

NSTA AREA CONFERENCE ON SCIENCE EDUCATION

# CHAMPIONS OF SCIENCE

A GAME PLAN  
FOR THE FUTURE!

COLUMBUS

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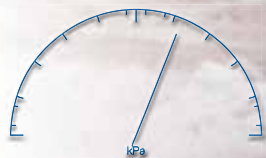
DECEMBER 1-3, 2016



#NSTA16

**NSTA** National  
Science  
Teachers  
Association

# 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 CO<sub>2</sub> emissions. The Earth's oceans act as a buffer by dissolving excess CO<sub>2</sub> into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO<sub>2</sub> 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 SPARKvue 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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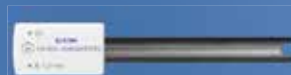
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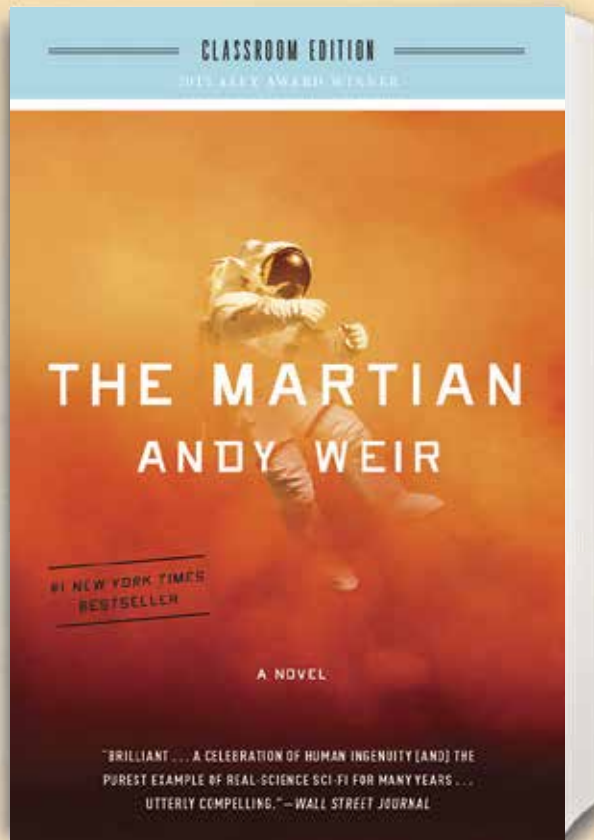
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**Collect and graph data in seconds.  
No additional hardware or interface  
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# NEW CLASSROOM EDITION

**“*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



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**B\|D\|W\|Y**

## 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. [www.AndyWeirAuthor.com](http://www.AndyWeirAuthor.com)

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go to: [tiny.cc/weiressay](http://tiny.cc/weiressay)

To read Andy Weir's interview with  
Education Week, go to: [tiny.cc/eduweek](http://tiny.cc/eduweek)

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**NSTA** National  
Science  
Teachers  
Association





# NSTA 2016 Area Conference on Science Education

## *Champions of Science: A Game Plan for the Future!*

Columbus, Ohio • December 1–3, 2016

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### National Science Teachers Association

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### NSTA Affiliates

- Association for Multicultural Science Education (AMSE)
- Association for Science Teacher Education (ASTE)
- Association of Science-Technology Centers (ASTC)
- Council for Elementary Science International (CESI)
- Council of State Science Supervisors (CSSS)
- National Association for Research in Science Teaching (NARST)
- National Middle Level Science Teachers Association (NMLSTA)
- National Science Education Leadership Association (NSELA)
- Society for College Science Teachers (SCST)

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



Kristie Reighard



Trudy Giasi



Patrick Herak

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.

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

## 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.

### Conference Chairperson

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Yorktown Middle School  
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#### *Manager of Services for People with Special Needs*

Samantha Knight  
Grand Island Public Schools  
Grand Island, NE

#### *Volunteers Manager*

Dawn Villares  
Science Education Council of Ohio  
Akron, OH

#### *Program Representatives*

Bill Badders  
2013-2014 NSTA President and Retired Educator  
Cleveland Heights, OH

Shannon Hudson  
NSTA Director, District X  
Crawfordsville Middle School  
Crawfordsville, IN

#### *Conference Advisory Board Liaison*

Juliana Texley  
2014-2015 NSTA President and Science Writer/Instructor  
New Baltimore, MI

### Program Committee

*Strand Leader: Training Camp: Strengthening Fundamentals in Elementary Education*  
Tysen Belcher  
Grove Patterson Academy  
Toledo, OH

#### *Strand Leader: Game Time: Tackling Scientific Problems and Pitching Engineering Solutions*

Janet Struble  
The University of Toledo  
Toledo, OH

#### *Strand Leader: Science Boosters: Taking It to the Next Level*

Tracy Cindric  
The Ohio State University  
Columbus, OH



## President's Welcome

### Connect, Collaborate, Celebrate—Teachers Are the Key



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 chal-

lenges 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  
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### Contributors

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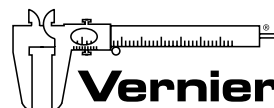


The environment is important to science educators. These programs are recyclable and were printed on recycled paper.



Science Education  
Council of Ohio

The Ohio chapter of the National Science Teachers Association



# NSTA Conferences Go Green!

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

## Conference Previews

Gone are the days of bulky, newspaper-style advance programs. 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](http://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 CO<sub>2</sub> 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](http://flycolumbus.com)). For information on ground transportation options, visit [bit.ly/2cUWTJd](http://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/1pbYjfa](http://bit.ly/1pbYjfa).

## 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](http://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](http://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](http://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](http://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](http://www.enterprise.com) and use "16AH230" in the "Optional: Coupon, Customer or Corporate Number" box, click on "search" and enter PIN "NST."



—Photo courtesy of COSI—Columbus, Ohio's Center of Science and Industry

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](http://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.



**NSTA** National Science Teachers Association





**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.

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](mailto:help@orchideventsolutions.com). After hours and on Saturday, call 801-505-4611.



### 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](http://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 t-shirts—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](http://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](http://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](mailto: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

Visit our website for registration materials. Registration deadline January 13, 2017.

[www.uni.edu/placement/overseas](http://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](mailto:overseas.placement@uni.edu)





—Photo courtesy of Mike Weiss

### The NSTA Conference App



Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience.

Features include the ability to view session and workshop listings by time and presenter; maps of the Hyatt, Convention Center, and Exhibit Hall; social media plugins; and a note-taking tool. Scan the QR code or visit [www.nsta.org/conferenceapp](http://www.nsta.org/conferenceapp) to download the app. Please make sure to create a CrowdCompass account when logging in to be able to export any notes taken within the app. *Note:* The NSTA Conference app does not sync to our online Personal Scheduler.

## Online Session Evaluations and Tracking Professional Development

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

Help NSTA's **GREEN** efforts by visiting the conference session browser to complete 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](http://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.

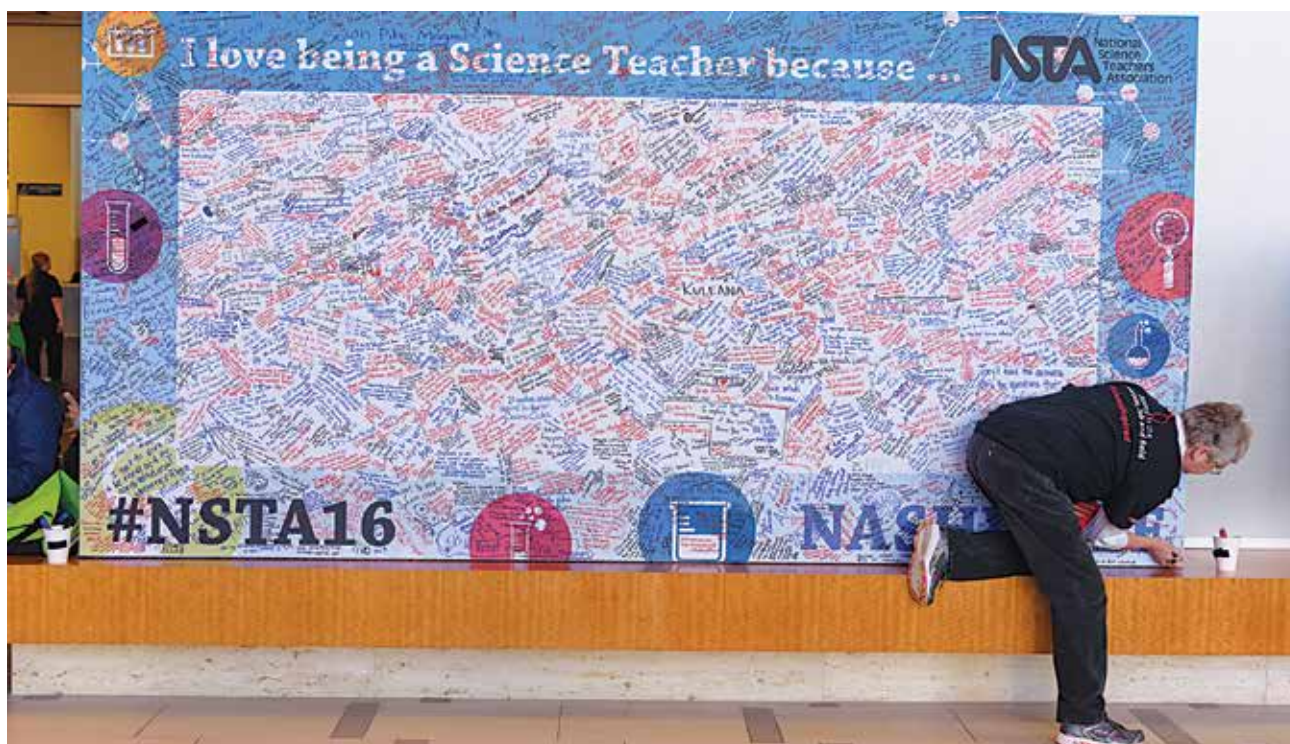
### Experience Columbus Information Desk and Visitor Center

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

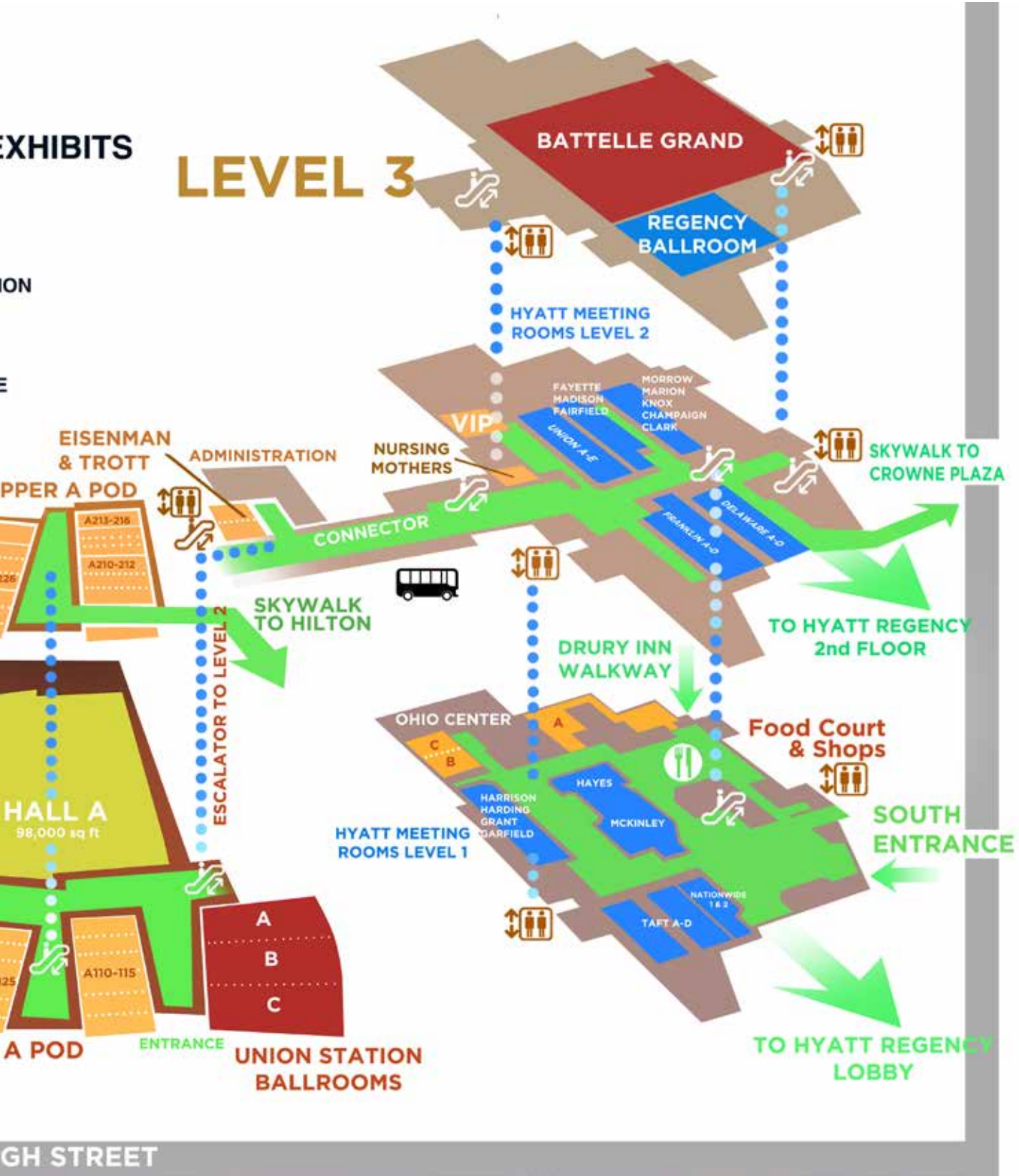








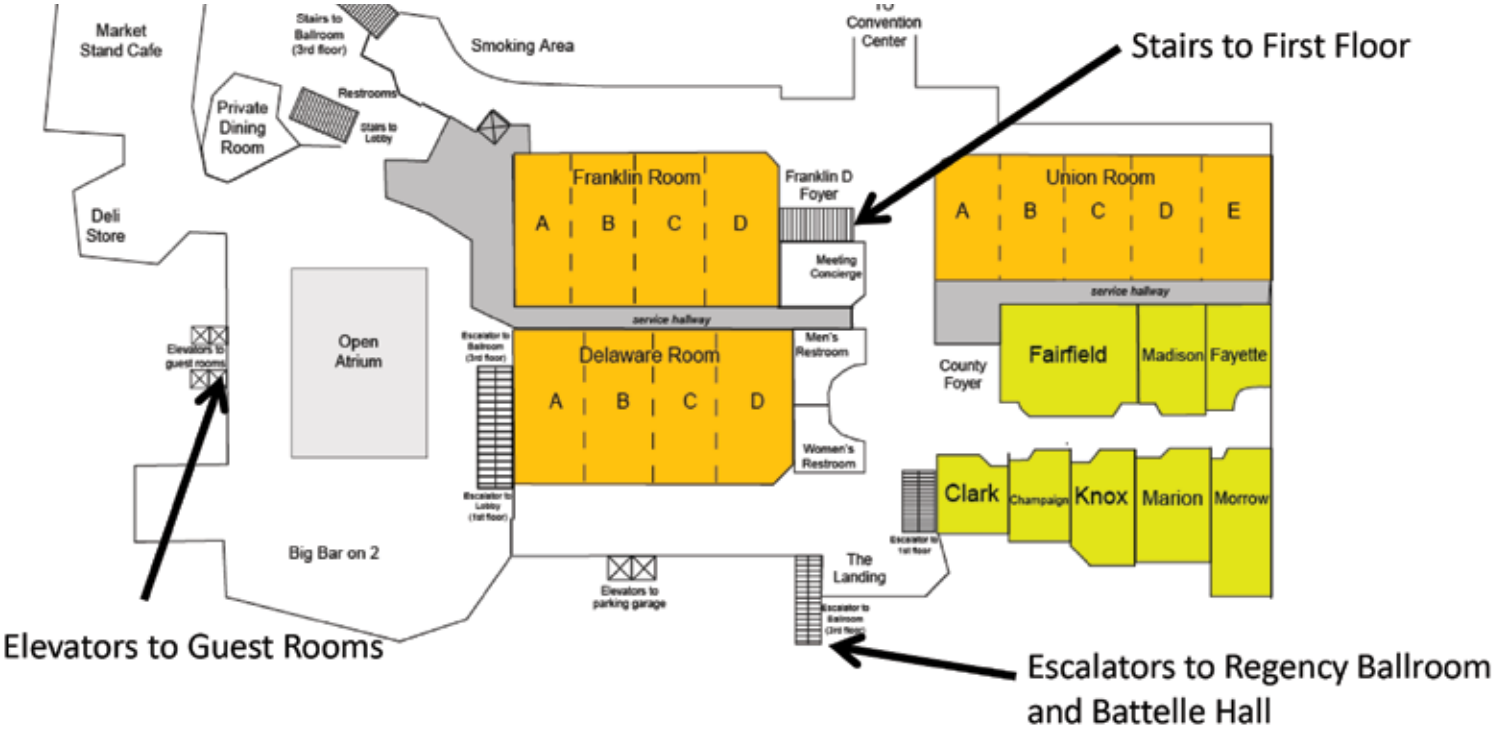
# Convention Center



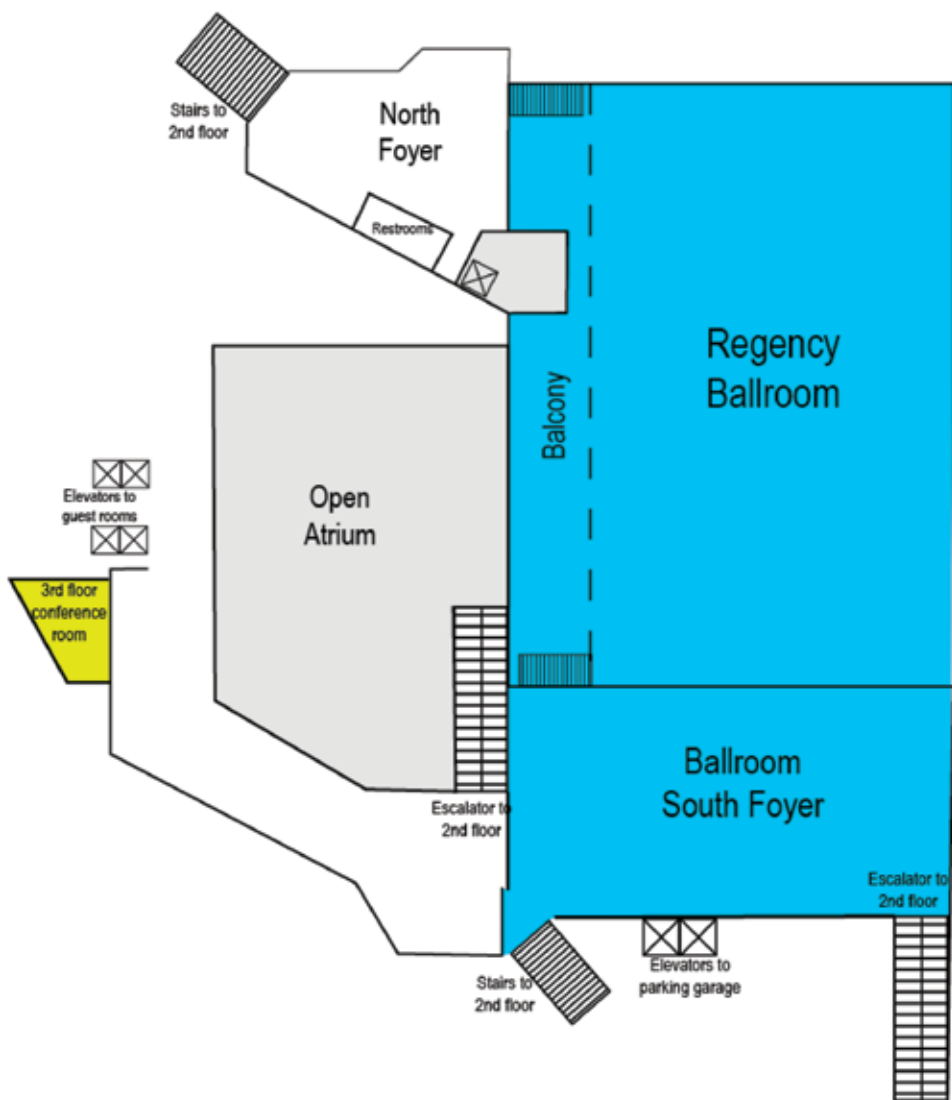
**First Floor**



**Second Floor**



### Third Floor





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Marcia Akeung, AEOP Logistics Coordinator  
Jarod Phillips, GEMS Project Manager  
Renee Wells, GEMS Administrative Assistant

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

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### *NSTA Mission Statement*

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

### **Officers and Board of Directors**

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David T. Crowther, President-Elect  
Carolyn Hayes, Retiring President  
Harold Pratt, Parliamentarian  
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Dennis Schatz, Informal Science  
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Eric Brunsell, Professional Development  
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Bob Sotak, NSELA Affiliate Representative  
Brian Shmaefsky, SCST Affiliate Representative

*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

# 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

**Proposal 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**

To submit a proposal, visit

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





# NSTA NATIONAL CONFERENCE ON SCIENCE EDUCATION

*"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

Over **1,200** sessions

Network with more  
than **10,000**  
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# 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

Stay up-to-date with conference information at  
[www.nsta.org/la](http://www.nsta.org/la)

**NSTA** National  
Science  
Teachers  
Association

## Conference Program • Highlights



—Courtesy of Ohio 4-H Youth Development

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.

### Thursday, December 1

8:00–9:00 AM	First-Timer Conference Attendees' Orientation . . . . .	36
	(Is This Your First NSTA Conference?)	
9:15–10:30 AM	General Session: Ainissa Ramirez . . . . .	40
11:00 AM–5:00 PM	Exhibits ( <i>Exclusive hours: 11:00 AM–12:30 PM</i> ) . . . . .	45
2:00–3:00 PM	Featured Presentation: Ellen Mosley-Thompson and Lonnie Thompson . . . . .	51

### Friday, December 2

8:00 AM–1:30 PM	Middle School Chemistry Day . . . . .	28
8:00 AM–5:30 PM	Chemistry Day (For Grades 9–12) . . . . .	28
8:00 AM–6:00 PM	Engineering Day . . . . .	29
8:00 AM–6:00 PM	Physics Day . . . . .	29
9:00 AM–3:00 PM	Exhibits ( <i>Exclusive hours: 1:30–3:00 PM</i> ) . . . . .	71
9:30–10:30 AM	Featured Presentation: Jason Dunion . . . . .	72
12:30–1:30 PM	Featured Presentation: Kimberly Clavin . . . . .	81
1:15–2:00 PM	Meet the Presidents and Board/Council . . . . .	86
1:15–3:00 PM	Exhibit Hall Beverage Break . . . . .	86
3:00–4:30 PM	SECO 2017 Awards and Member Reception ( <i>tickets through SECO</i> ) . . . . .	88

### Saturday, December 3

9:00 AM–12 Noon	Exhibits . . . . .	97
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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.*





# Stellar Service Makes a Measurable Difference

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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

**5:00–6:00 PM**

Nurturing Curious Minds: Exploring the Science Encountered in the Young Child’s World and Inspiring Sustained Curiosity, Interest, and Learning

**Friday, December 2**

**8:00–9:00 AM**

Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades

**9:30–10:30 AM**

Featured Presentation: Hurricanes: What Makes Them Tick and How Do We Track Them?

(Speaker: Jason Dunion)

*Picture-Perfect Science: Doing It Our Way*

**11:00 AM–12 Noon**

It’s in the Bag: Greening the NGSS

**12:30–1:30 PM**

Developing Coherent Storylines for Elementary Science Concepts

**3:30–4:30 PM**

Literacy Connections in Science—Beyond Just Picture Books

**5:00–6:00 PM**

Centering Around Science for K–3 Teachers

**Saturday, December 3**

**8:00–9:00 AM**

Beyond Spaceship Earth

**9:30–10:30 AM**

Preschool STEAM: Yes, They Can!

**11:00–11:30 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)

Bioplastic—Going from Synthetic to Natural Polymers

**3:30–4:30 PM**

Teaching Engineering in Grades K–3

**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

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

#### Thursday, December 1

##### 12:30–1:30 PM

Trees from the Top Down: A New Approach to Energy Transfer

##### 2:00–3:00 PM

Featured Presentation: Climate Change: The Evidence, People, and Our Options  
(Speakers: Ellen Mosley-Thompson and Lonnie Thompson)

Connect Chemistry to Your World with ChemClub

#### Friday, December 2

##### 8:00–8:30 AM

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

##### 8:30–9:00 AM

A Monumental Task: Connecting Washington, D.C., Across the Curriculum

##### 8:30–11:30 AM

SC-3: 4-H Innovation...Design Challenges in Action  
(Ticket Required: \$15)

##### 9:30–10:30 AM

Student Research and Publishing in High School Science

##### 11:00 AM–12 Noon

Food Chains: Using Field Surveys That Give Real Results

##### 12:30–1:30 PM

Climate Expeditions

##### 3:30–4:00 PM

U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy

##### 4:00–4:30 PM

Animal Multimedia Inspires Learning and Engagement

#### Saturday, December 3

##### 8:00–9:00 AM

Logistic Growth and the Zombie Apocalypse

##### 10:00–10:30 AM

Building a Community Science Festival: The JW Family Science Extravaganza

##### 11:00 AM–12 Noon

Inventing Is Just Plain Fun (for All)!

# CONFERENCE APP



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### 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*

- 11:00 AM–12 Noon *It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12*
- 12:30–1:30 PM *Next Time You See...*
- 3:30–4:30 PM *Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12*
- 5:00–6:00 PM Solar Science: NGSS-Focused Solar Astronomy Experiences and Preparation for the All-American Total Solar Eclipse

#### 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

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

#### Friday, December 2

SECO 2017 Awards and Member Reception  
 (Free for SECO members. Visit [www.secoonline.org](http://www.secoonline.org) to request a ticket.)  
 McKinley, Hyatt..... 3:00–4:30 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	<b>Energy in Chemistry—A Macroscopic View</b>
11:00 AM–1:00 PM	<b>Energy in Chemistry—A Particulate View</b>
3:30–5:30 PM	<b>Energy in Chemistry—An Atomic View</b>

## 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](http://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	<b>Solids, Liquids, Gases, and Changes of State</b>
9:30–10:30 AM	<b>Density: A Molecular View</b>
11:00 AM–12 Noon	<b>The Water Molecule and Dissolving</b>
12:30–1:30 PM	<b>Chemical Reactions: Breaking and Making Bonds</b>



## Engineering Day at NSTA

*Sponsored by the American Society for Engineering Education*

*Friday, December 2, 8:00 AM–6:00 PM*

*Union D, Hyatt*

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**



## Physics Day at NSTA

*Sponsored by the American Association of Physics Teachers (AAPT) and the Southern Ohio Section of AAPT*

*Friday, December 2, 8:00 AM–6:00 PM*

*Union A, Hyatt*

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 experi-

enced 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**



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  
 Science Focus: LS1.A, LS1.B, LS2.A, LS4.C, SEP1, SEP3  
 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, environ-



Photo courtesy of Ohio 4-H Youth Development

Students engage in 4-H Ag Innovators design challenges (SC-3).

mental 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.

Note: Please meet your leader at the High Street Entrance of the Convention Center 15 minutes prior to departure.



**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

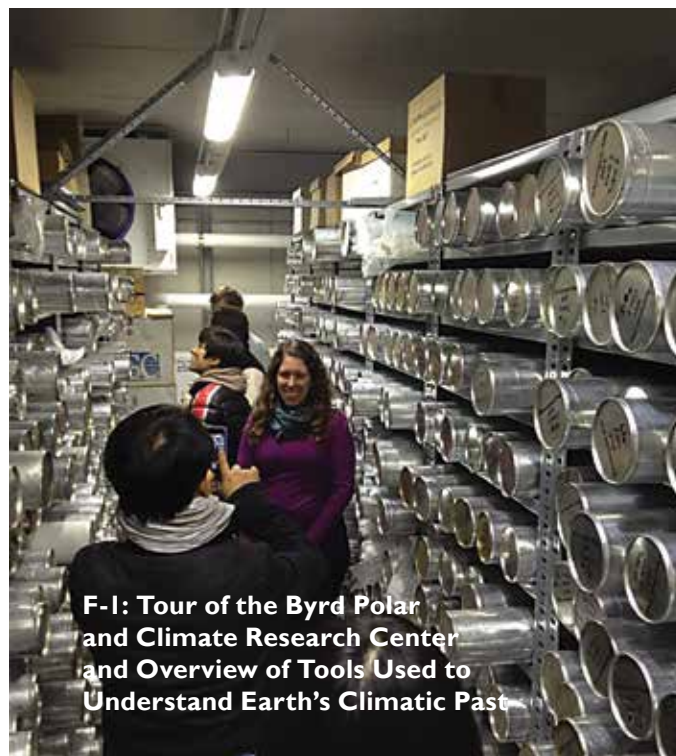
In this short course, learn about the Nationwide and Ohio Farm Bureau 4-H Center and engage in 4-H Ag Innovators design challenges. Participants will work in teams to brainstorm, design, build, test, and redesign solutions for an aquaculture feeding system and a wind-powered water pumping system. Modeling 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.



T-1: Columbus Idea Foundry Tour

—Photo courtesy of the Columbus Idea Foundry

*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.*



F-1: Tour of the Byrd Polar and Climate Research Center and Overview of Tools Used to Understand Earth's Climatic Past

—Photo courtesy of Byrd Polar and Climate Research Center

**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

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### Association for Multicultural Science Education (AMSE)

*President: Sharon Delesbore*

#### Friday, December 2

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12:30–1:30 PM	Empowering and Rewarding Educators of Economically Disadvantaged Students	B142/143, Conv. Center
2:00–3:00 PM	STEM and/or STEAM Design Challenges in Grades 4–12 Science Classrooms	Harrison, Hyatt

### Association for Science Teacher Education (ASTE)

*President: Malcolm Butler*

#### Thursday, December 1

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3:30–4:30 PM	Citizen Science: Argumentation and Modeling Safe Traffic Intersections	Harrison, Hyatt
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#### Friday, December 2

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8:00–9:00 AM	Tech Tools for Taking Your Secondary Science Class to the Next Level	Taft C, Hyatt
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### Council for Elementary Science International (CESI)

*President: James T. McDonald*

#### Friday, December 2

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9:30–10:30 AM	Integrating Science for Young Children with an Outdoor Focus	Taft C, Hyatt
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### National Association for Research in Science Teaching (NARST)

*President: Mei-Hung Chiu*

#### Thursday, December 1

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2:00–3:00 PM	Imagery Support Strategies for Developing Dynamic Scientific Models with Students	B140/141, Conv. Center
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#### Friday, December 2

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12:30–1:30 PM	Using Democratic Science to Engage Families in Scientific Explanation	Taft C, Hyatt
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*This form is for planning purposes only. Do NOT submit to NSTA.*

## Columbus Area Conference, December 1–3, 2016 Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the 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](http://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/columbusbrowser](http://www.nsta.org/columbusbrowser). 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:<br>a. for immediate classroom use.<br>b. based on the reputation of the speaker.<br>c. to improve my personal pedagogical knowledge/skill.<br>d. to improve my STEM content knowledge. | 2. The session met my needs.<br>3. The information presented was clear and well organized.<br>4. Safe practices were employed.<br>5. The session avoided commercial solicitation<br>(n/a for exhibitor workshops and NSTA Press® sessions).<br>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

Start Time	End Time	Activity/Event Title
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

***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!***



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

*President: Mary Lou Lipscomb*

#### **Thursday, December 1**

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3:30–4:30 PM	Calling All Middle Level Teachers	B140/141, Conv. Center
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#### **Friday, December 2**

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3:30–4:30 PM	Activate Your Learning, Engage Your Senses	Taft C, Hyatt
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### **National Science Education Leadership Association (NSELA)**

*President: Keri Randolph*

#### **Friday, December 2**

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9:30–10:30 AM	Tools for Science Leaders, Part 1	B144/145, Conv. Center
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11:00 AM–12 Noon	Tools for Science Leaders, Part 2	B144/145, Conv. Center
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## Three Dimensions of the Next Generation Science Standards (NGSS)

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

## Disciplinary Core Ideas

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

## 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*  
Science Focus: ESS1, ESS2.A, ESS2.B, ESS2.D, ESS3.C, PS1.A, PS1.B, PS2.C, PS3.B, PS4.B, CCC1, CCC2, CCC4, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

**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** (*adelia@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.

*The ideas and opinions expressed in the conference sessions, and in any handout materials provided, are those of the presenter. They are not those of the National Science Teachers Association nor can any endorsement by NSTA be claimed.*

## Science Area

A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 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.**



**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](mailto: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](mailto: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.

**INF 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 all 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](mailto: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](mailto: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.



**Need help navigating?**

Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join other first-time attendees for an interactive exploration through the conference 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.

- **First-Timer Attendee Session • Thursday, December 1, 8:00–9:00 AM**  
**McKinley, Hyatt Regency Columbus**





### 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](mailto:ruudruth61@gmail.com)), Cleveland State University, Cleveland, Ohio

**Juliana Texley** ([@JulianaTexley](mailto:@JulianaTexley); [texlej@cmich.edu](mailto:texlej@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](mailto:@SandersGISA); [rachs1205@gmail.com](mailto:rachs1205@gmail.com)),

**Pam Clark** ([@clarkGISA](mailto:@clarkGISA); [pclark@globalimpactacademy.org](mailto:pclark@globalimpactacademy.org)), and **Jennifer Foudray** ([@FoudrayGISA](mailto:@FoudrayGISA); [jfoudray@globalimpactacademy.org](mailto: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](mailto:@Ted_NSTA); [twillard@nsta.org](mailto: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](mailto:@terraunbound); [@UNAVCO](mailto:@UNAVCO); [@ESIPFed](mailto:@ESIPFed); [olds@unavco.org](mailto: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](mailto:@arbaldwin); [baldwina@wcsoh.org](mailto:baldwina@wcsoh.org)), Westerville (Ohio) City School District

**Julia Swartzel** ([swartzej@wcsoh.org](mailto:swartzej@wcsoh.org)) and **Lee Smith** ([smithlee@westerville.k12.oh.us](mailto: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](mailto:@phouse4h); [house.18@osu.edu](mailto:house.18@osu.edu)), **Robert Horton**, and **Carolyn Belczyk** ([belczyk.1@osu.edu](mailto: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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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**

**INF 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.

**INF 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)**



Tickets Required; \$27

(Grades K–2) Nationwide B, Hyatt

Science Focus: LS1.A, LS1.B, LS2.A, LS4.C, SEP1, SEP3

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

For description, see page 30.

**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.)

**9:15–10:30 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.*

**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](mailto: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](mailto: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

**Darrick 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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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 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.





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### 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](mailto: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](mailto:jeanne@educationprojects.org)), Upper Arlington Schools, Columbus, Ohio

**Heather Bryan** ([heather@educationprojects.org](mailto: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 mind-set 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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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](mailto:jputnam@nsta.org); [fmendez@nsta.org](mailto:fmendez@nsta.org)), Assistant Executive Director, Professional Programs, NSTA, Arlington, Va.

**Alexandra Wakely**, Administrative Coordinator, Services, NSTA, Arlington, Va.

**Al Byers** ([abyers@nsta.org](mailto: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** ([kenethom@gmail.com](mailto:kenethom@gmail.com)) and **Karen Kaleuati** ([@ACSCChemClubs](mailto:@ACSCChemClubs); [k\\_kaleuati@acs.org](mailto: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.

#### INF EXENTHUNCO: What Is That?

(Grades 6–8) *B144/145, Convention Center*  
Science Focus: LS4.B, INF

**Frederick Maier** ([fredmaier@sbcglobal.net](mailto:fredmaier@sbcglobal.net)), Environmental Services, Itasca, Ill.

**Roy “Jack” Tison** ([globes@comcast.net](mailto:globes@comcast.net)), Lincoln Marsh Natural Area, Wheaton, Ill.

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

#### 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](mailto: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](mailto:@BirdSleuth); [lig27@cornell.edu](mailto: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](mailto: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](mailto:cathy.holmes@education.ohio.gov)), Ohio Dept. of Education, Columbus

**Tracy Cindric** ([tracy.cindric@education.ohio.gov](mailto:tracy.cindric@education.ohio.gov)), Ohio Resource Center, Columbus

**Jenna Pollock** ([@jennaleep13](mailto:@jennaleep13); [jpolloc@bgsu.edu](mailto:jpolloc@bgsu.edu)), Bowling Green (Ohio) City Schools

**Angela McMurry** ([@AngelaMcMurry1](mailto:@AngelaMcMurry1); [angie.mcmurry@darkeesc.org](mailto: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** ([llmotz@comcast.net](mailto:llmotz@comcast.net)), 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.

**Juliana Texley** ([@JulianaTexley](mailto:@JulianaTexley); [texle1j@cmich.edu](mailto: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 7<sup>th</sup> – 12<sup>th</sup> grade teachers.

[www.paemst.org](http://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](mailto:amybain26@gmail.com)), Clermont County Educational Service Center, Loveland, Ohio

**Meri Johnson** (@Sci\_Centers; [merijohnson26@gmail.com](mailto: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](mailto: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](mailto: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](mailto: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](mailto:sgraper@holdenarb.org)) and **Rebecca Thompson** ([bthompson@holdenarb.org](mailto: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](mailto:psnyder5396@gmail.com)), Fort Hayes Career Center, Columbus, Ohio

Need strategies that simplify biotechnology explanations? Join me for activities that help explain the concepts behind genetic engineering. Free materials! Sponsored by [www.GrowNextGen.org](http://www.GrowNextGen.org) and the Ohio Soybean Council.



### 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](mailto: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](mailto: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](mailto:sue.wintering@dnr.state.oh.us)), Project Learning Tree Ohio, Columbus

**Debby Todd** ([dktoddl@icloud.com](mailto:dktoddl@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](mailto: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](mailto: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](http://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](mailto: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

Science Focus: LS1.A, LS1.B, LS1.D, CCC4, CCC6

Sponsor: Nasco

**Lainna Callentine**, [Sciexperience.com](http://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

Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS3

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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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

President: 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](mailto: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](mailto: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](mailto: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](mailto: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** ([llmotz@comcast.net](mailto:llmotz@comcast.net)), 1988–1989 NSTA President, and Motz Consultant Group, White Lake, Mich.  
**Juliana Texley** ([@JulianaTexley](mailto:@JulianaTexley); [texlej@cmich.edu](mailto:texlej@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](http://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](mailto:@Sci_Centers); [merijohnson26@gmail.com](mailto:merijohnson26@gmail.com)), Curriculum Engineers, Inc., Batavia, Ohio

**Amy Bain** ([amybain26@gmail.com](mailto: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](mailto:@BrianBortz); [bbortz@cantoncountryday.org](mailto:bbortz@cantoncountryday.org)), Canton Country Day School, Canton, Ohio

**Melinda Chase** ([melinda.chase@gmail.com](mailto: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](mailto: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** ([@ACSCChemClubs](mailto:@ACSCChemClubs); [k\\_kaleuati@acs.org](mailto: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](mailto: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** ([@lwhphd](mailto:@lwhphd); [lharvey@shawnee.edu](mailto:lharvey@shawnee.edu)), Shawnee State University, Portsmouth, Ohio

**Jeradi Cohen** ([jeradicohen@mac.com](mailto: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.





### **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](mailto:gaierk@battelle.org)), Battelle Education, Columbus, Ohio

**Claire Hampel** (@MissHampel; [hampel@themetroschool.org](mailto: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](mailto:sue.wintering@dnr.state.oh.us)), Project Learning Tree Ohio, Columbus

**Debby Todd** ([dk todd1@icloud.com](mailto:dk todd1@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!

### **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](mailto: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](mailto: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!



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.

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### **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

Science Focus: PS2.A, PS3.A, PS3.D, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4

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, Rosharon, 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@aacom.org](mailto:ndaniels@aacom.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](mailto:@knyzen); [knyzen@yahoo.com](mailto: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

Science Focus: ESS3.A, ESS3.C, ETS1.A, ETS1.B, LS2.A, PS3.A, PS3.B

**Brenda Bergman** ([bgbergma@mtu.edu](mailto:bgbergma@mtu.edu)), **Jacqueline Hunt-oon**, **Stephanie Tubman** ([@sctubman](mailto:@sctubman); [sctubman@mtu.edu](mailto:sctubman@mtu.edu)), **Douglas Opplinger**, **Emily Gochis**, **Christopher Wojick**, **Luke Bowman**, **Amy Lark**, and **Barbara McIntyre** ([mcintyrebe274@gmail.com](mailto: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

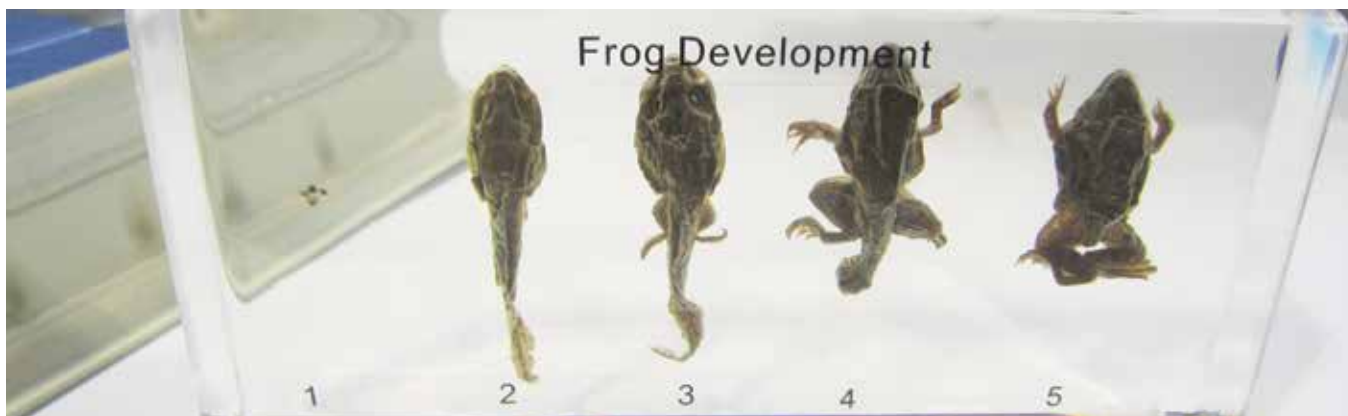
Science Focus: GEN

**Merryn Cole** ([merryncole@gmail.com](mailto:merryncole@gmail.com)) and **Jennifer Wilhelm** ([jennifer.wilhelm@uky.edu](mailto: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.







### 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](mailto: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](mailto: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

Science Focus: ESS1, ESS2.A, ESS2.B, ESS2.C, ESS2.D, ETS1, LS1.A, LS1.B, LS3, PS1.A, PS1.B, PS2.A, PS3.B, PS3.C, PS3.D, PS4.B, INF, CCC3, CCC4, SEP1, SEP2, SEP3, SEP4, SEP5, SEP8

**Donna Young** ([dlyoung.nso@gmail.com](mailto: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** (@CTSKeeley; [pagekeeley@gmail.com](mailto:pagekeeley@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](mailto: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/polymer/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** (@rdrfrsTIES; [bertha@richarddawkins.net](mailto: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

Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2.A, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC7, SEP

**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](mailto:patton.1@osu.edu)) and **Andrew Dougherty**, The Ohio State University, Columbus

**Jackie Thase** (@tbbeespcs; [thasej@piqua.org](mailto:thasej@piqua.org)) and **Jennifer Everett** (@je\_indians; [everettj@piqua.org](mailto: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

INF

(Grades 6–College)

Franklin B, Hyatt

Science Focus: ETS1, INF, CCC, SEP

**Jean Trusedell** ([jtrusede@purdue.edu](mailto: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](mailto: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** (@jediphysics; [matthewperkins@hotmail.com](mailto: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](mailto: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; [mackenh@miamioh.edu](mailto:mackenh@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

**Matthew Hartman**, eCYBERMISSION Content Manager, NSTA, Arlington, Va.

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 SEPUP 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, Rosharon, 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

**Ann Pearson**, Houghton Mifflin Harcourt, Boston, Mass. 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**

 **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](mailto:knewman3118@gmail.com)), Swanton High School, Swanton, Ohio

**Kathy Malone** ([klmalone60@gmail.com](mailto:klmalone60@gmail.com)), The Ohio State University, Columbus

**Jessica Dorman** (@[dorman\\_napls](https://twitter.com/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.

#### INF Sink into Science at Stone Lab

(Grades 5–College)

Franklin D, Hyatt

Science Focus: GEN, INF

**Lyndsey Manzo** (@[LyndseyManzo](https://twitter.com/LyndseyManzo); @[StoneLab](https://twitter.com/StoneLab); [manzol@wsoh.org](mailto:manzol@wsoh.org)), The Ohio Sea Grant College Program, Columbus

**Angela Greene** (@[AngelaGreene12](https://twitter.com/AngelaGreene12); @[StoneLab](https://twitter.com/StoneLab); [angela.greene@tecumsehlocal.org](mailto: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](https://twitter.com/drVictorsampson); [victor.sampson@gmail.com](mailto: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](https://twitter.com/GrowNextGen); @[OH\\_EPP](https://twitter.com/OH_EPP); @[Ohio-soycouncil](https://twitter.com/Ohio-soycouncil); @[HBryanfarms](https://twitter.com/HBryanfarms); [heather@educationprojects.org](mailto: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.



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### 8:00–8:30 AM Presentations



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

(General)

Franklin D, Hyatt

**INF**

Science Focus: INF, SEP

**Emilio Duran** (*eduram@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.

#### **INF 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!

### 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.

#### **Designing Access to Complex Texts**

(Grades 6–12)

B232, Convention Center

Science Focus: GEN, SEP8

**Diane Johnson** (*@MDHJohnson; diane.johnson@uky.edu*), Lewis County Schools, Lexington, Ky.

Come learn how to design lessons that support students in accessing complex texts. I'll share strategies, organizers, and text sources for middle school and high school.

#### **Exploring Earth's Climate System Like a Scientist Through the AMS DataStreme Project**

(General)

B242/243, Convention Center

Science Focus: ESS

**Chad Kauffman** (*@CalUClimateology; @AMSeducation; kauffman@calu.edu*), California University of Pennsylvania, California

The first step in conquering societal challenges is to understand them. Learn about our dynamic climate system through the AMS DataStreme Project.

#### **PolyWhat? Understanding What a Polymer Is: Polymer 101**

(Grades 5–12)

B244/245, Convention Center

Science Focus: PS, CCC, SEP

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

Discover different strategies of introducing what a polymer is in ways you and your students can understand. Many examples and a CD of materials will be shared.



### 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](mailto: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

Science Focus: ESS1, PS1.C, PS3.D, PS4.B

**Jay Sinclair**, Retired Earth Science Teacher, Milan, Mich. 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; [texlej@cmich.edu](mailto:texlej@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)

B240/241, Convention Center

Science Focus: ESS

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

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

**Christine Pegg**, Finland Middle School, Columbus, Ohio

**Taylor Wharton** ([taylor.wharton@swcsd.us](mailto:taylor.wharton@swcsd.us)) and **Kathleen Wheeler** (@KatMWheeler; [kathleen.wheeler@swcsd.us](mailto:kathleen.wheeler@swcsd.us)), Pleasant View Middle School, Grove City, Ohio

Presider: Gordon Aubrecht ([aubrecht.1@osu.edu](mailto: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)

B246, Convention Center

Science Focus: ETS, 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** ([jeffreylukens0613@gmail.com](mailto:jeffreylukens0613@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](mailto: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](mailto: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](mailto:ldonnell@kent.edu)), Kent State University, Kent, Ohio

**Trevor Smith** (@MrSmith4Science; [smith.t.denison@gmail.com](mailto:smith.t.denison@gmail.com)), Argenta-Oreana High School, Argenta, Ill.

**Taylor Voelker** (@TSchildy19; [taylor.voelker@newburyschools.org](mailto: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](mailto: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](http://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](mailto: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 Tigttag 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*  
Science Focus: PS4.A, PS4.B, CCC2, CCC5, SEP3, SEP4, SEP7, SEP8

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.

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***Come visit us  
at booth #1038!***



In partnership with the United States Patent and Trademark Office



**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 CO<sub>2</sub> emissions. Earth's oceans have acted as a buffer by dissolving excess CO<sub>2</sub> into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO<sub>2</sub> 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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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](mailto: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\_forrest@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** (*adeli@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)**

*Tickets Required; \$15*



(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.*

**9:30–10:30 AM Presentations**

**Grey Matter: Learning and Teaching Science with the Brain in Mind**

(General)

B140/141, Convention Center

Science Focus: GEN, NGSS

**Carolyn Hayes** (@caahayes; caahayes@comcast.net), NSTA Retiring President, and Retired Educator, Greenwood, Ind. Experience through science activities how discoveries in cognitive neuroscience are applied to NGSS teaching strategies and the principles of how students learn science.

**Beyond the Egg Drop: Infusing Engineering Design into the Physics/Science Classroom**

(Grades 9–12)

B142/143, Convention Center

Science Focus: ETS1, PS, SEP

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

**Julie Mills** (jmills@freelake.org), Apponequet Regional High School, Lakeville, Mass.

**Arthur Eisenkraft** (arthur.eisenkraft@umb.edu), 2000–2001 NSTA President, and UMass Boston, Dorchester, Mass.

Egg drop, marshmallow tower, motor building—we certainly don't lack "activities" in our science classroom. How can we go beyond trial and error? Explore concept-based engineering infusion!

**NSELA-Sponsored Session: Tools for Science Leaders, Part 1**

(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.

**Engineer Your World: Integrating Engineering Design, Computational Thinking, and 21st-Century Skills**

(Grades 9–12)

B242/243, Convention Center

Science Focus: ETS, CCC1, CCC4, SEP

**Marie Girardot** (@EngrYourWorld; marie.girardot@austin.utexas.edu), The University of Texas at Austin

Learn about an innovative, research-based engineering curriculum that meets the NGSS, fosters computational thinking and 21st-century skill development, and builds engineering career awareness.

**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.

**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** (*ahnbyungjoon14@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.

**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@lpsid.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.

**Learning Ecosystem Management with NGSS: Developing Solutions to Invasive Species Using Science and Engineering Practices***(Grades 6–8)**Franklin B, Hyatt*

Science Focus: LS2.A, LS2.C, CCC7, SEP4, SEP6, SEP7

**Stephanie Tubman** (*@sctubman; sctubman@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

Science Focus: ESS2.A, ESS2.D, ESS3.C, SEP

**Jodi Wheeler-Toppen** ([wheelertop@gmail.com](mailto: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](mailto: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)

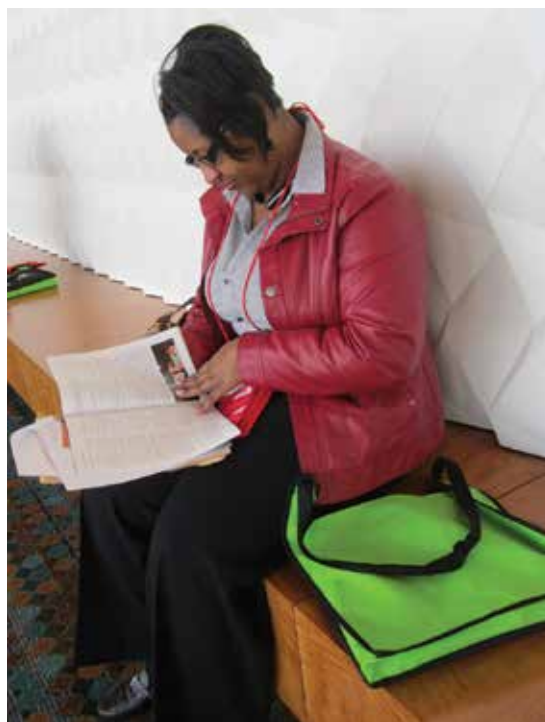
Taft D, Hyatt

Science Focus: ETS1, PS2.A, PS2.B, PS3.A, PS3.B, PS3.C, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP

**Bruce Patton** ([patton.1@osu.edu](mailto:patton.1@osu.edu)) and **Andrew Dougherty**, The Ohio State University, Columbus

**Leslie Phlipot** ([leslie.phlipot@sidneycityschools.org](mailto: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](mailto: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](http://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](mailto:@SciEdBurrows); [aburrow1@uwyo.edu](mailto:aburrow1@uwyo.edu)), University of Wyoming, Laramie

**Mike Borowczak** ([@MBorowczak](mailto:@MBorowczak); [mike@erebuslabs.com](mailto: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*  
 Science Focus: PS1.A, PS1.B, PS2.B, PS3.A, PS3.B, PS3.D, PS4.B

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*  
 Science Focus: LS1.A, LS1.B, LS1.D, CCC4, CCC6

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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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](mailto: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.

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**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](mailto:@Domo70J); [@SCOPESUnioto](mailto:@SCOPESUnioto); [domo@ohio.edu](mailto:domo@ohio.edu)), Unioto Elementary School, Chillicothe, Ohio

Hear how we have taken STEM (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.

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**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](mailto: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.

**Alexandra Wakely**, Administrative Coordinator, Services, NSTA, Arlington, Va.

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

**What's Under the Hood? A Framework and Tools for Evaluating Digital Classroom Materials That's Better Than Kicking the Tires!***(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*; *milibrea@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)**Franklin D, Hyatt*

Science Focus: LS2.B

**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)**Harrison, Hyatt*

Science Focus: ESS

**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)

Taft A, Hyatt

Science Focus: GEN, NGSS

**Ted Willard** (@Ted\_NSTA; [twillard@nsta.org](mailto: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)

Taft B, Hyatt

Science Focus: GEN, NGSS

**Jeffrey Dudukovich** ([jeffrey.dudukovich@ocps.net](mailto: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.

 **NSTA 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](mailto: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.

**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](mailto: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.

**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](mailto:rwfabich@gmail.com)), President, Ohio Earth Science Teachers Association, Medina

**Jay Sinclair**, Retired Earth Science Teacher, Milan, Mich.

**William Slattery** ([william.slattery@wright.edu](mailto: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!



**It’s in the Bag: Greening the NGSS**

(Grades K–8/College)

Franklin A, Hyatt

Science Focus: GEN, NGSS

**Vito Dipinto** ([vdipinto@nl.edu](mailto: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.

**Linking Science and Literacy for Improved Student Outcomes**

(Grades K–6)

Taft C, Hyatt

Science Focus: GEN, NGSS

**Bill Badders** (@baddersb; [baddersb@roadrunner.com](mailto: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.

**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.

**Telling Stories with David Goodsell's Watercolor Molecular Landscapes***(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.

Use these amazing landscapes to explore cell structure and illustrate where in the cell protein synthesis and other important processes occur. You can also tell molecular stories such as "Your Flu Shot in Action," tracing the production of an antibody protein all the way to its release into the circulation.

**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](mailto:amplifyscience@berkeley.edu)) and **Rebecca Abbott** ([amplifyscience@berkeley.edu](mailto: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](mailto: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 Particulate 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** (*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 modeling activities focused on energy transfer during physical and chemical processes by building and analyzing particulate models of matter. These activities are designed to deepen students' conceptual understanding of how 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@pillartechology.com*), Pillar Technology, Columbus, Ohio

President: Janet Struble, Strand Leader: Game Time: Tackling Scientific Problems and Pitching Engineering Solutions, and The University of Toledo, Ohio

Today's world delivers advanced technologies 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 Technology, 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 engineering 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](mailto: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](mailto:@mrzjconerly25); [mrz\\_conerly@yahoo.com](mailto: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](mailto:@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** ([adeli@hawken.edu](mailto:adeli@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](mailto: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** ([bjcj1980@yahoo.com](mailto:bjcj1980@yahoo.com)) and **Todd Bolenbaugh** ([bolenbaugh4@gmail.com](mailto: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](mailto:@MDHJohnson); [diane.johnson@uky.edu](mailto:diane.johnson@uky.edu)), Lewis County Schools, Lexington, Ky.

**Patti Works** ([@patti\\_works](mailto:@patti_works); [patriciaeworks@gmail.com](mailto:patriciaeworks@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](mailto: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***INF**

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 Pfeil**, 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.

**INF****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.

**12:30–1:30 PM Hands-On Workshops****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, OhioUtilizing 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.

**INF****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.

### 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, SEP1, SEP5, 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](http://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@felicityschoos.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, SEP1, SEP3

Sponsor: AEOP eCYBERMISSION

**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

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 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

Sponsor: Accelerate Learning–STEMscopes

**Terry Talley**, Accelerate Learning–STEMscopes, Houston, Tex.

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](mailto: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

Science Focus: LS4.A, LS4.D, CCC2, SEP6, SEP7, SEP8

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 Wyession**, Washington University in St. Louis, Mo.

A member of the NGSS writing team, Michael Wyession 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](mailto: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](mailto:rswami@centralstate.edu)) and **Leanne Petry** ([lpetry@centralstate.edu](mailto:lpetry@centralstate.edu)), Central State University, Wilberforce, Ohio

**Brett Doudican** ([bdoudican@daytonearlycollege.org](mailto:bdoudican@daytonearlycollege.org)), Dayton Early College Academy, Dayton, Ohio

**Marjorie Langston** ([mlangston@hlsd.org](mailto: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](mailto:joyce.e.cummings@nasa.gov); [grc-ed-opportunities@nasa.gov](mailto: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.

### INF The STEM Design Challenge

(Grades 4–8) B233/234, Convention Center

Science Focus: PS2.A, PS3.B, PS3.C, INF, CCC4, SEP2, SEP3, SEP4, SEP8

Sponsor: Fisher Science Education

**Robert Marshall** ([robert.marshall@thermofisher.com](mailto:robert.marshall@thermofisher.com)), Fisher Science Education, Pittsburgh, Pa.

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

Science Focus: ESS3.A, ETS1.A, ETS1.B, PS, SEP2

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*

Science Focus: LS1.A, LS1.B, LS3.A, CCC1, CCC2, SEP6

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

**Joseph Levine**, Author, Boston, Mass.

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 &amp; Technology

**David Carter** ([info@vernier.com](mailto: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](http://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](mailto: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.

### 3:30–4:00 PM Presentations

#### Spanning Astronomical and Atomic Spaces: Creating Project-Based Mathematics and Science Environments in the Classroom

(Grades 6–8) *B144/145, Convention Center*  
Science Focus: ESS

**Merryn Cole** ([merryncole@gmail.com](mailto:merryncole@gmail.com)) and **Jennifer Wilhelm** ([jennifer.wilhelm@uky.edu](mailto:jennifer.wilhelm@uky.edu)), University of Kentucky, Lexington

Join us for an overview of Project SAAS and details of an integrated mathematics science curriculum, review findings of its effectiveness, and learn how teachers can participate.



#### 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](https://twitter.com/BioenergyKDF); [#BioenergizeME](https://twitter.com/BioenergizeME); [alexis.wolfe@ee.doe.gov](mailto: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.

### 3:30–4:30 PM Presentations

#### Climate Myths

(Grades 9–College) *B130, Convention Center*  
Science Focus: ESS3

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

My local newspaper’s letters column receives letters from denialists. 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](https://twitter.com/JulianaTexley); [texle1j@cmich.edu](mailto:texle1j@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](mailto: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](mailto: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.

## **INF Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events**

(Grades 6–12) *B242/243, Convention Center*  
 Science Focus: ESS1.A, ESS1.B, PS1, PS2.A, PS2.C, PS3.B, PS3.C, PS4.B, INF, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP2, SEP4, SEP5, SEP8

**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.

## **3:30–4:30 PM Hands-On Workshops**

### **Mad for Marbles**

(Grades 5–College) *B240/241, Convention Center*  
 Science Focus: ETS, SEP6

**Raymond Francis** (*@CMU\_WVU; franc1rw@cmich.edu*), Central Michigan University, Mount Pleasant

Ready to test your gamesmanship, scientific understanding, and academic prowess—with marbles? Come see how the simple game of marbles is used to teach science, engineering, and problem solving in an interactive and experiential setting.

### **Completing the Engineering Cycle: It’s Not Complete ’til You Rinse and Repeat**

(Grades 3–12) *B246, Convention Center*  
 Science Focus: ETS1, SEP

**William Reitz** (*wreitz@neo.rr.com*), Retired Educator, Stow, Ohio

Engineering is a cyclical process, not a one-time thing. Here, children’s literature raises questions and we engineer the solutions by completing the cycle.

### **Poetry, Lyrics, Comics, Theatrics: Encouraging Students to Demonstrate Their Knowledge of Science Through Their Unique Talents in the Arts**

(Grades 3–College) *Ohio Center B/C, Convention Center*  
 Science Focus: GEN

**Kerry Cheesman**, Capital University, Columbus, Ohio  
 Draw out your students by using their artistic talents to assess science knowledge. Join me as we create examples for your classroom.



### **Teaching Engineering in Grades K–3**

(Grades K–3) *Franklin B, Hyatt*  
 Science Focus: ETS, SEP1, SEP2, SEP3, SEP6

**Bob Claymier**, STEM Is Elementary, Delaware, Ohio  
 Come hear about research in elementary engineering, receive free online elementary STEM resources, and engage in an NGSS-based STEM activity appropriate for grades K–3.



### **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.

**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.

**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

Science Focus: ETS1.B, LS2.B, LS2.C, PS3.D, CCC4, CCC5, CCC7, SEP2, SEP6, SEP7

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

**Ann Pearson**, Houghton Mifflin Harcourt, Boston, Mass.

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](mailto: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

#### INF Equity in Science Education Roundtable

(General)

Taft D, Hyatt

Science Focus: GEN, INF, NGSS

**Jerry Valadez** ([jdvscience@yahoo.com](mailto:jdvscience@yahoo.com)), NSTA Director, Multicultural/Equity in Science Education, and California State University, Fresno

**Juliana Texley** (@JulianaTexley; [texlelj@cmich.edu](mailto:texlelj@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](mailto:m_gmurczyk@acs.org)), American Chemical Society, Washington, D.C.

**Jennifer Keil** ([jenniferkeil11@gmail.com](mailto:jenniferkeil11@gmail.com)), Master Teacher, Boulder, Colo.

**Chad Bridle** (@sciencebridle; [cbridle@gpsbulldogs.org](mailto:cbridle@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.

### 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](mailto: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](mailto: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.

### 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](http://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](mailto: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



● [WWW.COSI.ORG](http://WWW.COSI.ORG)

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/2fPOKTI](http://bit.ly/2fPOKTI). 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](mailto: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***Harding, 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****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.

**5:00–6:00 PM Networking Opportunity****OESTA and NESTA “Friends of Earth Science” Reception***Harrison, Hyatt*

Join colleagues from Ohio, neighboring states, and elsewhere to socialize and recognize this year’s winner of the National Association of Geoscience Teachers’ Outstanding Earth Science Teacher for Ohio. Hors d’oeuvres, refreshments, and cash bar.

**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@uwo.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.

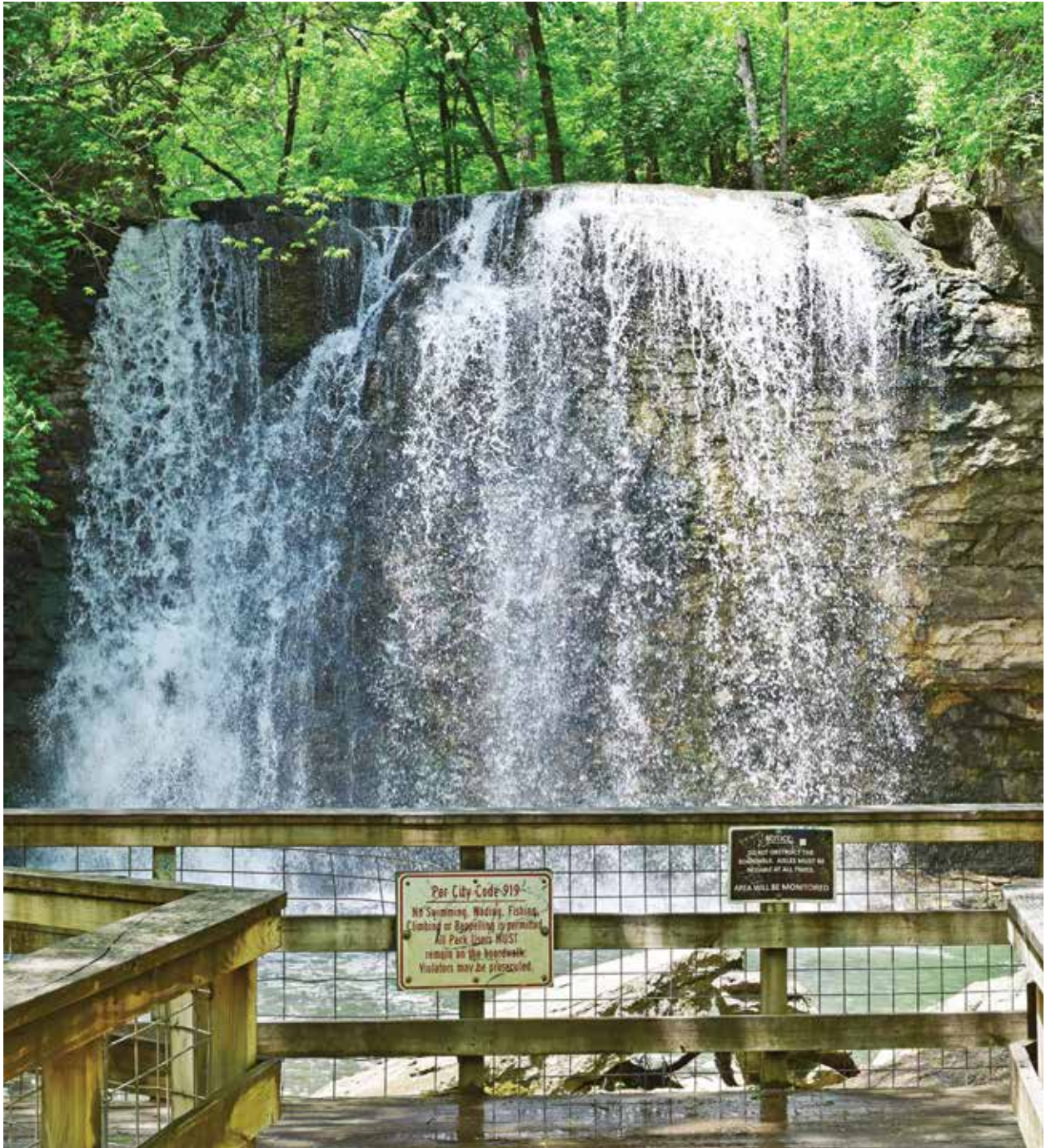
**5:30–6:00 PM Presentation****AAPT Session: Carnival Knowledge: The Flying Bernoulli Brother’s Stupendous Sideshow of Science by the Ohio Section of AAPT***(General)**Union A, Hyatt*

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.

#### Teaching Students to Analyze Data

(Grades 4–10) *B235, Convention Center*  
Science Focus: GEN, SEP4

**Diane Johnson** (*@MDHJohnson*; *diane.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.

### 8:00–9:00 AM Hands-On Workshops



#### Beyond Spaceship Earth

(Grades 3–5) *B131, Convention Center*  
Science Focus: ESS, PS, SEP1, SEP3, SEP6

**Becky Wolfe**, The Children's Museum of Indianapolis, Ind. Explore classroom STEM investigations related to the International Space Station. Human exploration of space integrates STEM disciplines from science research in micro-gravity to engineering life support systems for space travel.



#### EiE Ohio: Building 21st-Century STEAM Learners

(Grades 1–6) *B233/234, Convention Center*  
Science Focus: ETS, SEP

**Trudy Giasi** (*giasitrudy@gmail.com*), Program Coordinator, NSTA Columbus Area Conference, and Columbus (Ohio) City Schools

**Karen Irving** (*irving.8@osu.edu*), **Kathy Malone** (*klmalone60@gmail.com*), and **Vinta Tiarani**, The Ohio State University, Columbus

Come engage in the engineering design process and learn how urban elementary schools are integrating Engineering is Elementary® resources and curriculum into their unique contexts.



### 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

Science Focus: ESS1, ETS2.B, PS3.A, PS4.B, CCC4

**April Whitt** (*april.whitt@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.



—Photo courtesy of Mike Weiss

### Conceptual Chemistry: Repurposed Materials for Low-Cost Science Experiments

(Grades 5–College) Ohio Center B/C, Convention Center

Science Focus: PS1.A, PS1.B, PS3.A, PS3.B, PS4.B, PS4.C, CCC1, CCC3, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

**Christopher Fenk** (*cfenk@kent.edu*), Kent State University Tuscarawas Campus, New Philadelphia, Ohio

**Claudia Khourey-Bowers** (*cmkhoure@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.

### NSTA Press® Session: *Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5*

(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@darkeesc.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

*Hall B, Convention Center*

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** (*hershbs@miamioh.edu*), Miami University, Oxford, Ohio

Explore the challenge of minimizing health effects of toxicant exposure using nutrition with an Inquiry Cycle™ combin-

ing 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*  
Science Focus: ESS2.C, ESS2.D, ETS1.B, ETS2.A, SEP3, SEP4, SEP6, SEP7

**Lesla Marchiando** (*lesa.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](mailto: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.

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**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](mailto: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](mailto: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.

**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](mailto: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](mailto: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.

**11:00 AM–12 Noon Hands-On Workshops****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 devices for special needs students.

**INF 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** (@LPIToday; meredithharris@me.com), Spring ISD, Houston, Tex.

**Angela Fontenot** (@LPIToday; fontenota@lpsid.org), La Porte Junior High School, La Porte, Tex.

**Yolanda Ballard** (@LPIToday; 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*  
Science Focus: ESS2.C, ESS2.D, ESS3.A, ESS3.C, ESS3.D, ETS2, LS1.A, LS1.C, LS2.A, LS2.B, LS2.C, LS4.D, CCC2, CCC4, CCC5, CCC6, CCC7, SEP

**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

Integrating science and mathematics shouldn't just be a good idea, it should be the law! Come learn how easy, important, and fun it is to collect and analyze data as a part of good, solid, and responsible science education.



**Inventing Is Just Plain Fun (for All)!**

(Grades 4–12) *Franklin D, Hyatt*  
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) *B142/143, Convention Center*  
Science Focus: PS, SEP

**Ted Clark**, The Ohio State University, Columbus

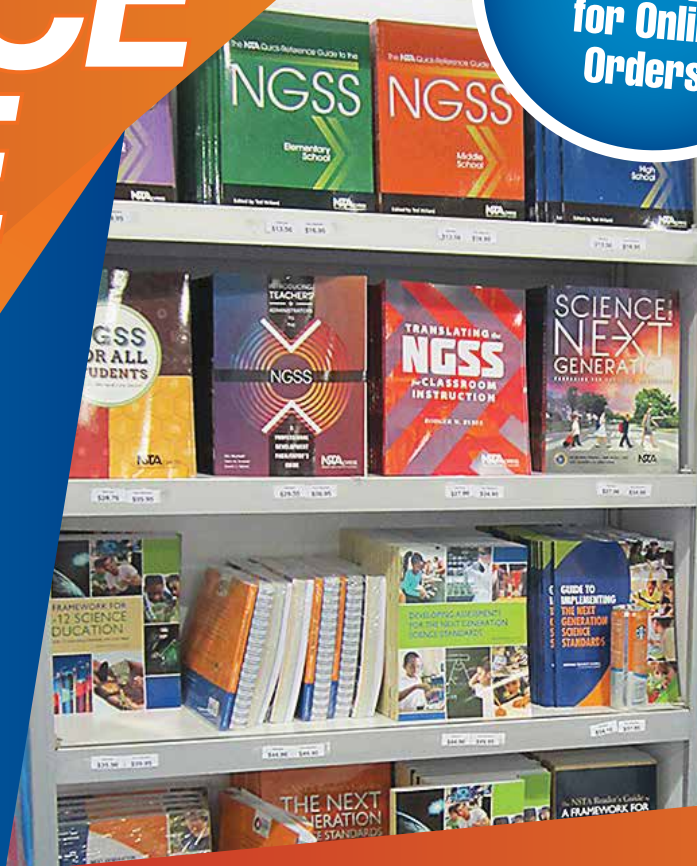
Let's consider whether students in physical science classrooms employing modeling improve their skills in science practices like posing research questions or graphing and interpreting data.



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Exhibit Hall B

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**NSTA** National  
Science  
Teachers  
Association

## Exhibitors

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

Biology/Life Science	B
Chemistry/Physical Science	C
Earth/Space Science	EA
Environmental Science	EN
Integrated/General Science	G
Physics/Physical Science	PH
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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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**ABRC at The Ohio State University #749**  
 B, EN  
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 Phone: 614-292-8208  
 E-mail: [price.1217@osu.edu](mailto:price.1217@osu.edu)  
 Website: [abrcoutreach.osu.edu](http://abrcoutreach.osu.edu)

The Arabidopsis Biological Resource Center (ABRC) collects, preserves, reproduces, and distributes seeds and other resources to researchers and educators worldwide. Our outreach efforts include a robust set of resources for K-12 education, including ready-to-teach modules with lab protocols and supporting materials. ABRC ships seeds free-of-charge for use in K-12 education.

**Accelerate Learning—STEMscopes #835**  
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 Phone: 281-833-4512 PreK-12  
 E-mail: [javier@acceleratelearning.com](mailto:javier@acceleratelearning.com)  
 Website: [www.acceleratelearning.com](http://www.acceleratelearning.com)

Accelerate Learning is a national leader in STEM curriculum and teacher, campus, and district STEM certification. Available preK-12, STEMscopes is in use by 7,600 schools in 40 states. The company has earned recognition from numerous industry programs such as *District Administration's* Top 100 Products and *EdTech Digest's* Cool Tool Awards.

**Activate Learning #737**  
 G  
 44 Amogerene Crossway, Suite 7862 K-8  
 Greenwich, CT 06836  
 Phone: 646-502-5231  
 E-mail: [info@activatelearning.com](mailto:info@activatelearning.com)  
 Website: [www.activatelearning.com](http://www.activatelearning.com)

Activate Learning is a leading publisher of investigation-centered, K-8 science curricula. Active Science (K-5) uses activities to develop problem-solving and communication skills across content areas. IQWST is a rigorous, grades 6-8 science curriculum that challenges and supports students as they investigate questions, engage in scientific practices, and explain scientific phenomena.

**AEOP eCYBERMISSION and GEMS** #1028  
 B, C, EA, EN, PH, T  
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[aeopgems@nsta.org](mailto:aeopgems@nsta.org)  
 Website: [www.usaeop.com](http://www.usaeop.com)

The National Science Teachers Association administers two U.S. Army STEM programs to engage students in real-world experiences. eCYBERMISSION is an online competition for students in grades 6-9, and GEMS is a summer STEM enrichment program held at specific U.S. sites for students and teachers in grades 5-12.

**American Association of Colleges of Osteopathic Medicine** #852  
 G  
 5550 Friendship Blvd., Suite 310 9-12,  
 Chevy Chase, MD 20815 College  
 Phone: 301-968-4100  
 Website: [www.aacom.org](http://www.aacom.org)

The American Association of Colleges of Osteopathic Medicine provides leadership for the osteopathic medical education community by promoting excellence in medical education, research, and service, and by fostering innovation and quality across the continuum of osteopathic medical education to improve the health of the American public.

**American Chemical Society** #525  
 C  
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 Washington, DC 20036  
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 E-mail: [education@acs.org](mailto:education@acs.org)  
 Website: [www.acs.org/education](http://www.acs.org/education)

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**American Meteorological Society** #827  
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 E-mail: [jmoore@appleseedexpeditions.com](mailto:jmoore@appleseedexpeditions.com)  
 Website: [www.appleseedexpeditions.com](http://www.appleseedexpeditions.com)

Appleseed Expeditions is a service-learning, student travel company designed to inspire students to use their education and talents to better our communities around the world.

**Arbor Scientific** #638  
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 E-mail: [andrea@arborsci.com](mailto:andrea@arborsci.com)  
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E-mail: [sfischer@castlelearning.com](mailto:sfischer@castlelearning.com)  
Website: [www.castlelearning.com](http://www.castlelearning.com)

Castle Learning is an online review and assessment tool tied to CCSS and used by teachers to differentiate instruction, as well as by students who receive instant instructional feedback. Covers all core subjects for grades K–12 including math, science, social studies, English, French, Spanish, ESL/ELL, and SAT/ACT.

**The Ceramic and Glass Industry** #1044  
**Foundation** G, PH, T  
600 N. Cleveland Ave. 6–12  
Westerville, OH 43082  
Phone: 614-794-5825  
E-mail: [brains@ceramics.org](mailto:brains@ceramics.org)  
Website: [foundation.ceramics.org](http://foundation.ceramics.org)

The Ceramic and Glass Industry Foundation provides financial and other resources for students to develop and thrive in our field. By doing this, we help the industry fulfill the need for skilled ceramic, glass, and materials science professionals by ensuring that the next generation is ready and waiting to meet future demand.

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E-mail: [kose@conceptschoools.org](mailto:kose@conceptschoools.org)  
Website: [www.conceptschoools.com](http://www.conceptschoools.com)

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ETA hand2mind offers proven hands-on solutions for grades preK–12, with educational and supplemental materials that enrich teaching and engage students in math, science, and reading. Our offerings include both traditional manipulatives and interactive digital versions. In addition, save time and money with our custom solutions designed for your specific needs.

**#744**  
G  
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Charlottesville, VA 22902 G, PH, T  
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E-mail: [sales@explorelearning.com](mailto:sales@explorelearning.com)  
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 Website: [www.thegemshop.com](http://www.thegemshop.com)

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 Charlottesville, VA 22906 K–12  
 Phone: 434-975-2629  
 E-mail: [maryannchapman@grandclassroom.com](mailto:maryannchapman@grandclassroom.com)  
 Website: [www.grandclassroom.com](http://www.grandclassroom.com)

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 Marysville, OH 43040 6–12  
 Phone: 317-289-4252  
 E-mail: [melinda@educationprojects.org](mailto:melinda@educationprojects.org)  
 Website: [grownextgen.org](http://grownextgen.org)

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 Website: [www.hhmi.org/biointeractive](http://www.hhmi.org/biointeractive)

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

**International Field Studies, Inc.** #848  
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 1550 Old Henderson Rd., Suite E268  
 Columbus, OH 43220  
 Phone: 614-268-9930 6–12, College  
 E-mail: [office@intfieldstudies.org](mailto:office@intfieldstudies.org)  
 Website: [www.intfieldstudies.org](http://www.intfieldstudies.org)

IFS is a nonprofit organization promoting science education and research at our Field Station on Andros, Bahamas. Explore the third largest barrier reef, oceanic and inland blue holes, and discover the culture of Andros. Spend your time hiking, boating, snorkeling, and exploring the unique ecosystems of Andros with our knowledgeable staff as your guides.

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 E-mail: [wfisher@knex.com](mailto:wfisher@knex.com)  
 Website: [www.knexeducation.com](http://www.knexeducation.com)

K'NEX Education develops curriculum supported science, technology, engineering, and math (STEM) sets for use in elementary, middle school, and high school classrooms. Making it easy to incorporate K'NEX into the classroom, our inquiry-based teacher's guides include objectives, activities, key concepts, journals, and worksheets. Everything the teacher needs to not only teach the students, but also assess what they have learned.

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 E-mail: [metheridge@lab-aids.com](mailto:metheridge@lab-aids.com)  
 Website: [www.lab-aids.com](http://www.lab-aids.com)

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 E-mail: [aperry@mit.edu](mailto:aperry@mit.edu)  
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NASA has prepared to showcase the “Let it Glide” Design Challenge as well as its newest

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**NGSS@NSTA**

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Website: [www.nsta.org/ngss](http://www.nsta.org/ngss)

**NSTA Membership**

Located in Hall B lobby • E-mail: [membership@nsta.org](mailto:membership@nsta.org)

Website: [www.nsta.org/membership](http://www.nsta.org/membership)

**NSTA Professional Learning Opportunities**

Booth #1027 • E-mails: [jputnam@nsta.org](mailto:jputnam@nsta.org); [fmendez@nsta.org](mailto:fmendez@nsta.org)

Website: [www.nsta.org/conferences#more](http://www.nsta.org/conferences#more)

**Shell Science Lab Challenge**

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Website: [www.nsta.org/shell](http://www.nsta.org/shell); [www.nsta.org/shellsciencelab](http://www.nsta.org/shellsciencelab)

**Toshiba/NSTA ExploraVision**

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Website: [www.exploravision.org](http://www.exploravision.org)

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 Phone: 513-688-1717  
 E-mail: [dyerkes@ohioenergy.org](mailto:dyerkes@ohioenergy.org)  
 Websites: [www.need.org/](http://www.need.org/) [www.ohioenergy.org](http://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**  
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 Arlington, VA 22201 K-12  
 E-mail: [ngss@nsta.org](mailto:ngss@nsta.org)  
 Website: [www.nsta.org/ngss](http://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  
 Room 1W514 K-12  
 Silver Spring, MD 20910  
 Phone: 301-713-1208  
 E-mail: [education@noaa.gov](mailto:education@noaa.gov)  
 Website: [www.education.noaa.gov](http://www.education.noaa.gov)

NOAA is a federal science agency provid-

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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.

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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



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### #633

B, C, EA, EN,  
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### Ohio Corn & Wheat

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E-mail: [heather@educationprojects.org](mailto:heather@educationprojects.org)  
Website: [www.ohiocornandwheat.org](http://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.

### #535

### 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](mailto:jen.dennison@dnr.state.oh.us)  
Website: [ohiodnr.gov](http://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.

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**NSTA** National  
Science  
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Association

## Exhibitors

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Granville, OH 43023  
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E-mail: [rreda@oogEEP.org](mailto:rreda@oogEEP.org)  
Website: [www.oogEEP.org](http://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](http://www.oogEEP.org).
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Website: [www.pasco.com](http://www.pasco.com)
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Website: [worldcampus.psu.edu](http://worldcampus.psu.edu)
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Website: [www.playmadagames.com](http://www.playmadagames.com)
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Indianapolis, IN 46240  
Phone: 317-669-0275  
E-mail: [events@pltw.org](mailto:events@pltw.org)  
Website: [www.pltw.org](http://www.pltw.org)
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Phone: 202-765-3641  
E-mail: [information@plt.org](mailto:information@plt.org)  
Website: [www.plt.org](http://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](http://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 preK-12 science teachers, curriculum specialists, and administrators.
- Science First®/StarLab®** #841  
86475 Gene Lasserre Blvd. B, C, EA,  
Yulee, FL 32097 EN, G, PH  
Phone: 904-225-5558 K-12, College  
E-mail: [helmut.albrecht@sciencefirst.com](mailto:helmut.albrecht@sciencefirst.com)  
Websites: [www.sciencefirst.com](http://www.sciencefirst.com), [www.starlab.com](http://www.starlab.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.

**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](mailto:info@nhmi.org); [info@seacamp.org](mailto:info@seacamp.org)  
 Websites: [www.nhmi.org](http://www.nhmi.org); [www.seacamp.org](http://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](mailto:shellsciencelab@nsta.org)  
 Website: [www.nsta.org/shell](http://www.nsta.org/shell)

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**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](mailto:mgoodman@simcur.com)  
 Website: [www.simulationcurriculum.com](http://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@southernsciencsupply.com](mailto:carol@southernsciencsupply.com)  
 Website: [www.southernsciencsupply.com](http://www.southernsciencsupply.com)

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**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](mailto:kelli@teachinglearningcollaborative.org)  
 Website: [teachinglearningcollaborative.org](http://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 athlete)—or grab yours for \$5!





# Exhibitors

**Texas Instruments #733**  
 PO Box 650311 MS 3821 All  
 Dallas, TX 75265 6–12, College  
 Phone: 800-TICARES (842-2737)  
 E-mail: [ti-cares@ti.com](mailto:ti-cares@ti.com)  
 Website: [education.ti.com](http://education.ti.com)

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.

**Toshiba/NSTA ExploraVision #1024**  
 1840 Wilson Blvd. T  
 Arlington, VA 22201 K–12  
 Phone: 800-Explor9  
 E-mail: [tchinick@nsta.org](mailto:tchinick@nsta.org)  
 Website: [www.exploravision.org](http://www.exploravision.org)

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.

**U.S. Dept. of Energy #543**  
**Bioenergy Technologies Office** EN, G, PD  
 1000 Independence Ave. SW K–12  
 Washington, DC 20585  
 Phone: 202–586-5188  
 E-mail: [eere.bioenergy@ee.doe.gov](mailto:eere.bioenergy@ee.doe.gov)  
 Website: [energy.gov/eere/bioenergy](http://energy.gov/eere/bioenergy)

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.

**United Skates of America #545**  
 4849 Evanswood Dr. G  
 Columbus, OH 43229 K–8  
 Phone: 614–802-2440  
 E-mail: [kwise@usa-skating.com](mailto:kwise@usa-skating.com)  
 Website: [www.unitedskates.com](http://www.unitedskates.com)

United Skates of America provides roller skating and family fun for all ages. We also provide 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!

**University of Cincinnati #948**  
**Secondary Engineering, Education**  
**Graduate Certificate Distance Learning**  
 PO Box 210076 All  
 Cincinnati, OH 45221 6–12  
 Phone: 513–556-6454  
 E-mail: [julie.steimle@uc.edu](mailto:julie.steimle@uc.edu)  
 Website: [www.uc.edu](http://www.uc.edu)

**University of the Sciences #850**  
**In Philadelphia** B, C, EN, PH  
 600 S. 43rd St. 9–12, College  
 Philadelphia, PA 19104  
 Phone: 215-596–8800  
 E-mail: [k.wolbach@uscience.edu](mailto:k.wolbach@uscience.edu)  
 Website: [www.usciences.edu](http://www.usciences.edu)

University of the Sciences 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.

**Vernier Software & Technology #725**  
 13979 SW Millikan Way B, C, EA, EN,  
 Beaverton, OR 97005 G, PH, PD, T  
 Phone: 888-837-6437 K–12, College  
 E-mail: [info@vernier.com](mailto:info@vernier.com)  
 Website: [www.vernier.com](http://www.vernier.com)

Vernier Software & Technology is a leading innovator of scientific data-collection technology. Focused on STEM, Vernier is dedicated to developing creative ways to teach and learn using hands-on science. Vernier creates easy-to-use science interfaces, sensors, and graphing/analysis software. Vernier's technology-based solutions enhance STEM education, increase learning, and build students' critical-thinking skills.

**Water Environment #937**  
**Federation** C, EN, G, T  
 601 Wythe St. 9–12  
 Alexandria, VA 22314-1994  
 Phone: 703–684-2454  
 E-mail: [shunt-cottrell@wef.org](mailto:shunt-cottrell@wef.org)  
 Website: [www.wef.org](http://www.wef.org)

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.

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

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

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

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

### Activate Learning (Booth #737)

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

### AEOP eCYBERMISSION (Booth #1028)

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

### AEOP GEMS (Booth #1028)

Thursday, Dec 1	11:00 AM–12 Noon	B131/132, Conv. Center	Gains in the Education of Mathematics and Science: What Can GEMS Do for You? (p. 44)
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### American Association of Colleges of Osteopathic Medicine (Booth #852)

Thursday, Dec 1	2:00–3:00 PM	C172, Conv. Center	Osteopathic Physicians 102: Helping Teachers Understand the Profession (p. 57)
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### Amplify (Booth #934)

Thursday, Dec 1	8:00–9:00 AM	C170, Conv. Center	Experience Amplify Science: Grades K–1 (p. 39)
Thursday, Dec 1	9:30–10:30 AM	C170, Conv. Center	Experience Amplify Science: Grades 2–5 (p. 42)
Thursday, Dec 1	11:00 AM–12 Noon	C170, Conv. Center	Experience Amplify Science: Middle School (p. 45)
Thursday, Dec 1	12:30–1:30 PM	C170, Conv. Center	What Is Amplify Science? (p. 50)
Friday, Dec 2	8:00–9:00 AM	C170, Conv. Center	What Is Amplify Science? (p. 70)
Friday, Dec 2	9:30–10:30 AM	C170, Conv. Center	Implementing Science Seminars and Scientific Argumentation with Amplify Science (p. 76)
Friday, Dec 2	11:00 AM–12 Noon	C170, Conv. Center	Not Your Typical Classroom Experience: Amplify Science's Digital Engineering Internships (p. 80)



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### Bio-Rad Laboratories (Booth #824)

Friday, Dec 2	8:00–9:00 AM	C172, Conv. Center	Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 70)
Friday, Dec 2	9:30–10:30 AM	C172, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 76)
Friday, Dec 2	11:00 AM–12 Noon	C172, Conv. Center	The GMO Debate Rages On! (p. 80)
Friday, Dec 2	12:30–1:30 PM	C172, Conv. Center	How to Use Pop Culture in Your Life Science Class (p. 85)
Friday, Dec 2	2:00–3:00 PM	C172, Conv. Center	How Do You Know What Fish Species You Are Eating? DNA Barcoding! (p. 87)
Friday, Dec 2	3:30–4:30 PM	C172, Conv. Center	Enzymes: Technology Inspired by Nature (p. 91)
Saturday, Dec 3	8:00–9:00 AM	C172, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 97)
Saturday, Dec 3	9:30–10:30 AM	C172, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 100)

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

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

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

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

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

Thursday, Dec 1	8:00–9:00 AM	C160, Conv. Center	Teach Next Gen Like Your Hair Is on Fire! (p.39)
Thursday, Dec 1	9:30–10:30 AM	C160, Conv. Center	SEPs Made Easy (p. 41)

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Thursday, Dec 1	2:00–3:00 PM	C160, Conv. Center	Increase Your 3-D Vision of NGSS (p. 56)
Thursday, Dec 1	3:30–4:30 PM	C160, Conv. Center	Liven Up Literacy with Science (p. 60)

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

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

## Dinah.com (Booth #828)

Friday, Dec 2	11:00 AM–12 Noon	B131/132, Conv. Center	FOLD-tastic Science Notebooks via Dinah Zike’s Notebook Foldables (p. 79)
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## Educational Innovations, Inc. (Booth #741)

Friday, Dec 2	9:30–10:30 AM	B131/132, Conv. Center	Fantastical Chemistry Demos for All Classrooms (p. 75)
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## Edvotek Inc. (Booth #935)

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

## Fisher Science Education (Booth #834)

Friday, Dec 2	2:00–3:00 PM	B233/234, Conv. Center	The STEM Design Challenge (p. 86)
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## Flinn Scientific, Inc. (Booth #925)

Thursday, Dec 1	9:30–10:30 AM	B131/132, Conv. Center	Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (p. 41)
Thursday, Dec 1	2:00–3:00 PM	B131/132, Conv. Center	Flinn Scientific’s Exploring Chemistry™: Connecting Content Through Experiments (p. 54)
Friday, Dec 2	8:00–9:00 AM	B131/132, Conv. Center	Flinn Scientific’s STEM Design Challenge™ “Build-It-Yourself” Lab Project (p. 68)

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### Frey Scientific/School Specialty Science (Booth #736)

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Thursday, Dec 1	9:30–10:30 AM	C162, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 42)
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### GrowNextGen (Booth #529)

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Thursday, Dec 1	11:00 AM–12 Noon	B233/234, Conv. Center	ChickQuest: A Classroom Journey Through the Life Cycle of Chickens (p. 44)
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### HHMI BioInteractive (Booth #825)

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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)

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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)

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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)

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Friday, Dec 2	12:30–1:30 PM	B235, Conv. Center	Use Science to Teach Reading; Reading to Teach Science (p. 85)
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### Measured Progress (Booth #636)

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Friday, Dec 2	11:00 AM–12 Noon	B235, Conv. Center	Engage with NGSS Using STEM Gauge® (p. 79)
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### miniPCR (Booth #836)

Friday, Dec 2	9:30–10:30 AM	B235, Conv. Center	miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 75)
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### MSOE Center for BioMolecular Modeling (Booth #644)

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

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

Friday, Dec 2	2:00–3:00 PM	B131/132, Conv. Center	“Let It Glide” Design Challenge (p. 86)
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### Nasco (Booth #524)

Thursday, Dec 1	12:30–1:30 PM	B233/234, Conv. Center	Let’s Pick Our Brains (p. 49)
Friday, Dec 2	9:30–10:30 AM	B233/234, Conv. Center	Let’s Pick Our Brains (p. 75)

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

Friday, Dec 2	11:00 AM–12 Noon	B233/234, Conv. Center	Engaging Reading and Writing Success: Incorporating Today’s Global Issues (p. 79)
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### Ohio Oil and Gas Energy Education Program (OOGEEP) (Booth #939)

Friday, Dec 2	2:00–3:00 PM	B235, Conv. Center	Teaching STEM Using the Oil and Gas Industry (p. 86)
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### PASCO scientific (Booth #632)

Friday, Dec 2	8:00–9:00 AM	C162, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
Friday, Dec 2	9:30–10:30 AM	C162, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 76)
Friday, Dec 2	11:00 AM–12 Noon	C162, Conv. Center	Exploring Misconceptions: There Is a Difference Between Heat and Temperature? (p. 80)

### Pearson (Booth #832)

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

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

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### Texas Instruments (Booth #733)

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## Earth and Space Science

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8:00–9:00 AM	6–12	Taft D, Hyatt	Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 38)
8:30–9:00 AM	3–12	B142/143, Conv. Center	Partnering with Your Local Planetarium (p. 40)
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9:30–10:30 AM	5–12	C172, Conv. Center	Earth and Space Science for the Modern Interactive Classroom (p. 42)
11:00 AM–12 Noon	9–12	C151, Conv. Center	Calling All Carbons (p. 44)
12:30–1:30 PM	9–12	C151, Conv. Center	Climate Proxies (p. 50)
12:30–1:30 PM	K–5	McKinley, Hyatt	“SCORE!” with Nonfiction Text and Inquiry-Based Science (p. 49)
12:30–1:30 PM	5–12	B242/243, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 46)
12:30–1:30 PM	6–C	Taft D, Hyatt	Teaching the Water Cycle and Watersheds Using Hands-On Experiences and Online Tools (p. 49)
2:00–2:30 PM	5–8	Booth #841, Exhibit Hall	Now You See It, Now You Don’t (p. 51)
2:00–3:00 PM	G	B130, Conv. Center	Featured Presentation: Climate Change: The Evidence, People, and Our Options (p. 51)
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3:30–4:30 PM	6–12	Ohio Center B/C, Conv.	Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 58)
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8:00–9:00 AM	P–3	Franklin A, Hyatt	Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades (p. 66)
8:00–9:00 AM	9–12	C162, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
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11:00 AM–12 Noon	11–C	Harrison, Hyatt	The New CPEP Cosmology Chart and How It Can Be Used (p. 77)
11:00 AM–12 Noon	5–12	B232, Conv. Center	GPS-Enabled Video Cameras for Real-World Earth and Environmental Science Investigations (p. 77)
11:00 AM–12 Noon	K–12	B242/243, Conv. Center	NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think! (p. 77)
12:30–1:30 PM	6–10	B232, Conv. Center	Biomimicry Design Project for Middle School Science and Art Students (p. 82)
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12:30–1:30 PM	K–5	Franklin A, Hyatt	Developing Coherent Storylines for Elementary Science Concepts (p. 82)
12:30–1:30 PM	K–12	Regency Ballroom, Hyatt	Ohio Earth Science Teachers Association (OESTA): “Famous” Rock Raffle (p. 83)
2:00–2:30 PM	5–8	Booth #841, Exhibit Hall	Earthquakes and Their Causes (p. 86)
3:30–4:00 PM	6–8	B144/145, Conv. Center	Spanning Astronomical and Atomic Spaces: Creating Project-Based Mathematics and Science Environments in the Classroom (p. 88)
3:30–4:00 PM	9–12	Franklin D, Hyatt	U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)
3:30–4:30 PM	9–C	B130, Conv. Center	Climate Myths (p. 88)
3:30–4:30 PM	5–12	B232, Conv. Center	Data Is Not a “Four Letter Word”: Use NOAA Resources to Build Student Proficiency in Data Analysis (p. 88)
3:30–4:30 PM	6–12	B242/243, Conv. Center	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 89)
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### Saturday

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9:30–10:30 AM	7–8	Franklin C, Hyatt	Caught Up in Currents (p. 99)
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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)
11:00 AM–12 Noon	P–8	B144/145, Conv. Center	Bringing the Outdoors in Through Fabric Models (p. 101)
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## Engineering, Technology, and the Application of Science

### Thursday

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8:00–9:00 AM	6–9	B140/141, Conv. Center	Simple Machines Design Challenge for Science and Math Students (p. 35)
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	5–12	Union C, Hyatt	STEM Pathways Design Challenges (p. 38)
11:00 AM–12 Noon	K–5	C160, Conv. Center	Build Skills to Boost the Makerspace Experience for Young Scientists! (p. 44)
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12:30–1:30 PM	6–12	C162, Conv. Center	CPO’s Wind Turbine: A STEM Approach to Engineering and Design (p. 50)
12:30–1:30 PM	K–12	Ohio Center B/C, Conv.	Incorporating Digital Technology While Ensuring Conceptual Learning and Deep Understanding Using Literacy and Math Skills (p. 48)
12:30–1:30 PM	3–5	Franklin C, Hyatt	Marble Mania: Teaching NGSS Fair Test the Inquiry Way (p. 48)
2:00–3:00 PM	K–5	Franklin B, Hyatt	Engineering Happily Ever After (p. 53)
2:00–3:00 PM	9–12	Taft D, Hyatt	Designing Bridges: Math, Materials, and Methods (p. 54)
2:00–3:00 PM	6–12	C162, Conv. Center	Building Electric Circuits with CPO’s New Link Learning Module (p. 56)
3:30–4:00 PM	6–7	B142/143, Conv. Center	A Practical Tool for Motivating Students with Real-World Challenges at the Intersection of Science and Society: Conceptually Relevant Curriculum and Assessments (p. 57)
3:30–4:30 PM	P–2	Franklin C, Hyatt	“Blooming” Children: Focusing on Kindergartners’ Natural Curiosity and Learning Capacities Through Science (p. 59)
3:30–4:30 PM	6–C	Franklin B, Hyatt	Human-Centered Engineering Design: The Key to STEM (p. 59)

## Schedule at a Glance Engineering, Technology, and the Application of Science

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8:00–9:00 AM	G	Union D, Hyatt	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 (p. 67)
8:00–9:00 AM	7–C	Franklin B, Hyatt	Implementing the Engineering Design Process in Your Classroom (p. 67)
8:00–9:00 AM	7–12	B131/132, Conv. Center	Flinn Scientific's STEM Design Challenge "Build-It-Yourself" Lab Project (p. 68)
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9:30–10:30 AM	9–12	B142/143, Conv. Center	Beyond the Egg Drop: Infusing Engineering Design into the Physics/Science Classroom (p. 72)
9:30–10:30 AM	P–8	Union D, Hyatt	ASEE Session: ASEE's Novel Engineering for K–8 Teachers and Students (p. 74)
9:30–10:30 AM	9–12	B242/243, Conv. Center	Engineer Your World: Integrating Engineering Design, Computational Thinking, and 21st-Century Skills (p. 72)
9:30–10:30 AM	6–12	B246, Conv. Center	Adapting Bioengineering Curriculum for the Visually Impaired (p. 73)
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12:30–1:30 PM	6–10	B232, Conv. Center	Biomimicry Design Project for Middle School Science and Art Students (p. 82)
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3:30–4:00 PM	9–12	Franklin D, Hyatt	U.S. Department of Energy's BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)
3:30–4:30 PM	8–C	Union D, Hyatt	ASEE Session: Building a Culture of Iterative Design with 3-D Modeling and Printing in the High School Classroom (p. 90)
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3:30–4:30 PM	3–12	B246, Conv. Center	Completing the Engineering Cycle: It's Not Complete 'til You Rinse and Repeat (p. 89)
3:30–4:30 PM	6–12	B230/231, Conv. Center	Science through Engineering Design...and a Squid! (p. 90)
3:30–4:30 PM	9–12	C151, Conv. Center	Energy Flow Through an Ecosystem (p. 90)
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## Schedule at a Glance Engineering, Technology, and the Application of Science

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9:30–10:30 AM	7–8	Franklin C, Hyatt	Caught Up in Currents (p. 99)
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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)
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## Life Science

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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)
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12:30–1:30 PM	5–12	B242/243, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 46)
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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)
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2:00–3:00 PM	5–12	Hayes, Hyatt	NSTA Press® Session: Argumentation in the Biology Science Classroom (p. 53)
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3:30–4:30 PM	6–12	Ohio Center B/C, Conv.	Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 58)
3:30–4:30 PM	8–C	C171, Conv. Center	Environmental Toxicology Using Edvotek’s New EZ-elegans (p. 61)
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3:30–4:30 PM	6–8	C161, Conv. Center	Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 60)
5:00–6:00 PM	9–12	Taft C, Hyatt	Great Big Gobs of Green Goo: Water Quality and Hazardous Algae Blooms (p. 62)
5:00–6:00 PM	7–12	Franklin B, Hyatt	Are You MoBILiSE’d? Modeling Biology Instruction: Leaders in Science and Engineering (p. 62)

### Friday

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8:00–9:00 AM	9–C	B144/145, Conv. Center	Nanoengineering with DNA Origami (p. 65)
8:00–9:00 AM	7–12	B131/132, Conv. Center	Flinn Scientific’s STEM Design Challenge “Build-It-Yourself” Lab Project (p. 68)
8:00–9:00 AM	K–8	Union E, Hyatt	Science Learning at Your Window! (p. 66)
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9:30–10:30 AM	8–C	C172, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 76)
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9:30–10:30 AM	P–8	B233/234, Conv. Center	Let’s Pick Our Brains (p. 75)
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12:30–1:30 PM	6–12	C150, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (p. 85)
12:30–1:30 PM	9–C	C172, Conv. Center	How to Use Pop Culture in Your Life Science Class (p. 85)
12:30–1:30 PM	9–C	C160, Conv. Center	Use Free BioInteractive Resources to Enhance Biology Data Literacy Skills (p. 85)
12:30–1:30 PM	9–12	C151, Conv. Center	What Is a Species (p. 85)
12:30–1:30 PM	9–12	Harrison, Hyatt	Combining a Medical Simulation Center Resources and High School Biomedical Curriculum to Diversify the Health Sciences Pipeline (p. 83)
2:00–3:00 PM	9–12	C151, Conv. Center	Cell Differentiation and Gene Expression (p. 87)
2:00–3:00 PM	6–12	C160, Conv. Center	Build Math Skills for the Ohio Life Science Standards (p. 87)
3:30–4:00 PM	9–12	Franklin D, Hyatt	U.S. Department of Energy’s BioenergizeME Infographic Challenge: Creative Methods to Explore Energy Literacy (p. 88)



## Schedule at a Glance Life Science

3:30–4:30 PM	9–12	Hayes, Hyatt	NSTA Press® Session: <i>Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12</i> (p. 89)
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–C	B230/231, Conv. Center	Genes, Genomes, and Personalized Medicine (p. 97)
8:30–9:00 AM	7–12	B144/145, Conv. Center	Learning STEM Through Bioenergy: Lessons from the Plants (p. 97)
9:30–10:30 AM	K–12	B140/141, Conv. Center	How Does Your Garden Grow? Creating and Maintaining Kid- and Bird-Friendly Gardens (p. 98)
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	6–8	C161, Conv. Center	Wave Properties and Information Transfer (p. 39)
8:00–9:00 AM	9–12	B242/243, Conv. Center	Turning Your Classroom INSIDE OUT (p. 36)
8:00–9:00 AM	6–9	B140/141, Conv. Center	Simple Machines Design Challenge for Science and Math Students (p. 35)
8:00–9:00 AM	7–C	B130, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of NGSS and STEM (p. 35)
8:00–9:00 AM	P–3	Franklin C, Hyatt	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)
9:30–10:30 AM	9–12	B131/132, Conv. Center	Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (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	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 46)
12:30–1:30 PM	4–8	Union B, Hyatt	Inquiry Matters: Identify Unknown Liquids (p. 49)
12:30–1:30 PM	K–12	Ohio Center B/C, Conv.	Incorporating Digital Technology While Ensuring Conceptual Learning and Deep Understanding Using Literacy and Math Skills (p. 48)
12:30–1:30 PM	9–12	B142/143, Conv. Center	Meet the Standards and Enhance Your Chemistry Classroom with Other People’s Money (p. 46)
12:30–1:30 PM	6–8	Hayes, Hyatt	NSTA Press® Session: <i>Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8</i> (p. 48)
12:30–1:30 PM	3–5	Franklin C, Hyatt	Marble Mania: Teaching NGSS Fair Test the Inquiry Way (p. 48)
12:30–1:30 PM	1–8	Union A, 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)

## Schedule at a Glance Physical Science

2:00–3:00 PM	9–12	Franklin D, Hyatt	Connect Chemistry to Your World with ChemClub (p. 53)
2:00–3:00 PM	8–C	B230/231, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 54)
2:00–3:00 PM	6–8	C151, Conv. Center	Chemical Batteries (p. 56)
2:00–3:00 PM	9–12	B131/132, Conv. Center	Flinn Scientific’s Exploring Chemistry: Connecting Content Through Experiments (p. 54)
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	K–5	C150, Conv. Center	Waves, Waves, Waves: Building Models to Explain Phenomena (p. 56)
2:00–3:00 PM	K–5	C161, Conv. Center	What Does Conceptual Modeling Look Like in an Elementary Classroom? (p. 56)
2:30–3:00 PM	6–C	B232, Conv. Center	Connecting the Dots: Science and Technology as Your Tool (p. 57)
3:30–4:30 PM	6–12	Ohio Center B/C, Conv.	Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 58)
3:30–4:30 PM	6–12	B144/145, Conv. Center	Lotions, Potions, and Scrubs: Polymer Science in Cosmetics (p. 58)
3:30–4:30 PM	9–12	Union B, Hyatt	Solids: The Neglected “State” of Chemistry (p. 58)
3:30–4:30 PM	6–9	Union C, Hyatt	Building STEM into the Science Classroom (p. 59)
3:30–4:30 PM	6–12	C162, Conv. Center	CPO Science’s Link Module: Learning About Chemistry Models (p. 60)
3:30–4:30 PM	6–8	C151, Conv. Center	Reclaiming the Metal (p. 60)
3:30–4:30 PM	P–5	Franklin A, Hyatt	How to Incorporate Math and Literacy in K–6 Active-Learning NGSS Activities (p. 59)
3:30–4:30 PM	4–9	Taft C, Hyatt	Force and Motion—Deeper and Cheaper (p. 59)
5:00–6:00 PM	9–12	Hayes, Hyatt	NSTA Press® Session: <i>Argument-Driven Inquiry in Chemistry: Lab Investigations for Grades 9–12</i> (p. 62)

### Friday

8:00–9:00 AM	6–8	C151, Conv. Center	Waves (p. 68)
8:00–9:00 AM	9–C	Regency Ballroom, Hyatt	NESTA Shares: Innovative Ways to Teach About Earth’s Place in the Universe (p. 66)
8:00–9:00 AM	P–3	Franklin A, Hyatt	Cultivating a Culture of Science Curiosity: Teaching Accurate Science in the Primary Grades (p. 66)
8:00–9:00 AM	5–12	B244/245, Conv. Center	PolyWhat? Understanding What a Polymer Is: Polymer 101 (p. 65)
8:00–9:00 AM	6–8	Union C, Hyatt	ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State (p. 67)
8:00–9:00 AM	7–12	B131/132, Conv. Center	Flinn Scientific’s STEM Design Challenge “Build-It-Yourself” Lab Project (p. 68)
8:00–9:00 AM	9–12	C162, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 70)
8:00–10:00 AM	9–12	Union B, Hyatt	ACS Session One: Energy in Chemistry—A Macroscopic View (p. 71)
8:00–10:00 AM	9–12	Union A, Hyatt	AAPT Session: Pedagogy for Conceptual Retention: Modeling Instruction in Science (p. 71)
9:30–10:30 AM	9–12	C162, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 76)
9:30–10:30 AM	3–12	B131/132, Conv. Center	Fantastical Chemistry Demos for All Classrooms (p. 75)
9:30–10:30 AM	6–8	Union C, Hyatt	ACS Middle Level Session: Density: A Molecular View (p. 74)
9:30–10:30 AM	P–8	Union D, Hyatt	ASEE Session: ASEE’s Novel Engineering for K–8 Teachers and Students (p. 74)
9:30–10:30 AM	9–12	B142/143, Conv. Center	Beyond the Egg Drop: Infusing Engineering Design into the Physics/Science Classroom (p. 72)
9:30–10:30 AM	6–12	Taft D, Hyatt	How to Incorporate Math and Literacy in Grades 6–12 Active Learning NGSS-Based Activities (p. 74)
9:30–10:30 AM	9–12	C151, Conv. Center	pH Scale and Math Modeling (p. 75)
9:30–10:30 AM	9–C	B230/231, Conv. Center	3D Printing for the BioScience Classroom (p. 75)
9:30–10:30 AM	K–9	Ohio Center B/C, Conv.	Inquiring in Matter—Deeper and Cheaper with NGSS (p. 73)
9:30–10:30 AM	8–12	C161, Conv. Center	STEM and NGSS Inquiry in Chemistry: Effective, Efficient, Economical (p. 76)
9:30–10:30 AM	9–12	C150, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 75)
9:30–10:30 AM	9–12	C171, Conv. Center	Chemistry with Vernier (p. 76)
10:00 AM–12 Noon	9–C	Union A, Hyatt	AAPT Session: Building Web/Tablet-Friendly Interactive Physics Simulations (p. 76)
11:00 AM–12 Noon	6–8	Union C, Hyatt	ACS Middle Level Session: The Water Molecule and Dissolving (p. 79)

## Schedule at a Glance Physical Science

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

### Saturday

8:00–9:00 AM	3–5	B131, Conv. Center	Beyond Spaceship Earth (p. 95)
8:00–9:00 AM	6–12	B246, Conv. Center	Science from the Stratosphere: STEM Activities in the Infrared (p. 96)
8:00–9:00 AM	6–12	B132, Conv. Center	Basic Polymer Science for the Science Classroom (p. 95)
8:00–9:00 AM	5–C	Ohio Center B/C, Conv.	Conceptual Chemistry: Repurposed Materials for Low-Cost Science Experiments (p. 96)
9:30–10:30 AM	5–12	B132, Conv. Center	Old Polymer Labs with 21st-Century Learning (p. 98)
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	6–12	B240/241, Conv. Center	Unlocking the Particulate Nature of Matter with Locking Blocks (p. 99)
10:00–10:30 AM	6–9	B232, Conv. Center	Students with Disabilities and the 5E Learning Cycle (p. 100)
11:00 AM–12 Noon	8–12	B235, Conv. Center	Cars: A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts (p. 101)
11:00 AM–12 Noon	G	B140/141, Conv. Center	AACT: Resources and Opportunities (p. 101)
11:30 AM–12 Noon	8–12	B142/143, Conv. Center	Addressing Integrated Process Skills in Physical Science Courses with Modeling Instruction (p. 102)

### General Science Education

#### Thursday

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

## 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	P–5	B144/145, Conv. Center	Shining the L.I.G.H.T on STEM in Your Community (p. 36)
8:00–9:00 AM	1–8	Union B, Hyatt	Looking Inside Argument-Based Inquiry Classrooms (p. 36)
8:00–9:00 AM	3–12	B232, Conv. Center	Deliver Your Science Content with iPads in Your 1:1 Classroom (p. 36)
8:30–9:00 AM	4–C	B244/245, Conv. Center	From a Traditional Science Fair to an Interactive STEM Expo (p. 40)
9:15–10:30 AM	G	Short North A/B, Conv. Ctr.	General Session: Be a STEM Hero (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	C162, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 42)
9:30–10:30 AM	K–5	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)
12:30–1:30 PM	K–5	C161, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (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)

## Schedule at a Glance General Science Education

3:30–4:00 PM	5–12	B232, Conv. Center	Partnership Enhancement Projects: Creating Teacher Leaders in Science Education (p. 57)
3:30–4:30 PM	K–8	Taft B, Hyatt	Embedded Assessment: Making Instructional Activities Opportunities for Formative Assessment (p. 58)
3:30–4:30 PM	G	Hayes, Hyatt	NSTA Press® Session: Uncovering K–16 Students’ and Teachers’ Ideas Using Familiar Phenomena (p. 58)
3:30–4:30 PM	5–9	B140/141, Conv. Center	NMLSTA-Sponsored Session: Calling All Middle Level Teachers (p. 58)
3:30–4:30 PM	6–C	Harrison, Hyatt	ASTE-Sponsored Session: Citizen Science: Argumentation and Modeling Safe Traffic Intersections (p. 59)
3:30–4:30 PM	P–6	Union A, Hyatt	Elementary Food Chemistry (p. 59)
3:30–4:30 PM	6–12	B230/231, Conv. Center	Zombie Apocalypse! (p. 60)
3:30–4:30 PM	K–12	C172, Conv. Center	HMH’s Virtual Reality Field Trips: Google Expeditions (p. 61)
3:30–4:30 PM	K–5	C160, Conv. Center	Liven Up Literacy with Science (p. 60)
3:30–4:30 PM	6–9	B131/132, Conv. Center	Group Work: Using Student Collaboration in the Middle School Science Classroom (p. 60)
5:00–6:00 PM	5–C	Franklin D, Hyatt	Sink into Science at Stone Lab (p. 62)
5:00–6:00 PM	P–2	Franklin A, Hyatt	Nurturing Curious Minds: Exploring the Science Encountered in the Young Child’s World and Inspiring Sustained Curiosity, Interest, and Learning (p. 61)

### Friday

8:00–9:00 AM	4–12	Harrison, Hyatt	STEM Projects for the Science Classroom (p. 66)
8:00–9:00 AM	K–5	Hayes, Hyatt	NSTA Press® Session: <i>Uncovering Elementary Students’ Ideas About Science Through Literacy Capacities</i> (p. 66)
8:00–9:00 AM	6–C	Ohio Center B/C, Conv.	Zombies Don’t Stand a Chance Against STEM! (p. 66)
8:00–9:00 AM	6–12	B232, Conv. Center	Designing Access to Complex Texts (p. 65)
8:00–9:00 AM	7–12	Taft C, Hyatt	ASTE-Sponsored Session: Tech Tools for Taking Your Secondary Science Class to the Next Level (p. 67)
8:00–9:00 AM	K–12	B233/234, Conv. Center	Building the Skills of Argumentation and Collaboration in STEM (p. 68)
8:00–9:00 AM	8–C	B142/143, Conv. Center	Strengthen Your STEM Lessons with NSTA High School Committee Activities (p. 65)
8:00–9:00 AM	G	B140/141, Conv. Center	Authors Needed! Publish Your Teaching Idea in an NSTA Journal (p. 65)
8:00–9:00 AM	3–12	C171, Conv. Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 70)
8:00–9:00 AM	K–8	C170, Conv. Center	What Is Amplify Science? (p. 70)
8:00–9:00 AM	5–8	B235, Conv. Center	Discourse Tools for Equitable and Rigorous Talk (p. 68)
8:00–9:00 AM	K–5	C150, Conv. Center	Bring Visual Science into K–5 Classrooms—It’s a Game Changer! (p. 68)
8:00–9:00 AM	9–C	C161, Conv. Center	Using Problem-Based Learning to Up Your NGSS Game (p. 70)
9:30–10:30 AM	1–6	Franklin C, Hyatt	Infusing, Scaffolding, STEM/STEAM, 5E Model, and Crosscutting the Curriculum...What More Could You Ask? (p. 73)
9:30–10:30 AM	K–5	Franklin A, Hyatt	<i>Picture-Perfect Science: Doing It Our Way</i> (p. 73)
9:30–10:30 AM	10–12	Franklin D, Hyatt	Student Research and Publishing in High School Science (p. 73)
9:30–10:30 AM	P–3	Taft C, Hyatt	CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus (p. 74)
9:30–10:30 AM	G	B144/145, Conv. Center	NSELA-Sponsored Session: Tools for Science Leaders, Part 1 (p. 72)
9:30–10:30 AM	6–8	C170, Conv. Center	Implementing Science Seminars and Scientific Argumentation with Amplify Science (p. 76)
9:30–10:30 AM	G	B140/141, Conv. Center	Grey Matter: Learning and Teaching Science with the Brain in Mind (p. 72)
9:30–10:30 AM	G	B244/245, Conv. Center	A Model for Quantitative Educational Research (p. 73)
10:00–10:30 AM	K–6/C	B232, Conv. Center	The Scoop on SCOPES: Science Cooperative of Physicians and Elementary Students (p. 76)
11:00 AM–12 Noon	K–12	B244/245, Conv. Center	MI Science PL@N: Resources for Introducing the Vision of the Framework to Teachers and Administrators (p. 77)
11:00 AM–12 Noon	K–12	B246, Conv. Center	Not Adopted but Still Relevant: Using NGSS to Support Ohio’s Learning Standards (p. 78)



## Schedule at a Glance    General Science Education

11:00 AM–12 Noon	P–3	Taft B, Hyatt	What Happens When I Don't Teach Science? Reflections of a Secondary Science Teacher (p. 78)
11:00 AM–12 Noon	K–6	Taft C, Hyatt	Linking Science and Literacy for Improved Student Outcomes (p. 78)
11:00 AM–12 Noon	G	B144/145, Conv. Center	NSELA-Sponsored Session: Tools for Science Leaders, Part 2 (p. 77)
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12:30–1:30 PM	G	B233/234, Conv. Center	Supporting Excellence in STEM Programs and Teaching Through STEM Certification (p. 84)
12:30–1:30 PM	6–9	B131/132, Conv. Center	Too Many Ideas: Helping Students Focus and Select a Topic to Investigate (p. 84)
12:30–1:30 PM	3–12	C171, Conv. Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 85)
1:15–2:00 PM	G	Exhibits Entrance, Hall B	Meet the Presidents and Board/Council (p. 86)
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3:00–5:00 PM	7–C	Union A, Hyatt	AAPT Session: Creating Your Own Effective Interactive Video Vignettes (p. 88)
3:30–4:30 PM	K–12	B142/B143, Conv. Center	How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions (p. 88)
3:30–4:30 PM	G	B140/141, Conv. Center	Eureka! Science Trade Books: Good as Gold! (p. 88)
3:30–4:30 PM	3–C	Ohio Center B/C, Conv.	Poetry, Lyrics, Comics, Theatrics: Encouraging Students to Demonstrate Their Knowledge of Science Through Their Unique Talents in the Arts (p. 89)
3:30–4:30 PM	K–8	Taft B, Hyatt	Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions (p. 89)
3:30–4:30 PM	5–9	Taft C, Hyatt	NMLSTA-Sponsored Session: Activate Your Learning, Engage Your Senses (p. 90)
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3:30–4:30 PM	K–12	C170, Conv. Center	A Series of Fortunate Events: Using Discrepant Events in the Classroom (p. 90)
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4:00–4:30 PM	5–9	B144/145, Conv. Center	Universal Design for Learning (UDL): Creating a Learning Environment That Challenges and Engages All Learners (p. 92)
5:00–6:00 PM	K–3	Franklin A, Hyatt	Centering Around Science for K–3 Teachers (p. 93)
5:00–6:00 PM	3–8	Taft B, Hyatt	Engaging Science Inquiry (p. 93)

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8:00–9:00 AM	K–5	Franklin A, Hyatt	NSTA Press® Session: <i>Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry, K–5</i> (p. 96)
8:00–9:00 AM	6–12	B232, Conv. Center	Universal Design for Learning: What It Is, and What It Isn't (p. 95)
8:00–9:00 AM	3–8	B140/141, Conv. Center	Sing for the Planet (p. 66)

## Schedule at a Glance General Science Education

8:00–9:00 AM	4–10	B235, Conv. Center	Teaching Students to Analyze Data (p. 95)
8:00–9:00 AM	1–8	B244/245, Conv. Center	A Polymer Primer for Elementary and Middle Grades (p. 95)
8:00–9:00 AM	K–6	B130, Conv. Center	Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success (p. 95)
9:30–10:00 AM	6–12	B232, Conv. Center	Equal Access STEM: Strategies for Educating Students with Visual Impairments and Other Low-Incidence Disabilities (p. 97)
9:30–10:30 AM	K–12	B244/245, Conv. Center	Crosswalk Between Ohio’s Learning Standards and NGSS Disciplinary Core Ideas (p. 98)
9:30–10:30 AM	5–8	Franklin A, Hyatt	NSTA Press® Session: Inquiring Scientists, Inquiring Readers: Integrating Literacy and Inquiry in Middle School Science (p. 99)
9:30–10:30 AM	P–2	B131, Conv. Center	Preschool STEAM: Yes, They Can! (p. 98)
9:30–10:30 AM	5–12	Ohio Center B/C, Conv. Center	Tackling Toxicant Exposure with Food Choices (p. 99)
9:30–10:30 AM	9–12	C151, Conv. Center	The Science of Keeping Food Fresh (p. 99)
9:30–10:30 AM	6–C	B235, Conv. Center	Shaping Teaching Practice Through Action Research (p. 98)
9:30–10:30 AM	1–12	B130, Conv. Center	Breaking The Bell Curve: Reaching ALL Students with Mastery Learning (p. 98)
9:30–10:30 AM	6–12	B144/145, Conv. Center	Engaging Reading and Writing Success: Incorporating Today’s Global Issues (p. 98)
11:00–11:30 AM	P–5	B131, Conv. Center	Making Science and Literacy Connections with NGSS (p. 100)
11:00 AM–12 Noon	K–6	B142/143, Conv. Center	What’s Under the Hood? A Framework and Tools for Evaluating Digital Classroom Materials That’s Better Than Kicking the Tires! (p. 77)
11:00 AM–12 Noon	4–C	B244/245, Conv. Center	Tackling Classroom Management in a Complex PBL Environment (p. 101)
11:00 AM–12 Noon	9–12	B132, Conv. Center	Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials (p. 100)
11:00 AM–12 Noon	6–C	Franklin C, Hyatt	Infect Your Science Classroom with Math (p. 102)
11:00 AM–12 Noon	P–8	B240/241, Conv. Center	Exploring the Seeds of SEED (Students Exploring Ecosystem Dynamics) (p. 101)

## Informal Science Education

### Thursday

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8:00–9:00 AM	5–12	Union C, Hyatt	STEM Pathways Design Challenges (p. 38)
8:00–9:00 AM	P–5	B144/145, Conv. Center	Shining the L.I.G.H.T on STEM in Your Community (p. 36)
8:00–9:00 AM	P–12	Taft A, Hyatt	Informal Science Education Panel for the Community (p. 36)
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12:30–1:30 PM	6–8	B144/145, Conv. Center	EXENTHUNCO: What Is That? (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)
12:30–1:30 PM	K–8	Taft C, Hyatt	Taking STEM Outside (p. 49)
2:00–3:00 PM	9–12	Franklin D, Hyatt	Connect Chemistry to Your World with ChemClub (p. 53)
3:30–4:30 PM	6–C	Franklin B, Hyatt	Human-Centered Engineering Design: The Key to STEM (p. 59)
4:00–4:30 PM	5–10	B142/143, Conv. Center	Science Outside—No Box Needed (p. 61)
4:00–4:30 PM	6–12	B232, Conv. Center	Connecting Students with Local Environmental Scientists and Engineers (p. 61)
5:00–6:00 PM	5–C	Franklin D, Hyatt	Sink into Science at Stone Lab (p. 62)

### Friday

8:00–8:30 AM	1–5	Taft B, Hyatt	Starting an Elementary Robotics Club: It’s Easy! (p. 65)
8:00–8:30 AM	G	Franklin D, Hyatt	STEM in the Park: Advancing STEM Education for People of All Ages (p. 65)
8:00–9:00 AM	K–8	Union E, Hyatt	Science Learning at Your Window! (p. 66)
8:30–11:30 AM	5–12	Nationwide B, Hyatt	SC-3: 4-H Innovation...Design Challenges in Action (p. 71)
12:30–1:30 PM	P–8	Taft B, Hyatt	Cross-Curricular and Innovative STEAM Teaching (p. 83)
12:30–1:30 PM	P–12	Franklin D, Hyatt	Climate Expeditions (p. 83)

## Schedule at a Glance Informal Science Education

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3:30–4:30 PM	6–12	B242/243, Conv. Center	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 89)
3:30–5:00 PM	G	Taft D, Hyatt	Equity in Science Education Roundtable (p. 91)

### Saturday

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

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9:30–10:30	Chemistry with Vernier
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12:30–1:30	Integrating Chromebook™ with Vernier Data-Collection Technology
2:00–3:00	Integrating iPad® with Vernier Data-Collection Technology
3:30–4:30	Physics and Physical Science with Vernier

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The Next Generation represents the most advanced Scout yet! Featuring the only touchscreen display on the market and a technologically intuitive design, the redesigned Scout STX helps turn your classroom into an interactive science center experience. Visit OHAUS in booth 633 to pick up ideas for hands-on experiments that will stick with your students, even after the final bell has rung.

- 4.3" touchscreen models available for fast setup, high visibility, and easy weighing
- Superior overload protection stands up to the rigors of classroom use, while stackable storage saves space
- One second stabilization time for faster weighing and ensured repeatability and reliability
- Multiple connectivity options are designed for flexibility in today's technology-driven classroom; you can even display the screen wirelessly to your class

Visit **OHAUS** in booth 633 to learn more

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