) 2215 A, Convention Center
Science Focus: ESS
Sponsor: It’s About Time
Carrie-Anne Sherwood, It’s About Time, Mount Kisco, N.Y.
Explore the power of clearly articulated middle school science content storylines developed around answering a Big Question and addressing a Big Challenge. Join us and investigate the storyline for the Project-Based Inquiry Science unit “Living Together,” an ecology/water quality unit, and discuss the nature of carefully ordered investigations that help students to actively engage. Formative and summative assessments included.

3:00–6:00 PM  Meeting
CESI Board Meeting
Salon 4, Marriott

3:30–4:00 PM  Presentation
STEM Stakeholders: Building the Vision for Science with Community Partners (General) 3501 D, Convention Center
Science Focus: GEN, INF, NGSS
Lucas Shivers (@adaptinstruct; lucas@usd383.org), Manhattan-Ogden Unified School District 383, Manhattan, Kans.
Unfold the possibilities of a community-based vision for STEM in your setting by partnering with others to build capacity and expand student potential with real-world Project Based Learning.

3:30–4:30 PM  Featured Presentation
Agriculture: Traditional Science Taught in an Unexpected Applied Way (General) 2105, Convention Center
Science Focus: ETS
Corey Flournoy, (corey@creativeoutreachconsulting.com), Vice President, Associate Director Global Talent Development, FCB Global, Chicago, Ill.
Presider: Chris Embry Mohr, Strand Leader, Combining Science with Agriculture, and Olympia High School, Stanford, Ill.
The field of agriculture is one of the most misunderstood, underestimated and undervalued industries in our country, often viewed as “traditional,” “antiquated,” and reserved for the “less educated.” Modern agriculture extends well beyond the traditional production of food for humans and animals. Today, the sciences of agriculture are recognized as areas of applied science in their own right. Through applied agricultural sciences, students can better understand biology and chemistry principles through plant and animal production or see physics and geology in soil science and agricultural engineering. Join Corey for a thoughtful conversation on how you can change how the world of science is viewed and used in your classroom.

Corey Flournoy is vice president/associate director for Global Talent Development for FCB (Foote, Cone & Belding). Recently, Corey was the director of the Illinois Center for Urban Agricultural Education for the University of Illinois at Urbana based in his alma mater, the Chicago High School for Agricultural Sciences. A native of Chicago, he has a specialized background in speech communications and agribusiness as a graduate of the University of Illinois at Urbana-Champaign with a BS in Agricultural and Consumer Economics and Michigan State University with a master’s degree in Agricultural and Extension Education. During his 27 years of experience in agricultural education, Corey served as the first African-American and non-rural president of the National FFA Organization and its 450,000-plus membership.

In addition, Corey is a Certified Professional Behaviors and Motivators, Emotional Intelligence and TriMetrix analyst through TTI International, a certified training generalist and instructional designer/developer through Langevin Learning Services, and a True Colors™ Personality/Temperament Style facilitator.
3:30–4:30 PM Presentations

How to Change an Old Lab to Do New Tricks!
(Grades 8–12) 1501 A, Convention Center
Science Focus: PS, CCC, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Sherri Rukes, Libertyville High School, Libertyville, Ill.
Trying to implement a changing curriculum to support the NGSS? Need help interpreting science and engineering practices vs. inquiry? Learn how some traditional fun labs could be changed to expand inquiry and design in the chemistry classroom. Take home a CD of information.

Backward Planning to Support Cross-Curricular Science Instruction: Developing a Farmer’s Market with Sixth-Graders
(Grades 5–9) 2215 B, Convention Center
Science Focus: GEN, SEP3, SEP4, SEP6
Ryan Mahn (@JTSDNixa; ryanmahn@nixaschools.net),
Chris Holmes (@JTSDNixa; chris Holmes@nixaschools.net), and Tracy Harris (@JTSDNixa; tracyharris@nixaschools.net), John Thomas School of Discovery, Nixa, Mo.
Give your students a real-world education, integrating all content areas, through the production and sales of plants, flowers, and health care products.

Project Based Learning: Useful Tips, Tools, and Strategies for Incorporating PBL Without Fear!
(Grades 7–12) 1501 C, Convention Center
Science Focus: GEN, NGSS
Jennifer Furstenberg (@mrsfurstenberg; jfurstenberg@bentonvillek12.org), Bentonville High School, Bentonville, Ark.
Jacqui Lovejoy (@mrsljscience; jmbprncs@yahoo.com), Lincoln Junior High School, Bentonville, Ark.
Bring relevancy into your classroom! Learn strategies for successful incorporation and see examples of Project Based Learning from several classrooms (including high tech and low tech).

Engineering Science Creativity: Brainstorming, Designing, and Evaluating Models
(Grades 4–8) 2504 B, Convention Center
Science Focus: ETS, SEP1, SEP2, SEP3, SEP6, SEP7, SEP8
Lori Elliott (@loriEll2013; lorijones@nixaschools.net), Nixa (Mo.) Public Schools
Develop instructional practices that integrate several NGSS practices while enhancing science concepts through model design. Let’s journey through the engineering process to build student engagement.

AAPT Session: Physics Potpourri
(Grades 6–12) 2102 A, Convention Center
Science Focus: PS, SEP8
Steven Maier (@SteveMaier; sjmaier@nwosu.edu), Northwestern Oklahoma State University, Alva
Presider: Jennifer Sattler (jsattler@nwosu.edu), Northwestern Oklahoma State University, Alva
Join physics teachers from the Arkansas—Oklahoma—Kansas section of AAPT as they share short presentations highlighting new classroom activities, equipment, and practices in physics education.

ASEE Session: The Innovation Portal: Connecting Student Design and Problem-Solving Projects with Opportunities
(Grades 6–College) 2103 C, Convention Center
Science Focus: ETS, SEP
Mark Schroll (@markschroll; m schroll@pltw.org), Project Lead The Way, Inc., Indianapolis, Ind.
Hear about a free online application allowing users to build engineering design portfolios, collaborate with partners from any location, share with mentors, and connect with opportunities.
(Grades K–12)  
2505 B, Convention Center 
Science Focus: GEN, SEP 
Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla. 
How do you know what your students are really thinking about core concepts in the NGSS? How can the practices be used to reveal student thinking in order to make better instructional decisions? Learn how formative assessment probes and techniques connect to core NGSS ideas and practices.

3:30–4:30 PM  Hands-On Workshops

ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences  
(Grades 6–8)  
2102 B, Convention Center 
Science Focus: PS1.A 
James Kessler (jkhessler@acs.org), American Chemical Society, Washington, D.C. 
Explore water characteristics and learn what makes water a polar molecule through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

NABT Session: Tiny Bubbles, Popcorn, and More—Modeling Population Demographics  
(Grades 9–College)  
2104 B, Convention Center 
Pamela Close (@comobio) and Noelle Gilzow, Hickman High School, Columbia, Mo. 
Rachel Tinsley, Muriel Battle High School, Columbia, Mo. 
Join us for this hands-on workshop as we engage in a series of high-interest skill-building modeling simulations.

English Language Development Opportunities for ELL Through Meaningful Integration of the NGSS and CCSS  
(Grades K–12)  
2502 A, Convention Center 
Jerry Valadez (jdvscience@yahoo.com), NSTA Director, Multicultural/Equity, and California State University, Fresno 
Explore how to effectively support English language learners to develop science identities using the NGSS science and engineering practices.

Solids: The Neglected “State” of Chemistry  
(Grades 9–12)  
3501 G, Convention Center 
Science Focus: PS1.A, PS1.B, CCC1, CCC2, CCC6, SEP2, SEP3, SEP6, SEP8 
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo. 
Gissel McDonald (mcdonaldg@usd230.org), Spring Hill High School, Spring Hill, Kans. 
Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymer/ceramics) make concepts easier to teach and learn. We’ll share NGSS correlations as well as a CD of information.

Stellar Evolution—From Star Formation to Catastrophic Destruction  
(Grades 6–12)  
2502 B, Convention Center 
Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz. 
Model star and planet formation and destruction using images from NASA missions, including stellar nurseries, protostars, supernovas, white dwarfs, neutron stars, pulsars, and black holes.

Cleaning the Glass to Get a Closer Look at STEM  
(Grades 3–6)  
2503 A, Convention Center 
Science Focus: ETS1, PS1.A, PS2.A, CCC, SEP 
Rebecca McDowell (@BeTheChnge; beckymcdoewell@gmail.com), Barrington (Ill.) 220 School District 
Elizabeth Gajdzik (egajdzik@purdue.edu), INSPIRE, West Lafayette, Ind. 
Reimagine your magnets and properties of matter lessons as an integrated STEM experience that engages students in authentic hands-on engineering design projects.

AgSTEM: Precision Agriculture  
(Grades 8–12)  
3501 A, Convention Center 
Science Focus: ETS, LS2.B, PS4.C, CCC1, CCC2, SEP 
Peggy Welch (peggywelch851@gmail.com), Retired Educator, Lexington, Ky. 
Integrate agriculture and STEM by exploring precision farming. We will cover kinesthetic activity modeling GPS (geometry), graphing GPS diagnostic soil nutrient data (agriculture engineering), and nitrogen cycle (biology). Handouts!
The ART of Science Teaching: A Paint-by-Numbers Schema
(Grades 6–12) 3501 B, Convention Center
Science Focus: ESS, SEP
Barry Fried (bfriedfab4@optonline.net), Retired Principal and STEM Advisor, East Meadow, N.Y.
Honora Dash (hdash@schools.nyc.gov), Edward R. Murrow High School, Brooklyn, N.Y.
Learn how to use innovative teaching strategies to create an enriched, real, rigorous, and all-inclusive classroom environment using Earth and space science as a unifying theme to promote problem solving and communication and build literacy and research skills for students to have authentic science learning experiences.

3-D Tissue Models That Anyone Can Build
(Grades 9–12) 3501 C, Convention Center
Ruth Hutson (ruthhutson@bluevalley.net), Blue Valley High School, Randolph, Kans.
Increase your students’ 3-D spatial understanding by constructing models of the four tissues. Tissue models will be combined showing how they make skin.

It’s Elementary—Engineering, the Environment, and Literacy
(Grades 1–5) 3501 E, Convention Center
Science Focus: ESS, ETS, CCC1, CCC2, CCC5, CCC6, CCC7, SEP
Alice (Jill) Black (abrack@missouristate.edu), Missouri State University, Springfield
Come participate in four literacy-related activities and learn about others that invite elementary children to use engineering principles to solve environmentally related problems.

3:30–4:30 PM Exhibitor Workshops

Physics and Physical Science with Vernier
(Grades 8–College) 2202, Convention Center
Science Focus: PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com) Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, you will use various digital tools, such as probeware, to conduct experiments from our popular physics and physical science lab books. Use LabQuest Mini with a computer or LabQuest 2 as a stand-alone device. Learn about data collection for iPad, Chromebook, and BYOD environments, including wireless options.

Introduction to Wisconsin Fast Plants®
(Grades K–12) 2206, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants are ideal classroom tools for all learning levels. Learn the basics for successful planting, flower dissections, and pollination. Integrate plant development, life cycle, environmental effects, genetics, and evolution into your class with these amazing plants. Door prizes!

The Cell Cycle and Cancer
(Grades 9–College) 2209, Convention Center
Science Focus: LS1.B, SEP4
Sponsor: HHMI BioInteractive
Karen Lucci, Hopewell Valley Central High School, Pennington, N.J.
Learn to use a multilayered resource to have students explore the cell cycle and its relationship to cancer. Useful for all levels in high school, students interact with the resources to visualize the patterns in cell division and the changes that can result in cancer.
PBIS Roundtables: Discussions to Support Successful Implementation
(Grades 6–8) 2215 A, Convention Center
Science Focus: GEN, NGSS
Sponsor: It’s About Time
Amanda Wilson and Carrie-Anne Sherwood, It’s About Time, Mount Kisco, N.Y.
Mary Pat Siewert and Sharon Hushek, Ben Franklin Elementary School, Franklin, Wis.
Elizabeth Gorak, Forest Park Middle School, Franklin, Wis.
Join the Project-Based Inquiry Science™ (PBIS) community to learn best practices from teachers, school-based administrators, program developers, and support staff. Find tools to support implementation, face-to-face teacher support, and online tools that provide a blended approach to professional learning for successful implementation of PBIS in your classroom and school.

3:30–4:30 PM Hands-On Workshop
ACS Session Three: Energy in Chemistry: An Atomic View
(Grades 9–12) 2103 B, Convention Center
Science Focus: PS, CCC
Marta Gmurczyk, American Chemical Society, Washington, D.C.
Engage in “argumentation activities” that can help students understand energy transfer at the atomic level by building arguments based on evidence and scientific models and ideas. These activities are designed to deepen students’ conceptual understanding about atomic models of matter, quantization of energy, and atomic emission spectroscopy.

4:00–4:30 PM Presentation
Reinforce STEM with Medical Mysteries Web Adventures
(Grades 6–College) 3501 D, Convention Center
Science Focus: LS
Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, Colo.
Promote scientific inquiry, STEM careers, and science literacy in the context of infectious diseases with this free online adventure game. Science practices and investigations are modeled and support materials for assessment and reinforcement are included. Handouts!

4:30–6:30 PM Networking Opportunity
Kansas Association of Teachers of Science (KATS) Reception
Andy Kirk, Marriott
FREE FOOD! PRIZES! Meet and visit with members of the Kansas Association of Teachers of Science. Learn about our 47th Annual “KATS Kamp”—coming in 2016!
5:00–6:00 PM  Hands-On Workshops

AAPT Session: An Engineering Design Process  
(Grades K–12)  2102 A, Convention Center  
Science Focus: ETS, PS, SEP  
**Mari Hayes,** Lincoln Junior High School, Bentonville, Ark.  
This collaborative hands-on session provides K–12 teachers with a clearer understanding of the engineering process for addressing the NGSS engineering practices and incorporating them into your courses.

ACS Middle Level Session: Chemical Change—Breaking and Making Bonds  
(Grades 6–8)  2102 B, Convention Center  
Science Focus: PS1.B  
**James Kessler** (jhkessler@acs.org), American Chemical Society, Washington, D.C.  
Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

ASEE Session: Feel the Heat—Design Your Own Photovoltaic Water Heater  
(Grades 6–9)  2103 C, Convention Center  
Science Focus: ETS, SEP  
**Cecilia Elmore,** Missouri University of Science and Technology, Rolla  
Use the engineering design process while teaching energy transformations. Learn an expensive and simple design challenge for your classroom.

NABT Session: Scientific Argumentation and Wolf Management  
(Grades 7–College)  2104 B, Convention Center  
**Pamela Close** (@comobio), Hickman High School, Columbia, Mo.  
**Rachel Tinsley** (rtinsley@cpsk12.org), Muriel Battle High School, Columbia, Mo.  
Develop students’ skills in scientific argumentation by engaging them in current real-world bioethical, ecological, and wildlife management issues.

5:30–7:00 PM  Meeting

Equity in Science Education Roundtable  
**Bennie Moten, Marriott**  
The Equity in Science Education Roundtable will include conference participants in the development of a white paper that will guide NSTA as follows:  
• Summarize NSTA work to date and define the need for future work.  
• Develop a framework describing an organized and accessible pathway to design authentic programs for equity in science education.  
• Collect and analyze appropriate data that will help to assess the effectiveness of the NSTA initiative for equity in science education.
A time capsule for life of the American pioneers in the 1800s, the Arabia Steamboat Museum showcases remarkably preserved clothes, tools, guns, dishware, and more from the Steamboat Arabia that sank in 1856. See page 11 for a special offer to the museum for Kansas City conference registrants.
8:00–8:30 AM  Presentation

New Science Standards for Missouri
(Grades 7–12)  1501 A, Convention Center
Science Focus: GEN, NGSS
Frank Vovk (@MrVovk1; frank.vovk@lsr7.net), Lee’s Summit (Mo.) R-7 School District
Get a first look at the proposed new standards for the State of Missouri before they are adopted as well as what to expect for science education in the upcoming years. What is being emphasized, what is lost, and what direction is Missouri science education going?

8:00–9:00 AM  Presentations

Developing Symbiotic Relationships Between PreK–12 and University Faculties
(General)  1501 C, Convention Center
Science Focus: GEN, CCC
Julie Thomas (julie.thomas@unl.edu), University of Nebraska–Lincoln
Bev DeVore-Wedding (@bdevore; bdevorewedding@gmail.com), NSTA Director, High School Science Teaching, and University of Nebraska–Lincoln
With tight budgets and shortage of time, forming collaborative relationships between educational institutions provides increased resources, personalized professional development, and bridges for students as well as instructors. Ask not what you can do for universities but what universities can do for you.

(Grades K–12)  2502 B, Convention Center
Science Focus: ESS
Preston Lewis (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.
Using MY NASA DATA, your students will have the data to answer their Earth science questions though data visualizations right in one place.

STEM Is EASY with GreenSchools! Program
(Grades K–8)  2504 B, Convention Center
Science Focus: ESS3, ETS1, PS3, CCC2, CCC3, CCC7, SEP1, SEP4, SEP6
Laura Downey (@KansasEE; ldowney@kacee.org), Kansas Association for Conservation and Environmental Education (KACEE), Manhattan
GreenSchools! projects connect STEM subjects to service learning. Come learn more about free access to GreenSchools! program resources and materials.

Engineering Explorations
(Grades P–3)  2505 A, Convention Center
Science Focus: ETS
Nancy Smith (@Wiggleworm7; nsmithbe@olatheschools.org), Bentwood Elementary School, Overland Park, Kans.
Let’s explore ideas and lessons that can actively engage young learners in the NGSS and the exciting world of engineering.

NSTA Press® Session: Teaching for Conceptual Understanding in Science
(General)  2505 B, Convention Center
Science Focus: GEN, NGSS
Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
What does it really mean to teach for conceptual change and what are the implications for your classroom or your work with teachers? Explore how this new thought-provoking opus can be used to transform teaching practices and beliefs about science teaching and learning.

Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA
(Grades 4–12)  3501 A, Convention Center
Science Focus: ESS
Lindsay Knippenberg (lindsayknippenberg@mgsd.k12.nc.us), Mooresville High School, Mooresville, N.C.
Flooding. Water Pollution. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of watersheds. NOAA has a wealth of online lesson plans, videos, data sets, webinars, and more to help inform and inspire students to action in research, stewardship, and resource management for vital freshwater ecosystems.
Bioplastic—Going from Synthetic to Natural Polymers  
(Grades 6–12)  
3501 C, Convention Center  
Science Focus: PS, CCC1, CCC3, CCC6, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8  
Sherri Rukes (sherri.rukes@d128.org), Libertyville High School, Libertyville, Ill.  
Many of the items that we use today are becoming more Earth friendly. Learn how a bioplastic is made and what plant materials are used. Take home a CD with information.
8:00–9:00 AM Exhibitor Workshop
Chicken Little…Chicken Big—DuPont Agriscience Institute
(Grades 9–12) 2204, Convention Center
Science Focus: LS1, CCC3
Sponsor: LAB-AIDS®, Inc.
Scott Stone, Centralia R-VI High School, Centralia, Mo.
Discover how to help your students gain a better understanding of how the number of supplements is determined in growing livestock. This interactive lab puts the learning in the hands of the students using chicken production as the main concept, although it can be related to both animals and plants.

8:00–10:00 AM Meeting
CESI Meeting: Engineering—Build a Better Mousetrap Vehicle Workshop
(By Invitation Only) Salon 7, Marriott
Build a better mousetrap vehicle and integrate science, technology, engineering, and mathematics (STEM). Mousetrap vehicle kits and a mousetrap vehicle book will be provided for preregistered CESI member participants.

8:00 AM–5:00 PM Meeting
Shell Judging Panel Meeting
(By Invitation Only) Salon 4, Marriott

8:30–9:00 AM Presentations
STEM-based Learning in the High School Classroom
(Grades 8–12) 1501 A, Convention Center
Science Focus: GEN
Kellen Conroy (@ConroyKellen; kconroy@esu1.org), Educational Service Unit #1, Wakefield, Neb.
Attention will be paid to implementing and sustaining a STEM-based learning environment centered on classroom setup, instructional strategies, and meaningful hands-on student investigation and application.

Expressive Arts in Chemistry and Physics
(Grades 9–12) 2503 B, Convention Center
Science Focus: PS1
Susan Allison (sallison@bentonschools.org), Benton High School, Benton, Ark.
Marc Reif (mreif@fayar.net), Fayetteville High School, Fayetteville, Ark.
Teach chemistry and physics with the arts—drawings, models, and appealing high school science biographies and books. Great for block periods and modifications. Samples provided!

8:30–11:30 AM Short Courses
(Grades K–6) (Elementary) Ticket Required; $30 Jay McShann A, Marriott
Science Focus: GEN, CCC
J. Carrie Launius (@janetcarrie; janetcarrie@gmail.com), STOM President, St. Louis, Mo.
Celeste Nicholas (celeste.nicholas@gmail.com), University of Missouri—St. Louis
Scott Kratzer (scttkrtzr@gmail.com), Garrett Elementary School, Hazelwood, Mo.
Sara Berghoff (sberghoff@hazelwoodschools.org), Jamestown Elementary School, Florissant, Mo.
Nathan G. Williams (nwilliams@hazelwoodschools.org), Laramore Elementary School, St. Louis, Mo.
Paris Bouchard (parisbouchard@hotmail.com), Barrington Elementary School, Florissant, Mo.
Georgene Collier (hippies2@swbell.net), Russell Elementary School, Hazelwood, Mo.
For description, see page 34.

Meeting the CCSS and NGSS Through Outdoor Studies (SC-4)
(Middle Level–College) Ticket Required; $55 Truman B, Marriott
Science Focus: LS
Bill Klein, Western Iowa Tech Community College, Sioux City
For description, see page 35.
9:00 AM–12 Noon  Meeting

AMSE Board Meeting (By Invitation Only)  Salon 1, Marriott
Please visit amsek16.org for additional information.

9:00 AM–12 Noon  Exhibits

Hall B, Convention Center
Did you know that NSTA offers Exclusive Exhibits Hall hours today from 10:30 AM to 12 Noon? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

9:30–10:00 AM  Presentation

Let’s Explore Gay-Lussac’s Law (Grades 8–College)  2502 B, Convention Center
Science Focus: PS
Jim Concannon (jim.concannon@westminster-mo.edu), Westminster College, Fulton, Mo.
Patrick Brown (plbtfc@gmail.com), Dubray Middle School, St. Peters, Mo.
Join us as we explore relationships between temperature and pressure using low-cost materials.

9:30–10:30 AM  Featured Presentation

A Vision and Plan for Science Teaching and Learning (General)  2105, Convention Center
Science Focus: GEN, NGSS

Brett Moulding (mouldingb@ogdensd.org), Director, Partnership for Effective Science Teaching and Learning, Ogden, Utah
Presider: David Evans, NSTA Executive Director, Arlington, Va.

Brett Moulding will outline a set of instructional strategies to effectively implement instruction that meets the Framework and NGSS. Attention will be paid to how teaching and learning at the intersection of three dimensions happens in the classroom. Discussion centers on insights into ways to use an organizational schema to effectively bring the three dimensions, described in the Framework and NGSS, into classroom teaching and learning.

Brett Moulding is the director of the Utah Partnership for Effective Science Teaching and Learning, a five-district professional development collaborative. He is co-author of A Vision and Plan for Science Teaching and Learning, a book providing educators with insights into classroom instruction consistent with the Framework and NGSS. He is a consultant for Achieve, Inc. and director of the Council of State Science Supervisors’ Building Capacity for State Science Education (BCSSE) initiative. Brett served on the National Academies’ Board on Science Education (BOSE), NRC Framework for K–12 Science Education committee, and is a member of the NGSS leadership team that developed the Next Generation Science Standards.

Brett taught chemistry for 20 years at Roy High School in the Weber School District and served as the district science teacher leader for eight years. He has an administrative supervisory certificate from Utah State University; a BS in chemistry from the University of Utah, Salt Lake City; and an MEd from Weber State University.
9:30–10:30 AM  Presentations

Bridging the Poles: A Polar E-Book Resource for Educators
(Grades 6—College) 1501 A, Convention Center
Science Focus: GEN, INF
Gary Wesche, Kansas City Zoo, Kansas City, Mo.
The Polar e-book brings the excitement and adventure of living and working in the Polar regions to a wide range of grade levels.

Integrating Technology into the Inquiry-Based Classroom
(Grades K–8) 1501 C, Convention Center
Science Focus: GEN
Ryan Mahn (@)TSDNixa; ryanmahn@nixaschools.net) and Stephanie Williams (@)TSDNixa; stephaniewilliams@nixaschools.net), John Thomas School of Discovery, Nixa, Mo.
Learn applicable strategies and take home sample plans for integrating instructional technology into your science instruction. You don’t have to be 1:1 to love technology.

Going Paperless in the iPad Science Classroom
(Grades 6–12) 2215 B, Convention Center
Science Focus: GEN
David Beier (david.beier@barstowschool.org), The Barstow School, Kansas City, Mo.
Learn about our successes as we moved to iPads and went paperless in our science classrooms. I’ll share what has worked and some bumps we encountered along the road. Paperless handouts if you attend.

Assessing Thinking Skills of Nonscience Majors in Biology Classes with a Field Study Component
(Grades 10—College) 2503 B, Convention Center
Science Focus: LS
Stephen Reinbold (stephen.reinbold@mcckc.edu), Metropolitan Community College—Longview, Lee’s Summit, Mo.
Immerse students in a long-term watershed study. Lead them into grasping scientific methodology. Chart their progress using pre- and post-tests of thinking skills and surveys.

Spark Students’ Curiosity with Chemistry!
(Grades K–12) 2504 A, Convention Center
Science Focus: PS
Karen Kaleuati, American Chemical Society, Washington, D.C.
The American Chemical Society offers many free resources from kindergarten to beyond postdoc. Learn about numerous resources available in print and online for grades K–12, including animations, books, lesson plans, grants, and much more.

NSTA Press® Session: Gardening with Children’s Books
(Grades P–5) 2505 B, Convention Center
Science Focus: GEN
Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Douglasville
Discover the author’s strategies for integrating multiple subjects with the NSTA Kids books My School Yard Garden and Mrs. Carter’s Butterfly Garden, indoors and out.

9:30–10:30 AM  Hands-On Workshops

Decoding Starlight—From Photons to Pixels to Images
(Grades 6–12) 2102 A, Convention Center
Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz.
Explore a STEAM activity using NASA data to produce a scientific photon intensity image of a supernova remnant and a separate artistic image for public release.

Family Science Night: Creating a Successful Experience
(Grades 5–9) 2102 B, Convention Center
Science Focus: INF
Paul Ridgway, Encyclopaedia Britannica, Inc., Chicago, Ill.
Engage in several activities that have been used to run several successful Family Nights for students and their families in a fun environment.
Green Teams: A Case Study of a Green Ribbon School  
(Grades K–6) 2103 C, Convention Center  
Science Focus: ESS  
Lucas Shivers (@adaptinstruct; @LCteach_learn; lucass@usd383.org), Manhattan-Ogden Unified School District 383, Manhattan, Kans.  
Lindsey Constance (@adaptinstruct; @LCteach_learn; lindseyconstance@smsd.org), Bluejacket-Flint Elementary School, Shawnee, Kans.  
Follow Bluejacket-Flint on a five-year journey of sustainability, green project-based learning, community partnerships, and student-centered passion for environmental literacy.

Using Robots to Build STEM-Loving Students  
(Grades 4–12) 2104 B, Convention Center  
Science Focus: ETS1, ETS2.A, PS2, PS4.C, INF, CCC2, CCC3, CCC4, CCC6, SEP  
Gavin Wood (gavin.wood@barstowschool.org), The Barstow School, Kansas City, Mo.  
Leave with a how-to guide for creating an engaging robotics program in the classroom or after school. Guide includes costs, lessons, resources, products, and how to use competition to motivate and teach.

Practicing the Practices: Recognizing Them in Use  
(Grades 1–8) 2503 A, Convention Center  
Science Focus: GEN, SEP  
Ollie Bogdon (obogdon@aol.com), Chance Nevarez, Kenny Nez (kenny.nez@my.stmary.edu), Lee Griffin, Ashley Muldoon, and Margaret Stewart, University of Saint Mary, Leavenworth, Kans.  
Explore similarities in the science and math practices. Using technology aides, we will work in groups to deepen our understanding of the practices in action.

All Aboard Our STEAM Train—Where Planning with Enrichment Creates Integrated Units for Our Youngest Scientists  
(Grades P–3) 3501 C, Convention Center  
Science Focus: GEN, SEP  
Brooke Gantt (brookegantt@nixaschools.net), John Thomas School of Discovery, Nixa, Mo.  
Hop aboard JTSD’s STEAM train and learn effective ways to plan units collaboratively with all building staff to best meet the needs of all learners.

9:30–10:30 AM Exhibitor Workshop  
Vet Detective: Tracking the Spread—DuPont Agri-science Institute  
(Grades 9–12) 2204, Convention Center  
Science Focus: LS, CCC3  
Sponsor: LAB-AIDS®, Inc.  
Scott Stone, Centralia R-VI High School, Centralia, Mo.  
Understand the spread of diseases in livestock using this engaging hands-on lab. Students determine who the culprit is in this activity using the scenario of a sick horse that has been in contact with others. While this may focus on livestock, it is certainly applicable to plant science, wildlife, and other agricultural content areas.

Empowering Our Students to Be Citizen Scientists  
(Grades K–9) 2502 B, Convention Center  
Science Focus: GEN, SEP4, SEP6, SEP8  
Susan Koppendrayer (@teachspacemn; skdrayer@calvin-christian.org), Calvin Christian School, Edina, Minn.  
Hear how citizen science provides students with an established outlet for real scientific practice and application that meets the NGSS.

Engineering Adaptations: Redesigning Early Childhood and Elementary Inquiry-Based Lessons with an Engineering Focus  
(Grades P–6) 2504 B, Convention Center  
Science Focus: ESS2, ETS, PS2  
Anne Gatling (gatlinga@merrimack.edu), Merrimack College, North Andover, Mass.  
I’ll share two examples—early childhood (physics) and elementary (environmental) focused—of how we adapted two “classic” science lessons to focus on the engineering design cycle.

Supporting STEM: The Role of an Elementary STEM Specialist  
(Grades K–5) 2505 A, Convention Center  
Science Focus: GEN  
Heather McCullar (@McCullarHeather; heatherl1818@gmail.com), Benton STEM Elementary School, Columbia, Mo.  
Hear how my school transitioned to STEM, including the development of a STEM specialist position. I will share successes, struggles, and how I helped our school/teachers during this change.
12:30–1:00 PM  Presentations

**NASA’s SOFIA Is Flying! So Are the Airborne Astronomy Ambassadors**  
(Grades 6–12) 2503 B, Convention Center  
Science Focus: ESS, SEP2  
**Pamela Harman (pharman@seti.org), SETI Institute, Mountain View, Calif.**  
Join me for the latest astronomical images, lesson plans, and application process information on NASA’s Stratospheric Observatory for Infrared Astronomy (SOFIA) Airborne Astronomy Ambassador program.

**NGSS Crosscutting Concepts, Engineering Practices, and Bernoulli’s Principle**  
(Grades 9–12) 3501 C, Convention Center  
Science Focus: ETS, CCC  
**Jim Concannon (jim.concannon@westminster-mo.edu), Westminster College, Fulton, Mo.**  
**Patrick Brown (phbfc@gmail.com), D Bray Middle School, Saint Peters, Mo.**  
Propel new learning in your classroom with an original “windmill” lesson where students explore Bernoulli’s Principle using low-cost materials.

12:30–1:30 PM  Presentations

**“Nuclear”ification: A Smorgasbord of NGSS-Focused Classroom Applications and Resources for Teaching Nuclear Topics**  
(Grades 6–College) 1501 A, Convention Center  
Science Focus: ESS, PS, CCC  
**Mark Klawiter (mklawit@mtu.edu), Michigan Technological University, Houghton**  
**Jenelle Hopkins (jhopkins@interact.ccsd.net), Shadow Ridge High School, Las Vegas, Nev.**  
Presider: Carol Engelmann (cengelmann@unomaha.edu), University of Nebraska Omaha  
Join two impassioned veteran science teachers for nuclear science content and pedagogical strategies with cross-curricular ties to social studies, political science, literature, and the arts.

**Data Is Not a Four-Letter Word! Use NOAA Resources to Build Student Proficiency in Data Analysis**  
(Grades 6–12) 2215 B, Convention Center  
Science Focus: ESS  
**Lindsay Knippenberg (lindsayknippenberg@mgsd.k12.nc.us), Mooresville High School, Mooresville, N.C.**  
Scientists at the National Oceanic and Atmospheric Administration collect a stunning array of data in their work. Learn how to access this treasure trove of archived and real-time data, and explore NOAA’s data-rich resources, lesson plans, and visualization tools to help you build student proficiency in scientific data analysis.

**Energy 101: Connecting STEM and Classroom Projects with Real-World Application**  
(Grades 7–College) 2502 B, Convention Center  
Science Focus: PS  
**Dan Whisler, Sterling High School, Sterling, Kans.**  
Making real-world connections with wind energy and an electric car? Come join us to hear two high school students share what they have learned through this highly integrated project!

**Meeting Standards Through Citizen Science and Schoolyard Investigations**  
(Grades K–8) 2504 B, Convention Center  
Science Focus: GEN, INF, NGSS  
**Lindsay Glasner (@BirdSleuth; lig27@cornell.edu) and Barbara Jacobs-Smith (barbara.jacobs-smith@breckschool.org), The Cornell Lab of Ornithology, Ithaca, N.Y.**  
Meeting the NGSS and CCSS goes hand in hand with student research projects and contributing data to citizen science. Motivate your students with schoolyard inquiry and real data. Get inspired with ideas and resources!

**Discussing Discussions: Doing Teacher Research to Facilitate Meaningful Discussions in Elementary Science Classrooms**  
(Grades K–6) 2505 A, Convention Center  
Science Focus: GEN, SEP8  
**Laura Schisler, Crowder College, Neosho, Mo.**  
**Roberta Aram (robertaaram@missouristate.edu) and Amanda Benedict-Chambers (benedictchambers@missouristate.edu), Missouri State University, Springfield**  
Join our panel of preservice teachers as they share their teacher research experiences designing and facilitating meaningful discussions in elementary science classrooms. Handouts!
12:30–1:30 PM  Hands-On Workshops

**Using ImageJ and Excel to Analyze Color Spectrum Data: Integrating Chemistry, Mathematics, and Technology**  
(Grades 10–College)  
2102 B, Convention Center  
Science Focus: ETS, PS  
**Fides Ybañez**, Junction City High School, Junction City, Kans.  
The classic metal salt flame test is extended in this hands-on activity using technology and mathematics to test Bohr’s model. Bring your laptop.

**High Five: Five Ways to Make Teaching Biotechnology Easier and Faster**  
(Grades 7–College)  
2104 B, Convention Center  
Science Focus: LS  
**Whitney Hagins** (belahill@aol.com), Massachusetts Biotechnology Education Foundation, Chelmsford  
Make biomore hands on and manageable. From reagent prep to running gels and PCR, you and your students will love these innovative ideas and solutions.

**1:00–1:30 PM  Presentations**

**A 3-D View of Earth System Science**  
(Grades 6–12)  
2503 B, Convention Center  
Science Focus: ESS  
**Brandon Gillette** (@astro2111; astro2111@gmail.com), Kansas City Kansas Public Schools  
**Zach Smith** (thelastenvironment@gmail.com), Boston Latin School, Boston, Mass.  
Come explore the NGSS and 3-D learning through authentic environmental investigations using the 3-D quadrat.

**STEM, NGSS, and Technology: Implementation for Middle School Classrooms**  
(Grade 8)  
3501 C, Convention Center  
**Beth Newton** (@trekkingnewt; bnewton@cpsk12.org), Oakland Middle School, Columbia, Mo.  
**Jennifer Szydlowski** (jszydlowski@cpsk12.org), Jefferson Middle School, Columbia, Mo.  
We will cover designing solutions, integrating iPads, and implementing the NGSS. Discover engaging classroom strategies, apps, and ideas for STEM integration that support Earth and space science as well as the process of natural selection.

**Inquiry in Action: Identify Liquids by Their Physical Properties**  
(Grades 3–8)  
2503 A, Convention Center  
Science Focus: PS1.A, CCC1, SEP1, SEP2, SEP3, SEP6  
**Patricia Galvan** (p_galvan@acs.org), American Chemical Society, Washington, D.C.  
Conduct simple tests on four identical-looking household liquids to tell them apart. Videos model observations on the molecular level. Instructions and videos are free at www.inquiryinaction.org.

**Redesigning Lessons in the Curriculum**  
(General)  
2504 A, Convention Center  
Science Focus: GEN, NGSS  
**Sharon Schleigh** (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.  
Explore how to meet the three dimensions of the NGSS in this hands-on workshop by examining and rewriting real lesson plans. Bring your favorite lesson that needs modification or learn some new ones!

**Using Models and Motion for Teaching DNA and Protein Synthesis**  
(Grades 9–College)  
3501 B, Convention Center  
Science Focus: LS1, LS3, CCC6, SEP2  
**Carol Robertson** (crobertson.fulton@gmail.com), Fulton High School, Fulton, Mo.  
Engage in kinesthetic activities and build inexpensive models to help students learn DNA structure, DNA replication, and protein synthesis while using a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) approach.
This dynamic event brings together educators and organizations who are actively implementing STEM programs in their schools or districts.

Come prepared to learn tactics that work, build your professional learning network, connect with effective outreach programs and partnerships, discover new resources, and build a strong curriculum.

For information and to register, visit www.nsta.org/stemforum
3D Molecular Designs #205
1050 N. Market St., CC130A  B, C, EA, Milwaukee, WI 53202  EN, G, PD
Phone: 414-774-6362  4–12, College
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Our innovative, hands-on kits and models focus on core ideas and crosscutting concepts in biology, chemistry, and physical and life sciences. We involve teachers in developing kits, writing materials, and field testing. Kits support STEM and the NGSS. Ask about our new Flow of Genetic Information Kit.

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5177 Richmond Ave., Suite 1025  G
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Phone: 281-833-4512
E-mail: javier@acceleratelearning.com
Website: www.acceleratelearning.com

Built on a digital platform, enhanced by print, and brought to life in hands-on kits, STEMscopes PreK–12 is an all-in-one STEM solution for NGSS and non-NGSS states. Developed in the lab by teachers for teachers, STEMscopes is rooted in unique instructional models that emphasize hands-on, inquiry-based exploration of STEM topics alongside videos, games, PBLs, and literacy development activities.

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Greenwich, CT 06836  PH, PD, T
Phone: 630-215-3017  PreK–8
E-mail: info@activatelearning.com
Website: www.activatelearning.com

Activate Learning is a mix of former teachers and leading researchers focused on classroom success and differentiation. The Activate Learning developers include team members who developed the Framework for K–12 Science Education and the NGSS. Our curricula are not textbooks; they emphasize writing, talking about, and doing science. Through the use of hands-on activities, kits, and digital components, Active Science (K–5) and IQWST (middle school) give students the ability to use data and explain it in a meaningful way, both orally and in writing.

American Chemical Society #318
1155 16th St. NW  C
Washington, DC 20036  K–12, College
Phone: 800-333-9511
E-mail: s_nicholson@acs.org
Website: www.acs.org

The ACS Education Division serves learners and educators by building communities and providing effective chemistry education resources, grants, communities, professional development opportunities, standards, and guidelines. Stop by our booth to find information that can support your efforts to provide innovative, relevant, and effective chemistry education from kindergarten through professional education.

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STR School & Science  #227
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6630 Hwy. 9, Suite 201  PreK–12, College
Felton, CA 95018
Phone: 831-430-9061
E-mail: bhoffman@strscopes.com
Website: www.schooltr.com

STR specializes in handheld microscope cameras. Just touch the microscope camera to an object and display the magnified image on a Mac or PC computer; on Android, Chrome, and iPad via Wi-Fi; or on TVs and projectors. These microscope cameras are easy and fun to use, and very engaging for all ages. See live video as you examine objects, capture pictures and movies, as well as time-lapse and measure, and then draw and label on the pictures. STR has complete education kits with curriculum, specimens, and accessories for every grade level.

TCI  #306
2440 W. El Camino Real, Suite 400  All
Mountain View, CA 94040  K–12
Phone: 800-497-6138
E-mail: info@teachtci.com
Website: www.teachtci.com

TCI is a K–12 publishing company created by teachers, for teachers. We believe the best teaching marries great content, meaningful technology, and interactive classroom experiences. The end result—students of all abilities and learning styles succeed.

Texas Instruments  #511
PO Box 650311 MS 3817  All
Dallas, TX 75265  6–12, College
Phone: 800-TICARES (842-2737)
E-mail: ti-cares@ti.com
Website: education.ti.com

Texas Instruments provides free classroom activities that enhance math, science, and STEM curricula; technology that encourages students to develop a deeper understanding of concepts; and professional development that maximizes your investment in TI technology. Visit education.ti.com for more information.

UNI Fabulous Resources for  #417
Energy Education  EN, PH
University of Northern Iowa, CEEE 12  4–9
Cedar Falls, IA 50614
Phone: 319-273-6012
E-mail: highy@uni.edu
Website: www.uni.edu/ceee/free

Fabulous Resources for Energy Education (FREE) from the University of Northern Iowa assists K–12 educators with online STEM activities, economical renewable energy kits, and online face-to-face professional development. Our mission is to help teachers empower their students to build a better, safer, and healthier world using renewable energy sources.
### Exhibitors

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<td></td>
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<td>1 Brookings Dr.</td>
<td>9–12, College</td>
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<td></td>
<td>St. Louis, MO 63130</td>
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<tr>
<td></td>
<td></td>
<td>Phone: 314-935-8974</td>
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<tr>
<td></td>
<td></td>
<td>E-mail: <a href="mailto:hathaway@wustl.edu">hathaway@wustl.edu</a></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Website: ucollege.wustl.edu/msinbiology</td>
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<tr>
<td>Earn a Master of Science in biology degree in two years through this hybrid program that combines life science content knowledge with pedagogy and leadership projects. It consists of two summer institutes, three weeks each, in residence. The remaining course work during the two academic years is completed through distance learning.</td>
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<tbody>
<tr>
<td>13979 SW Millikan Way</td>
<td></td>
<td>Beaverton, OR 97005</td>
</tr>
<tr>
<td>Phone: 888-837-6437</td>
<td></td>
<td>E-mail: <a href="mailto:info@vernier.com">info@vernier.com</a></td>
</tr>
<tr>
<td>Website: <a href="http://www.vernier.com">www.vernier.com</a></td>
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<tr>
<td>Vernier Software &amp; Technology is a leading innovator of scientific data-collection technology. Focused on STEM, Vernier is dedicated to developing creative ways to teach and learn using hands-on science. Vernier creates easy-to-use and affordable science interfaces, sensors, and graphing/analysis software. Vernier’s technology-based solutions enhance STEM education, increase learning, and build students’ critical-thinking skills.</td>
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<tr>
<td>4001 S 700 E, #700</td>
<td></td>
<td>Salt Lake City, UT 84107</td>
</tr>
<tr>
<td>Phone: 866-225-5948</td>
<td></td>
<td>E-mail: <a href="mailto:wgu@wgu.edu">wgu@wgu.edu</a></td>
</tr>
<tr>
<td>Website: <a href="http://www.wgu.edu">www.wgu.edu</a></td>
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<tr>
<td>The Teachers College at Western Governors University offers regionally, nationally, and NCATE-accredited online competency-based master’s degrees in science education. As a student, you’ll enjoy modest tuition rates, unbelievable flexibility, and unmatched student support. Scholarships and financial aid are available.</td>
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Photo courtesy of Jacob Slaton
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### It’s About Time (Booth #131)

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<td>Active Physics and Active Chemistry: Leading Project-based High School Physics and Chemistry Programs Capturing the Essence of the NGSS and STEM (p. 73)</td>
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### Earth and Space Science

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- **Pluto: New Horizons** (p. 79)

**11:00 AM–12 Noon**
- **6–C** 1501 B, Conv. Center
- **NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science** (p. 80)

**11:00 AM–12 Noon**
- **10–C** 2203, Conv. Center
- **Environmental Study: A Real-World Investigation** (p. 84)

**11:00 AM–12 Noon**
- **6–12** 3501 A, Conv. Center
- **Breathing Soils: Measuring Soil Respiration in the Classroom** (p. 82)

**11:00 AM–12 Noon**
- **K–1/3/6–8** 2503 A, Conv. Center
- **A Progression of Learning Through the NGSS: K–8 Weather** (p. 82)

**11:00 AM–12 Noon**
- **6–12** 3501 G, Conv. Center
- **Coral Reefs: Fragile Wonders Under Threat** (p. 81)

**11:30 AM–12 Noon**
- **5–8** Booth #311, Exhibit Hall
- **The Solid Earth** (p. 85)

**12:30–1:30 PM**
- **5–C** 2502 A, Conv. Center
- **NASA Astrobiology: The Search for Life Beyond Earth** (p. 88)

**12:30–1:30 PM**
- **4–C** 3501 D, Conv. Center
- **NASA’s Goldstone Apple Valley Radio Telescope (GAVRT) Project** (p. 88)

**12:30–1:30 PM**
- **9–12** 2215 A, Conv. Center
- **EarthComm, a Project-Based High School Earth Science Curriculum—Developed by the American Geosciences Institute—with an Authentic NGSS Approach** (p. 90)

**2:00–3:00 PM**
- **6–12** 2210, Conv. Center
- **Weather and Climate Change: Are We Doomed?** (p. 91)

**2:00–3:00 PM**
- **6–8** 2215 A, Conv. Center
- **Project-Based Inquiry Science™ (PBIS): Creating “Coherence and Science Storylines” for Middle School Science: Grades 6–8** (p. 92)

**3:30–4:30 PM**
- **6–12** 3501 B, Conv. Center
- **The ART of Science Teaching: A Paint-by-Numbers Schema** (p. 95)

**3:30–4:30 PM**
- **1–5** 3501 E, Conv. Center
- **It’s Elementary—Engineering, the Environment, and Literacy** (p. 95)

**3:30–4:30 PM**
- **6–12** 2502 B, Conv. Center
- **Stellar Evolution—From Star Formation to Catastrophic Destruction** (p. 94)

### Saturday

**8:00–9:00 AM**
- **K–12** 2502 B, Conv. Center
- **MY NASA DATA: Understanding the World Around Us Through NASA Earth Science DATA!** (p. 99)

**8:00–9:00 AM**
- **K–8** 2504 B, Conv. Center
- **STEM Is EASY with GreenSchools! Program** (p. 99)

**8:00–9:00 AM**
- **4–12** 3501 A, Conv. Center
- **Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA** (p. 99)

**9:30–10:30 AM**
- **K–6** 2103 C, Conv. Center
- **Green Teams: A Case Study of a Green Ribbon School** (p. 104)

**9:30–10:30 AM**
- **6–12** 2102 A, Conv. Center
- **Decoding Starlight—from Photons to Pixels to Images** (p. 103)

**10:00–10:30 AM**
- **P–6** 2504 B, Conv. Center
- **Engineering Adaptations: Redesigning Early Childhood and Elementary Inquiry-Based Lessons with an Engineering Focus** (p. 104)

**12:30–1:00 PM**
- **6–12** 2503 B, Conv. Center
- **NASA’s SOFIA Is Flying! So Are the Airborne Astronomy Ambassadors** (p. 105)

**12:30–1:30 PM**
- **6–C** 1501 A, Conv. Center
- **“Nuclear”ification: A Smorgasbord of NGSS-focused Classroom Applications and Resources for Teaching Nuclear Topics** (p. 105)

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- **6–12** 2215 B, Conv. Center
- **Data Is Not a Four-Letter Word! Use NOAA Resources to Build Student Proficiency in Data Analysis** (p. 105)

**1:00–1:30 PM**
- **6–12** 2503 B, Conv. Center
- **A 3-D View of Earth System Science** (p. 106)

**1:00–1:30 PM**
- **8** 3501 C, Conv. Center
- **STEM, NGSS, and Technology: Implementation for Middle School Classrooms** (p. 106)
Schedule at a Glance  Engineering, Technology, and the Application of Science

**Thursday**

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<td>8:00–8:30 AM</td>
<td>ASTE Session: Integrating Engineering into Middle School Science Classrooms (p. 41)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Hovercrafts and Newton's Laws (p. 44)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Teach Engineering Principles on the Cheap with Concrete (p. 42)</td>
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<td>8:00–9:00 AM</td>
<td>NSTA Press® Session: Uncovering Students’ STEM-Related Ideas (p. 44)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Spelling Success (with NGSS) in an Earth and Space Science Learning Lab (p. 43)</td>
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<tr>
<td>9:15–10:30 AM</td>
<td>General Session: From Farm to Flesh—How We Transform Soil into Civilization (p. 46)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Engineering Design Process in the STEM Classroom (p. 50)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Engineering Design: Will It Sink or Float? (p. 49)</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Engineering in Elementary Science: Designing with FOSS (p. 54)</td>
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<td>12:30–1:30 PM</td>
<td>High Flying Connections with Science and Literacy (p. 54)</td>
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<td>12:30–1:30 PM</td>
<td>CPO’s Link™Wind Turbine Learning Module: A STEM Approach to Engineering and Design (p. 54)</td>
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<td>1:00–1:30 PM</td>
<td>Amusement Park Physics (p. 53)</td>
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<td>Teaching with 3-D Puzzle Boxes to Integrate NGSS’s Three Dimensions (p. 53)</td>
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<td>2:00–3:00 PM</td>
<td>Bringing Science to Life by Creating a Wax Museum (p. 55)</td>
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<td>2:00–3:00 PM</td>
<td>Discover the NGSS: An Interactive Exploration of the Next Generation Science Standards (p. 58)</td>
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<td>3:30–4:30 PM</td>
<td>Revolutionize Your Science Curriculum with Picture-Perfect Lessons (p. 58)</td>
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<td>3:30–4:30 PM</td>
<td>Engineering with Sound Science (p. 57)</td>
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<td>3:30–4:30 PM</td>
<td>Genes, Schemes, and Molecular Machines (p. 60)</td>
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<td>Building an Electric Motor the STEM Way with CPO’s Link™Learning Module (p. 62)</td>
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<tr>
<td>4:30–5:30 PM</td>
<td>NGSS: A Model for the Engineering Design Process (p. 65)</td>
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<td>4:30–5:30 PM</td>
<td>An Ice Core Classroom Investigation That Connects the Three Dimensions of NGSS with CCSS (p. 64)</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>NSTA Press® Session: Outdoor Science: A Practical Guide (p. 65)</td>
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**Friday**

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<tr>
<td>8:00–9:00 AM</td>
<td>ASEE Session: Introducing Engineering to Elementary School (p. 70)</td>
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<td>8:00–9:00 AM</td>
<td>Investigating Pollinators in the Schoolyard (p. 72)</td>
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<td>8:00–9:00 AM</td>
<td>Engineering Is Everywhere (p. 70)</td>
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<td>8:00–9:00 AM</td>
<td>Lights, Camera, Enzymes in Action! (p. 72)</td>
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<td>8:00–9:00 AM</td>
<td>National Geographic Explorers: Ideal Role Models of STEM (p. 73)</td>
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<td>9:30–10:30 AM</td>
<td>Students Analyze Scientific and Engineering Data in the Quest for Sustainable Bioenergy (p. 77)</td>
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<td>9:30–10:30 AM</td>
<td>Engineer Your World: Integrating Engineering Design, Computational Thinking, and 21st-Century Skills (p. 75)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>ASEE Session: ASEE’s K–12 Outreach Program, eGFI: Engineering, Go For It and TeachEngineering.org (p. 76)</td>
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<td>9:30–10:30 AM</td>
<td>Engineering for Kindergarten! Yes! (p. 76)</td>
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<td>11:00 AM–12 Noon</td>
<td>A Progression of Learning Through the NGSS: K–8 Weather (p. 82)</td>
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<td>11:00 AM–12 Noon</td>
<td>Put the “E” in STEM! (p. 83)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>ASEE Session: Designing for Safety (p. 81)</td>
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## Schedule at a Glance

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<td>9–12 Hands-On Standards: Having Your Curriculum Meet the NGSS, CCSS, and More (p. 82)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>4–10 Using Engineering Design for Seed Dispersal (p. 82)</td>
<td>3501 C, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–C Let’s Get Helical (p. 84)</td>
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<td>12:30–1:00 PM</td>
<td>K–5 Project SOAR: Creating a Science Curriculum That Soars to New Heights Through the Use of Understanding by Design (p. 86)</td>
<td>2215 B, Conv. Center</td>
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<td>12:30–1:30 PM</td>
<td>P–6 Physical Structures, Plants, and Everyday Tools: Helping Children Understand the Impact of Science and the Essential Integration of All STEM Disciplines (p. 88)</td>
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<td>12:30–1:30 PM</td>
<td>6–C Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 89)</td>
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<td>12:30–1:30 PM</td>
<td>9–12 ASEE Session: Engineering Design for High School Chemistry: Water Filters for a Developing Country (p. 88)</td>
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<td>12:30–1:30 PM</td>
<td>7–12 Makerspace: A Place for Students to Learn and Create Instead of Consume and Regurgitate (p. 86)</td>
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<td>2:00–3:00 PM</td>
<td>K–2 Engineering Design for Grades K–2 (p. 91)</td>
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<td>3:30–4:30 PM</td>
<td>8–12 Featured Presentation: Agriculture: Traditional Science Taught in an Unexpected Applied Way (p. 92)</td>
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<td>3:30–4:30 PM</td>
<td>P–C Engineering Science Creativity: Brainstorming, Designing, and Evaluating Models (p. 93)</td>
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<td>3:30–4:30 PM</td>
<td>6–C ASEE Session: The Innovation Portal: Connecting Student Design and Problem-solving Projects with Opportunities (p. 93)</td>
<td>2103 C, Conv. Center</td>
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<td>3:30–4:30 PM</td>
<td>1–5 It’s Elementary—Engineering, the Environment, and Literacy (p. 95)</td>
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<td>3:30–4:30 PM</td>
<td>3–6 Cleaning the Glass to Get a Closer Look at STEM (p. 94)</td>
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<td>3:30–4:30 PM</td>
<td>4–8 Engineering Adaptations: Redesigning Early Childhood and Elementary Inquiry-Based Lessons with an Engineering Focus (p. 104)</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>6–9 ASEE Session: Feel the Heat: Design Your Own Photovoltaic Water Heater (p. 97)</td>
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<td>5:00–6:00 PM</td>
<td>K–12 AAPT Session: An Engineering Design Process (p. 97)</td>
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<td>3–12 Exploring the NGSS with Hydrogels (p. 100)</td>
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<td>8:00–9:00 AM</td>
<td>P–3 Engineering Explorations (p. 99)</td>
<td>2505 A, Conv. Center</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>K–8 STEM Is EASY with GreenSchools! Program (p. 99)</td>
<td>2504 B, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>4–12 Using Robots to Build STEM-Loving Students (p. 104)</td>
<td>2104 B, Conv. Center</td>
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<tr>
<td>10:00–10:30 AM</td>
<td>P–6 Engineering Adaptations: Redesigning Early Childhood and Elementary Inquiry-Based Lessons with an Engineering Focus (p. 104)</td>
<td>2504 B, Conv. Center</td>
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<td>12:30–1:00 PM</td>
<td>9–12 Crosscutting Concepts, Engineering Practices, and Bernoulli’s Principle (p. 105)</td>
<td>3501 C, Conv. Center</td>
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<td>1:00–1:30 PM</td>
<td>8 STEM, NGSS, and Technology: Implementation for Middle School Classrooms (p. 106)</td>
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### General Science Education

#### Thursday

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<td>8:00–8:30 AM</td>
<td>P–C Grant Writing for the Classroom Teacher (p. 41)</td>
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<td>8:00–9:00 AM</td>
<td>9–12 Teach Engineering Principles on the Cheap with Concrete (p. 42)</td>
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<td>8:00–9:00 AM</td>
<td>K–8 STEM: Investigating Touch Screen Devices (p. 44)</td>
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<tr>
<td>Time</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:00–9:00 AM</td>
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<td>8:30–9:00 AM</td>
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<td>11:00 AM–12 Noon</td>
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<td>7–12</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>6–C Implementing NGSS One Project at a Time</td>
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<td>3:30–4:30 PM</td>
<td>8–12 Cars: A Fun and Relevant Way to Teach Science Concepts</td>
<td>2215 B, Conv. Center</td>
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<td>3:30–4:30 PM</td>
<td>P–3 Engaging and Nurturing the Curiosity of Young Children with Everyday Science That Surrounds Them</td>
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<td>3:30–4:30 PM</td>
<td>6–12 Useful Apps for a Science Classroom with 1:1 Technology</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>K–5 Elementary Success with NGSS: Inquiry Activities for the K–5 Classroom</td>
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<td>6–C Kinesthetic Learning...from a STEM Viewpoint</td>
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<td>8:00–9:00 AM</td>
<td>3–12 Integrating Chromebook with Vernier Technology</td>
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<td>8:00–9:00 AM</td>
<td>K–12 NSTA Press® Session: Mastery Learning in the Science Classroom</td>
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<td>8:00–9:00 AM</td>
<td>P/1–C Exploring the Science and Engineering Practices</td>
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<td>8:00–9:00 AM</td>
<td>6–12 Using Project-Based Instruction to Teach the Standards</td>
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<td>8:00–9:00 AM</td>
<td>9–12 NARST Session: An Instructional Model for NGSS-Focused, Socio-scientific Issues-Based Teaching</td>
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<td>8:00–9:00 AM</td>
<td>P–5 Integrating Literacy and Science—the Wow Factor</td>
<td>2203, Conv. Center</td>
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<td>8:00–9:00 AM</td>
<td>3–5 How MEMTA Can Change Your Classroom!</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–9 Getting Started with Classroom Robotics and Programming</td>
<td>2207, Conv. Center</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>9–C How to Use Pop Culture Science in Your Classes</td>
<td>2201, Conv. Center</td>
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<tr>
<td>8:30–11:30 AM</td>
<td>1–12 SC-2: Transitioning to NGSS Instruction</td>
<td>Truman, Marriott</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–12 Designing Solutions to Feed the World’s Growing Population</td>
<td>2505 A, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>9–12 Cross-Curricular Collaboration Using NGSS and CCSS</td>
<td>1501 C, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>1–11 Extreme Makeover: Redesigning Laboratory Activities!</td>
<td>3501 F, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>P–C Selecting and Using the Best in Trade Books</td>
<td>3501 D, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>3–8 NexGenReady: Interactive Online NGSS Modules for Grades 3–8</td>
<td>2207, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>9–12 Engineering in the NGSS Grades 9–12</td>
<td>2215 A, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–12 Zombie Apocalypse!</td>
<td>2211, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>P–C Featured Presentation: Fostering an Insatiable Curiosity: Planning for the Future</td>
<td>2105, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 Debunking the Myths of Project-Based Learning: Yes We CAN!</td>
<td>2215 A, Conv. Center</td>
<td></td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>P–C Observing and Inferring in the Science Classroom: New Tips and Tools from Dinah Zike's Notebooking Central</td>
<td>2215 C, Conv. Center</td>
<td></td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 Engineer Excitement in Your Classroom with a Carolina STEM Challenge®</td>
<td>2206, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>K–8 CESI Session: From Explanation to Effective Reasoning for Your Students</td>
<td>2504 A, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>4–8 Science, Art, and Innovation</td>
<td>3501 B, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>K–6 Linking Science and Literacy for Improved Student Outcomes</td>
<td>3501 D, Conv. Center</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>7–12 Could It Be This Cheap? Modeling Phenomena via Budget-friendly Labs</td>
<td>2502 A, Conv. Center</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 Engaging Writing Success: Incorporating Today’s Global Issues</td>
<td>1501 C, Conv. Center</td>
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</tbody>
</table>
Schedule at a Glance

**General Science Education**

**Sunday**

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–C</td>
<td>2505 A, Conv. Center</td>
<td>The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (p. 81)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–C</td>
<td>2505 B, Conv. Center</td>
<td>NSTA Press® Session: Scientific Argumentation Classroom Activities (p. 82)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–C</td>
<td>2504 B, Conv. Center</td>
<td>NSELA Session: Tools for Science Leaders, Part 1 (p. 80)</td>
</tr>
<tr>
<td>12 Noon –12:45 PM</td>
<td>P–C</td>
<td>Exhibits (Hall B Entrance)</td>
<td>Meet the Presidents and Board/Council (p. 86)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–8</td>
<td>2504 A, Conv. Center</td>
<td>Feeding Our Feathered Friends (p. 89)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>3–12</td>
<td>3501 F, Conv. Center</td>
<td>Think-Connect-Act: A 3-D Learning Model for Teaching the Academic Vocabulary Students Need to Succeed (p. 89)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–C</td>
<td>2504 B, Conv. Center</td>
<td>NSELA Session: Tools for Science Leaders, Part 2 (p. 87)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–C</td>
<td>2505 A, Conv. Center</td>
<td>Authors Needed! Publish Your Teaching Ideas in an NSTA Journal (p. 87)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–12</td>
<td>1501 A, Conv. Center</td>
<td>Modeling NGSS Crosscutting Concepts with Aligned Topics (p. 86)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>3–12</td>
<td>2202, Conv. Center</td>
<td>Integrating Chromebook with Vernier Technology (p. 89)</td>
</tr>
<tr>
<td>1:00–1:30 PM</td>
<td>P–2</td>
<td>2215 B, Conv. Center</td>
<td>Integrating Science and Literacy Through STEM for Early Childhood Learners (p. 90)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–7</td>
<td>2208, Conv. Center</td>
<td>Bake for Good: Kids Learn-Bake-Share Program (p. 91)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>2211, Conv. Center</td>
<td>A Matter of Life and Death (p. 91)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>3–12</td>
<td>2202, Conv. Center</td>
<td>Integrating iPad with Vernier Technology (p. 90)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–9</td>
<td>2207, Conv. Center</td>
<td>Student Collaboration in the Science Classroom (p. 91)</td>
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<tr>
<td>3:30–4:00 PM</td>
<td>P–C</td>
<td>3501 D, Conv. Center</td>
<td>STEM Stakeholders: Building the Vision for Science with Community Partners (p. 92)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–9</td>
<td>2215 B, Conv. Center</td>
<td>Backward Planning to Support Cross-Curricular Science Instruction: Developing a Farmer’s Market with Sixth-Graders (p. 93)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>C</td>
<td>2505 A, Conv. Center</td>
<td>The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 93)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–8</td>
<td>2215 A, Conv. Center</td>
<td>PBIS Roundtables: Discussions to Support Successful Implementation (p. 96)</td>
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**Saturday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>7–12</td>
<td>1501 A, Conv. Center</td>
<td>New Science Standards for Missouri (p. 99)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–C</td>
<td>2505 B, Conv. Center</td>
<td>NSTA Press® Session: Teaching for Conceptual Understanding in Science (p. 99)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–C</td>
<td>1501 C, Conv. Center</td>
<td>Developing Symbiotic Relationships Between PreK–12 and University Faculties (p. 99)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–3</td>
<td>2503 A, Conv. Center</td>
<td>We Can All Work Together! Effective Student Collaboration in the Primary Grades (p. 100)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–C</td>
<td>3501 B, Conv. Center</td>
<td>Science Meets Art: The Power of Observation (p. 100)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>8–12</td>
<td>1501 A, Conv. Center</td>
<td>STEM-based Learning in the High School Classroom (p. 101)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–C</td>
<td>1501 A, Conv. Center</td>
<td>Bridging the Poles: A Polar E-Book Resource for Educators (p. 103)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–5</td>
<td>2505 B, Conv. Center</td>
<td>NSTA Press® Session: Gardening with Children’s Books (p. 103)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>2215 B, Conv. Center</td>
<td>Going Paperless in the iPad Science Classroom (p. 103)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–3</td>
<td>3501 C, Conv. Center</td>
<td>All Aboard Our STEAM Train—Where Planning with Enrichment Creates Integrated Units for Our Youngest Scientists (p. 104)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–8</td>
<td>1501 C, Conv. Center</td>
<td>Integrating Technology into the Inquiry-Based Classroom (p. 103)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>3501 B, Conv. Center</td>
<td>Digging Deeper with Data to Improve Classroom Instruction (p. 103)</td>
</tr>
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</table>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10:00–10:30 AM</td>
<td>K–5</td>
<td>2505 A, Conv.</td>
<td>Supporting STEM: The Role of an Elementary STEM Specialist (p. 104)</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>K–9</td>
<td>2502 B, Conv.</td>
<td>Empowering Our Students to Be Citizen Scientists (p. 104)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>1–C</td>
<td>2504 A, Conv.</td>
<td>Redesigning Lessons in the Curriculum (p. 106)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–6</td>
<td>2505 A, Conv.</td>
<td>Discussing Discussions: Doing Teacher Research to Facilitate Meaningful Discussions in Elementary Science Classrooms (p. 105)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–8</td>
<td>2504 B, Conv.</td>
<td>Meeting Standards Through Citizen Science and Schoolyard Investigations (p. 105)</td>
</tr>
</tbody>
</table>

### Informal Science Education

#### Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>8:30–9:00 AM</td>
<td>K–C</td>
<td>2502 A, Conv.</td>
<td>Preparing You and Your Students for Totality (p. 45)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–8</td>
<td>2102 A, Conv.</td>
<td>Taking STEM Outside (p. 53)</td>
</tr>
<tr>
<td>4:00–4:30 PM</td>
<td>P–8</td>
<td>1501 A, Conv.</td>
<td>Why Girls? Why STEM? (p. 66)</td>
</tr>
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</table>

#### Saturday

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<tr>
<th>Time</th>
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<th>Room</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>2102 B, Conv.</td>
<td>EXENTHUNCO: What Is That? (p. 100)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>4–12</td>
<td>2104 B, Conv.</td>
<td>Using Robots to Build STEM-Loving Students (p. 104)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–9</td>
<td>2102 B, Conv.</td>
<td>Family Science: Night: Creating a Successful Experience (p. 103)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–C</td>
<td>1501 A, Conv.</td>
<td>Bridging the Poles: A Polar E-Book Resource for Educators (p. 103)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–8</td>
<td>2504 B, Conv.</td>
<td>Meeting Standards Through Citizen Science and Schoolyard Investigations (p. 105)</td>
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### Life Science

#### Thursday

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<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Room</th>
<th>Topic</th>
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<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>9–C</td>
<td>2215 B, Conv.</td>
<td>Simulate STEM Online Through Virtual Clinical Trials (p. 41)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>3501 D, Conv.</td>
<td>Insect Investigations (p. 42)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>2209, Conv.</td>
<td>Archaea and the Three Domains: Classification of Life for Middle School (p. 45)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>2204, Conv.</td>
<td>Gas Exchange (p. 44)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–C</td>
<td>2202, Conv.</td>
<td>Detecting the Silent Killer: Clinical Detection of Diabetes (p. 46)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>3501 A, Conv.</td>
<td>Breathing Soils: Measuring Soil Respiration in the Classroom (p. 82)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–C</td>
<td>2202, Conv.</td>
<td>Using the Polymerase Chain Reaction to Identify GM Foods (p. 48)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12</td>
<td>2206, Conv.</td>
<td>Hands-On Science with Classroom Critters (p. 49)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–C</td>
<td>2205, Conv.</td>
<td>Constructing and Crossing Cell Membranes (p. 48)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>2215 A, Conv.</td>
<td>Genetics: Crazy Traits and CPO’s Link™ Learning Module (p. 50)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>2204, Conv.</td>
<td>Calling All Carbons (p. 48)</td>
</tr>
<tr>
<td>11:00 AM–12:15 PM</td>
<td>9–C</td>
<td>2201, Conv.</td>
<td>Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 50)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–C</td>
<td>2202, Conv.</td>
<td>Case of the Missing Records (p. 54)</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>P–C</td>
<td>3501 C, Conv.</td>
<td>Teaching with 3-D Puzzle Boxes to Integrate NGSS’s Three Dimensions (p. 53)</td>
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### Earth and Space Science

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<th>Title</th>
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<tbody>
<tr>
<td>1:00–1:30 PM</td>
<td>K–5</td>
<td>3501 A, Conv. Center</td>
<td>Learning by Doing: Teaching Life Science Using School Gardens (p. 55)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>8–12</td>
<td>2207 Conv. Center</td>
<td>Human Anatomy Lab—Building from the Inside Out (p. 60)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>3501 A Conv. Center</td>
<td>Is All This Burning Necessary? (p. 58)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–C</td>
<td>3501 B, Conv. Center</td>
<td>Hot Dog Soup and Other Creative “Recipes” for Teaching Cell Division (p. 59)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>2505 B, Conv. Center</td>
<td>NSTA Press® Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12 (p. 59)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>2202, Conv. Center</td>
<td>Teaching STEM Using Agarose Gel Electrophoresis (p. 60)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>K–8</td>
<td>2203, Conv. Center</td>
<td>The Extraordinary Odyssey: An Expedition Through the Human Body (p. 60)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>2205, Conv. Center</td>
<td>Genes, Schemes, and Molecular Machines (p. 60)</td>
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<tr>
<td>2:30–3:00 PM</td>
<td>9–12</td>
<td>2215 B, Conv. Center</td>
<td>Teaching and Learning Modules That Build from Cutting-Edge Research on Climate, Plants, and Communities (p. 62)</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>6–8</td>
<td>2504 A, Conv. Center</td>
<td>Use Fun, Interactive Online Games to Teach STEM in the Context of Substance Abuse (p. 63)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–2</td>
<td>2502 A, Conv. Center</td>
<td>Science Comes Alive in Stories, Video, and E-Books—Integrating STEM, Literacy, Creativity, and Media (p. 63)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–C</td>
<td>2102 B, Conv. Center</td>
<td>Practice Scientific Argumentation Through Gaming and Social Media (p. 64)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>2206, Conv. Center</td>
<td>Comparative Vertebrate Anatomy with Carolina’s Perfect Solution® Specimens (p. 65)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>8–12</td>
<td>3501 A, Conv. Center</td>
<td>A Model for Seed Transmission (p. 65)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>2202, Conv. Center</td>
<td>The Drunken Worms: Exploring Gene Function with C. elegans (p. 65)</td>
</tr>
<tr>
<td>3:30–5:00 PM</td>
<td>6–C</td>
<td>2201, Conv. Center</td>
<td>Effortlessly Integrate Inquiry with Glowing Bacteria (AP Big Idea 3) (p. 66)</td>
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### Life Science

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<th>Time</th>
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<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>K–6</td>
<td>3501 B, Conv. Center</td>
<td>Rewind! Designing Successful Science Lessons in Elementary (p. 69)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>8–12</td>
<td>3501 A, Conv. Center</td>
<td>Down on the Farm(s) (p. 71)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>3501 F, Conv. Center</td>
<td>Investigating Pollinators in the Schoolyard (p. 72)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>2209, Conv. Center</td>
<td>The Making of the Fittest: Natural Selection and Adaptation: Rock Pocket Mouse (p. 73)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–C</td>
<td>2205, Conv. Center</td>
<td>Lights, Camera, Enzymes in Action! (p. 72)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>2208, Conv. Center</td>
<td>Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 73)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>2206, Conv. Center</td>
<td>Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (p. 72)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>2104 B, Conv. Center</td>
<td>NABT Session: KABT Presents Training Young Scientists Share-a-Thon (p. 69)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>7–12</td>
<td>2502 B, Conv. Center</td>
<td>20 in 20: The Next Chapter (p. 76)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–8</td>
<td>2504 A, Conv. Center</td>
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<tr>
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<td>8–C</td>
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<td>Students Analyze Scientific and Engineering Data in the Quest for Sustainable Bioenergy (p. 77)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>2206, Conv. Center</td>
<td>They Come in Pairs: Using Socks to Identify and Address Student Misconceptions About Chromosomes (p. 78)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>9–C</td>
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<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>2209, Conv. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>K–8</td>
<td>2203, Conv. Center</td>
<td>The Extraordinary Odyssey: An Expedition Through the Human Body (p. 78)</td>
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### Schedule at a Glance

#### Earth and Space Science

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<td>NABT Session: AP Biology Meets the NGSS with Floating Leaf Disk Lab (p. 80)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Coral Reefs: Fragile Wonders Under Threat (p. 81)</td>
<td>3501 G, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Breathing Soils: Measuring Soil Respiration in the Classroom (p. 82)</td>
<td>3501 A, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>STEM Behind Medicine: Curing Type 1 Diabetes (p. 82)</td>
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<tr>
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<td>MiniOne™ Electrophoresis: Revolutionizing Biotechnology in Real Time (p. 84)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
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<tr>
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<td>2209, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>Let’s Get Helical (p. 84)</td>
<td>2205, Conv. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>What Is a Species?</td>
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<tr>
<td>11:00 AM–12 Noon</td>
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<tr>
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<td>NABT Session: Quantified Plant Behavior: An Inquiry Lab Ready for Monday (p. 88)</td>
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<td>12:30–1:30 PM</td>
<td>Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 89)</td>
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<td>12:30–1:30 PM</td>
<td>Physical Structures, Plants, and Everyday Tools: Helping Children Understand the Impact of Science and the Essential Integration of All STEM Disciplines (p. 88)</td>
<td>3501 G, Conv. Center</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Cell Differentiation and Gene Expression (p. 89)</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Food Chains: Using Field Surveys That Give Real Numbers (p. 89)</td>
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<td>From Sun to Food (p. 89)</td>
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<td>Energy Flow Through an Ecosystem (p. 91)</td>
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<td>2:00–3:00 PM</td>
<td>Explore Virtual Labs from BioInteractive (p. 91)</td>
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<td>3:30–4:30 PM</td>
<td>NABT Session: Tiny Bubbles, Popcorn, and More—Modeling Population Demographics (p. 94)</td>
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<td>AgSTEM: Precision Agriculture (p. 94)</td>
<td>3501 A, Conv. Center</td>
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<td>3:30–4:30 PM</td>
<td>Introduction to Wisconsin Fast Plants® (p. 95)</td>
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<td>4:00–4:30 PM</td>
<td>Reinforce STEM with Medical Mysteries Web Adventures (p. 96)</td>
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<td>8:30–11:30 AM</td>
<td>SC-4: Meeting the CCSS and NGSS Through Outdoor Studies (p. 101)</td>
<td>Truman B, Marriott</td>
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<td>9:30–10:30 AM</td>
<td>Vet Detective: Tracking the Spread—DuPont Agriscience Institute (p. 104)</td>
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<td>9:30–10:30 AM</td>
<td>Assessing Thinking Skills of Nonscience Majors in Biology Classes with a Field Study Component (p. 103)</td>
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<td>12:30–1:30 PM</td>
<td>High Five: Five Ways to Make Teaching Biotechnology Easier and Faster (p. 106)</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Using Models and Motion for Teaching DNA and Protein Synthesis (p. 106)</td>
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<td>1:00–1:30 PM</td>
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## Physical Science

### Thursday

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<td>3501 B, Conv. Center</td>
<td>Hovercrafts and Newton’s Laws (p. 44)</td>
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<tr>
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<td>6–12</td>
<td>2215 A, Conv. Center</td>
<td>CPO’s Link™ Chemistry Models: Fun with Atom Building and the Periodic Table (p. 45)</td>
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<td>2104 B, Conv. Center</td>
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<td>2215 C, Conv. Center</td>
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<td>6–12</td>
<td>2215 A, Conv. Center</td>
<td>CPO’s New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 47)</td>
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<td>9:30–10:30 AM</td>
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<td>2206, Conv. Center</td>
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<td>1501 A, Conv. Center</td>
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<td>K–2</td>
<td>2104 B, Conv. Center</td>
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<td>2503 A, Conv. Center</td>
<td>NMLSTA Session: The Magic of Rube Goldberg and the NGSS (p. 53)</td>
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<td>2102 B, Conv. Center</td>
<td>Amusement Park Physics (p. 53)</td>
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<td>3501 C, Conv. Center</td>
<td>Teaching with 3-D Puzzle Boxes to Integrate NGSS’s Three Dimensions (p. 53)</td>
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<td>9–12</td>
<td>2215 B, Conv. Center</td>
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<td>2215 B, Conv. Center</td>
<td>AP Physics 1 and 2: Inquiry-Based Learning (p. 56)</td>
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<td>6–12</td>
<td>3501 C, Conv. Center</td>
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<td>6–12</td>
<td>2505 B, Conv. Center</td>
<td>NSTA Press® Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12 (p. 59)</td>
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<td>4–8</td>
<td>1501 A, Conv. Center</td>
<td>Engineering with Sound Science (p. 57)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>P–3</td>
<td>2503 A, Conv. Center</td>
<td>Let’s Get Physical—From Force and Friction to Water and Weather (p. 59)</td>
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<td>2103C, Conv. Center</td>
<td>iPad: Realize Its Full Potential in Your Classroom! (p. 59)</td>
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<td>Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism (p. 66)</td>
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<tr>
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<td>2215 A, Conv. Center</td>
<td>CPO’s New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 66)</td>
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<tr>
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<td>3501 G, Conv. Center</td>
<td>Create Your Own NASA Portal to NGSS with NASA Wavelength (p. 65)</td>
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### Friday

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<th>Activity</th>
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<td>1501 A, Conv. Center</td>
<td>STEMazing Lessons for Middle School (p. 69)</td>
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<td>3501 E, Conv. Center</td>
<td>Flinn Scientific Resources Prepare Students for AP Chemistry Success (p. 73)</td>
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<td>8:00–9:00 AM</td>
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<td>2215 C, Conv. Center</td>
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<tr>
<td>Time</td>
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<tr>
<td>8:00–9:00 AM</td>
<td><strong>ACS Middle Level Session: Matter—Solids, Liquids, and Gases (p. 70)</strong></td>
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<tr>
<td>8:00–9:00 AM</td>
<td>“Seeing” the Invisible: Making the EMS Spectrum Concrete (p. 70)</td>
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<td>8:00–9:00 AM</td>
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<td>I Like the Sound of That! (p. 70)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Lights, Camera, Enzymes in Action! (p. 72)</td>
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<td>8:00–9:00 AM</td>
<td>Rewind! Designing Successful Science Lessons in Elementary (p. 70)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>AAPT Session: 30 Demos in 60 Minutes: Elementary and Middle School (p. 69)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Active Physics and Active Chemistry: Leading Project-based High School Physics and Chemistry Programs Capturing the Essence of the NGSS and STEM (p. 73)</td>
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<td>8:00–9:00 AM</td>
<td>Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 73)</td>
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<tr>
<td>8:00–10:00 AM</td>
<td>ACS Session One: Energy in Chemistry: A Macroscopic View (p. 74)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>Cool! Can We Do That Again?! (p. 79)</td>
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<td>9:30–10:30 AM</td>
<td>AAPT Session: 30 Demos in 60 Minutes: High School (p. 75)</td>
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<tr>
<td>9:30–10:30 AM</td>
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<td>Chemical Formula and Amino Acids (p. 78)</td>
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<td>FLUnamentals of Energy Education (p. 85)</td>
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<td>ASEE Session: Designing for Safety (p. 81)</td>
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<td>Polymers: New Twists on Old Favorites (p. 80)</td>
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<td>Physics with PASCO scientific, Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics (p. 84)</td>
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<td>11:00 AM–12 Noon</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>ACS Session Two: Energy in Chemistry: A Particulate View (p. 85)</td>
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<td>Project SOAR: Creating a Science Curriculum That Soars to New Heights Through the Use of Understanding by Design (p. 86)</td>
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<td>AAPT Session: Physics on the Cheap (p. 88)</td>
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<td>12:30–1:00 PM</td>
<td>The Secrets to Successful PBL (p. 90)</td>
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<td>12:30–1:00 PM</td>
<td>ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (p. 88)</td>
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<td>12:30–1:00 PM</td>
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<td>50 Labs You Can Do on a Small Budget (p. 87)</td>
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<td>The GMO Debate Rages On! (p. 90)</td>
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<td>Using the Classic Chemistry Demonstration to Engage Students (p. 91)</td>
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<td>AgSTEM: Precision Agriculture (p. 94)</td>
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<td>Stellar Evolution—From Star Formation to Catastrophic Destruction (p. 94)</td>
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<td>3:30–4:30 PM</td>
<td>English Language Development Opportunities for ELL Through Meaningful Integration of the NGSS and CCSS (p. 94)</td>
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<td>3:30–4:30 PM</td>
<td>AAPT Session: Physics Potpourri (p. 93)</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>Physics and Physical Science with Vernier (p. 95)</td>
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### Schedule at a Glance

#### Physical Science

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<td>3:30–4:30 PM</td>
<td>6–8</td>
<td>2102 B, Conv. Center</td>
<td>ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (p. 94)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>3501 G, Conv. Center</td>
<td>Solids: The Neglected “State” of Chemistry (p. 94)</td>
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<td>3:30–4:30 PM</td>
<td>8–12</td>
<td>1501 A, Conv. Center</td>
<td>How to Change an Old Lab to Do New Tricks! (p. 93)</td>
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<td>3:30–4:30 PM</td>
<td>3–6</td>
<td>2503 A, Conv. Center</td>
<td>Cleaning the Glass to Get a Closer Look at STEM (p. 94)</td>
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<tr>
<td>3:30–5:00 PM</td>
<td>5–12</td>
<td>2201, Conv. Center</td>
<td>Fostering High School Science Engagement Using an NGSS-Focused Interactive Experience (p. 96)</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>K–12</td>
<td>2102 A, Conv. Center</td>
<td>AAPT Session: An Engineering Design Process (p. 97)</td>
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<td>5:00–6:00 PM</td>
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<td>2102 B, Conv. Center</td>
<td>ACS Middle Level Session: Chemical Change—Breaking and Making Bonds (p. 97)</td>
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<td>3501 C, Conv. Center</td>
<td>Bioplastic—Going from Synthetic to Natural Polymers (p. 100)</td>
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<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>2102 A, Conv. Center</td>
<td>Using Modeling Activities in the High School Chemistry Class (p. 100)</td>
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<td>8:00–9:00 AM</td>
<td>3–12</td>
<td>2104 B, Conv. Center</td>
<td>Exploring the NGSS with Hydrogels (p. 100)</td>
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<td>8:00–9:00 AM</td>
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<td>2504 B, Conv. Center</td>
<td>STEM Is EASY with GreenSchools! Program (p. 99)</td>
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<td>8:30–9:00 AM</td>
<td>9–12</td>
<td>2503 B, Conv. Center</td>
<td>Expressive Arts in Chemistry and Physics (p. 101)</td>
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<td>9:30–10:00 AM</td>
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<td>2502 B, Conv. Center</td>
<td>Let’s Explore Gay-Lussac’s Law (p. 102)</td>
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<td>9:30–10:30 AM</td>
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<td>2102 A, Conv. Center</td>
<td>Decoding Starlight—From Photons to Pixels to Images (p. 103)</td>
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<td>9:30–10:30 AM</td>
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<td>2504 A, Conv. Center</td>
<td>Spark Students’ Curiosity with Chemistry! (p. 103)</td>
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<td>10:00–10:30 AM</td>
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<td>2504 B, Conv. Center</td>
<td>Engineering Adaptations: Redesigning Early Childhood and Elementary Inquiry-Based Lessons with an Engineering Focus (p. 104)</td>
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<td>12:30–1:30 PM</td>
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<td>“Nuclear”ification: A Smorgasbord of NGSS-focused Classroom Applications and Resources for Teaching Nuclear Topics (p. 105)</td>
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<td>12:30–1:30 PM</td>
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