CHAMPIONS OF SCIENCE
A GAME PLAN FOR THE FUTURE!
COLUMBUS
DECEMBER 1–3, 2016
#NSTA16
What happens to tires when it’s cold?

When temperatures fall, they succumb to the pressure of winter.

$69
Wireless Pressure
PS-3203

Come see us in booth #632
FREE Inquiry-based workshops
Friday 12/2 Room C162

Modeling Climate Change: Dissolving Carbon Dioxide.
8:00 - 9:00 am
Rising temperatures are not the only impact of increased CO₂ emissions. The Earth’s oceans act as a buffer by dissolving excess CO₂ into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO₂ using the wireless pH sensor and experience how easy inquiry can be.

Exploring Misconceptions: Speed & Velocity.
9:30 - 10:30 am
Speed and velocity are two ways to describe the motion of an object that students often confuse. In this workshop, you will use the wireless Smart Cart to collect real-time motion data and compare the graphs of the Smart Cart’s speed and velocity.

Exploring Misconceptions: Is there a Difference Between Heat and Temperature?
11:00 am - 12:00 pm
Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKevue and wireless temperature sensors will provide you effective new ways to teach the concepts of heat and temperature, central to physical science.

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Wireless pH: PS-3204 $59
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Wireless Current: PS-3212 $49
Wireless Voltage: PS-3211 $49

Collect and graph data in seconds. No additional hardware or interface is required!
“The Martian should be required reading for all middle and high school students, and it should serve as a call to action for improving science education.”

—Jacqueline Miller, Ph.D., senior research scientist at Education Development Center (EDC) and Thomas Max Roberts, Ph.D., postdoctoral fellow in plasma physics at Dartmouth College

THE MARTIAN: A Novel
by ANDY WEIR

Set in the not-so-distant future, The Martian tells the story of astronaut Mark Watney, who is stranded on Mars after a mission failure leads his crew and NASA to assume he is dead. Using his background in botany and engineering, Watney must find a way to survive until he can contact NASA and they can arrange a rescue mission. Once NASA realizes that Watney is, in fact, alive, a race begins to save his life.

This new edition has:

• Classroom-appropriate language
• Discussion questions and activities
• Q&A with Andy Weir.

ANDY WEIR was first hired as a programmer for a national laboratory at age fifteen and has been working as a software engineer ever since. He is also a lifelong space nerd and a devoted hobbyist of subjects like relativistic physics, orbital mechanics, and the history of manned spaceflight. The Martian is his first novel.

Broadway Books • TR
978-0-804-18935-4 • 400 pp.
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To order an examination copy, go to: www.randomhouse.com/highschool/exam

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Committee Welcome ........................................ 4
Columbus Conference Committee ........................ 4
President’s Welcome ......................................... 5
Sponsors and Contributors to the Columbus Conference .... 5
NSTA Conferences Go Green! .............................. 6

Registration, Travel, and Hotels
Meeting Location and Times .............................. 7
Registration .................................................... 7
Purchasing Ticketed Events ............................... 7
Ground Transportation to/from Airport .................. 7
Getting Around Town ...................................... 7
Parking ......................................................... 7
Lyft Offer ..................................................... 7
Airlines ......................................................... 8
Discounted Rental Cars ..................................... 8
Conference Hotels .......................................... 9
Columbus Map ................................................ 9

Conference Resources
Exhibits ....................................................... 10
Exhibit Hall Beverage Break ............................... 10
NSTA Science Store ....................................... 10
Meet the Presidents and Board/Council .............. 10
Wi-Fi in Convention Center .............................. 11
SECO Booth ................................................. 11
Membership Booth ....................................... 11
Graduate Credit Opportunity ............................. 11
NSTA Conference App .................................. 12
Online Session Evaluations/Tracking Professional Development ...................................................... 12
First Aid Services .......................................... 13
Audiovisual Needs ......................................... 13
Lost and Found ............................................ 13
Presenters and Presiders Check-In ....................... 13
Business Services ......................................... 13

Conference Resources, cont.
Experience Columbus Information Desk and Visitor Center .................................................. 13
Floor Plans .................................................... 14
NSTA Headquarters Staff ................................ 18
NSTA Officers, Board of Directors, Council, and
Alliance of Affiliates ....................................... 19
Future NSTA Conferences ................................ 20
Call for Sessions ............................................ 20
NSTA Los Angeles National Conference ................. 21
Professional Development Documentation
Form ......................................................... following p. 32

Conference Program
Conference Highlights ..................................... 22
Conference Strands ......................................... 24
NSTA Press® Sessions ..................................... 27
Meetings and Social Functions .......................... 27
Chemistry Day at NSTA .................................... 28
Middle School Chemistry Day ........................... 28
Engineering Day at NSTA ................................ 29
Physics Day at NSTA ........................................ 29
Short Courses .............................................. 30
Educational Trips ............................................ 31
NSTA Affiliate Sessions .................................. 32
Three Dimensions of the NGSS .......................... 34
COSI Special Offer ......................................... 92

Thursday Daily Program ................................... 35
Friday Daily Program ....................................... 65
Saturday Daily Program .................................. 95

Indexes
Exhibitor List ................................................ 104
Index of Exhibitor Workshops ............................ 117
Schedule at a Glance ........................................ 123
Index of Participants ...................................... 136
Index of Advertisers ....................................... 144

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 Columbus: Champions of Science: A Game Plan for the Future!

Welcome to the NSTA Area conference in Columbus, Ohio. We are very excited to show off not only the best in science education professional development, but also our wonderful city. Many do not realize that Columbus is the 15th most populated city in the U.S. (4th largest state capital).

Central Ohio is not only home to The Ohio State University (the second largest undergraduate on-campus population and a fine research institution), but many other teacher colleges, including Ohio Dominican University, Otterbein University, Capital University, and Ohio Wesleyan University.

Columbus Conference Committee

We at NSTA wish to express our heartfelt thanks to the members of the Science Education Council of Ohio for the many hours of time they volunteered in planning this conference.

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Crawfordsville, IN

Conference Advisory Board Liaison
Juliana Texley
2014–2015 NSTA President and Science Writer/Instructor
New Baltimore, MI

Additionally, Columbus is the corporate headquarters (and often test market) for many companies, including Cardinal Health, Nationwide Children’s Hospital, EAS, and Limited Brands. The conference committee has organized a wide variety of experiences across all grade levels and disciplines that will challenge you and help you grow your practice as a science educator and leader.

The conference is organized around these three strands:

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

Columbus as a city, and central Ohio in general, is growing and thriving. It is this same leadership in innovation that we hope you will see at the conference this week.

As the 2014 National Champion Buckeyes and 2016 NBA Champion Cavaliers would say, “IT’S GAME TIME!”

2016 Columbus Area Conference Committee Leaders
Kristie Reighard, Trudy Giasi, and Patrick Herak

2016 Columbus Area Conference Committee Leaders
Kristie Reighard, Trudy Giasi, and Patrick Herak
Welcome to NSTA’s 2016 Columbus Area Conference on Science Education. This state of champions in athletics and science will provide you with many opportunities for science professional development aligned to the most current science curriculum and enhanced with the most current technology. The overall theme of this conference—Champions of Science: A Game Plan for the Future!—will promote outstanding professional development focused on three strands that explore topics of current significance. These strands are based on my theme for the year Connect, Collaborate, Celebrate—Teachers are the Key.

In the strand Training Camp: Strengthening Fundamentals in Elementary Education, teachers will explore strategies that CONNECT three-dimensional learning with crosscutting concepts, integrating content, and using science and engineering practices. In these strand sessions, participants will build the fundamentals to implement and assess instruction for all students. A short course will be offered in this strand that enhance the connections of science with social studies, mathematics, and English Language Arts.

The strand Game Time: Tackling Scientific Problems and Pitching Engineering Solutions addresses current challenges facing society and what must be designed and implemented to arrive at solutions. These challenges are complex and interdisciplinary in nature. Issues such as water availability, improved transportation, renewable energy, biomedical innovation, and city infrastructure require defining problems that can be solved through careful planning, designing, building models, and creating solutions. Trips to the Columbus Idea Foundry, the world’s largest and most active makerspace location and to the Byrd Polar and Climate Research Center, a leader in polar, alpine, and climate research, will strengthen the COLLABORATION necessary for educational success in the science classroom.

The third strand, Science Boosters: Taking It to the Next Level, emphasizes the importance for teachers to make real-world connections beyond the classroom. TEACHERS are the KEY to the success of these collaborations. Participants will understand how to initiate and build successful collaborative partnerships that provide many resources inside and outside the classroom to benefit the teaching and learning of science.

I encourage you to take advantage of this dynamic opportunity to attend the many sessions that meet your needs and check out the latest in science education resources in the Exhibit Hall. NSTA has provided the CONNECT, now you must provide the COLLABORATE and CELEBRATE. Enjoy—Learn—Share—Network with others. Teachers are the Key!

Mary Gromko
2016–2017 NSTA President

Sponsors and Contributors to the Columbus Conference

NSTA, SECO, and the Columbus Planning Committee are extremely grateful to the following companies and associations for their generous contributions to the NSTA Columbus Area Conference on Science Education.

**Sponsors**

- ExploreLearning
- Science Education Council of Ohio
- Southwest Airlines
- Texas Instruments
- Vernier Software & Technology

**Contributors**

- American Association of Physics Teachers (AAPT)
- American Chemical Society Education Division
- American Society for Engineering Education
- COSI

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

**Conference Previews**
Gone are the days of bulky, newspaper-style advance programs. Our conference preview is a smaller size and includes highlights for our three area conferences. As an added bonus, this new preview is more environmentally friendly, as it dramatically reduces 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 one week 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 printed on recycled paper whenever possible. 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) 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.

**Greater Columbus Convention Center’s Green Practices**
The Greater Columbus Convention Center is determined to build a green footprint. Some of the eco-friendly practices currently in place include:

- **Waste Reduction:** GCCC has implemented a single-stream recycling program, where plastic and glass bottles, aluminum/ tin cans, paper, and cardboard products can all be co-mingled. In addition, used equipment batteries, oil, carpet, ballasts, and light bulbs are recycled.
- **Energy-Efficiency:** LED lamps are installed in all exhibit halls, ballrooms, and all parking garages. In addition, a centralized building automation management system ensures proper HVAC and light controls are in place maximizing energy conservation.
- **Air Quality:** Half of all daily facility exterior security and parking rounds are done via usage of facility GEM battery electric vehicles or walking patrols. Low NOx burners for facility boilers reduce nitrogen oxide emissions. Hepa filter backpack and upright vacuums for the housekeeping department have recently been introduced. Leak detection monitors are in place for refrigerant or other harmful gases, and CO2 detectors monitor and report the facility carbon dioxide levels.
- **Catering:** The Catering Department uses organic and locally grown products, in-season produce, as well as local meat and seafood when it is available. The GCCC has installed a Somat® Pulper and Waste Dehydrator system, which dehydrates compostable waste using an energy-efficient and automated process—reducing water matter by up to 93%, producing a dry, light, and odor-free material that can be used as soil amendment.

**“Go Green” at the Columbus 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 Hyatt Regency Columbus (headquarters), Drury Inn & Suites, and Hampton Inn & Suites. Conference registration, exhibits, the Membership Booth, the NSTA Science Store, exhibitor workshops, and many sessions will be located at the Greater Columbus Convention Center. Other sessions and events will be held at the Hyatt. The conference will begin on Thursday, December 1, at 8:00 AM, and end on Saturday, December 3, at 12 Noon.

Registration

Registration is required for participation in all conference activities and the exhibits. The lapel badge e-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, educational trips, etc.).

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

- Wed., Nov. 30: 5:00–7:00 PM
- Thu., Dec. 1: 7:00 AM–5:00 PM
- Fri., Dec. 2: 7:00 AM–5:00 PM
- Sat., Dec. 3: 7:30 AM–12 Noon

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

Purchasing Ticketed Events

The Columbus 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 30) for details. Note that some events may have required advance registration.

Ground Transportation to/from Airport

The John Glenn Columbus International Airport (CMH) is approximately six miles east from downtown Columbus (flycolumbus.com). For information on ground transportation options, visit bit.ly/2cUWTjd. Taxi fares average $25 to downtown Columbus. AirConnect, a new circulator route, runs to/from Port Columbus and downtown Columbus. Stops will be made at the Convention Center and many of the downtown hotels. Cost is $2.75 each way. For details, visit bit.ly/1pbYifa.

Getting Around Town

COTA’s CBUS® is the city’s free Downtown Circulator, traveling from Brewery District, through Downtown to Short North, and back again (www.cota.com/CBUS). CBUS runs every 10–15 minutes, seven days a week!

Parking

Parking is easy to find at the Convention Center. There are many parking ramps within easy walking distance, most connected to the Convention Center. For directions to the Convention Center as well as parking rates and maps, visit bit.ly/2cXY6w3.

Lyft Offer

Lyft is offering $50 in free rides to and from the Columbus conference! Go to www.lyft.com/i/NSTA to download the free Lyft app. Enter the credit code “NSTA” in the payment section before requesting a Lyft to claim $50 IN FREE RIDES! *Valid for new accounts, $5 off 10 rides.
Registration, Travel, and Hotels

Airlines
NSTA has made arrangements with several major airlines to offer discounted fares to Columbus conference attendees. Visit www.nsta.org/ColumbusTravel for details.

Discounted Rental Cars
The toll-free number to contact an 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.”

See page 92 for details about special discounted tickets to visit COSI, Columbus’ dynamic science center.

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

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

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

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

• WE’RE GIVING AWAY an APPLE iPAD MINI 2 Wi-Fi TABLET

• CONFERENCE APP

Scan QR code below to access our NSTA Conference App.
Registration, Travel, and Hotels

If you have questions or concerns regarding your housing, please contact Orchid Event Solutions, Monday through Friday, 9:00 AM–8:00 PM EST at 877-352-6710 (toll-free) or 801-505-4611, or e-mail help@orchideventsolutions.com. After hours and on Saturday, call 801-505-4611.

1. **Hyatt Regency Columbus**  
   *(Headquarters Hotel)*  
   350 N. High St.

2. **Drury Inn & Suites Columbus Convention Center**  
   88 E. Nationwide Blvd.

3. **Hampton Inn & Suites Columbus Downtown**  
   501 N. High St.
   Shuttle service will not be provided as all 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 e-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. Maps of the Exhibit Hall and other meeting rooms will be accessible via our conference app (see page 12). See page 104 for a complete list of exhibitors and contact information.

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

- Thu., Dec. 1 11:00 AM–5:00 PM
- Fri., Dec. 2 9:00 AM–3:00 PM
- Sat., Dec. 3 9:00 AM–12 Noon

Did you know that NSTA offers Exclusive Exhibits Hall hours? 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.

Thu., Dec. 1 11:00 AM–12:30 PM
Fri., Dec. 2 1:30–3:00 PM

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 117 for a complete listing of exhibitor workshops.

Exhibit Hall Beverage Break
Enjoy complimentary Iced Tea and Lemonade in the Exhibit Hall on Friday, from 1:15 to 3:00 PM. Coinciding with our exclusive Exhibit Hall hours, we welcome you to drop by for a refreshing beverage.

NSTA Science Store
Visit us at the NSTA Science Store to explore a wide selection of resources 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 offer convenient free shipping when you place your order on-site at the conference. We’ve lined up a number of unique opportunities for conference-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—Argument-Driven Inquiry in Physical Science; Inquiring Scientists, Inquiring Readers in Middle School; Disciplinary Core Ideas: Reshaping Teaching and Learning; and Uncovering Student Ideas in Earth and Environmental Science—and our new children’s books from NSTA Kids, including Next Time You See a Cloud; From Flower to Fruit; and Notable Notebooks: Scientists and Their Writings
- “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
- Daily book and gear specials, product giveaways, and more.

Meet the Presidents and Board/Council
Be sure to stop by Friday from 1:15 to 2:00 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!
Wi-Fi in Convention Center
Complimentary Wi-Fi internet access is available throughout all public spaces in the Convention Center. Service is intended for casual internet access, e-mail, etc. It is not intended to provide general internet access needs for all conference attendees. To access, choose “Free Internet”; no code required.

Additional bandwidth and a more secure internet service are available for an additional charge through Smart City. Visit bit.ly/2dylYaU for details.

SECO Booth
The Science Education Council of Ohio (SECO) booth is located in Hall B near the NSTA Registration Area. The booth will have membership forms and information about science activities in Ohio. Stop by to say hello, learn how we can keep you up to date on the latest happenings in our area, and pick up some great commemorative items! Note: If you have registered for the SECO Awards Reception and Member Meeting, please stop by to pick up your “Golden” ticket by Friday at 12 Noon. Space is limited.

Membership Booth
Come by the membership booth to meet NSTA staff and board members to learn more about NSTA membership and become part of the group that is crafting the future of science education. Win great prizes, including airfare on Southwest Airlines to the 2017 NSTA Los Angeles National Conference on Science Education. We’ll be handing out our new #ONLYatNSTA tweetshirts—come by and get one while supplies last!

Graduate Credit Opportunity
Columbus area conference attendees can earn one or two graduate-level credit/s in professional development through Dominican University of California (dominicancaonline.com). To obtain credit/s, you must be registered for the NSTA Columbus Conference, complete a DUC Registration Form, and pay a fee of $95 for one credit or $175 for two credits. Visit bit.ly/2aBJikX for details or stop by the Dominican booth near the NSTA Registration Area. You can also contact Lisa Johnson-Bowers at 330-289-9159 or LJB@DominicanCAonline.com.

UNI Overseas Placement Service for Educators
“An incredible opportunity for science teachers to meet and interview with over 120 American K-12 schools from around the world.”

Teachers: $50 All-In Registration Fee includes:
- Access to UNI Overseas Recruiting Fair - Feb. 3-5, 2017
- UNI Employment Database
- UNI Staff Support and Publications

Visit us @ Booth 811 at the Minneapolis Area Conference

Overseas Placement Service for Educators

www.uni.edu/placement/overseas

UNI Career Services, Cedar Falls, Iowa USA  50614-0390
Phone: (319) 273-2083  Fax: (319) 273-6998
E-mail: overseas.placement@uni.edu
Help NSTA’s GREEN efforts by visiting the conference session browser to complete session evaluations online, December 1–20, 2016. 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 4, 2017, 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 “My 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 development 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 room is located in the rear of Hall B in the Convention Center. Attendees in need of first aid can use any house phone to dial extension #2547 or call 614-827-2547 for the Public Safety Department.

In addition, a Mother’s Room is located along the Second Floor Connector of the Hyatt and Convention Center behind the Concierge Kiosk.

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, the designated AV company on-site, will be located in the following rooms:

• Back Show Office, Convention Center
• Nationwide A, Hyatt

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

Presenters and Presiders Check-In
If you are presenting or presiding at a session, please check in at the Presenters/Presiders booth in the Registration Area.

Business Services
Located on the first floor by the Food Court and Shops, the Convention Center has a service center staffed by their Ambassadors who will assist you with your copying and light shipping needs. Normal business hours are

Monday–Friday 7:30 AM–5:00 PM
Saturday 9:30 AM–3:00 PM

The Hyatt offers a 24-hour business center that is conveniently located in the hotel lobby next to the front desk. The automated business center includes a PC workstation with a printer that will print in both black and white and color.

Experience Columbus Information Desk and Visitor Center
An Experience Columbus information desk will be located in Concourse B near the Exhibit Hall to assist conference attendees. Stop by to learn about Columbus’ top attractions, restaurants, and nightlife. The hours for the information desk are:

Wednesday 5:00–7:00 PM
Thursday/Friday 9:00 AM–5:00 PM

In addition, the Experience Columbus Visitor Center is located in Suite 127, adjacent to the Food Court in the Convention Center. Come in for more information about the city and neighborhoods, and discover what’s happening in Columbus. Don’t forget to browse the Columbus items and souvenirs available for purchase, which include shirts, jerseys, books, postcards, magnets, and collectible shot glasses. The Visitor Center is open:

Monday–Friday 9:00 AM–5:00 PM
Saturday 10:00 AM–4:00 PM
Third Floor
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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.

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Brian Shmaesk, SCST Affiliate Representative
Conference Resources • Future Conferences

All cities are subject to change pending final negotiation.

National Conferences on Science Education

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

6th Annual STEM Forum & Expo, hosted by NSTA

Gaylord Palms Resort/Kissimmee, Orlando, Florida
July 12–14, 2017

Area Conferences on Science Education

2017 Area Conferences

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

2018 National Conference

Atlanta, GA ……………… March 15–18

Proposal Deadline: 4/17/2017

To submit a proposal, visit

www.nsta.org/conferenceproposals

Share Your Ideas!

NSTA’s CONFERENCES ON SCIENCE EDUCATION

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

6th Annual STEM Forum & Expo, hosted by NSTA

Gaylord Palms Resort/Kissimmee, Orlando, FL………………..July 12–14

Propposal Deadline: 12/5/2016

2017 Area Conferences

Baltimore, MD………………October 5–7
Milwaukee, WI………………November 9–11
New Orleans, LA …………November 30–December 2

Proposal Deadline: 1/17/2017

2018 National Conference

Atlanta, GA ……………… March 15–18

Proposal Deadline: 4/17/2017

NSTA Columbus Area Conference on Science Education
NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION

Stay up-to-date with conference information at www.nsta.org/la

“The conference provides a wealth of information from lesson plans to the latest science news. I leave each conference renewed and recharged!”

– Sharon Ruggieri, past conference attendee

SUN • SURF

Science

LOS ANGELES

March 30–April 2 2017

CONFERENCE STRANDS

NGSS
The Next Generation of Science Teaching

2017
A STEM Odyssey

Science & Literacy Reloaded

Mission Possible
Equity for Universal Access

Over 1,200 sessions

Network with more than 10,000 educators

375+ exhibitors with cutting-edge resources

And much more!
Conference Program • Highlights

See page 30 for details about the short course SC-3: 4-H Innovation...Design Challenges in Action!

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 36 for details.

Win a round-trip Southwest ticket to the NSTA National Conference on Science Education in Los Angeles.

Thanks to the generosity of Southwest Airlines we’re giving away three round-trip tickets on Southwest Airlines for educators to attend the NSTA National Conference in LA, March 30–April 2, 2017!

The drawings will be held at:
• 4:00 PM, Thursday, Dec. 1
• 2:00 PM, Friday, Dec. 2
• 10:00 AM, Saturday, Dec. 3

Stop by the NSTA Membership booth for all the details! You need not be present to win.
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Founded by a science teacher, our company puts student understanding and teacher support first. So when you use Vernier data-collection technology, you always get educator-developed solutions, resources, and support. From professional development and personalized customer service to grant opportunities, online training videos, and more, you’ll always find what you need for hands-on experiments and learning.

When science teachers succeed, students succeed—and that makes all the difference.

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www.vernier.com
The Columbus 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.

**Training Camp: Strengthening Fundamentals in Elementary Education**

Effective elementary science instruction requires a specific set of skills to provide students meaningful learning opportunities. Teachers need to have a fundamental understanding of integrating content, crosscutting concepts, science and engineering practices, as well as strategies to assess student understanding. This strand will strengthen participants' abilities to implement and assess rich science instruction for all students.

**Game Time: Tackling Scientific Problems and Pitching Engineering Solutions**

The current challenges facing society are both complex and interdisciplinary. Issues like water availability/quality, climate change, renewable energies, food shortages, the need for improved transportation/city infrastructure, and issues in the biomedical realm require clearly defining problems that can be solved through design. Students address these issues by implementing the practices of scientists and engineers, including developing explanations, designing and building models, and creating solutions. Students must be able to link the domains of science and teachers must teach students in a learnable manner that reaches multiple grade levels, increasing in depth and sophistication.

**Science Boosters: Taking It to the Next Level**

People are naturally inquisitive and make real-world connections beyond the science classroom. Teachers are the key to the establishment and success of educational partnerships, as well as the promotion of enriching experiences. This strand increases participants' understanding and ability to initiate and build successful collaborative partnerships that provide a wealth of resources inside and outside of the classroom in order to take science to the next level.
Training Camp: Strengthening Fundamentals in Elementary Education

**Thursday, December 1**

**8:00–9:00 AM**
STEAM IT UP: Are You Learning to Read or Reading to Learn Using Literacy with Science?

**8:30–11:30 AM**
SC-1: Curious KIDSS (Kindling Inquiry and Discovery in Science and Social Studies)
(Ticket Required: $27)

**12:30–1:30 PM**
STEM Lab Experiences for Authentic Inquiry in Early Childhood

**2:00–3:00 PM**
Teaching Claims and Evidence Through PERC

**3:30–4:30 PM**
How to Incorporate Math and Literacy in K–6 Active-Learning NGSS Activities

---

**Friday, December 2**

**8:00–9:00 AM**
Nurturing Curious Minds: Exploring the Science Encountered in the Young Child’s World and Inspiring Sustained Curiosity, Interest, and Learning

**9:30–10:30 AM**
Developing Coherent Storylines for Elementary Science Concepts

**3:30–4:30 PM**
Literacy Connections in Science—Beyond Just Picture Books

**Saturday, December 3**

**8:00–9:00 AM**
Making Science and Literacy Connections with NGSS

---

**Game Time: Tackling Scientific Problems and Pitching Engineering Solutions**

**Thursday, December 1**

**8:00–9:00 AM**
Interactive STEM Notebooks: The Role of Knowledge Construction and the Assessment of Learning

**12:30–1:30 PM**
Developing Scientific Arguments: Claims and Stories in the Graphs

**2:00–3:00 PM**
Engineering Happily Ever After

**3:30–4:30 PM**
Human-Centered Engineering Design: The Key to STEM

**5:00–6:00 PM**
Are You MoBILiSE’d? Modeling Biology Instruction: Leaders in Science and Engineering

---

**Friday, December 2**

**8:00–9:00 AM**
Implementing the Engineering Design Process in Your Classroom

**9:30–10:30 AM**
Learning Ecosystem Management with NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices

**12:30–1:30 PM**
Featured Presentation: Sowing the Seeds of STEM
(Speaker: Kimberly Clavin)

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**Saturday, December 3**

**8:00–9:00 AM**
EiE Ohio: Building 21st-Century STEAM Learners

**11:00 AM–12 Noon**
Impactful Learning: Engineering to Serve Special Needs Students—The Win-Win Scenario

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NSTA Columbus Area Conference on Science Education
### Conference Program • Conference Strands

**Science Boosters: Taking It to the Next Level**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Session</th>
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<tbody>
<tr>
<td><strong>Thursday, December 1</strong></td>
<td></td>
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<tr>
<td>12:30–1:30 PM</td>
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<td>Trees from the Top Down: A New Approach to Energy Transfer</td>
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<tr>
<td>2:00–3:00 PM</td>
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<td>Featured Presentation: Climate Change: The Evidence, People, and Our Options (Speakers: Ellen Mosley-Thompson and Lonnie Thompson)</td>
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<td>Connect Chemistry to Your World with ChemClub</td>
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<td><strong>Friday, December 2</strong></td>
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<tr>
<td>8:00–8:30 AM</td>
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<td>STEM in the Park: Advancing STEM Education for People of All Ages</td>
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<tr>
<td>8:30–9:00 AM</td>
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<td>A Monumental Task: Connecting Washington, D.C., Across the Curriculum</td>
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<tr>
<td>8:30–11:30 AM</td>
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<td>SC-3: 4-H Innovation…Design Challenges in Action (Ticket Required: $15)</td>
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<tr>
<td>9:30–10:30 AM</td>
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<td>Student Research and Publishing in High School Science</td>
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<td>11:00 AM–12 Noon</td>
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<td>Food Chains: Using Field Surveys That Give Real Results</td>
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<tr>
<td>12:30–1:30 PM</td>
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<td>Climate Expeditions</td>
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<td>3:30–4:00 PM</td>
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<td>U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy</td>
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<tr>
<td>4:00–4:30 PM</td>
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<td>Animal Multimedia Inspires Learning and Engagement</td>
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<td><strong>Saturday, December 3</strong></td>
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<tr>
<td>8:00–9:00 AM</td>
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<td>Logistic Growth and the Zombie Apocalypse</td>
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<td>10:00–10:30 AM</td>
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<td>Building a Community Science Festival: The JW Family Science Extravaganza</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td></td>
<td>Inventing Is Just Plain Fun (for All)!</td>
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</tbody>
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**Conference App**


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

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

Available for download on

- iPhone + iPad
- Android

Powered by: NSTA National Science Teachers Association

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NSTA Columbus Area Conference on Science Education
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 1
12:30–1:30 PM Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8
2:00–3:00 PM Argumentation in the Biology Science Classroom
3:30–4:30 PM Uncovering K–16 Students’ and Teachers’ Ideas Using Familiar Phenomena
5:00–6:00 PM Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12

Friday, December 2
8:00–9:00 AM Uncovering Elementary Students’ Ideas About Science Through Literacy Capacities
9:30–10:30 AM Once Upon an Earth Science Book

Saturday, December 3
8:00–9:00 AM Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5
9:30–10:30 AM Inquiring Scientists, Inquiring Readers: Integrating Literacy and Inquiry in Middle School Science

Meetings and Social Functions

Thursday, December 1
Central Michigan University Doctor of Education Technology Meeting
Nationwide B, Hyatt 4:00–5:00 PM

Friday, December 2
SECO 2017 Awards and Member Reception
(Free for SECO members. Visit www.secoonline.org to request a ticket.)
McKinley, Hyatt 3:00–4:30 PM

Cleveland Regional Council of Science Teachers (CRCST) Open House Reception
Nationwide B, Hyatt 4:00–6:00 PM

Central Michigan University Doctor of Education Technology Meeting
Harding, Hyatt 5:00–6:00 PM

OESTA and NESTA “Friends of Earth Science” Reception
Harrison, Hyatt 5:00–6:00 PM
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 2, 8:00 AM–5:30 PM*

*Union B, Hyatt*

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 2, 8:00 AM–1:30 PM*

*Union C, Hyatt*

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 four 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**

Solids, Liquids, Gases, and Changes of State

**9:30–10:30 AM**

Density: A Molecular View

**11:00 AM–12 Noon**

The Water Molecule and Dissolving

**12:30–1:30 PM**

Chemical Reactions: Breaking and Making Bonds
The American Society for Engineering Education 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 the 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  ASEE's K–12 Outreach: Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, the National Science Digital Library, and UC Project STEP
9:30–10:30 AM  ASEE's Novel Engineering for K–8 Teachers and Students
11:00 AM–12 Noon  Engineering Your Future

12:30–1:30 PM  Engineering Water Filtration Systems: Two Units and Two Teachers
3:30–4:30 PM  Building a Culture of Iterative Design with 3-D Modeling and Printing in the High School Classroom
5:00–6:00 PM  Demystifying the Difference Between Science and Engineering for K–6 Teachers

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 Columbus is being organized by the Southern Ohio Section of the American Association of Physics Teachers.

8:00–10:00 AM  Pedagogy for Conceptual Retention: Modeling Instruction in Science
10:00 AM–12 Noon  Building Web/Tablet-Friendly Interactive Physics Simulations
12:30–1:30 PM  Alternative Tasks to Develop Expert Problem-Solving Skills
3:00–5:00 PM  Creating Your Own Effective Interactive Video Vignettes
5:00–5:30 PM  30 Demos in 60 Minutes from the Ohio Section of AAPT
5:30–6:00 PM  Carnival Knowledge: The Flying Bernoulli Brother’s Stupendous Sideshow of Science by the Ohio Section of AAPT
Conference Program • Short Courses

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.

Curious KIDSS (Kindling Inquiry and Discovery in Science and Social Studies) (SC-1)
Jennifer Dennison (@OhioWILDed; outdoor.education@dnr.state.oh.us), Div. of Wildlife, Ohio Dept. of Natural Resources, Columbus
Level: Grades K–2
Date: Thursday, December 1, 8:30–11:30 AM
Location: Nationwide B, Hyatt
Ticket Price: $27
Come learn how K–2 educators can use the Growing Up WILD activities as a platform to expand upon and incorporate more science and social studies into their ELA and math lessons. This short course will introduce interactive hands-on lessons that allow students access to the outdoors to experience these integrated lessons in a real-life setting. Curious KIDSS is working with K–2 teachers to adapt existing Growing Up WILD lessons to address standards in math, ELA, science, and social studies instruction. Each participant will receive a copy of the award-winning Growing Up WILD guide. Dress for the weather as we may go outside. For more information, visit wildohio.gov.

Sowing the Seeds of Science: Using Plants as a Model to Teach Science Concepts (SC-2)
Courtney Price (price.1217@osu.edu), Diana Shin, and Julie Miller, Arabidopsis Biological Resource Center (ABRC), The Ohio State University, Columbus
Science Focus: ETS2, LS1, LS3, SEP
Level: Grades 6–12
Date: Thursday, December 1, 12:30–5:30 PM
Location: Off-site, Arabidopsis Biological Resource Center
Ticket Price: $35
Join us for this off-site short course at The Ohio State University’s Center for Applied Plant Sciences and ABRC where we will tour the centers’ laboratories, growth chambers, and greenhouse. This short course will feature hands-on activities and experiments that demonstrate how plants can be used as a model system to teach a variety of science concepts such as genetics, growth and development, environmental issues, and global problems. Course highlights will include an overview of best practices for growing research plants as well as an overview of the research being conducted by scientists using plants to solve global challenges. Participants will be introduced to the free Greening the Classroom modules. For more information, visit abrcoutreach.osu.edu and www.caps.osu.edu. Light snack included.

4-H Innovation...Design Challenges in Action! (SC-3)
Patty House (@phouse4h; house.18@osu.edu), Bob Horton (horton.2@osu.edu), Carolyn Belczyk (belczyk.1@osu.edu), Michelle Stumbo (stumbo.5@osu.edu), Tracy Winters (winters.5@osu.edu), and Travis West (west.222@osu.edu), The Ohio State University Extension, 4-H Youth Development, Columbus
Science Focus: ETS, INF, SEP
Level: Grades 5–12
Date: Friday, December 2, 8:30–11:30 AM
Location: Nationwide B, Hyatt
Ticket Price: $15
In this short course, learn about the Nationwide and Ohio Farm Bureau 4-H Center and engage in 4-H Ag Innovators design challenges. Participants will work in teams to brainstorm, design, build, test, and redesign solutions for an aquaculture feeding system and a wind-powered water pumping system. Modeling is used as the platform for students to explore the role honeybees play in pollinating our food supply. Researchers will share job forecasts for those interested in making a difference in providing a sustainable future for generations to come.
Tickets for educational trips may be purchased (space permitting) at the Ticket Sales Counter in the NSTA Registration Area. Meet your educational trip leader at the High Street Entrance of the Greater Columbus Convention Center 15 minutes prior to departure.

**Columbus Idea Foundry Tour**

$62

#T-1  Thurs., Dec. 1  9:00 AM–12 Noon

The Columbus Idea Foundry is one of the world’s largest and most active makerspaces! Join us to tour our workshop areas—welding, woodworking, blacksmithing, metalworking, and the foundry. Participants will also be taken to our tech-based stations, including our electronics lab, 3D printers, and laser cutters. Founder and CEO Alex Bandar will talk briefly about how the maker movement and facilities like this are bringing new life to STEM education and inspiring entrepreneurs in many different markets from libraries to K–12 schools and colleges. Participants will get to see up close and in person demos in blacksmithing and laser cutting.

*Note:* For your safety and comfort in this active workshop environment, please plan to wear long pants and closed-toed shoes. High heels, long scarves, jewelry, or other dangling accessories should be avoided by participants who will be using tool stations. All participants must sign a liability waiver and photo release.

**Tour of the Byrd Polar and Climate Research Center and Overview of Tools Used to Understand Earth’s Climatic Past**

$20, by preregistration only

#F-1  Fri, Dec. 2  12 Noon–4:30 PM

The Byrd Polar and Climate Research Center at The Ohio State University is recognized internationally as a leader in polar, alpine, and climate research. The research programs are conducted throughout the world. The Center is named in honor of Admiral Richard Byrd, America’s most famous polar explorer. Research at the Center focuses on the role of cold regions in the Earth’s overall climate system, and encompasses geological sciences, geochemistry, glaciology, paleoclimatology, meteorology, remote sensing, ocean dynamics, and the history of polar exploration. The tour will include a look at the Polar Rock Repository containing more than 40,000 samples collected by U.S. expeditions to polar regions, an opportunity to walk through the minus 25 degree Fahrenheit freezers housing the largest collection of tropical ice cores in the world, and two featured talks by researchers from the center on how scientists use measurements from ice and sediment to understand Earth’s climatic past. Visitors are welcome to bring cameras.
### Conference Program • Affiliate Sessions

#### Association for Multicultural Science Education (AMSE)
*President: Sharon Delesbore*

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<th>Day</th>
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<tr>
<td><strong>Friday, December 2</strong></td>
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<tr>
<td>12:30–1:30 PM</td>
<td>Empowering and Rewarding Educators of Economically Disadvantaged Students</td>
<td>B142/143, Conv. Center</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>STEM and/or STEAM Design Challenges in Grades 4–12 Science Classrooms</td>
<td>Harrison, Hyatt</td>
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#### Association for Science Teacher Education (ASTE)
*President: Malcolm Butler*

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<td><strong>Thursday, December 1</strong></td>
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<tr>
<td>3:30–4:30 PM</td>
<td>Citizen Science: Argumentation and Modeling Safe Traffic Intersections</td>
<td>Harrison, Hyatt</td>
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<tr>
<td><strong>Friday, December 2</strong></td>
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<tr>
<td>8:00–9:00 AM</td>
<td>Tech Tools for Taking Your Secondary Science Class to the Next Level</td>
<td>Taft C, Hyatt</td>
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#### Council for Elementary Science International (CESI)
*President: James T. McDonald*

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<td><strong>Friday, December 2</strong></td>
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<tr>
<td>9:30–10:30 AM</td>
<td>Integrating Science for Young Children with an Outdoor Focus</td>
<td>Taft C, Hyatt</td>
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#### National Association for Research in Science Teaching (NARST)
*President: Mei-Hung Chiu*

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<th>Day</th>
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<tr>
<td><strong>Thursday, December 1</strong></td>
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<tr>
<td>2:00–3:00 PM</td>
<td>Imagery Support Strategies for Developing Dynamic Scientific Models with Students</td>
<td>B140/141, Conv. Center</td>
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<tr>
<td><strong>Friday, December 2</strong></td>
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</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Using Democratic Science to Engage Families in Scientific Explanation</td>
<td>Taft C, Hyatt</td>
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</table>
All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the 2016 Columbus Area Conference. Sessions/events such as exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

**Beginning January 4, 2017, Columbus conference transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your conference 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 Columbus conference 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 Columbus session browser: www.nsta.org/columbusbrowse. 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.

**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 STEM 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 1 8:00 AM–6:00 PM**

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<th>Start Time</th>
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*We’re giving an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who evaluates sessions that he or she attends. The more sessions you attend and evaluate, the more chances you have to win!*
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**Thursday, December 1  8:00 AM–6:00 PM, continued**

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**Friday, December 2  7:30 AM–6:00 PM**

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<th>Start Time</th>
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**Saturday, December 3  8:00 AM–12 Noon**

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<th>Start Time</th>
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# Conference Program

## Affiliate Sessions

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

*President: Mary Lou Lipscomb*

**Thursday, December 1**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>3:30–4:30 PM</td>
<td>Calling All Middle Level Teachers</td>
<td>B140/141, Conv. Center</td>
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</table>

**Friday, December 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>3:30–4:30 PM</td>
<td>Activate Your Learning, Engage Your Senses</td>
<td>Taft C, Hyatt</td>
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</tbody>
</table>

### National Science Education Leadership Association (NSELA)

*President: Keri Randolph*

**Friday, December 2**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>Tools for Science Leaders, Part 2</td>
<td>B144/145, Conv. Center</td>
</tr>
</tbody>
</table>
### Three Dimensions of the Next Generation Science Standards (NGSS)

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

<table>
<thead>
<tr>
<th>Disciplinary Core Ideas in Physical Science</th>
<th>Disciplinary Core Ideas in Life Science</th>
<th>Disciplinary Core Ideas in Earth and Space Science</th>
<th>Disciplinary Core Ideas in Engineering, Technology, and the Application of Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS1: Matter and Its Interactions</td>
<td>LS1: From Molecules to Organisms: Structures and Processes</td>
<td>ESS1: Earth's Place in the Universe</td>
<td>ETS1: Engineering Design</td>
</tr>
<tr>
<td>PS4: Waves and Their Applications in Technologies for Information Transfer</td>
<td>LS3.D: Global Climate Change</td>
<td>ES3.D: Global Climate Change</td>
<td></td>
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</tbody>
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**NSTA Columbus Area Conference on Science Education**
8:00–8:30 AM Presentation

**INF**

**Geek Sneaks: Informal Science Education in a Movie Theater**
*(General)*

*B142/143, Convention Center*

Science Focus: INF

*Dan Mushalko (@MushGuy; dmushalko.wcbe@gmail.com)*, Columbus (Ohio) City Schools

*Robert Pyatt (@RobertPyatt1; robpyatt@gmail.com)*, The Ohio State University, Columbus

Hear how we have collaborated on a project to present informal science education in the unique setting of a movie theater. For the last two years, we have worked to coordinate a series of science-related events featuring scientists from local universities in conjunction with the theater’s Geek Sneak series. We will share the strengths and challenges of conducting informal science education in this unique setting.

8:00–9:00 AM Presentations

**A Unique Ice Core Investigation That Integrates the Three Dimensions of NGSS and STEM**
*(Grades 7–College)*

*B130, Convention Center*


*Donna Young (dlyoung.nso@gmail.com)*, Chandra X-Ray Center, Bullhead City, Ariz.

This open-ended investigation uses absolute and relative dating techniques and anomalies to date Icelandic and mid-latitude volcanoes, solar proton events, terrestrial events, and possibly supernovas.

**Simple Machines Design Challenge for Science and Math Students**
*(Grades 6–9)*

*B140/141, Convention Center*

Science Focus: ETS1, PS2.A, CCC2, SEP

*Anna Delia (adeli@hawken.edu)* and *Kim Brandt (kbran@hawken.edu)*, Hawken Lower and Middle Schools, Cleveland, Ohio

We will share an interdisciplinary group project where students investigate the history and physics of simple machines; design a new machine; and construct, test, and evaluate peers’ designs.

---

**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 123, 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 34 for a complete list of the NGSS codes used in this program.

**Strands**

The Columbus 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 24.

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

The following icons will be used throughout this program.

- **NSTA Press® Sessions**

Sessions highlighting STEM learning experiences that occur in out-of-school environments.
Thursday, 8:00–9:00 AM

**INF** Shining the L.I.G.H.T on STEM in Your Community
(Grades P–5) B144/145, Convention Center
Science Focus: GEN, INF, SEP1, SEP2, SEP3
Angela McMurry (@AngelaMcMurry1; angie.mcmurry@darkeesc.org), Darke County Educational Service Center, Greenville, Ohio
LIGHT stands for Literacy, Inquiry, Getting Outside, Having Fun, Time Spent with Family. Join me as I spotlight the LIGHT Project, a collaboration among the Darke County ESC, the Matt Light Foundation, and the Miami Valley Leave No Child Inside initiative. Discover how elementary teachers can incorporate this accessible, fun hands-on integrated program into their classrooms and communities through partnerships with local, state, and national foundations.

**Deliver Your Science Content with iPads in Your 1:1 Classroom**
(Grades 3–12) B232, Convention Center
Science Focus: GEN, NGSS
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!

**Turning Your Classroom INSIDE OUT**
(Grades 9–12) B242/243, Convention Center
Science Focus: ESS, ETS, LS, PS, CCC5, SEP1, SEP2
Rachel Kannady, White Station High School, Memphis, Tenn.
Find out how to use literary materials such as the experiences in The Martian to guide instruction and create pathways for bringing the community into your classroom.

**Is This Your First NSTA Conference? First-Timer Conference Attendees’ Orientation**
(General) McKinley, Hyatt
Science Focus: GEN
NSTA Board and Council
Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive exploration through the program, the conference app, and NSTA’s social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

**Informal Science Education Panel for the Community**
(Grades P–12) Taft A, Hyatt
Science Focus: INF
Stacey Glatz, Columbus Zoo and Aquarium, Powell, Ohio
Wondering what informal science education can do for you and your students? Join our panel of local informal science education institutions to hear about what they can do for you! There will be opportunities to learn about many types of programming and ask questions about how these informal educational programs can correlate with your curriculum and directly into your classroom!

**50 iPad Apps for STEM Activities in the Elementary Classroom**
(Grades P–6) Taft B, Hyatt
Science Focus: GEN, NGSS
Janet Jordan (janetjordan37@gmail.com), Retired Educator, Fort Wayne, Ind.
Discover many excellent, engaging, and challenging iPad apps with links to current award-winning children's books. Tips for integrating apps into the curriculum will be given.

**Looking Inside Argument-Based Inquiry Classrooms**
(Grades 1–8) Union B, Hyatt
Science Focus: GEN, NGSS
Brian Hand (brian-hand@uiowa.edu), The University of Iowa, Iowa City
Let me introduce you to innovative approaches for having science classrooms meet the NGSS practices by viewing a video of teachers using the Science-Writing Heuristic approach.
8:00–9:00 AM  Hands-On Workshops
What Do You Mean I Have to Teach Engineering?  
(Grades 7–College)  
B240/241, Convention Center  
Science Focus: ETS1, PS  
Gregory Dodd (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.  
Let’s focus on engineering design by engaging in a hands-on STEM activity on how a colorimeter works. You’ll learn how to design and use a simple colorimeter.

English, ELLs, and STEM: A Collaboration Worth Pursuing  
(Grades 9–12)  
B246, Convention Center  
Science Focus: GEN, NGSS  
Diane Carter (dhcarter@iupui.edu), Retired Educator, Indianapolis, Ind.  
Collaborative projects between secondary English, science, and math courses can help English language learners to develop academic language, grasp STEM concepts, connect information, and improve communication skills.

STEAM IT UP: Are You Learning to Read or Reading to Learn Using Literacy with Science?  
(Grades P–5)  
Franklin A, Hyatt  
Science Focus: GEN, CCC  
Ava Pugh and Rhonda Mann, University of Louisiana at Monroe  
Engage in hands-on STEM/STEAM activities merging science and literacy across the curriculum asking, “Are you learning to read or reading to learn?”

Interactive STEM Notebooks: The Role of Knowledge Construction and the Assessment of Learning  
(Grades 6–8)  
Franklin B, Hyatt  
Science Focus: GEN, NGSS  
Teresa Bombrys (@TeresaBombrys; bombrysteresa@gmail.com), Hilltonia Middle School, Columbus, Ohio  
Kerry Dixon (kerrydixon001@gmail.com), Education Consultant, Granville, Ohio  
Learn to create engaging Interactive STEM Notebooks with your middle school or high school students! Make an exemplar, exploring multiple layouts, data representations, and assessment strategies.
Thursday, 8:00–9:00 AM

Let’s Get Physical—From Force and Friction to Water and Weather
(Grades P–3) Franklin C, Hyatt
Science Focus: PS2.A
Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio
Juliana Texley (@JulianaTexley; texle1j@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Don’t look now, but the CCSS asks that you teach physical sciences as early as kindergarten, and the NGSS have specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

Soy Fresh, Soy Clean…Connecting Community and Kids to STEM Careers
(Grades K–12) Garfield, Hyatt
Science Focus: GEN, NGSS
Rachel Sanders (@SandersGISA; rachsl205@gmail.com), Pam Clark (@clarkGISA; pclairl@globalimpactacademy.org), and Jennifer Foudray (@FoudrayGISA; jfoudray@globalimpactacademy.org), Global Impact STEM Academy, Springfield, Ohio
In this workshop sponsored by the Ohio Soybean Council, learn how to use SLOPs (Standard Laboratory Operating Procedures) and STEM equipment to create soy-based products.

Exploring the Science and Engineering Practices
(Grades K–12) Harrison, Hyatt
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.

Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects
(Grades 6–12) Taft D, Hyatt
Science Focus: ESS2, ESS3, ETS1, ETS2.A, PS2, CCC3, SEP1, SEP3, SEP4, SEP6
Shelley Olds (@terraunbound; @UNAVCO; @ESIPFed; olds@unavco.org), UNAVCO, Boulder, Colo.
Engage students in STEM using the “it” toy of the year—Unmanned Aerial Vehicles (UAVs or drones)! Try free teacher-developed activities for STEM learning.

Using a Fab Lab and the Design Cycle: Engineering Engaging Learning Experiences for Middle School Students
(Grades 5–8) Union A, Hyatt
Science Focus: GEN, SEP1, SEP2, SEP6
Anne Baldwin (@arbaldwin; baldwina@wcsoh.org), Westerville (Ohio) City School District
Julia Swartzel (swartzej@wcsoh.org) and Lee Smith (smithlee@westerville.k12.oh.us), Genoa Middle School, Westerville, Ohio
We will share the successes and lessons learned during the initial years of using a mobile lab in suburban grade 7 classrooms. Join us to engage in a design challenge from the program.

INF

STEM Pathways Design Challenges
(Grades 5–12) Union C, Hyatt
Science Focus: ETS, INF, SEP
Patty House (@phouse4h; house.18@osu.edu), Robert Horton, and Carolyn Belczyk (belczyk.1@osu.edu), The Ohio State University Extension, 4-H Youth Development, Columbus
Equation: Engagement + Problem Solving = Learning.
Answer: Design challenges to inspire classroom critical thinking and creative problem solving targeted at solutions for real-world problems.
8:00–9:00 AM  Exhibitor Workshops

Hands-On Science with Classroom Critters
(Grades K–12)  
C150, 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 fun hands-on activities with pill/sow bugs, termites, bessbugs, and butterflies you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online.

Gas Exchange
(Grades 6–8)  
C151, Convention Center
Science Focus: LS1, PS3, CCC1, CCC4, SEP3, SEP5
Sponsor: LAB-AIDS®, Inc.
Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Teachers know their students have many misconceptions about respiration. In this activity from the SEPUP middle level life science program, participants use an acid-base indicator to determine the relative amount of carbon dioxide gas in a sample of their exhaled breath. They 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.

Teach Next Gen Like Your Hair Is on Fire!
(Grades K–2)  
C160, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Become legendary in your own time when you teach science in your classroom. Experience lessons from Delta Science Modules that incorporate the NGSS. Receive corresponding content readers, strategies, and resources that you can take back and use with your students next week.

Wave Properties and Information Transfer
(Grades 6–8)  
C161, Convention Center
Science Focus: PS4
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
Engage in activities using lasers and optical fibers in the new FOSS Next Generation Edition Waves Course for Middle School. Explore properties of refraction and reflection that allow information transfer by fiber-optic technology, and identify connections to the three dimensions of NGSS.

CPO’s Link™ with Car and Ramp: Force, Motion, and Variables
(Grades 6–12)  
C162, Convention Center
Science Focus: PS2
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
Learn to distinguish between dependent, manipulated, resultant, controlled, and independent variables. In this hands-on workshop, students discover variables while designing their own experiment. We will feature the Link learning module for car and ramp as we present a new “angle” on how to master confusing terminology using scientific investigations.

Experience Amplify Science: Grades K–1
(Grades P–2)  
C170, Convention Center
Science Focus: GEN, NGSS
Sponsor: Amplify
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Immerse yourself in Amplify Science, a new curriculum developed by University of California Berkeley’s Lawrence Hall of Science. Experience the program’s rich, multi-modal and problem-based approach. See how your K–1 students engage with deep dives into understanding the natural and designed worlds.

Martian Genetics: An Electrophoresis Exploration
(Grades 6–College)  
C171, Convention Center
Science Focus: LS
Sponsor: Edvotek Inc.
Maria Dayton and Danielle Snowflack, Edvotek Inc., Washington, D.C.
Explore genetics with our “out of this world” workshop! Imagine being the first scientist to explore Mars and discovering extraterrestrials. How would you use biotechnology to learn about the Martians? Discover how DNA technology can be used to explore the relationship between genotype and phenotype. Fluorescent dyes simulate DNA fragments, eliminating post-electrophoresis staining and saving classroom time! Take home a free gift and entry in a LabStation™ giveaway.
8:30–9:00 AM Presentations

**Partnering with Your Local Planetarium**
(Grades 3–12) B142/143, Convention Center
Science Focus: ESS, INF

Ken Brandt (@kenb1213; brandt@uncp.edu), Robeson Planetarium and Science Center, Lumberton, N.C.
Timothy Slater (@CAPERteam; timslaterwyo@gmail.com), University of Wyoming, Laramie

How can you use a planetarium’s programs to enhance your instruction? Discussion centers on strategies and ideas for getting the most out of the planetarium experience and relating it to NGSS. We will also share educator guides for currently running planetarium shows at Robeson Planetarium and Science Center.

**From a Traditional Science Fair to an Interactive STEM Expo**
(Grades 4–College) B244/245, Convention Center
Science Focus: GEN, INF, SEP8

Nicole VanTassel (nvantassel@eriesd.org), Strong Vincent High School, Erie, Pa.

Get the tools to turn your school’s traditional science fair into a student-led, school-wide STEM Expo that brings together your school and local community and provides opportunities for student leadership and research.

8:30–11:30 AM Short Course

**Curious KIDSS (Kindling Inquiry and Discovery in Science and Social Studies) (SC-1)**
(Grades K–2) Nationwide B, Hyatt

Jennifer Dennison (@OhioWILDed; outdoor.education@dnr.state.oh.us), Div. of Wildlife, Ohio Dept. of Natural Resources, Columbus

For description, see page 30.

9:15–10:30 AM General Session

**Be a STEM Hero**
(General) Short North Ballroom A/B, Convention Center
Science Focus: GEN

Ainissa Ramirez (@ainissaramirez), Scientist, Educator, and Science Evangelist, Conn.

Presider and Introduction: Mary Gromko, NSTA President, Colorado Springs, Colo.

Platform Guests: Ainissa Ramirez; Mary Gromko; Carolyn Hayes, NSTA Retiring President, and Retired Educator, Greenwood, Ind.; David Crowther, NSTA President-Elect, and University of Nevada, Reno; Kristie Reighard, Chairperson, NSTA Columbus Area Conference, and Delta High School, Delta, Ohio; Trudy Giasi, Program Coordinator, NSTA Columbus Area Conference; and Linmoor Education Center, Columbus, Ohio; Patrick Herak, Local Arrangements Coordinator, NSTA Columbus Area Conference, and The Ohio State University, Columbus; David Evans, NSTA Executive Director, Arlington, Va.

Children are inundated with information, both good and bad. To sort through all this information, children need the ability to think critically. Here is where STEM comes in. STEM is more than the combination of different topics. It contains a set of skills, such as problem solving, critical thinking, and curiosity, which are the key ingredients for success in the 21st century. This talk will invite listeners to get in touch with their inner STEM hero and share strategies to develop the STEM skills that children need for the future.

Ainissa Ramirez is a science evangelist and science lecturer, passionate about getting kids of all ages excited about science. She is dedicated to sharing the joy of materials, process, and creativity with students of all ages. At Yale, Ainissa is the founder of the award-winning science lecture series for children called Science Saturdays. She has served as a science advisor to WGBH/NOVA, National Geographic, Time magazine, and the American Film Institute. Currently, she is writing a book on the role of materials in history and co-hosts a science podcast called Science Underground.

Prior to taking on the call to improve science understanding, Ainissa was an associate professor of mechanical engineering and materials science at Yale University, leading a research program in smart materials and nanomaterials. Her research has been awarded the Sloan Research Fellowship and the NSF CAREER award.

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**Evaluate Your Sessions Online!**
This year, we’re giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation!

Remember, the more sessions you attend and evaluate, the more chances you have to win! (See page 12 for details.)
9:30–10:30 AM  Exhibitor Workshops

Year-Round Solutions for Success in AP Chemistry from Flinn Scientific
(Grades 9–12)  B131/132, Convention Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Mike Marvel (mmarvel@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Join Flinn as they present new guided inquiry experiments that support the learning objectives and skills your students need. Discover the benefits of preparing students for the first day of class with FlinnPREP™: an online review of foundational chemistry concepts. Handouts!

Dive In with Magnetic Water Molecules
(Grades 5–College)  B230/231, Convention Center
Science Focus: PS, SEP
Sponsor: 3D Molecular Designs
Tim Herman and Gina Vogt (gina.vogt@3dmoleculardesigns.com), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Engaging water molecules enable you to use an inquiry approach to explore why water is essential for life. Discover the physical and chemical properties of water, states of matter, evaporation, condensation, transpiration, erosion, and more, using interactive water molecules with embedded magnets that mimic the polar interactions in real water.

The Value of Writing Scientific Explanations in STEM
(Grades K–12)  B233/234, Convention Center
Science Focus: GEN, NGSS
Sponsor: Accelerate Learning–STEMscopes
Terry Talley, Accelerate Learning–STEMscopes, Houston, Tex.
Claim-Evidence-Reasoning (CER) is a way for students to explain, in a scientific way, how their observations and data from an investigation are connected to science knowledge. Using a CER framework provides a scaffold for building the skill of argumentation and writing scientific explanations.

Science Storylines: Developing Three-Dimensional Lessons That Build on Student Curiosity
(Grades 6–8)  B235, Convention Center
Science Focus: GEN, CCC2, CCC4, SEP1, SEP2, SEP6, SEP7, SEP8
Sponsor: Activate Learning
Heather Milo, Activate Learning, Greenwich, Conn.
With NGSS being taken up by educators across the country, it can be easy to lose sight of student interest and identity in the search for NGSS-focused curricula. Join us for an engaging workshop on storyline coherence as a means to not only have pedagogy meet the standards, but also build on students’ ideas and questions about the natural world. This workshop targets both middle school teachers and science education leaders.

Engineer Physical Science Excitement with a Carolina STEM Challenge®
(Grades 6–12)  C150, Convention Center
Science Focus: LS, PS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Bounce and race into hands-on activities that engage middle school and high school students. Apply creative problem-solving skills and engineering practices to chemistry and physical science challenges. Experience how Carolina makes it easy to bring STEM to your classroom.

Modeling Convection Currents and Plate Motion
(Grades 6–8)  C151, Convention Center
Science Focus: ESS2.A, CCC3, CCC4, CCC5, SEP2, SEP3, SEP4, SEP6
Sponsor: LAB-AIDS®, Inc.
Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Investigate and model convection currents using unique LAB-AIDS/SEPUP materials to develop an operational understanding between water temperature and its movement. The hands-on experience with convection in water coupled with the knowledge of Earth’s interior is combined to explain the motion of tectonic plates and how that motion causes major geological events.

SEPs Made Easy
(Grades 2–5)  C160, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Derrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Experience lessons from Delta Science Modules that incorporate science and engineering practices. Receive a corresponding content reader, strategies, and resources that you can take back and use with your students next week.
Engage Students in FOSS Next Generation
(Grades K–5) C161, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science—FOSS
Diana Velez and Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS developers to learn about the FOSS Next Generation Elementary Program. We’ll introduce the instructional design, and illustrate how the system incorporates science-centered language development, notebooks, digital resources, formative assessments, and outdoor excursions into a coherent learning experience for students and teachers.

Solving the Mystery of STEM Using Forensic Science
(Grades 6–12) C162, Convention Center
Science Focus: GEN, NGSS
Sponsor: Frey Scientific/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
Conduct STEM-focused beginning forensic activities that connect scientific investigations to analysis and investigative skills. Solve “cases” involving fingerprinting, blood spatter, and document or fabric analysis. We’ll use a digital learning environment with simple supplies to apply basic mathematic principles, plus integrate reading and writing strategies.

Experience Amplify Science: Grades 2–5
(Grades P–5) C170, Convention Center
Science Focus: GEN
Sponsor: Amplify
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Immerse yourself in Amplify Science, a new curriculum developed by University of California Berkeley’s Lawrence Hall of Science. Experience the program’s rich, multimodal, and problem-based approach. See how your grades 2–5 students engage with deep dives into understanding the natural and designed worlds.

Left at the Scene of the Crime: Introduction to Forensic Science
(Grades 6–College) C171, Convention Center
Science Focus: LS
Sponsor: Edvotek Inc.
Danielle Snowflack 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.

Earth and Space Science for the Modern Interactive Classroom
(Grades 5–12) C172, Convention Center
Science Focus: ESS1, ESS2.B
Sponsor: Simulation Curriculum Corp.
Michael Goodman and Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.
Join us on the big screen as we demonstrate the acclaimed Starry Night and Layered Earth lessons, exercises, stunning simulations, animations, and images. These complete curriculum solutions for Earth and space science from grades 5 to 12 are all now available for Chromebook, Windows, Mac OS, iPads, or Android tablets.
Want to help build your student's interest in STEM?

Join our national competition free to students in grades 6-9

Register Now!

Visit our website for more information:
www.ecybermission.com
Thursday, 11:00 AM–12 Noon

11:00 AM–12 Noon  Exhibitor Workshops

Gains in the Education of Mathematics and Science: What Can GEMS Do for You?
(Grades 5–12)  
B131/132, Convention Center
Science Focus: GEN
Sponsor: AEOP
Jarod Phillips (aeopgems@nsta.org), GEMS Project Manager, NSTA, Arlington, Va.
Receive an overview of the AEOP GEMS programs and find out how you can incorporate similar ideas and practices into your science classroom.

Using Maggots, Flies, and Flesh to Solve a Mystery!
(Grades 6–12)  
B230/231, Convention Center
Science Focus: GEN
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

ChickQuest: A Classroom Journey Through the Life Cycle of Chickens
(Grades 1–5)  
B233/234, Convention Center
Science Focus: LS
Sponsor: GrowNextGen
Jeanne Gogolski (jeanne@educationprojects.org), Upper Arlington Schools, Columbus, Ohio
Heather Bryan (heather@educationprojects.org), Education Projects & Partnerships, LLC, Columbus, Ohio
Hear about a 4-H School Enrichment Program that challenges students to use science, engineering, and technology to investigate the life cycle of an embryonic chicken egg. From monitoring living eggs to observing fluffy chicks, these lively activities pique curiosity, encourage collaboration and communication, and provide young scientists with unforgettable experiences.

Learning By Arguing: Claims, Evidence, and Reasoning
(Grades 6–8)  
C150, Convention Center
Science Focus: GEN
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Middle school students naturally love to argue. How can we use scientific argumentation to produce real learning in the science classroom? Explore claims, evidence, and reasoning through practical real-world applications. Experience phenomena as delivered in the new Smithsonian Science and Technology Concepts (STC) Middle School program.

Calling All Carbons
(Grades 9–12)  
C151, Convention Center
Science Focus: ESS2.A, SEP2, SEP3, SEP4
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.

Build Skills to Boost the Makerspace Experience for Young Scientists!
(Grades K–5)  
C160, Convention Center
Science Focus: ETS
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for students in grades K–3, tackling STEM-related challenges requires a foundation in science investigation. Help young scientists build the skills needed for independent exploration in their makerspaces with programs like Science in a Nutshell.

The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes
(Grades K–5)  
C161, Convention Center
Science Focus: GEN
Sponsor: Delta Education/School Specialty Science–FOSS
Kathy Long, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS developers to learn how assessment can become an integrated teaching tool that both teachers and students can embrace. Create a classroom culture of self-motivation and growth mindset by just adding a 10-minute reflective practice to your day.
CPO’s Link™ Genetics Learning Modules: Crazy Chromosomes and Crazy Traits
(Grades 6–12) C162, Convention Center
Science Focus: LS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosharon, Tex.
CPO Science’s Link learning modules for genetics use NGSS strategies in a real-time digital learning environment. Students can study the relationship between DNA, genes, mitosis, meiosis, traits, alleles, phenotypes, and genotypes. Heredity will come alive as you use hands-on models to create crazy creatures in a unique collaborative program.

Experience Amplify Science: Middle School
(Grades 6–8) C170, Convention Center
Science Focus: GEN, NGSS
Sponsor: Amplify
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Immerse yourself in Amplify Science, developed by University of California Berkeley’s Lawrence Hall of Science. Experience the program’s technology-enhanced and problem-based approach. See how your grades 6–8 students engage with deep dives into understanding the natural and designed worlds.

Using the Polymerase Chain Reaction to Identify GM Foods
(Grades 9–College) C171, Convention Center
Science Focus: LS
Sponsor: Edvotek Inc.
Maria Dayton and Danielle Snowflack, 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!

Motivate and Engage with Chemistry
(Grades 6–12) C172, Convention Center
Science Focus: PS, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Sponsor: Houghton Mifflin Harcourt
A. Mickey Sarquis, Professor Emeritus, Miami University–Middletown, Ohio
Use chemistry to reunite the fun/hands-on and mental/minds-on aspects of science teaching as you spur curiosity and a desire to understand our world while increasing motivation, learning, and conceptual understanding.

11:00 AM–5:00 PM Exhibits
Hall B, Convention Center
As you enter the exhibit hall, enjoy musical entertainment courtesy of Dublin Youth Brass Band under the direction of Joe Antram. Did you know that NSTA offers Exclusive Exhibits Hall hours today from 11:00 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.
12:30–1:30 PM  Presentations
The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (General)  B140/141, Convention Center
Science Focus: GEN
John Putnam (jputnam@nsta.org; fmendez@nsta.org), Assistant Executive Director, Professional Programs, NSTA, Arlington, Va.
Alexandra Wakely, Administrative Coordinator, Services, NSTA, Arlington, Va.
Al Byers (abyers@nsta.org), Associate Executive Director, Strategic Development & Research Division, NSTA, Arlington, Va.
Lost when it comes to finding online professional learning resources to enhance your content knowledge and skills? With more than 12,000 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!

Meet the Standards and Enhance Your Chemistry Classroom with Other People's Money (Grades 9–12)  B142/143, Convention Center
Science Focus: PS
Kenetia Thompson (kenetom@gmail.com) and Karen Kaleuati (@ACSChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, D.C.
Find out about grant opportunities available to high school chemistry teachers (including those from the American Chemical Society) and the process for writing a fundable proposal.

Coral Reefs—Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (Grades 5–12)  B242/243, Convention Center
Science Focus: ESS, LS, PS, CCC
June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.
Coral reefs are a 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, and more—using lesson plans, demos, labs, activities, and multimedia from the National Oceanic and Atmospheric Administration (NOAA).

INF Developing Science Process Skills Through School Yard Investigations (Grades K–12)  B244/245, Convention Center
Science Focus: LS, INF
Lindsay Glasner (@BirdSleuth; lig27@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.
Meeting standards goes hand in hand with student investigations and citizen science. Motivate students with school yard projects and real data...we’ll inspire you with ideas and free resources!

Helping Children Understand the Impact of STEM and the Essential Integration of All STEM Disciplines: Explorations with Physical Structures, Plants, and Everyday Household Tools (Grades 3–6)  Taft A, Hyatt
Science Focus: GEN, NGSS
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.
Attention will be paid to strategies and activities to engage elementary students actively in STEM applications by constructing physical structures (bridges, ramps, etc.), growing plants, and exploring how everyday objects use simple machines for mechanical advantage.
Bio Blitz: Opening the Eyes of Students to the Science Around Them
(Grades K–5) Taft B, Hyatt
Science Focus: LS, SEP1, SEP3, SEP4, SEP8
Cathy Holmes (cathy.holmes@education.ohio.gov), Ohio Dept. of Education, Columbus
Tracy Cindric (tracy.cindric@education.ohio.gov), Ohio Resource Center, Columbus
Jenna Pollock (@jennaleep13; jpolloc@bgsu.edu), Bowling Green (Ohio) City Schools
Angela McMurry (@AngelaMcMurry1; angie.mcmurry@darkeesc.org), Darke County Educational Service Center, Greenville, Ohio

Integrating STEM practices is key to reaching diverse learners in technology and engineering. Our focus is for diverse learners to understand the world around them by building an understanding of biodiversity in their communities through a combination of literacy, hands-on learning, and technology integration.

12:30–1:30 PM Hands-On Workshops
Planning and Designing Safe and Sustainable Facilities for STEM-Based Science (Science Facilities 101)
(General) B240/241, Convention Center
Science Focus: GEN
LaMoine Motz (lpmotz@comcast.net), 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.
Juliana Texley (@JulianaTexley; texle1j@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

So you want new science facilities? Does your curriculum define your science teaching facility? With more than 15 years of conducting visits and presentations of new/renovated school science facilities, the author team of NSTA Guide to Planning School Science Facilities (2nd ed.) will present the “basics” of science facility planning for safe, ergonomically designed, and sustainable facilities.

Do you know an excellent STEM teacher?
Nominate them today for the Presidential Awards for Excellence in Mathematics and Science Teaching!
Now accepting nominations and applications for 7th – 12th grade teachers.
www.paemst.org

The National Science Foundation administers PAEMST on behalf of The White House Office of Science and Technology Policy.
Differentiation Strategies for Grades 5–12
(Grades 5–11) B246, Convention Center
Science Focus: GEN, NGSS
Amy Bain (amybain26@gmail.com), Clermont County Educational Service Center, Loveland, Ohio
Meri Johnson (@Sci_Centers; merijohnson26@gmail.com), Curriculum Engineers, Inc., Batavia, Ohio
Differentiation in science can be accomplished with leveled labs, centers, contracts, varying texts, and vocabulary strategies. See how to incorporate these strategies into your classroom.

Incorporating Digital Technology While Ensuring Conceptual Learning and Deep Understanding Using Literacy and Math Skills
(Grades K–12) Ohio Center B/C, Convention Center
Science Focus: ETS, PS2, PS3, CCC, SEP
Bruce Patton (patton.1@osu.edu) and Andrew Dougherty, The Ohio State University, Columbus
Explore Ohio and NGSS-based inquiry lessons on force, motion, and energy in a systematic learning progression, with conceptual, hands-on and computer-based stages.

STEM Lab Experiences for Authentic Inquiry in Early Childhood
(Grades P–3) Franklin A, Hyatt
Science Focus: GEN, NGSS
Mandy McCormick Smith (@ecesciencerocks; msmith21@capital.edu), Capital University, Columbus, Ohio
Experience a 5E/preK instructional model just as young children would during science lessons. Key components of the experience will include the importance of inquiry, engineering design, mathematical manipulation, and play in the preK setting.

Developing Scientific Arguments: Claims and Stories in the Graphs
(Grades 5–College) Franklin B, Hyatt
Science Focus: GEN, NGSS
Sharon Schleigh, East Carolina University, Greenville, N.C.
Participate in discussions and activities to learn how the interpretation of data through graphical representations serves as an essential tool in helping students develop a scientific argument.

Marble Mania: Teaching NGSS Fair Test the Inquiry Way
(Grades 3–5) Franklin C, Hyatt
Science Focus: ETS, PS
Jody Stone (stone@uni.edu), University of Northern Iowa, Cedar Falls
Explore the variables of ramp height, marble size, and ramp length while learning the big ideas of carrying out a fair test with an open-ended inquiry approach.

Trees from the Top Down: A New Approach to Energy Transfer
(Grades 5–8) Franklin D, Hyatt
Science Focus: LS2.B, INF, CCC5
Sharon Graper (sgraper@holdenarb.org) and Rebecca Thompson (bthompson@holdenarb.org), The Holden Arboretum, Kirtland, Ohio
Partnering with an informal institution can help you put a cool spark into your curriculum. Learn new ways to teach energy transfer focusing on black bears in a real forest.

Moving Genes
(Grades 10–College) Garfield, Hyatt
Science Focus: LS1.A, LS3, SEP2
Pamela Petzel Snyder (psnyder5396@gmail.com), Fort Hayes Career Center, Columbus, Ohio

NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8
(Grades 6–8) Hayes, Hyatt
Science Focus: LS, PS, CCC, SEP
Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin
Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

“SCORE!” with Nonfiction Text and Inquiry-Based Science
(Grades K–5) McKinley, Hyatt
Science Focus: ESS, LS, SEP3
Kelli Shrewsberry (@Connect2TLC; kelli@teaching-learningcollaborative.org), Teaching & Learning Collaborative, Columbus, Ohio
“Ready, Text Set, Go...” Come dive into K–5 nonfiction
text and inquiry-based science to experience and explore the connections that can maximize student learning and deepen understanding. Learn how to access text sets aligning to grade levels across all science disciplines. Leave with a framework in which text sets can be developed.

INF

Taking STEM Outside

(Grades K–8)

Taft C, Hyatt

Science Focus: GEN, INF, NGSS

Sue Hemmelgarn Wintering (sue.wintering@dnr.state.oh.us), Project Learning Tree Ohio, Columbus

Debby Todd (dktodd1@icloud.com), Retired Educator, Delaware, Ohio

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.

Teaching the Water Cycle and Watersheds Using Hands-On Experiences and Online Tools

(Grades 6–College)

Taft D, Hyatt

Science Focus: ESS

Jason Cervenec (cervenec.1@osu.edu), Byrd Polar and Climate Research Center, Columbus, Ohio

Join me as I share five curriculum models created by the team under a grant from the National Science Foundation. Participants are encouraged to bring a laptop/tablet.

I See the Light! An Introduction to Basic Properties of Light

(Grades 1–8)

Union A, Hyatt

Science Focus: PS4

Mike McKee, University of Central Florida, Orlando

I’ll spotlight simple and fun lessons to teach light-based concepts that meet the NGSS. Join me for hands-on inquiry-based activities plus free materials, posters, and DVDs.

Inquiry Matters: Identify Unknown Liquids

(Grades 4–8)

Union B, Hyatt

Science Focus: PS1.A, CCC6, SEP3, SEP4, SEP6

Patricia Galvan (p_galvan@acs.org), American Chemical Society, Washington, D.C.

Conduct simple tests on four clear colorless household liquids to identify unknowns. Videos explain observations. Complete instructions will be provided and are available at www.inquiryinaction.org.

12:30–1:30 PM  Exhibitor Workshops

Constructing and Crossing Cell Membranes

(Grades 8–12)  B230/231, Convention Center

Science Focus: LS, PS, CCC, SEP

Sponsor: 3D Molecular Designs

Tim Herman and Gina Vogt (gina.vogt@3dmoleculardesigns.com), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Hook biology and chemistry students with models that demonstrate the chemical and physical properties of water and the membranes that separate cells from the surrounding environment. Use hands-on teaching tools to explore diffusion, osmosis, and the transmembrane proteins that facilitate the transport of polar molecules across the cell membrane.

Let’s Pick Our Brains

(Grades P–8)  B233/234, Convention Center


Sponsor: Nasco

Lainna Callentine, Sciexperience.com, West Chicago, Ill.

Roll up your sleeves and explore ways to experience science using hands-on activities that draw from many multiple intelligence styles. We will demonstrate using one of the most integral organs—the brain. Learn practical tips to make hands-on dissection come alive for your students regardless of the level. Enhance your projects with resources that students can create at home. Come let us pick our brains and peer into the ultimate multitaskers.

Hands-On Activities to Model Habitat Preference and Population Sampling

(Grades K–12)  C150, Convention Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Watch and learn! First you’ll create a terrestrial model to observe how pill bugs respond to habitat change. Then you’ll use inquiry to develop experiments to observe the habitat preference of bess beetles, millipedes, and other insects. This engaging workshop gives you new inquiry-based tools to nurture students’ curiosity.
Climate Proxies  
(Grades 9–12) C151, Convention Center  
Sponsor: LAB-AIDS®, Inc.  
Jennifer Boldt, Solon High School, Solon, Iowa  
How can scientists tell what Earth’s climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. We will analyze and graph samples of replicas of these organisms, and then determine relative warm and cold periods in the past 200,000 years. This activity is from EDC Earth Science, a new NSF-supported program from LAB-AIDS.

STEM-gineering  
(Grades 2–6) C160, Convention Center  
Science Focus: ETS  
Sponsor: Delta Education/School Specialty Science  
Kathy Armstrong, Northside Elementary School, Midway, Ky.  
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.  
Experience science lessons from Delta Science Modules that provide opportunities for students to be engaged in activities that incorporate Science, Technology, Engineering, and Math (STEM) and meet Technological Design Standards. Make and take prototypes, strategies, and other workshop materials.

Science Practices: What Does Argumentation Look Like in an Elementary Classroom?  
(Grades K–5) C161, Convention Center  
Science Focus: GEN  
Sponsor: Delta Education/School Specialty Science—FOSS  
Diana Velez and 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.

CPO’s Wind Turbine: A STEM Approach to Engineering and Design  
(Grades 6–12) C162, Convention Center  
Science Focus: ETS  
Sponsor: CPO Science/School Specialty Science  
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.  
Kat Mills, School Specialty Science, Rosharon, Tex.  
CPO’s Link™ Wind Turbine learning module lets students learn in a real-time digital platform and engineer a wind turbine. Students build, test, and revise their designs. Link uses STEM activities and an NGSS approach, giving students an understanding of how to apply the engineering cycle in science class.

What Is Amplify Science?  
(Grades K–8) C170, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Amplify  
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley  
Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley’s Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for NGSS, engages students as scientists and engineers to solve real-world problems.

Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA)  
(Grades 9–College) C171, Convention Center  
Science Focus: LS  
Sponsor: Edvotek Inc.  
Maria Dayton and Danielle Snowflack, Edvotek Inc., Washington, D.C.  
The spread of the Zika virus has led to a public health crisis in the Americas. While most infections are mild, the virus can contribute to birth defects and neurological problems. In this workshop, you will perform a quick, easy ELISA that simulates Zika testing. Free gift/raffle entry for attending!
12:30–5:30 PM  **Short Course**  
*Sowing the Seeds of Science: Using Plants as a Model to Teach Science Concepts (SC-2)*  
*Tickets Required: $35*  
*(Grades 6–12)*  
Arabidopsis Biological Resource Center  
Science Focus: ETS2, LS1, LS3, SEP  
**Courtney Price** (price.1217@osu.edu), **Diana Shin**, and **Julie Miller**, Arabidopsis Biological Resource Center (ABRC), The Ohio State University, Columbus  
For description, see page 30.  
*Note:* Please meet your leader at the High Street Entrance of the Convention Center 15 minutes prior to departure.

2:00–2:30 PM  **Exhibitor Workshop**  
*Now You See It, Now You Don’t*  
*(Grades 5–8)*  
Booth #841, Exhibit Hall  
Science Focus: ESS  
Sponsor: Science First®/StarLab®  
**Helmut Albrecht**, Science First/StarLab, Yulee, Fla.  
In this in-dome workshop, you will learn about solar and lunar eclipses.

2:00–3:00 PM  **Featured Presentation**  
*Climate Change: The Evidence, People, and Our Options*  
*(General)*  
B130, Convention Center  
Science Focus: ESS3.D  
**Ellen Mosley-Thompson**, Director, Byrd Polar and Climate Research Center, Columbus, Ohio  
**Lonnie Thompson**, Distinguished University Professor, Byrd Polar and Climate Research Center, Columbus, Ohio  
Presider: Kristie Reighard, Chairperson, NSTA Columbus Area Conference, and Delta High School, Delta, Ohio  
We will review the abundance of evidence of the global climate changes that are currently underway. Glaciers will be highlighted as both recorders and indicators of climate change. The natural and the human factors that drive these climate changes will be discussed. We will emphasize climate changes as they relate to human beings and consider why it has been challenging to implement the mitigation and adaptation strategies necessary to avoid the most severe threats to societies globally. We will highlight a few of the successful educational programs implemented by the Byrd Polar and Climate Research Center and conclude with a brief discussion of our options and the greatest challenges we will face in the 21st century.

Ellen Mosley-Thompson and Lonnie G. Thompson are both climate scientists at The Ohio State University (OSU) and they lead the Ice Core Paleoclimate Research Group at OSU’s Byrd Polar and Climate Research Center where Ellen is currently the director. Ellen is a Distinguished University Professor in OSU’s Atmospheric Science Program and Lonnie is a Distinguished University Professor in OSU’s School of Earth Sciences and a Senior Research Scientist at the Byrd Polar and Climate Research Center.

As paleoclimatologists, they use the chemical and physical properties preserved in Earth’s ice sheets, ice caps, and glaciers to reconstruct the climate history of our planet. To collect ice cores for their research, Ellen and Lonnie have conducted numerous field projects to some of Earth’s most remote parts, including Antarctica, Greenland, the Tibetan Plateau, the Russian Arctic, and the South American Andes among many others.

They have jointly received the Common Wealth Award for Science and Invention, the Dan David Prize, and the Benjamin Franklin Medal. Lonnie has received the National Medal of Science, the country’s highest award given for scientific accomplishments.
2:00–3:00 PM  Presentations

NARST-Sponsored Session: Imagery Support Strategies for Developing Dynamic Scientific Models with Students
(Grades 5–12)  B140/141, Convention Center
Science Focus: LS1, PS1, PS2, SEP
Norman Price (@Box886; nprice@educ.umass.edu) and Zach Holmboe, Amherst-Pelham Regional Middle School, Amherst, Mass.
Developing, evaluating, and revising scientific models is one of the eight science practices in the NGSS. We will discuss a set of imagery support strategies that you can use to promote this kind of model-based reasoning through the use of diagrams, simulations, and “mental movies.”

Leading from the Classroom
(General)  B142/143, Convention Center
Science Focus: GEN
Douglas Hodum (@DougHodum; dhodum@mtbluersd.org), NSTA Director, District II, and Mt. Blue High School, Farmington, Maine
During this session, you will have conversations and hear suggestions to help you feel empowered to either become a teacher leader or propel you further.

The Restoration of New York Harbor: Reconnecting Students to the Water
(Grades 6–8)  B144/145, Convention Center
Science Focus: LS
Denise McNamara, Retired Director of Science, Staten Island, N.Y.
Delve into the work that is being done in New York City middle school science classes in conjunction with the hands-on components that are taking place in New York Harbor.

Science and Literature: The Pitfalls and the Pendulum
(Grades 6–12)  B242/243, Convention Center
Science Focus: GEN, SEP8
Caryn Jackson (bjcj1980@yahoo.com), Tolles Career & Technical Center, Plain City, Ohio
Books can be used to introduce and expand scientific thinking. Advantages and potential hazards will be presented with suggestions for elementary, middle school, and high school grades.

Leveraging Technology to Teach a Hands-On/Minds-On NGSS-Focused Curriculum in a Digital Environment
(Grades 4–12)  B244/245, Convention Center
Science Focus: GEN, NGSS
Mark Yanisch, Whitefish Bay Middle School, Milwaukee, Wis.
Engage students in collaborative science practices adapting an NGSS-focused curriculum using Google and other technology for collaborative science practices, seamless assessment, and teacher efficiency.

Science Storytelling at the Heart of Integration
(Grades P–3)  Taft A, Hyatt
Science Focus: GEN, CCC, SEP1, SEP8
Char Shryock (@edtechgirl; char.shryock@bayschoolsohio.org), Bay Village (Ohio) City School District
Learn how to create your own stories as the starting point for integrating science, math, literacy, and arts. Hear some of mine and borrow my lessons!
2:00–3:00 PM  Hands-On Workshops
Science Facilities 102: The Architects Have Started Without Me—What Do I Do Now?
(General)  B240/241, Convention Center
Science Focus: GEN
LaMoine Motz (@lmotz@comcast.net), 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.
Juliana Texley (@JulianaTexley; texle1j@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
Is your district planning for new science facilities? Are you involved? If not, you need to get involved before it is too late. In an advanced course (an extension of the Science Facilities 101 session), the NSTA author team for NSTA Guide to Planning School Science Facilities (2nd ed.) will present more detailed information and examples of safe, ergonomically correct, and functional science facilities for STEM-based science. Budgeting, working with the architect, technology, and special adjacencies will also be presented, and a packet will be distributed.

Biological Machines: Bioengineering Activities for the Classroom
(Grades 3–College)  Ohio Center B/C, Convention Center
Science Focus: LS
Carrie Kouadio, University of Illinois at Urbana-Champaign, Urbana
Cutting-edge research on biological machines for use in health, security, and environment will inspire interest. Hands-on activities and ethics modules will engage your students. Visit www.ebics.net for more information.

Teaching Claims and Evidence Through PERC
(Grades 3–8)  Franklin A, Hyatt
Science Focus: GEN, NGSS
Meri Johnson (@Sci_Centers; merijohnson26@gmail.com), Curriculum Engineers, Inc., Batavia, Ohio
Amy Bain (amybain26@gmail.com), Clermont County Educational Service Center, Loveland, Ohio
The PERC strategy guides students through the process of learning science. PERC involves students in generating Preliminary ideas, collecting Evidence, incorporating Scientific Reasoning, and creating Claims that meet the rigorous expectations of new science assessments.

Engineering Happily Ever After
(Grades K–5)  Franklin B, Hyatt
Science Focus: ETS
Brian Bortz (@BrianBortz; bboord@cantoncountryday.org), Canton Country Day School, Canton, Ohio
Melinda Chase (melinda.chase@gmail.com), Hammontree & Associates, Limited, North Canton, Ohio
Use fairy tales to teach the engineering design process. The highlight is bridge building and a field trip with a professional engineer.

Sounds Like Fun
(Grades 1–5)  Franklin C, Hyatt
Science Focus: PS
Katrina Brown (kwb@pitt.edu), University of Pittsburgh at Greensburg, Pa.
Concepts such as longitudinal waves, frequency, and wavelength will be introduced and then explored through inexpensive, easy, and fun hands-on activities.

Connect Chemistry to Your World with ChemClub
(Grades 9–12)  Franklin D, Hyatt
Science Focus: PS, INF
Karen Kaleuati (@ACSChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, D.C.
The ACS ChemClub program provides fun and educational resources—all for FREE! Find out about the program, try out some of the activities, and take home a copy of the resources.

NSTA Press® Session: Argumentation in the Biology Science Classroom
(Grades 5–12)  Hayes, Hyatt
Science Focus: LS
Sharon Schleigh (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.
In this hands-on workshop, learn how to engage in scientific argumentation to support teaching in your classroom. Sample activities from the NSTA Press books provided.

Science Centers and Books, Oh My!
(Grades P–5)  Taft C, Hyatt
Science Focus: GEN, SEP1, SEP8
Loretta Harvey (@lwphd; lharvey@shawnee.edu), Shawnee State University, Portsmouth, Ohio
Jeradi Cohen (jeradicohen@mac.com), Marshall University, Huntington, W.Va.
We will share approaches to elementary science literacy centers based on state and national standards. Participants will interact with artifacts, materials, technology, and books.
Thursday, 2:00–3:00 PM

2:00–3:00 PM  Exhibitor Workshops
Flinn Scientific’s Exploring Chemistry™: Connecting Content Through Experiments
(Grades 9–12)  B131/132, Convention Center
Science Focus: PS1, PS2, PS3
Sponsor: Flinn Scientific, Inc.
Mike Marvel (mmarvel@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Join us as we present interactive activities and demonstrations that showcase the features and benefits of our Exploring Chemistry line of kits! We will highlight integrated lab and learning activities for some of the major topics in your chemistry curriculum! These experiments, demonstrations, and POGIL™ activities ensure that students really understand the concepts and get a glimpse of the underlying simplicity and beauty of chemistry!

The Many Jobs of Proteins: Enzymes in the Spotlight
(Grades 8–College)  B230/231, Convention Center
Science Focus: PS, CCC, SEP
Sponsor: 3D Molecular Designs
Tim Herman and Gina Vogt (gina.vogt@3dmoleculardesigns.com), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Use 3-D physical representations to 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 specific class of proteins—enzymes—to introduce the concepts of substrate, active site, specificity, and competitive/noncompetitive inhibition.

STEM Literacy: Strategies for Making Complex Text Meaningful
(Grades K–12)  B233/234, Convention Center
Science Focus: GEN, NGSS
Sponsor: Accelerate Learning–STEMscopes
Terry Talley, Accelerate Learning–STEMscopes, Houston, Tex.
Join us as we learn the power of using close reading strategies to engage students in reading, writing, and discussing the science text in collaborative groups, which can lead to student mastery and high achievement. Build the capacity for scientific literacy success in your STEM classroom!

Designing Bridges: Math, Materials, and Methods
(Grades 9–12)  Taft D, Hyatt
Science Focus: ETS, SEP2, SEP4, SEP5, SEP6
Briana Richardson, Washington High School, Washington Court House, Ohio
Add more math and engineering to bridge projects. Build simple bridges, use composites, test breakage force, and use Young’s modulus to predict best design choices.

Squirmy Science
(Grades 6–8)  Union B, Hyatt
Science Focus: LS2, CCC4, SEP2, SEP6, SEP7, SEP8
Kelly Gaier Evans (@kellymgaier; gaierk@battelle.org), Battelle Education, Columbus, Ohio
Claire Hampel (@MissHampel; hampel@themetroschool.org), Metro Early College Middle School, Columbus, Ohio
Engineers have to balance resources and client requirements while clearly communicating. Put on your engineering cap for this project that builds science and literacy skills.

Studying Climate Change and Forest Ecosystems: A Systems Approach
(Grades 6–College)  Union C, Hyatt
Science Focus: ESS
Sue Hemmelgarn Wintering (sue.wintering@dnr.state.oh.us), Project Learning Tree Ohio, Columbus
Debby Todd (dktodd1@icloud.com), Retired Educator, Delaware, Ohio
Join us to explore patterns and relationships between climate change and terrestrial ecosystems using recent, scientific, and U.S.-based forest data. Walk away with multiple classroom-ready lessons!
We believe teachers are the real miracles of modern science.

Teachers get up every morning knowing they have the potential to change the world – just by showing up in the classroom and inspiring a love of science. Yes, they may feel overworked and even underappreciated. But by some miraculous feat, they remain true to their mission, touching the lives of students by imparting the gifts of knowledge and curiosity. We know. Because Carolina equips them for the task.

Learn more about our commitment at www.carolina.com/withyou
Integrating Literacy and Science—The Wow Factor
(Grades P–5)  B235, Convention Center
Science Focus: GEN, SEP7
Sponsor: Activate Learning
Ellen Mintz, Charleston County School District, Charleston, S.C.
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.”

Waves, Waves, Waves: Building Models to Explain Phenomena
(Grades K–5)  C150, Convention Center
Science Focus: PS4
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
The phenomena of waves can be explained by children through model building. Explore examples of how elementary students can share their learnings of how waves work through modeling. Discover how the new Carolina Building Blocks of Science leads to student success in only 30 minutes a day.

Chemical Batteries
(Grades 6–8)  C151, Convention Center
Sponsor: LAB-AIDS®, Inc.
Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.
Although we live a battery-powered lifestyle, most of us (students included) have no idea how batteries actually work. In this hands-on workshop, we will engage in an activity from Issues and Physical Science from LAB-AIDS. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.

Increase Your 3-D Vision of NGSS
(Grades 3–5)  C160, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Experience lessons from Delta Science Modules that incorporate the three dimensions of the NGSS. Tackle argumentation embedded in the session. Receive a corresponding content reader, strategies, and resources that you can take back and use with your students next week.

What Does Conceptual Modeling Look Like in an Elementary Classroom?
(Grades K–5)  C161, Convention Center
Science Focus: PS
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 explore how students construct models within the context of physical science. Experience strategies within an active investigation to create and refine models about matter. Find out how student models can be used to guide future instruction within the FOSS program.

Building Electric Circuits with CPO’s New Link™ Learning Module
(Grades 6–12)  C162, Convention Center
Science Focus: ETS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosarhon, Tex.
The new CPO’s Link Electric Motor learning module is a STEM- and NGSS-based 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.

Using Biotechnology to Diagnose HIV/AIDS
(Grades 9–College)  C171, Convention Center
Science Focus: LS
Sponsor: Edvotek Inc.
Danielle Snowflack and Maria Dayton, Edvotek Inc., Washington, D.C.
The Human Immunodeficiency Virus (HIV) causes acquired immune deficiency syndrome (AIDS), a serious disease that suppresses a patient’s immune system, leaving them susceptible to infections. In this simulation, we’ll perform two common tests (western blot, ELISA) used by doctors to diagnose an HIV infection. Attendees receive a free gift!
Osteopathic Physicians 102: Helping Teachers Understand the Profession
(Grades 8–College) C172, Convention Center
Science Focus: GEN
Sponsor: American Association of Colleges of Osteopathic Medicine
Nicole Daniels (ndaniels@aaom.org), American Association of Colleges of Osteopathic Medicine, Chevy Chase, Md.
Jill Harman, Ohio University Heritage College of Osteopathic Medicine, Athens
Gain insight into the role of Doctors of Osteopathic Medicine (DO) and what medical school admissions committees seek and assess in applicant files. This session will provide an overview of the profession, application process, and tips for helping students build their applications and gain health care–related experiences in high school.

2:30–3:00 PM Presentation
Connecting the Dots: Science and Technology as Your Tool
(Grades 6–College) B232, Convention Center
Science Focus: PS, SEP
Kelly Nyzen (@knyzen; knyzen@yahoo.com), Nordonia High School, Macedonia, Ohio
Emphasis will be placed on online learning resources. I will demonstrate how using these tools has turned my chemistry classroom into more of a student-centered and self-paced blended learning environment.

3:30–4:00 PM Presentations
A Practical Tool for Motivating Students to Design Solutions to Real-World Challenges at the Intersection of Science and Society
(Grades 6–7) B142/143, Convention Center
Brenda Bergman (bgbergma@mtu.edu), Jacqueline Hunt- oon, Stephanie Tubman (@sctubman; scubman@mtu.edu), Douglas Oppliger, Emily Gochis, Christopher Wojick, Luke Bowman, Amy Lark, and Barbara McIntyre (mcintyrebe274@gmail.com), Michigan Technological University, Houghton
We will show how the Decision Matrix tool can be used in your classroom to help students design solutions to real-world challenges while addressing engineering and science performance expectations. Examples shared include challenges related to Changing Ecosystems and Sustainable Building Materials.

Partnership Enhancement Projects: Creating Teacher Leaders in Science Education
(Grades 5–12) B232, Convention Center
Science Focus: GEN
Merryn Cole (merryncole@gmail.com) and Jennifer Wilhelm (jennifer.wilhelm@uky.edu), University of Kentucky, Lexington
We provide an overview of Partnership Enhancement Projects, where districts used micro-investments to create bottom-up solutions to address issues in science and mathematics education.
Thursday, 3:30–4:30 PM

3:30–4:30 PM  Presentations

NMLSTA-Sponsored Session: Calling All Middle Level Teachers
(Grades 5–9)  B140/141, Convention Center
Science Focus: GEN
Mary Lou Lipscomb (mllscience@aol.com), NMLSTA President, Naperville, Ill.
Rebecca Haub Knipp, Retired Educator, West Harrison, Ind.
The National Middle Level Science Teachers Association is an organization devoted to middle level science education. Join us to learn about NMLSTA membership opportunities.

Lotions, Potions, and Scrubs: Polymer Science in Cosmetics
(Grades 6–12)  B144/145, Convention Center
Science Focus: PS, CCC, SEP
Sherri Rukes (@SherriRukes; sherri.rukes@d128.org), Libertyville High School, Libertyville, Ill.
Examine the various chemicals and chemistry behind some of their most common cosmetic products. Learn how to make various cosmetics as well as the polymer science behind them. Handouts!

INF Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content
(Grades 6–12)  Ohio Center B/C, Convention Center
Donna Young (dlyoung.nso@gmail.com), Chandra X-Ray Center, Bullhead City, Ariz.
National Science Olympiad regional, state, and national competitions include STEM events and supporting resources that are easily incorporated into existing curricula to actively engage students.

NSTA Press® Session: Uncovering K–16 Students’ and Teachers’ Ideas Using Familiar Phenomena
(General)  Hayes, Hyatt
Science Focus: GEN, NGSS
Page Keeley (@CTSKeley; pagekeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.
Learn how the Uncovering Student Ideas in Science formative assessment probes elicit students’ and teachers’ initial ideas about everyday phenomena and engage them in constructing explanations using disciplinary core ideas and crosscutting concepts.

Embedded Assessment: Making Instructional Activities Opportunities for Formative Assessment
(Grades K–8)  Taft B, Hyatt
Science Focus: GEN, NGSS
Lauren Brodsky, The Lawrence Hall of Science, University of California, Berkeley
Explore techniques and work through examples of how to build formative assessment opportunities into students’ learning experiences without stopping the flow of instruction.

Solids: The Neglected “State” of Chemistry
(Grades 9–12)  Union B, Hyatt
Science Focus: PS1.A, CCC6
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymers/ceramics) make concepts easier to teach/learn. Pick up NGSS correlations and a CD of information.
3:30–4:30 PM  Hands-On Workshops

**Evolution for Educators**
(Grades 6–8)  B240/241, Convention Center
Science Focus: LS4
Bertha Vazquez (@rdfrsTIES; bertha@richarddawkins.net), Richard Dawkins Foundation for Reason and Science, Coral Gables, Fla.
The Teacher Institute for Evolutionary Science was founded to help teachers teach evolution by providing free resources on our website and conducting free workshops nationwide. Our latest project, TIES Partnerships, seeks to connect science teachers with biologists in their area who are willing to come and speak to classes about evolutionary biology.

**Activities for the Anthropocene**
(Grades 6–12)  B246, Convention Center
Karen Daugherty, Ohio Dept. of Education, Columbus
Combine history and environmental science in this hands-on workshop exploring how humans have shaped Earth and the oceans and atmosphere since the Industrial Revolution.

**How to Incorporate Math and Literacy in K–6 Active-Learning NGSS Activities**
(Grades P–5)  Franklin A, Hyatt
Science Focus: ETS1, PS1.A, PS2.C, CCC1, CCC2, CCC3, CCC4, CCC7, SEP
Bruce Patton (patton.1@osu.edu) and Andrew Dougherty, The Ohio State University, Columbus
Jackie Thase (@ttbeeps; thasej@piqua.org) and Jennifer Everett (@je_indians; everettj@piqua.org), Springcreek Primary School, Piqua, Ohio
Hands-on inquiry activities model Ohio and NGSS learning progressions on K–6 math and science content using literacy and math skills to reason, communicate, and explain.

**Human-Centered Engineering Design: The Key to STEM**
(Grades 6–College)  Franklin B, Hyatt
Science Focus: ETS1, INF, CCC, SEP
Jean Trusedell (jtrusede@purdue.edu), Purdue University, West Lafayette, Ind.
Engaging middle school and high school students in engineering through service learning is the focus of this hands-on interactive workshop that explains the EPICS engineering design process. EPICS stands for Engineering Projects in Community Service.

**“Blooming” Children: Focusing On Kindergartners’ Natural Curiosity and Learning Capacities Through Science**
(Grades P–2)  Franklin C, Hyatt
Science Focus: ETS1.A, ETS1.B
Pam Vernot (@manywaystogrow; vernotpam@gmail.com), Hamilton (Ohio) City School District
Wonder and curiosity are natural to children. Promoting science inquiry allows for interdisciplinary connections. Experience science and engineering projects that provide relevance to young learners.

**ASTE-Sponsored Session: Citizen Science: Argumentation and Modeling Safe Traffic Intersections**
(Grades 6–College)  Harrison, Hyatt
Science Focus: GEN, SEP2, SEP4, SEP7
Matthew Perkins Coppola (@ajediphysics; matthewperkins@hotmail.com), Indiana University–Purdue University Fort Wayne
Students use simple kinematics to build mathematical models to evaluate traffic intersection safety, and then collect data from their community to write an argumentative paper.

**Force and Motion—Deeper and Cheaper**
(Grades 4–9)  Taft C, Hyatt
Science Focus: PS2, PS3.B, SEP
Gene Easter (gleaster@sbcglobal.net), Retired Educator, Tallmadge, Ohio
Experience a research-based learning progression to teach force and motion using cheap and familiar materials. Learn to “teach the laws for less” and leave with effective and captivating activities and strategies.

**Elementary Food Chemistry**
(Grades P–6)  Union A, Hyatt
Science Focus: GEN, NGSS
James Warner, Wexner Medical Center, Columbus, Ohio
Create an appetite for science by having your students learn about chemical reactions using common foods through heat, manipulation, and how time and temperature makes foods taste great.

**Building STEM into the Science Classroom**
(Grades 6–9)  Union C, Hyatt
Science Focus: PS2
Ann Haley Mackenzie (@annmackenzie; mackenah@miamioh.edu), Miami University, Oxford, Ohio
Let’s get together to engage in two design activities that involve force, motion, and stresses involved in construction. Alternative assessments and equity strategies will be addressed.
3:30–4:30 PM Exhibitor Workshops

Group Work: Using Student Collaboration in the Middle School Science Classroom
(Grades 6–9) B131/132, Convention Center
Science Focus: GEN, SEP7, SEP8
Sponsor: AEOP eCYBERMISSION
Grades 6–9 students either love or loathe the idea of working in a group. The science and engineering practices in the NGSS involve students collectively in making sense of the world around them by working in groups—plus group work enhances learning for all students. We will cover aspects of quality group work and how it can be beneficial to the middle school science class through hands-on activities. Discussion includes how the online STEM competition eCYBERMISSION sets up and uses groups for investigations.

Zombie Apocalypse!
(Grades 6–12) B230/231, Convention Center
Science Focus: GEN
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Be part of a zombie apocalypse! Learn about disease spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens
(Grades 9–12) C150, Convention Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Come show us your surgical skills while experiencing the superior quality of Carolina’s Perfect Solution specimens! Participants dissect a sheep brain, cow eye, pig heart, or pig kidney and observe internal and external structures. Use this excellent comparative dissection to gain a better understanding of these mammalian organs.

Reclaiming the Metal
(Grades 6–8) C151, Convention Center
Science Focus: PS1.B, CCC5, SEP3, SEP7
Sponsor: LAB-AIDS®, Inc.
Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.
In this activity from the SEPU P middle level physical science program, participants role-play a scenario involving the pretreatment of copper containing liquid wastes from a computer circuit board manufacturer. They 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.

Liven Up Literacy with Science
(Grades K–5) C160, Convention Center
Science Focus: GEN, NGSS
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Use science to put some enthusiasm into your literacy program. Experience engaging lessons from Delta Science Modules that incorporate literacy skills. Receive a corresponding content reader, strategies, and resources that you can take back and use with your students next week.

Evolutionary Evidence in the Fossil Record: Life Science with FOSS
(Grades 6–8) C161, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Edition Heredity and Adaptation Course for Middle School, and identify connections to the three dimensions of NGSS.

CPO Science’s Link™ Module: Learning About Chemistry Models
(Grades 6–12) C162, Convention Center
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Kat Mills, School Specialty Science, Rosarhon, Tex.
CPO’s new Link Chemistry Models module is an NGSS approach that lets students experience innovative activities to learn about atomic structure and the periodic table. We’ll use a digital learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity.
Environmental Toxicology Using Edvotek’s New EZ-elegans  
(Grades 8–College)  
C171, Convention Center  
Science Focus: LS  
Sponsor: Edvotek Inc.  
Danielle Snowflack and Maria Dayton, Edvotek Inc., Washington, D.C.  
Model organisms allow scientists to investigate biological questions that cannot be studied in humans. Learn how Edvotek’s EZ-elegans simplifies culturing C. elegans in your classroom. Then, explore effects of environmental factors on C. elegans using a simple locomotion assay. Integrate STEM concepts with data collection and statistics. Freebie/raffle entry for attending!

HMH’s Virtual Reality Field Trips: Google Expeditions  
(Grades K–12)  
C172, Convention Center  
Science Focus: GEN, SEP1, SEP6  
Sponsor: Houghton Mifflin Harcourt  
Taking students on a virtual reality trip under the sea, to Mars, or through the digestive system is a very easy way to engage them. However, beyond the “WOW!” factor of virtual reality, you need to be able to use Google Expeditions as a true learning experience. Join us to experience virtual reality science field trips and learn how to use them to effectively instruct and enhance learning.

4:00–4:30 PM Presentations

INF  
Science Outside—No Box Needed  
(Grades 5–10)  
B142/143, Convention Center  
Science Focus: INF  
Christina Porn, Science Consultant, Erie, Colo.  
Learning does not need to happen only in a classroom. Spark interest for science outside the classroom by providing unique experiences. Get the most out of your field trips by focusing on the pre- and post-trip experience.

INF  
Connecting Students with Local Environmental Scientists and Engineers  
(Grades 6–12)  
B232, Convention Center  
Science Focus: INF, SEP8  
Carolyn Watkins (carolyn.watkins@epa.ohio.gov), Ohio Environmental Protection Agency, Columbus  
Jennifer Dennison (@OhioWILDed; jen.dennison@dnr.state.oh.us), Ohio Dept. of Natural Resources, Columbus  
Access 400 Ohio environmental professionals volunteering as Environmental Career Ambassadors, with interactive classroom career exploration activities—or learn how to build a similar partnership in your state.

4:00–5:00 PM Meeting

Central Michigan University Doctor of Education Technology Meeting  
Nationwide B, Hyatt  
Central Michigan University, a top provider of online programs, is offering an online Doctor of Educational Technology degree program. Come to this meeting for more information.

5:00–6:00 PM Presentation

INF  
Nurturing Curious Minds: Exploring the Science Encountered in the Young Child’s World and Inspiring Sustained Curiosity, Interest, and Learning  
(Grades P–2)  
Franklin A, Hyatt  
Science Focus: GEN, NGSS  
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.  
Come learn how to create opportunities for children to explore and manipulate materials and variables, and to examine the myriad examples of science in their everyday world. Ignite curiosity and a love of science!
5:00–6:00 PM  Hands-On Workshops

Are You MoBIliSE’d? Modeling Biology Instruction: Leaders in Science and Engineering
(Grades 7–12)  Franklin B, Hyatt
Science Focus: LS1, SEP2, SEP3, SEP4, SEP7, SEP8
Kristina Newman (knewman3118@gmail.com), Swanton High School, Swanton, Ohio
Kathy Malone (klmalone60@gmail.com), The Ohio State University, Columbus
Jessica Dorman (@dorman_napls), New Albany High School, New Albany, Ohio
Join us to engage in a hands-on biomodeling activity designed by secondary school educators as part of a NGSS-focused modeling instruction–based biology curriculum.

Sink into Science at Stone Lab
(Grades 5—College)  Franklin D, Hyatt
Science Focus: GEN, INF
Lyndsey Manzo (@LyndseyManzo; @StoneLab; manzol@wcsoh.org), The Ohio Sea Grant College Program, Columbus
Angela Greene (@AngelaGreene12; @StoneLab; angela.greene@tecumsehlocal.org), Tecumseh Local Schools/Ohio Sea Grant, New Carlisle
Dive into curricula and professional development opportunities offered by Stone Laboratory and Ohio Sea Grant that foster inclusion of Great Lakes science into K–12 classrooms.

NSTA Press® Session: Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12
(Grades 9–12)  Hayes, Hyatt
Science Focus: PS, CCC, SEP
Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin
Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

Great Big Gobs of Green Goo: Water Quality and Hazardous Algae Blooms
(Grades 9–12)  Taft C, Hyatt
Science Focus: LS, CCC, SEP
Heather Bryan (@GrowNextGen; @OH_EPP; @Ohio-soycouncil; @HBryanfarms; heather@educationprojects.org), Education Projects & Partnerships, LLC, Columbus, Ohio
Understand the science behind hazardous algae blooms, test water quality factors, study cultural eutrophication data, and consider how agriculture is part of the solution.
Destination: Success® is a unique educational platform that assists students with discovering their “perfect fit” career in the sciences or health professions. USciences is uniquely positioned with the academic programs, faculty, and resources to support students as they follow their path.

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

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

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

To learn more, visit usciences.edu/DestinationSuccess/NSTA
A 47-story Art Deco–style building built in 1924, the LeVeque Tower was added to the National Register of Historic Places in 1975. Known for its bright and elaborate lighting, its hues frequently signal special occasions and events.
**8:00–8:30 AM Presentations**

**STEM in the Park: Advancing STEM Education for People of All Ages**

(General) Franklin D, Hyatt

Science Focus: INF, SEP

**Emilio Duran** (eduran@bgsu.edu), Bowling Green State University, Bowling Green, Ohio

**Lena Duran** (ballone@bgsu.edu) and **Jenna Pollock** (@jennaleep13; jpolloc@bgsu.edu), Bowling Green (Ohio) City Schools

STEM in the Park is a free community event that features STEM activities facilitated by higher education institutions, preK–12 educational agencies, community nonprofit organizations, and local businesses.

**8:00–9:00 AM Presentations**

**Authors Needed! Publish Your Teaching Idea in an NSTA Journal**

(General) B140/141, Convention Center

Science Focus: GEN

**Ken Roberts** (ken_r@nsta.org), Assistant Executive Director, Journals, NSTA, Arlington, Va.

Learn how to successfully prepare and submit an article for publication in an NSTA journal.

**Strengthen Your STEM Lessons with NSTA High School Committee Activities**

(Grades 8—College) B142/143, Convention Center

Science Focus: GEN, SEP

**Carrie Jones** (ncscienceteacher@yahoo.com), NSTA Director, High School Science Teaching, and Middle Creek High School, Apex, N.C.

A variety of lessons and activities will be presented to enrich your current curricula, connecting with the NGSS science and engineering practices. Resources available online.

**Nanoengineering with DNA Origami**

(Grades 9—College) B144/145, Convention Center

Science Focus: LS

**Michael Hudoba**, The Ohio State University, Columbus

DNA origami enables the precise fabrication of nanoscale geometries, such as Ohio State’s Script Ohio, and nanoscale mechanical devices with controllable motion for application in biosensing, molecular robotics, smart materials, and nanomanufacturing.

**Starting an Elementary Robotics Club—It’s Easy!**

(Grades 1—5) Taft B, Hyatt

Science Focus: ETS, INF

**Kara Crowley** (kara.crowley@swcsd.us), Darby Woods Elementary School, Galloway, Ohio

Find out how easy it can be to start a Robotics Club at your elementary school!
**STEM Projects for the Science Classroom**  
*(Grades 4–12)*  
*Harrison, Hyatt*

Science Focus: GEN, NGSS  

**DJ West,** Schoolcraft College, Livonia, Mich.

Two of the problems with integrating STEM into the science or math classroom are the lack of intentionality and finding great ideas. Discussion centers on what makes a good STEM project, as well as different projects for the science classroom that intentionally include all areas of STEM.

**NSTA Press® Session: Uncovering Elementary Students’ Ideas About Science Through Literacy Capacities**  
*(Grades K–5)*  
*Hayes, Hyatt*

Science Focus: GEN, NGSS  

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

Experience examples of formative assessment probes and techniques that uncover what students really think about NGSS concepts and core ideas in science through the use of the literacy capacities of speaking, listening, and language.

**NESTA Shares: Innovative Ways to Teach About Earth’s Place in the Universe**  
*(Grades 7–12)*  
*Regency Ballroom, Hyatt*


NESTA members will share a variety of strategies to enhance your studies of astronomy to help implement NGSS and network your school.

**INF Sing for the Planet**  
*(Grades 3–8)*  
*Taft A, Hyatt*

Science Focus: GEN, INF  

**Juliana Texley** (@JulianaTexley; textlej@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Celebrate connections with the Grammy award–winning music of Pete Seeger and the Rivertown Kids, nine free films, and support materials on citizen science.

**INF Science Learning at Your Window!**  
*(Grades K–8)*  
*Union E, Hyatt*

Science Focus: LS, INF  

**Kathleen Dougherty,** Media Specialist, Naples, Fla.

Come get a free window bird feeder and discover how it can attract birds and student interest! Take home activities to teach science content through birds.

**8:00–9:00 AM Hands-On Workshops**

**Bringing Students Back to Earth: An Inquiry Approach to a Middle School Earth Science Unit**  
*(Grades 7–8)*  
*Presider: Gordon Aubrecht (aubrecht.1@osu.edu), The Ohio State University at Marion*

Science Focus: ESS  

**Amy Kimmel** (amy.kimmel@swcsd.us) and **Melanie Retterer** (melanie.retterer@swcsd.us), Brookpark Middle School, Grove City, Ohio

**Mollie Kountz** (mollie.kountz@swcsd.us), Jackson Middle School, Grove City, Ohio

**Christine Pegg,** Finland Middle School, Columbus, Ohio  
**Taylor Wharton** (taylor.wharton@swcsd.us) and **Kathleen Wheeler** (@KatMWheeler; kathleen.wheeler@swcsd.us), Pleasant View Middle School, Grove City, Ohio

Presider: **Gordon Aubrecht** (aubrecht.1@osu.edu), The Ohio State University at Marion

Participate in learning segments focused on grade 8 Earth science content standards. The student-driven instruction includes constructing models and analyzing evidence.

**Teach an Old Dog New Tricks: Engaging Older Students in STEM**  
*(Grades 9–12)*  
*Ohio Center B/C, Convention Center*

Science Focus: ESS, SEP  

**Karen McDonough,** Batavia High School, Batavia, Ohio

Older students with limited science background may be resistant to STEM. Explore how to engage them and lead them to successfully completing an engineering project.

**Zombies Don’t Stand a Chance Against STEM!**  
*(Grades 6–College)*  
*Ohio Center B/C, Convention Center*

Science Focus: GEN  

**Jeffrey Lukens** (jeffrey.lukens0613@gmail.com), Sioux Falls (S.Dak.) School District

Use the “Zombie Craze” to make STEM become “undead” in your science classroom! This is not only a hands-on session, but a brains-on session, as well!

**Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades**  
*(Grades P–3)*  
*Franklin A, Hyatt*

Science Focus: ESS1, ESS2, ETS1, PS2, PS3, PS4  

**Jeffrey Dudukovich** (jeffrey.dudukovich@ocps.net), Liberty Middle School, Orlando, Fla.

Get ready to try an original hands-on approach to teaching fundamental scientific concepts in a way that students will remember forever! Prizes awarded!
Implementing the Engineering Design Process in Your Classroom
(Grades 7–College) Franklin B, Hyatt
Science Focus: ETS1, SEP6
Patrick Herak, Local Arrangements Coordinator, NSTA Columbus Area Conference, and The Ohio State University, Columbus
Audrey Nguyen, The Ohio State University, Columbus
The engineering design process is iterative and can explicitly teach problem-solving skills. We will address all five steps in the design process (define, represent, plan, implement, and evaluate) with an emphasis on two often skipped steps, represent and evaluate.

Fun with Ethanol! Engineering Design in the Classroom!
(Grades 6–12) Grant, Hyatt
Science Focus: ETS1, SEP1, SEP3, SEP4, SEP5, SEP7
Heather Bryan (@HBryanfarms; @OH_EPP; @Ohio-CornWheat; heather@educationprojects.org), Education Projects & Partnerships, LLC, Columbus, Ohio
Let’s create ethanol! Use the engineering design process to determine the best feedstocks, enzyme usage, and fermentation rates for ethanol production. Free fuel tester kit!

ASTE-Sponsored Session: Tech Tools for Taking Your Secondary Science Class to the Next Level
(Grades 7–12) Taft C, Hyatt
Science Focus: GEN, NGSS
Lisa Borgerding (@LisaBorgerding; ldonnell@kent.edu), Kent State University, Kent, Ohio
Trevor Smith (@MrSmith4Science; smith.t.denison@gmail.com), Argenta-Oreana High School, Argenta, Ill.
Taylor Voelker (@TSchildy19; taylor.voelker@newburyschools.org), Newbury High School, Newbury, Ohio
Join us as we demonstrate our favorite simulations, social media tools, apps, and other technology for engaging, assessing, and enriching our secondary science students.

ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State
(Grades 6–8) Union C, Hyatt
Science Focus: PS1.A
James Kessler and Patricia Galvan (p_galvan@acs.org), American Chemical Society, Washington, D.C.
Explore solids, liquids, gases, and changes of state through hands-on activities and molecular animations from the free completely developed 5E lesson plans available at www.middleschoolchemistry.com.

ASEE Session: ASEE’s K–12 Outreach: Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, the National Science Digital Library, and UC Project STEP
(General) Union D, Hyatt
Science Focus: ETS
Andrea Burrows (@SciEdBurrows; aburrow1@uwyo.edu), University of Wyoming, Laramie
The American Society for Engineering Education’s (ASEE) K–12 division introduces teachers to electronic resources and innovative engineering for the K–12 classroom.
8:00–9:00 AM  Exhibitor Workshops

**Flinn Scientific’s STEM Design Challenge™ “Build-It-Yourself” Lab Project**  
*(Grades 7–12)*  
*[B131/132, Convention Center]*

Science Focus: ETS1, LS4, PS1, PS2, PS3, SEP  
Sponsor: Flinn Scientific, Inc.

Janet Hoekenga (jhoekenga@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.

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

**Let’s Get Helical: Exploring DNA Structure and Function with Physical Models**  
*(Grades 9–College)*  
*[B230/231, Convention Center]*

Science Focus: LS, CCC  
Sponsor: 3D Molecular Designs  
Tim Herman and Diane Munzenmaier (munzenmaier@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

DNA can be viewed as a macromolecule or a source of genetic information. Explore both features with interactive DNA models and a paper bioinformatics exercise focusing on the beta subunit of hemoglobin. Examine the mutation that leads to sickle cell disease and the regulation of fetal and adult hemoglobin expression.

**Building the Skills of Argumentation and Collaboration in STEM**  
*(Grades K–12)*  
*[B233/234, Convention Center]*

Science Focus: GEN, SEP7  
Sponsor: Accelerate Learning–STEMscopes  
Terry Talley, Accelerate Learning–STEMscopes, Houston, Tex.

“Engaging in argument from evidence” is a practice of scientists and engineers that is a vital part of a STEM classroom. Join us in this interactive workshop where we will model protocols and structures that you can use for successful implementation of consensus building and evidence-based argumentation in your classroom.

**Discourse Tools for Equitable and Rigorous Talk**  
*(Grades 5–8)*  
*[B235, Convention Center]*

Science Focus: GEN, SEP8  
Sponsor: Activate Learning  
Heather Milo, Activate Learning, Greenwich, Conn.

The Framework promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires all members to articulate, make sense of, and evaluate each other’s ideas, making discourse tools vitally important. Walk away with ready-to-use tools that foster productive talk around big science ideas!

**Bring Visual Science into K–5 Classrooms—It’s a Game Changer!**  
*(Grades K–5)*  
*[C150, Convention Center]*

Science Focus: GEN  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner

Spark student interest and improve outcomes! Master teacher Harvey Bagshaw demonstrates engaging science instruction using Tigtag Science real-world STEM videos, interactive content, and a hands-on activity. Harvey’s blend of compelling online learning tools with hands-on fun is guaranteed to delight you and your students! "Watch out! It might get messy."

**Waves**  
*(Grades 6–8)*  
*[C151, Convention Center]*

Sponsor: LAB-AIDS®, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Although we live an EM waves–enabled lifestyle, most of us (students included) have no idea how they work. Join LAB-AIDS for a new middle level NGSS-based waves activity from SEPUP’s Issues and Physical Science program. Explore light properties by investigating colors of the visible spectrum and their energy levels using phosphorescent material. Activities exemplify the NGSS and show how SEPUP embeds the research-based practices and real issues to deliver powerful content learning.
Where big ideas become the next big thing.

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

The National Inventors Hall of Fame provides educators the strategies and environment necessary to nurture curiosity into big ideas through STEM-based curricula in an out-of-school time setting.

Programs for pre-K through 9th grade students.

800.968.4332 | invent.org/inspire

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

**Come visit us at booth #1038!**
Beak of the Finch: Natural Selection and Darwin’s Finches  
(Grades 9–12)  
C160, Convention Center  
Science Focus: LS3  
Sponsor: HHMI BioInteractive  
Chris Monsour, Columbian High School, Tiffin, Ohio  
Participants will explore the classroom-ready resources that complement *The Origin of Species: The Beak of the Finch*. By following four decades of research on the finches of the Galápagos Islands, the film with accompanying resources illustrates how geography and ecology can drive the evolution of new species.

Using Problem-Based Learning to Up Your NGSS Game  
(Grades 9–College)  
C161, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Pearson  
Michael Padilla, 2005–2006 NSTA President, and Professor Emeritus, Clemson University, Clemson, S.C.  
The NGSS seeks to incorporate more scenario-based and Problem-Based Learning. To help prepare students in school and beyond, students need to be doing science and seeing how it fits into their daily lives. Join Pearson author Mike Padilla as he brings PBL into the science classroom to help prepare students for future science and technology careers.

Modeling Climate Change Impacts: Dissolving Carbon Dioxide  
(Grades 9–12)  
C162, Convention Center  
Science Focus: ESS3, PS  
Sponsor: PASCO scientific  
Brett Sackett, PASCO scientific, Roseville, Calif.  
Rising temperatures are not the only impact of increased CO₂ emissions. Earth’s oceans have acted as a buffer by dissolving excess CO₂ into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO₂ using the wireless pH sensor and experience how easy inquiry can be.

What Is Amplify Science?  
(Grades K–8)  
C170, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Amplify  
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley  
Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley’s Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for NGSS, engages students as scientists and engineers to solve real-world problems.

Integrating Chromebook with Vernier Data-Collection Technology  
(Grades 3–12)  
C171, Convention Center  
Science Focus: GEN, SEP3, SEP4  
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. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country  
(Grades 9–College)  
C172, Convention Center  
Science Focus: LS  
Sponsor: Bio-Rad Laboratories  
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.  
Disease can spread like wildfire through populations. In this hands-on workshop you will assume the role of an epidemiologist and use an ELISA assay to track viruses like HIV, Ebola, Zika, and SARS. See if you can find patient zero.
8:00–10:00 AM  Hands-On Workshops  

**AAPT Session: Pedagogy for Conceptual Retention: Modeling Instruction in Science**  
(Grades 9–12)  
Union A, Hyatt  
Science Focus: PS, SEP2, SEP4, SEP5, SEP8  
Mary Whalen (@marybwhalen; mary_whalen@olsd.us), Olentangy High School, Lewis Center, Ohio  
Douglas Forrest (@PickPhysics; doug_forest@plsd.us), Pickerington High School North, Pickerington, Ohio  
Matthew Kennedy (@PickPhysics; mkennedy@fuchsmizrachi.org), Fuchs Mizrachi School, Beachwood, Ohio  
Brian Carpenter (@physicscarp), Laurel School, Shaker Heights, Ohio  
Get a taste of the modeling method of instruction by working through a condensed modeling cycle. Discussion includes the larger picture of an entire model-based high school physics course.

ACS Session One: Energy in Chemistry—A Macroscopic View  
(Grades 9–12)  
Union B, Hyatt  
Science Focus: PS3, SEP6  
Marta Gmurczyk (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.  
Jennifer Keil (jenniferkeil11@gmail.com), Master Teacher, Boulder, Colo.  
Chad Bridle (cbridle1@gpsbulldogs.org), Grandville High School, Grandville, Mich.  
Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.  
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.

8:30–9:00 AM  Presentation  

**A Monumental Task: Connecting Washington, D.C., Across the Curriculum**  
(Grades 6–9)  
Franklin D, Hyatt  
Science Focus: ETS1, ETS2.A, CCC3, SEP  
Anna Delia (adelia@hawken.edu) and Kim Brandt (kbran@hawken.edu), Hawken Lower and Middle Schools, Cleveland, Ohio  
Humanities, science, math, and art come together as students propose a new national monument. Skills taught include SketchUp, LEED certification, construction, Google Earth, writing, and presenting.

8:30–11:30 AM  Short Course  

**4-H Innovation…Design Challenges in Action (SC-3)**  
(Grades 5–12)  
Nationwide B, Hyatt  
Science Focus: ETS, INF, SEP  
Patty House (@phouse4h; house.18@osu.edu), Bob Horton (horton.2@osu.edu), Carolyn Belczyk (belczyk.1@osu.edu), Michelle Stumbo (stumbo.5@osu.edu), Tracy Winters (winters.5@osu.edu), and Travis West (west.222@osu.edu), The Ohio State University Extension, 4-H Youth Development, Columbus  
For description, see page 30.

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.

Take a break and join us today from 1:15 to 3:00 PM for complimentary Iced Tea and Lemonade. Coinciding with our exclusive Exhibit Hall hours, we welcome you to drop by for a refreshing beverage.
9:30–10:30 AM  Featured Presentation
Hurricanes: What Makes Them Tick and How Do We Track Them?
(General) B130, Convention Center
Science Focus: ESS2.D

Jason Dunion (@jason_dunion), Meteorologist, University of Miami and NOAA’s Atlantic Oceanographic and Meteorological Laboratory, Key Biscayne, Fla.

Presider: Tysen Belcher, Strand Leader, Training Camp: Strengthening Fundamentals in Elementary Education, and Grove Patterson Academy, Toledo, Ohio

Jason will begin his talk by providing background on how he became interested in studying hurricanes and the different kinds of work meteorologists do around the world. Discussion includes how hurricanes in the Atlantic are named, when and where they occur around the globe, and the kinds of damage they can cause. Jason will cover the key ingredients needed for making a hurricane, how to track them with satellites, and he’ll share his involvement with NOAA’s Hurricane Hunters and what it’s like flying into the eye of a hurricane.

Jason Dunion is a meteorologist at the University of Miami and also works closely with the NOAA Hurricane Research Division in Miami. Specializing in satellite remote sensing of hurricanes, he has developed several new satellite products for monitoring tropical cyclones and Saharan dust storms.

Jason has served as director of the Hurricane Research Division’s Field Program, acted as chief scientist on several Hurricane Hunter research missions using NOAA’s high-altitude jet and P-3 Orions, and has flown on over 50 hurricane hunter flights. He is also a member of the NOAA and NASA science teams who are studying Atlantic and Pacific hurricanes with high-altitude drone aircraft.
A Model for Quantitative Educational Research
(General) B244/245, Convention Center
Science Focus: GEN, NGSS
Esther Hopkins, Ohio Dept. of Education, Columbus
Ohio’s Mathematics and Science Program will demonstrate how using currently funded MSP programs are one model for collecting quantifiable evidence to support claims of educational improvement.

Picture-Perfect Science: Doing It Our Way
(Grades K–5) Franklin A, Hyatt
Science Focus: GEN
Heather Allen (hallen704@columbus.k12.oh.us), Columbus (Ohio) City Schools
Come learn about the Picture-Perfect Science resources and how Columbus City Schools uses the program.

9:30–10:30 AM Hands-On Workshops
Moon Mania: Modeling Lunar Phases
(Grades 6–8) B240/241, Convention Center
Science Focus: ESS1.B, CCC1, CCC4, SEP2, SEP4, SEP7
Meredith Harris (@LPIToday; meredithaharris@me.com), Spring ISD, Houston, Tex.
Angela Fontenot (@LPIToday; fontenota@lpisd.org), La Porte Junior High School, La Porte, Tex.
Yolanda Ballard (@LPIToday; ballard@lpi.usra.edu), Lunar and Planetary Institute, Houston, Tex.
Conduct innovative hands-on activities to build an understanding of the lunar cycle and explore kinesthetic models to assess student understanding of phases.

Adapting Bioengineering Curriculum for the Visually Impaired
(Grades 6–12) B246, Convention Center
Science Focus: ETS, LS, CCC3, CCC4, CCC6, SEP2
Deborah Grzybowski (grzybowski.3@osu.edu) and Tiffany Wild (wild.13@osu.edu), The Ohio State University, Columbus
Discover how to adapt bioengineering curriculum for the visually impaired.

Inquiring in Matter—Deeper and Cheaper with NGSS
(Grades K–9) Ohio Center B/C, Convention Center
Science Focus: PS1.A, PS1.B, SEP
Gene Easter (gleaster@sbcglobal.net), Retired Educator, Tallmadge, Ohio
Experience a research-based K–12 learning progression in matter and its interaction using cheap and familiar materials. Learn to teach the conservation of mass, particle nature of matter, phase change, and chemical reactions. Most activities are drawn from Kent State University’s Conceptual Chemistry and Operation Physics.

Student Research and Publishing in High School Science
(Grades 10–12) Franklin D, Hyatt
Science Focus: GEN, NGSS
Jonathan Eales (jonathae@isb.ac.th), International School Bangkok, Nonthaburi, Thailand
Byung Joon Ahn (ahnyungjoon14@gmail.com), The Ohio State University, Columbus
Learn how your students can conduct original research on topics appropriate to their level and then publish their findings in an entry-level, peer-reviewed scientific journal.

Learning Ecosystem Management with NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices
(Grades 6–8) Franklin B, Hyatt
Stephanie Tubman (@sctubman; stubman@mtu.edu), Brenda Bergman, and Barbara McIntyre (mcintyrebe274@gmail.com), Michigan Technological University, Houghton
Use science and engineering practices to investigate an example of ecosystem change and compare solutions for managing ecosystem threats such as invasive species and disease.

Infusing, Scaffolding, STEM/STEAM, 5E Model, and Crosscutting the Curriculum—What More Could You Ask?
(Grades 1–6) Franklin C, Hyatt
Science Focus: GEN, NGSS
Ava Pugh and Rhonda Mann, University of Louisiana at Monroe
We will cover science inferencing, technology implementation, engineering synectics, and mathematical patterns by infusing and crosscutting the curriculum with the book Somewhere Today. Hands-on activities integrating STEM will be infused into each segment of the 5E model as we explore STEAM activities with the lyrics of songs, vocal expressions, and dance movements.
NSTA Press® Session: Once Upon an Earth Science Book
(Grades 5–10) Hayes, Hyatt
Jodi Wheeler-Toppen (wheelertop@gmail.com), Author, Atlanta, Ga.
Would you like for your students to read and write more effectively? Join Jodi Wheeler-Toppen, author of the Once Upon a Science Book series, for painless lessons that integrate literacy with important Earth science content.

NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources
(Grades 6–College) Regency Ballroom, Hyatt
Science Focus: ESS, CCC
William Slattery (william.slattery@wright.edu), Wright State University, Dayton, Ohio
NESTA members facilitate classroom-ready activities weaving together NGSS threads of practice, disciplinary core ideas, and crosscutting concepts regarding minerals, rocks, and natural resources.

CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus
(Grades P–3) Taft C, Hyatt
Science Focus: GEN, SEP
Jim McDonald, CESI President, and Central Michigan University, Mount Pleasant
We will present engaging activities that allow you to take children outside and easily integrate science, art, music, and social studies while using NGSS science practices.

How to Incorporate Math and Literacy in Grades 6–12 Active Learning NGSS-Based Activities
(Grades 6–12) Taft D, Hyatt
Bruce Patton (patton.1@osu.edu) and Andrew Dougherty, The Ohio State University, Columbus
Leslie Phlipot (leslie.phlipot@sidneycityschools.org), Sidney Middle School, Sidney, Ohio
We will show how hands-on inquiry activities model Ohio and NGSS-focused learning progressions for grades 6–12 math and science content using literacy and math skills to reason, communicate, and explain. Participants will be able to test their own inquiry skills as they move through stations on force and motion and forms of energy.

ACS Middle Level Session: Density: A Molecular View
(Grades 6–8) Union C, Hyatt
Science Focus: PS1.A
James Kessler and Patricia Galvan (p_galvan@acs.org), American Chemical Society, Washington, D.C.
Explore and identify materials based on density through hands-on activities and molecular models from the free completely developed 5E lesson plans available at www.middleschoolchemistry.com.

ASEE Session: ASEE’s Novel Engineering for K–8 Teachers and Students
(Grades P–8) Union D, Hyatt
Science Focus: ETS1, LS4, PS2, SEP
Andrea Burrows (@SciEdBurrows; aburrow1@uwyo.edu), University of Wyoming, Laramie
Mike Borowczak (@MBorowczak; mike@erebuslabs.com), Erebus Labs, Laramie, Wyo.
This workshop from ASEE’s K–12 division focuses innovative ways to implement engineering, such as use of real-world STEM careers, as well as has participants engage in a hands-on engineering activity for the K–8 classroom.
9:30–10:30 AM  Exhibitor Workshops

Fantastical Chemistry Demos for All Classrooms
(Grades 3–12)  B131/132, Convention Center
Sponsor: Educational Innovations, Inc.
William Richey, Xenia High School, Xenia, Ohio
These super fun and exciting chemistry demonstrations can be used by all teachers at any level to get their classrooms of students excited about the amazing world of chemistry. These easy and practical demonstrations will truly show your students what we already know—that science is fun!

3D Printing for the BioScience Classroom
(Grades 9–College)  B230/231, Convention Center
Science Focus: LS, PS, CCC, SEP
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman and Mark Hoelzer (hoelzer@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Recent advances in 3D printing technology make these amazing machines affordable for schools. Learn how 3D printing can be used to integrate NGSS science and engineering practices with crosscutting concepts and disciplinary core ideas by creating physical models of molecular structures in your biology or chemistry classroom!

Let’s Pick Our Brains
(Grades P–8)  B233/234, Convention Center
Sponsor: Nasco
Lainna Callentine, Sciexperience.com, West Chicago, Ill.
Roll up your sleeves and explore ways to experience science using hands-on activities that draw from many multiple intelligence styles. We will demonstrate using one of the most integral organs—the brain. Learn practical tips to make hands-on dissection come alive for your students regardless of the level. Enhance your projects with resources that students can create at home. Come let us pick our brains and peer into the ultimate multitaskers.

miniPCR PTC Taster Lab—From Genotype to Phenotype
(Grades 6–College)  B235, Convention Center
Science Focus: LS1, LS3, LS4, CCC2, CCC3, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Sponsor: miniPCR
Ezequiel Alvarez Saavedra (team@minipcr.com) and Sebastian Kraves (team@minipcr.com), miniPCR, Cambridge, Mass.
Are you a super taster? Come explore the molecular genetics of taste at the DNA level! Learn how a single letter change in our DNA can transform our taste perception. In this classroom-friendly lab, students start from a cheek swab and use PCR, restriction enzymes, and electrophoresis to study their taste receptor genes.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher
(Grades 9–12)  C150, 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 ways to create excitement with hands-on labs and demonstrations.

pH Scale and Math Modeling
(Grades 9–12)  C151, Convention Center
Science Focus: PS1.B, CCC3, SEP3, SEP4, SEP5
Sponsor: LAB-AIDS®, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
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.

What’s the Big Idea? Addressing the AP Biology Curriculum
(Grades 9–12)  C160, Convention Center
Science Focus: LS
Sponsor: HHMI BioInteractive
Brenda Royal, John Overton High School, Nashville, Tenn.
Teachers with limited lab resources can still teach the AP Biology curriculum through engaging videos, virtual labs, and class activities for free from HHMI BioInteractive. Lessons in evolution, enzyme activity, gene regulation, and ecology will all be addressed in a quick trip through the AP curriculum.
STEM and NGSS Inquiry in Chemistry—Effective, Efficient, Economical  
(Grades 8–12) C161, Convention Center
Science Focus: PS
Sponsor: Pearson

Ed Waterman, Retired Educator, Fort Collins, Colo.
Learn how to transition to a STEM and NGSS student-centered chemistry classroom by implementing safe, simple, material-conserving, time-efficient, and effective inquiry activities in chemistry. Safety and differentiation are built in. Teach core content while fostering problem solving, creativity, and invention. Students design original experiments not possible with traditional methods.

Exploring Misconceptions: Speed and Velocity  
(Grades 9–12) C162, Convention Center
Science Focus: PS2
Sponsor: PASCO scientific

Brett Sackett, PASCO scientific, Roseville, Calif.
Speed and velocity are two ways to describe the motion of an object that students often confuse. In this workshop, you will use the wireless Smart Cart to collect real-time motion data and compare the graphs of the Smart Cart’s speed and velocity.

Implementing Science Seminars and Scientific Argumentation with Amplify Science  
(Grades 6–8) C170, Convention Center
Science Focus: GEN, SEP7
Sponsor: Amplify

Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

What is a science seminar? How do I effectively implement scientific argumentation in the classroom? Discover how the Amplify Science approach supports students as they gain expertise formulating written and oral arguments. Experience an authentic and powerful instructional sequence that supports students in formulating both oral and written arguments.

Chemistry with Vernier  
(Grades 9–12) C171, Convention Center
Science Focus: PS, SEP3, SEP4
Sponsor: Vernier Software & Technology

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

In this hands-on workshop, learn how Vernier supports chemistry teachers who want their students to use probe-ware. A variety of experiments from our popular chemistry lab books will be conducted. Find out how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Investigate Photosynthesis and Cellular Respiration with Algae Beads  
(Grades 8–College) C172, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories

Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

10:00–10:30 AM Presentation
The Scoop on SCOPES: Science Cooperative of Physicians and Elementary Students  
(Grades K–6/College) B232, Convention Center
Science Focus: GEN, NGSS

Jenni Domo (@Domo70J; @SCOPESUnioto; domo@ohio.edu), Unioto Elementary School, Chillicothe, Ohio

Hear how we have taken STEMM (the second M is for medicine) to the next level by partnering with Adena Regional Medical Center and The Animal Care Clinic of Chillicothe. SCOPES Academy participants get to experience medical procedure simulations with real physicians and veterinarians. Students are engaged in case studies that give them a rich, real-life experience.

10:00 AM–12 Noon Hands-On Workshop
AAPT Session: Building Web/Tablet-Friendly Interactive Physics Simulations  
(Grades 9–College) Union A, Hyatt
Science Focus: PS2.A, PS4, SEP2

Lenore Horner (lenore.horner@7hills.org), The Seven Hills School, Cincinnati, Ohio

Learn to use GeoGebra for 3-D visualizations and more. Please bring a laptop or tablet with GeoGebra installed.
**11:00 AM–12 Noon Presentations**

**The NSTA Learning Center: A Tool to Develop Pre-service Teachers**  
(College)  
B140/141, Convention Center  
Science Focus: GEN  
**Al Byers** (abyers@nsta.org), Associate Executive Director, Strategic Development & Research Division, NSTA, Arlington, Va.  
**John Putnam** (jputnam@nsta.org; fmendez@nsta.org), Assistant Executive Director, Professional Programs, 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 pre-service teachers.

(Grades K–6)  
B142/143, Convention Center  
Science Focus: GEN  
**Tanya Parisi** (@SpotOn_k12; parisi.17@osu.edu), The Ohio State University, Columbus  
The advent of digital content has led to an explosion of new classroom resources, while the complexity of evaluating these resources has increased. This session will provide you with a framework and tools to select quality digital content for your students.

**NSELA-Sponsored Session: Tools for Science Leaders, Part 2**  
(General)  
B144/145, Convention Center  
Science Focus: GEN  
**Keri Randolph**, NSELA President, and Hamilton County Dept. of Education, Chattanooga, Tenn.  
Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

**GPS-Enabled Video Cameras for Real-World Earth and Environmental Science Investigations**  
(Grades 5–12)  
B232, Convention Center  
Science Focus: ESS2, ESS3  
**Bridget Mulvey** (@ksuearthsystems; bkmulvey@gmail.com) and **Mila Rosa Librea** (@ksuearthsystems; mlibrea@kent.edu), Kent State University, Kent, Ohio  
Zoom in on how to use a new geospatial technology—GPS-enabled video cameras and Google Earth—for real-world science investigations (e.g., natural disaster recovery, water quality).

**NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think!**  
(Grades K–12)  
B242/243, Convention Center  
Science Focus: ESS, CCC  
**June Teisan** (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.  
The National Oceanic and Atmospheric Administration (NOAA) has hundreds of facilities and professional communicators across the nation. Get connected to guest speakers, field trips, and local and national professional development opportunities.

**MI Science PL@N: Resources for Introducing the Vision of the Framework to Teachers and Administrators**  
(Grades K–12)  
B244/245, Convention Center  
Science Focus: GEN, NGSS  
**Mary Starr** (@MiMathScience; mary@starrscience.com), Michigan Mathematics and Science Centers Network, Plymouth  
The Michigan Mathematics and Science Centers Network will share resources for implementing five workshops to introduce teachers and administrators to Framework-focused instruction.

**Food Chains: Using Field Surveys That Give Real Results**  
(Grades 6–8)  
**Frederick Maier** (fredmaier@sbcglobal.net), Environmental Services, Itasca, Ill.  
**Roy “Jack” Tison** (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, Ill.  
We will share three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

**The New CPEP Cosmology Chart and How It Can Be Used**  
(Grades 11–College)  
**Gordon Aubrecht** (aubrecht.1@osu.edu), The Ohio State University at Marion  
The Contemporary Physics Education Project has revised its History and Fate of the Universe chart. We will examine features of the chart and the web-based Universe Adventure.
The NGSS@NSTA Hub  
(Grades K–12)  
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 NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

What Happens When I Don’t Teach Science? Reflections of a Secondary Science Teacher  
(Grades P–3)  
Science Focus: GEN, NGSS  
Jeffrey Dudukovich (jeffrey.dudukovich@ocps.net), Liberty Middle School, Orlando, Fla.  
Hear reflections of a secondary science teacher on the long-term effects of neglecting science in the elementary classroom. Intimidated? Not interested? Overcome your fears with easy lessons! Demonstrations and prizes!

11:00 AM–12 Noon  Hands-On Workshops
Transitioning Instructional Materials for the NGSS  
(Grades K–12)  
B240/241, Convention Center  
Science Focus: GEN, NGSS  
Zoe Evans, NSTA Director, District V, and Bowdon High School, Carrollton, Ga.  
Explore tools and resources that can help evaluate whether instructional materials are designed for the NGSS and help guide their revision if they aren’t.

Not Adopted but Still Relevant: Using NGSS to Support Ohio’s Learning Standards  
(Grades K–12)  
B246, Convention Center  
Science Focus: GEN, NGSS  
David Vernot (@dvernot; dvernot@gmail.com), Butler County Educational Service Center, Hamilton, Ohio  
Ohio has not adopted the NGSS, yet they are still valuable. See how NGSS can be used to enhance science instruction in “non-adoption” states.

It’s in the Bag: Greening the NGSS  
(Grades K–8/College)  
Franklin A, Hyatt  
Science Focus: GEN, NGSS  
Vito Dipinto (vdipinto@nl.edu), National Louis University at Wheeling, Ill.  
Come explore greening the NGSS through a university and “green” K–8 partnership. Design a self-contained backpack lesson.

NSSTA Press® Session: It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12  
(General)  
Hayes, Hyatt  
Science Focus: GEN, NGSS  
Sami Kahn (samkn@aol.com), Ohio University, Athens  
We will model the use of controversial societal issues related to science to develop students’ scientific literacy during this interactive workshop.

The Ohio and National Earth Science Teachers Association Share-a-Thon  
(Grades K–12)  
Regency Ballroom, Hyatt  
Science Focus: ESS2  
Ron Fabich (rwfabich@gmail.com), President, Ohio Earth Science Teachers Association, Medina  
William Slattery (william.slattery@wright.edu), Wright State University, Dayton, Ohio  
Join more than 20 OESTA and NESTA members and other educators as they share their favorite geology, atmosphere, oceanography, astronomy, and Earth systems science classroom and lab activities. Many free handouts!

Linking Science and Literacy for Improved Student Outcomes  
(Grades K–6)  
Taft C, Hyatt  
Science Focus: GEN, NGSS  
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.
ACS Middle Level Session: The Water Molecule and Dissolving  
(Grades 6—8) Union C, Hyatt  
Science Focus: PS1.A  
James Kessler and Patricia Galvan (p_galvan@acs.org), American Chemical Society, Washington, D.C.  
Explore the polarity of the water molecule and identify substances based on their solubility using hands-on activities and molecular animations from the free website www.middleschoolchemistry.com.

ASEE Session: Engineering Your Future  
(Grades 9—College) Union D, Hyatt  
Science Focus: ETS  
Eugene Rutz, University of Cincinnati, Ohio  
Join us to interact with Engineering Your Future, engineering design, NGSS roles, and an open-ended problem with an activity. Take home teaching materials and project resources.

Friday, 11:00 AM–12 Noon  

11:00 AM–12 Noon Exhibitor Workshops  
FOLD-tastic Science Notebooks via Dinah Zike’s Notebook Foldables  
(General) B131/132, Convention Center  
Science Focus: GEN  
Sponsor: Dinah.com  
Nancy Wisker, Nancy Wisker Consulting, LLC, Columbia, Tenn.  
Cut, fold, and more in this hands-on workshop as you construct Notebook Foldables that are sure to make your students’ science notebooks FOLD-tastic. Use basic classroom materials and depart with examples and ideas ready to use on Monday.

Engaging Reading and Writing Success: Incorporating Today’s Global Issues  
(Grades 6—12) B233/234, Convention Center  
Science Focus: GEN  
Sponsor: National Geographic Learning  
Linda Linnen, Retired Teacher, Aurora, Colo.  
A multitude of reading and writing strategies will be provided to engage middle school and high school educators in presenting today’s global issues.

Engage with NGSS Using STEM Gauge®  
(Grades P—8) B235, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Measured Progress  
Janet Dykstra, Science Content Developer, Dover, N.H.  
Alice Sneary, Measured Progress, Dover, N.H.  
Learn strategies for transition to the NGSS and gathering evidence of three-dimensional learning using STEM Gauge formative assessment tools. This interactive workshop highlights a variety of classroom strategies to engage students with assessment questions, rubrics, and self-reflection templates. Participants will get a free STEM Gauge topic set.

Introduction to Wisconsin Fast Plants®  
(Grades K–12) C150, 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 engage students, suit all learning levels, and let you integrate plant development, life cycle, environmental effects, genetics, and evolution into your instruction. Learn the basics for successful planting, flower dissection, and pollination.
Chemical Formula and Amino Acids
(Grades 9–12) C151, Convention Center
Science Focus: PS1.A, PS2.B, CCC3, SEP3, SEP4
Sponsor: LAB-AIDS®, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
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.

Tracking Populations in Gorongosa Park: An NGSS-Focused Exploration
(Grades 9–12) C160, Convention Center
Science Focus: LS2
Sponsor: HHMI BioInteractive
Sydney Bergman, School Without Walls, Washington, D.C.
How can we count populations of large predators and use data to understand ecosystem interactions? Watch as scientists track lion recovery and then work with real data to understand food web dynamics. HHMI BioInteractive’s free NGSS-focused resources (also in Spanish) integrate key concepts in ecology, conservation biology, and environmental science.

Effective Teaching Resources for AP Chemistry
(Grades 9–12) C161, Convention Center
Science Focus: PS
Sponsor: Pearson
Ed Waterman, Retired Educator, Fort Collins, Colo.
Join Ed Waterman and explore how this book concisely summarizes all the important content in the six big ideas and 117 learning objectives of the chemistry curriculum framework.

Exploring Misconceptions: There’s a Difference Between Heat and Temperature?
(Grades 6–12) C162, Convention Center
Science Focus: PS
Sponsor: PASCO scientific
Brett Sackett, PASCO scientific, Roseville, Calif.
Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKvue and wireless temperature sensors will provide you with effective new ways to teach the concepts of heat and temperature, central to physical science.

Not Your Typical Classroom Experience: Amplify Science’s Digital Engineering Internships
(Grades 6–8) C170, Convention Center
Science Focus: ETS
Sponsor: Amplify
Traci Shields (amplifyscience@berkeley.edu) and Rebecca Abbott (amplifyscience@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley
Discover Amplify Science’s digital Engineering Internships—compelling, immersive classroom experiences. As students become interns at the firm Futura Engineering, teachers are able to facilitate an authentic opportunity for students to iterate and design solutions to real-world problems.

Biology with Vernier
(Grades 9–12) C171, Convention Center
Science Focus: LS, SEP3, SEP4
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, learn how Vernier supports biology teachers who want their students to use probeware. A variety of experiments from our popular biology lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

The GMO Debate Rages On!
(Grades 9–College) C172, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Are GM crops a good thing? Do all countries have the same GM food labeling requirements? Learn more about GMOs and how to test for the presence of GM content in foods. Join a debate and learn how to bring this experience to your classroom.
11:00 AM–1:00 PM Hands-On Workshop
ACS Session Two: Energy in Chemistry—A Particu-
late View
(Grades 9–12) Union B, Hyatt
Science Focus: PS3, SEP2
Marta Gmurczyk (m_gmurczyk@acs.org), American
Chemical Society, Washington, D.C.
Jennifer Keil (jenniferkeill1@gmail.com), Master Teacher,
Boulder, Colo.
Chad Bridle (chbriddle1@gpsbulldogs.org), Grandville High
School, Grandville, Mich.
Rebecca Stober, Mapleton Expeditionary School of the
Arts, Denver, Colo.
Engage in modeling activities focused on energy transfer dur-
ing physical and chemical processes by building and analyzing
particulate models of matter. These activities are designed to
depthen students’ conceptual understanding of how 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.

12:30–1:00 PM Presentation
An Innovative Design for an Ecology Class Engages
Students of All Abilities
(Grades 9–12) B242/243, Convention Center
Science Focus: LS, CCC1, CCC6, CCC7, SEP1, SEP2, SEP3,
SEP4, SEP5, SEP8
Penny Rodrick-Williams (pennyrodrickwilliams@tatnall.
org), The Tatnall School, Wilmington, Del.
An innovative design for an ecology class can both engage
advanced students and assist students that have struggled in
previous classes with their science skills.

12:30–1:30 PM Featured Presentation
Sowing the Seeds of STEM
(Grades 6–12) B130, Convention Center
Science Focus: ETS
Kimberly Clavin (@clavinator; kclavin@pillartechonology.com), Pillar
Technology, Columbus, Ohio
Presider: Janet Struble, Strand Leader:
Game Time: Tackling Scientific Problems and Pitching Engineering
Solutions, and The University of
Toledo, Ohio
Today’s world delivers advanced tech-
nologies at lightning speeds—with that comes an exponential
growth in STEM fields. How can educators prepare middle
school and high school students without a background in the
emerging fields? Learn various strategies to attract and grow
a diverse range of students into these in-demand career fields.

Kimberly Clavin has often been referred to as the “Connector of
Things” as her focus is creating digital experiences that bring together
people, places, and products. Currently she works for Pillar Tech-
nology, a business consulting company that solves complex business
problems by providing technical ingenuity, innovation acceleration,
and digital business transformation.

Kimberly earned her bachelor’s degree in mechanical engineering
from Purdue University and a master’s degree in acoustic engineer-
ing from The Ohio State University. She has taught engineering at
The Ohio State University as well as been the manager for STEM
initiatives for Dublin City Schools. In keeping with her mission to
empower future engineers, she volunteers as a robotics judge as well
as promotes STEM to the Girl Scouts and other organizations.
**12:30–1:30 PM Presentations**

**Do You Need a New Science Lab?**  
(Grades 6–12) B140/141, Convention Center  
Science Focus: GEN  
Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio  
Win a Shell Science Lab Makeover ($20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this Shell Science Lab presentation and learn how you can apply to win the Shell Science Lab Challenge. You will have an opportunity to actually begin to complete the application and have your questions answered.

**AMSE-Sponsored Session: Empowering and Rewarding Educators of Economically Disadvantaged Students**  
(Grades K–12) B142/143, Convention Center  
Science Focus: GEN  
Alicia Conerly (@mrzjconerly25; mrz_conerly@yahoo.com), Hazlehurst (Miss.) City School District  
Motivate yourself! Be innovative for others! The rewarding begins with you!

**Spark Students’ Curiosity with Chemistry!**  
(Grades K–12) B144/145, Convention Center  
Science Focus: PS  
Karen Kaleuati (@ACSChemClubs), American Chemical Society, Washington, D.C.  
Did you know that the American Chemical Society has resources for K–12 teachers, and you don’t need to be a member? Learn about these free resources, including games, lesson plans, grants, and more.

**Biomimicry Design Project for Middle School Science and Art Students**  
(Grades 6–10) B232, Convention Center  
Science Focus: ESS3.A, ESS3.C, ETS, CCC3, CCC4, CCC6, SEP1, SEP2, SEP3, SEP6, SEP7, SEP8  
Anna Delia (adelia@hawken.edu) and Erin Thomas, Hawken Lower and Middle Schools, Cleveland, Ohio  
Science and art combine! Using the biomimicry design principles, students experiment and propose a new solution to a problem through writing and sculpture.

**Corrosion: Chemistry Made Simple, Relevant, and Fun**  
(Grades 7–12) B244/245, Convention Center  
Science Focus: PS, CCC, SEP  
Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.  
Find out about labs, demonstrations, and examples that make reactivity, oxidation/reduction, and corrosion engineering exciting and practical, as well as easy to teach and learn. STEM connections and a CD of information will be shared.

**Materials Matters**  
(Grades 6–12) B246, Convention Center  
Science Focus: GEN, SEP  
Caryn Jackson (bjeq1980@yahoo.com) and Todd Bolenbaugh (bolenbaugh4@gmail.com), Tolles Career & Technical Center, Plain City, Ohio  
Materials science investigates cutting-edge processes and technologies for science- and STEM-related programs. We will provide demonstrations, resources, and information about national teacher camps.

**Developing Coherent Storylines for Elementary Science Concepts**  
(Grades K–5) Franklin A, Hyatt  
Science Focus: ESS, LS  
Diane Johnson (@MDHJohnson; diane.johnson@luky.edu), Lewis County Schools, Lexington, Ky.  
Patti Works (@patti_works; patriciaworks@gmail.com), Partnership Institute for Math and Science Education Reform, Lexington, Ky.  
Come learn how to develop coherent storylines for elementary science concepts. You’ll leave with strategies and tools that you’ve practiced using along with sample storylines for K–5 life and Earth science.

**Bioplastic—Going from Synthetic to Natural Polymers**  
(Grades 6–12) Franklin B, Hyatt  
Science Focus: PS, CCC, SEP  
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 and activities.
Climate Expeditions  
(Grades P–12)  
Franklin D, Hyatt  
Science Focus: ESS3, INF, CCC7, SEP1, SEP4, SEP8  
Char Shryock (@edtechgirl; @lensc; char.shryock@bay-schoolsohio.org), Bay Village (Ohio) City School District  
Darci Sanders (darci@lensc.org), Lake Erie Nature & Science Center, Bay Village, Ohio  
Work with community partners to create a trail of locally relevant, interactive climate kiosks to develop climate literacy skills for students and adults.

Combining Medical Simulation Center Resources and a High School Biomedical Curriculum to Diversify the Health Sciences Pipeline  
(Grades 9–12)  
Harrison, Hyatt  
Science Focus: LS  
Scott Winfield (scott.winfield@osumc.edu), Quinn Capers (quinn.capers@osumc.edu), and Sheryl Pfieif, The Ohio State University College of Medicine, Columbus  
Hear how medical simulation centers can engage in community outreach and partner with inner city or rural schools to advance diversity in the U.S. health care workforce.

Cross-Curricular and Innovative STEAM Teaching  
(Grades P–8)  
Taft B, Hyatt  
Science Focus: GEN, INF, NGSS  
Stephanie Miller (smiller@congressdistrict.org), Congress (Ariz.) Elementary School District  
Come find out how to create and implement STEAM cross-curricular instruction, STEAM supplementary programs, and a STEAM Drama Club.

D.E.S.I.G.N.: Developing Engineering Solutions Inspired by Graphic Novels  
(Grades 5–12)  
Union E, Hyatt  
Science Focus: GEN, SEP  
William Reitz (wreitz@neo.rr.com), Retired Educator, Stow, Ohio  
Graphic novels are increasingly popular. Their story lines can provide design problems to solve while making NGSS-CCSS connections. Let’s examine a range of examples.

Students Have the Power  
(Grades 4–8)  
Franklin C, Hyatt  
Science Focus: ESS2, ETS1.B, ETS2.B, CCC2, CCC4, CCC5, CCC6, SEP2, SEP4, SEP6, SEP7, SEP8  
Amy Boros (aboros@perrysburgschools.net), Perrysburg Junior High School, Perrysburg, Ohio  
Utilizing the topic of water for developing countries based on the book A Long Walk to Water by Linda Sue Park, participants will incorporate the 5E model with science, social studies, language arts, mathematics, and citizen action in a dynamic and timely hands-on, problem-based learning environment.

NSTA Press® Session: Next Time You See...  
(Grades P–5)  
Hayes, Hyatt  
Science Focus: GEN, NGSS  
Emily Morgan (@EmilyMorganNTYS; emily@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio  
Join Emily Morgan, author of the Next Time You See series from NSTA Press, as she shares her picture books and some simple activities to help connect children with nature.

Ohio Earth Science Teachers Association (OESTA): “Famous” Rock Raffle  
(Grades K–12)  
Regency Ballroom, Hyatt  
Science Focus: ESS2  
Ron Fabich (rwfabich@gmail.com), President, Ohio Earth Science Teachers Association, Medina  
Come bid for a chance to win crystals, minerals, rocks, and fossil specimens, as well as other Earth science–related items such as books, posters, and DVDs for your classroom or lab. Proceeds benefit the OESTA Teacher Mini-Grant Program.

NARST-Sponsored Session: Using Democratic Science to Engage Families in Scientific Explanation  
(Grades 3–9)  
Taft C, Hyatt  
Science Focus: INF, SEP  
Michelle Fleming (michelle.fleming@wright.edu), Lisa Kenyon (lisa.kenyon@wright.edu), and Len Kenyon (len.kenyon@wright.edu), Wright State University, Dayton, Ohio  
Join us as we share a democratic science framework and discuss how to apply it to create an interactive Family Science Explanation Night.
**Friday, 12:30–1:30 PM**

**Classroom iPad iDeas**  
*Grades 7–College*  
Taft D, Hyatt  
Science Focus: GEN, NGSS  
**Gregory Dodd (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.**  
Experience the enormous potential of the iPad and how to make the iPad an essential tool in your science classroom.

**AAPT Session: Alternative Tasks to Develop Expert Problem-Solving Skills**  
*Grades 7–College*  
Union A, Hyatt  
Science Focus: GEN, SEPI, SEPS, SEP8  
**Kathleen Harper (harper.217@osu.edu), The Ohio State University, Columbus**  
**David Maloney (maloney@ipfw.edu), Indiana University–Purdue University Fort Wayne**  
Teach students to problem solve using research-based approaches used by experts.

**ACS Middle Level Session: Chemical Reactions: Breaking and Making Bonds**  
*Grades 6–8*  
Union C, Hyatt  
Science Focus: PS1.B  
**James Kessler and Patricia Galvan (p_galvan@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 lesson plans available at www.middleschoolchemistry.com.

**ASEE Session: Engineering Water Filtration Systems: Two Units and Two Teachers**  
*Grades 5–9*  
Union D, Hyatt  
Science Focus: ETS  
**Barbara Doppes (doppes_b@burgschools.org), Williamsburg Middle/High School, Williamsburg, Ohio**  
**C. Marie Pollitt (pollittm@feliciyschools.org), Felicity-Franklin Middle School, Felicity, Ohio**  
Engage with two units regarding water quality presented by middle school teachers. Drinking water is a global issue, and students build water filtration systems.

**12:30–1:30 PM Exhibitor Workshops**

**Too Many Ideas: Helping Students Focus and Select a Topic to Investigate**  
*Grades 6–9*  
B131/132, Convention Center  
Science Focus: GEN, SEPI, SEPS  
**Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, Va.**  
One way for science students to take ownership of their learning is to allow them a chance to choose what they want to investigate. But many students (especially in the middle grades) don’t know where to start. This workshop will provide strategies for helping students focus and pick topics without becoming overwhelmed to the point of inaction. Discussion includes the online STEM competition eCYBERMISSION and how you and your students can participate at no cost.

**Zombie Apocalypse!**  
*Grades 6–12*  
B230/231, Convention Center  
Science Focus: GEN  
**Jeffrey Lukens, Sioux Falls (S.Dak.) School District**  
Be part of a zombie apocalypse! Learn about disease-spread modeling using simulations and fun story lines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

**Supporting Excellence in STEM Programs and Teaching Through STEM Certification**  
*General*  
B233/234, Convention Center  
Science Focus: GEN, NGSS  
**Terry Talley, Accelerate Learning–STEMscopes**  
Do you want to be a STEM-certified teacher? Come learn more about the National Institute for STEM Education (NISE), which clearly defines the practices of a successful STEM program and those of the STEM classroom teacher. STEM Teacher Certification recognizes excellence at the classroom, campus, and district levels.
Use Science to Teach Reading; Reading to Teach Science
(Grades K–6) B235, Convention Center
Science Focus: GEN, NGSS
Sponsor: Learning A–Z
Lori Smith (lori.smith@learninga-z.com), Learning A–Z, Tucson, Ariz.
Come explore Learning A–Z’s Science Literacy Collection that allows teachers to deliver digital, leveled content and hands-on learning experiences that strengthen students’ reading skills and scientific literacy simultaneously. This session features FOCUS books, which include a hands-on, student-directed science experiment or engineering design challenge. Free trials to all participants!

Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs
(Grades 6–12) C150, 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 mammalian structure and function lessons with a real classroom autopsy. Participants dissect a Carolina’s Perfect Solution pig by modeling the protocols of a professional forensic pathologist. This exciting workshop features our exclusive Carolina’s Perfect Solution preserved specimens.

What Is a Species
(Grades 9–12) C151, Convention Center
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. Then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

Use Free BioInteractive Resources to Enhance Biology Data Literacy Skills
(Grades 9–College) C160, Convention Center
Science Focus: LS, SEP4, SEP5
Sponsor: HHMI BioInteractive
Ann Brokaw, Rocky River High School, Rocky River, Ohio
HHMI BioInteractive presents a “Data Points” series that feature figures from primary literature to engage students in the processes of analyzing graphs, making claims, and supporting claims with evidence. The workshop will model various ways to implement these resources in the biology classroom to engage students in scientific thinking.

Teaching Geoscience in an NGSS-Focused Curriculum
(Grades 8–College) C161, Convention Center
Science Focus: ESS
Sponsor: Pearson
Michael Wysession, Washington University in St. Louis, Mo.
A member of the NGSS writing team, Michael Wysession will talk about challenges and solutions to teaching Earth and space science (ESS) that meets the NGSS.

Integrating Chromebook with Vernier Data-Collection Technology
(Grades 3–12) C171, Convention Center
Science Focus: GEN, SEP3, SEP4
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. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

How to Use Pop Culture in Your Life Science Class
(Grades 9–College) C172, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Use popular science to engage high school and college students in your classroom. See how popular TV shows and movies connect to real-world discoveries and issues. Learn how to use examples like DNA fingerprinting to make gel electrophoresis the foundation of a fun hands-on lab that increases student involvement and understanding.
1:15–2:00 PM  Special Session
Meet the Presidents and Board/Council
(General) NSTA Exhibits (Hall B) Entrance
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!

1:15–3:00 PM  Exhibit Hall Beverage Break
Hall B, Convention Center
Take a break and join us for complimentary iced tea and lemonade. Coinciding with our exclusive Exhibit Hall hours, we welcome you to drop by for a refreshing beverage.

2:00–2:30 PM  Exhibitor Workshop
Earthquakes and Their Causes
(Grades 5–8) Booth #841, Exhibit Hall
Science Focus: ESS2.B
Sponsor: Science First®/StarLab®
Helmut Albrecht, Science First/StarLab, Yulee, Fla.
In this in-dome workshop, you will learn about what causes earthquakes and why they occur where they occur.

2:00–3:00 PM  Workshop
AMSE-Sponsored Session: STEM and/or STEAM Design Challenges in Grades 4–12 Science Classrooms
(Grades 4–12) Harrison, Hyatt
Science Focus: ETS
Rajeev Swami (rswami@centralstate.edu) and Leanne Petry (lpetry@centralstate.edu), Central State University, Wilberforce, Ohio
Brett Doudican (bdoudican@daytonearlycollege.org), Dayton Early College Academy, Dayton, Ohio
Marjorie Langston (mlangston@hlsd.org), Hamilton Township High School, Columbus, Ohio
Emphasis will be placed on materials engineering and how high school teachers can create real experiences that engage grades 4–12 students with a unique type of engineering design process.

2:00–3:00 PM  Exhibitor Workshops
“Let It Glide” Design Challenge
(Grades 4–9) B131/132, Convention Center
Science Focus: PS
Sponsor: NASA Glenn Research Center
Joy Cummings (joyce.e.cummings@nasa.gov; grc-ed-opportunities@nasa.gov), NASA Glenn Research Center, Cleveland, Ohio
Join NASA representatives as they showcase the “Let it Glide” Design Challenge and promote Glenn Research Center’s professional development opportunities.

Using Maggots, Flies, and Flesh to Solve a Mystery!
(Grades 6–12) B230/231, Convention Center
Science Focus: GEN
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

The STEM Design Challenge
(Grades 4–8) B233/234, Convention Center
Sponsor: Fisher Science Education
Join us to experience how you can easily create interactive experiments about force, energy, and motion in the classroom. Help your students identify variables to test. Along the way, solve an engineering problem using realistic scientific processes. Finally, support your understanding with a creative and fun team competition that can expand after school.

Teaching STEM Using the Oil and Gas Industry
(Grades 6–12) B235, Convention Center
Sponsor: Ohio Oil and Gas Energy Education Program (OOGEEP)
Jane Hunt, Education Projects & Partnerships, LLC, Columbus, Ohio
Use engineering design to investigate Ohio’s energy resources. Participants will create a pipeline, an oil derrick, and a model oil well. This workshop includes sample lessons from the two-day Ohio Oil and Gas Energy Education Program workshop.
The Best of Engineering for Elementary Students  
(Grades 1–5)  
C150, Convention Center  
Science Focus: ETS  
Sponsor: Carolina Biological Supply Co.  

**Carolina Teaching Partner**  
What is engineering for elementary students? How do I know it when I see it? Participants will define engineering and experience the practices of engineering and science through lessons from the new Smithsonian Engineering and Science program developed from the ground up to meet the NGSS.

**Cell Differentiation and Gene Expression**  
(Grades 9–12)  
C151, Convention Center  
Sponsor: LAB-AIDS®, Inc.  

**Dawn Posekany**, Solon High School, Solon, Iowa  
Students often have trouble conceptualizing how selective gene expression works. In this workshop, participants will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the *Science and Global Issues: Biology* program from SEPUP and LAB-AIDS.

**Build Math Skills for the Ohio Life Science Standards**  
(Grades 6–12)  
C160, Convention Center  
Science Focus: LS, SEP4, SEP5  
Sponsor: HHMI BioInteractive  

**Ann Brokaw**, Rocky River High School, Rocky River, Ohio  
The new Ohio Life Science Standards include several mathematical and computational practices. To enhance the teaching of these practices, participants in this workshop will receive and work through several free classroom-ready resources from HHMI’s BioInteractive team that incorporate the math and computational skills required in Ohio’s life science standards.

**A Conceptual Framework for Teaching Global Change—NGSS Ready!**  
(Grades 8–12)  
C161, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Pearson  

The interdisciplinary science of global change fits NGSS perfectly, but its complexity can seem daunting. A new conceptual framework organizes and presents system models, crosscutting concepts, core ideas, and structure/function relationships in uniquely accessible and flexible informational graphics and storyboards. Preview a forthcoming website and offer suggestions!

**Motivate and Engage with Chemistry**  
(Grades 6–12)  
C170, Convention Center  
Science Focus: PS, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8  
Sponsor: Houghton Miﬄin Harcourt  

**A. Mickey Sarquis**, Professor Emeritus, Miami University–Middletown, Ohio  
Use chemistry to reunite the fun/hands-on and mental/minds-on aspects of science teaching as you spur curiosity and a desire to understand our world while increasing motivation, learning, and conceptual understanding.

**Integrating iPad with Vernier Data-Collection Technology**  
(Grades 3–12)  
C171, Convention Center  
Science Focus: GEN, SEP3, SEP4  
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. In this hands-on workshop, learn how Vernier supports teachers who use iPads in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

**How Do You Know What Fish Species You Are Eating? DNA Barcoding!**  
(Grades 9–College)  
C172, Convention Center  
Science Focus: GEN, NGSS  
Sponsor: Bio-Rad Laboratories  

**Leigh Brown**, Bio-Rad Laboratories, Hercules, Calif.  
How many aquatic species are there in the world? DNA barcoding has shown that there may be more than were ever thought to exist. Can you be certain the sushi you are eating really is what you think it is? Many instances of fish mislabeling (sometimes even endangered species) have also been brought to light through DNA barcoding activities. Learn more about this fascinating topic and how you can apply it in your classroom.
3:00–4:30 PM Networking Opportunity
SECO 2017 Awards and Member Reception
(Tickets Through SECO) McKinley, Hyatt
Come congratulate the 2017 SECO award winners and network with the SECO Executive Committee, District Directors, and members. This FREE event is open to all SECO members, but you must request a ticket through www.secoonline.org prior to the reception.

3:00–5:00 PM Hands-On Workshop
AAPT Session: Creating Your Own Effective Interactive Video Vignettes
(Grades 7–College) Union A, Hyatt
Science Focus: GEN
Kathleen Koenig (kathy.koenig@uc.edu), University of Cincinnati, Ohio
Learn how to access and make interactive video vignettes with freely available software from the web. Note: Please bring a laptop if possible.

3:30–4:30 PM Presentations
Climate Myths
(Grades 9–College) B130, Convention Center
Science Focus: ESS
Gordon Aubrecht (aubrecht.1@osu.edu), The Ohio State University at Marion
My local newspaper’s letters column receives letters from denialsists. I have gathered a long list of their myths and my responses to the myths will be listed and explained.

Eureka! Science Trade Books: Good as Gold!
(General) B140/141, Convention Center
Science Focus: GEN, CCC, SEP8
Suzanne Flynn, Lesley University and Cambridge College, Carver, Mass.
Juliana Texley (@JulianaTexley; texleyj@cmich.edu), 2014–2015 NSTA President, Central Michigan University, Mount Pleasant
Need great books for student learning? Explore and use NSTA Recommends and the Children’s Book Council Outstanding Science Trade Books. Door prizes—books, of course!

How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions
(Grades K–12) B142/143, Convention Center
Science Focus: GEN, NGSS
Kathleen Kelly (kkelly@nsta.org), eCYBERMISSION Project Manager, NSTA, Arlington, Va.
Hear about various NSTA competitions and how they can bring STEM and the NGSS into the classroom, as well as give students and teachers a chance to earn recognition and prizes.

Data Is Not a “Four-Letter Word”: Use NOAA Resources to Build Student Proficiency in Data Analysis
(Grades 5–12) B232, Convention Center
Science Focus: ESS, CCC
June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.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.

U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy
(Grades 9–12) Franklin D, Hyatt
Science Focus: ESS2, ESS3, ETS, LS, PS1, PS3
Alexis Wolfe (@BioenergyKDF; #BioenergizeME; alexis.wolfe@ee.doe.gov), U.S. Dept. of Energy, Washington, D.C.
Leslie Ovard, Idaho National Laboratory, Idaho Falls
The U.S. Department of Energy’s BioenergizeME Infographic Challenge is designed to support high school educators and administrators in planning activities for their classrooms that integrate bioenergy topics with cross-curricular STEM topics.
Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events
(Grades 6–12) B242/243, Convention Center
Donna Young (dlyoung.nso@gmail.com), Chandra X-Ray Center, Bullhead City, Ariz.
Science Olympiad coaches will be provided information on strategies, extensive resources, and content for regional, state, and national competitions by the National Astronomy Event Supervisor.

Teach Engineering Principles on the Cheap with Concrete
(Grades 7–12) B244/245, Convention Center
Science Focus: PS1.A, CCC6, SEP1, SEP3, SEP4
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Teach engineering using concrete and other composite materials. Discover inexpensive STEM projects that engage students in using the #1 building material in the world. NGSS correlations shared.

Literacy Connections in Science—Beyond Just Picture Books
(Grades 2–5) Franklin A, Hyatt
Science Focus: GEN, SEP7, SEP8
Jennifer Garwood (@luckeyfrog; jennifer.a.garwood@gmail.com), Lakota Local School District, Liberty Township, Ohio
See how concrete hands-on experiences can help the vocabulary “stick!” Discover practical strategies to build vocabulary, discuss critically, analyze text, and write to explain so all students can access science content and strengthen literacy skills.

Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions
(Grades K–8) Taft B, Hyatt
Science Focus: GEN, NGSS
Eric Greenwald, The Lawrence Hall of Science, University of California, Berkeley
We will examine how short-term learning progressions (e.g., for an instructional unit) can help teachers monitor and support student progress toward three-dimensional performance expectations.

NSTA Press® Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12
(Grades 9–12) Hayes, Hyatt
Science Focus: LS, CCC, SEP
Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin
Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.
**NSTA Columbus Area Conference on Science Education**

**NMLSTA-Sponsored Session: Activate Your Learning, Engage Your Senses**

*(Grades 5–9)*  
Taft C, Hyatt  
Science Focus: GEN, SEP  
Mary Lou Lipscomb *(mllscience@aol.com)*, NMLSTA President, Naperville, Ill.  
Rebecca Haub Knipp, Retired Educator, West Harrison, Ind.  
Engage in a fun STEM activity highlighting science and engineering practices (SEPs), designed for middle level learners, that can be implemented next week.

**ASEE Session: Building a Culture of Iterative Design with 3-D Modeling and Printing in the High School Classroom**

*(Grades 8–College)*  
Union D, Hyatt  
Science Focus: ETS  
Andrea Burrows *(@SciEdBurrows; aburrow1@uwyo.edu)*, University of Wyoming, Laramie  
Incorporate 3-D modeling techniques into your classroom. We will compare/contrast modeling software, print a 3-D model, and address engineering design standards and concepts.

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**Friday, 3:30–4:30 PM**

**3:30–4:30 PM   Exhibitor Workshops**

**Science Through Engineering Design…and a Squid!**

*(Grades 6–12)*  
B230/231, Convention Center  
Science Focus: ETS1, CCC, SEP  
Sponsor: Texas Instruments  
Fred Fotsch, Texas Instruments, Dallas  
Using technology and the design iteration process are great ways to engage students in learning science. This exciting workshop challenges participants to build solutions to interesting scenarios. Searching for giant squid, growing food in space, and exploring Mars are some of the challenges!

**Strawberry Milkshakes: DNA and Lactose Intolerance**

*(Grades 6–12)*  
C150, Convention Center  
Science Focus: LS  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Introduce middle school students to the fascinating world of molecular biology through age-appropriate hands-on activities. They're designed to make challenging abstract concepts (including DNA, genes, and enzymes) more concrete—and to make biology fun. Presented in partnership with the DNA Learning Center.

**Energy Flow Through an Ecosystem**

*(Grades 9–12)*  
C151, Convention Center  
Sponsor: LAB-AIDS®, Inc.  
Dawn Posekany, Solon High School, Solon, Iowa  
Use an interactive card sort of organism cards and ecosystem events to predict the effect of different events on the food web and the ecosystem. Then construct an energy pyramid to examine how much energy is stored at each level of a food web.

**Viruses—From Adenovirus to HIV to Zika**

*(Grades 9–12)*  
C160, Convention Center  
Science Focus: LS1.A  
Sponsor: HHMI BioInteractive  
Mary Colvard, Retired Educator, Deposit, N.Y.  
How are viruses the same…and different? How do they infect different hosts? Why do they cause disease in some hosts and not others? Explore free HHMI BioInteractive materials including click and learns, hands-on activities, and videos that can engage your students in both asking and answering these questions.

**Measles, the Flu, Vaccination, and You**

*(Grades 6–12)*  
C161, Convention Center  
Science Focus: LS  
Sponsor: Pearson  
Joseph Levine, Author, Boston, Mass.  
New influenza strains appear out of nowhere. Measles re-emerges. What’s going on? Scientific storytelling around disease fascinates and engages students, and demonstrates dynamic host-pathogen relationships. Narratives of diseases past and present demonstrate NGSS core ideas and the value of evolutionary and ecological concepts in medicine and public health.

**A Series of Fortunate Events: Using Discrepant Events in the Classroom**

*(Grades K–12)*  
C170, Convention Center  
Science Focus: GEN, SEP1, SEP6  
Sponsor: Houghton Mifflin Harcourt  
What is a discrepant event? Why does the NGSS encourage using them? How can I use them to foster inquiry, encourage curiosity, and deepen the learning experience for my students? Come find out as we explore the use of discrepant events in HMH Science Dimensions.
Physics and Physical Science with Vernier
(Grades 7–12) C171, Convention Center
Science Focus: PS, SEP3, SEP4
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, you will learn how Vernier supports physics and physical science teachers who want their students to use probeware. A variety of experiments from our popular lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Enzymes: Technology Inspired by Nature
(Grades 9–College) C172, Convention Center
Science Focus: PS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
With rising greenhouse gases, scientists look to nature for a biofuel solution. The star of this hands-on workshop is the cellobiase enzyme, an engine for cellulosic biofuel production. Use the inquiry-based approach to extract enzyme, test activity, and design experiments to study how pH, temperature, and concentrations affect reaction rates.

3:30–5:00 PM Presentation
Equity in Science Education Roundtable
(General) Taft D, Hyatt
Science Focus: GEN, INF, NGSS
Jerry Valadez (jdvscience@yahoo.com), NSTA Director, Multicultural/Equity in Science Education, and California State University, Fresno
Juliana Texley (@julianaTexley; texle1j@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant
J. Carrie Launius, NSTA Director, District XI, Saint Louis, Mo.
Sami Kahn, Ohio University, Athens
The NSTA Roundtable on Equity in Science Education was created to enable engaging dialogue and discussion of issues related to diversity and equity.

3:30–5:30 PM Hands-On Workshop
ACS Session Three: Energy in Chemistry—An Atomic View
(Grades 9–12) Union B, Hyatt
Science Focus: PS3, SEP7
Marta Gmurczyk (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.
Jennifer Keil (jenniferkeil11@gmail.com), Master Teacher, Boulder, Colo.
Chad Bridle (@sciencebridle; cbridle1@gpsbulldogs.org), Grandville High School, Grandville, Mich.
Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.
Engage in argumentation activities focused on 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.
Friday, 4:00–4:30 PM

4:00–4:30 PM  Presentations
Universal Design for Learning (UDL): Creating a Learning Environment That Challenges and Engages All Learners
(Grades 5–9)  B144/145, Convention Center
Science Focus: GEN
Amy Biggs (@ProfAmy; amy.biggs@dys.ohio.gov), Ohio Dept. of Youth Services, Columbus
UDL provides multiple and flexible methods of presentation, expression, and engagement. Come to this session for an overview of UDL, methods and strategies for implementation, and two teachers’ use of UDL.

Animal Multimedia Inspires Learning and Engagement
(Grades K–12)  Franklin D, Hyatt
Science Focus: LS
Lindsay Glasner (@BirdSleuth; lig27@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.
Each spring and summer, birds, frogs, and insects are real “country” music singers! Come discover online resources, lessons, and apps that support STEM learning through animal sounds and videos.

Friday, 4:00–6:00 PM

4:00–6:00 PM  Networking Opportunity
Cleveland Regional Council of Science Teachers (CRCST) Open House Reception
Nationwide B, Hyatt
Please visit www.crcst.org for more information.

5:00–5:30 PM  Presentation
AAPT Session: 30 Demos in 60 Minutes from the Ohio Section of AAPT
(Grades 6–College)  Union A, Hyatt
Science Focus: PS2, PS3.B
Gene Easter (gleaster@sbcglobal.net), Retired Educator, Tallmadge, Ohio
William Reitz, Retired Educator, Stow, Ohio
The Ohio Section of AAPT’s Flying Bernoulli Brothers, Gene Easter and Bill Reitz, present 30 dynamic demonstrations that are sure to engage your physics and physical science students.

COSI, CENTER OF SCIENCE AND INDUSTRY SPECIAL OFFER

COSI is offering discounted tickets to NSTA Columbus Conference attendees for regular COSI admission, as well as COSI After Dark (ADULTS only—ages 21+, valid ID required). Attendees will save off the general public admission of $20 for those ages 13+ and $15 for children ages 2–12. The admission discounts vary, up to $5 per ticket. To receive the discount, visit bit.ly/2fPOKTL. Select your tickets, purchase, and download to your smartphone. Bring proof of purchase to COSI’s Box Office.

Questions? Contact Roxi Komminsk at 614-629-3140 or rkomminsk@cosi.org. Hope to see you there!

• Regular Hours—COSI, Columbus’ dynamic science center features 320,000 square feet of hands-on science, exhibition areas, Central Ohio’s largest digital movie screen, a Planetarium, the country’s only high-wire unicycle, and live rats that play basketball. Open daily during the NSTA Conference from 10:00 AM to 5:00 PM.

• COSI After Dark (Adults Only)—‘Tis the season for toys! Become a kid again at COSI After Dark. Challenge your friends to a battle in the Nerf® Gun Arena. Solve puzzles and interact with some of COSI’s favorite toys. Conquer one of life’s mysteries and learn how to solve Rubik’s Cube. Plus explore COSI, ride the High Wire Unicycle, enjoy special-themed activities, concessions, and a cash bar. Participants must be ages 21+. Valid ID required.
5:00–6:00 PM  Meeting
Central Michigan University Doctor of Education Technology Meeting

Central Michigan University, a top provider of online programs, is offering an online Doctor of Educational Technology degree program. Come to this meeting for more information.

5:00–6:00 PM  Presentation
Engaging Science Inquiry
(Grades 3–8) Taft B, Hyatt
Science Focus: GEN, SEP

Cindy Miller (@EdcinMiller; cindy.miller@mvesc.org), Muskingum Valley Educational Service Center, Zanesville, Ohio
Engage your students and inspire questions to investigate real-world problems through the lens of your standards. Learn inquiry-based strategies to promote critical-thinking skills.

5:00–6:00 PM  Hands-On Workshops
Centering Around Science for K–3 Teachers (Grades K–3) Franklin A, Hyatt
Science Focus: GEN, NGSS

Amy Bain (amybain26@gmail.com), Clermont County Educational Service Center, Loveland, Ohio
Science centers differentiate instruction and build foundational concepts through hands-on experiences. Management tips and samples of hands-on science centers will be shared.

NSTA Press® Session: Solar Science: NGSS-Focused Solar Astronomy Experiences and Preparation for the All-American Total Solar Eclipse (Grades 5–9) Hayes, Hyatt
Science Focus: ESS

Dennis Schatz (schatz@pacsci.org), NSTA Director, Informal Science, and Pacific Science Center, Seattle, Wash.
Andrew Fraknoi, Foothill College, Los Altos Hills, Calif.
NSTA recently published Solar Science, a NGSS-focused solar astronomy curriculum resource that prepares you for the 2017 solar eclipse. Come explore some of these effective learning experiences.

ASEE Session: Demystifying the Difference Between Science and Engineering for K–6 Teachers (Grades P–6) Union D, Hyatt
Science Focus: ETS1

Andrea Burrows (@SciEdBurrows; aburrow1@uwyo.edu), University of Wyoming, Laramie
Using an authentic engineering design challenge, participants will uncover how scientific investigations are an important component of the engineering design process.

5:30–6:00 PM  Presentation
AAPT Session: Carnival Knowledge: The Flying Bernoulli Brother’s Stupendous Sideshow of Science by the Ohio Section of AAPT (General) Union A, Hyatt
Science Focus: PS2, PS3.B

Gene Easter (gleaster@sbcglobal.net), Retired Educator, Tallmadge, Ohio
William Reitz, Retired Educator, Stow, Ohio
Hurry! Hurry! Hurry! Come to the Greatest Show and Tell on Earth! Take a stroll down the Magic Midway as the Flying Bernoulli Brothers explore the games of chance—or so they are called. How do they work? Learn how to play using scientific principles. *Funded by Misspent Youth.
Located in a suburb northwest of Columbus, Hayden Falls is a beautiful 35-foot waterfall on the west side of the Scioto River, accessible via a stairway and boardwalk that were added in 2006.
8:00–9:00 AM  Presentations
Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success
(Grades K–6) B130, Convention Center
Science Focus: GEN, NGSS
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.
Join in for ways to differentiate effectively to maximize student participation and learning, as well as to accommodate the needs of English language learners and the diverse range of student abilities in K–6 science classrooms.

Basic Polymer Science for the Science Classroom
(Grades 6–12) B132, Convention Center
Science Focus: PS1.A, PS1.B, CCC6
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Simple demonstrations, labs, and activities bring STEM-relevant polymers into your curriculum. Concepts include formation, classification, structure, and properties. Pick up NGSS correlations and take home a CD of activities/information.

Universal Design for Learning: What It Is, and What It Isn’t
(Grades 6–12) B232, Convention Center
Science Focus: GEN
Gregory Taylor, Dayton (Ohio) Public Schools
Receive an overview of Universal Design for Learning as common misconceptions are addressed. Find out what implementing UDL would look like in your science classroom.

8:00–9:00 AM  Hands-On Workshops
Beyond Spaceship Earth
(Grades 3–5) B131, Convention Center
Science Focus: ESS, PS, SEP1, SEP3, SEP6
Explore classroom STEM investigations related to the International Space Station. Human exploration of space integrates STEM disciplines from science research in microgravity to engineering life support systems for space travel.

Teaching Students to Analyze Data
(Grades 4–10) B235, Convention Center
Science Focus: GEN, SEP4
Diane Johnson (@MDHJohnson; dsane.johnson@uky.edu), Lewis County Schools, Lexington, Ky.
Patti Works (@patti_works; patriciaeworks@gmail.com), Partnership Institute for Math and Science Education Reform, Lexington, Ky.
Move from telling students to teaching students how to analyze data. Learn a variety of strategies you can start using on Monday in your classroom.

A Polymer Primer for Elementary and Middle Grades
(Grades 1–8) B244/245, Convention Center
Science Focus: GEN, NGSS
Caryn Jackson (@Matscigirl5; bjcj1980@yahoo.com) and Todd Bolenbaugh, Tolles Career & Technical Center, Plain City, Ohio
Gak, oobleck, slime! Polymers can be fun and educational. Join us for recipes and connections to try with your students and learn the science behind them.
Gamification of Protein Synthesis
(Grades 9–12)  B240/241, Convention Center
Science Focus: LS, CCC1, CCC6, SEP2
Andria Stammen (stammen.52@osu.edu), The Ohio State University, Columbus
Participate in a hands-on/minds-on activity built on gaming and design principles that targets students’ conceptual understanding of protein synthesis.

Science from the Stratosphere: STEM Activities in the Infrared
(Grades 6–12)  B246, Convention Center
April Whitt (april.white@fernbank.edu), Fernbank Science Center, Atlanta, Ga.
Jeff Peterson (@petersonjeffrey; petersonj@centergrove.k12.in.us), Center Grove Middle School North, Greenwood, Ind.
Join two NASA SOFIA Science Ambassadors as they share specifics about flying with NASA and infrared astronomy. They’ll also present hands-on infrared activities to use in the classroom.

Conceptual Chemistry: Repurposed Materials for Low-Cost Science Experiments
(Grades 5–College)  Ohio Center B/C, Convention Center
Christopher Fenk (cfenk@kent.edu), Kent State University Tuscarawas Campus, New Philadelphia, Ohio
Claudia Khoury-Bowers (cmkhour@kent.edu), Kent State University at Stark, North Canton, Ohio
Engage in a creative use of Bubble Wrap, plastic pipets, mobile phones, and other store-bought materials in a novel, low-cost experiment for the colorimetric determination of solution concentrations.

(Grades K–5)  Franklin A, Hyatt
Science Focus: GEN, NGSS
Emily Morgan (emily@pictureperfectscience.com) and Karen Ansberry (karen@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio
Authors Karen Ansberry and Emily Morgan will share lessons from their award-winning Picture-Perfect Science series that integrate science and reading in a meaningful way.

Taking Advantage of the Power of Google Drive
(Grades 3–9)  Franklin C, Hyatt
Science Focus: ETS, SEP7
Mary Lightbody (lightbody.1@osu.edu), The Ohio State University at Newark
Integrate media literacy with science for powerful learning experiences. Learn what Google forms, spreadsheets, and other online tools do to foster science argumentation in your classroom. (BYOD)

Logistic Growth and the Zombie Apocalypse
(Grades 7–College)  Franklin D, Hyatt
Science Focus: LS
Angela McMurry (@AngelaMcMurry1; angie.mcmurry@darkesc.org), Darke County Educational Service Center, Greenville, Ohio
Investigate biodiversity and logistic growth by simulating changes in population in a closed environment and then analyze the collected data using the free graphing software program Desmos.
8:00–9:00 AM  Exhibitor Workshops

Genes, Genomes, and Personalized Medicine
(Grades 9–College)  B230/231, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman and Diane Munzenmaier (munzenmaier@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Introduce students to the science of genomics and personalized medicine with interactive DNA models and gene maps.
We will tell a genomic story of how whole genome sequencing has been used to reach a molecular diagnosis of a disease.

Photosynthesis and Respiration—It’s a Plant’s Life!
(Grades 9–12)  C151, Convention Center
Science Focus: LS, CCC3, SEP1, SEP3, SEP4, SEP5
Sponsor: LAB-AIDS®, Inc.
JoAnn Pfeiffer, Federal Hocking Secondary School, Stewart, Ohio
Help your students sprout and grow with a different approach to teaching photosynthesis and cellular respiration. Learn how to captivate students through inquiry activities that can challenge and excite them. Easily implement activities into your current biology or plant science class.

Investigate Photosynthesis and Cellular Respiration with Algae Beads
(Grades 8–College)  C172, Convention Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

8:30–9:00 AM  Presentation

Learning STEM Through Bioenergy: Lessons from the Plants
(Grades 7–12)  B144/145, Convention Center
Science Focus: LS, CCC
Kathryn Orvis (orvis@purdue.edu), Purdue University, West Lafayette, Ind.
Invigorate your lessons with a comprehensive curriculum focused on biofuels from plants that provides a foundation for teaching fundamental STEM concepts and making connections to a range of diverse careers.

9:00 AM–12 Noon  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. Some exhibitors will offer materials for sale.

9:30–10:00 AM  Presentation

Equal Access STEM: Strategies for Educating Students with Visual Impairments and Other Low-Incidence Disabilities
(Grades 6–12)  B232, Convention Center
Science Focus: GEN
Karen Koehler (kkoehler@ossb.oh.gov), The Ohio State School for the Blind, Columbus
Inclusive STEM classrooms benefit both students with and without disabilities. Learn about the unique needs of visually impaired students and science instructional strategies.
9:30–10:30 AM  Presentations

Breaking the Bell Curve: Reaching ALL Students with Mastery Learning
(Grades 1–12)  B130, Convention Center
Science Focus: GEN
Chad Ostrowski (@chadostrowski; chad@thegridmethod.com), STEAMM Academy @ Hartford Middle School, Canton, Ohio
Leave with easy-to-implement, tech-embedded instructional strategies to successfully implement mastery learning to assess and reach ALL learners in the classroom.

Preschool STEAM: Yes, They Can!
(Grades P–2)  B131, Convention Center
Science Focus: GEN, NGSS
Nancy DeJarnette (ndejarne@bridgeport.edu), University of Bridgeport, Conn.
Review research that addresses the need for STEAM (Science, Technology, Engineering, Arts, and Math) initiatives at the early childhood level and sample activities.

Old Polymer Labs with 21st-Century Learning
(Grades 5–12)  B132, Convention Center
Science Focus: PS, CCC, SEP
Andrew Nydam, Polymer Ambassador, Olympia, Wash.
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.

How Does Your Garden Grow? Creating and Maintaining Kid- and Bird-Friendly Gardens
(Grades K–12)  B140/141, Convention Center
Science Focus: LS
Lindsay Glasner (@BirdSleuth; lig27@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.
Through school gardens, students can explore the characteristics that create good habitats for birds and other wildlife. Discover grants and resources to support your work.

STEM for ALL
(Grades P–12)  B142/143, Convention Center
Science Focus: ETS1, CCC, SEP
Amanda Oberski (@aoberski; amandaoberski@gmail.com), Teach for America, San Francisco, Calif.
Explore a new style of teaching and learning that facilitates deep interest and connection to science, technology, and design for ALL students. Can be adapted for all grade levels.

Engaging Reading and Writing Success: Incorporating Today’s Global Issues
(Grades 6–12)  B144/145, Convention Center
Science Focus: GEN
Linda Linnen, Retired Teacher, Aurora, Colo.
A multitude of reading and writing strategies will be provided to engage middle school and high school educators in presenting today’s global issues.

Shaping Teaching Practice Through Action Research
(Grades 6–College)  B235, Convention Center
Science Focus: GEN
Nidaa Makki (nmakki@uakron.edu), Karen Plaster (@kbp9pbk; kbp9@uakron.edu), and Gary Holliday (gh30@uakron.edu), The University of Akron, Ohio
Woodrow Wilson Teaching Fellows will share their action research projects and discuss the impact on their teaching. They’ll also share strategies to conduct research in your classroom.

Crosswalk Between Ohio’s Learning Standards and NGSS Disciplinary Core Ideas
(Grades K–12)  B244/245, Convention Center
Science Focus: GEN, NGSS
Belinda Clark, Science Education Consultant, Grove City, Ohio
Resources often claim to meet specific NGSS practices, but Ohio teachers are responsible for meeting Ohio’s Learning Standards. Find out how to use an alignment crosswalk between the two.
9:30–10:30 AM  Hands-On Workshops
Unlocking the Particulate Nature of Matter with Locking Blocks
(Grades 6–12)  B240/241, Convention Center
Science Focus: PS, SEP2
Claudia Khourey-Bowers (cmkhoure@kent.edu), Kent State University at Stark, North Canton, Ohio
Christopher Fenk (cfenk@kent.edu), Kent State University Tuscarawas Campus, New Philadelphia, Ohio
Ian Meiser (imeiser@claymontschools.org), Claymont High School, Uhrichsville, Ohio
Discover a series of performance assessments, using physical models made with locking blocks, to uncover students' understandings of chemical and physical changes, reactions, and solutions.

Applying Design Thinking to a Water Rescue
(Grades 5–12)  B246, Convention Center
Science Focus: ETS, SEP1, SEP2, SEP3
Sue Counterman (sue.counterman@coloradoacademy.org) and Thanh Luong (thanh.luong@coloradoacademy.org), Colorado Academy, Denver
Focusing on brainstorming and prototyping, design and build a watercraft that a robotic ball can pull and navigate to successfully complete a water rescue mission. Bring your tablet/smartphone that can download and run apps.

Tackling Toxicant Exposure with Food Choices
(Grades 5–12)  Ohio Center B/C, Convention Center
Science Focus: GEN, SEP
Susan Hershberger (hershbss@miamioh.edu), Miami University, Oxford, Ohio
Explore the challenge of minimizing health effects of toxicant exposure using nutrition with an Inquiry Cycle™ combining graphic inquiry stories, student-led investigations, and magazine-style readings.

NSTA Press® Session: Inquiring Scientists, Inquiring Readers: Integrating Literacy and Inquiry in Middle School Science
(Grades 5–8)  Franklin A, Hyatt
Science Focus: GEN, NGSS
Jessica Fries-Gaither (@ElemSciTchr; jfriesgaither@gmail.com), Columbus School for Girls, Columbus, Ohio
Learn about the variety of nonfiction texts and literacy strategies that support inquiry science. Experience how these components come together in one powerful learning experience.

Caught Up in Currents
(Grades 7–8)  Franklin C, Hyatt
Lesa Marchiando (lesia.marchiando@swcsd.us) and Amber Noonan, Pleasant View Middle School, Grove City, Ohio
Ashley Gustin and Leah Walter (leah.walter@swcsd.us), Finland Middle School, Columbus, Ohio
Cary Lindberg and Kimberly Diehl (kimberly.diehl@swcsd.us), Jackson Middle School, Grove City, Ohio
Presider: Gordon Aubrecht (aubrecht.1@osu.edu), The Ohio State University at Marion
Find out how these teachers have worked collaboratively to develop activities and approaches that emphasize formative assessment, questioning, and reasoning to achieve deeper understanding.

9:30–10:30 AM  Exhibitor Workshops
Of All the Nerve: Modeling Neurotransmission
(Grades 9–College)  B230/231, Convention Center
Science Focus: LS, CCC, SEP
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman and Gina Vogt (vogt@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Construct models of cholinergic, dopaminergic, and GABAergic synapses. Explore the role of various ions in action potential generation and neurotransmitter release. Visualize neurotransmitter synthesis using 3D-printed models, Handouts provided!

The Science of Keeping Food Fresh
(Grades 9–12)  C151, Convention Center
Science Focus: GEN, CCC3, SEP1, SEP3, SEP4, SEP7, SEP8
Sponsor: LAB-AIDS®, Inc.
JoAnn Pfeiffer, Federal Hocking Secondary School, Stewart, Ohio
Discover the chemistry of how food additives make your food safe and preserved. Get your students firsthand experience in analyzing and determining the best method for food preservation. A great activity that mirrors a real-world challenge food scientists tackle.
Build a Box: Engineering Food Dye Electrophoresis for NGSS
(Grades 7—College)  C172, Convention Center
Science Focus: ETS, PS, SEP
Sponsor: Bio-Rad Laboratories
Leigh Brown, Bio-Rad Laboratories, Hercules, Calif.
In this hands-on workshop, see great ways to engage your students in engineering practices to study something they encounter in their everyday lives—food dyes! Have students engineer a protocol to separate and identify dyes using an integrated do-it-yourself electrophoresis box. It’s a colorful way to introduce pipetting and electrophoresis skills in addition to chemistry and physics concepts.

10:00–10:30 AM Presentations
Students with Disabilities and the 5E Learning Cycle
(Grades 6–9)  B232, Convention Center
Science Focus: PS
Gregory Taylor, Dayton (Ohio) Public Schools
We analyzed over 70 middle school physics lessons that use the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate) and share our findings for students with learning disabilities.

Building a Community Science Festival: The JW Family Science Extravaganza
(Grades K–5)  Franklin D. Hyatt
Science Focus: INF, SEP
Robert Pyatt (@RobertPyatt1; robpyatt@gmail.com), The Ohio State University, Columbus
Learn strategies for organizing a volunteer science festival and review assessment results and experiences from five years of the JW Family Science Extravaganza.

11:00–11:30 AM Presentations
Making Science and Literacy Connections with NGSS
(Grades P–5)  B131, Convention Center
Science Focus: GEN, NGSS
Mandy McCormick Smith (@ecesciencerocks; msmith21@capital.edu), Capital University, Columbus, Ohio
Discussion centers on activities and crosscutting concepts of the NGSS, Culturally Responsive Pedagogy (CRP), as well as Developmentally Appropriate Practices (DAP), both explicitly and implicitly.

Eclipses: A Tool for Teaching the Evolution of Astronomy
(Grades 7–College)  B142/143, Convention Center
Science Focus: ESS
Katrina Brown (kwb@pitt.edu), University of Pittsburgh at Greensburg, Pa.
We will discuss how we use a historical database of national newspapers to discuss the evolution of astronomical concepts, particularly eclipses.

Building a Community Science Festival: The JW Family Science Extravaganza
(Grades K–5)  Franklin D. Hyatt
Science Focus: INF, SEP
Robert Pyatt (@RobertPyatt1; robpyatt@gmail.com), The Ohio State University, Columbus
Learn strategies for organizing a volunteer science festival and review assessment results and experiences from five years of the JW Family Science Extravaganza.

11:00 AM–12 Noon Presentations
CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content
(Grades 7–12)  B130, Convention Center
Science Focus: ETS
David Vernot (@dvernot; dvernot@gmail.com), Cincinnati Enhanced Engineering Math and Science Program (CEEMS), University of Cincinnati, Ohio
Secondary teachers developed CBL engineering units through this NSF-funded program. See examples and get access to a searchable database of 100+ of these units.

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials
(Grades 9–12)  B132, Convention Center
Science Focus: GEN, NGSS
Patrice Pages (p_pages@acs.org), American Chemical Society, Washington, D.C.
Promote critical thinking using standards-based inquiry lesson plans based on high-interest, scientifically accurate articles about topics relevant to high school students’ everyday lives.
AACT: Resources and Opportunities  
(General)  
B140/141, Convention Center  
Science Focus: PS  
Scott Hawkins (@hawkins_chem; shawkins@ignatius.edu), Saint Ignatius High School, Cleveland, Ohio  
Find out how the American Association of Chemistry Teachers can save you time and connect you with other teachers of chemistry across the country. I’ll provide an overview of the teaching resources available through AACT.

Bringing the Outdoors in Through Fabric Models  
(Grades P–8)  
B144/145, Convention Center  
Science Focus: ESS2, LS  
Linda Pettit (linda-pettit@franklinswcd.org), Franklin Soil and Water Conservation District, Columbus, Ohio  
Can’t take your students outside? Through “dry stream” and other fabric habitats, experience ways to bring environmental features and stories to life in your classroom.

The Emerging Bioeconomy: The Products Being Made, the Technologies Behind It, and Future Careers  
(Grades 7–12)  
B232, Convention Center  
Science Focus: ETS1.A, ETS1.B  
Shannon Hollis, The Ohio State University, Columbus  
Bioproducts are made from renewable bioresources that are a sustainable alternative to petroleum-based materials. Come learn about the emerging bioeconomy and related career paths.

Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts  
(Grades 8–12)  
B235, Convention Center  
Science Focus: PS, CCC, SEP  
Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.  
Generate student interest and understanding of STEM with labs and demonstrations that relate automobiles to physical science (chemistry) concepts. Pick up CCSS correlations and take home a CD of information.

Tackling Classroom Management in a Complex PBL Environment  
(Grades 4–College)  
B244/245, Convention Center  
Science Focus: GEN, NGSS  
Chuck Crawford (@chuckcrawfordsr; crawford_chuck@dublinschools.net), Dublin (Ohio) City Schools  
Discover several examples of how to use project management to help control the chaos of the classroom environment and increase the workflow efficiency of the modern classroom.

Hands-On Workshops  
11:00 AM–12 Noon  
Impactful Learning: Engineering to Serve Special Needs Students—The Win-Win Scenario  
(Grades 6–College)  
B233/234, Convention Center  
Science Focus: ETS1, CCC, SEP  
Jean Trusedell (jtrusede@purdue.edu), Purdue University, West Lafayette, Ind.  
Engaging students in engineering through human-centered design is the focus of this interactive workshop that explains the development of assistive devises for special needs students.

Exploring the Seeds of SEED (Students Exploring Ecosystem Dynamics)  
(Grades P–8)  
B240/241, Convention Center  
Science Focus: GEN, INF  
Tanya Taylor (tanyataylor@metroparks.net) and Kim Strosnider (kstrosnider@metroparks.net), Columbus and Franklin County Metro Parks, Westerville, Ohio  
SEED is an award-winning curriculum program partnership between informal and formal educators. We will unpack SEED resources and tools to create your own program partnerships.

Seasons in the Sun  
(Grades 6–8)  
B246, Convention Center  
Science Focus: ESS1.B, CCC1, CCC4, SEP2, SEP4  
Meredith Harris (@LPI Today; meredithaharris@me.com), Spring ISD, Houston, Tex.  
Angela Fontenot (@LPI Today; fontenota@lpisd.org), La Porte Junior High School, La Porte, Tex.  
Yolanda Ballard (@LPI Today; ballard@lpi.usra.edu), Lunar and Planetary Institute, Houston, Tex.  
Participate in data-rich activities, examining patterns in temperatures, modeling the reasons for seasons, and predicting patterns for the number of daylight hours for cities.

Using the Engineering Design Process to Better Understand Space Science  
(Grades 4–7)  
C161, Convention Center  
Science Focus: ETS1  
David Murduck (dave.murduck@neomin.org), Champion Middle School, Warren, Ohio  
Construct two scale models of our solar system and learn how to use a NASA design challenge to further develop student understanding of the engineering design process in your classroom.
From the Arctic to the Classroom—Translating Research into Student Learning  
(Grades 1–12)  
Ohio Center B/C, Convention Center  
Sandra Thornton (slwthornton@gmail.com), Broadwater Academy, Exmore, Va.  
Use cutting-edge Arctic research from the Chukchi Sea to enhance student learning. Instructional strategies, collaborative opportunities, and research data will be shared.

Infect Your Science Classroom with Math  
(Grades 6–College)  
Franklin C, Hyatt  
Science Focus: GEN  
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District  
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(Grades 4–12)  
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Science Focus: ETS1, SEP6  
Anthony Perry (@tonyperry; aperry@mit.edu), The Lemelson-MIT Program, Cambridge, Mass.  
Kevin Sweeney (ksweeney@columbusschoolforgirls.org), Columbus School for Girls, Columbus, Ohio  
This hands-on workshop will give you experience leading design challenges and incorporating invention into your curriculum to provide authentic, cross-curricular opportunities that engage community resources.

11:30 AM–12 Noon  
Presentation  
Addressing Integrated Process Skills in Physical Science Courses with Modeling Instruction  
(Grades 8–12)  
BI42/143, Convention Center  
Science Focus: PS, SEP  
Ted Clark, The Ohio State University, Columbus  
Let’s consider whether students in physical science classrooms employing modeling improve their skills in science practices like posing research questions or graphing and interpreting data.
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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

Look for a map display of the Exhibit Hall. Maps are also available via our NSTA Conference app. Scan QR code to download.

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</table>
**Exhibitors**

**NSTA Programs**

AEOP eCYBERMISSION and GEMS
Booth #1028 • E-mails: missioncontrol@ecybermission.com
aeopgems@nsta.org
Website: www.usaep.org

NGSS@NSTA
Booth #1025 • E-mail: ngs@nsta.org
Website: www.nsta.org/ngss

NSTA Membership
Located in Hall B lobby • E-mail: membership@nsta.org
Website: www.nsta.org/membership

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**National Geographic Learning | #747**

Cengage Learning
20 Channel Center St. K–12
Boston, MA 02210
Phone: 888-915-3276
E-mail: schoolcustomerservice@cengage.com
Website: www.nationalgeographiclearning.com

National Geographic Learning, a part of Cengage Learning, provides quality preK–12, academic, and adult education instructional solutions for reading; science; social studies; mathematics; ESL/ELD; advanced, honors, and electives; career and technical education; and professional development. See our new catalog at NGL.Cengage.com/catalogs.

---

**National Inventors Hall #1038**

of Fame®/Camp Invention
B, C, EA, EN, G, PH, PD, T
3701 Highland Park NW
North Canton, OH 44720
Phone: 800-968-4332
E-mail: campinvention@invent.org
Website: www.invent.org/camp-invention

WHERE BIG IDEAS BECOME THE NEXT BIG THING™ Camp Invention is the only nationally recognized, nonprofit summer enrichment program for kindergartners through 6th-graders that is inspired by the greatest innovators around—the Inductees of the National Inventors Hall of Fame®. At Camp Invention, children are empowered to question, brainstorm, collaborate, and invent!

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**The NEED/Ohio Energy Project #742**

200 E. Wilson Bridge, Suite 320 EN, G, PH
Worthington, OH 43085
Phone: 513–688-1717
E-mail: dyerkes@ohioenergy.org
Website: www.need.org/ www.ohioenergy.org

Stop by to see our energy educational resources that facilitate students’ and teachers’ understanding of the science of energy and its efficient use to empower the next generation of energy consumers.

**NGSS@NSTA #1025**

1840 Wilson Blvd.
Arlington, VA 22201 K–12
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 #532**

1305 East-West Hwy. B, EA, EN, PD
Silver Spring, MD 20910
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, fisheries, satellite data, and solar weather. Every day NOAA’s science touches the lives of all Americans.

**Non-Fiction Text for Inquiry Based #538**

(NFTI) Science PD
1900 Kenny Rd.
Columbus, OH 43210
Phone: 614-247-4792
E-mail: kamb.3@osu.edu
Website: nfti-science.ehe.osu.edu

Stop by to learn about NFTI’s professional development program for grades 3–5. The increased emphasis on reading nonfiction texts provides an ideal opportunity for teachers to explore the links between Ohio’s New Learning Standards for science and English language arts. NFTI provides strategies to support learning through the integration of nonfiction texts into science instruction.

**NSTA Professional Learning #1027 Opportunities**

PreK–12, College
Arlington, VA 22201
Phone: 703-312-9274
E-mail: awakely@nsta.org

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 is NSTA’s professional learning portal designed to enhance the content and pedagogical knowledge of teachers of science.

OHAUS Corp.  #633
7 Campus Dr., Suite 310  B, C, EA, EN, Parsippany, NJ 07054-4413  G, PH, T
Phone: 973–944–7026  K–12, College
E-mail: debbie.foreman@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.

Ohio Corn & Wheat  #535
59 Grief Pkwy., Suite 101  Delaware, OH 43015  Phone: 419-306-0351
E-mail: heather@educationprojects.org
Website: www.ohiocornandwheat.org
Ohio Corn & Wheat recognizes the value of providing high-quality resources and free professional development for Ohio’s teachers. Classroom lessons and online platform answer the question “How will we feed 9 billion people?” and address topics such as water quality, biotechnology, energy and ethanol, soil, and sustainability while also connecting teachers with industry experts.

Ohio Dept. of Natural Resources  #945
Divisions of Wildlife and Geo Survey
2045 Morse Rd., Bldg. G  B, EA, EN, G, PD
Columbus, OH 43229  PreK–12, College
Phone: 614-265-6316  E-mail: jen.dennison@dnr.state.oh.us
Website: ohiodnr.gov

The Ohio Department of Natural Resources provides a wide variety of materials for Ohio science educators, from field guides, maps, technical documents, posters, and more. Stop by and see what the Divisions of Wildlife and Geo Survey have to offer.

Come by the membership booth to learn more about NSTA Membership and become part of the group who is crafting the future of science education!

Win great prizes including airfare on Southwest Airlines to future NSTA Conferences on Science Education.

#NSTA16
#NSTAGroupie
#NSTAawesome

NSTA Columbus Area Conference on Science Education  113
Ohio Oil and Gas Energy  #939
Education Program  PD
1718 Columbus Rd. SW  6–8
PO Box 187
Granville, OH 43023
Phone: 740-587-0410
E-mail: kdecina@oogeep.org
Website: www.oogeep.org

The Ohio Oil and Gas Energy Education Program (OOGEEP) is a public outreach program focused on energy education. Stop by our booth and receive some great teaching activities, lesson plans, posters, DVDs, workshop information, and lots of other free educational materials! Learn more about us at www.oogeep.org.

PASCO scientific  #632
10101 Foothills Blvd.  All
Roseville, CA 95747  6–12, College
Phone: 916-462-8208
E-mail: kdecina@pasco.com
Website: www.pasco.com

PASCO scientific transforms science education and student learning with innovative solutions featuring wireless probeware, intuitive award-winning software for all devices, quality lab equipment, core curriculum, and world-class professional development. PASCO offers solutions for physics, biology, chemistry, Earth, environmental, and middle school science.

Pearson Education  #832
501 Boylston St.  B, C, EA, EN, G, PH, T
Boston, MA 02116  K–12
Phone: 800-848-9500
Website: www.pearson.com

Pearson is the world’s learning company. We’re inspired by the way education transforms lives. We help K–12 educators create better learning across all disciplines with our products and services. We’re dedicated to improving student outcomes and helping learners prepare for college and careers...because where learning flourishes, so do people.

Penn State World Campus  #842
The Pennsylvania State University  PD
Suite 408, The 329 bldg.
University Park, PA 16802
Phone: 814–865-7600
E-mail: eah29@psu.edu
Website: worldcampus.psu.edu

Penn State World Campus, backed by over a century of distance education and 15+ years of outstanding online instruction, offers more than 100 programs, awarding degrees and transcripts identical to those earned by on-campus students. Our mission is to ensure your access to a quality academic experience, anywhere, anytime.

PEPCO Inc.  #930
1615 Robertson Rd.  B, C, EA, EN, G, PH, T
Moberly, MO 65270-0457  K–12, College
Phone: 800-568-1067
E-mail: dave@pepcoinc.com
Website: www.pepcoinc.com

PEPCO is a family-owned manufacturer of lab furniture serving school districts nationwide. Using only the finest materials available and a centralized location, our direct sales save districts money while providing a quality product. Building better tables since 1989.

PlayMada Games  #533
261 Madison Ave., 9th Floor  C
New York, NY 10016  9–12
Phone: 212–574-6194
E-mail: info@playmadagames.com
Website: www.playmada games.com

PlayMada Games is a devoted team of educators, designers, and developers on a mission to bring game-based learning experiences into high school science classrooms. We create digital games that give students a deepened understanding of fundamental scientific concepts while exploring systems of science through play.

Project Lead The Way  #1034
3939 Priority Way S. Dr., Suite 400  B, C, EA, EN, G, PH
Indianapolis, IN 46240
Phone: 317-669-0275
E-mail: events@pltw.org
Website: www.pltw.org

Project Lead The Way (PLTW) is a nonprofit organization that provides a transformative learning experience for K–12 students and teachers across the U.S. Through our pathways in computer science, engineering, and biomedical science, students learn problem-solving strategies, critical and creative thinking, and how to communicate and collaborate.

Project Learning Tree  #826
2000 M St. NW, Suite 550  EN, PD
Washington, DC 20036
Phone: 202-765-3641
E-mail: information@plt.org
Website: www.plt.org

Project Learning Tree is an award-winning environmental education program designed for teachers and other educators, parents, and community leaders working with youth from preschool through grade 12.

School Specialty Science  #738
80 Northwest Blvd.  B, C, EA, EN, G, PH
Nashua NH 03063
K–12
Website: www.schoolspecialtyscience.com

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 pre-K–12 science teachers, curriculum specialists, and administrators.

Science First®/StarLab®  #841
Yulee, FL 32097
K–12
Phone: 904-225-5558
E-mail: helmut.albrecht@sciencefirst.com


From grade school to graduate school, Science First helps ignite science! Take your students to the stars or dive to the Earth’s center with StarLab, our portable planetarium. We specialize in STEM-incorporated classroom products and activities and are the exclusive dealer in the U.S. for PHYWE products that test the minds of university and college students with state-of-the-art technology.

Washington, DC 20036  PreK–12
Seacamp Association, Inc. #1031
1300 Big Pine Ave. B, EN, G, PD
Big Pine Key, FL 33043 K–12, College
Phone: 305–872-2331
E-mails: info@nhmi.org; info@seacamp.org
Websites: www.nhmi.org; www.seacamp.org

Seacamp Association is a private, nonprofit organization that operates two programs in the Florida Keys. Newfound Harbor Marine Institute is our school-based program offering marine and environmental education programs for visiting school groups. Seacamp is our summer residential program for youths ages 12 to 17 with programs in marine science, scuba, sailing, and windsurfing.

Shell Science Lab Challenge #1026
1 Shell Plaza B, C, EA, EN, G, PH, PD, T
Houston, TX 77252 K–12
Phone: 703-312-9217
E-mail: shellsciencelab@nsta.org
Website: www.nsta.org/shell

Come learn how to win $20,000 for your classrooms, $10,000 for your exemplary teaching, and $1,800 to attend the NSTA National Conference in Los Angeles March 30 to April 2, 2017.

Simulation Curriculum #1030
11900 Wayzata Blvd., Suite 126 EA, G, PD, T
Minnetonka, MN 55305 K–12, College
Phone: 952–653-0493
E-mail: mgoodman@simcur.com
Website: www.simulationcurriculum.com

Simulation Curriculum is the leading developer of interactive, computer, and web-delivered Earth and space science curriculum solutions for schools.

Southern Science Supply #643
2914 Oakleaf Dr. B, C, EN, G, T
San Antonio, TX 78209 K–12
Phone: 210-887-0479
E-mail: carol@southernsciencesupply.com
Website: www.southernsciencesupply.com

Magnify what you do with the MicroSight Dlite and ProScope Microscopes. These magnificent microscopes are available in USB, Wi-Fi, and portable models and will allow you to see the world in brilliant detail. Many accessories are available for each model as well as unique specimen observation kits and lesson plan booklets. Come scope us out!

Teaching & Learning Collaborative #536
200 E. Wilson Bridge Rd. PD, T
Worthington, OH 43085 PreK–8
Phone: 614-265–9800
E-mail: kelli@teachinglearningcollaborative.org
Website: teachinglearningcollaborative.org

The Teaching & Learning Collaborative is a nonprofit organization dedicated to high-quality professional development and support for grades preK–12 in mathematics, science, and technology. TLC also coordinates the Annual Pi Day 5K—to engage students, families, and educators in 3.14 miles of fun! Walk 3.14 miles any day of the conference (you’ll have to show your distance for the day) and get your Pi Day 5K spinner medal for FREE (while supplies last, limit one per mathlete)—or grab yours for $5!
<table>
<thead>
<tr>
<th>Exhibitors</th>
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<th>Address</th>
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<tr>
<td>Texas Instruments</td>
<td>#733</td>
<td>All</td>
<td>PO Box 650311 MS 3821 Dallas, TX 75265</td>
<td>800-TICARES (842-2737)</td>
<td><a href="mailto:ti-cares@ti.com">ti-cares@ti.com</a></td>
<td><a href="http://education.ti.com">education.ti.com</a></td>
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<tr>
<td>Toshiba/NSTA ExploraVision</td>
<td>#1024</td>
<td>K–12</td>
<td>1840 Wilson Blvd, Arlington, VA 22201</td>
<td>800-Explor9</td>
<td><a href="mailto:techinick@nsta.org">techinick@nsta.org</a></td>
<td><a href="http://www.exploravision.org">www.exploravision.org</a></td>
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<tr>
<td>University of Cincinnati</td>
<td>#948</td>
<td>All</td>
<td>PO Box 210076, Cincinnati, OH 45221</td>
<td>513–556-6454</td>
<td><a href="mailto:julie.steimle@uc.edu">julie.steimle@uc.edu</a></td>
<td><a href="http://www.uc.edu">www.uc.edu</a></td>
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<tr>
<td>United Skates of America</td>
<td>#545</td>
<td>G</td>
<td>4849 Evanswood Dr, Columbus, OH 43229</td>
<td>614–802-2440</td>
<td><a href="mailto:kwise@usa-skating.com">kwise@usa-skating.com</a></td>
<td><a href="http://www.unitedskates.com">www.unitedskates.com</a></td>
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<tr>
<td>University of the Sciences</td>
<td>#850</td>
<td>B, C, 9–12</td>
<td>600 S. 43rd St, Philadelphia, PA 19104</td>
<td>215-596–8800</td>
<td><a href="mailto:k.wolbach@uscience.edu">k.wolbach@uscience.edu</a></td>
<td><a href="http://www.uscience.edu">www.uscience.edu</a></td>
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<tr>
<td>Vernier Software &amp; Technology</td>
<td>#725</td>
<td>B, C, 9–12</td>
<td>13979 SW Millikan Way, Beaverton, OR 97005</td>
<td>888-837-6437</td>
<td><a href="mailto:info@vernier.com">info@vernier.com</a></td>
<td><a href="http://www.vernier.com">www.vernier.com</a></td>
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Texas Instruments (TI) 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. TI offers handhelds, software, apps for iPads, and data collection technology, designed to promote conceptual understanding, and formative assessment tools that gauge student progress.

United Skates of America provides roller skating and family fun for all ages. It also provides a STEM-based field trip program for grades K–8. Our STEM Field Trip is a unique educational experience that gets students EXCITED about learning! Students will learn how the concepts of SCIENCE, TECHNOLOGY, ENGINEERING, and MATH can be found in everyday experiences, even FUN experiences like ROLLER SKATING!

The ExploraVision K–12 competition challenges students in the U.S. and Canada to research a technology of interest and explore what that technology could be like 20 years from now. Up to $240,000 in savings bonds (at maturity) are awarded annually to student winners for the most innovative ideas that combine imagination with the tools of science.

United Skates of America prepares students to become leaders, innovators, and skilled practitioners in the sciences, health professions, and related disciplines. We offer 17 different Bachelor of Science degree programs, three direct entry professional programs, including DrOT, DPT, and PharmD; and graduate programs at the master’s and doctoral levels.

The U.S. Department of Energy’s Bioenergy Technologies Office (BETO) establishes public-private partnerships to develop and demonstrate technologies to commercialize a sustainable, domestic bioenergy industry. To enhance this work, BETO’s education and workforce efforts improve public accessibility to bioenergy information, support formal and informal education, and engage future scientists and engineers.

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 science interfaces, sensors, and graphing/analysis software. Vernier’s technology-based solutions enhance STEM education, increase learning, and build students’ critical-thinking skills.

The U.S. Stockholm Junior Water Prize (SJWP) is a $10,000 scholarship opportunity administered by the Water Environment Federation for high school students in grades 9–12, who conduct water-science research projects. State winners receive an all-expenses paid trip to the national finals at the University of North Carolina at Charlotte.
## Index of Exhibitor Workshops

### 3D Molecular Designs (Booth #642)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>B230/231, Conv. Center</td>
<td>Dive In with Magnetic Water Molecules (p. 41)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>B230/231, Conv. Center</td>
<td>Constructing and Crossing Cell Membranes (p. 49)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>B230/231, Conv. Center</td>
<td>The Many Jobs of Proteins: Enzymes in the Spotlight (p. 54)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>B230/231, Conv. Center</td>
<td>Let’s Get Helical: Exploring DNA Structure and Function with Physical Models (p. 68)</td>
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</table>

### Accelerate Learning–STEMscopes (Booth #835)

<table>
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<tr>
<th>Date</th>
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<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>B233/234, Conv. Center</td>
<td>The Value of Writing Scientific Explanations in STEM (p. 41)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>B233/234, Conv. Center</td>
<td>STEM Literacy: Strategies for Making Complex Text Meaningful (p. 54)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>B233/234, Conv. Center</td>
<td>Building the Skills of Argumentation and Collaboration in STEM (p. 68)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>B233/234, Conv. Center</td>
<td>Supporting Excellence in STEM Programs and Teaching Through STEM Certification (p. 84)</td>
</tr>
</tbody>
</table>

### Activate Learning (Booth #737)

<table>
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<th>Date</th>
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<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>B235, Conv. Center</td>
<td>Science Storylines: Developing Three-Dimensional Lessons That Build on Student Curiosity (p. 41)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>B235, Conv. Center</td>
<td>Integrating Literacy and Science—The Wow Factor (p. 56)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>B235, Conv. Center</td>
<td>Discourse Tools for Equitable and Rigorous Talk (p. 68)</td>
</tr>
</tbody>
</table>

### AEOP eCYBERMISSION (Booth #1028)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>B131/132, Conv. Center</td>
<td>Group Work: Using Student Collaboration in the Middle School Science Classroom (p. 60)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>B131/132, Conv. Center</td>
<td>Too Many Ideas: Helping Students Focus and Select a Topic to Investigate (p. 84)</td>
</tr>
</tbody>
</table>

### AEOP GEMS (Booth #1028)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<th>Description</th>
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<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>B131/132, Conv. Center</td>
<td>Gains in the Education of Mathematics and Science: What Can GEMS Do for You? (p. 44)</td>
</tr>
</tbody>
</table>

### American Association of Colleges of Osteopathic Medicine (Booth #852)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C172, Conv. Center</td>
<td>Osteopathic Physicians 102: Helping Teachers Understand the Profession (p. 57)</td>
</tr>
</tbody>
</table>

### Amplify (Booth #934)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
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<th>Description</th>
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<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C170, Conv. Center</td>
<td>Experience Amplify Science: Grades K–1 (p. 39)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C170, Conv. Center</td>
<td>Experience Amplify Science: Grades 2–5 (p. 42)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C170, Conv. Center</td>
<td>Experience Amplify Science: Middle School (p. 45)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C170, Conv. Center</td>
<td>What Is Amplify Science? (p. 50)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C170, Conv. Center</td>
<td>What Is Amplify Science? (p. 70)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C170, Conv. Center</td>
<td>Implementing Science Seminars and Scientific Argumentation with Amplify Science (p. 76)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C170, Conv. Center</td>
<td>Not Your Typical Classroom Experience: Amplify Science’s Digital Engineering Internships (p. 80)</td>
</tr>
</tbody>
</table>
# Index of Exhibitor Workshops

## Bio-Rad Laboratories (Booth #824)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Title</th>
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<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C172, Conv. Center</td>
<td>Contagion! Track the Progress of Dangerous Viruses that Are Spreading Through the Country (p. 70)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C172, Conv. Center</td>
<td>Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 76)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C172, Conv. Center</td>
<td>The GMO Debate Rages On! (p. 80)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>C172, Conv. Center</td>
<td>How to Use Pop Culture in Your Life Science Class (p. 85)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>C172, Conv. Center</td>
<td>How Do You Know What Fish Species You Are Eating? DNA Barcoding! (p. 87)</td>
<td></td>
</tr>
</tbody>
</table>

## Carolina Biological Supply Co. (Booth #625)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C150, Conv. Center</td>
<td>Hands-On Science with Classroom Critters (p. 39)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C150, Conv. Center</td>
<td>Engineer Physical Science Excitement with a Carolina STEM Challenge® (p. 41)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C150, Conv. Center</td>
<td>Learning By Arguing: Claims, Evidence, and Reasoning (p. 44)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C150, Conv. Center</td>
<td>Hands-On Activities to Model Habitat Preference and Population Sampling (p. 49)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C150, Conv. Center</td>
<td>Waves, Waves, Waves: Building Models to Explain Phenomena (p. 56)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>C150, Conv. Center</td>
<td>Comparative Mammalian Organ Dissection with Carolina’s Perfect Solution® Specimens (p. 60)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C150, Conv. Center</td>
<td>Bring Visual Science into K–5 Classrooms—It’s a Game Changer! (p. 68)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C150, Conv. Center</td>
<td>Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 75)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C150, Conv. Center</td>
<td>Introduction to Wisconsin Fast Plants® (p. 79)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>C150, Conv. Center</td>
<td>Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (p. 85)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>C150, Conv. Center</td>
<td>The Best of Engineering for Elementary Students (p. 87)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>3:30–4:30 PM</td>
<td>C150, Conv. Center</td>
<td>Strawberry Milkshakes: DNA and Lactose Intolerance (p. 90)</td>
<td></td>
</tr>
</tbody>
</table>

## CPO Science/School Specialty Science (Booth #734)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C162, Conv. Center</td>
<td>CPO’s Link™ with Car and Ramp: Force, Motion, and Variables (p. 39)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C162, Conv. Center</td>
<td>CPO’s Link™ Genetics Learning Modules: Crazy Chromosomes and Crazy Traits (p. 45)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C162, Conv. Center</td>
<td>CPO’s Wind Turbine: A STEM Approach to Engineering and Design (p. 50)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C162, Conv. Center</td>
<td>Building Electric Circuits with CPO’s New Link™ Learning Module (p. 56)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>C162, Conv. Center</td>
<td>CPO Science’s Link™ Module: Learning About Chemistry Models (p. 60)</td>
<td></td>
</tr>
</tbody>
</table>

## Delta Education/School Specialty Science (Booth #732)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C160, Conv. Center</td>
<td>Teach Next Gen Like Your Hair Is on Fire! (p. 39)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C160, Conv. Center</td>
<td>SEP’s Made Easy (p. 41)</td>
<td></td>
</tr>
</tbody>
</table>
## Delta Education/School Specialty Science, continued

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C160, Conv. Center</td>
<td>Build Skills to Boost the Makerspace Experience for Young Scientists!</td>
<td>(p. 44)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C160, Conv. Center</td>
<td>STEM-gineering (p. 50)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C160, Conv. Center</td>
<td>Increase Your 3-D Vision of NGSS (p. 56)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>C160, Conv. Center</td>
<td>Liven Up Literacy with Science (p. 60)</td>
<td></td>
</tr>
</tbody>
</table>

### Delta Education/School Specialty Science–FOSS (Booth #732)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C161, Conv. Center</td>
<td>Wave Properties and Information Transfer (p. 39)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C161, Conv. Center</td>
<td>Engage Students in FOSS Next Generation (p. 42)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C161, Conv. Center</td>
<td>The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes (p. 44)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C161, Conv. Center</td>
<td>Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 50)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C161, Conv. Center</td>
<td>What Does Conceptual Modeling Look Like in an Elementary Classroom? (p. 56)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>C161, Conv. Center</td>
<td>Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 60)</td>
<td></td>
</tr>
</tbody>
</table>

### Dinah.com (Booth #828)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>B131/132, Conv. Center</td>
<td>FOLD-tastic Science Notebooks via Dinah Zike’s Notebook Foldables (p. 79)</td>
<td></td>
</tr>
</tbody>
</table>

### Educational Innovations, Inc. (Booth #741)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>B131/132, Conv. Center</td>
<td>Fantastical Chemistry Demos for All Classrooms (p. 75)</td>
<td></td>
</tr>
</tbody>
</table>

### Edvotek Inc. (Booth #935)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>8:00–9:00 AM</td>
<td>C171, Conv. Center</td>
<td>Martian Genetics: An Electrophoresis Exploration (p. 39)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C171, Conv. Center</td>
<td>Left at the Scene of the Crime: Introduction to Forensic Science (p. 42)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>C171, Conv. Center</td>
<td>Using the Polymerase Chain Reaction to Identify GM Foods (p. 45)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>C171, Conv. Center</td>
<td>Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA) (p. 50)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>C171, Conv. Center</td>
<td>Using Biotechnology to Diagnose HIV/AIDS (p. 56)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>C171, Conv. Center</td>
<td>Environmental Toxicology Using Edvotek’s New EZ-elegans (p. 61)</td>
<td></td>
</tr>
</tbody>
</table>

### Fisher Science Education (Booth #834)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>B233/234, Conv. Center</td>
<td>The STEM Design Challenge (p. 86)</td>
<td></td>
</tr>
</tbody>
</table>

### Flinn Scientific, Inc. (Booth #925)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Workshop Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>B131/132, Conv. Center</td>
<td>Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (p. 41)</td>
<td></td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–3:00 PM</td>
<td>B131/132, Conv. Center</td>
<td>Flinn Scientific’s Exploring Chemistry™: Connecting Content Through Experiments (p. 54)</td>
<td></td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>B131/132, Conv. Center</td>
<td>Flinn Scientific’s STEM Design Challenge™ “Build-It-Yourself” Lab Project (p. 68)</td>
<td></td>
</tr>
</tbody>
</table>
### Index of Exhibitor Workshops

#### Frey Scientific/School Specialty Science (Booth #736)
- **Thursday, Dec 1** 9:30–10:30 AM  C162, Conv. Center  Solving the Mystery of STEM Using Forensic Science (p. 42)

#### GrowNextGen (Booth #529)
- **Thursday, Dec 1** 11:00 AM–12 Noon  B233/234, Conv. Center  ChickQuest: A Classroom Journey Through the Life Cycle of Chickens (p. 44)

#### HHMI BioInteractive (Booth #825)
- **Friday, Dec 2** 8:00–9:00 AM  C160, Conv. Center  Beak of the Finch: Natural Selection and Darwin’s Finches (p. 70)
- **Friday, Dec 2** 9:30–10:30 AM  C160, Conv. Center  What’s the Big Idea? Addressing the AP Biology Curriculum (p. 75)
- **Friday, Dec 2** 11:00 AM–12 Noon  C160, Conv. Center  Tracking Populations in Gorongosa Park: An NGSS-Focused Exploration (p. 80)
- **Friday, Dec 2** 12:30–1:30 PM  C160, Conv. Center  Use Free BioInteractive Resources to Enhance Biology Data Literacy Skills (p. 85)
- **Friday, Dec 2** 2:00–3:00 PM  C160, Conv. Center  Build Math Skills for the Ohio Life Science Standards (p. 87)
- **Friday, Dec 2** 3:30–4:30 PM  C160, Conv. Center  Viruses: From Adenovirus to HIV to Zika (p. 90)

#### Houghton Mifflin Harcourt (Booth #924)
- **Thursday, Dec 1** 11:00 AM–12 Noon  C172, Conv. Center  Motivate and Engage with Chemistry (p. 45)
- **Thursday, Dec 1** 3:30–4:30 PM  C172, Conv. Center  HMH’s Virtual Reality Field Trips: Google Expeditions (p. 61)
- **Friday, Dec 2** 2:00–3:00 PM  C170, Conv. Center  Motivate and Engage with Chemistry (p. 87)
- **Friday, Dec 2** 3:30–4:30 PM  C170, Conv. Center  A Series of Fortunate Events: Using Discrepant Events in the Classroom (p. 90)

#### LAB-AIDS®, Inc. (Booth #635)
- **Thursday, Dec 1** 8:00–9:00 AM  C151, Conv. Center  Gas Exchange (p. 39)
- **Thursday, Dec 1** 9:30–10:30 AM  C151, Conv. Center  Modeling Convection Currents and Plate Motion (p. 41)
- **Thursday, Dec 1** 11:00 AM–12 Noon  C151, Conv. Center  Calling All Carbons (p. 44)
- **Thursday, Dec 1** 12:30–1:30 PM  C151, Conv. Center  Climate Proxies (p. 50)
- **Thursday, Dec 1** 2:00–3:00 PM  C151, Conv. Center  Chemical Batteries (p. 56)
- **Thursday, Dec 1** 3:30–4:30 PM  C151, Conv. Center  Reclaiming the Metal (p. 60)
- **Friday, Dec 2** 8:00–9:00 AM  C151, Conv. Center  Waves (p. 68)
- **Friday, Dec 2** 9:30–10:30 AM  C151, Conv. Center  pH Scale and Math Modeling (p. 75)
- **Friday, Dec 2** 11:00 AM–12 Noon  C151, Conv. Center  Chemical Formula and Amino Acids (p. 80)
- **Friday, Dec 2** 12:30–1:30 PM  C151, Conv. Center  What Is a Species (p. 85)
- **Friday, Dec 2** 2:00–3:00 PM  C151, Conv. Center  Cell Differentiation and Gene Expression (p. 87)
- **Friday, Dec 2** 3:30–4:30 PM  C151, Conv. Center  Energy Flow Through an Ecosystem (p. 90)
- **Saturday, Dec 3** 8:00–9:00 AM  C151, Conv. Center  Photosynthesis and Respiration—It’s a Plant’s Life! (p. 97)
- **Saturday, Dec 3** 9:30–10:30 AM  C151, Conv. Center  The Science of Keeping Food Fresh (p. 99)

#### Learning A–Z (Booth #931)
- **Friday, Dec 2** 12:30–1:30 PM  B235, Conv. Center  Use Science to Teach Reading; Reading to Teach Science (p. 85)

#### Measured Progress (Booth #636)
- **Friday, Dec 2** 11:00 AM–12 Noon  B235, Conv. Center  Engage with NGSS Using STEM Gauge® (p. 79)
## Index of Exhibitor Workshops

### miniPCR (Booth #836)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>B235, Conv. Center</td>
<td>miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 75)</td>
</tr>
</tbody>
</table>

### MSOE Center for BioMolecular Modeling (Booth #644)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>B230/231, Conv. Center</td>
<td>3D Printing for the BioScience Classroom (p. 75)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>B230/231, Conv. Center</td>
<td>Telling Stories with David Goodsell’s Watercolor Molecular Landscapes (p. 79)</td>
</tr>
<tr>
<td>Saturday, Dec 3</td>
<td>8:00–9:00 AM</td>
<td>B230/231, Conv. Center</td>
<td>Genes, Genomes, and Personalized Medicine (p. 97)</td>
</tr>
<tr>
<td>Saturday, Dec 3</td>
<td>9:30–10:30 AM</td>
<td>B230/231, Conv. Center</td>
<td>Of All the Nerve: Modeling Neurotransmission (p. 99)</td>
</tr>
</tbody>
</table>

### NASA Glenn Research Center (Booth #1042)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>B131/132, Conv. Center</td>
<td>“Let It Glide” Design Challenge (p. 86)</td>
</tr>
</tbody>
</table>

### Nasco (Booth #524)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>12:30–1:30 PM</td>
<td>B233/234, Conv. Center</td>
<td>Let’s Pick Our Brains (p. 49)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>B233/234, Conv. Center</td>
<td>Let’s Pick Our Brains (p. 75)</td>
</tr>
</tbody>
</table>

### National Geographic Learning | Cengage Learning (Booth #747)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>B233/234, Conv. Center</td>
<td>Engaging Reading and Writing Success: Incorporating Today’s Global Issues (p. 79)</td>
</tr>
</tbody>
</table>

### Ohio Oil and Gas Energy Education Program (OOGEEP) (Booth #939)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>B235, Conv. Center</td>
<td>Teaching STEM Using the Oil and Gas Industry (p. 86)</td>
</tr>
</tbody>
</table>

### PASCO scientific (Booth #632)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C162, Conv. Center</td>
<td>Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C162, Conv. Center</td>
<td>Exploring Misconceptions: Speed and Velocity (p. 76)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C162, Conv. Center</td>
<td>Exploring Misconceptions: There Is a Difference Between Heat and Temperature? (p. 80)</td>
</tr>
</tbody>
</table>

### Pearson (Booth #832)

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C161, Conv. Center</td>
<td>Using Problem-Based Learning to Up Your NGSS Game (p. 70)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C161, Conv. Center</td>
<td>STEM and NGSS Inquiry in Chemistry: Effective, Efficient, Economical (p. 76)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C161, Conv. Center</td>
<td>Effective Teaching Resources for AP Chemistry (p. 80)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>C161, Conv. Center</td>
<td>Teaching Geoscience in an NGSS-Focused Curriculum (p. 85)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>C161, Conv. Center</td>
<td>A Conceptual Framework for Teaching Global Change—NGSS Ready (p. 87)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>3:30–4:30 PM</td>
<td>C161, Conv. Center</td>
<td>Measles, the Flu, Vaccination, and You (p. 90)</td>
</tr>
</tbody>
</table>
## Index of Exhibitor Workshops

### Science First®/StarLab® (Booth #841)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>2:00–2:30 PM</td>
<td>Booth #841, Exhibit Hall</td>
<td>Now You See It, Now You Don’t (p. 51)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–2:30 PM</td>
<td>Booth #841, Exhibit Hall</td>
<td>Earthquakes and Their Causes (p. 86)</td>
</tr>
</tbody>
</table>

### Simulation Curriculum Corp. (Booth #1030)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>9:30–10:30 AM</td>
<td>C172, Conv. Center</td>
<td>Earth and Space Science for the Modern Interactive Classroom (p. 42)</td>
</tr>
</tbody>
</table>

### Texas Instruments (Booth #733)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, Dec 1</td>
<td>11:00 AM–12 Noon</td>
<td>B230/231, Conv. Center</td>
<td>Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 44)</td>
</tr>
<tr>
<td>Thursday, Dec 1</td>
<td>3:30–4:30 PM</td>
<td>B230/231, Conv. Center</td>
<td>Zombie Apocalypse! (p. 60)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>B230/231, Conv. Center</td>
<td>Zombie Apocalypse! (p. 84)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>B230/231, Conv. Center</td>
<td>Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 86)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>3:30–4:30 PM</td>
<td>B230/231, Conv. Center</td>
<td>Science through Engineering Design…and a Squid! (p. 90)</td>
</tr>
</tbody>
</table>

### Vernier Software & Technology (Booth #725)

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Friday, Dec 2</td>
<td>8:00–9:00 AM</td>
<td>C171, Conv. Center</td>
<td>Integrating Chromebook with Vernier Data-Collection Technology (p. 70)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>9:30–10:30 AM</td>
<td>C171, Conv. Center</td>
<td>Chemistry with Vernier (p. 76)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>11:00 AM–12 Noon</td>
<td>C171, Conv. Center</td>
<td>Biology with Vernier (p. 80)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>12:30–1:30 PM</td>
<td>C171, Conv. Center</td>
<td>Integrating Chromebook with Vernier Data-Collection Technology (p. 85)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>2:00–3:00 PM</td>
<td>C171, Conv. Center</td>
<td>Integrating iPad with Vernier Data-Collection Technology (p. 87)</td>
</tr>
<tr>
<td>Friday, Dec 2</td>
<td>3:30–4:30 PM</td>
<td>C171, Conv. Center</td>
<td>Physics and Physical Science with Vernier (p. 91)</td>
</tr>
</tbody>
</table>
# Earth and Space Science

## Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session ID</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>7–C</td>
<td>B130, Conv. Center</td>
<td>A Unique Ice Core Investigation that Integrates the Three Dimensions of NGSS and STEM (p. 35)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>Regency Ballroom, Hyatt</td>
<td>NESTA Shares: Innovative Ways to Teach About Earth’s Place in the Universe (p. 66)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>B242/243, Conv. Center</td>
<td>Turning Your Classroom INSIDE OUT (p. 36)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Taft D, Hyatt</td>
<td>Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 38)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>3–12</td>
<td>B142/143, Conv. Center</td>
<td>Partnering with Your Local Planetarium (p. 40)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–8</td>
<td>C151, Conv. Center</td>
<td>Modeling Convection Currents and Plate Motion (p. 41)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–12</td>
<td>C172, Conv. Center</td>
<td>Earth and Space Science for the Modern Interactive Classroom (p. 42)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
<td>Calling All Carbons (p. 44)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>9–12</td>
<td>C141, Conv. Center</td>
<td>Climate Proxies (p. 50)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–5</td>
<td>McKinley, Hyatt</td>
<td>“SCORE!” with Nonfiction Text and Inquiry-Based Science (p. 49)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–C</td>
<td>Taft D, Hyatt</td>
<td>Teaching the Water Cycle and Watersheds Using Hands-On Experiences and Online Tools (p. 49)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>5–8</td>
<td>Booth #841, Exhibit Hall</td>
<td>Now You See It, Now You Don’t (p. 51)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>G</td>
<td>B130, Conv. Center</td>
<td>Featured Presentation: Climate Change: The Evidence, People, and Our Options (p. 51)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>Union C, Hyatt</td>
<td>Studying Climate Change and Forest Ecosystems: A Systems Approach (p. 54)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>6–7</td>
<td>B142/143, Conv. Center</td>
<td>A Practical Tool for Motivating Students with Real-World Challenges at the Intersection of Science and Society: Conceptually Relevant Curriculum and Assessments (p. 57)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Ohio Center B/C, Conv.</td>
<td>Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 58)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Activities for the Anthropocene (p. 59)</td>
</tr>
</tbody>
</table>

## Friday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session ID</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>7–8</td>
<td>B240/241, Conv. Center</td>
<td>Bringing Students Back to Earth: An Inquiry Approach to a Middle School Earth Science Unit (p. 66)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>G</td>
<td>B242/243, Conv. Center</td>
<td>Exploring Earth’s Climate System Like a Scientist Through the AMS DataStreme Project (p. 65)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–3</td>
<td>Franklin A, Hyatt</td>
<td>Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades (66)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>C162, Conv. Center</td>
<td>Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–8</td>
<td>B240/241, Conv. Center</td>
<td>Moon Mania: Modeling Lunar Phases (p. 73)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–10</td>
<td>Hayes, Hyatt</td>
<td>NESTA Press® Session: Once Upon an Earth Science Book (p. 74)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–C</td>
<td>Regency Ballroom, Hyatt</td>
<td>NESTA Shares: Innovative Ways to Teach About Minerals, Rocks, and Resources (p. 74)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12</td>
<td>Regency Ballroom, Hyatt</td>
<td>The Ohio and National Earth Science Teachers Association Share-a-Thon (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>11–C</td>
<td>Harrison, Hyatt</td>
<td>The New CPEP Cosmology Chart and How It Can Be Used (p. 77)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>5–12</td>
<td>B232, Conv. Center</td>
<td>GPS-Enabled Video Cameras for Real-World Earth and Environmental Science Investigations (p. 77)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12</td>
<td>B242/243, Conv. Center</td>
<td>NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think! (p. 77)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–10</td>
<td>B232, Conv. Center</td>
<td>Biomimicry Design Project for Middle School Science and Art Students (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>8–C</td>
<td>C161, Conv. Center</td>
<td>Teaching Geoscience in an NGSS-Focused Curriculum (p. 85)</td>
</tr>
</tbody>
</table>
## Schedule at a Glance

**Earth and Space Science**

<table>
<thead>
<tr>
<th>Time</th>
<th>Grade Levels</th>
<th>Location</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:30–1:30 PM</td>
<td>4–8</td>
<td>Franklin C, Hyatt</td>
<td>Students Have the Power (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–12</td>
<td>Franklin D, Hyatt</td>
<td>Climate Expeditions (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–5</td>
<td>Franklin A, Hyatt</td>
<td>Developing Coherent Storylines for Elementary Science Concepts (p. 82)</td>
</tr>
<tr>
<td>2:00–2:30 PM</td>
<td>5–8</td>
<td>Booth #841, Exhibit Hall</td>
<td>Spanning Astronomical and Atomic Spaces: Creating Project-Based Mathematics and Science Environments in the Classroom (p. 88)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>6–8</td>
<td>B144/145, Conv. Center</td>
<td>U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>9–12</td>
<td>Franklin D, Hyatt</td>
<td>Climate Myths (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>B130, Conv. Center</td>
<td>Data Is Not a “Four Letter Word”: Use NOAA Resources to Build Student Proficiency in Data Analysis (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–12</td>
<td>B232, Conv. Center</td>
<td>Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 89)</td>
</tr>
</tbody>
</table>

**Saturday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Grade Levels</th>
<th>Location</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>3–5</td>
<td>B131, Conv. Center</td>
<td>Beyond Spaceship Earth (p. 95)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>7–8</td>
<td>Franklin C, Hyatt</td>
<td>Caught Up in Currents (p. 99)</td>
</tr>
<tr>
<td>11:00–11:30 AM</td>
<td>7–C</td>
<td>B142/143, Conv. Center</td>
<td>Eclipses: A Tool for Teaching the Evolution of Astronomy (p. 100)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>1–12</td>
<td>Ohio Center B/C, Conv.</td>
<td>From the Arctic to the Classroom—Translating Research into Student Learning (p. 102)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–8</td>
<td>B144/145, Conv. Center</td>
<td>Bringing the Outdoors in Through Fabric Models (p. 101)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–8</td>
<td>B246, Conv. Center</td>
<td>Seasons in the Sun (p. 101)</td>
</tr>
</tbody>
</table>

**Engineering, Technology, and the Application of Science**

**Thursday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Grade Levels</th>
<th>Location</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Taft D, Hyatt</td>
<td>Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 88)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>B242/243, Conv. Center</td>
<td>Turning Your Classroom INSIDE OUT (p. 88)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–9</td>
<td>B140/141, Conv. Center</td>
<td>Simple Machines Design Challenge for Science and Math Students (p. 88)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>7–C</td>
<td>B240/241, Conv. Center</td>
<td>What Do You Mean I Have to Teach Engineering? (p. 88)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>Union C, Hyatt</td>
<td>STEM Pathways Design Challenges (p. 88)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–5</td>
<td>C160, Conv. Center</td>
<td>Build Skills to Boost the Makerspace Experience for Young Scientists! (p. 44)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>2–6</td>
<td>C160, Conv. Center</td>
<td>STEM-gineering (p. 50)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>C162, Conv. Center</td>
<td>CPO’s Wind Turbine: A STEM Approach to Engineering and Design (p. 50)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>C160, Conv. Center</td>
<td>Incorporating Digital Technology While Ensuring Conceptual Learning and Deep Understanding Using Literacy and Math Skills (p. 48)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>3–5</td>
<td>Franklin C, Hyatt</td>
<td>Marble Mania: Teaching NGSS Fair Test the Inquiry Way (p. 48)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>5–K</td>
<td>Franklin B, Hyatt</td>
<td>Engineering Happily Ever After (p. 53)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>Taft D, Hyatt</td>
<td>Designing Bridges: Math, Materials, and Methods (p. 54)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>C162, Conv. Center</td>
<td>Building Electric Circuits with CPO’s New Link Learning Module (p. 56)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>6–7</td>
<td>B142/143, Conv. Center</td>
<td>A Practical Tool for Motivating Students with Real-World Challenges at the Intersection of Science and Society: Conceptually Relevant Curriculum and Assessments (p. 57)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–C</td>
<td>Franklin B, Hyatt</td>
<td>Human-Centered Engineering Design: The Key to STEM (p. 59)</td>
</tr>
</tbody>
</table>
### Schedule at a Glance  Engineering, Technology, and the Application of Science

<table>
<thead>
<tr>
<th>Time</th>
<th>Session #</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30–4:30 PM</td>
<td>P–5</td>
<td>Franklin A, Hyatt</td>
<td>How to Incorporate Math and Literacy in K–6 Active-Learning NGSS Activities (p. 59)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Ohio Center B/C, Conv.</td>
<td>Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 58)</td>
</tr>
</tbody>
</table>

#### Friday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session #</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>1–5</td>
<td>Taft B, Hyatt</td>
<td>Starting an Elementary Robotics Club: It’s Easy! (p. 65)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>G</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: ASEE’s Novel Engineering for K–8 Teachers and Students (p. 74)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>7–C</td>
<td>Franklin B, Hyatt</td>
<td>Implementing the Engineering Design Process in Your Classroom (p. 67)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>7–12</td>
<td>B131/132, Conv. Center</td>
<td>Flinn Scientific’s STEM Design Challenge “Build-It-Yourself” Lab Project (p. 68)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>Grant, Hyatt</td>
<td>Fun with Ethanol! Engineering Design in the Classroom! (p. 67)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>6–9</td>
<td>Franklin D, Hyatt</td>
<td>A Monumental Task: Connecting Washington, D.C., Across the Curriculum (p. 71)</td>
</tr>
<tr>
<td>8:30–11:30 AM</td>
<td>5–12</td>
<td>Nationwide B, Hyatt</td>
<td>SC-3: 4-H Innovation…Design Challenges in Action (p. 71)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>B142/143, Conv. Center</td>
<td>Beyond the Egg Drop: Infusing Engineering Design into the Physics/Science Classroom (p. 72)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–8</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: ASEE’s Novel Engineering for K–8 Teachers and Students (p. 74)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Adapting Bioengineering Curriculum for the Visually Impaired (p. 73)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>Taft D, Hyatt</td>
<td>How to Incorporate Math and Literacy in Grades 6–12 Active Learning NGSS-Based Activities (p. 74)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–C</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: Engineering Your Future (p. 79)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–8</td>
<td>C170, Conv. Center</td>
<td>Not Your Typical Classroom Experience: Amplify Science’s Digital Engineering Internships (p. 80)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>B130, Conv. Center</td>
<td>Featured Presentation: Sowing the Seeds of STEM (p. 81)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>5–9</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: Engineering Water Filtration Systems: Two Units and Two Teachers (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>4–8</td>
<td>Franklin C, Hyatt</td>
<td>Students Have the Power (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–10</td>
<td>B232, Conv. Center</td>
<td>Biomimicry Design Project for Middle School Science and Art Students (p. 82)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–12</td>
<td>Harrison, Hyatt</td>
<td>AMSE-Sponsored Session: STEM and/or STEAM Design Challenges in Grades 4–12 Science Classrooms (p. 86)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>1–5</td>
<td>C150, Conv. Center</td>
<td>The Best of Engineering for Elementary Students (p. 87)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>B235, Conv. Center</td>
<td>Teaching STEM Using the Oil and Gas Industry (p. 86)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>9–12</td>
<td>Franklin D, Hyatt</td>
<td>U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>8–C</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: Building a Culture of Iterative Design with 3-D Modeling and Printing in the High School Classroom (p. 90)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–3</td>
<td>Franklin B, Hyatt</td>
<td>Teaching Engineering in Grades K–3 (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–C</td>
<td>B240/241, Conv. Center</td>
<td>Mad for Marbles (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>3–12</td>
<td>B246, Conv. Center</td>
<td>Completing the Engineering Cycle: It’s Not Complete ‘til You Rinse and Repeat (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>B230/231, Conv. Center</td>
<td>Science through Engineering Design…and a Squid! (p. 90)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
<td>Energy Flow Through an Ecosystem (p. 90)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>P–6</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: Demystifying the Difference Between Science and Engineering for K–6 Teachers (p. 93)</td>
</tr>
</tbody>
</table>

#### Saturday

<table>
<thead>
<tr>
<th>Time</th>
<th>Session #</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>1–6</td>
<td>B233/234, Conv. Center</td>
<td>EiE Ohio: Building 21st-Century STEAM Learners (p. 95)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Science from the Stratosphere: STEM Activities in the Infrared (p. 96)</td>
</tr>
</tbody>
</table>
Schedule at a Glance

Engineering, Technology, and the Application of Science

8:00–9:00 AM  3–9  Franklin C, Hyatt  Taking Advantage of the Power of Google Drive (p. 96)
9:30–10:30 AM  7–C  C172, Conv. Center  Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 100)
9:30–10:30 AM  7–8  Franklin C, Hyatt  Caught Up in Currents (p. 99)
9:30–10:30 AM  P–12  B142/143, Conv. Center  STEM for ALL (p. 98)
9:30–10:30 AM  5–12  B246, Conv. Center  Applying Design Thinking to a Water Rescue (p. 99)
11:00 AM–12 Noon  1–12  Ohio Center B/C, Conv. Center  From the Arctic to the Classroom—Translating Research into Student Learning (p. 102)
11:00 AM–12 Noon  7–12  B130, Conv. Center  CEEMS: Challenge-Based Learning Units Incorporating Engineering Design with Secondary Science and Math Content (p. 100)
11:00 AM–12 Noon  7–12  B232, Conv. Center  The Emerging Bioeconomy: The Products Being Made, the Technologies Behind It, and Future Careers (p. 101)
11:00 AM–12 Noon  6–C  B233/234, Conv. Center  Impactful Learning: Engineering to Serve Special Needs Students—The Win-Win Scenario (p. 101)
11:00 AM–12 Noon  4–7  C161, Conv. Center  Using the Engineering Design Process to Better Understand Space Science (p. 101)
11:00 AM–12 Noon  4–12  Franklin D, Hyatt  Inventing Is Just Plain Fun (for All)! (p. 102)

Life Science

Thursday

8:00–9:00 AM  9–12  B242/243, Conv. Center  Turning Your Classroom INSIDE OUT (p. 36)
8:00–9:00 AM  K–12  C150, Conv. Center  Hands-On Science with Classroom Critters (p. 39)
8:00–9:00 AM  6–8  C151, Conv. Center  Gas Exchange (p. 39)
8:00–9:00 AM  6–C  C171, Conv. Center  Martian Genetics: An Electrophoresis Exploration (p. 39)
8:30–11:30 AM  P–2  Nationwide B, Hyatt  SC-1: Curious KIDSS (Kindling Inquiry and Discovery in Science and Social Studies) (p. 40)
9:30–10:30 AM  6–C  C171, Conv. Center  Left at the Scene of the Crime: Introduction to Forensic Science (p. 42)
9:30–10:30 AM  6–12  C150, Conv. Center  Engineer Physical Science Excitement with a Carolina STEM Challenge® (p. 41)
11:00 AM–12 Noon  6–12  C162, Conv. Center  CPO's Link Genetics Learning Modules: Crazy Chromosomes and Crazy Traits (p. 45)
11:00 AM–12 Noon  9–C  C171, Conv. Center  Using the Polymerase Chain Reaction to Identify GM Foods (p. 45)
11:00 AM–12 Noon  1–5  B233/234, Conv. Center  ChickQuest: A Classroom Journey Through the Life Cycle of Chickens (p. 44)
12:30–1:30 PM  10–C  Garfield, Hyatt  Moving Genes (p. 48)
12:30–1:30 PM  9–C  C171, Conv. Center  Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA) (p. 50)
12:30–1:30 PM  K–12  C150, Conv. Center  Hands-On Activities to Model Habitat Preference and Population Sampling (p. 49)
12:30–1:30 PM  K–12  C150, Conv. Center  Let’s Pick Our Brains (p. 49)
12:30–1:30 PM  K–5  McKinley, Hyatt  “SCORE!” with Nonfiction Text and Inquiry-Based Science (p. 49)
12:30–1:30 PM  6–8  Hayes, Hyatt  NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8 (p. 48)
12:30–1:30 PM  8–12  B230/231, Conv. Center  Constructing and Crossing Cell Membranes (p. 49)
12:30–1:30 PM  K–5  Taft B, Hyatt  Bio Blitz: Opening the Eyes of Students to the Science Around Them (p. 47)
12:30–1:30 PM  K–12  B244/245, Conv. Center  Developing Science Process Skills Through Schoolyard Investigations (p. 46)
12:30–1:30 PM  5–8  Franklin D, Hyatt  Trees from the Top Down: A New Approach to Energy Transfer (p. 48)
12:30–5:30 PM  6–12  @ OSU, Off-site  SC-2: Sowing the Seeds of Science: Using Plants as a Model to Teach Science Concepts (p. 51)
2:00–3:00 PM  5–12  B140/141, Conv. Center  NARST-Sponsored Session: Imagery Support Strategies for Developing Dynamic Scientific Models with Students (p. 52)
2:00–3:00 PM  9–C  C171, Conv. Center  Using Biotechnology to Diagnose HIV/AIDS (p. 56)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00–3:00 PM</td>
<td>Biological Machines: Bioengineering Activities for the Classroom</td>
<td>Ohio Center B/C, Conv.</td>
<td>Squirmy Science (p. 54)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>The Restoration of New York Harbor: Reconnecting Students to the Water</td>
<td>Union B, Hyatt</td>
<td>NSTA Press® Session: Argumentation in the Biology Science Classroom (p. 53)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Evolution for Educators</td>
<td>B240/B241, Conv. Center</td>
<td>Argumentation in the Biology Science Classroom (p. 53)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Activities for the Anthropocene</td>
<td>B246, Conv. Center</td>
<td>Using the National Science Olympiad and STEM to Address NGSS Crosscutting</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Environmental Toxicology Using Edvotek’s New EZ-elegans</td>
<td>C171, Conv. Center</td>
<td>Concepts and Content (p. 58)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Comparative Mammalian Organ Dissection with Carolina’s Perfect Solution®</td>
<td>C150, Conv. Center</td>
<td>Concepts and Content (p. 58)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Evolutionary Evidence in the Fossil Record: Life Science with FOSS</td>
<td>C161, Conv. Center</td>
<td>Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 60)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Great Big Gobs of Green Goo: Water Quality and Hazardous Algae Blooms</td>
<td>Taft C, Hyatt</td>
<td>Are You MoBILiSE’d? Modeling Biology Instruction: Leaders in Science and</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Flinn Scientific’s STEM Design Challenge “Build-It-Yourself” Lab Project</td>
<td>C160, Conv. Center</td>
<td>Engineering (p. 62)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Science Learning at Your Window!</td>
<td>Franklin B, Hyatt</td>
<td>Science Learning at Your Window!</td>
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<td>2:00–3:00 PM</td>
<td>Adapting Bioengineering Curriculum for the Visually Impaired</td>
<td>C172, Conv. Center</td>
<td>Adapting Bioengineering Curriculum for the Visually Impaired (p. 73)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Tracking Populations in Gorongosa Park: An NGSS-Focused Exploration</td>
<td>B230/231, Conv. Center</td>
<td>Tracking Populations in Gorongosa Park: An NGSS-Focused Exploration (p. 80)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Telling Stories with David Goodsell’s Watercolor Molecular Landscapes</td>
<td>B230/231, Conv. Center</td>
<td>Telling Stories with David Goodsell’s Watercolor Molecular Landscapes (p. 79)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>The GMO Debate Rages On!</td>
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</tr>
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<td>Introduction to Wisconsin Fast Plants®</td>
<td>C150, Conv. Center</td>
<td>Introduction to Wisconsin Fast Plants® (p. 79)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Biology with Vernier</td>
<td>C171, Conv. Center</td>
<td>Biology with Vernier (p. 80)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>An Innovative Design for an Ecology Class Engages Students of All Abilities</td>
<td>B242/243, Conv. Center</td>
<td>An Innovative Design for an Ecology Class Engages Students of All Abilities (p. 81)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Developing Coherent Storylines for Elementary Science Concepts</td>
<td>K–5, Franklin A, Hyatt</td>
<td>Developing Coherent Storylines for Elementary Science Concepts (p. 82)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs</td>
<td>C150, Conv. Center</td>
<td>Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (p. 85)</td>
</tr>
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<td>2:00–3:00 PM</td>
<td>How to Use Pop Culture in Your Life Science Class</td>
<td>C172, Conv. Center</td>
<td>How to Use Pop Culture in Your Life Science Class (p. 85)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Use Free BioInteractive Resources to Enhance Biology Data Literacy Skills</td>
<td>C160, Conv. Center</td>
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</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>What Is a Species</td>
<td>C151, Conv. Center</td>
<td>What Is a Species (p. 85)</td>
</tr>
<tr>
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<td>Combining a Medical Simulation Center Resources and High School Biomedical</td>
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</tr>
<tr>
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<td>Cell Differentiation and Gene Expression</td>
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<td>Cell Differentiation and Gene Expression (p. 87)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Build Math Skills for the Ohio Life Science Standards</td>
<td>C160, Conv. Center</td>
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</tr>
<tr>
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<td>U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative</td>
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</tr>
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</tr>
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</tr>
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</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>Comparative Mammalian Organ Dissection with Carolina’s Perfect Solution®</td>
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</tr>
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</tr>
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</tr>
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</tr>
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</tr>
</tbody>
</table>
Schedule at a Glance  Life Science

3:30–4:30 PM  9–12  C151, Conv. Center  Energy Flow Through an Ecosystem (p. 90)
3:30–4:30 PM  6–12  C161, Conv. Center  Measles, the Flu, Vaccination, and You (p. 90)
3:30–4:30 PM  9–12  C160, Conv. Center  Viruses: From Adenovirus to HIV to Zika (p. 90)
3:30–4:30 PM  6–12  C150, Conv. Center  Strawberry Milkshakes: DNA and Lactose Intolerance (p. 90)
4:00–4:30 PM  K–12  Franklin D, Hyatt  Animal Multimedia Inspires Learning and Engagement (p. 92)

Saturday

8:00–9:00 AM  7–C  Franklin D, Hyatt  Logistic Growth and the Zombie Apocalypse (p. 96)
8:00–9:00 AM  9–12  B240/241, Conv. Center  Gamification of Protein Synthesis (p. 96)
8:00–9:00 AM  9–12  C151, Conv. Center  Photosynthesis and Respiration—It’s a Plant’s Life! (p. 97)
8:00–9:00 AM  8–C  C172, Conv. Center  Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 97)
8:00–9:00 AM  9–12  B230/231, Conv. Center  Genes, Genomes, and Personalized Medicine (p. 97)
8:00–9:00 AM  7–12  B144/145, Conv. Center  Learning STEM Through Bioenergy: Lessons from the Plants (p. 97)
9:30–10:30 AM  9–C  B230/231, Conv. Center  Of All the Nerve: Modeling Neurotransmission (p. 99)
11:00 AM–12 Noon  P–8  B144/145, Conv. Center  Bringing the Outdoors in Through Fabric Models (p. 101)
11:00 AM–12 Noon  1–12  Ohio Center B/C, Conv.  From the Arctic to the Classroom—Translating Research into Student Learning (p. 102)

Physical Science  Thursday

8:00–9:00 AM  7–C  B240/241, Conv. Center  What Do You Mean I Have to Teach Engineering? (p. 37)
8:00–9:00 AM  6–12  C162, Conv. Center  CPO’s Link with Car and Ramp: Force, Motion, and Variables (p. 39)
8:00–9:00 AM  6–8  C151, Conv. Center  Gas Exchange (p. 39)
8:00–9:00 AM  6–12  C161, Conv. Center  Simple Machines Design Challenge for Science and Math Students (p. 35)
8:00–9:00 AM  9–12  B242/243, Conv. Center  A Unique Ice Core Investigation that Integrates the Three Dimensions of NGSS and STEM (p. 35)
8:00–9:00 AM  8–12  B140/141, Conv. Center  Let’s Get Physical—From Force and Friction to Water and Weather (p. 38)
9:30–10:30 AM  5–C  B230/231, Conv. Center  Dive in with Magnetic Water Molecules (p. 41)
9:30–10:30 AM  6–12  C150, Conv. Center  Engineer Physical Science Excitement with a Carolina STEM Challenge® (p. 41)
11:00 AM–12 Noon  6–12  C172, Conv. Center  Motivate and Engage with Chemistry (p. 45)
12:30–1:30 PM  8–12  B230/231, Conv. Center  Constructing and Crossing Cell Membranes (p. 49)
12:30–1:30 PM  5–12  B242/243, Conv. Center  Inquiry Matters: Identify Unknown Liquids (p. 49)
12:30–1:30 PM  4–8  Union B, Hyatt  Incorporating Digital Technology While Ensuring Conceptual Learning and Deep Understanding Using Literacy and Math Skills (p. 48)
12:30–1:30 PM  K–12  Ohio Center B/C, Conv.  Meet the Standards and Enhance Your Chemistry Classroom with Other People’s Money (p. 46)
12:30–1:30 PM  9–12  B142/143, Conv. Center  Marble Mania: Teaching NGSS Fair Test the Inquiry Way (p. 48)
12:30–1:30 PM  6–8  Hayes, Hyatt  I See the Light! An Introduction to Basic Properties of Light (p. 49)
2:00–3:00 PM  1–5  Franklin C, Hyatt  Sounds Like Fun (p. 53)
<table>
<thead>
<tr>
<th>Time</th>
<th>Group</th>
<th>Location</th>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>Franklin D, Hyatt</td>
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<td></td>
</tr>
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<td>8–C</td>
<td>B230/231, Conv. Center</td>
<td>The Many Jobs of Proteins: Enzymes in the Spotlight (p. 54)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–8</td>
<td>C151, Conv. Center</td>
<td>Chemical Batteries (p. 56)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>B131/132, Conv. Center</td>
<td>Flinn Scientific’s Exploring Chemistry: Connecting Content Through Experiments (p. 54)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>5–12</td>
<td>B140/141, Conv. Center</td>
<td>NARST-Sponsored Session: Imagery Support Strategies for Developing Dynamic Scientific Models with Students (p. 52)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–5</td>
<td>C150, Conv. Center</td>
<td>Waves, Waves, Waves: Building Models to Explain Phenomena (p. 56)</td>
<td></td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>K–5</td>
<td>C161, Conv. Center</td>
<td>What Does Conceptual Modeling Look Like in an Elementary Classroom? (p. 56)</td>
<td></td>
</tr>
<tr>
<td>2:30–3:00 PM</td>
<td>6–C</td>
<td>B232, Conv. Center</td>
<td>Connecting the Dots: Science and Technology as Your Tool (p. 57)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>C162, Conv. Center</td>
<td>CPO Science’s Link Module: Learning About Chemistry Models (p. 60)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–8</td>
<td>C151, Conv. Center</td>
<td>Reclaiming the Metal (p. 60)</td>
<td></td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–5</td>
<td>Franklin A, Hyatt</td>
<td>How to Incorporate Math and Literacy in K–6 Active-Learning NGSS Activities (p. 59)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–8</td>
<td>C151, Conv. Center</td>
<td>Waves (p. 68)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>Regency Ballroom, Hyatt</td>
<td>NESTA Shares: Innovative Ways to Teach About Earth’s Place in the Universe (p. 66)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–3</td>
<td>Franklin A, Hyatt</td>
<td>Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades (p. 66)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>B244/245, Conv. Center</td>
<td>PolyWhat? Understanding What a Polymer Is: Polymer 101 (p. 65)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–9</td>
<td>Union C, Hyatt</td>
<td>ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State (p. 67)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>7–12</td>
<td>B131/132, Conv. Center</td>
<td>Flinn Scientific’s STEM Design Challenge “Build-It-Yourself” Lab Project (p. 68)</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>C162, Conv. Center</td>
<td>Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)</td>
<td></td>
</tr>
<tr>
<td>8:00–10:00 AM</td>
<td>9–12</td>
<td>Union B, Hyatt</td>
<td>ACS Session One: Energy in Chemistry—A Macroscopic View (p. 71)</td>
<td></td>
</tr>
<tr>
<td>8:00–10:00 AM</td>
<td>9–12</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: Pedagogy for Conceptual Retention: Modeling Instruction in Science (p. 71)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>C162, Conv. Center</td>
<td>Exploring Misconceptions: Speed and Velocity (p. 76)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>3–12</td>
<td>B131/132, Conv. Center</td>
<td>Fantastical Chemistry Demos for All Classrooms (p. 75)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–8</td>
<td>Union C, Hyatt</td>
<td>ACS Middle Level Session: Density: A Molecular View (p. 74)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>8–12</td>
<td>Union D, Hyatt</td>
<td>ASEE Session: ASEE’s Novel Engineering for K–8 Teachers and Students (p. 74)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>B142/143, Conv. Center</td>
<td>Beyond the Egg Drop: Infusing Engineering Design into the Physics/Science Classroom (p. 72)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>Taft D, Hyatt</td>
<td>How to Incorporate Math and Literacy in Grades 6–12 Active Learning NGSS-Based Activities (p. 74)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
<td>pH Scale and Math Modeling (p. 75)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–C</td>
<td>B230/231, Conv. Center</td>
<td>3D Printing for the BioScience Classroom (p. 75)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–9</td>
<td>Ohio Center B/C, Conv.</td>
<td>Inquiring in Matter—Deeper and Cheaper with NGSS (p. 73)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>8–12</td>
<td>C161, Conv. Center</td>
<td>STEM and NGSS Inquiry in Chemistry: Effective, Efficient, Economical (p. 76)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>C150, Conv. Center</td>
<td>Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 75)</td>
<td></td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>C171, Conv. Center</td>
<td>Chemistry with Vernier (p. 76)</td>
<td></td>
</tr>
<tr>
<td>10:00 AM–12 Noon</td>
<td>9–C</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: Building Web/Tablet-Friendly Interactive Physics Simulations (p. 76)</td>
<td></td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–8</td>
<td>Union C, Hyatt</td>
<td>ACS Middle Level Session: The Water Molecule and Dissolving (p. 79)</td>
<td></td>
</tr>
</tbody>
</table>
### General Science Education

#### Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Section</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>Garfield, Hyatt</td>
<td>Soy Fresh, Soy Clean...Connecting Community and Kids to STEM Careers (p. 38)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–2</td>
<td>C170, Conv. Center</td>
<td>Experience Amplify Science: Grades K–1 (p. 39)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–2</td>
<td>C160, Conv. Center</td>
<td>Teach Next Gen Like Your Hair Is on Fire! (p. 39)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>Harrison, Hyatt</td>
<td>Exploring the Science and Engineering Practices (p. 38)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>B246, Conv. Center</td>
<td>English, ELLs, and STEM: A Collaboration Worth Pursuing (p. 37)</td>
</tr>
</tbody>
</table>

### Saturday

<table>
<thead>
<tr>
<th>Time</th>
<th>Section</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>3–5</td>
<td>B131, Conv. Center</td>
<td>Beyond Spaceship Earth (p. 95)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Science from the Stratosphere: STEM Activities in the Infrared (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>B132, Conv. Center</td>
<td>Basic Polymer Science for the Science Classroom (p. 95)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–C</td>
<td>Ohio Center B/C, Conv.</td>
<td>Conceptual Chemistry: Repurposed Materials for Low-Cost Science Experiments (p. 96)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–12</td>
<td>B132, Conv. Center</td>
<td>Old Polymer Labs with 21st-Century Learning (p. 98)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>7–C</td>
<td>C172, Conv. Center</td>
<td>Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 100)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–12</td>
<td>B240/241, Conv. Center</td>
<td>Unlocking the Particulate Nature of Matter with Locking Blocks (p. 99)</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>6–9</td>
<td>B232, Conv. Center</td>
<td>Students with Disabilities and the 5E Learning Cycle (p. 100)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>8–12</td>
<td>B235, Conv. Center</td>
<td>Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts (p. 101)</td>
</tr>
</tbody>
</table>

### NSTA Columbus Area Conference on Science Education

#### Schedule at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Section</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>C161, Conv. Center</td>
<td>Effective Teaching Resources for AP Chemistry (p. 80)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
<td>Chemical Formula and Amino Acids (p. 80)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>C162, Conv. Center</td>
<td>Exploring Misconceptions: There Is A Difference Between Heat and Temperature? (p. 80)</td>
</tr>
<tr>
<td>11:00 AM–1:00 PM</td>
<td>9–12</td>
<td>Union B, Hyatt</td>
<td>ACS Session Two: Energy in Chemistry—A Particulate View (p. 81)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>Franklin B, Hyatt</td>
<td>Bioplastic—Going from Synthetic to Natural Polymers (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–12</td>
<td>B244/245, Conv. Center</td>
<td>Corrosion: Chemistry Made Simple, Relevant, and Fun (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–12</td>
<td>B144/145, Conv. Center</td>
<td>Spark Students’ Curiosity with Chemistry! (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–8</td>
<td>Union C, Hyatt</td>
<td>ACS Middle Level Session: Chemical Reactions: Breaking and Making Bonds (p. 84)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>B235, Conv. Center</td>
<td>Teaching STEM Using the Oil and Gas Industry (p. 86)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–9</td>
<td>B131/132, Conv. Center</td>
<td>“Let It Glide” Design Challenge (p. 86)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>4–8</td>
<td>B233/234, Conv. Center</td>
<td>The STEM Design Challenge (p. 86)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>C170, Conv. Center</td>
<td>Motivate and Engage with Chemistry (p. 87)</td>
</tr>
<tr>
<td>3:30–4:00 PM</td>
<td>9–12</td>
<td>Franklin D, Hyatt</td>
<td>U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>B242/243, Conv. Center</td>
<td>Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>B244/245, Conv. Center</td>
<td>Teach Engineering Principles on the Cheap with Concrete (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
<td>Energy Flow Through an Ecosystem (p. 90)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>7–12</td>
<td>C171, Conv. Center</td>
<td>Physics and Physical Science with Vernier (p. 91)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>C172, Conv. Center</td>
<td>Enzymes: Technology Inspired by Nature (p. 91)</td>
</tr>
<tr>
<td>3:30–5:30 PM</td>
<td>9–12</td>
<td>Union B, Hyatt</td>
<td>ACS Session Three: Energy in Chemistry—An Atomic View (p. 91)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>6–C</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: 30 Demos in 60 Minutes from the Ohio Section of AAPT (p. 92)</td>
</tr>
<tr>
<td>5:00–5:30 PM</td>
<td>G</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: Carnival Knowledge: The Flying Bernoulli Brother’s Stupendous Sideshow of Science by the Ohio Section of AAPT (p. 93)</td>
</tr>
</tbody>
</table>

### Physical Science

<table>
<thead>
<tr>
<th>Time</th>
<th>Section</th>
<th>Location</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>3–5</td>
<td>B131, Conv. Center</td>
<td>Beyond Spaceship Earth (p. 95)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Science from the Stratosphere: STEM Activities in the Infrared (p. 96)</td>
</tr>
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<td>B132, Conv. Center</td>
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</tr>
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<td>Ohio Center B/C, Conv.</td>
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</tr>
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</tr>
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<td>B235, Conv. Center</td>
<td>Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts (p. 101)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>G</td>
<td>B140/141, Conv. Center</td>
<td>AACT: Resources and Opportunities (p. 101)</td>
</tr>
<tr>
<td>11:30 AM–12 Noon</td>
<td>8–12</td>
<td>B142/143, Conv. Center</td>
<td>Addressing Integrated Process Skills in Physical Science Courses with Modeling Instruction (p. 102)</td>
</tr>
</tbody>
</table>
Schedule at a Glance

General Science Education

8:00–9:00 AM  P–5  Franklin A, Hyatt  STEAM IT UP: Are You Learning to Read or Reading to Learn Using Literacy with Science? (p. 37)
8:00–9:00 AM  6–8  Franklin B, Hyatt  Interactive STEM Notebooks: The Role of Knowledge Construction and the Assessment of Learning (p. 37)
8:00–9:00 AM  G  McKinley, Hyatt  Is This Your First NSTA Conference? First-Timer Conference Attendees’ Orientation (p. 36)
8:00–9:00 AM  P–6  Taft B, Hyatt  50 iPad Apps for STEM Activities in the Elementary Classroom (p. 36)
8:00–9:00 AM  5–8  Union A, Hyatt  Using a Fab Lab and the Design Cycle: Engineering Engaging Learning Experiences for Middle School Students (p. 38)
8:00–9:00 AM  4–C  B244/245, Conv. Center  From a Traditional Science Fair to an Interactive STEM Expo (p. 40)
9:30–10:30 AM  6–8  B235, Conv. Center  Science Storylines: Developing Three-Dimensional Lessons that Build on Student Curiosity (p. 41)
9:30–10:30 AM  6–12  C161, Conv. Center  Engage Students in FOSS Next Generation (p. 42)
9:30–10:30 AM  2–5  C160, Conv. Center  SEPs Made Easy (p. 41)
9:30–10:30 AM  K–12  B233/234, Conv. Center  The Value of Writing Scientific Explanations in STEM (p. 41)
9:30–10:30 AM  P–5  C170, Conv. Center  Experience Amplify Science: Grades 2–5 (p. 42)
11:00 AM–12 Noon  K–5  C161, Conv. Center  The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes (p. 44)
11:00 AM–12 Noon  6–8  C150, Conv. Center  Learning By Arguing: Claims, Evidence, and Reasoning (p. 44)
11:00 AM–12 Noon  6–12  B230/231, Conv. Center  Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 44)
11:00 AM–12 Noon  6–8  C170, Conv. Center  Experience Amplify Science: Middle School (p. 45)
11:00 AM–12 Noon  5–12  B131/132, Conv. Center  Gains in the Education of Mathematics and Science: What Can GEMS Do for You? (p. 44)
12:30–1:30 PM  K–8  Taft C, Hyatt  Taking STEM Outside (p. 49)
12:30–1:30 PM  3–6  Taft A, Hyatt  Helping Children Understand the Impact of STEM and the Essential Integration of All STEM Disciplines: Explorations with Physical Structures, Plants, and Everyday Household Tools (p. 46)
12:30–1:30 PM  5–11  B246, Conv. Center  Differentiation Strategies for Grades 5–12 (p. 48)
12:30–1:30 PM  G  B240/241, Conv. Center  Planning and Designing Safe and Sustainable Facilities for STEM-Based Science (Science Facilities 101) (p. 47)
12:30–1:30 PM  G  B140/141, Conv. Center  The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (p. 46)
12:30–1:30 PM  5–C  Franklin B, Hyatt  Developing Scientific Arguments: Claims and Stories in the Graphs (p. 48)
12:30–1:30 PM  P–3  Franklin A, Hyatt  STEM Lab Experiences for Authentic Inquiry in Early Childhood (p. 48)
12:30–1:30 PM  K–8  C170, Conv. Center  What Is Amplify Science? (p. 50)
2:00–3:00 PM  P–3  Taft A, Hyatt  Science Story Telling at the Heart of Integration (p. 52)
2:00–3:00 PM  4–12  B244/245, Conv. Center  Leveraging Technology to Teach a Hands-On/Minds-On NGSS-Focused Curriculum in a Digital Environment (p. 52)
2:00–3:00 PM  G  B142/143, Conv. Center  Leading from the Classroom (p. 52)
2:00–3:00 PM  6–12  B242/243, Conv. Center  Science and Literature: The Pitfalls and the Pendulum (p. 52)
2:00–3:00 PM  3–5  C160, Conv. Center  Increase Your 3-D Vision of NGSS (p. 56)
2:00–3:00 PM  K–12  B233/234, Conv. Center  STEM Literacy: Strategies for Making Complex Text Meaningful (p. 54)
2:00–3:00 PM  P–5  B235, Conv. Center  Integrating Literacy and Science—The Wow Factor (p. 56)
2:00–3:00 PM  3–8  Franklin A, Hyatt  Teaching Claims and Evidence Through PERC (p. 53)
2:00–3:00 PM  G  B240/241, Conv. Center  Science Facilities 102: The Architects Have Started Without Me—What Do I Do Now? (p. 53)
2:00–3:00 PM  P–5  Taft B, Hyatt  Science Centers and Books, Oh My! (p. 53)
2:00–3:00 PM  8–C  C172, Conv. Center  Osteopathic Physicians 102: Helping Teachers Understand the Profession (p. 57)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30–4:00 PM</td>
<td>5–12 B232, Conv. Center</td>
<td>Partnership Enhancement Projects: Creating Teacher Leaders in Science Education (p. 57)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–8 Taft B, Hyatt</td>
<td>Embedded Assessment: Making Instructional Activities Opportunities for Formative Assessment (p. 58)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>G Hayes, Hyatt</td>
<td>NSTA Press® Session: Uncovering K–16 Students’ and Teachers’ Ideas Using Familiar Phenomena (p. 58)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–9 B140/141, Conv. Center</td>
<td>NMLSTA-Sponsored Session: Calling All Middle Level Teachers (p. 58)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–C Harrison, Hyatt</td>
<td>ASTE-Sponsored Session: Citizen Science: Argumentation and Modeling Safe Traffic Intersections (p. 59)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>P–6 Union A, Hyatt</td>
<td>Elementary Food Chemistry (p. 59)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12 B230/231, Conv. Center</td>
<td>Zombie Apocalypse! (p. 60)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–12 C172, Conv. Center</td>
<td>HMH’s Virtual Reality Field Trips: Google Expeditions (p. 61)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–5 C160, Conv. Center</td>
<td>Liven Up Literacy with Science (p. 60)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–9 B131/132, Conv. Center</td>
<td>Group Work: Using Student Collaboration in the Middle School Science Classroom (p. 60)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12 Taft C, Hyatt</td>
<td>STEM Projects for the Science Classroom (p. 66)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12 B230/231, Conv. Center</td>
<td>Integrating Chromebook with Vernier Data-Collection Technology (p. 70)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–8 C170, Conv. Center</td>
<td>What Is Amplify Science? (p. 70)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–8 B235, Conv. Center</td>
<td>Discourse Tools for Equitable and Rigorous Talk (p. 68)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–8 C150, Conv. Center</td>
<td>Bring Visual Science into K–5 Classrooms—It’s a Game Changer! (p. 68)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>9–C C161, Conv. Center</td>
<td>Using Problem-Based Learning to Up Your NGSS Game (p. 70)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–5 Franklin A, Hyatt</td>
<td>Picture-Perfect Science: Doing It Our Way (p. 73)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>10–12 Taft C, Hyatt</td>
<td>CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus (p. 74)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–8 C170, Conv. Center</td>
<td>Implementing Science Seminars and Scientific Argumentation with Amplify Science (p. 76)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>G B140/141, Conv. Center</td>
<td>Grey Matter: Learning and Teaching Science with the Brain in Mind (p.72)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>10–12 B244/245, Conv. Center</td>
<td>The Scoop on SCOPES: Science Cooperative of Physicians and Elementary Students (p. 76)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12 B244/245, Conv. Center</td>
<td>MI Science PL@N: Resources for Introducing the Vision of the Framework to Teachers and Administrators (p. 77)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12 B246, Conv. Center</td>
<td>Not Adopted but Still Relevant: Using NGSS to Support Ohio’s Learning Standards (p. 78)</td>
</tr>
</tbody>
</table>

**Friday**

8:00–9:00 AM 4–12 Harrison, Hyatt
8:00–9:00 AM K–5 Hayes, Hyatt
8:00–9:00 AM 6–12 Ohio Center B/C, Conv. Center
8:00–9:00 AM 6–12 B232, Conv. Center
8:00–9:00 AM 7–12 Taft C, Hyatt
8:00–9:00 AM K–12 B233/234, Conv. Center
8:00–9:00 AM 8–C B142/143, Conv. Center
8:00–9:00 AM K–5 B140/141, Conv. Center
8:00–9:00 AM 3–12 C171, Conv. Center
8:00–9:00 AM K–8 C170, Conv. Center
8:00–9:00 AM 5–8 B235, Conv. Center
8:00–9:00 AM K–5 C150, Conv. Center
8:00–9:00 AM 9–C C161, Conv. Center
9:30–10:30 AM 1–6 Franklin C, Hyatt
9:30–10:30 AM K–5 Franklin A, Hyatt
9:30–10:30 AM 10–12 Franklin D, Hyatt
9:30–10:30 AM P–3 Taft C, Hyatt
9:30–10:30 AM G B144/145, Conv. Center
9:30–10:30 AM 6–8 C170, Conv. Center
9:30–10:30 AM G B140/141, Conv. Center
9:30–10:30 AM G B244/245, Conv. Center
10:00–10:30 AM K–6/C B232, Conv. Center
11:00 AM–12 Noon K–12 B244/245, Conv. Center
11:00 AM–12 Noon K–12 B246, Conv. Center

**Schedule at a Glance**  
**General Science Education**
<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Presenter/Center</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–3</td>
<td>Taft B, Hyatt</td>
<td>What Happens When I Don’t Teach Science? Reflections of a Secondary Science Teacher (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–6</td>
<td>Taft C, Hyatt</td>
<td>Linking Science and Literacy for Improved Student Outcomes (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>G</td>
<td>B144/145, Conv. Center</td>
<td>NSELA-Sponsored Session: Tools for Science Leaders, Part 2 (p. 77)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>G</td>
<td>Hayes, Hyatt</td>
<td>NSTA Press® Session: It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12 (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–8/C</td>
<td>Franklin A, Hyatt</td>
<td>It’s in the Bag: Greening the NGSS (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–8</td>
<td>B235, Conv. Center</td>
<td>Engage with NGSS Using STEM Gauge® (p. 79)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>G</td>
<td>B131/132, Conv. Center</td>
<td>FOLD-tastic Science Notebooks via Dinah Zike’s Notebook Foldables (p. 79)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>C</td>
<td>B140/141, Conv. Center</td>
<td>The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 77)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12</td>
<td>B240/241, Conv. Center</td>
<td>Transitioning Instructional Materials for the NGSS (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>K–12</td>
<td>Taft A, Hyatt</td>
<td>The NGSS@NSTA Hub (p. 78)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>B233/234, Conv. Center</td>
<td>Engaging Reading and Writing Success: Incorporating Today’s Global Issues (p. 79)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>B246, Conv. Center</td>
<td>Materials Matters (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–8</td>
<td>Taft B, Hyatt</td>
<td>Cross-Curricular and Innovative STEAM Teaching (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–C</td>
<td>Taft D, Hyatt</td>
<td>Classroom iPad iDeas (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>K–12</td>
<td>B142/143, Conv. Center</td>
<td>AMSE-Sponsored Session: Empowering and Rewarding Educators of Economically Disadvantaged Students (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>7–C</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: Alternative Tasks to Develop Expert Problem-Solving Skills (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–5</td>
<td>Hayes, Hyatt</td>
<td>NSTA Press® Session: Next Time You See... (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>5–12</td>
<td>Union E, Hyatt</td>
<td>D.E.S.I.G.N.: Developing Engineering Solutions Inspired by Graphic Novels (p. 83)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>B140/141, Conv. Center</td>
<td>Do You Need A New Science Lab? (p. 82)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–12</td>
<td>B230/231, Conv. Center</td>
<td>Zombie Apocalypse! (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>G</td>
<td>B233/234, Conv. Center</td>
<td>Supporting Excellence in STEM Programs and Teaching Through STEM Certification (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–9</td>
<td>B131/132, Conv. Center</td>
<td>Too Many Ideas: Helping Students Focus and Select a Topic to Investigate (p. 84)</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>3–12</td>
<td>C171, Conv. Center</td>
<td>Integrating Chromebook with Vernier Data-Collection Technology (p. 85)</td>
</tr>
<tr>
<td>1:15–2:00 PM</td>
<td>G</td>
<td>Exhibits Entrance, Hall B</td>
<td>Meet the Presidents and Board/Council (p. 86)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>3–12</td>
<td>C171, Conv. Center</td>
<td>Integrating iPad with Vernier Data-Collection Technology (p. 87)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>8–12</td>
<td>C161, Conv. Center</td>
<td>A Conceptual Framework for Teaching Global Change— NGSS Ready! (p. 87)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>B230/231, Conv. Center</td>
<td>Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 86)</td>
</tr>
<tr>
<td>3:00–5:00 PM</td>
<td>7–C</td>
<td>Union A, Hyatt</td>
<td>AAPT Session: Creating Your Own Effective Interactive Video Vignettes (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–12</td>
<td>B142/B143, Conv. Center</td>
<td>How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>G</td>
<td>B140/141, Conv. Center</td>
<td>Eureka! Science Trade Books: Good as Gold! (p. 88)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>3–C</td>
<td>Ohio Center B/C, Conv.</td>
<td>Poetry, Lyrics, Comics, Theatrics: Encouraging Students to Demonstrate Their Knowledge of Science Through Their Unique Talents in the Arts (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–8</td>
<td>Taft B, Hyatt</td>
<td>Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>5–9</td>
<td>Taft C, Hyatt</td>
<td>NMLSTA-Sponsored Session: Activate Your Learning, Engage Your Senses (p. 90)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>2–5</td>
<td>Franklin A, Hyatt</td>
<td>Literacy Connections in Science—Beyond Just Picture Books (p. 89)</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>K–12</td>
<td>C170, Conv. Center</td>
<td>A Series of Fortunate Events: Using Discrepant Events in the Classroom (p. 90)</td>
</tr>
<tr>
<td>3:30–5:00 PM</td>
<td>G</td>
<td>Taft D, Hyatt</td>
<td>Equity in Science Education Roundtable (p. 91)</td>
</tr>
<tr>
<td>4:00–4:30 PM</td>
<td>5–9</td>
<td>B144/145, Conv. Center</td>
<td>Universal Design for Learning (UDL): Creating a Learning Environment That Challenges and Engages All Learners (p. 92)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>K–3</td>
<td>Franklin A, Hyatt</td>
<td>Centering Around Science for K–3 Teachers (p. 93)</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>3–8</td>
<td>Taft B, Hyatt</td>
<td>Engaging Science Inquiry (p. 93)</td>
</tr>
</tbody>
</table>

**Saturday**

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Presenter/Center</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>K–5</td>
<td>Franklin A, Hyatt</td>
<td>NSTA Press® Session: Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5 (p. 96)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>6–12</td>
<td>B232, Conv. Center</td>
<td>Universal Design for Learning: What It Is, and What It Isn’t (p. 95)</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>3–8</td>
<td>B140/141, Conv. Center</td>
<td>Sing for the Planet (p. 66)</td>
</tr>
</tbody>
</table>
Schedule at a Glance  General Science Education

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>4–10</td>
<td>B235, Conv. Center</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>1–8</td>
<td>B244/245, Conv. Center</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–6</td>
<td>B130, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:00 AM</td>
<td>6–12</td>
<td>B232, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–12</td>
<td>B244/245, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–8</td>
<td>Franklin A, Hyatt</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–2</td>
<td>B131, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–12</td>
<td>Ohio Center B/C, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>C151, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–C</td>
<td>B235, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>1–12</td>
<td>B130, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>5–8</td>
<td>Franklin A, Hyatt</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>P–5</td>
<td>B131, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>K–6</td>
<td>B142/143, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>4–C</td>
<td>B244/245, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>9–12</td>
<td>B132, Conv. Center</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>6–C</td>
<td>Franklin C, Hyatt</td>
</tr>
<tr>
<td>11:00–12 Noon</td>
<td>6–C</td>
<td>Franklin C, Hyatt</td>
</tr>
<tr>
<td>11:00–12 Noon</td>
<td>P–8</td>
<td>B240/241, Conv. Center</td>
</tr>
</tbody>
</table>

Informal Science Education

Thursday

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>G</td>
<td>B142/143, Conv. Center</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>Union C, Hyatt</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–5</td>
<td>B144/145, Conv. Center</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>P–12</td>
<td>Taft A, Hyatt</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>4–C</td>
<td>B244/245, Conv. Center</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>3–12</td>
<td>B142/143, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>6–8</td>
<td>B144/145, Conv. Center</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>5–8</td>
<td>Franklin D, Hyatt</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>Franklin D, Hyatt</td>
</tr>
<tr>
<td>3:30–4:30 PM</td>
<td>6–C</td>
<td>Franklin B, Hyatt</td>
</tr>
<tr>
<td>4:00–4:30 PM</td>
<td>5–10</td>
<td>B142/143, Conv. Center</td>
</tr>
<tr>
<td>4:00–4:30 PM</td>
<td>6–12</td>
<td>B232, Conv. Center</td>
</tr>
<tr>
<td>5:00–6:00 PM</td>
<td>5–C</td>
<td>Franklin D, Hyatt</td>
</tr>
</tbody>
</table>

Friday

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–8:30 AM</td>
<td>1–5</td>
<td>Taft B, Hyatt</td>
</tr>
<tr>
<td>8:00–8:30 AM</td>
<td>G</td>
<td>Franklin D, Hyatt</td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>K–8</td>
<td>Union E, Hyatt</td>
</tr>
<tr>
<td>8:30–11:30 AM</td>
<td>5–12</td>
<td>Nationwide E, Hyatt</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–8</td>
<td>Taft B, Hyatt</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>P–12</td>
<td>Franklin D, Hyatt</td>
</tr>
</tbody>
</table>

NSTA Columbus Area Conference on Science Education
### Schedule at a Glance

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>B242/243, Conv. Center Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 89)</td>
</tr>
<tr>
<td>3:30–5:00 PM</td>
<td>G</td>
<td>Taft D, Hyatt Equity in Science Education Roundtable (p. 91)</td>
</tr>
</tbody>
</table>

### Saturday

<table>
<thead>
<tr>
<th>Time</th>
<th>Room</th>
<th>Session Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 AM</td>
<td>3–8</td>
<td>B140/141, Conv. Center Sing for the Planet (p. 66)</td>
</tr>
<tr>
<td>8:30–9:00 AM</td>
<td>7–12</td>
<td>B144/145, Conv. Center Learning STEM Through Bioenergy: Lessons from the Plants (p. 97)</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>K–5</td>
<td>Franklin D, Hyatt Building a Community Science Festival: The JW Family Science Extravaganza (p. 100)</td>
</tr>
<tr>
<td>11:00 AM–12 Noon</td>
<td>P–8</td>
<td>B240/241, Conv. Center Exploring the Seeds of SEED (Students Exploring Ecosystem Dynamics) (p. 101)</td>
</tr>
</tbody>
</table>
Index of Participants

A
Abbott, Rebecca 39, 42, 45, 50, 76, 80
Ahn, Byung Joon 73
Albrecht, Helmut 51, 86
Allen, Heather 73
Ansberry, Karen 96
Antram, Joe 45
Armstrong, Kathy 39, 41, 44, 50, 56, 60
Aubrecht, Gordon 66, 77, 88, 99

B
Badders, Bill 78
Bain, Amy 48, 53, 93
Baldwin, Anne 38
Ballard, Yolanda 73, 101
Belcher, Tysen 72
Belczyk, Carolyn 38, 71
Benton, Erik 39, 42, 45, 50, 56, 60
Bergman, Brenda 57, 73
Bergman, Sydney 80
Bigin, Amy 92
Boldt, Jennifer 44, 50
Bolenbaugh, Todd 82, 95
Bombrys, Teresa 37
Borgerding, Lisa 67
Boros, Amy 83
Borowczak, Mike 74
Bortz, Brian 53
Bowman, Luke 57
Brandt, Ken 40
Brandt, Kim 35, 71
Brielle, Chad 71, 81, 91
Brodsky, Lauren 58
Brokaw, Ann 85, 87
Brown, Katrina 53, 100
Brown, Leigh 70, 76, 80, 85, 87, 91, 97, 100
Bryan, Heather 44, 62, 67
Burrows, Andrea 67, 74, 90, 93
Byers, Al 46, 77

C
Callentine, Lainna 49, 75
Campbell, Brian 42, 50, 56
Capers, Quinn 83
Carpenter, Brian 71
Carter, David 70, 76, 80, 85, 87, 91
Carter, Diane 37
Cervenec, Jason 49
Chase, Melinda 53
Cheesman, Kerry 89
Cindric, Tracy 47
Clark, Belinda 98
Clark, Pam 38
Clark, Ted 102
Clavin, Kimberly 81
Claymier, Bob 89
Cohen, Jeradi 53
Cole, Jeradi 67
Cone, Mary 90
Conerly, Alicia 82
Coppola, Matthew Perkins 59
Counterman, Sue 99
Crowford, Chuck 101
Crowley, Kara 65
Crowther, David 40
Cummings, Joy 86

D
Daniels, Nicole 57
Daugherty, Karen 59
Dayton, Maria 39, 42, 45, 50, 56, 61
DeJarnette, Nancy 98
Delia, Anna 35, 71, 82
Dennison, Jennifer 40, 61
Diehl, Kimberly 99
Dipinto, Vito 78
Dixon, Kerry 37
Dodd, Gregory 37, 84
Domo, Jenni 76
Doppes, Barbara 84
Dorman, Jessica 62
Doucican, Brett 86
Dougherty, Andrew 48, 59, 74
Dougherty, Kathleen 66
Dudukovich, Jeffrey 66, 78
Dunion, Jason 72
Duran, Emilio 65
Duran, Lena 65
Dyktara, Janet 79

E
Eales, Jonathan 73
Easter, Gene 59, 73, 92, 93
Eisenkraft, Arthur 72
Evans, David 40
Evans, Kelly Gaier 54
Evans, Zoe 78
Everett, Jennifer 59

F
Fabich, Ron 78, 83
Fenf, Christopher 96, 99
Fleming, Michelle 83
Flynn, Suzanne 88
Fontenot, Angela 73, 101
Forrest, Douglas 71
Fotsch, Fred 90
Foudray, Jennifer 38
Framknoi, Andrew 93
Francis, Raymond 89
Freaker, Shu-Yee 72
Fries-Gaither, Jessica 99

G
Galvan, Patricia 49, 67, 74, 79, 84
Garwood, Jennifer 89
Giasi, Trudy 40, 95
Girardot, Marie 72
Glasner, Lindsay 46, 92, 98
Glatz, Stacey 36
Gmurczyk, Marta 71, 81, 91
Gochis, Emily 57
Goodman, Michael 42
Goodwin, Debbie 58, 89, 95
Graper, Sharon 48
Greene, Angela 62
Greenwald, Eric 89
Gromko, Mary 40
Grzybowski, Deborah 73
Gustin, Ashley 99

H
Hampel, Claire 54
Hand, Brian 36
Harman, Jill 57
Harper, Kathleen 84
Harris, Meredith 73, 101
Hartman, Matthew 60, 84
Harvey, Loretta 53
Hawkins, Scott 101
Hayes, Carolyn 40, 72
Herak, Patrick 40, 67
Herman, Tim 41, 49, 54, 68, 75, 79, 97, 99
Hersheberger, Susan 99
Hodum, Douglas 52
Hoekenga, Janet 68
Hoelzer, Mark 75
Holliday, Gary 98
Hollis, Shannon 101
Holvmo, Zach 52
Holmes, Cathy 47
Hopkins, Esther 73
Horner, Lenore 76
Horton, Robert 38, 71
House, Patty 38, 71
Hudoba, Michael 65
Hunt, Jane 86
Huntoon, Jacqueline 57

I
Irving, Karen 95

J
Jackson, Caryn 52, 82, 95
Johnson, Diane 65, 82, 95
Johnson, Meri 48, 53
Jones, Carrie 65
Jordan, Janet 36

K
Kahn, Sami 78, 91
Kalouvati, Karen 46, 53, 82
Kasperic, Diane 36
Kauffman, Chad 65
Keeley, Page 58, 66
Keil, Jennifer 71, 81, 91
Kelly, Kathleen 88
Kelp, Lisa 39, 41, 56, 60, 68
Kennedy, Matthew 71
Kenyon, Len 83
Kenyon, Lisa 83
Kessler, James 67, 74, 79, 84
Khoury-Bowers, Claudia 96, 99
Kimmel, Amy 66
Knipp, Rebecca Haub 58, 90
Knoell, Donna 46, 61, 95
Koehler, Karen 97
Koenig, Kathleen 88
Koller, Herb 42
Kountz, Mollie 66
Kountz, Mollie 66

136

NSTA Columbus Area Conference on Science Education
Index of Participants

L
Langston, Marjorie 86
Lark, Amy 57
Launius, J. Carrie 91
Levine, Joseph 87, 90
Librea, Mila Rosa 77
Lightbody, Mary 96
Lindberg, Cary 99
Linnen, Linda 79, 98
Lipscomb, Mary Lou 58, 90
Long, Kathy 44, 60, 66, 84, 86, 102
Luong, Thanh 99

M
Mackenzie, Ann Haley 59
Maier, Frederick 46, 77
Makki, Nidaa 98
Malone, Kathy 62, 95
Maloney, David 84
Mann, Rhonda 37, 73
Marchiando, Lesa 99
Marshall, Robert 86
Marvel, Mike 41, 54
McDonald, Jim 74
McIntyre, Barbara 57, 73
McKee, Mike 49
McMurry, Angela 36, 47, 96
McNamara, Denise 52
Meiser, Ian 99
Miller, Cindy 93
Miller, Julie 51
Miller, Stephanie 83
Mills, Julie 72
Mills, Kat 39, 42, 45, 50, 56, 60
Milo, Heather 41, 68
Mintz, Ellen 56
Monsour, Chris 70
Morgan, Emily 83, 96
Mosley-Thompson, Ellen 51
Motz, LaMoine 47, 53
Mulvey, Bridget 77
Munzenmaier, Diane 68, 79, 97
Murduck, David 101
Mushalko, Dan 35

N
Newman, Kristina 62
Nguyen, Audrey 67
Noonan, Amber 99
Nydam, Andrew 82, 98, 101
Nyzen, Kelly 57

O
Oberski, Amanda 98
Olds, Shelley 38
Opliger, Douglas 57
Orvis, Kathy 97
Ostrowski, Chad 98
Ovard, Leslie 88

P
Padilla, Michael 70
Pages, Patrice 100
Paris, Tanya 77
Patton, Bruce 48, 59, 74
Pearson, Ann 61, 90
Pegg, Christine 66
Penchos, Jessica 39, 60
Perry, Anthony 102
Peterson, Jeff 96
Petry, Leanne 86
Petit, Linda 101
Pfeiffer, JoAn 97, 99
Pfeil, Sheryl 83
Phillips, Jarod 44
Philpot, Leslie 74
Plaster, Karen 98
Pollitt, C. Marie 84
Pollock, Jenna 47, 65
Porn, Christina 61
Posekany, Dawn 85, 87, 90
Price, Courtney 51
Price, Norman 52
Pugh, Aha 37, 73
Putnam, John 46, 77
Pyatt, Robert 35, 100

R
Ramirez, Ainissa 40
Randolph, Keri 72, 77
Reid, Virginia 39, 60
Reighard, Kristie 40, 51
Reitz, William 83, 89, 92, 93
Rettacker, Melanie 66
Richardson, Briana 54
Richey, William 75
Roberts, Ken 65
Rodrick-Williams, Penny 81
Royal, Brenda 75
Rukes, Sherri 58, 65, 82
Rutz, Eugene 79
Ruud, Ruth 38, 82

S
Saavedra, Ezequiel Alvarez 75
Sackett, Brett 70, 76, 80
Sampson, Victor 48, 62, 89
Sanders, Darci 83
Sanders, Rachel 38
Sarquis, A. Mickey 45, 87
Schatz, Dennis 93
Schleigh, Sharon 48, 53
Shields, Traci 39, 42, 45, 50, 70, 76, 80
Shin, Diana 51
Shrewsberry, Kelli 48
Shryock, Char 52, 83
Sinclair, Jay 66, 78
Slater, Timothy 40
Slattery, William 74, 78
Smith, Lee 38
Smith, Lori 85
Smith, Mandy McCormick 48, 100
Smith, Trevor 67
Sneary, Alice 79
Snowflack, Danielle 39, 42, 45, 50, 56, 61
Snyder, Pamela Petzel 48
Stammen, Andria 96
Starr, Mary 77
Stober, Rebecca 71, 81, 91
Stone, Jody 48
Strosnider, Kim 101
Stubble, Janet 81
Stumbo, Michelle 71
Swami, Rajeev 86
Swartzel, Julia 38
Sweeney, Kevin 102

T
Talley, Terry 41, 54, 68, 84
Taylor, Gregory 95, 100
Taylor, Tanya 101
Teisan, June 46, 77, 88
Texley, Juliana 38, 47, 53, 66, 88, 91
Thase, Jackie 59
Thomas, Erin 82
Thompson, Kenetia 46
Thompson, Lonnie 51
Thompson, Rebecca 48
Thornton, Sandra 102
Tirani, Vinta 95
Tison, Roy “Jack” 46, 77
Todd, Debby 49, 54
Trusedell, Jean 59, 101
Tubman, Stephanie 57, 73

V
Valadez, Jerry 91
VanTassel, Nicole 40
Vazquez, Bertha 59
Velez, Diana 42, 50
Vernot, David 78, 100
Vernot, Pam 59
Voelker, Taylor 67
Vogt, Gina 41, 49, 54, 99

W
Wakely, Alexandra 46, 77
Walter, Leah 99
Warner, James 59
Waterman, Ed 76, 80
Watkins, Carolyn 61
Watters, Brandon 75, 80
West, DJ 66
West, Travis 71
Whalen, Mary 71
Wharton, Taylor 66
Wheeler, Kathleen 66
Wheeler-Toppen, Jodi 74
Whitt, April 96
Wild, Tiffany 73
Wilhelm, Jennifer 57, 88
Willard, Ted 38, 78
Winfield, Scott 83
Wintering, Sue Hemmelgarn 49, 54
Winters, Tracy 71
Wisker, Nancy 79
Wojick, Christopher 57
Wolle, Alexis 88
Wolfe, Becky 95
Wood, Becky 39, 41, 44, 50, 56, 60
Works, Patty 82, 95
Wysession, Michael 85

Y
Young, Donna 35, 58, 89
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Carolina Biological Supply Co. (Booth #625), www.carolina.com, 800-334-5551 .................................................. 55
OHAUS Corp. (Booth #633), www.ohaus.com, 800-672-7722 ........................................................................... Cover 4
PAEMST, www.paemst.org ................................................................. 47
PASCO scientific (Booth #632), www.pasco.com, 800-772-8700 .................................................. Cover 2
UNI Overseas Placement Service for Educators, www.uni.edu/placement/overseas ........................................... 11
University of Nebraska at Kearney, www.unk.edu/onlinesciencemath, 800-865-6388 ............................................. 108
University of the Sciences in Philadelphia (Booth #850), www.usciences.edu, 888-996-8747 ..................................... 63
Vernier Software & Technology (Booth #725), www.vernier.com, 888-837-6437 .............................................. 23, Cover 3

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<table>
<thead>
<tr>
<th>Time</th>
<th>Room Number C171</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00–9:00 a.m.</td>
<td>Integrating Chromebook™ with Vernier Data-Collection Technology</td>
</tr>
<tr>
<td>9:30–10:30</td>
<td>Chemistry with Vernier</td>
</tr>
<tr>
<td>11:00 a.m.–12:00 p.m.</td>
<td>Biology with Vernier</td>
</tr>
<tr>
<td>12:30–1:30</td>
<td>Integrating Chromebook™ with Vernier Data-Collection Technology</td>
</tr>
<tr>
<td>2:00–3:00</td>
<td>Integrating iPad® with Vernier Data-Collection Technology</td>
</tr>
<tr>
<td>3:30–4:30</td>
<td>Physics and Physical Science with Vernier</td>
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