AREA CONFERENCE ON SCIENCE EDUCATION

RAISING THE STAKES IN SCIENCE

KANSAS CITY

DECEMBER 3–5, 2015

#NSTA15

NSTA National Science Teachers Association

Gizmos®

ExploreLearning Gizmos are research-based interactive online simulations that help students develop a deep understanding of challenging science and math concepts through inquiry and exploration. Gizmos are correlated to NGSS and state curriculum standards.

NEW!

Responsive website design

HTML

MORE!

... and more Gizmos are available for use on Chromebooks and other devices

FUN!

New engaging and fun science Gizmos

Take a free trial to learn more! **www.explorelearning.com/freetrial**

Free Hands-On Workshops

USING VERNIER DATA-COLLECTION TECHNOLOGY

FRIDAY, DECEMBER 4 | ROOM 2202 (CONVENTION CENTER)	
8:00 – 9:00 am	Integrating Chromebook™ with Vernier Technology
9:30 – 10:30 am	Chemistry with Vernier
11:00 am – 12:00 pm	Biology with Vernier
12:30 – 1:30 pm	Integrating Chromebook™ with Vernier Technology
2:00 – 3:00 pm	Integrating iPad® with Vernier Technology
3:30 – 4:30 pm	Physics and Physical Science with Vernier

Stop by **Booth 125**
and enter to **WIN** a LABQUEST® 2

Vernier

Vernier Software & Technology
www.vernier.com
888-VERNIER

Get Your Hands On Science

DID YOU KNOW?

You get deep discounts to our famous NSTA conferences as an NSTA Member!

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.

"I try to attend at least one NSTA conference a year because going to the workshops is like a B-12 shot to boost my teaching."

– NSTA member

Learn more about member benefits at *www.nsta.org/membership*

NSTA National Science Teachers Association

NSTA 2015 Area Conference on Science Education

Raising the Stakes in Science

Kansas City, Missouri • December 3–5, 2015

Registration, Travel, and Hotels

Conference Resources

Conference Resources, cont.

Conference Program

Indexes

National Science Teachers Association
1840 Wilson Blvd.
Arlington, VA 22201-3000
703-243-7100, E-mail: *conferences@nsta.org*
www.nsta.org

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


Mike Szydlowski


Betsy O'Day


James L. Puckett

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.

Conference Chairperson
Mike Szydlowski
K–12 Science Coordinator
Columbia Public Schools
1818 W. Worely
Columbia, MO 65203
mszydlowski@columbia.k12.mo.us

Program Coordinator
Betsy O'Day
Elementary Science Specialist
Hallsville Intermediate School
411 E. Hwy. 124
Hallsville, MO 65255
betsy.oday@gmail.com

Local Arrangements Coordinator
James L. Puckett
Retired Educator
Hamilton, MO 64644
puckettj@mac.com

Local Arrangements Committee
Educational Trips Manager
Linda Lacy
Science Education Consultant
Excelsior Springs, MO

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

President's Welcome: Developing Creative Attitudes in Science

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.

NSTA Conferences Go Green!

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.

—Photo courtesy of Visit KC

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/1NGr0z6* 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.

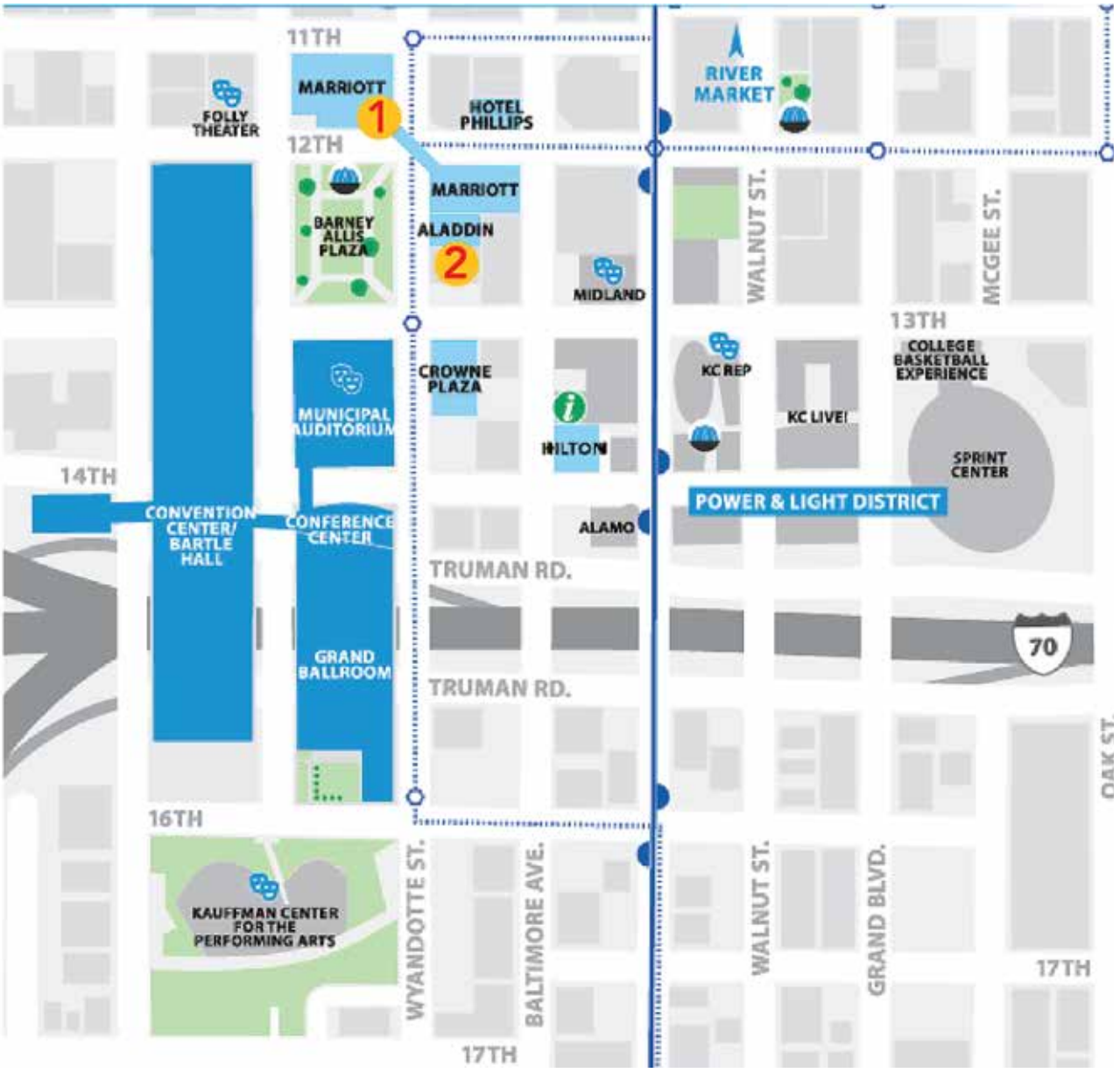
Discounted Rental Cars

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



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:

Thu., Dec. 3	11:00 AM–5:00 PM
Fri., Dec. 4	9:00 AM–3:00 PM
Sat., Dec. 5	9:00 AM–12 Noon

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.

Thu., Dec. 3	11:00 AM–12:30 PM
Fri., Dec. 4	1:30–3:00 PM
Sat., Dec. 5	10:30 AM–12 Noon

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.

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).

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.

A Professional Development Documentation Form is included following page 32 to help attendees keep track of sessions/events attended that are NOT available for online session evaluation. This form can also be used to take notes on sessions attended that are available for online session evaluation.

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.

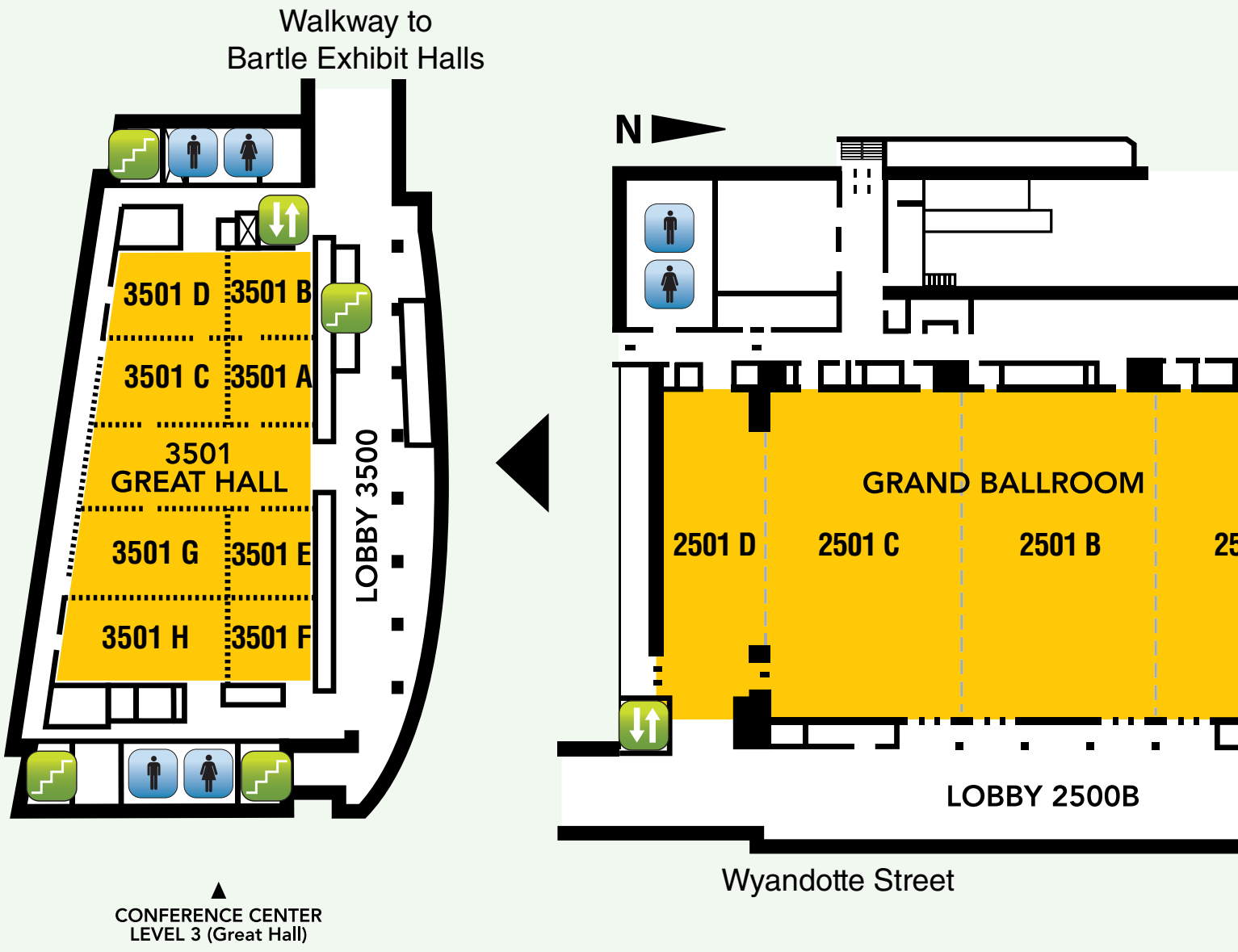
The Marriott offers guests a 24-hour self-service business center via key card access. Located in the lobby, services include computer access, faxing, copying, and computer printing.

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:

Wed., Dec. 2	5:00–7:00 PM
Thu., Dec. 3	9:00 AM–5:00 PM
Fri., Dec. 4	9:00 AM–5:00 PM
Sat., Dec. 5	9:00 AM–12 Noon

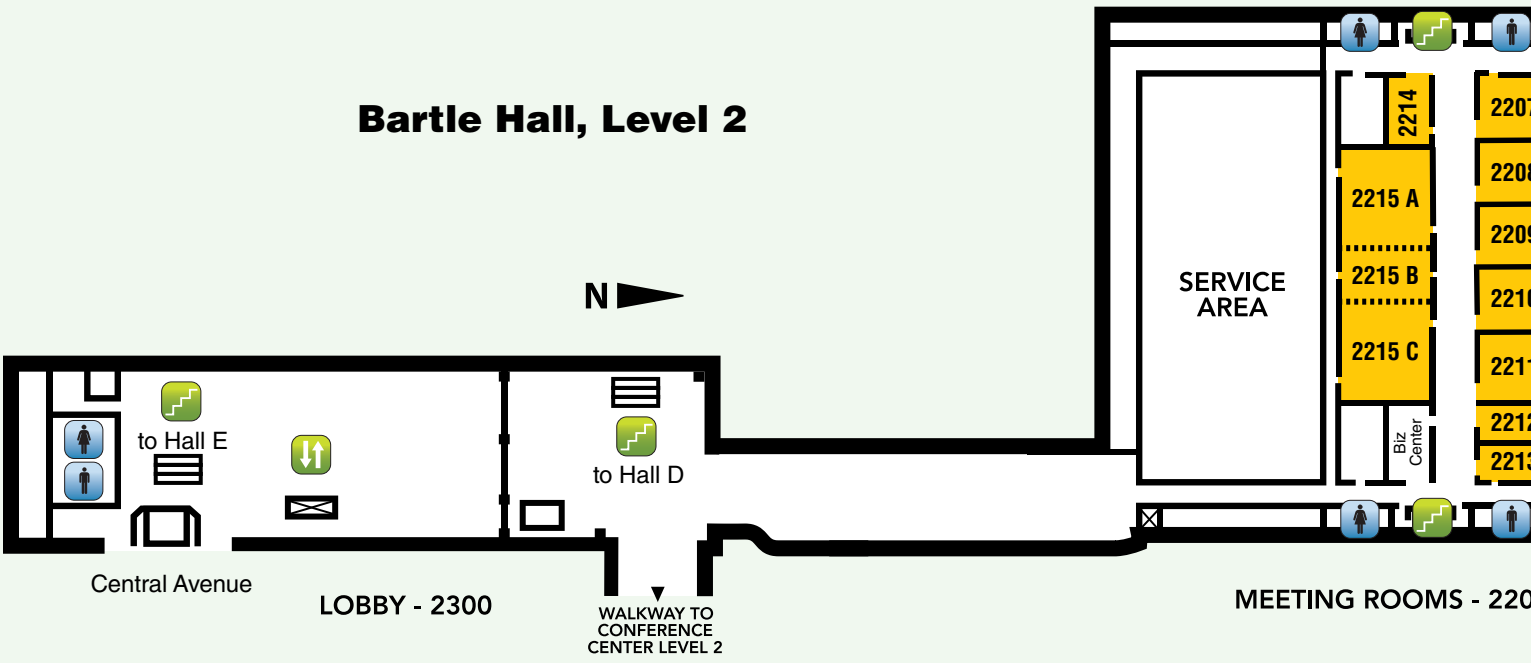
Information about Kansas City's attractions and dining opportunities are available. The staff can also assist with dining reservations.



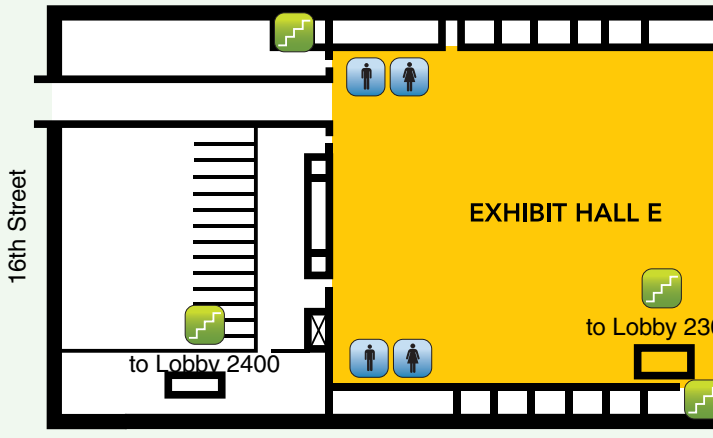
Conference Center a

and Grand Ballroom

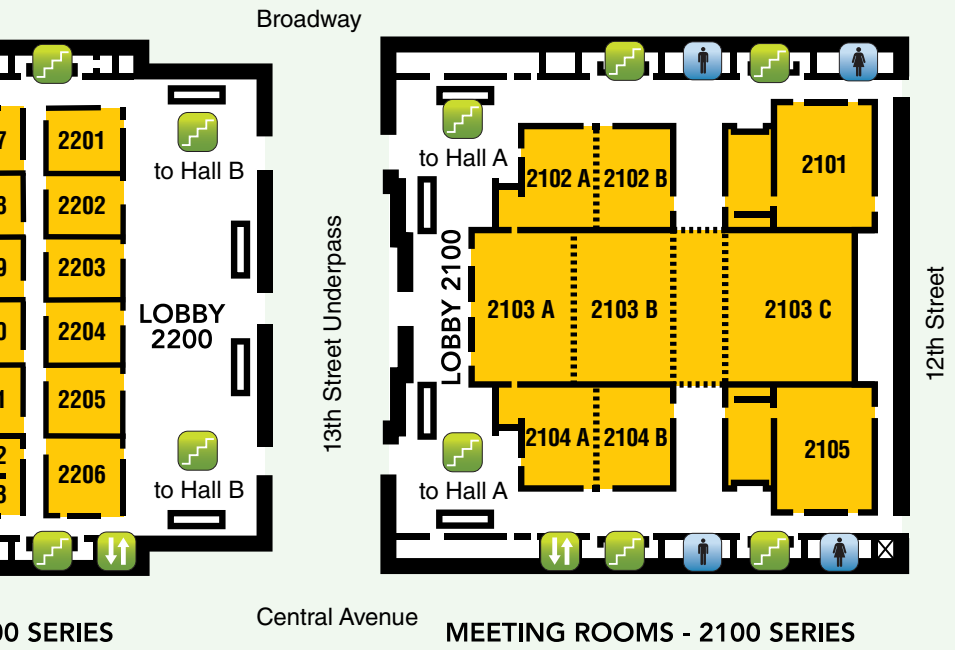
Bartle Hall, Level 2

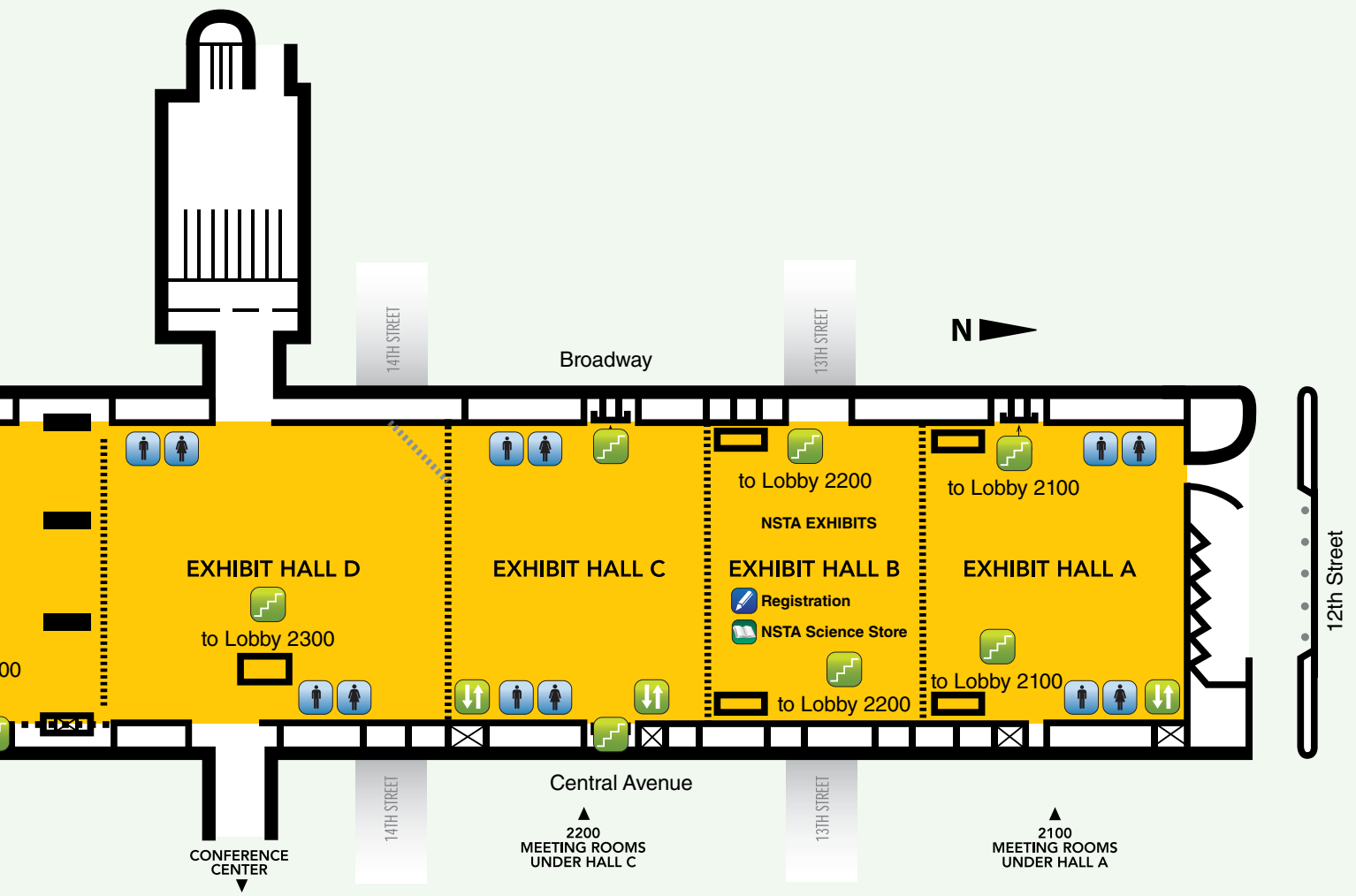


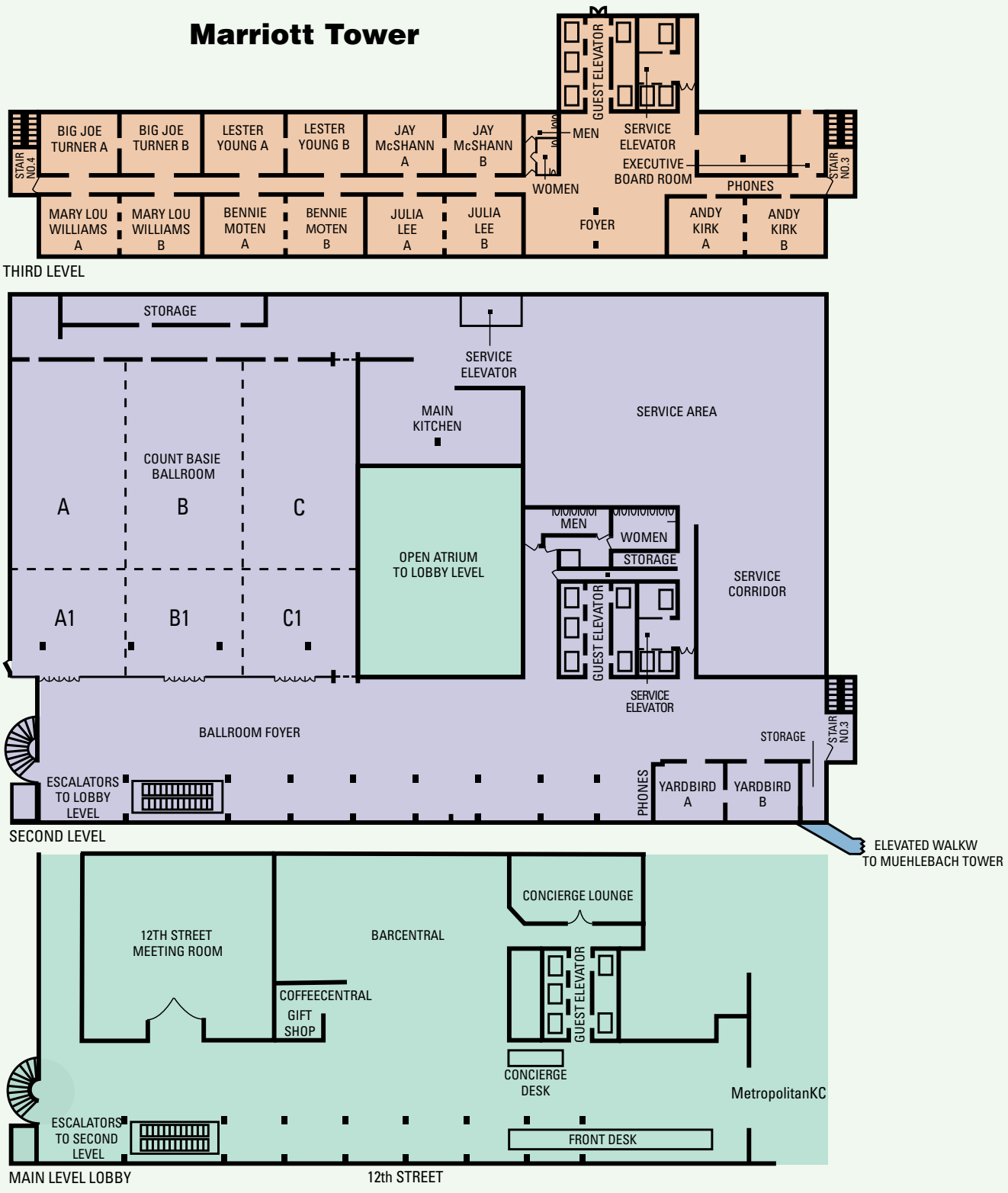
Bartle Hall, Level 3



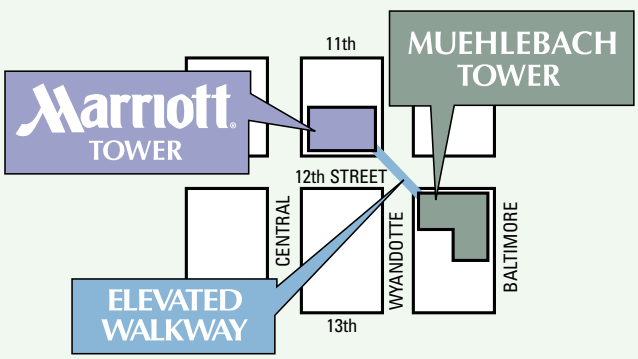
nvention Center

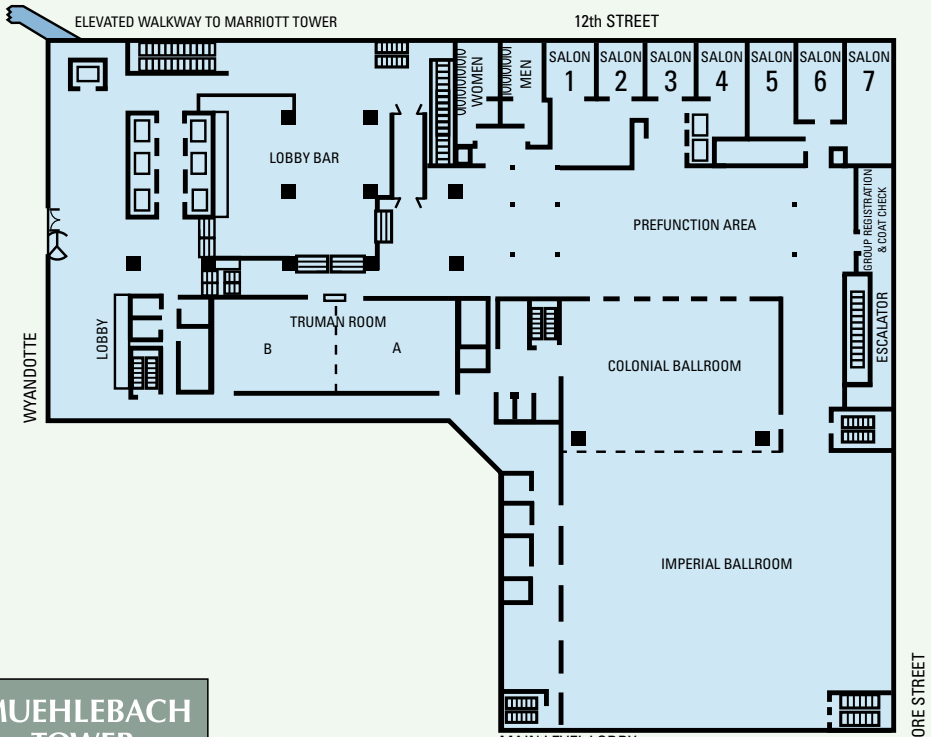




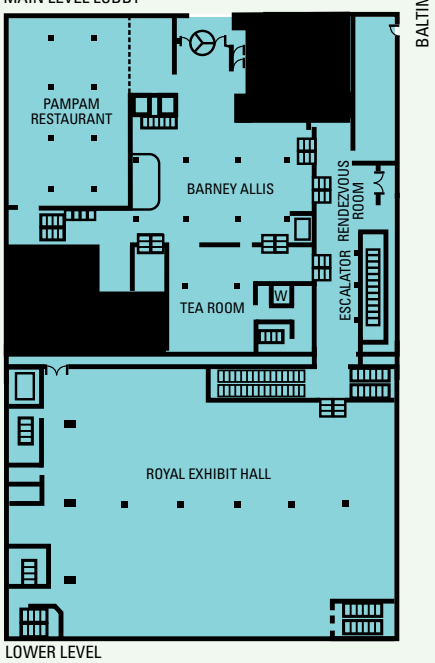

Marriott Tower
GUEST ELEVATOR
STAIR NO.4
BIG JOE TURNER A
BIG JOE TURNER B
LESTER YOUNG A
LESTER YOUNG B
JAY McSHANN A
JAY McSHANN B
MEN
WOMEN
SERVICE ELEVATOR
EXECUTIVE BOARD ROOM
PHONES
STAIR NO.3
MARY LOU WILLIAMS A
MARY LOU WILLIAMS B
BENNIE MOTEN A
BENNIE MOTEN B
JULIA LEE A
JULIA LEE B
FOYER
ANDY KIRK A
ANDY KIRK B
THIRD LEVEL
STORAGE
SERVICE ELEVATOR
MAIN KITCHEN
SERVICE AREA
COUNT BASIE BALLROOM
A
B
C
A1
B1
C1
OPEN ATRIUM TO LOBBY LEVEL
MEN
WOMEN
STORAGE
SERVICE CORRIDOR
GUEST ELEVATOR
SERVICE ELEVATOR
BALLROOM FOYER
STORAGE
STAIR NO.3
ESCALATORS TO LOBBY LEVEL
PHONES
YARDBIRD A
YARDBIRD B
SECOND LEVEL
ELEVATED WALKW TO MUEHLEBACH TOWER
CONCIERGE LOUNGE
12TH STREET MEETING ROOM
BARCENTRAL
COFFEECENTRAL
GIFT SHOP
GUEST ELEVATOR
CONCIERGE DESK
MetropolitanKC
ESCALATORS TO SECOND LEVEL
FRONT DESK
MAIN LEVEL LOBBY
12th STREET

Muehlebach Tower

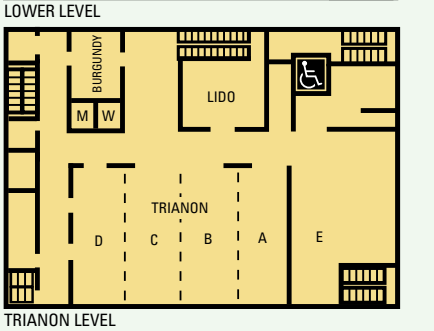




MAIN LEVEL LOBBY



LOWER LEVEL



TRIANON LEVEL

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
La'Keisha Hines, Jr. Accountant

CustomerService

Michelle Chauncey, Director
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

Art and Design

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

Journals

Ken Roberts, Assistant Executive Director
Kate Lu, Associate Editor
Luke Towler, Editorial Assistant

Science & Children

Linda Froschauer, Field Editor
Valynda Mayes, Managing Editor

Science Scope

Inez Fugate Liftig, 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

NSTA Press

Claire Reinburg, Assistant Executive Director
Wendy Rubin, Managing Editor, Books (NSTA Press)
Amanda O'Brien, Associate Editor
Donna Yudkin, Book Acquisitions Coordinator
Rachal 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

Delores Howard, Assistant Executive Director
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

Learning Center/SciLinks
Flavio Mendez, Senior Director
Edward Hausknecht, Web and Database Developer

Professional Programs
John Putnam Assistant Executive Director, Services
Wendy Binder, SPIR Project Director
Dayna Anderson, Program Manager
Alexandra Wakely, Administrative Coordinator, Services

Science Education Competitions
Acacia McKenna, Director, Competitions
Sarah Beistel, Program Manager, Science Education Competitons
Vacant, Assistant Manager, Science Education Competitions
Tonya Hunt, Administrative Assistant, Competitions
Sue Whitsett, eCYBERMISSION Project Manager
Frank Curcio, eCYBERMISSION Outreach Specialist
Cheryl Long, eCYBERMISSION Outreach Specialist
Matt Hartman, eCYBERMISSION Content Manager
Alexis Mundis, eCYBERMISSION Volunteer Coordinator
Dimetrius Simon, AEOP Communications Coordinator
Renee Wells, AEOP Administrative Assistant
Jasmine Culver, eCYBERMISSION Administrative Assistant
Keisha Jeffries, eCYBERMISSION Administrative Assistant

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
LeRoy Lee, Treasurer

Jennifer S. Thompson, Preschool/Elementary
Kenneth L. Huff, Middle Level
Beverly DeVore-Wedding, High School Science Teaching
Sally Harms, College Science Teaching
Kelly Price, Coordination and Supervision of Science Teaching
Dennis Schatz, Informal Science
Jerry D. Valadez, Multicultural/Equity
Eric J. Pyle, Preservice Teacher Preparation
Eric Brunsell, Professional Development
John Tillotson, Research

Council

Carolyn Hayes President
Harold Pratt, Parliamentarian

Jeanelle Day, District I
Doug Hodum, District II
Stephanie Wright, District III
Mary Loesing, District IV
Donna Governor, District V
Manley Midgett, District VI
John Ammons, District VII
Dennis Alan Casey, District VIII
Mary Colson, District IX
Shannon Hudson, District X
Paul Adams, District XI
Natacia Campbell, District XII
Norma Neely, District XIII
Jen Gutierrez, District XIV
Tim Maze, District XV
Camille T. Stegman, District XVI
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

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

NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION

SAVE THE DATE

NASHVILLE

MARCH 31 – APRIL 3

2016

OVER 1,200 SESSIONS

NETWORK WITH OVER 10,000 EDUCATORS

350+ EXHIBITORS WITH CUTTING-EDGE RESOURCES

SPECIAL PROGRAMMING: INTERNATIONAL DAY

(PLIs) PROFESSIONAL LEARNING INSTITUTES

GRADUATE CREDIT FOR SESSIONS

MUCH MORE!

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

NSTA National Science Teachers Association

Courtesy of theVisit KC

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.

Thursday, December 3

Friday, December 4

Saturday, December 5

ARMY EDUCATIONAL OUTREACH PROGRAM

eCYBERMISSION

ACCEPT THE CHALLENGE

U.S.ARMY

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

Administered by

NSTA National Science Teachers Association

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.

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.

The Art and Craftsmanship of Teaching

Thursday, December 3

8:00–9:00 AM
Hovercrafts and Newton's Laws

1:00–1:30 PM
Reading Informational Text in the Science Classroom to Construct Explanatory Models

2:00–3:00 PM
Hot Dog Soup and Other Creative "Recipes" for Teaching Cell Division

Friday, December 4

8:00–9:00 AM
Rewind! Designing Successful Science Lessons in Elementary

9:30–10:30 AM
Featured Presentation: Fostering an Insatiable Curiosity: Planning for the Future
(Speaker: E. Wendy Saul)

11:00 AM–12 Noon
Science, Art, and Innovation

12:30–1:30 PM
50 Labs You Can Do on a Small Budget

3:30–4:30 PM
The ART of Science Teaching: A Paint-by-Numbers Schema

Saturday, December 5

8:00–9:00 AM
Science Meets Art: The Power of Observation

9:30–10:30 AM
Digging Deeper with Data to Improve Classroom Instruction

12:30–1:30 PM
Using Models and Motion for Teaching DNA and Protein Synthesis

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)

AgSTEM: Precision Agriculture

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

ACS Chemistry for Life™

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.

8:00–10:00 AM	**Energy in Chemistry: A Macroscopic View**
11:00 AM–1:00 PM	**Energy in Chemistry: A Particulate View**
3:30–5:30 PM	**Energy in Chemistry: An Atomic View**

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.

8:00–9:00 AM	**Matter—Solids, Liquids, and Gases**
9:30–10:30 AM	**Changes of State—Evaporation and Condensation**
11:00 AM–12 Noon	**Density—A Molecular View**
12:30–1:30 PM	**The Periodic Table, Energy Levels, and Bonding**
3:30–4:30 PM	**Polarity of the Water Molecule and Its Consequences**
5:00–6:00 PM	**Chemical Change—Breaking and Making Bonds**

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

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.

8:00–9:00 AM	**30 Demos in 60 Minutes for Elementary and Middle School**
9:30–10:30 AM	**30 Demos in 60 Minutes for High School**
11:00 AM–12 Noon	**Moving Your Students into Motion Using Modeling**
12:30–1:30 PM	**Physics on the Cheap**
3:30–4:30 PM	**Physics Potpourri**
5:00–6:00 PM	**An Engineering Design Process**

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).*

8:00–9:00 AM	**Introducing Engineering to Elementary School**
9:30–10:30 AM	**ASEE's K–12 Outreach Program, eGFI: Engineering, Go For It! and *TeachEngineering.org***
11:00 AM–12 Noon	**Designing for Safety**
12:30–1:30 PM	**Engineering Design for High School Chemistry: Water Filters for a Developing Country**
3:30–4:30 PM	**The Innovation Portal: Connecting Student Design and Problem-Solving Projects with Opportunities**
5:00–6:00 PM	**Feel the Heat: Design Your Own Photovoltaic Water Heater**

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!

8:00–9:00 AM	**KABT Presents Training Young Scientists Share-a-Thon**
9:30 AM–12 Noon	**AP Biology Meets the *NGSS* with Floating Leaf Disk Lab**
12:30–1:30 PM	**Quantified Plant Behavior: An Inquiry Lab Ready for Monday**
3:30–4:30 PM	**Tiny Bubbles, Popcorn, and More—Modeling Population Demographics**
5:00–6:00 PM	**Scientific Argumentation and Wolf Management**

This form is for planning purposes only. Do NOT submit to NSTA.

NSTA 2015 Kansas City Area Conference
Professional Development Documentation Form

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 *(learningcenter.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

Start Time	End Time	Activity/Event Title

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!

Friday, December 4 8:00 AM–7:00 PM

Start Time	End Time	Activity/Event Title

Saturday, December 5 8:00 AM–5:00 PM

Start Time	End Time	Activity/Event Title

2015 NSTA Regional Conference Workshops

Kansas City, MO • December 3–5, 2015

FOSS Workshop Schedule
Room 2209

8:00–9:00
Archaea 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 2208

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

2:00–3:00
Solving the Mystery of STEM using Forensic Science

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
CPO's Link Wind Turbine Module—A STEM Approach to Engineering and Design

2:00–3:00
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

Visit SchoolSpecialtyScience.com to see full workshop descriptions.

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

CANCELED

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.

NGSS Transitioning to *NGSS* Instruction (SC-2)

Paul Adams *(padams@fhsu.edu),* Fort Hays State University, Hays, Kans.
Earl Legleiter *(elegleiter@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.

A+ Science Literature–Science Learning: The SL/SL Project (SC-3)

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@hazelwoodschools.org),* Jamestown Elementary School, Florissant, Mo.
Nathan G. Williams *(nwillims@ hazelwoodschools.org),* Larimore Elementary School, St. Louis, Mo.
Paris D. Bouchard, Barrington Elementary School, Florissant, Mo.

CANCELED

Georgene Collier *(gcollier@hazelwoodschools.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.

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.

Alliance of Affiliates

Thursday, December 3

12:30–2:30 PM	The 3Rs—Research, Resources, and Relationships	2504 B, Conv. Center

Association for Multicultural Science Education (AMSE)

President: Robert Ferguson

Thursday, December 3

8:00–9:00 AM	The Overlap Between Culturally Responsive Teaching and the *NGSS*	2504 B, Conv. Center

Saturday, December 5

9:00 AM–12 Noon	AMSE Board Meeting (By Invitation Only) Visit *amsek16.org* for details.	Salon 1, Marriott

Association for Science Teacher Education (ASTE)

President: Lisa Martin–Hansen

Thursday, December 3

8:00–8:30 AM	Integrating Engineering into Middle School Science Classrooms	2503 B, Conv. Center
8:30–9:00 AM	Service Learning in High School Environmental Science Classrooms	2503 B, Conv. Center
12:30–1:00 PM	Science and Literacy: Improving Classroom Talk in Elementary Science	2503 B, Conv. Center

Council for Elementary Science International (CESI)

President: James T. McDonald

Thursday, December 3

12:30–1:30 PM	Elementary Science Share-a-Thon	1501 B, Conv. Center

Friday, December 4

11:00 AM–12 Noon	From Explanation to Effective Reasoning for Your Students	2504 A, Conv. Center
3:00–6:00 PM	CESI Board Meeting	Salon 4, Marriott

Saturday, December 5

10:00 AM–12 Noon	CESI Meeting: Engineering—Build a Better Mousetrap Vehicle Workshop (By Invitation Only)	Salon 7, Marriott

National Association for Research in Science Teaching (NARST)

President: Mary M. Atwater

Friday, December 4

8:00–9:00 AM	An Instructional Model for *NGSS*-Focused, Socio-Scientific Issues–Based Teaching	2504 B, Conv. Center
9:30–10:30 AM	Crafting a Coherent Conceptual Storyline: Lessons About Lesson Design	2504 B, Conv. Center

National Middle Level Science Teachers Association (NMLSTA)

President: Diana Cost

Thursday, December 3

12:30–1:30 PM	The Magic of Rube Goldberg and the *NGSS*	2503 A, Conv. Center

National Science Education Leadership Association (NSELA)

President: Elizabeth Mulkerrin

Friday, December 4

11:00 AM–12 Noon	Tools for Science Leaders, Part 1	2504 B, Conv. Center
12:30–1:30 PM	Tools for Science Leaders, Part 2	2504 B, Conv. Center

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

PS1: Matter and Its Interactions
PS1.A: Structure and Properties of Matter
PS1.B: Chemical Reactions
PS1.C: Nuclear Processes

PS2: Motion and Stability: Forces and Interactions
PS2.A: Forces and Motion
PS2.B: Types of Interactions
PS2.C: Stability and Instability in Physical Systems

PS3: Energy
PS3.A: Definitions of Energy
PS3.B: Conservation of Energy and Energy Transfer
PS3.C: Relationship Between Energy and Forces
PS3.D: Energy in Chemical Processes and Everyday Life

PS4: Waves and Their Applications in Technologies for Information Transfer
PS4.A: Wave Properties
PS4.B: Electromagnetic Radiation
PS4.C: Information Technologies and Instrumentation

Disciplinary Core Ideas in Life Science

LS1: From Molecules to Organisms: Structures and Processes
LS1.A: Structure and Function
LS1.B: Growth and Development of Organisms
LS1.C: Organization for Matter and Energy Flow in Organisms
LS1.D: Information Processing

LS2: Ecosystems: Interactions, Energy, and Dynamics
LS2.A: Interdependent Relationships in Ecosystems
LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
LS2.C: Ecosystem Dynamics, Functioning, and Resilience
LS2.D: Social Interactions and Group Behavior

LS3: Heredity: Inheritance and Variation of Traits
LS3.A: Inheritance of Traits
LS3.B: Variation of Traits

LS4: Biological Evolution: Unity and Diversity
LS4.A: Evidence of Common Ancestry and Diversity
LS4.B: Natural Selection
LS4.C: Adaptation
LS4.D: Biodiversity and Humans

Disciplinary Core Ideas in Earth and Space Science

ESS1: Earth's Place in the Universe
ESS1.A: The Universe and Its Stars
ESS1.B: Earth and the Solar System
ESS1.C: The History of Planet Earth

ESS2: Earth's Systems
ESS2.A: Earth Materials and Systems
ESS2.B: Plate Tectonics and Large-Scale System Interactions
ESS2.C: The Roles of Water in Earth's Surface Processes
ESS2.D: Weather and Climate
ESS2.E: Biogeology

ESS3: Earth and Human Activity
ESS3.A: Natural Resources
ESS3.B: Natural Hazards
ESS3.C: Human Impacts on Earth Systems
ESS3.D: Global Climate Change

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

ETS1: Engineering Design
ETS1.A: Defining and Delimiting an Engineering Problem
ETS1.B: Developing Possible Solutions
ETS1.C: Optimizing the Design Solution

ETS2: Links Among Engineering, Technology, Science, and Society
ETS2.A: Interdependence of Science, Engineering, and Technology
ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

Visit NSTA's *SCIENCE STORE*

Exhibit Hall B,
Kansas City Convention Center

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

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

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

Check in often for special giveaways, contests, and more throughout the conference!

Visit *www.nsta.org/store* to make a purchase today, or call 800-277-5300.

NSTA National Science Teachers Association

—Photo courtesy of Kansas City's Science Center, Science City

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/Writer/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:

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

NGSS

See page 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.

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 (@JTSDNixa; *stephaniewilliams@nixaschools.net)* and **Susan Hansche** (@mrshansche; *susanhansche@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.

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 CO_2 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/Instructor, 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, 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.; 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!

—*Photo courtesy of Jacob Slaton*

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!

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

—Photo courtesy of Jacob Slaton

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*

Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS3.A, ESS3.D, LS1.A, LS2.A, LS2.B, LS2.C, PS1.A, PS1.B, PS2, CCC, SEP1, SEP2, SEP5

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.

Engineering Design—Will It Sink or Float?
(Grades K–2) *2208, Convention Center*
Science Focus: ETS1
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, FOSS, Midway, Ky.
Delta Education can help send your students on a mission to answer this question. During the workshop, you will learn about buoyancy and whether the shape of an object can determine if it will sink or float. We will show how it connects to the *NGSS* performance expectations K-2-ETS1-1, 2, 3 (Engineering Design).

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.

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 *(mbenus@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.

12:30–1:30 PM Presentations

Leadership Pathways for Exemplary K–12 STEM Teachers

(General) *2502 A, Convention Center*

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) *2502 B, Convention Center*

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) *2504 A, Convention Center*

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) *2505 A, Convention Center*

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) *2505 B, Convention Center*

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) *2103C, 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.

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.

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; *heatherl1818@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

NGSS **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
(College) *2504 A, Convention Center*
Science Focus: GEN
Bill Badders ((@baddersb; *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 Awards 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*
Science Focus: ESS3.C, ESS3.D, LS2.C, SEP
Ruth Hutson *(ruthhutson@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.

2:00–3:00 PM Hands-On Workshops

Deliver Your Science Content with iPads in Your 1:1 Classroom
(Grades 6–12) *2101, Convention Center*
Science Focus: GEN, SEP1, SEP2, SEP3, SEP7
Diane Kasparie *(dkasparie@quincynotredame.org),* Quincy Notre Dame High School, Quincy, Ill.
Deliver your high-quality, standards-based science curriculum to your students in your iPad 1:1 classroom to ensure genuine student learning, painlessly! BYOD!

Birds Bring Your Science Class Alive!
(Grades K–8) *2102 A, Convention Center*
Science Focus: GEN
Lindsay Glasner ((@BirdSleuth; *lig27@cornell.edu),* The Cornell Lab of Ornithology, Ithaca, N.Y.
We're partnering with teachers to host an interactive show-and-tell about Cornell Lab of Ornithology resources (bird cams, citizen-science projects, and interactive websites) that you can use to engage students.

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 integrate 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 University, Cleveland, Ohio
Juliana Texley *(jtexley@att.net),* NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.
Don't look now, but the *CCSS* asks that you teach physical sciences as early as kindergarten, and the *NGSS* have very specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and 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.enderleadi@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*.

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 teaching 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 SEPUP 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*
Science Focus: ETS2.A, LS1.A, LS1.C, LS1.D, PS1.A, PS1.B, PS2, PS3.B, CCC1, CCC2, CCC3, CCC6, CCC7, SEP1, SEP2, SEP5
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.

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!

2:30–3:00 PM Presentation

Teaching and Learning Modules That Build from Cutting-Edge Research on Climate, Plants, and Communities
(Grades 9–12) *2215 B, Convention Center*
Science Focus: ESS, LS2, SEP2
Troy Sadler (@ReSTEMInst; *sadlert@missouri.edu)* and **Andrew Kinslow** *(atkz8b@mail.missouri.edu),* University of Missouri–Columbia
We will share several issues-based modules that stem from active research related to climate change and ways in which plants and human communities are responding.

3:30–4:00 PM Presentation

***NGSS*-Focused Integrated Science Education in Michigan Middle Schools: The Mi-STAR Initiative**
(Grades 5–9) *2101, Convention Center*
Science Focus: GEN, NGSS
Brenda Bergman, Amy Lark (@AmyMLark; *amlark@mtu.edu),* **Jacqueline Huntoon** *(jch@mtu.edu),* **Christopher Wojick, Brad Baltensperger, Stephanie Tubman, Emily Gochis, Joshua Davis, Meral Jackson,** and **Alex Guth,** Michigan Technological University, Houghton
We'll present findings and facilitate discussion regarding opportunities and challenges in the transition toward *NGSS*-focused education, based on lessons from middle school educators across Michigan.

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.rukes@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*
Science Focus: ESS, ETS2.A, PS1.B, PS1.C, PS2.B, PS2.C, PS3.D, PS4.B, CCC1, CCC2, CCC4, CCC5, CCC7, SEP2, SEP4, SEP5, SEP7, SEP8
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*
Science Focus: ESS1.A, PS2.A, PS2.C, PS3.B, PS3.C
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.

NGSS **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** *(kcgxv4@mail.missouri.edu),* and **Kathryn Arnone** *(kam7t4@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.

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.

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.

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

STEMscopes™
PREK-12

Try STEMscopes FOR FREE

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.

- ☑ Varied Assessment Types
- ☑ HTML5 Platform
- ☑ PBLs and Engineering
- ☑ Crosscurricular
- ☑ Hands-on Science

STEMpreview.com

learn more at accelerate**learning**.com | 800-531-0864

Accelerate Learning™ RICE

—*Photo courtesy of Visit KC*

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.

8:00–9:00 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; *nsmithbe@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 *(bwellmanonw@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.

Investigating Pollinators in the Schoolyard
(Grades 5–12) *3501 F, Convention Center*
Science Focus: ESS3.C, ETS1.B, ETS2.B, LS1.A, LS2.A, LS2.C, LS3.B, LS4.C, LS4.D, CCC, SEP
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*

Science Focus: LS3.B, LS4.B, LS4.C

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

Arthur Eisenkraft, 2000–2001 NSTA President, and UMass Boston, Dorchester, Mass.

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; $80* *Salon 7, Marriott*
CANCELED
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.

NGSS **Transitioning to *NGSS* Instruction (SC-2)**
(Elementary–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 *(elegleiter@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

E. 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** *(libaker@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.

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.

ACS Middle Level Session: Changes of State—Evaporation and Condensation
(Grades 6–8) *2102 B, Convention Center*
Science Focus: PS1.A
James Kessler *(jhkessler@acs.org),* American Chemical Society, Washington, D.C.
Explore evaporation and condensation 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: ASEE's K–12 Outreach Program, eGFI: Engineering, Go For It and *TeachEngineering.org*
(Grades K–12) *2103 C, Convention Center*
Science Focus: ETS, SEP
Bruce Wellman *(bwellmanonw@olatheschools.org),* Olathe Northwest High School, Olathe, Kans.
The American Society for Engineering Education (ASEE) and its K–12 division will introduce participants to innovative ways to add engineering into the K–12 classroom.

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.

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 (@GLBionergy; *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 *(suzannenflynn@earthlink.net),* Lesley University and Cambridge College, Cambridge, Mass.

RESCHEDULED (see program changes for details)

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*

Science Focus: PS1.A, PS1.B, PS3.D, CCC1, CCC2, CCC6, SEP

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*

Science Focus: LS3.A, LS3.B, LS4.B, SEP4

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*
Science Focus: ETS, PS2.A, PS3.B, CCC2, CCC4, CCC6, SEP
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!

NSTA Press® Session: Scientific Argumentation Classroom Activities
(Grades 5–College) *2505 B, Convention Center*
Science Focus: GEN, NGSS
Sharon Schleigh *(sharonpschleigh@gmail.com),* East Carolina University, Greenville, N.C.
Victor Sampson *(victor.sampson@gmail.com),* The University of Texas at Austin
Engage in an activity that encourages scientific argumentation in the classroom, and review different models and examples of activities from various disciplines.

Breathing Soils: Measuring Soil Respiration in the Classroom
(Grades 6–12) *3501 A, Convention Center*
Science Focus: ESS2.C, ESS2.D, ESS2.E, ESS3.C, ESS3.D, LS2.A, LS2.B, LS2.C, PS1.B, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP8
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.

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!

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.

Environmental Study: A Real-World Investigation
(Grades 10–College) *2203, Convention Center*
Science Focus: ESS, CCC
Sponsor: Fisher Science Education
Robert Marshall *(robert.marshall@thermofisher.com),* Fisher Science Education, Pittsburgh, Pa.
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*
Science Focus: ETS1.A, ETS1.B, ETS2, LS1.A, LS1.B, LS3, LS4.A, LS4.D, CCC1, CCC2, CCC6, CCC7, SEP1, SEP2
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.

Engineer Excitement in Your Classroom with a Carolina STEM Challenge®
(Grades 6–12) *2206, Convention Center*
Science Focus: GEN
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Catapult, float, and race your way into hands-on activities that will engage your middle school and high school students while encouraging critical thinking and creative problem solving! Join us and experience how Carolina makes it easy to incorporate STEM into your classroom. Free handouts and door prizes!

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 Education 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, Columbia, Tenn.
Leave with new Notebooking Central templates for classroom (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 activities 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 Laboratories, Hercules, Calif.
Learn how algae can be used in authentic inquiry investigations 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 CO_2 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, Washington, 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.

—Photo courtesy of Jacob Slaton

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; *jgbeasle@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 Preservice 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_r@nsta.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.

NGSS **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 *(bwellmanonw@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.
Astrobiologists 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@wust1.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 tropic 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 (@joannebillings1; *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 SEPUP 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

Cheryl Long, eCYBERMISSION Outreach Specialist, NSTA, Arlington, Va.

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, Astoria, Ore.

The FREE 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; *lucass@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.

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).

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 *(jasattler@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; *mschroll@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.

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; *chrisholmes@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.

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.

The NSTA Learning Center: A Tool to Develop Preservice Teachers
(College) *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.
Come learn about a new online system to assist professors in creating customized e-textbooks using the Learning Center's interactive and e-print resources for their preservice teachers.

NSTA Press® Session: What Are They Really Thinking? Connecting Concepts and Practices Through Formative Assessment

(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.

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/polymers/ceramics) make concepts easier to teach and learn. We'll share *NGSS* correlations as well as a CD of information.

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 *(jhkessler@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*

Science Focus: LS2.A, LS2.C, SEP

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*

Science Focus: ETS1.C, PS2.A, PS3.A, PS3.B, PS3.C, SEP6

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.

Stellar Evolution—From Star Formation to Catastrophic Destruction

(Grades 6–12) *2502 B, Convention Center*

Science Focus: ESS1, PS1.C, PS2.C, PS4.B, CCC2, CCC7, SEP2, SEP8

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; *beckymmcdowell@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!

—*Photo courtesy of Jacob Slaton*

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*

Science Focus: LS1.A, LS1.B, SEP2

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 *(ablack@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.

3:30–5:00 PM Exhibitor Workshop

Fostering High School Science Engagement Using an *NGSS*-Focused Interactive Experience

(Grades 9–12) *2201, Convention Center*

Science Focus: PS

Sponsor: Bio-Rad Laboratories

Leigh Brown *(leigh_brown@bio-rad.com),* Bio-Rad Laboratories, Hercules, Calif.

Engage with curriculum training specialist Leigh Brown for a high school *NGSS*-focused science experience. Developed collaboratively with Kirk Brown—master teacher, curriculum expert, and a lead writer of the revised California science framework—this workshop encourages participation in an engaging activity focused on understanding the mechanism underlying size exclusion chromatography (SEC). Leave with practical measures and insights for encouraging three-dimensional learning and assessment in your classroom.

3:30–5:30 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*
Science Focus: LS2.A, LS2.C, LS2.D
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:

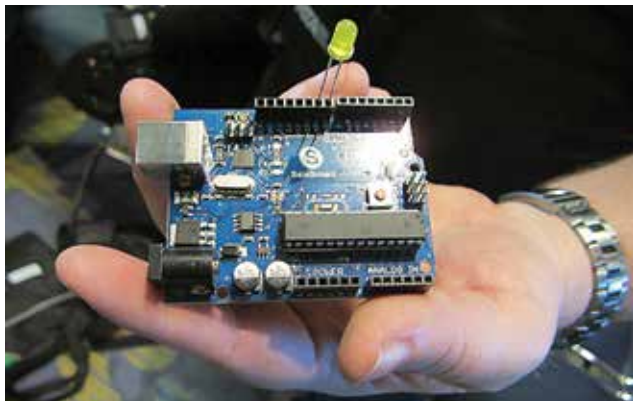
- Summarize NSTA work to date and define the need for future work.
- Develop a framework describing an organized and accessible pathway to design authentic programs for equity in science education.
- Collect and analyze appropriate data that will help to assess the effectiveness of the NSTA initiative for equity in science education.

—Photo courtesy of Jacob Slaton

—*Photo courtesy of Visit KC*

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.

MY NASA DATA: Understanding the World Around Us Through NASA Earth Science DATA!

(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.

NGSS 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 Hands-On Workshops

Using Modeling Activities in the High School Chemistry Class

(Grades 9–College) *2102 A, Convention Center*

Science Focus: PS, SEP2, SEP6

Michael Mury *(m_mury@acs.org),* American Chemical Society, Washington, D.C.

Visualization is difficult for many students. Join me as I discuss and demonstrate several modeling activities you can use in your chemistry class.

EXENTHUNCO: What Is That?

(Grades 6–8) *2102 B, Convention Center*

Science Focus: INF, SEP3, SEP4

Frederick Maier *(fredmaier@sbcglobal.net),* Village of Itasca Nature Center, Itasca, Ill.

Roy "Jack" Tison *(globes@comcast.net),* Lincoln Marsh Natural Area, Wheaton, Ill.

Species populations change over time. This session presents a program taking students on a 100-year journey where some species thrive, and some go extinct.

Exploring the *NGSS* with Hydrogels

(Grades 3–12) *2104 B, Convention Center*

Science Focus: ESS3, ETS1, PS1, PS2

Karen Lindebrekke (@ibioeducate; *klmc617@gmail.com),* iBIO Institute, Chicago, Ill.

Explore the *NGSS* by engineering and investigating remarkable polymers called hydrogels. Discussion includes real-world applications of hydrogels in health care and agriculture.

We Can All Work Together! Effective Student Collaboration in the Primary Grades

(Grades P–3) *2503 A, Convention Center*

Science Focus: GEN, NGSS

Brooke Gantt *(brookegantt@nixaschools.net),* John Thomas School of Discovery, Nixa, Mo.

We expect students to effectively collaborate, but do they know how? View videos and receive instructional tips for teaching your youngest scientists/engineers how to work together.

Science Meets Art: The Power of Observation

(General) *3501 B, Convention Center*

Science Focus: GEN, SEP4, SEP7, SEP8

Rosie Riordan *(rriordan@nelson-atkins.org),* The Nelson-Atkins Museum of Art, Kansas City, Mo.

Hone your students' observation skills and create excitement for looking and learning. Techniques will be shared that incorporate basic drawing observation.

—*Photo courtesy of Jacob Slaton*

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 *(marc.reif@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

Science Literature–Science Learning: The SL/SL Project (SC-3)

(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 *(scttkrtz@gmail.com),* Garrett Elementary School, Hazelwood, Mo.

CANCELED

Sara Berghoff *(sberghff@hazelwoodschools.org),* Jamestown Elementary School, Florissant, Mo.

Nathan G. Williams *(nwillims@hazelwoodschools.org),* Larimore 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
CANCELED
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 (@JTSDNixa; *ryanmahn@nixaschools.net)* and **Stephanie Williams** (@JTSDNixa; *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.

Digging Deeper with Data to Improve Classroom Instruction
(Grades 6–12) *3501 B, Convention Center*
Science Focus: GEN
Melinda Yaklin *(mmyaklin@bluevalleyk12.org),* Lakewood Middle School, Overland Park, Kans.
Jodi Barber-Harris *(jodi.barber@fortbendisd.com),* Fort Bend ISD, Sugar Land, Tex.
Are you collecting student data but not sure how to use it to change instruction? Practice with a successful framework that facilitates effective data-driven conversations for instructional adjustments.

9:30–10:30 AM Hands-On Workshops

Decoding Starlight—From Photons to Pixels to Images
(Grades 6–12) *2102 A, Convention Center*
Science Focus: ESS1.A, PS4.B, PS4.C, SEP2, SEP4, SEP5, SEP8
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.

NGSS **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 Agriscience 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.

10:00–10:30 AM Presentations

Empowering Our Students to Be Citizen Scientists
(Grades K–9) *2502 B, Convention Center*
Science Focus: GEN, SEP4, SEP6, SEP8
Susan Koppendrayer (@teachspacemn; *skdrayer@calvinchristian.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 *(plbtfc@gmail.com),* Dubray 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 *(mfklawit@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.

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.

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*

Science Focus: ESS1.C, ESS2.B, ETS1, LS3, LS4, SEP4, SEP7

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.

JOIN US

5TH ANNUAL

STEM

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Forum & Expo

HOSTED BY NSTA

Denver, CO

July 27–29, 2016

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

#STEMforum

NSTA National Science Teachers Association

Exhibitors

Some exhibitors have classified their products by grade level and subject area. Subject areas are abbreviated here as follows:

Biology/Life Science	B
Chemistry/Physical Science	C
Earth/Space Science	EA
Environmental Science	EN
Integrated/General Science	G
Physics/Physical Science	PH
Professional Development	PD
Technology Education	T

3D Molecular Designs **#205**
1050 N. Market St., CC130A — B, C, EA, EN, G, PD
Milwaukee, WI 53202 — 4–12, College
Phone: 414-774-6562
E-mail: *contactus@3dmoleculardesigns.com*
Website: *www.3dmoleculardesigns.com*

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.

Accelerate Learning **#211**
5177 Richmond Ave., Suite 1025 — G
Houston, TX 77056 — PreK–12
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.

Activate Learning **#231**
44 Amogerene Crossway — B, C, EA, G, PH, PD, T
Greenwich, CT 06836 — PreK–8
Phone: 630-215-3017
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.

ANATOMY IN CLAY® Learning System **#418**
2198 W. 15th St. — B
Loveland, CO 80538 — 8–12, College
Phone: 970-667-9047
E-mail: *info@anatomyinclay.com*
Website: *www.anatomyinclay.com*

The Mind Cannot Forget What the Hands Have Learned™—ANATOMY IN CLAY® Learning System provides the most effective, informative, and relevant anatomy education through hands-on learning. Our system advances the study of anatomy and creates success for both teachers and students, who gain higher understanding and knowledge retention.

Arbor Scientific **#525**
PO Box 2750 — C, G, PH
Ann Arbor, MI 48106 — 1–12, College
Phone: 734-477-9370
E-mail: *mail@arborsci.com*
Website: *www.arborsci.com*

A leader in educational science supplies, science instruments, and physics lab equipment for nearly 30 years, we provide classroom educational aids that make learning memorable and fun. Check out our online catalog of physics and physical science demonstrations and labs for classroom use by students in elementary school, middle school, high school, and college.

Army Educational Outreach Program (AEOP) #338
G
1840 Wilson Blvd. K–12, College
Arlington, VA 22201
Phone: 703-312-9360
E-mail: *swhitsett@nsta.org*

AEOP's mission is to provide both students and teachers with a collaborative, cohesive portfolio of Army-sponsored STEM programs that effectively engage, inspire, and attract the next generation of STEM talent through K–12 and college programs and expose them to DoD STEM careers.

ASM Education Foundation #430
Teachers Camp Program C, G, PD
UMKC Camp 7–12
5100 Rockhill Rd.
Kansas City, MO 64110
Phone: 440-338-5151, x5533
E-mail: *jeane.deatherage@asminternational.org*

This is a chance to obtain knowledge about materials science that can be incorporated into your current classes. UMKC will be hosting an ASM International Education Foundation Materials Camp for middle school and high school science teachers June 2016. Stop by our booth to get information about this camp, which offers two hours of graduate credit from UMKC for a nominal fee.

Astronomy To Go #439
1115 Melrose Ave. B, C, EA, EN, G, PH
Melrose Park, PA 19027 PreK–12, College
Phone: 215-831-0485
E-mail: *astro2go@aol.com*
Website: *stores.ebay.com/astronomy-to-go*

As a nonprofit education organization, we fund our traveling astronomy programs through our traveling Museum Shop which carries a large assortment of astronomy and science-related T-shirts, books, teaching aids, and gifts, as well as an extensive collection of meteoritess and tektites. We also carry the full line of GIANT MICROBES. Visit our online store any time at *stores.ebay.com/astronomytogo*.

Bio-Rad Laboratories, Inc. #425
2000 Alfred Nobel Dr. B
Hercules, CA 94547 9–12
Phone: 800-4-BIORAD (424-6723)
Website: *www.bio-rad.com*

From DNA extraction techniques to sequencing a gene and protein analysis, Bio-Rad synergistically brings about change in science learning and provides educators with research quality kits, equipment, reagents, and curricula…allowing educators to stay on the leading edge of science education.

BOXLIGHT #310
PO Box 2609 B, C, EA, EN, G, PH, T
Belfair, WA 98528 K–12, College
Phone: 360-464-2119
E-mail: *sales@boxlight.com*
Website: *www.boxlight.com*

BOXLIGHT's classroom solutions begin with patented, award-winning interactive classroom technology. Options for sound, assessment, STEM, and hands-on learning curricula all come together with Oktopus, BOXLIGHT's integrated classroom software and LabDisc, the only solution for K–12 science with up to 14 wireless sensors built into a single device.

Britannica Digital Learning #516
331 N. LaSalle St. G, T
Chicago, IL 60654 6–8
Phone: 800-621-3900
E-mail: *contact@eb.com*
Website: *www.info.eb.com*

Pathways: Science is an online interactive a pproach to teaching scientific investigations in grades 6, 7, and 8. It's framework is ideal for Project-Based Learning, teacher-led instruction, and STEM programs.

Camp Invention #521
3701 Highland Park NW G
North Canton, OH 44720 K–8
Phone: 800-968-4332
E-mail: *campatmyschool@invent.org*
Website: *www.campinvention.org*

Become a part of something big…join us on our mission to recognize inventors and invention, promote creativity, and advance the spirit of innovation and entrepreneurship. By hosting Camp Invention or Invention Project, you are partnering with the only nationally recognized nonprofit elementary enrichment program backed by The National Inventors Hall of Fame.

Carolina Biological Supply Co. #117
2700 York Rd. All
Burlington, NC 27215 K–12, College
Phone: 800-334-5551
E-mail: *carolina@carolina.com*
Website: *www.carolina.com*

Carolina is a worldwide leader in providing educators with top-quality, innovative science and math materials, including our newest e-learning tools available at *Carolinascienceonline.com*. Carolina also serves the K–12 and college markets with everything to equip a science laboratory or classroom. Our *Carolina™ Science* catalog is free for educators and health professionals.

Carolina Curriculum #217
2700 York Rd. B, C, EA, G,
Burlington, NC 27215 PH, PD, T
Phone: 800-334-5551 K–8
E-mail: *carolinacurriculum@carolina.com*
Website: *www.carolinacurriculum.com*

Carolina has the results-driven curricula and literacy resources you need to prepare students to work in STEM careers and to succeed in the 21st-century global marketplace. Stop by our booth to learn more. Also, request your copy of the 2015–2016 *Carolina™ Curriculum* catalog.

Exhibitors

Cogent™ Education **#421**
470 E. Paces Ferry Rd., Suite 390 B, EN, PD, T
Atlanta, GA 30305 8–10
Phone: 877-654-1001
E-mail: *tyler@cogenteducation.com*
Website: *www.cogenteducation.com*

Cogent Education is dedicated to assisting teachers by creating interactive case study software that provides captivating real-world scenarios where students learn difficult biological concepts through inquiry and problem-solving. Funded by NIH and NSF, our Interactive Cases were designed by scientists to provide students opportunities to act like real scientists.

The Cornell Lab of Ornithology, **#316**
159 Sapsucker Woods Rd. B, EN, G, PD
Ithaca, NY 14850 K–12
Phone: 607-254-2489
E-mail: *slm355@cornell.edu*
Website: *www.birdsleuth.org*

With engaging hands-on activities and authentic scientific research opportunities, BirdSleuth is an ideal way to teach science content and build science process skills. Students are at the center of the action, making firsthand observations, collecting data, and sharing their results. Count on us to support inquiry learning in your classroom.

CPO Science/School Specialty Science **#105**
80 Northwest Blvd. 6–12
Nashua, NH 03063
Phone: 800-442-5444
E-mail: *customerservice.cpo@schoolspecialty.com*
Website: *www.cposcience.com*

CPO Science provides all the essential components for a hands-on, inquiry-based science program for grades 6–12. Students are truly engaged through hands-on learning, STEM projects, collaborative social learning, and real-world activities. CPO Science core and supplemental programs are ideal for differentiated instruction, helping students of all abilities succeed in science class and the world beyond.

Creative Discovery Museum **#413**
321 Chestnut St. B, EA, EN, G, T
Chattanooga, TN 37402 4–12, College
Phone: 423-290-4641
E-mail: *drwaynerobinson@gmail.com*
Website: *www.dcmfun.org*

Creative Discovery Museum (Chattanooga, Tennessee) is working with the BioEnergy Science Center (BESC) in Oak Ridge, Tennessee, on a biofuels/alternative energies project called Farming For Fuels. Come by our booth to pick up free STEM materials, including curriculum, hands-on activities, "Road Trip Challenge" iPad app, website (*www.learnbiofuels.org*), and distance learning lesson information.

Delta Education/School Specialty Science **#107**
80 Northwest Blvd.
Nashua, NH 03063
Phone: 800-258-1302
E-mail: *customerservice.delta@schoolspecialty.com*
Website: *www.deltaeducation.com*

Delta Education is your leading educational partner in providing hands-on, inquiry-based K–8 curriculum and instructional resources. With programs like FOSS® and DSM®, informational texts *(Delta Science Content Readers)*, and STEM resources, we help you develop students who set a world-class standard for college and workforce readiness.

Dinah.com **#331**
PO Box 690328 G, PD
San Antonio, TX 78269 K–12
Phone: 800-993-4624
E-mail: *sara@dinah.com*
Website: *www.dinah.com*

Dinah-Might Adventures is an educational publishing and consulting company owned by author/speaker Dinah Zike. Her books are known for their innovative ways to use Foldables® in teaching all subjects and grade levels. She also offers professional development at the Dinah Zike Academy, a unique trainer of trainers facility.

The DuPont Challenge **#334**
1840 Wilson Blvd. B, C, EA, EN, G, PH, T
Arlington, VA 22201 K–12
E-mail: *thedupontchallenge@gmail.com*
Website: *thechallenge.dupont.com*

The DuPont Challenge Science Essay Competition is the premier science competition in the United States and Canada, inspiring students to excel and achieve in scientific writing. Students from grades K–12 are eligible. When students win, teachers win, too! For more information, visit The DuPont Challenge website at *www.thechallenge.dupont.com*.

Educational Innovations, Inc. **#325**
5 Francis J. Clarke Circle B, C, EA, EN,
Bethel, CT 06801 G, PH, T
Phone: 203-748-3224 K–12, College
E-mail: *ted@teachersource.com*
Website: *www.teachersource.com*

At Education Innovations, "Teachers Serving Teachers" isn't just our slogan—it's our mission! We're committed to offering SUPER! WOW! NEAT!® science materials that bring out the scientist in everyone—colleagues, students, grandkids. We make science sizzle!

Edvotek Inc. **#224**
1121 5th St. NW B, EN
Washington, DC 20001 8–12, College
Phone: 202-370-1500
E-mail: *mariad@edvotek.com*
Website: *www.edvotek.com*

Edvotek manufactures robust research-grade biotechnology education experiments, biologics, reagents, and equipment for high schools and colleges. Experiments include DNA fingerprinting, electrophoresis, forensics, PCR, molecular cloning, immunology, environmental science, and AP biology. Products offer hands-on investigations with options for student participation in inquiry-based extensions that merge science and education.

ExploreLearning **#226**
110 Avon St., Suite 300 B, C, EA, EN,
Charlottesville, VA 22902 G, PH, T
Phone: 866-882-4141 3–12
E-mail: *sales@explorelearning.com*
Website: *www.explorelearning.com*

ExploreLearning.com is the world's largest library of interactive, online simulations for math and science in grades 3–12. With more than 450 Gizmos online (also on iPad), its growing base of inquiry-based learning materials provides a powerful enhancement to today's classrooms.

FDA Food Safety & Nutrition Education Programs **#426**
B, C, EN, G, PD
c/o Graduate School USA
600 Maryland Ave. SW
Washington, DC 20024

FDA's Center for Food Safety and Applied Nutrition (CFSAN) offers free food safety and nutrition education materials. FDA and NSTA collaborated to create Science and Our Food Supply, an innovative, interactive curriculum for middle school and high school classrooms. Stop by our booth to learn about the content and find out how to get a free copy of the newly updated and redesigned curriculum and other supplementary FDA materials that will also help teach your students more about nutrition.

Fisher Science Education **#432**
300 Industry Dr. B, C, EA, EN, G
Pittsburgh, PA 15275 K–12, College
Website: *www.fisheredu.com*

Got STEM? We totally do! Fisher Science Education provides today's teachers with the cutting-edge products they need to prepare their students for STEM careers.

Flinn Scientific, Inc. **#319**
PO Box 219 All
Batavia, IL 60510 6–12, College
Phone: 800-452-1261
E-mail: *flinn@flinnsci.com*
Website: *www.flinnsci.com*

Flinn Scientific is the leader in science and laboratory chemical safety. Publisher of the world-renowned *Flinn Science Catalog Reference Manual*, Flinn develops and offers a full line of chemistry, biology, physics, life science, Earth science, physical science, and safety products for middle school and high school.

Forestry Suppliers Inc. **#312**
205 W. Rankin St. B, EA, EN, G
Jackson, MS 39201
Phone: 601-354-3565
E-mail: *sonyaw@forestry-suppliers.com*
Website: *www.forestry-suppliers.com*

We offer products for teaching Earth, life, environmental, and physical sciences. Products include orienteering, environmental sampling, and forest and agriculture/horticulture equipment; geological/surveying and meteorological instruments; and reference and field guidebooks.

Frey Scientific/School Specialty Science **#103**
80 Northwest Blvd. K–12
Nashua, NH 03063
Phone: 800-225-3739
E-mail: *customercare.frey@schoolspecialty.com*
Website: *www.freyscientific.schoolspecialty.com*

Frey Scientific offers a complete line of supplies, equipment, technology, and lab design services for grades K–12. Among its secondary-level supplemental science curriculum offerings, Inquiry Investigations® and iNeo/SCI® are proven to support student achievement through hands-on and virtual lab experiences.

Grand Classroom, Inc. **#433**
1455 E. Rio Rd. EA, EN
Charlottesville, VA 22901 6–12
Phone: 434-466-5821
E-mail: *johnraymond@grandclassroom.com*
Website: *www.grandclassroom.com*

Grand Classroom provides educational student travel to the Washington, D.C.; the Grand Canyon; and national parks across the country. These worry-free tours emphasize safety and fun. Grand Classroom provides superior customer service and numerous benefits for educators, including free travel.

Howard Hughes Medical Institute **#225**
B, EA, EN
4000 Jones Bridge Rd. 7–12, College
Chevy Chase, MD 20815
Website: *www.hhmi.org/biointeractive*

The HHMI BioInteractive team develops free resources based on real data, highlighting research practices. Our short films, virtual labs, apps, and print materials combine important science with engaging presentation. These multimedia resources are developed, vetted, and field-tested by educators and scientists—and are all free and tied to national curriculum standards.

It's About Time **#131**
333 N. Bedford Rd., Suite 110 All
Mount Kisco, NY 10549 6–12, College
Phone: 914-273-2233
Email: *support@iat.com*
Website: *www.iat.com*

It's About Time partners with educators to move STEM education forward with student-focused project- and problem-based programs—with the engineering process embedded throughout. It's About Time is the leading publisher of NSF-funded middle school and high school science and math STEM programs.

Kansas Academy of Mathematics and Science **#235**
B, C, EA, EN, PH, T
600 Park St. 9–12
Haysk, KS 67601
Phone: 785-628-4719
E-mail: *andelzeit@fhsu.edu*
Website: *www.fhsu.edu/kams*

The Kansas Academy of Mathematics and Science (KAMS) is an early entry to college program for high school juniors and seniors that is located on the Fort Hays State University campus. KAMS gives students the opportunity to be challenged in a college classroom environment while conducting research with PhD faculty members. While attending the program, students will received 68 hours of college credit for free.

Ken-A-Vision Manufacturing Co., Inc. **#230**
B, C, EA, EN, G, T
5615 Raytown Rd. PreK–12
Kansas City, MO 64133
Phone: 816-595-5621
E-mail: *emeyer@ken-a-vision.com*
Website: *www.ken-a-vision.com*

Ken-A-Vision digital microscopes and document cameras are maximized for 1:1 and 1:many or "bring your own device" environments—ideal for all school classroom sets of devices. Software is today's sharing medium and Ken-A-Vision delivers on this need with EduCam®, the first fully functional collaboration and assessment software for visual feedback and sharing. With more than 65 years, Ken-A-Vision continues creating tomorrow's technology for today's classroom worldwide.

Kendall Hunt Publishing Co. **#424**
4050 Westmark Dr. All
Dubuque, IA 52002 K–12
Phone: 563-589-1075
E-mail: *lsteines@kendallhunt.com*
Website: *www.kendallhunt.com*

Kendall Hunt publishes a variety of inquiry and research-based science curriculum. Our hands-on programs are available in print and digital formats and focus on biology; the environment; Earth, life, and physical sciences; integrated science; chemistry; and forensic science as well as STEM concepts like technology and engineering.

King Arthur Flour **#517**
62 Fogg Farm Rd. G
White River Junction, VT 05001 4–7
Phone: 503-298-1987
E-mail: *nate.sandel@kingarthurflour.com*
Website: *www.kingarthurflour.com/learnbakeshare*

The free 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 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

LAB-AIDS®, Inc. **#420**
17 Colt Court B, C, EA, EN, G, PD
Ronkonkoma, NY 11779 6–12
Phone: 804-325-1241
E-mail: *customercare@lab-aids.com*
Website: *www.lab-aids.com*

At LAB-AIDS®, we believe students should experience science and be encouraged to question how it relates to them and the world around them. We do this by providing students with hands-on activities that excite them in science, integrate math, and are relevant to their own lives.

The Markerboard People, Inc. **#330**
1611 N. Grand River Ave. B, C, EA, EN
Lansing, MI 48906 G, PH, T
Phone: 800-379-3727 PreK–12, College
E-mail: *feedback@dryerase.com*
Website: *www.dryerase.com*

We offer student dry-erase markerboards and response boards in class sets at unbeatable prices! They're great for instant response and instant assessment Single- and double-sided available—perfect for science, math, language arts, graphing, handwriting, and more. Long-lasting, nontoxic, ultra-low-odor markers, and durable student erasers, too!

McGraw-Hill Education **#533**
8787 Orion Place All
Columbus, OH 43240 PreK–12
Phone: 614-430-4709
Website: *www.mheducation.com*

Making Education a Priority—as a leading provider of print and online solutions to help teachers teach and students to learn, McGraw-Hill Education is committed to providing educators with the tools needed to meet the requirements of groundbreaking reforms. At McGraw-Hill Education, results matter and our commitment to excellence is unparalleled.

Minerals Education Coalition **#305**
12999 E. Adam Aircraft Circle EA
Englewood, CO 80112 PreK–12, College
Phone: 303-948-4247
Email: *mec@smenet.org*
Website: *www.mineralseducationcoalition.org*

Products you use daily come from mining. Which minerals are used in creating technology and why? Stop by our booth for free rock kits and posters to teach your students about the importance of mining and minerals. Visit *www.mineralseducationcoalition.org* for SMART board lessons, activities, demonstrations, videos, and more.

The MiniOne™ Electrophoresis **#317**
7738 Arjons Dr. B
San Diego, CA 92126 8–12, College
Phone: 858-684-3190
E-mail: *info@theminione.com*
Website: *www.theminione.com*

The MiniOne allows you to separate, view, and capture DNA band images within a single class period. It delivers a complete, real-time electrophoresis experience in the palm of your hand. The MiniOne is a game-changer for teaching molecular biology in the classroom.

Mountain Press Publishing Co. **#524**
1301 S. 3rd St. W G
Missoula, MT 59801 K–12, College
Phone: 406-728-1900
E-mail: *info@mtnpress.com*
Website: *www.mountain-press.com*

Mountain Press publishes nonfiction books on geology and natural history for children and adults. We are known for our best-selling *Roadside Geology, Geology Underfoot*, and *Nature's Yucky!* series.

MSOE Center for BioMolecular Modeling **#207**
1025 N. Broadway St.
Milwaukee, WI 53202
Phone: 414-277-2824
E-mail: *herman@msoe.edu*
Website: *cbm.msoe.edu*

As an instructional materials development laboratory, we create student-centered, hands-on kits and models for the molecular biosciences. Through our professional development experiences, teachers learn active teaching skills and are involved in developing and field-testing new kits. Ask about our outreach programs—SMART Teams and Science Olympiad Protein Modeling Event.

Nancy Larson® Science **#431**
PO Box 688 G
Old Lyme, CT 06371 K–4
Phone: 860-434-0800
E-mail: *gracia.roberson@nancylarsonpublishers.com*
Website: *www.nancylarsonscience.com*

Nancy Larson® Science provides a complete hands-on elementary science curriculum with challenging content that engages students and is easy for teachers to use. To read what school administrators and teachers say about the program, go to *nancylarsonsuccess.com*.

Nasco **#427**
901 Janesville Ave. B, C, EA, EN, G, PH, T
Fort Atkinson, WI 53538 K–12
Phone: 800-558-9595
Website: *www.enasco.com*

For over 70 years, Nasco has made a commitment to provide quality teaching aids, reliable service, realistic pricing, and most importantly, customer satisfaction. Known as the "Science Teacher's Favorite Catalog," Nasco offers supplies for a full-line science curriculum, including many items developed by Nasco. Please visit us at *eNasco.com* or call 800-558-9595.

National Geographic Learning/ Cengage Learning **#518**
20 Channel Center St. G
Boston, MA 02210 K–12
Phone: 888-915-3276
E-mail: *schoolcustomerservice@cengage.com*
Website: *www.ngl.cengage.com/school*

National Geographic Learning, a part of Cengage Learning, provides quality preK–12, academic, and adult education instructional solutions for reading; science; social studies; ESL/ELD; Spanish/dual language; advanced and electives; career and technical education; and professional development.

Navajo Jewelry and Crafts **#512**
6008 Hemlock Ave. NW
Albuquerque, NM 87114
Phone: 505-301-9133
E-mail: *krsanchezabq@hotmail.com*

We specialize in handcrafted jewelry made by the Navajo, Zuni, and Santo Domingo tribes of New Mexico. All jewelry is handcrafted by family and extended family, all set in sterling silver with all natural stones and shells.

Nebraska Scientific **#304**
3823 Leavenworth St. B
Omaha, NE 68105 4–12, College
Phone: 800-228-7117
E-mail: *staff@nebraskascientific.com*
Website: *www.nebraskascientific.com*

We are a supplier of biology and life science materials, including quality preserved specimens, microscopes, balances, furniture, and more.

NexGenReady Science **519**
2598 Quincy Rd. G
Solon, IA 52333 K–8
Phone: 319-331-5755
E-mail: *julieana17ph@yahoo.com*
Website: *www.nexgenready.com*

NexGenReady features an online library of interactive science modules that meet the K–8 *NGSS*.

NGSS@NSTA **#238**
1840 Wilson Blvd.
Arlington, VA 22201
E-mail: *ngss@nsta.org*
Website: *www.nsta.org/ngss*

How can NSTA help you prepare for the *Next Generation Science Standards*? Stop by our booth to hear the latest news about state adoption and check out a sampling of NSTA resources dedicated to helping teachers understand and implement the new standards.

NOAA Education **#530**
1401 Constitution Ave. NW EA, EN
#6863 2–12
Washington, DC 20230
Phone: 301-713-1208
E-mail: *education@noaa.gov*
Website: *www.education.noaa.gov*

NOAA is a federal science agency providing free information about weather, climate, oceans, coasts, satellite data, solar weather, and fisheries. Every day, NOAA's science touches the lives of all Americans.

NSTA Membership **#238**
1840 Wilson Blvd. All
Arlington, VA 22201 PreK–12, College
Phone: 703-243-7100
E-mail: *membership@nsta.org*
Website: *www.nsta.org/membership*

Meet the NSTA staff and other members, pick up copies of recent journals, get info on the *NGSS*, find out how to enter our teacher award programs, and see our new Learning Center. NSTA members—this is the place to pick up your district ribbon to display on your badge so you can more easily identify and meet other teachers from your region. Come by and ASK US ANYTHING about NSTA benefits, products, and resources—and earn a chance to win prizes, including tweet-shirts and Southwest Airline vouchers good on travel to future conferences!

NSTA Professional Learning Opportunities **#239**
1840 Wilson Blvd.
Arlington, VA 22201
Website: *www.nsta.org/conferences*

The NSTA Professional Learning team supports science educators in school districts and institutions of higher education through a variety of face-to-face, online, and blended experiences tailored to their specific needs. The Learning Center, NSTA's online learning portal, is designed to enhance the content and pedagogical knowledge of teachers of science. Visit our booth to learn more about the professional learning opportunities available through NSTA.

#askNSTA

Army Educational Outreach Program (AEOP)
Booth #338 • E-mail: *swhitsett@nsta.org*
Website: *www.usaeop.com*

The DuPont Challenge
Booth #334 • E-mail: *thedupontchallenge@gmail.com*
Website: *thechallenge.dupont.com*

NGSS@NSTA
Booth #238 • E-mail: *ngss@nsta.org*
Website: *www.nsta.org/ngss*

NSTA Membership
Booth #238 • E-mail: *membership@nsta.org*
Website: *www.nsta.org/membership*

NSTA Professional Learning Opportunities
Booth #239 • E-mail: *fmendez@nsta.org*
Website: *www.nsta.org/conferences*

Shell Science Lab Challenge
Booth #335 • E-mail: *shellsciencelab@nsta.org*
Website: *www.nsta.org/shellsciencelab*

#askNSTA

JOIN US AT BOOTH #238

How can I find funds to attend an NSTA conference?

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

What are the Next Generation Science Standards?

What does NSTA have for student teachers?

#NSTA15

NSTA National Science Teachers Association

Exhibitors

Nutrients for Life Foundation **#326**
425 3rd St. SW, Suite 950 EA
Washington, DC 20024 K–12
Phone: 202-515-2714
E-mail: *jmcguire@nutrientsforlife.org*
Website: *www.nutrientsforlife.org*

Nutrients for Life Foundation provides free education resources about soil science and crop nutrients.

OHAUS Corp. **#232**
7 Campus Dr., Suite 310 B, C, EA, EN,
Parsippany, NJ 07054 G, PH, T
Phone: 973-377-9000 K–12, College
E-mail: *sales@ohaus.com*
Website: *www.ohaus.com*

OHAUS—a leading manufacturer of balances, scales, and water quality test meters—offers a complete array of measurement solutions for grades K–12 and beyond. With OHAUS, you'll connect your students to the real world of measurement through dependable equipment and relevant technology, which serve to help improve student learning outcomes.

Otto Trading, Inc. **#135**
1921 Carnegie Ave., Suite C
Santa Ana, CA 92705
Phone: 714-540-5595
Website: *www.unimedmassager.com*

We sell tens massage machines.

PASCO scientific **#139**
10101 Foothills Blvd. All
Roseville, CA 95747 K–12, College
Phone: 916-462-8208
E-mail: *tstout@pasco.com*
Website: *www.pasco.com*

Help students "think science" with PASCO scientific's award-winning, state-of-the-art science learning environment. Integrating STEM and the latest standards-based content, probeware, and data collection and analysis software, PASCO science solutions are easy to use, cost-effective, and work on your devices, including iPad, Chromebook, Android tablets and phones, and Mac and Windows computers.

Pearson Education, Inc. **#510**
501 Boylston St. All
Boston, MA 02116 K–12
E-mail: *john.fitzgerald2@pearson.com*
Website: *www.pearsonk12.com*

Pearson's defining goal is to help people progress in their lives through learning. Pearson Science assists in this goal by helping teachers spark students' natural interest in science and create lifelong critical thinkers. We provide powerful standards-based instructional solutions, STEM activities, and professional development to help educators improve student learning.

PEPCO Inc. **#111**
1615 Robertson Rd. B, C, EA, EN,
Moberly, MO 65270-0457 G, PH, T
Phone: 800-568-1067
E-mail: *dave@pepcoinc.com*
Website: *www.pepcoinc.com*

We manufacture quality science furniture—proudly located in central Missouri.

Pitsco Education **#324**
915 E. Jefferson PH, PD, T
Pittsburg, KS 66762 K–12
Phone: 620-231-0000
E-mail: *aricks@pitsco.com*
Website: *www.pitsco.com*

From robots to dragsters to alternative energy, from kits to curriculum, from activities to full-fledged math and science learning labs—Pitsco Education offers STEM solutions for every classroom. Our products are backed by unparalleled customer service and will engage your students via 21st-century learning experiences steeped in the *Common Core State Standards*.

Project Learning Tree **#419**
2000 M St. NW, Suite 550 EN, PD
Washington, DC 20036 PreK–12
Phone: 202-765-3641
E-mail: *information@plt.org*
Website: *www.plt.org*

Project Learning Tree is a nationally award-winning environmental education program designed for preK–12 formal and nonformal educators. The supplementary materials provide hands-on/minds-on multidisciplinary activities.

School Specialty Science **#103/#105/#107**
80 Northwest Blvd.
Nashua NH 03063

School Specialty Science brings together the very best curriculum with FOSS® and CPO Science; classroom resources, equipment, and furniture with Delta Education and Frey Scientific. Together, these effective teaching and learning solutions serve all the needs of preK–12 science teachers, curriculum specialists, and administrators.

Science First®/STARLAB® **#311**
86475 Gene Lasserre Blvd. B, C, EA, EN,
Yulee, FL 32097 G, PH, T
Phone: 904-225-5558 PreK–12, College
E-mail: *info@sciencefirst.com*
Website: *www.sciencefirst.com*

Science First/STARLAB specializes in the design, manufacturing, marketing, and distribution of high-quality hands-on science education products. Our classic and digital STARLAB® creates an exciting, immersive, and lasting learning experience.

Shell Science Lab Challenge **#335**
1840 Wilson Blvd. B, C, EA, EN, G, PH
Arlington, VA 22201 6–12
Phone: 703-312-9378
E-mail: *shellsciencelab@nsta.org*
Website: *www.nsta.org/shellsciencelab*

Are you succeeding in science lab instruction with minimal equipment? The Shell Science Lab Challenge gives you an opportunity to share your exemplary approach for a chance to win a school science lab makeover support package valued at $20,000!

Simulation Curriculum **#526**
11900 Wayzata Blvd., Suite 126 EA, G, PD
Minnetonka, MN 55305 K–12, College
Phone: 952-653-0493
E-mail: *mgoodman@simcur.com*
Website: *www.simulationcurriculum.com*

Simulation Curriculum is a leading developer of interactive, standards-based astronomy, geology, meteorology, and physical geography software and curriculum for grades K–12 through college.

South Dakota State University **#206**
Avera Health Sciences 351 C
Brookings, SD 57007 6–12, College
Phone: 605-688-6274
E-mail: *matt.miller@sdstate.edu*
Website: *www.sdstate.edu/chem*

Stop by our booth to learn about our master's program in chemistry. This is an online program focused on important topics typically covered in the secondary chemistry curriculum.

STR School & Science Technology Resources **#227**
B, EA, EN, G
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 Energy Education **#417**
EN, PH
University of Northern Iowa, CEEE 12 4–9
Cedar Falls, IA 50614
Phone: 319-273-6012
E-mail: *higby@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

University College **#416**
Washington University in St. Louis B, PD
1 Brookings Dr. 9–12, College
CB 1064
St. Louis, MO 63130
Phone: 314-935-8974
E-mail: *hathaway@wustl.edu*
Website: *ucollege.wustl.edu/msinbiology*

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.

Vernier Software & Technology, LLC **#125**
B, C, EN, G,
13979 SW Millikan Way PH, PD, T
Beaverton, OR 97005 3–12, College
Phone: 888-837-6437
E-mail: *info@vernier.com*
Website: *www.vernier.com*

Vernier Software & 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.

Western Governors University **#332**
4001 S 700 E, #700 B, C, EA, EN, G
Salt Lake City, UT 84107 K–12
Phone: 866-225-5948
E-mail: *wgu@wgu.edu*
Website: *www.wgu.edu*

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.

Photo courtesy of Jacob Slaton

3D Molecular Designs (Booth #205)

Thursday, Dec. 3	11:00 AM–12 Noon	2205, Conv. Center	Constructing and Crossing Cell Membranes (p. 48)
Thursday, Dec. 3	2:00–3:00 PM	2205, Conv. Center	Genes, Schemes, and Molecular Machines (p. 60)
Friday, Dec. 4	11:00 AM–12 Noon	2205, Conv. Center	Let's Get Helical (p. 84)

Accelerate Learning —STEMscopes (Booth #211)

Thursday, Dec. 3	9:30–10:30 AM	2211, Conv. Center	Demystifying the *NGSS* with STEMscopes (p. 47)
Thursday, Dec. 3	11:00 AM–12 Noon	2211, Conv. Center	Engineering Design Process in the STEM Classroom (p. 50)
Friday, Dec. 4	12:30–1:30 PM	2211, Conv. Center	The Secrets to Successful PBL (p. 90)

Activate Learning (Booth #231)

Thursday, Dec. 3	12:30–1:30 PM	2203, Conv. Center	Making Critical Thinking More Than Just a Cliché© Using 3 Dimensional Learning (p. 54)
Friday, Dec. 4	8:00–9:00 AM	2203, Conv. Center	Integrating Literacy and Science—the Wow Factor (p. 72)

ANATOMY IN CLAY® Learning System (Booth #418)

Thursday, Dec. 3	2:00–3:00 PM	2207, Conv. Center	Human Anatomy Lab: Building from the Inside Out (p. 60)
Friday, Dec. 4	11:00 AM–12 Noon	2207, Conv. Center	Creating to Understand: Come Build Your Muscles in Clay! (p. 84)

Army Educational Outreach Program (Booth #338)

Thursday, Dec. 3	11:00 AM–12 Noon	2207, Conv. Center	"Hard" Doesn't Mean "Bad" (p. 49)
Friday, Dec. 4	2:00–3:00 PM	2207, Conv. Center	Student Collaboration in the Science Classroom (p. 91)

Bio-Rad Laboratories (Booth #425)

Thursday, Dec. 3	11:00 AM–12:15 PM	2201, Conv. Center	Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 50)
Thursday, Dec. 3	3:30–5:00 PM	2201, Conv. Center	Effortlessly Integrate Inquiry with Glowing Bacteria (AP Big Idea 3) (p. 66)
Friday, Dec. 4	8:00–9:30 AM	2201, Conv. Center	How to Use Pop Culture Science in Your Classes (p. 74)
Friday, Dec. 4	11:00 AM–12:15 PM	2201, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 85)
Friday, Dec. 4	2:00–3:00 PM	2201, Conv. Center	The GMO Debate Rages On! (p. 90)
Friday, Dec. 4	3:30–5:00 PM	2201, Conv. Center	Fostering High School Science Engagement Using an *NGSS*-Focused Interactive Experience (p. 96)

Carolina Biological Supply Co. (Booth #117)

Thursday, Dec. 3	8:00–9:00 AM	2206, Conv. Center	STEM: Investigating Touch Screen Devices (p. 44)
Thursday, Dec. 3	9:30–10:30 AM	2206, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 46)
Thursday, Dec. 3	11:00 AM–12 Noon	2206, Conv. Center	Hands-On Science with Classroom Critters (p. 49)
Thursday, Dec. 3	2:00–3:00 PM	2206, Conv. Center	Bring Visual Science into K–5 Classrooms—It's a Game Changer! (p. 60)
Thursday, Dec. 3	3:30–4:30 PM	2206, Conv. Center	Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 65)
Friday, Dec. 4	8:00–9:00 AM	2206, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 72)

Carolina Biological Supply Co. , continued

Friday, Dec. 4	9:30–10:30 AM	2206, Conv. Center	They Come in Pairs: Using Socks to Identify and Address Student Misconceptions About Chromosomes (p. 78)
Friday, Dec. 4	11:00 AM–12 Noon	2206, Conv. Center	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 84)
Friday, Dec. 4	2:00–3:00 PM	2206, Conv. Center	Engineering Design for Grades K–2 (p. 91)
Friday, Dec. 4	3:30–4:30 PM	2206, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 95)

CPO Science/School Specialty Science (Booth #105)

Thursday, Dec. 3	8:00–9:00 AM	2215 A, Conv. Center	CPO's Link™ Chemistry Models: Fun with Atom Building and the Periodic Table (p. 45)
Thursday, Dec. 3	9:30–10:30 AM	2215 A, Conv. Center	CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 47)
Thursday, Dec. 3	11:00 AM–12 Noon	2215 A, Conv. Center	Genetics: Crazy Traits and CPO's Link™ Learning Module (p. 50)
Thursday, Dec. 3	12:30–1:30 PM	2215 A, Conv. Center	CPO's Link™ Wind Turbine Learning Module: A STEM Approach to Engineering and Design (p. 54)
Thursday, Dec. 3	2:00–3:00 PM	2215 A, Conv. Center	Building an Electric Motor the STEM Way with CPO's Link™ Learning Module (p. 62)
Thursday, Dec. 3	3:30–4:30 PM	2215 A, Conv. Center	CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 66)

Delta Education/School Specialty Science (Booth #107)

Thursday, Dec. 3	8:00–9:00 AM	2208, Conv. Center	Earth Science for Our Next Generation of Very Young Scientists (p. 44)
Thursday, Dec. 3	11:00 AM–12 Noon	2208, Conv. Center	Engineering Design: Will It Sink or Float? (p. 49)
Thursday, Dec. 3	12:30–1:30 PM	2208, Conv. Center	High Flying Connections with Science and Literacy (p. 54)
Thursday, Dec. 3	3:30–4:30 PM	2208, Conv. Center	Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism (p. 66)

Delta Education/School Specialty Science-FOSS (Booth #107)

Thursday, Dec. 3	8:00–9:00 AM	2209, Conv. Center	Archaea and the Three Domains: Classification of Life for Middle School (p. 45)
Thursday, Dec. 3	9:30–10:30 AM	2209, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 47)
Thursday, Dec. 3	11:00 AM–12 Noon	2209, Conv. Center	Engage Them Early: Engineering Experiences with FOSS (p. 50)
Thursday, Dec. 3	12:30–1:30 PM	2209, Conv. Center	Engineering in Elementary Science: Designing with FOSS (p. 54)
Thursday, Dec. 3	2:00–3:00 PM	2209, Conv. Center	What to Look for in Science Learning Progressions: Experience FOSS Next Generation (p. 61)
Thursday, Dec. 3	3:30–4:30 PM	2209, Conv. Center	Floods, Heat Waves, and Hurricanes: Analyzing Evidence for a Changing Climate (p. 66)

Dinah.com (Booth #331)

Friday, Dec. 4	11:00 AM–12 Noon	2215 C, Conv. Center	Observing and Inferring in the Science Classroom: New Tips and Tools from Dinah Zike's Notebooking Central (p. 85)

Educational Innovations, Inc. (Booth #325)

Friday, Dec. 4	9:30–10:30 AM	2215 C, Conv. Center	Cool! Can We Do That Again?! (p. 79)

Edvotek, Inc. (Booth #224)

Thursday, Dec. 3	9:30–10:30 AM	2202, Conv. Center	Detecting the Silent Killer: Clinical Detection of Diabetes (p. 46)
Thursday, Dec. 3	11:00 AM–12 Noon	2202, Conv. Center	Using the Polymerase Chain Reaction to Identify GM Foods (p. 48)
Thursday, Dec. 3	12:30–1:30 PM	2202, Conv. Center	Case of the Missing Records (p. 54)
Thursday, Dec. 3	2:00–3:00 PM	2202, Conv. Center	Teaching STEM Using Agarose Gel Electrophoresis (p. 60)
Thursday, Dec. 3	3:30–4:30 PM	2202, Conv. Center	The Drunken Worms: Exploring Gene Function with *C. elegans* (p. 65)

Fisher Science Education (Booth #432)

Friday, Dec. 4	11:00 AM–12 Noon	2203, Conv. Center	Environmental Study: A Real-World Investigation (p. 84)

Flinn Scientific, Inc. (Booth #319)

Thursday, Dec. 3	9:30–10:30 AM	2215 C, Conv. Center	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 47)
Thursday, Dec. 3	2:00–3:00 PM	2215 C, Conv. Center	Flinn Activities to Integrate STEM Education (p. 62)
Friday, Dec. 4	8:00–9:00 AM	2215 C, Conv. Center	Flinn Scientific Resources Prepare Students for AP Chemistry Success (p. 73)

Frey Scientific/School Specialty Science (Booth #103)

Thursday, Dec. 3	9:30–10:30 AM	2208, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 47)
Thursday, Dec. 3	2:00–3:00 PM	2208, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 61)

HHMI BioInteractive (Booth #225)

Friday, Dec. 4	8:00–9:00 AM	2209, Conv. Center	The Making of the Fittest: Natural Selection and Adaptation: Rock Pocket Mouse (p. 73)
Friday, Dec. 4	9:30–10:30 AM	2209, Conv. Center	Exploring a Genetic Trait with Sticklebacks (p. 79)
Friday, Dec. 4	11:00 AM–12 Noon	2209, Conv. Center	Modeling and the Double Helix (p. 84)
Friday, Dec. 4	12:30–1:30 PM	2209, Conv. Center	Modeling and Storytelling: A Means to Understand Enzyme Regulation (p. 90)
Friday, Dec. 4	2:00–3:00 PM	2209, Conv. Center	Explore Virtual Labs from BioInteractive (p. 91)
Friday, Dec. 4	3:30–4:30 PM	2209, Conv. Center	The Cell Cycle and Cancer (p. 95)

It's About Time (Booth #131)

Friday, Dec. 4	8:00–9:00 AM	2215 A, Conv. Center	Active Physics and Active Chemistry: Leading Project-based High School Physics and Chemistry Programs Capturing the Essence of the *NGSS* and STEM (p. 73)
Friday, Dec. 4	9:30–10:30 AM	2215 A, Conv. Center	Engineering in the *NGSS:*Grades 9–12 (p. 79)
Friday, Dec. 4	11:00 AM–12 Noon	2215 A, Conv. Center	Debunking the Myths of Project-Based Learning: Yes We CAN! (p. 85)
Friday, Dec. 4	12:30–1:30 PM	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)
Friday, Dec. 4	2:00–3:00 PM	2215 A, Conv. Center	Project-Based Inquiry Science™ (PBIS): Creating "Coherence and Science Storylines" for Middle School Science: Grades 6–8 (p. 92)
Friday, Dec. 4	3:30–4:30 PM	2215 A, Conv. Center	PBIS Roundtables: Discussions to Support Successful Implementation (p. 96)

Index of Exhibitor Workshops

King Arthur Flour (Booth #517)

Friday, Dec. 4	2:00–3:00 PM	2208, Conv. Center	Bake for Good: Kids Learn-Bake-Share Program (p. 91)

LAB-AIDS®, Inc. (Booth #420)

Thursday, Dec. 3	8:00–9:00 AM	2204, Conv. Center	Gas Exchange (p. 44)
Thursday, Dec. 3	9:30–10:30 AM	2204, Conv. Center	Modeling Convection Currents and Plate Motion (p. 46)
Thursday, Dec. 3	11:00 AM–12 Noon	2204, Conv. Center	Calling All Carbons (p. 48)
Thursday, Dec. 3	12:30–1:30 PM	2204, Conv. Center	Prospecting for Mineral Ore (p. 54)
Thursday, Dec. 3	2:00–3:00 PM	2204, Conv. Center	Reclaiming the Metal (p. 60)
Friday, Dec. 4	8:00–9:00 AM	2204, Conv. Center	pH Scale and Math Modeling (p. 72)
Friday, Dec. 4	9:30–10:30 AM	2204, Conv. Center	Chemical Formula and Amino Acids (p. 78)
Friday, Dec. 4	11:00 AM–12 Noon	2204, Conv. Center	What Is a Species? (p. 84)
Friday, Dec. 4	12:30–1:30 PM	2204, Conv. Center	Cell Differentiation and Gene Expression (p. 89)
Friday, Dec. 4	2:00–3:00 PM	2204, Conv. Center	Energy Flow Through an Ecosystem (p. 91)
Saturday, Dec. 5	8:00–9:00 AM	2204, Conv. Center	Chicken Little…Chicken Big—DuPont Agriscience Institute (p. 101)
Saturday, Dec. 5	9:30–10:30 AM	2204, Conv. Center	Vet Detective: Tracking the Spread—DuPont Agriscience Institute (p. 104)

The MiniOne Electrophoresis (Booth #317)

Friday, Dec. 4	11:00 AM–12 Noon	2210, Conv. Center	MiniOne™ Electrophoresis: Revolutionizing Biotechnology in Real Time (p. 84)

MSOE Center for BioMolecular Modeling (Booth #207)

Thursday, Dec. 3	12:30–1:30 PM	2205, Conv. Center	Of All the Nerve! (p. 54)
Friday, Dec. 4	8:00–9:00 AM	2205, Conv. Center	Lights, Camera, Enzymes in Action! (p. 72)
Friday, Dec. 4	12:30–1:30 PM	2205, Conv. Center	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 89)

Nasco (Booth #427)

Thursday, Dec. 3	2:00–3:00 PM	2203, Conv. Center	The Extraordinary Odyssey: An Expedition Through the Human Body (p. 60)
Friday, Dec. 4	9:30–10:30 AM	2203, Conv. Center	The Extraordinary Odyssey: An Expedition Through the Human Body (p. 78)

National Geographic Learning (Booth #518)

Friday, Dec. 4	8:00–9:00 AM	2210, Conv. Center	National Geographic Explorers: Ideal Role Models of STEM (p. 73)

NexGenReady Science (Booth #519)

Friday, Dec. 4	9:30–10:30 AM	2207, Conv. Center	NexGenReady: Interactive Online *NGSS* Modules for Grades 3–8 (p. 79)

PASCO scientific (Booth #139)

Friday, Dec. 4	8:00–9:00 AM	2208, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 73)
Friday, Dec. 4	9:30–10:30 AM	2208, Conv. Center	Adapting Traditional Biology Labs to Sensor Technology (p. 79)
Friday, Dec. 4	11:00 AM–12 Noon	2208, Conv. Center	Physics with PASCO scientific, Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics (p. 84)

Pitsco Education (Booth #324)

Friday, Dec. 4	8:00–9:00 AM	2207, Conv. Center	Getting Started with Classroom Robotics and Programming (p.73)

Science First®/STARLAB® (Booth #311)

Thursday, Dec. 3	11:30 AM–12 Noon	Booth #311, Exhibit Hall	The Change of Seasons (p. 50)
Friday, Dec. 4	11:30 AM–12 Noon	Booth #311, Exhibit Hall	The Solid Earth (p. 85)

Simulation Curriculum Corp. (Booth #526)

Thursday, Dec. 3	9:30–10:30 AM	2210, Conv. Center	Plate Tectonics: Continents on the Move (p. 47)
Thursday, Dec. 3	2:00–3:00 PM	2210, Conv. Center	Stellar Evolution Made Easy (p. 61)
Friday, Dec. 4	9:30–10:30 AM	2210, Conv. Center	Pluto: New Horizons (p. 79)
Friday, Dec. 4	2:00–3:00 PM	2210, Conv. Center	Weather and Climate Change: Are We Doomed? (p. 91)

South Dakota State University (Booth #206)

Friday, Dec. 4	2:00–3:00 PM	2203, Conv. Center	Using the Classic Chemistry Demonstration to Engage Students (p. 91)

Texas Instruments, Inc. (Booth #511)

Friday, Dec. 4	9:30–10:30 AM	2211, Conv. Center	Zombie Apocalypse! (p. 79)
Friday, Dec. 4	2:00–3:00 PM	2211, Conv. Center	A Matter of Life and Death (p. 91)

UNI Fabulous Resources for Energy Education (Booth #417)

Friday, Dec. 4	11:00 AM–12 Noon	2211, Conv. Center	FUNdamentals of Energy Education (p. 85)

Vernier Software & Technology (Booth #125)

Friday, Dec. 4	8:00–9:00 AM	2202, Conv. Center	Integrating Chromebook with Vernier Technology (p. 72)
Friday, Dec. 4	9:30–10:30 AM	2202, Conv. Center	Chemistry with Vernier (p. 78)
Friday, Dec. 4	11:00 AM–12 Noon	2202, Conv. Center	Biology with Vernier (p. 83)
Friday, Dec. 4	12:30–1:30 PM	2202, Conv. Center	Integrating Chromebook with Vernier Technology (p. 89)
Friday, Dec. 4	2:00–3:00 PM	2202, Conv. Center	Integrating iPad with Vernier Technology (p. 90)
Friday, Dec. 4	3:30–4:30 PM	2202, Conv. Center	Physics and Physical Science with Vernier (p. 95)

Earth and Space Science

Thursday

8:00–9:00 AM	6–12	2103 B, Conv. Center	Spelling Success (with *NGSS*) in an Earth and Space Science Learning Lab (p. 43)
8:00–9:00 AM	K–7	2102 A, Conv. Center	Students' Cloud Observations On-Line: A Hands-On Science Project for the Classroom (p. 42)
8:00–9:00 AM	K–2	2208, Conv. Center	Earth Science for Our Next Generation of Very Young Scientists (p. 44)
8:30–9:00 AM	9–12	2503 B, Conv. Center	ASTE Session: Service Learning in High School Environmental Science Classrooms (p. 45)
8:30–9:00 AM	K–C	2502 A, Conv. Center	Preparing You and Your Students for Totality (p. 45)
9:30–10:30 AM	6–8	2204, Conv. Center	Modeling Convection Currents and Plate Motion (p. 46)
9:30–10:30 AM	6–12	2210, Conv. Center	Plate Tectonics: Continents on the Move (p. 47)
11:00 AM–12 Noon	9–12	2204, Conv. Center	Calling All Carbons (p. 48)
11:30 AM–12 Noon	5–8	Booth #311, Exhibit Hall	The Change of Seasons (p. 50)
12:30–1:00 PM	8–C	3501 A, Conv. Center	In the Cracks of the Concrete (p. 51)
12:30–1:30 PM	P–C	3501 C, Conv. Center	Teaching with 3-D Puzzle Boxes to Integrate *NGSS*'s Three Dimensions (p. 53)
12:30–1:30 PM	6–12	2103C, Conv. Center	No Answer Key! Becoming a Mentor-Scholar with the *NGSS* Science Practices (p. 53)
12:30–1:30 PM	9–12	2204, Conv. Center	Prospecting for Mineral Ore (p. 54)
1:00–1:30 PM	K–5	3501 A, Conv. Center	Learning by Doing: Teaching Life Science Using School Gardens (p. 55)
2:00–3:00 PM	K–C	2502 A, Conv. Center	The AMS DataStreme Project: The *NGSS* in Action (p. 57)
2:00–3:00 PM	9–12	3501 A Conv. Center	Is All This Burning Necessary? (p. 58)
2:00–3:00 PM	6–12	2103 B, Conv. Center	NASA: Inquiry Activities for Learning About Light and the EM Spectrum and Multiwavelength Astronomy (p. 58)
2:00–3:00 PM	6–12	2210, Conv. Center	Stellar Evolution Made Easy (p. 61)
2:30–3:00 PM	9–12	2215 B, Conv. Center	Teaching and Learning Modules That Build from Cutting-Edge Research on Climate, Plants, and Communities (p. 62)
3:30–4:30 PM	P–12	3501 G, Conv. Center	Create Your Own NASA Portal to *NGSS* with NASA Wavelength (p. 65)
3:30–4:30 PM	6–10	2103 B, Conv. Center	NASA Brings You Newton's Laws of Motion (p. 64)
3:30–4:30 PM	9–C	2504 B, Conv. Center	An Ice Core Classroom Investigation That Connects the Three Dimensions of *NGSS* with *CCSS* (p. 64)
3:30–4:30 PM	3–12	2502 B, Conv. Center	NASA's "Eyes on the Solar System": Bringing Planets into Your Classroom (p. 63)
3:30–4:30 PM	6–8	2209, Conv. Center	Floods, Heat Waves, and Hurricanes: Analyzing Evidence for a Changing Climate (p. 66)

Friday

8:00–9:00 AM	5–8	1501 A, Conv. Center	STEMazing Lessons for Middle School (p. 69)
8:00–9:00 AM	9–12	2215 B, Conv. Center	Understanding Climate Change and Climate Change Models (p. 69)
8:00–9:00 AM	5–12	3501 F, Conv. Center	Investigating Pollinators in the Schoolyard (p. 72)
8:00–9:00 AM	8–12	3501 A, Conv. Center	Down on the Farm(s) (p. 71)
8:00–9:00 AM	6–C	1501 B, Conv. Center	NESTA Shares: Innovative Ways to Teach About Weather Observation and Weather Hazards (p. 70)
8:00–9:00 AM	9–12	3501 E, Conv. Center	Hot Topics Workshop: Nuclear Energy (p. 71)
8:00–9:00 AM	K–5	2504 A, Conv. Center	Crosscutting Concepts Go to S'COOL (p. 71)
9:30–10:30 AM	8–C	3501 A, Conv. Center	Students Analyze Scientific and Engineering Data in the Quest for Sustainable Bioenergy (p. 77)
9:30–10:30 AM	6–C	1501 B, Conv. Center	NESTA Shares: Innovative Ways to Teach About Climate and Climate Change (p. 76)

9:30–10:30 AM	6–12	2210, Conv. Center	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	1–12	1501 B, Conv. Center	NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources (p. 88)
12:30–1:30 PM	6–8	3501 C, Conv. Center	Mission HydroSci: A Virtual Environment for Teaching Water Systems and Argumentation (p. 87)
12:30–1:30 PM	2–6	3501 A, Conv. Center	From Sun to Food (p. 89)
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 Sciencetm (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)
12:30–1:30 PM	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)

Engineering, Technology, and the Application of Science

Thursday

8:00–8:30 AM	6–8	2503 B, Conv. Center	ASTE Session: Integrating Engineering into Middle School Science Classrooms (p. 41)
8:00–9:00 AM	7–12	3501 B, Conv. Center	Hovercrafts and Newton's Laws (p. 44)
8:00–9:00 AM	9–12	2101, Conv. Center	Teach Engineering Principles on the Cheap with Concrete (p. 42)
8:00–9:00 AM	3–C	2505 B, Conv. Center	NSTA Press® Session: Uncovering Students' STEM-Related Ideas (p. 44)
8:00–9:00 AM	6–12	2103 B, Conv. Center	Spelling Success (with *NGSS*) in an Earth and Space Science Learning Lab (p. 43)
9:15–10:30 AM	P–C	Great Hall (3501 E-H), CC	General Session: From Farm to Flesh—How We Transform Soil into Civilization (p. 46)
11:00 AM–12 Noon	P–12	2211, Conv. Center	Engineering Design Process in the STEM Classroom (p. 50)
11:00 AM–12 Noon	K–2	2208, Conv. Center	Engineering Design: Will It Sink or Float? (p. 49)
12:30–1:30 PM	K–5	2209, Conv. Center	Engineering in Elementary Science: Designing with FOSS (p. 54)
12:30–1:30 PM	3–5	2208, Conv. Center	High Flying Connections with Science and Literacy (p. 54)
12:30–1:30 PM	6–12	2215 A, Conv. Center	CPO's Link™ Wind Turbine Learning Module: A STEM Approach to Engineering and Design (p. 54)
12:30–1:30 PM	4–8	2102 B, Conv. Center	Amusement Park Physics (p. 53)
12:30–1:30 PM	P–C	3501 C, Conv. Center	Teaching with 3-D Puzzle Boxes to Integrate *NGSS*'s Three Dimensions (p. 53)
1:00–1:30 PM	3–5	1501 A, Conv. Center	Bringing Science to Life by Creating a Wax Museum (p. 55)
2:00–3:00 PM	K–12	2502 B, Conv. Center	Discover the *NGSS:* An Interactive Exploration of the *Next Generation Science Standards* (p. 58)
2:00–3:00 PM	K–6	2102 B, Conv. Center	Revolutionize Your Science Curriculum with Picture-Perfect Lessons (p. 58)
2:00–3:00 PM	4–8	1501 A, Conv. Center	Engineering with Sound Science (p. 57)
2:00–3:00 PM	6–C	2205, Conv. Center	Genes, Schemes, and Molecular Machines (p. 60)
2:00–3:00 PM	6–12	2215 A, Conv. Center	Building an Electric Motor the STEM Way with CPO's Link™ Learning Module (p. 62)
3:30–4:30 PM	4–8	2503 A, Conv. Center	*NGSS*: A Model for the Engineering Design Process (p. 65)
3:30–4:30 PM	9–C	2504 B, Conv. Center	An Ice Core Classroom Investigation That Connects the Three Dimensions of *NGSS* with *CCSS* (p. 64)
3:30–4:30 PM	K–8	2505 B, Conv. Center	NSTA Press® Session: Outdoor Science: A Practical Guide (p.65)

Friday

8:00–9:00 AM	5–8	1501 A, Conv. Center	STEMazing Lessons for Middle School (p. 69)
8:00–9:00 AM	K–5	2103 C, Conv. Center	ASEE Session: Introducing Engineering to Elementary School (p. 70)
8:00–9:00 AM	5–12	3501 F, Conv. Center	Investigating Pollinators in the Schoolyard (p. 72)
8:00–9:00 AM	K–8	2502 B, Conv. Center	Engineering Is Everywhere (p. 70)
8:00–9:00 AM	6–C	2205, Conv. Center	Lights, Camera, Enzymes in Action! (p. 72)
8:00–9:00 AM	3–12	2210, Conv. Center	National Geographic Explorers: Ideal Role Models of STEM (p. 73)
9:30–10:30 AM	8–C	3501 A, Conv. Center	Students Analyze Scientific and Engineering Data in the Quest for Sustainable Bioenergy (p. 77)
9:30–10:30 AM	9–12	2215 B, Conv. Center	Engineer Your World: Integrating Engineering Design, Computational Thinking, and 21st-Century Skills (p. 75)
9:30–10:30 AM	K–12	2103 C, Conv. Center	ASEE Session: ASEE's K–12 Outreach Program, eGFI: Engineering, Go For It and *TeachEngineering.org* (p. 76)
9:30–10:30 AM	K	2503 A, Conv. Center	Engineering for Kindergarten? Yes! (p. 76)
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	7–C	3501 F, Conv. Center	Put the "E" in STEM! (p. 83)
11:00 AM–12 Noon	5–8	2103 C, Conv. Center	ASEE Session: Designing for Safety (p. 81)

11:00 AM–12 Noon	9–12	3501 E, Conv. Center	Hands-On Standards: Having Your Curriculum Meet the *NGSS*, *CCSS*, and More (p. 82)
11:00 AM–12 Noon	4–10	3501 C, Conv. Center	Using Engineering Design for Seed Dispersal (p. 82)
11:00 AM–12 Noon	6–C	2205, Conv. Center	Let's Get Helical (p. 84)
12:30–1:00 PM	K–5	2215 B, Conv. Center	Project SOAR: Creating a Science Curriculum That Soars to New Heights Through the Use of Understanding by Design (p. 86)
12:30–1:30 PM	P–6	3501 G, Conv. Center	Physical Structures, Plants, and Everyday Tools: Helping Children Understand the Impact of Science and the Essential Integration of All STEM Disciplines (p. 88)
12:30–1:30 PM	6–C	2205, Conv. Center	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 89)
12:30–1:30 PM	9–12	2103 C, Conv. Center	ASEE Session: Engineering Design for High School Chemistry: Water Filters for a Developing Country (p. 88)
12:30–1:30 PM	7–12	1501 C, Conv. Center	Makerspace: A Place for Students to Learn and Create Instead of Consume and Regurgitate (p. 86)
2:00–3:00 PM	K–2	2206, Conv. Center	Engineering Design for Grades K–2 (p. 91)
3:30–4:30 PM	K–12	2502 A, Conv. Center	English Language Development Opportunities for ELL Through Meaningful Integration of the *NGSS* and *CCSS* (p. 94)
3:30–4:30 PM	8–12	3501 A, Conv. Center	AgSTEM: Precision Agriculture (p. 94)
3:30–4:30 PM	P–C	2105, Conv. Center	Featured Presentation: Agriculture: Traditional Science Taught in an Unexpected Applied Way (p. 92)
3:30–4:30 PM	6–C	2103 C, Conv. Center	ASEE Session: The Innovation Portal: Connecting Student Design and Problem-solving Projects with Opportunities (p. 93)
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	3–6	2503 A, Conv. Center	Cleaning the Glass to Get a Closer Look at STEM (p. 94)
3:30–4:30 PM	4–8	2504 B, Conv. Center	Engineering Science Creativity: Brainstorming, Designing, and Evaluating Models (p. 93)
5:00–6:00 PM	6–9	2103 C, Conv. Center	ASEE Session: Feel the Heat: Design Your Own Photovoltaic Water Heater (p. 97)
5:00–6:00 PM	K–12	2102 A, Conv. Center	AAPT Session: An Engineering Design Process (p. 97)

Saturday

8:00–9:00 AM	3–12	2104 B, Conv. Center	Exploring the *NGSS* with Hydrogels (p. 100)
8:00–9:00 AM	P–3	2505 A, Conv. Center	Engineering Explorations (p. 99)
8:00–9:00 AM	K–8	2504 B, Conv. Center	STEM Is EASY with GreenSchools! Program (p. 99)
9:30–10:30 AM	4–12	2104 B, Conv. Center	Using Robots to Build STEM-Loving Students (p. 104)
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	9–12	3501 C, Conv. Center	Crosscutting Concepts, Engineering Practices, and Bernoulli's Principle (p. 105)
12:30–1:30 PM	10–C	2102 B, Conv. Center	Using ImageJ and Excel to Analyze Color Spectrum Data: Integrating Chemistry, Mathematics, and Technology (p. 106)
1:00–1:30 PM	8	3501 C, Conv. Center	STEM, *NGSS*, and Technology: Implementation for Middle School Classrooms (p. 106)

General Science Education

Thursday

8:00–8:30 AM	P–C	2502 A, Conv. Center	Grant Writing for the Classroom Teacher (p. 41)
8:00–9:00 AM	9–12	2101, Conv. Center	Teach Engineering Principles on the Cheap with Concrete (p. 42)
8:00–9:00 AM	K–8	2206, Conv. Center	STEM: Investigating Touch Screen Devices (p. 44)

8:00–9:00 AM	6–12	2502 B, Conv. Center	STEMming The Zombie Tide (p. 44)
8:00–9:00 AM	P–C	1501 B, Conv. Center	Welcome to Your First NSTA Conference (p. 42)
8:00–9:00 AM	7–12	1501 C, Conv. Center	Teaching Argumentation in an Introductory ESL Science Classroom (p. 42)
8:00–9:00 AM	K–12	2504 B, Conv. Center	AMSE Session: The Overlap Between Culturally Responsive Teaching and the *NGSS* (p. 42)
8:00–9:00 AM	7–12	3501 A, Conv. Center	Stimulate Student Learning with Food! (p. 44)
8:00–9:00 AM	P–C	2505 A, Conv. Center	So We're Retired…What Can We Do Now? (p. 42)
8:00–9:00 AM	K–5	2102 B, Conv. Center	Linking Inquiry and Content Through Children's Literature (p. 43)
8:00–9:00 AM	1–5	2504 A, Conv. Center	Into the Woods: Meaningful Field Experiences to Take Science Instruction to the Next Level (p. 42)
8:30–9:00 AM	9–C	2215 B, Conv. Center	Flipping the Classroom: Use Technology to Create More Classroom Time (p. 45)
8:30–9:00 AM	K–6	1501 A, Conv. Center	Implementing Successful Labs in the Elementary Classroom (p. 45)
9:30–10:30 AM	G	2211, Conv. Center	Demystifying the *NGSS* with STEMscopes (p. 47)
9:30–10:30 AM	K–5	2209, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 47)
9:30–10:30 AM	6–12	2208, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 47)
11:00 AM–12 Noon	6–9	2207, Conv. Center	"Hard" Doesn't Mean "Bad" (p. 49)
12:30–1:00 PM	P–6	2503 B, Conv. Center	ASTE Session: Science and Literacy: Improving Classroom Talk in Elementary Science (p. 51)
12:30–1:30 PM	9–C	2205, Conv. Center	Of All the Nerve! (p. 54)
12:30–1:30 PM	P–C	2502 B, Conv. Center	The NGSS@NSTA Hub (p. 52)
12:30–1:30 PM	6–12	2505 A, Conv. Center	Do You Need a New Science Lab? (p. 52)
12:30–1:30 PM	K–2	2504 A, Conv. Center	Using *NGSS* with Early Childhood Learners (p. 52)
12:30–1:30 PM	P–5	2505 B, Conv. Center	NSTA Press® Session: The Power of Questioning: Guiding Student Investigations (p. 52)
12:30–1:30 PM	P–12	2502 A, Conv. Center	Leadership Pathways for Exemplary K–12 STEM Teachers (p. 52)
12:30–1:30 PM	K–8	2102 A, Conv. Center	Taking STEM Outside (p. 53)
12:30–1:30 PM	P–8	1501 B, Conv. Center	CESI Session: Elementary Science Share-a-Thon (p. 53)
12:30–1:30 PM	6–8	2203, Conv. Center	Making Critical Thinking More Than Just a Cliché© Using 3 Dimensional Learning (p. 54)
12:30–2:30 PM	P–C	2504 B, Conv. Center	Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships (p. 55)
1:00–1:30 PM	P–12	2101, Conv. Center	Save the Drama for Your Mama! (p. 55)
1:00–1:30 PM	6–8	3501 B, Conv. Center	Reading Informational Text in the Science Classroom to Construct Explanatory Models (p. 55)
2:00–3:00 PM	6–12	2208, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 61)
2:00–3:00 PM	K–5	2206, Conv. Center	Bring Visual Science into K–5 Classrooms—It's a Game Changer! (p. 60)
2:00–3:00 PM	7–12	2215 C, Conv. Center	Flinn Activities to Integrate STEM Education (p. 62)
2:00–3:00 PM	C	2504 A, Conv. Center	CAEP Elementary Standards: A First Look (p. 58)
2:00–3:00 PM	P–C	2105, Conv. Center	Featured Presentation: Teaching for Conceptual Understanding in Science: Building a Bridge Between Students' (and Teachers') Ideas and the *NGSS* Core Ideas (p. 56)
2:00–3:00 PM	6–12	2101, Conv. Center	Deliver Your Science Content with iPads in Your 1:1 Classroom (p. 58)
2:00–3:00 PM	K–12	2505 A, Conv. Center	How to Implement STEM and *NGSS* into Your Classroom Through the Use of NSTA Competitions (p. 58)
2:00–3:00 PM	K–8	2102 A, Conv. Center	Birds Bring Your Science Class Alive! (p. 58)
2:00–3:00 PM	6–9	2104 B, Conv. Center	Chapter Books at the Crossroads of the *NGSS* and *CCSS* (p.59)
2:00–3:00 PM	6–C	1501 C, Conv. Center	*NGSS* Pioneers: The SEEDS Project (p. 57)
3:30 - 4:00 PM	5–9	2101, Conv. Center	*NGSS*-Focused Integrated Science Education in Michigan Middle Schools: The Mi-STAR Initiative (p. 62)
3:30–4:30 PM	6–12	1501 C, Conv. Center	"Grow Our Own" Food and Scientists (p. 62)
3:30–4:30 PM	9–12	2505 A, Conv. Center	Science and Engineering Practices Share Session (p. 64)

3:30–4:30 PM	6–C	2104 B, Conv. Center	Implementing *NGSS* One Project at a Time (p. 64)
3:30–4:30 PM	8–12	2215 B, Conv. Center	Cars: A Fun and Relevant Way to Teach Science Concepts (p. 62)
3:30–4:30 PM	P–3	2503 B, Conv. Center	Engaging and Nurturing the Curiosity of Young Children with Everyday Science That Surrounds Them (p. 63)
3:30–4:30 PM	6–12	3501 F, Conv. Center	Useful Apps for a Science Classroom with 1:1 Technology (p. 65)
3:30–4:30 PM	K–5	3501 C, Conv. Center	Elementary Success with *NGSS*: Inquiry Activities for the K–5 Classroom (p. 65)

Friday

8:00–8:30 AM	6–C	3501G, Conv. Center	Kinesthetic Learning…from a STEM Viewpoint (p. 69)
8:00–9:00 AM	3–12	2202, Conv. Center	Integrating Chromebook with Vernier Technology (p. 72)
8:00–9:00 AM	K–12	2505 B, Conv. Center	NSTA Press® Session: Mastery Learning in the Science Classroom (p. 70)
8:00–9:00 AM	P/1–C	2505 A, Conv. Center	Exploring the Science and Engineering Practices (p. 70)
8:00–9:00 AM	6–12	1501 C, Conv. Center	Using Project-Based Instruction to Teach the Standards (p. 69)
8:00–9:00 AM	9–12	2504 B, Conv. Center	NARST Session: An Instructional Model for *NGSS*-Focused, Socio-scientific Issues–Based Teaching (p. 69)
8:00–9:00 AM	P–5	2203, Conv. Center	Integrating Literacy and Science—the Wow Factor (p. 72)
8:00–9:00 AM	3–5	3501 D, Conv. Center	How MEMTA Can Change Your Classroom! (p. 71)
8:00–9:00 AM	6–9	2207, Conv. Center	Getting Started with Classroom Robotics and Programming (p. 73)
8:00–9:30 AM	9–C	2201, Conv. Center	How to Use Pop Culture Science in Your Classes (p. 74)
8:30–11:30 AM	1–12	Truman, Marriott	SC-2: Transitioning to *NGSS* Instruction (p. 74)
9:30–10:30 AM	P–C	2504 B, Conv. Center	NARST Session: Crafting a Coherent Conceptual Storyline: Lessons About Lesson Design (p. 75)
9:30–10:30 AM	6–12	2505 A, Conv. Center	Designing Solutions to Feed the World's Growing Population (p. 76)
9:30–10:30 AM	K–5	2505 B, Conv. Center	NSTA Press® Session: Teaching Science Through Integrating Children's Literature and Outdoor Investigations (p. 77)
9:30–10:30 AM	9–12	1501 C, Conv. Center	Cross-Curricular Collaboration Using *NGSS* and *CCSS* (p. 75)
9:30–10:30 AM	K–6,C	3501 G, Conv. Center	STEM Meets Technical Text: A Recipe for Growing Our Future Makers (p. 76)
9:30–10:30 AM	1–11	3501 F, Conv. Center	Extreme Makeover: Redesigning Laboratory Activities! (p. 78)
9:30–10:30 AM	P–C	3501 D, Conv. Center	Selecting and Using the Best in Trade Books (p. 78)
9:30–10:30 AM	3–8	2207, Conv. Center	NexGenReady: Interactive Online *NGSS* Modules for Grades 3–8 (p. 79)
9:30–10:30 AM	9–12	2215 A, Conv. Center	Engineering in the *NGSS*:Grades 9–12 (p. 79)
9:30–10:30 AM	6–12	2211, Conv. Center	Zombie Apocalypse! (p. 79)
9:30–10:30 AM	P–C	2105, Conv. Center	Featured Presentation: Fostering an Insatiable Curiosity: Planning for the Future (p. 75)
11:00 AM–12 Noon	6–12	2215 A, Conv. Center	Debunking the Myths of Project-Based Learning: Yes We CAN! (p. 85)
11:00 AM–12 Noon	P–C	2215 C, Conv. Center	Observing and Inferring in the Science Classroom: New Tips and Tools from Dinah Zike's Notebooking Central (p. 85)
11:00 AM–12 Noon	6–12	2206, Conv. Center	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 84)
11:00 AM–12 Noon	K–8	2504 A, Conv. Center	CESI Session: From Explanation to Effective Reasoning for Your Students (p. 82)
11:00 AM–12 Noon	4–8	3501 B, Conv. Center	Science, Art, and Innovation (p. 81)
11:00 AM–12 Noon	K–6	3501 D, Conv. Center	Linking Science and Literacy for Improved Student Outcomes (p. 82)
11:00 AM–12 Noon	7–12	2502 A, Conv. Center	Could It Be This Cheap? Modeling Phenomena via Budget-friendly Labs (p. 81)
11:00 AM–12 Noon	6–12	1501 C, Conv. Center	Engaging Writing Success: Incorporating Today's Global Issues (p. 80)

11:00 AM–12 Noon	K–C	2505 A, Conv. Center	The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (p. 81)
11:00 AM–12 Noon	5–C	2505 B, Conv. Center	NSTA Press® Session: Scientific Argumentation Classroom Activities (p. 82)
11:00 AM–12 Noon	K–C	2504 B, Conv. Center	NSELA Session: Tools for Science Leaders, Part 1 (p. 80)
12 Noon –12:45 PM	P–C	Exhibits (Hall B) Entrance	Meet the Presidents and Board/Council (p. 86)
12:30–1:30 PM	K–8	2504 A, Conv. Center	Feeding Our Feathered Friends (p. 89)
12:30–1:30 PM	3–12	3501 F, Conv. Center	Think-Connect-Act: A 3-D Learning Model for Teaching the Academic Vocabulary Students Need to Succeed (p. 89)
12:30–1:30 PM	K–C	2504 B, Conv. Center	NSELA Session: Tools for Science Leaders, Part 2 (p. 87)
12:30–1:30 PM	P–C	2505 A, Conv. Center	Authors Needed! Publish Your Teaching Ideas in an NSTA Journal (p. 87)
12:30–1:30 PM	7–12	1501 A, Conv. Center	Modeling *NGSS* Crosscutting Concepts with Aligned Topics (p. 86)
12:30–1:30 PM	3–12	2202, Conv. Center	Integrating Chromebook with Vernier Technology (p. 89)
1:00–1:30 PM	P–2	2215 B, Conv. Center	Integrating Science and Literacy Through STEM for Early Childhood Learners (p. 90)
2:00–3:00 PM	4–7	2208, Conv. Center	Bake for Good: Kids Learn-Bake-Share Program (p. 91)
2:00–3:00 PM	6–12	2211, Conv. Center	A Matter of Life and Death (p. 91)
2:00–3:00 PM	3–12	2202, Conv. Center	Integrating iPad with Vernier Technology (p. 90)
2:00–3:00 PM	6–9	2207, Conv. Center	Student Collaboration in the Science Classroom (p. 91)
3:30–4:00 PM	P–C	3501 D, Conv. Center	STEM Stakeholders: Building the Vision for Science with Community Partners (p. 92)
3:30–4:30 PM	5–9	2215 B, Conv. Center	Backward Planning to Support Cross-Curricular Science Instruction: Developing a Farmer's Market with Sixth-Graders (p. 93)
3:30–4:30 PM	7–12	1501 C, Conv. Center	Project-Based Learning: Useful Tips, Tools, and Strategies for Incorporating PBL Without Fear! (p. 93)
3:30–4:30 PM	K–12	2505 B, Conv. Center	NSTA Press® Session: What Are They Really Thinking? Connecting Concepts and Practices Through Formative Assessment (p. 94)
3:30–4:30 PM	C	2505 A, Conv. Center	The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 93)
3:30–4:30 PM	6–8	2215 A, Conv. Center	PBIS Roundtables: Discussions to Support Successful Implementation (p. 96)

Saturday

8:00–8:30 AM	7–12	1501 A, Conv. Center	New Science Standards for Missouri (p. 99)
8:00–9:00 AM	K–C	2505 B, Conv. Center	NSTA Press® Session: Teaching for Conceptual Understanding in Science (p. 99)
8:00–9:00 AM	K–C	1501 C, Conv. Center	Developing Symbiotic Relationships Between PreK–12 and University Faculties (p. 99)
8:00–9:00 AM	P–3	2503 A, Conv. Center	We Can All Work Together! Effective Student Collaboration in the Primary Grades (p. 100)
8:00–9:00 AM	P–C	3501 B, Conv. Center	Science Meets Art: The Power of Observation (p. 100)
8:30–9:00 AM	8–12	1501 A, Conv. Center	STEM-based Learning in the High School Classroom (p. 101)
9:30–10:30 AM	6–C	1501 A, Conv. Center	Bridging the Poles: A Polar E-Book Resource for Educators (p. 103)
9:30–10:30 AM	P–5	2505 B, Conv. Center	NSTA Press® Session: Gardening with Children's Books (p. 103)
9:30–10:30 AM	6–12	2215 B, Conv. Center	Going Paperless in the iPad Science Classroom (p. 103)
9:30–10:30 AM	P–3	3501 C, Conv. Center	All Aboard Our STEAM Train—Where Planning with Enrichment Creates Integrated Units for Our Youngest Scientists (p. 104)
9:30–10:30 AM	K–8	1501 C, Conv. Center	Integrating Technology into the Inquiry-Based Classroom (p. 103)
9:30–10:30 AM	6–12	3501 B, Conv. Center	Digging Deeper with Data to Improve Classroom Instruction (p. 103)

9:30–10:30 AM	1–8	2503 A, Conv. Center	Practicing the Practices: Recognizing Them in Use (p. 104)
9:30–10:30 AM	P–C	2105, Conv. Center	Featured Presentation: A Vision and Plan for Science Teaching and Learning (p. 102)
10:00–10:30 AM	K–5	2505 A, Conv. Center	Supporting STEM: The Role of an Elementary STEM Specialist (p. 104)
10:00–10:30 AM	K–9	2502 B, Conv. Center	Empowering Our Students to Be Citizen Scientists (p. 104)
12:30–1:30 PM	1–C	2504 A, Conv. Center	Redesigning Lessons in the Curriculum (p. 106)
12:30–1:30 PM	K–6	2505 A, Conv. Center	Discussing Discussions: Doing Teacher Research to Facilitate Meaningful Discussions in Elementary Science Classrooms (p. 105)
12:30–1:30 PM	K–8	2504 B, Conv. Center	Meeting Standards Through Citizen Science and Schoolyard Investigations (p. 105)

Informal Science Education

Thursday

8:30–9:00 AM	K–C	2502 A, Conv. Center	Preparing You and Your Students for Totality (p. 45)
12:30–1:30 PM	K–8	2102 A, Conv. Center	Taking STEM Outside (p. 53)
4:00–4:30 PM	P–8	1501 A, Conv. Center	Why Girls? Why STEM? (p. 66)

Saturday

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

Life Science

Thursday

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

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

Friday

8:00–9:00 AM	K–6	3501 B, Conv. Center	Rewind! Designing Successful Science Lessons in Elementary (p. 69)
8:00–9:00 AM	8–12	3501 A, Conv. Center	Down on the Farm(s) (p. 71)
8:00–9:00 AM	5–12	3501 F, Conv. Center	Investigating Pollinators in the Schoolyard (p. 72)
8:00–9:00 AM	6–12	2209, Conv. Center	The Making of the Fittest: Natural Selection and Adaptation: Rock Pocket Mouse (p. 73)
8:00–9:00 AM	6–C	2205, Conv. Center	Lights, Camera, Enzymes in Action! (p. 72)
8:00–9:00 AM	9–C	2208, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 73)
8:00–9:00 AM	6–12	2206, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 72)
8:00–9:00 AM	6–12	2104 B, Conv. Center	NABT Session: KABT Presents Training Young Scientists Share-a-Thon (p. 69)
9:30–10:30 AM	7–12	2502 B, Conv. Center	20 in 20: The Next Chapter (p. 76)
9:30–10:30 AM	6–8	2504 A, Conv. Center	Flipping for *NGSS*: Differentiated Lessons to Stretch All Learners (p. 76)
9:30–10:30 AM	8–C	3501 A, Conv. Center	Students Analyze Scientific and Engineering Data in the Quest for Sustainable Bioenergy (p. 77)
9:30–10:30 AM	6–12	2206, Conv. Center	They Come in Pairs: Using Socks to Identify and Address Student Misconceptions About Chromosomes (p. 78)
9:30–10:30 AM	9–C	2208, Conv. Center	Adapting Traditional Biology Labs to Sensor Technology (p. 79)
9:30–10:30 AM	9–12	2209, Conv. Center	Exploring a Genetic Trait with Sticklebacks (p. 79)
9:30–10:30 AM	K–8	2203, Conv. Center	The Extraordinary Odyssey: An Expedition Through the Human Body (p. 78)

9:30 AM–12 Noon	10–C	2104 B, Conv. Center	NABT Session: AP Biology Meets the *NGSS* with Floating Leaf Disk Lab (p. 80)
11:00 AM–12 Noon	6–12	3501 G, Conv. Center	Coral Reefs: Fragile Wonders Under Threat (p. 81)
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	9–C	2502 B, Conv. Center	STEM Behind Medicine: Curing Type 1 Diabetes (p. 82)
11:00 AM–12 Noon	7–C	2210, Conv. Center	MiniOne™ Electrophoresis: Revolutionizing Biotechnology in Real Time (p. 84)
11:00 AM–12 Noon	8–C	2202, Conv. Center	Biology with Vernier (p. 83)
11:00 AM–12 Noon	8–12	2209, Conv. Center	Modeling and the Double Helix (p. 84)
11:00 AM–12 Noon	6–C	2205, Conv. Center	Let's Get Helical (p. 84)
11:00 AM–12 Noon	9–12	2204, Conv. Center	What Is a Species? (p. 84)
11:00 AM–12 Noon	4–10	3501 C, Conv. Center	Using Engineering Design for Seed Dispersal (p. 82)
11:00 AM–12:15 PM	9–C	2201, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 85)
12:30–1:30 PM	9–12	2209, Conv. Center	Modeling and Storytelling: A Means to Understand Enzyme Regulation (p. 90)
12:30–1:30 PM	6–C	2104 B, Conv. Center	NABT Session: Quantified Plant Behavior: An Inquiry Lab Ready for Monday (p. 88)
12:30–1:30 PM	6–C	2205, Conv. Center	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 89)
12:30–1:30 PM	P–6	3501 G, Conv. Center	Physical Structures, Plants, and Everyday Tools: Helping Children Understand the Impact of Science and the Essential Integration of All STEM Disciplines (p. 88)
12:30–1:30 PM	9–12	2204, Conv. Center	Cell Differentiation and Gene Expression (p. 89)
12:30–1:30 PM	6–8	2503 A, Conv. Center	Food Chains: Using Field Surveys That Give Real Numbers (p. 89)
12:30–1:30 PM	2–6	3501 A, Conv. Center	From Sun to Food (p. 89)
2:00–3:00 PM	9–12	2204, Conv. Center	Energy Flow Through an Ecosystem (p. 91)
2:00–3:00 PM	9–12	2209, Conv. Center	Explore Virtual Labs from BioInteractive (p. 91)
3:30–4:30 PM	9–12	3501 C, Conv. Center	3-D Tissue Models That Anyone Can Build (p. 95)
3:30–4:30 PM	9–C	2209, Conv. Center	The Cell Cycle and Cancer (p. 95)
3:30–4:30 PM	9–C	2104 B, Conv. Center	NABT Session: Tiny Bubbles, Popcorn, and More—Modeling Population Demographics (p. 94)
3:30–4:30 PM	8–12	3501 A, Conv. Center	AgSTEM: Precision Agriculture (p. 94)
3:30–4:30 PM	K–12	2206, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 95)
4:00–4:30 PM	6–C	3501 D, Conv. Center	Reinforce STEM with Medical Mysteries Web Adventures (p. 96)
5:00–6:00 PM	7–C	2104 B, Conv. Center	NABT Session: Scientific Argumentation and Wolf Management (p. 97)

Saturday

8:00–9:00 AM	9–12	2204, Conv. Center	Chicken Little…Chicken Big—DuPont Agriscience Institute (p. 101)
8:30–11:30 AM	2–C	Truman B, Marriott	SC-4: Meeting the *CCSS* and *NGSS* Through Outdoor Studies (p. 101)
9:30–10:30 AM	9–12	2204, Conv. Center	Vet Detective: Tracking the Spread—DuPont Agriscience Institute (p. 104)
9:30–10:30 AM	10–C	2503 B, Conv. Center	Assessing Thinking Skills of Nonscience Majors in Biology Classes with a Field Study Component (p. 103)
12:30–1:30 PM	7–C	2104 B, Conv. Center	High Five: Five Ways to Make Teaching Biotechnology Easier and Faster (p. 106)
12:30–1:30 PM	9–C	3501 B, Conv. Center	Using Models and Motion for Teaching DNA and Protein Synthesis (p. 106)
1:00–1:30 PM	8	3501 C, Conv. Center	STEM, *NGSS*, and Technology: Implementation for Middle School Classrooms (p. 106)

Physical Science

Thursday

8:00–9:00 AM	7–12	3501 B, Conv. Center	Hovercrafts and Newton's Laws (p. 44)
8:00–9:00 AM	6–12	2215 A, Conv. Center	CPO's Link™Chemistry Models: Fun with Atom Building and the Periodic Table (p. 45)
8:00–9:00 AM	9–C	2104 B, Conv. Center	Science and Engineering Practices in the Chemistry Classroom (p. 44)
9:30–10:30 AM	7–12	2215 C, Conv. Center	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 47)
9:30–10:30 AM	6–12	2215 A, Conv. Center	CPO's New Physics AP1 Link™Module: Rotational Motion with the CPO Roller Coaster (p. 47)
9:30–10:30 AM	9–12	2206, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 46)
11:00 AM–12 Noon	K–5	2209, Conv. Center	Engage Them Early: Engineering Experiences with FOSS (p. 50)
11:00 AM–12 Noon	P–12	2211, Conv. Center	Engineering Design Process in the STEM Classroom (p.50)
12:30–1:00 PM	6–9	1501 A, Conv. Center	It's All Matter with Matter Tag (p. 51)
12:30–1:30 PM	K–2	2104 B, Conv. Center	What Does Success with the *NGSS* SOUND Like? (p. 53)
12:30–1:30 PM	4–8	2503 A, Conv. Center	NMLSTA Session: The Magic of Rube Goldberg and the *NGSS* (p. 53)
12:30–1:30 PM	4–8	2102 B, Conv. Center	Amusement Park Physics (p. 53)
12:30–1:30 PM	P–C	3501 C, Conv. Center	Teaching with 3-D Puzzle Boxes to Integrate *NGSS*'s Three Dimensions (p. 53)
1:00–1:30 PM	9–12	2215 B, Conv. Center	Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials (p. 55)
2:00–2:30 PM	12	2215 B, Conv. Center	AP Physics 1 and 2: Inquiry-Based Learning (p. 56)
2:00–3:00 PM	6–12	3501 C, Conv. Center	The Modeling Method in *NGSS* (p. 59)
2:00–3:00 PM	6–12	2505 B, Conv. Center	NSTA Press® Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12 (p. 59)
2:00–3:00 PM	6–12	2103 B, Conv. Center	NASA: Inquiry Activities for Learning About Light and the EM Spectrum and Multiwavelength Astronomy (p. 58)
2:00–3:00 PM	4–8	1501 A, Conv. Center	Engineering with Sound Science (p. 57)
2:00–3:00 PM	P–3	2503 A, Conv. Center	Let's Get Physical—From Force and Friction to Water and Weather (p. 59)
2:00–3:00 PM	7–C	2103C, Conv. Center	iPad: Realize Its Full Potential in Your Classroom! (p. 59)
2:00–3:00 PM	6–C	2205, Conv. Center	Genes, Schemes, and Molecular Machines (p. 60)
2:00–3:00 PM	K–5	2209, Conv. Center	What to Look for in Science Learning Progressions: Experience FOSS Next Generation (p. 61)
2:00–3:00 PM	6–8	2204, Conv. Center	Reclaiming the Metal (p. 60)
3:30–4:30 PM	9–C	2504 B, Conv. Center	An Ice Core Classroom Investigation That Connects the Three Dimensions of *NGSS* with *CCSS* (p. 64)
3:30–4:30 PM	3–5	2208, Conv. Center	Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism (p. 66)
3:30–4:30 PM	6–12	2215 A, Conv. Center	CPO's New Physics AP1 Link™Module: Rotational Motion with the CPO Roller Coaster (p. 66)
3:30–4:30 PM	6–10	2103 B, Conv. Center	NASA Brings You Newton's Laws of Motion (p. 64)
3:30–4:30 PM	3–5	2103C, Conv. Center	Universal Design for Learning: An Attractive Way to Teach Magnetic Interactions (p. 64)
3:30–4:30 PM	P–12	3501 G, Conv. Center	Create Your Own NASA Portal to *NGSS* with NASA Wavelength (p. 65)

Friday

8:00–9:00 AM	5–8	1501 A, Conv. Center	STEMazing Lessons for Middle School (p. 69)
8:00–9:00 AM	9–12	3501 E, Conv. Center	Hot Topics Workshop: Nuclear Energy (p. 71)
8:00–9:00 AM	9–12	2215 C, Conv. Center	Flinn Scientific Resources Prepare Students for AP Chemistry Success (p. 73)

8:00–9:00 AM	6–8	2102 B, Conv. Center	ACS Middle Level Session: Matter—Solids, Liquids, and Gases (p. 70)
8:00–9:00 AM	7–10	2502 A, Conv. Center	"Seeing" the Invisible: Making the EMS Spectrum Concrete (p. 70)
8:00–9:00 AM	9–12	2204, Conv. Center	pH Scale and Math Modeling (p. 72)
8:00–9:00 AM	P–2	3501 C, Conv. Center	I Like the Sound of That! (p. 70)
8:00–9:00 AM	6–C	2205, Conv. Center	Lights, Camera, Enzymes in Action! (p. 72)
8:00–9:00 AM	K–6	3501 B, Conv. Center	Rewind! Designing Successful Science Lessons in Elementary (p. 70)
8:00–9:00 AM	3–8	2102 A, Conv. Center	AAPT Session: 30 Demos in 60 Minutes: Elementary and Middle School (p. 69)
8:00–9:00 AM	9–12	2215 A, Conv. Center	Active Physics and Active Chemistry: Leading Project-based High School Physics and Chemistry Programs Capturing the Essence of the *NGSS* and STEM (p. 73)
8:00–9:00 AM	9–C	2208, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 73)
8:00–10:00 AM	9–12	2103 B, Conv. Center	ACS Session One: Energy in Chemistry: A Macroscopic View (p. 74)
9:30–10:30 AM	2–8	2215 C, Conv. Center	Cool! Can We Do That Again?! (p. 79)
9:30–10:30 AM	9–12	2102 A, Conv. Center	AAPT Session: 30 Demos in 60 Minutes: High School (p. 75)
9:30–10:30 AM	6–12	2502 A, Conv. Center	Electricity Made Simple (p. 76)
9:30–10:30 AM	9–12	3501 E, Conv. Center	Turning Traditional Labs into Ones That Reflect the NGSS (p. 78)
9:30–10:30 AM	9–12	2204, Conv. Center	Chemical Formula and Amino Acids (p. 78)
9:30–10:30 AM	8–C	2202, Conv. Center	Chemistry with Vernier (p. 78)
9:30–10:30 AM	6–8	2102 B, Conv. Center	ACS Middle Level Session: Changes of State—Evaporation and Condensation (p. 76)
11:00 AM–12 Noon	4–9	2211, Conv. Center	FUNdamentals of Energy Education (p. 85)
11:00 AM–12 Noon	5–8	2103 C, Conv. Center	ASEE Session: Designing for Safety (p. 81)
11:00 AM–12 Noon	6–12	3501 G, Conv. Center	Coral Reefs: Fragile Wonders Under Threat (p. 81)
11:00 AM–12 Noon	6–8	2102 B, Conv. Center	ACS Middle Level Session: Density—A Molecular View (p. 81)
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	7–12	1501 A, Conv. Center	Polymers: New Twists on Old Favorites (p. 80)
11:00 AM–12 Noon	9–C	2208, Conv. Center	Physics with PASCO scientific, Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics (p. 84)
11:00 AM–12 Noon	9–12	2102 A, Conv. Center	AAPT Session: Moving Your Students into Motion Using Modeling (p. 81)
11:00 AM –1:00 PM	9–12	2103 B, Conv. Center	ACS Session Two: Energy in Chemistry: A Particulate View (p. 85)
12:30–1:00 PM	K–5	2215 B, Conv. Center	Project SOAR: Creating a Science Curriculum That Soars to New Heights Through the Use of Understanding by Design (p. 86)
12:30–1:30 PM	9–12	2102 A, Conv. Center	AAPT Session: Physics on the Cheap (p. 88)
12:30–1:30 PM	3–12	2211, Conv. Center	The Secrets to Successful PBL (p. 90)
12:30–1:30 PM	6–8	2102 B, Conv. Center	ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (p. 88)
12:30–1:30 PM	9–12	2103 C, Conv. Center	ASEE Session: Engineering Design for High School Chemistry: Water Filters for a Developing Country (p. 88)
12:30–1:30 PM	9–C	3501 B, Conv. Center	50 Labs You Can Do on a Small Budget (p. 87)
2:00–3:00 PM	9–C	2201, Conv. Center	The GMO Debate Rages On! (p. 90)
2:00–3:00 PM	7–C	2203, Conv. Center	Using the Classic Chemistry Demonstration to Engage Students (p. 91)
3:30–4:30 PM	8–12	3501 A, Conv. Center	AgSTEM: Precision Agriculture (p. 94)
3:30–4:30 PM	6–12	2502 B, Conv. Center	Stellar Evolution—From Star Formation to Catastrophic Destruction (p. 94)
3:30–4:30 PM	K–12	2502 A, Conv. Center	English Language Development Opportunities for ELL Through Meaningful Integration of the *NGSS* and *CCSS* (p. 94)
3:30–4:30 PM	6–12	2102 A, Conv. Center	AAPT Session: Physics Potpourri (p. 93)
3:30–4:30 PM	8–C	2202, Conv. Center	Physics and Physical Science with Vernier (p. 95)

3:30–4:30 PM	6–8	2102 B, Conv. Center	ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (p. 94)
3:30–4:30 PM	9–12	3501 G, Conv. Center	Solids: The Neglected "State" of Chemistry (p. 94)
3:30–4:30 PM	8–12	1501 A, Conv. Center	How to Change an Old Lab to Do New Tricks! (p. 93)
3:30–4:30 PM	3–6	2503 A, Conv. Center	Cleaning the Glass to Get a Closer Look at STEM (p. 94)
3:30–5:00 PM	5–12	2201, Conv. Center	Fostering High School Science Engagement Using an *NGSS*-Focused Interactive Experience (p. 96)
3:30–5:30 PM	9–12	2103 B, Conv. Center	ACS Session Three: Energy in Chemistry: An Atomic View (p. 96)
5:00–6:00 PM	K–12	2102 A, Conv. Center	AAPT Session: An Engineering Design Process (p. 97)
5:00–6:00 PM	6–8	2102 B, Conv. Center	ACS Middle Level Session: Chemical Change—Breaking and Making Bonds (p. 97)

Saturday

8:00–9:00 AM	6–12	3501 C, Conv. Center	Bioplastic—Going from Synthetic to Natural Polymers (p. 100)
8:00–9:00 AM	9–C	2102 A, Conv. Center	Using Modeling Activities in the High School Chemistry Class (p. 100)
8:00–9:00 AM	3–12	2104 B, Conv. Center	Exploring the *NGSS* with Hydrogels (p. 100)
8:00–9:00 AM	K–8	2504 B, Conv. Center	STEM Is EASY with GreenSchools! Program (p. 99)
8:30–9:00 AM	9–12	2503 B, Conv. Center	Expressive Arts in Chemistry and Physics (p. 101)
9:30–10:00 AM	8–C	2502 B, Conv. Center	Let's Explore Gay-Lussac's Law (p. 102)
9:30–10:30 AM	6–12	2102 A, Conv. Center	Decoding Starlight—From Photons to Pixels to Images (p. 103)
9:30–10:30 AM	K–12	2504 A, Conv. Center	Spark Students' Curiosity with Chemistry! (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)
12:30–1:30 PM	6–C	1501 A, Conv. Center	"Nuclear"ification: A Smorgasbord of *NGSS*-focused Classroom Applications and Resources for Teaching Nuclear Topics (p. 105)
12:30–1:30 PM	7–C	2502 B, Conv. Center	Energy 101: Connecting STEM and Classroom Projects with Real-World Application (p. 105)
12:30–1:30 PM	3–8	2503 A, Conv. Center	Inquiry in Action: Identify Liquids by Their Physical Properties (p. 106)
12:30–1:30 PM	10–C	2102 B, Conv. Center	Using ImageJ and Excel to Analyze Color Spectrum Data: Integrating Chemistry, Mathematics, and Technology (p. 106)


esri
NSTA Membership
NSTA
NSTA MEMBERSHIP
Your one-stop

Index of Participants

Notes

Notes

Advertisers

NSTA Ads

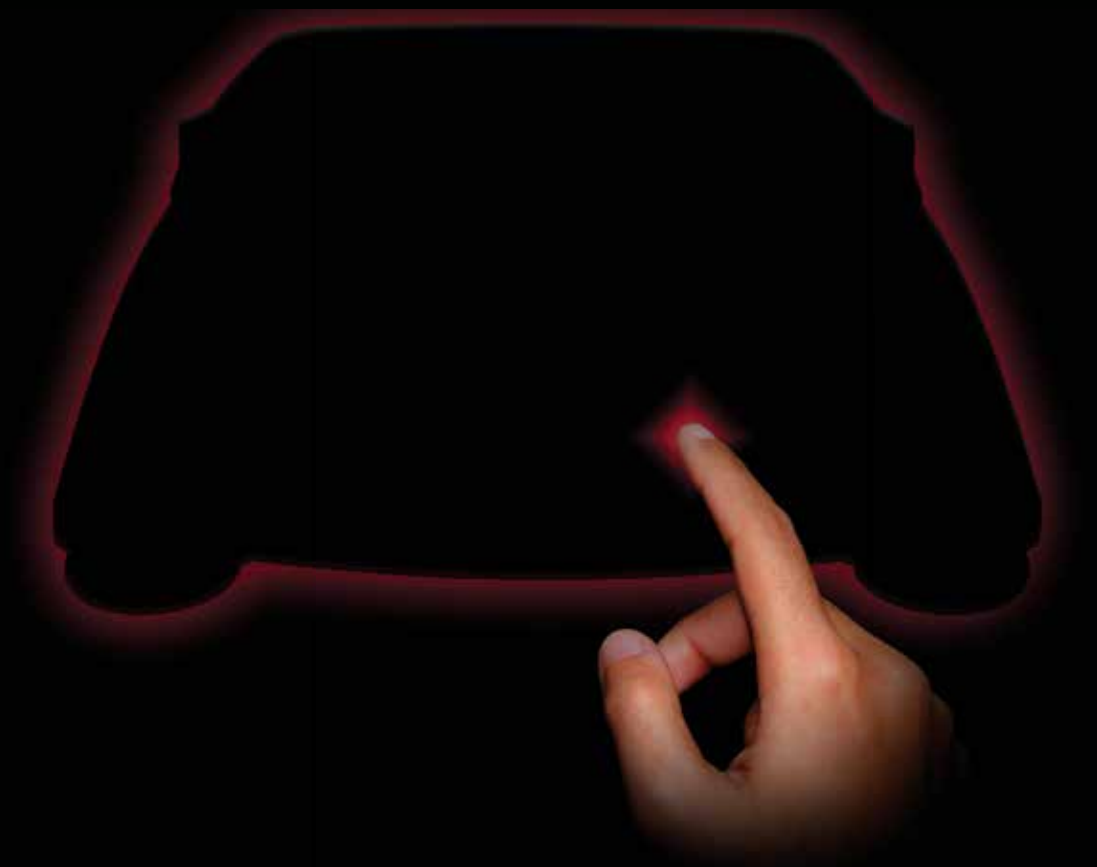
Building Next Generation Skills in Engineering and Design

Introducing the Vernier Structures & Materials Tester

Build engineering and design skills with a testing platform perfect for project-based STEM and engineering classrooms. Built-in force and displacement sensors enable data collection and analysis, an essential practice of the Next Generation Science Standards.

Learn more about the Vernier Structures & Materials Tester, including experiments and specifications, at www.vernier.com/vsmt

Make way for the next generation.



January 2016

www.ohaus.com/nextgeneration

ohaus.com
facebook.com/ohauscorp
youtube.com/ohauschannel
twitter.com/ohaus_corp

Ingeniously Practical