

AREA CONFERENCE ON SCIENCE EDUCATION

REVOLUTIONARY
SCIENCE

PHILADELPHIA

NOVEMBER 12-14, 2015



#NSTA15

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Science
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Workshops

Location: Room 111B

Plate Tectonics:

Continents on the Move

11/12 | Thurs 9:30-10:30AM

Stellar Evolution Made Easy

11/12 | Thurs 2:00-3:00PM

Pluto: New Horizons

11/13 | Friday 9:30-10:30AM

Weather & Climate Change: Are We Doomed?

11/13 | Friday 2:00-3:00PM

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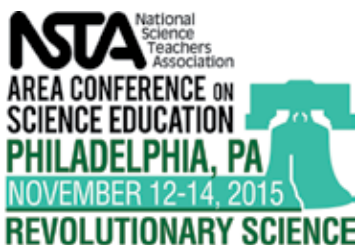
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Visit www.nsta.org/store to make a purchase today, or call 800-277-5300.

STORE HOURS

Wednesday	4:00 PM–7:00 PM
Thursday	7:30 AM–5:30 PM
Friday	7:30 AM–5:30 PM
Saturday	8:00 AM–12:30 PM

NSTA National
Science
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Association



NSTA 2015 Area Conference on Science Education *Revolutionary Science*

Philadelphia, Pennsylvania • November 12–14, 2015

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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 Philadelphia: Revolutionary Science



Ambra Hook

Christine Anne Royce

Margaret M. Monahan

On behalf of the NSTA Philadelphia Conference Committee, we want to take the opportunity to welcome you to the NSTA Area Conference on Science Education taking place here in the birthplace of America. For the past 15 months, science educators and NSTA staff have been working diligently to bring you invited speakers, exhibitor workshops, short courses, teacher sessions, educational trips, and other opportunities to REVOLUTIONIZE your science classroom.

Our theme, *Revolutionary Science*, brings the spirit of American ingenuity and dedicated focus to the science education arena with three strands:

- Revolutionizing Engineering for the Future
- Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction
- Technology: Teaching Revolutionary Science in the Digital Age

We challenge each of you to expand your horizons during your time in Philadelphia by taking advantage of everything the conference has to offer—returning to your classrooms with not only a newfound passion for your teaching, but also with ideas that will start a revolution in your students’ desire to engage in science.

Again, on behalf of everyone involved—welcome to Philadelphia!

2015 Philadelphia Area Conference Committee Leaders
Ambra Hook, Christine Anne Royce, and Margaret Monahan

Philadelphia Conference Committee

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

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President's Welcome

Developing Creative Attitudes in Science



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

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

- *Revolutionizing Engineering for the Future*—Connect with Damon Bradley as he shares his experiences growing up in South Philadelphia and the importance of raising the overall scientific consciousness of American society. The strand sessions will provide educators with a deeper knowledge of the teaching and learning practices for the application of engineering, as well as techniques and strategies to better infuse engineering concepts into the classroom.

- *Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction*—Join Dennis Creedon as he shares how educators can move forward in our ever-evolving landscape of building creativity, discoveries, and literacies in and through the sciences. The strand sessions will provide educators with examples that support common cognitive processes in literacy and science.
- *Technology: Teaching Revolutionary Science in the Digital Age*—Get the tools to create plugged-in learners from Chris Lehmann as he shares the five core values of his inquiry process—*inquiry, research, collaboration, presentation, and reflection*. The strand sessions will provide examples to overcome challenges educators face when using digital technologies in order to have successful learning experiences.

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

Carolyn Hayes
2015–2016 NSTA President

Sponsors and Contributors to the Philadelphia Conference

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

Sponsors

Pennsylvania Science Teachers Association
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Contributors

American Association of Physics Teachers and the Southeast Pennsylvania Section of AAPT
American Chemical Society
American Society for Engineering Education (ASEE)
The Franklin Institute
University of the Sciences in Philadelphia



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

NSTA Conferences Go Green!

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

Conference Previews

Gone are the days of bulky, newspaper-style advance programs. This year, we redesigned the conference preview to a smaller size, which included highlights for our three area conferences. As an added bonus, this new preview is more environmentally friendly, as it dramatically reduces both our print and mailing requirements.

Online Conference Information and Personal Scheduler

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

Final Conference Programs by E-Mail/Conference App

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

Recycled Paper and Sustainable Print Services

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

Environmentally Friendly Exhibition Practices

Our conference partner, Hargrove, Inc., offers many green product options and services in the production of our conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a "reclaimer" that recycles 92% of all solvents the company uses in production of graphics, use of LP natural gas

in 75–90% of show-site vehicles, and many biodegradable and recycled products such as trash bags and wastebaskets. Their green efforts are extended operationally with reductions in electricity, heating fuel, and water usage, as well as a move to 100% recyclable and biodegradable products.

Pennsylvania Convention Center's Green Practices

The Pennsylvania Convention Center (PCC) staff is committed to reducing the environmental impact of their operations and services by becoming environmentally responsible in providing the following:

- **Waste Reduction/Recycling:** In fiscal years 2009 and 2010, the PCC recycled and diverted a combined 469.83 tons of waste from landfills, helping to reduce the impact on the environment.
- **Low Environmental Impact Cleaning Policy:** This policy requires cleaning staff to use equipment that is designed to remove pollutants with less chemicals and reduced water usage. In addition, all cleaning chemicals are green seal certified.
- **Food and Beverage:** PCC Culinary Services provides sustainable cutlery as well as hot/cold beverage cups, napkins, and plates made of 100% decomposable and biodegradable materials.
- **Restroom Upgrades:** Restroom paper products are made from recycled products and hand soap is Green Seal certified. Automatic dispensers for water, soap, and paper products save on waste consumption as well as automatic lighting helps to lower energy costs.

"Go Green" at the Philadelphia 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 Philadelphia Marriott Downtown (*headquarters*), Hampton Inn Philadelphia Center City–Convention Center, and Home2 Suites by Hilton Philadelphia–Convention Center. Conference registration, exhibits, #askNSTA Booth, NSTA Expert Lounges, the NSTA Science Store, exhibitor workshops, and many sessions will be located at the Pennsylvania Convention Center. Other sessions and events will be held at the Marriott. The conference will begin on Thursday, November 12, at 8:00 AM, and end on Saturday, November 14, at 1:30 PM.

Registration

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

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

Wed., Nov. 11	5:00–7:00 PM
Thu., Nov. 12	7:00 AM–5:00 PM
Fri., Nov. 13	7:00 AM–5:00 PM
Sat., Nov. 14	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 Philadelphia 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 32) for details. Note that some events may have required advance registration.



—Photo courtesy of Edward Savaria/Philadelphia Convention & Visitors Bureau

Ground Transportation to/from Airport

It’s a 25-minute ride by SEPTA mass transit or a 10-minute ride in a taxi to cover the eight miles from Philadelphia International Airport (PHL) to Center City. SEPTA’s Airport Line leaves at 30-minute intervals, and a one-way fare is \$7. The taxi ride costs a flat rate of \$28.50. For more information, visit the Philadelphia International Airport website at www.phl.org.

By Train

Amtrak Acela and commuter trains arrive at Philadelphia’s historic 30th Street Station throughout the day, placing passengers within a short walk of Center City and 1.2 miles from the Convention Center. For more information, visit www.amtrak.com or call 800-USA-RAIL.

Getting Around Town

Center City provides plenty of opportunities for visitors to stroll and take in the sights. And, if you want to stay on the move, hop aboard the Southeastern Pennsylvania Transportation Authority (SEPTA) (www.septa.org), which provides an extensive network of buses, subways, trolleys, and regional rail lines throughout Center City and the surrounding region. For more details and to access city maps, visit www.discoverphl.com/visit/basics.

Conference Hotels

See page 9 for a list of hotels and a map of the downtown area. If you have questions or concerns regarding your housing, please contact Orchid Event Solutions (during business hours), Monday through Friday, 9:00 AM–8:00 PM EST at 877-352-6710 (toll-free) or 801-505-4611, or e-mail help@orchideventsolutions.com. After hours and on Saturday, call 866-748-9565.



—Photo courtesy of bkphoto.com/Philadelphia Convention & Visitors Bureau

Registration, Travel, and Hotels

Parking

There are many parking options—both garages and lots—conveniently located within blocks of the Convention Center. For directions and a list of parking options and rates, visit bit.ly/1hsKemY.

Airlines

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

Discounted Rental Cars

The toll-free number to contact an NSTA-designated car rental company is:

Enterprise 800-593-0505 16AH230

* go to www.enterprise.com and use "16AH230" in the "Optional: Coupon, Customer or Corporate Number" box, click on "search" and enter PIN "NST."



— Photo courtesy of Andrea Golod / Philadelphia Convention & Visitors Bureau

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NSTA and **The Franklin Institute** welcome you to Philadelphia.

At The Franklin Institute, we have FUN down to a science! Your NSTA Philadelphia conference badge grants you **FREE** admission during the conference.



Experience live science happening all around you! Walk through the iconic, two-story-tall Giant Heart; have a ball in our NEW sport science exhibit, SportsZone; and climb through a web of firing neurons in Your Brain. Travel to faraway galaxies in the Fels Planetarium; see explosive, live science shows; and more!

Be sure to visit The Brain Bar where you can touch a real (plastinated) human brain.

Visit www.fi.edu for more information.





1. Philadelphia Marriott Downtown

(Headquarters Hotel)

1201 Market St.

2. Hampton Inn Philadelphia Center City-Convention Center

1301 Race St.

3. Home2 Suites by Hilton Philadelphia-Convention Center

1200 Arch St.



Shuttle service will not be provided as all hotels are within walking distance to the Convention Center.

—Photo courtesy of Philadelphia Convention & Visitors Bureau



NSTA Exhibits

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

The lapel badge mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities. A map display of the Exhibit Hall will be on-site in Attendee Registration and in the Exhibit Hall, and maps will be accessible via our Conference app (see page 13). See page 122 for a complete list of exhibitors and contact information.

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

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

Thu., Nov. 12	11:00 AM–5:00 PM
Fri., Nov. 13	9:00 AM–3:00 PM
Sat., Nov. 14	9:00 AM–12 Noon

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

Thu., Nov. 12	11:00 AM–12:30 PM
Fri., Nov. 13	12 Noon–2:00 PM
Sat., Nov. 14	10:30 AM–12 Noon

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

information to you while the conference is still fresh in your mind.

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 140 for a complete listing of exhibitor workshops.

NSTA Science Store

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

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—*The BSCS 5E Instructional Model*; *Earth Science Success, 2nd Edition*; *Reimagining the Science Department*; and *Teaching for Conceptual Understanding in Science*—and our new children's books from NSTA Kids, including the *Next Time You See* series
- "I Love Science" and NSTA gear product lines to show your love of science and pride in teaching
- Member discounts of 20% on NSTA Press® items and 10% on books from other publishers for all attendees
- Daily book and gear specials, product giveaways, and more.

Meet the Presidents and Board/Council

Be sure to stop by Friday from 12 Noon to 12:45 PM at the entrance to Hall A 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 wireless internet is provided on all concourses, including the Grand Hall, Broad Street Atrium, Arch Street Bridge, Overlook Café area, and ballroom foyers of the Convention Center. *Note:* The complimentary wireless is an unmanaged service with shared 1.5Mb band-width. No password is required; to access, connect to “PCCWELCOME.”

PSTA Booth

The Pennsylvania Science Teachers Association (PSTA) Booth is located in the Grand Hall. PSTA’s mission is to work toward the advancement, improvement, and coordination of science education in all areas of science at all educational levels. Stop by to meet us, get science education resources, and to join PSTA. Forms will also be available for graduate credit through Shippensburg University.

Presenters and Presiders Check-In

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

Graduate Credit Opportunity

Philadelphia conference attendees can earn one graduate-level credit in professional development through Shippensburg University. Visit www.ship.edu/pcede/nsta/philadelphia for complete details or visit the PSTA Booth. The fee is \$150. *Note:* Credit is by pass/fail option only.

Lost and Found

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

Conference Evaluation

All conference attendees are invited to complete a conference evaluation form online at <http://svy.mk/1M26qrl>.

CONFERENCE APP



Connect. Share. Engage.

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

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

Available for download on



iPhone + iPad



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#askNSTA and NSTA Expert Lounges

Visit the #askNSTA booth (#1322) during exhibit hall hours Thursday, Friday, and Saturday. NSTA staff and board members will be there, and you can **ask us anything!** Learn how to write an article for the journals, find out how to implement the NGSS at your school, learn about the New Science Teacher Academy, ask about the Mickelson Teacher Academies held during the summer, or get info about our teacher awards (earn cash or equipment for your classroom). Not sure what you want to know? Get insider information from our exclusive mini-sessions, held in the new NSTA Expert Lounges. These tailored, small-group sessions will focus on the new NSTA Learning Center website, the NGSS, and more. Visit bit.ly/1Fv77bE for complete NSTA lounge schedules and locations.

Online Session Evaluations and Tracking Professional Development

All attendees can now 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, November 11–December 1, 2015. During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Registration Area. **And this year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!**

To evaluate a session, attendees should follow these steps:

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

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

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

Beginning December 8, 2015, an attendee can view his or her transcript at the NSTA Learning Center (learningcenter.nsta.org) by first logging on and then clicking "My Profile" under the Welcome. Here you'll find a "Certificates" tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional 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.

The NSTA Conference App



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

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

First Aid Services

Located in the rear of Hall A of the Convention Center, the First Aid office is clearly marked with a large first aid symbol. For all emergencies, call 215-418-4911 or dial 4911 from any house phone throughout the Convention Center, and your call will be directed to the command center who can dispatch the EMT.

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:

- Room 101A, Conv. Center
- Room 405, Marriott

Business Services

The FedEx Office Print & Ship Center is located on the 200 level between Exhibit Halls B and C of the Convention Center. Offering printing, packing, shipping, copying, and office supplies, the FedEx Business Center is open Monday–Saturday, 8:00 AM–5:00 PM, during the conference. For more information, call 215-925-1218 or e-mail usa5530@fedex.com.

PHL CVB Information Desk

The Philadelphia Convention & Visitors Bureau has an Information Desk located at the 12th and Arch Street lobby of the Convention Center. The desk is open as follows:

Wed., Nov. 11	5:00–7:00 PM
Thu., Nov. 12	9:00 AM–6:00 PM
Fri., Nov. 13	9:00 AM–6:00 PM
Sat., Nov. 14	9:00 AM–12 Noon

Stop by for city information, brochures, and sample menus, as well as assistance with restaurant reservations.



Pennsylvania Convention Center

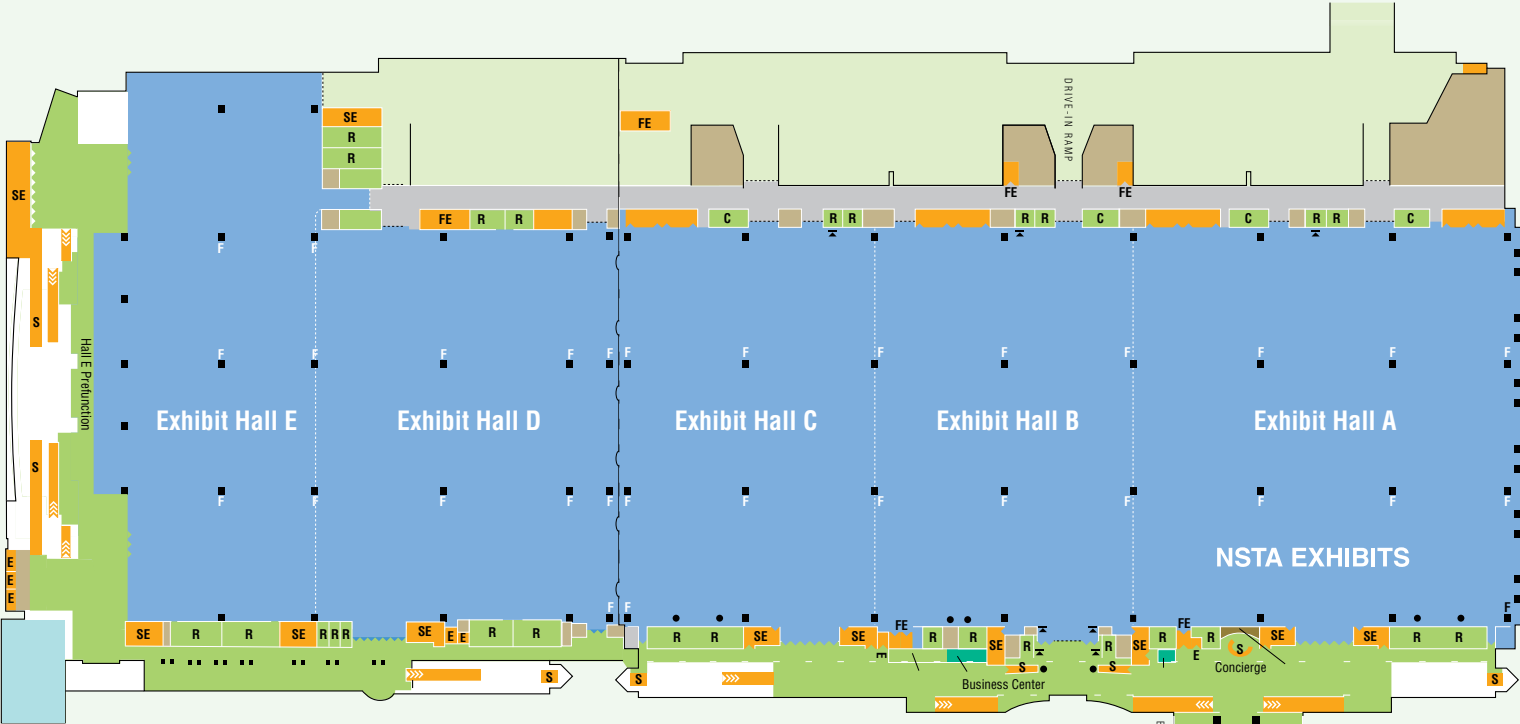


100 Level

KEY

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| Entrances | Back of House |
| Exhibit Halls | Concession Stand |
| Meeting Rooms | Dressing Rooms |
| Ballrooms | Elevator |
| Shops | Freight Elevator |
| Public Areas | Fire Hose Conne |
| Stair, Elevator, Escalator | Restrooms |
| Loading Dock | Ticket Offices |
| House Storage | Columns |
| Offices | Telephone |
| | Water Fountain |

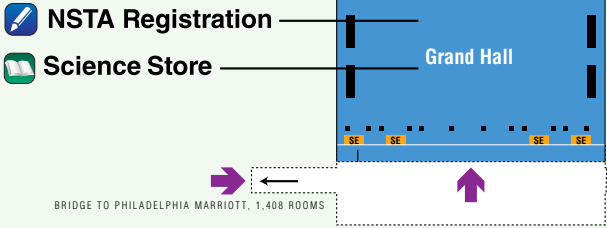
Pennsylvania Convention Center



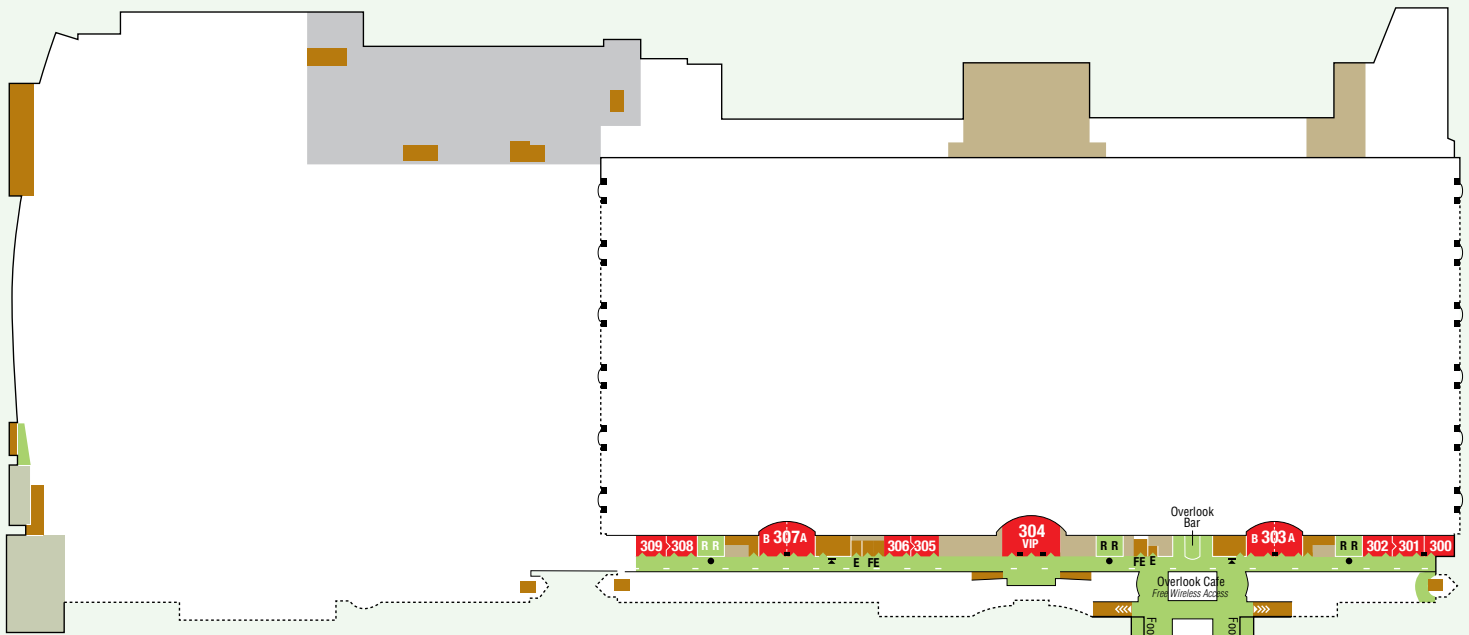
200 Level

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| Exhibit Halls | Concession Stand |
| Meeting Rooms | Dressing Rooms |
| Ballrooms | Elevator |
| Shops | Freight Elevator |
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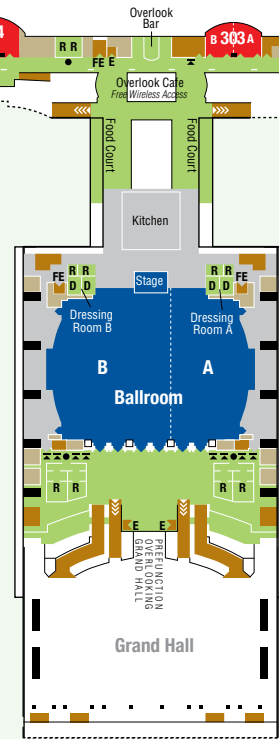
Pennsylvania Convention Center



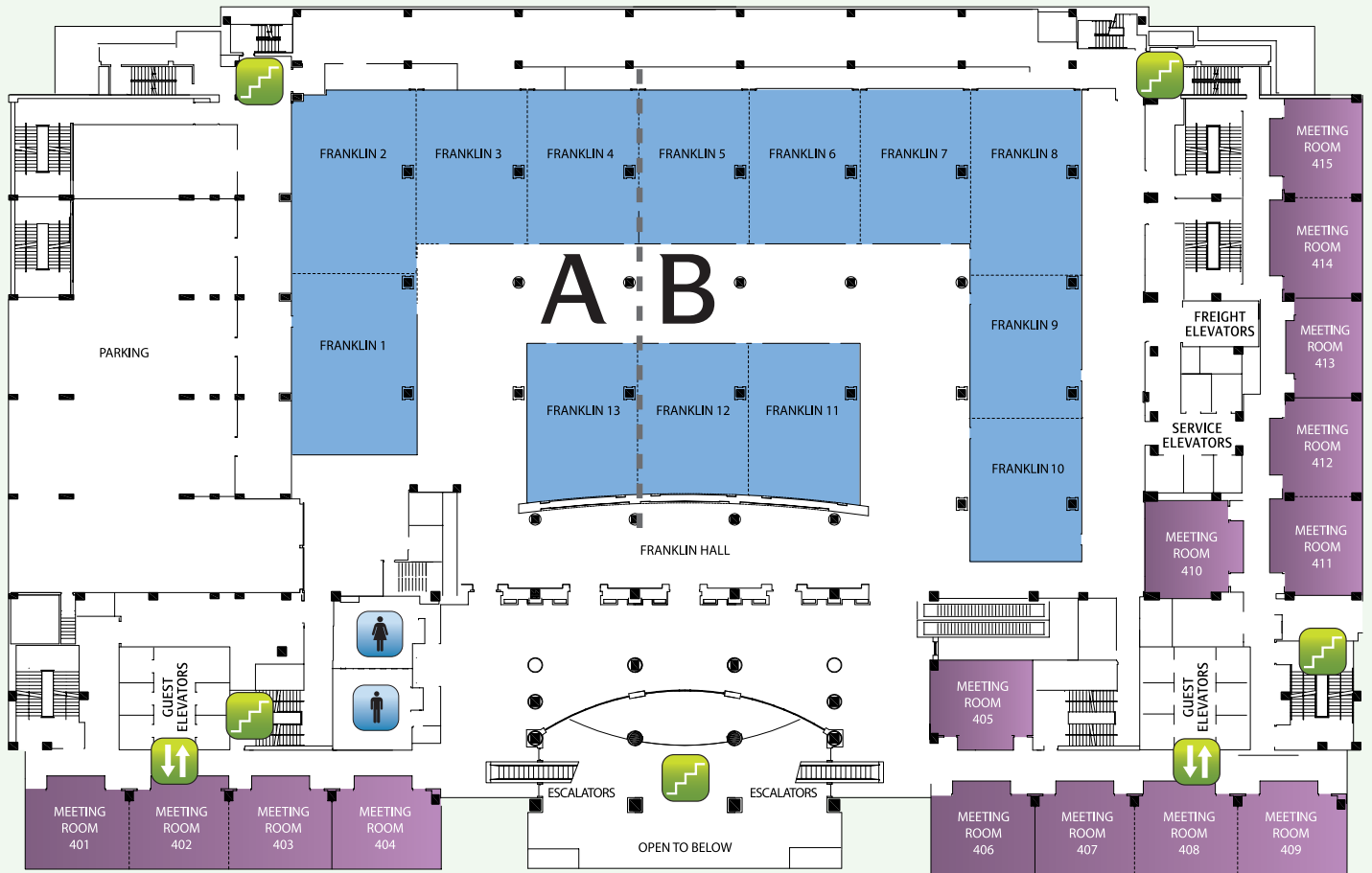
300 Level

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| Entrances | Back of House |
| Exhibit Halls | C Concession Stand |
| Meeting Rooms | D Dressing Rooms |
| Ballrooms | E Elevator |
| Shops | FE Freight Elevator |
| Public Areas | F Fire Hose Conne |
| Stair, Elevator, Escalator | R Restrooms |
| Loading Dock | T Ticket Offices |
| House Storage | Columns |
| Offices | Telephone |
| | Water Fountain |



Philadelphia Marriott Downtown



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NSTA Mission Statement

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

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All cities are subject to change pending final negotiation.

National Conferences on Science Education

- Nashville, Tennessee
March 31–April 3, 2016
- Los Angeles, California
March 30–April 2, 2017
- Atlanta, Georgia
March 15–18, 2018
- St. Louis, Missouri
April 11–14, 2019
- Boston, Massachusetts
March 26–29, 2020
- Chicago, Illinois
April 8–11, 2021

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

Area Conferences on Science Education

2015 Area Conference
Kansas City, Missouri—December 3–5

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

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

Share Your Ideas!

NSTA's CONFERENCES ON SCIENCE EDUCATION

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

5th Annual STEM Forum & Expo *hosted by NSTA*

Denver, CO July 27–29

Proposal Deadline:
1/15/2016

2016 Area Conferences

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

Proposal Deadline:
1/15/2016

2017 National Conference

Los Angeles, CA March 30–April 2

Proposal Deadline:
4/15/2016

To submit a proposal, visit

www.nsta.org/conferenceproposals



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the Stage:
Scientific
Literacy

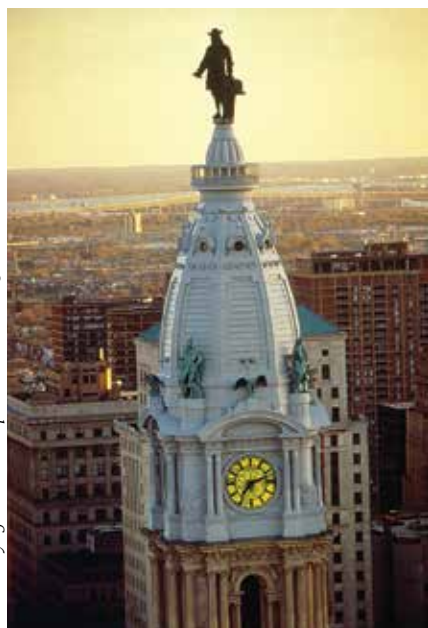
Building the Band:
Involving
Community
Stakeholders

Harmonizing
Concepts:
Integrating
Instruction

Stringing It
All Together:
Three-Dimensional
Learning

FOR INFORMATION AND UPDATES, VISIT,
www.nsta.org/nashville

NSTA National
Science
Teachers
Association



Courtesy of the Philadelphia Convention & Visitors Bureau

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 43 for details.

Thursday, November 12

8:00–9:00 AM	First-Timer Conference Attendees' Orientation	43
	(Welcome to Your First NSTA Conference)	
9:15–10:30 AM	General Session: Richard Alley.	46
11:00–11:05 AM	Ribbon Cutting Ceremony/Exhibits Opening	50
11:05 AM–5:00 PM	Exhibits (<i>Exclusive hours: 11:05 AM–12:30 PM</i>)	50
2:00–3:00 PM	Featured Presentation: Damon Bradley.	56
5:00–7:00 PM	An Evening of STEM, Energy, and Hip-Hop Presented by Master Scientist Grand Hank	69

Friday, November 13

8:00 AM–4:00 PM	Chemistry Day (For Grades 9–12)	28
8:00 AM–4:30 PM	Engineering Day.	29
8:00 AM–6:00 PM	Middle School Chemistry Day	28
8:00 AM–6:00 PM	Physics Day	30
9:00 AM–3:00 PM	Exhibits (<i>Exclusive hours: 12 Noon–2:00 PM</i>)	76
9:30–10:30 AM	Featured Presentation: Dennis Creedon	77
11:00 AM–12 Noon	Featured Presentation: Peter McLaren	83
12 Noon–12:45 PM	Meet the Presidents and Board/Council	90
2:00–3:00 PM	Featured Presentation: Chris Lehmann	92

Saturday, November 14

9:00 AM–12 Noon	Exhibits (<i>Exclusive hours: 10:30 AM–12 Noon</i>)	114
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Win a round-trip Southwest travel scholarship to the NSTA **Nashville** conference.

Thanks to the generosity of **Southwest Airlines**

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

During the conference, the drawings will be held at

- 4:00 PM, Thursday, Nov. 12
- 2:00 PM, Friday, Nov. 13

You must be present to win.

Stop by the NSTA Membership booth in the Exhibit Hall for all the details!



Southwest

NSTA National Science Teachers Association

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Each 8- to 10-minute video focuses on a single topic, lesson plans support activities and discussion. All can be downloaded or streamed FREE from our website:

www.sosq.vcu.edu.

2015 NSTA Area Conference in Philadelphia, PA

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212 views • 1 year ago



Rover Redefined - Pet Genetics
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Justice DNA -- Freeing the Innocent
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The Next Supermodel - Zebrafish
120 views • 1 year ago



From Slime to Sublime
109 views • 1 year ago



A Green Light for Biology -- Making the Invisible Visible
312 views • 1 year ago



Salt of the Earth -- Engineering Salt-tolerant Plants
872 views • 1 year ago



The Cloning Conflict -- Parkinson's Disease
288 views • 1 year ago



Bioethics -- Drawing the Line
836 views • 1 year ago



Xenografts -- Alternative Transplants
281 views • 1 year ago



The Secret of Life -- Discovery of DNA Structure
1,804 views • 1 year ago



Risk-taking Genes -- Genes, Environment, or Both?
1,118 views • 1 year ago



Avoiding Bottlenecks
1,873 views • 4 years ago



Beyond the Classroom: Connecting Students to Real ...
3,162 views • 5 years ago



A New Frontier: Systems Biology
20,191 views • 5 years ago



All in the Family: Genetics and Family Health History
7,044 views • 8 years ago

The Philadelphia 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.



Technology: Teaching Revolutionary Science in the Digital Age

Every day, students are spending countless hours engaged with digital technology outside of the classroom. Educational institutions have been slow to embrace the use of technology at the same rate that students are exposed to digital devices. This may create a disconnect between students' everyday life and educational experiences. We need to revolutionize the classroom culture by including the use of digital technology in innovative and creative ways. This change is evidenced by disruptive technologies that take root and drastically transform the way by which users connect, engage, and relate with the world.

By incorporating these technologies, teachers can design instructional experiences that stimulate and connect learning, allow opportunities for students to engage in real-world applications, and enhance critical-thinking skills.

This strand will address the challenges that teachers experience with utilizing digital technologies in the classroom as well as strategies for meeting and overcoming these challenges in order to achieve successful learning experiences.



Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction

The *Common Core State Standards* highlight the need for literacy at all grade levels in science and technical subjects. By integrating literacy skills in science, students are able to construct strong content knowledge, communicate effectively, and comprehend and critique scientific works. The utilization of literacy skills assists students in making meaning by reading, writing, speaking, and listening in science, especially when accompanied by direct investigation of scientific phenomena.

This strand will demonstrate how science supports literacy and literacy supports science, what strategies can be utilized that support common cognitive processes in literacy and science, and why teachers should incorporate best practices in literacy.



Revolutionizing Engineering for the Future

Engineering recognizes and defines problems posed around human needs and wants. Engineering solutions are designs that require the application of disciplinary core ideas (physical, life, Earth/environmental, space, engineering, and technology). By focusing on engineering, teachers can assist students with developing skills in critical thinking, creativity, and science and engineering practices. Developing engineering practices builds on student learning through actual experience and incorporates Problem-Based Learning or Project-Based Learning activities and connects students to the world around them.

This strand will provide participants with a deeper knowledge of the teaching and learning practices for the application of engineering (reflected in both the *NGSS* and/or state standards), as well as techniques and strategies to better infuse engineering concepts into the classroom.

Technology: Teaching Revolutionary Science in the Digital Age

Thursday, November 12

8:00–8:30 AM

Leveraging Technology to Provide Students with the Autonomy to Differentiate Their Own Learning

12:30–1:00 PM

Teaching Science Completely Online

2:00–3:00 PM

NASA's "Eyes on the Solar System": Bringing Planets into Your Classroom

3:30–4:30 PM

An Interactive Exploration of Hurricane-Associated Storm Surge Using Google Earth

5:00–5:30 PM

A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning

5:30–6:00 PM

Sustainability and Storytelling: iPads in the Outdoors

Friday, November 13

8:00–9:00 AM

Mitosis Lab Instruction Using Smartphones and Tablets

9:30–10:00 AM

Using the Cyberinfrastructure to Conduct Bioinformatics Research in Your Classroom

10:00–10:30 AM

Physics at the Philadelphia Museum of Art

11:00 AM–12 Noon

Science 2.0—Putting Web 2.0 into the Science Classroom

2:00–3:00 PM

Featured Presentation: Beyond Googling—Building the Conditions for Structured Inquiry (Speaker: Chris Lehmann)

3:30–4:30 PM

iPad: Realize Its Full Potential in Your Classroom!

5:00–5:30 PM

BioCONNECT (Biology and Cancer Online Education Connecting Teens)

5:30–6:00 PM

Bringing Medical Imaging into the Physics Classroom

Saturday, November 14

8:00–9:00 AM

Nature's Notebook: A Modern Spin on an Age-Old Process

9:30–10:30 AM

Forensic Science and Biology: Fun Forensic Inquiry Entomology Activities to Estimate Time of Death

Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction

Thursday, November 12

8:00–8:30 AM

Imagining Reading/Writing: Big Ideas and Literacy in the Chemistry Classroom

8:30–9:00 AM

Incorporating Informational Texts into High School Science

12:30–1:30 PM

Critical Thinking in Earth Science: Using the Model-Evidence Link Diagram

1:00–4:00 PM

SC-1: Meeting the CCSS and NGSS Through Outdoor Studies (Tickets required: \$50)

5:00–5:30 PM

Science Current Events Journals: Real Science and Media Literacy

5:00–6:00 PM

Infusing Literacy Strategies into Established State Science Prompts

Friday, November 13

8:00–9:00 AM

Chapter Books at the Crossroads of the NGSS and CCSS

9:30–10:30 AM

Featured Presentation: The Ever-Evolving Literacy Within the Sciences (Speaker: Dennis Creedon)

3:30–4:30 PM

Game On! Using Game Design to Engage Students in Natural Science and Literacy

Saturday, November 14

9:30–10:30 AM

Science Has Many Stories to Tell: NASA Literacy Resources for Your Students

Revolutionizing Engineering for the Future

Thursday, November 12

12:30–1:30 PM

This Efficient House

2:00–3:00 PM

Featured Presentation: Scientific Literacy and the Survival of Our Species
(Speaker: Damon Bradley)

3:30–4:30 PM

Teaching Engineering with the Staple Light Bulb Challenge

5:00–6:00 PM

STEM Full Circle

Friday, November 13

8:00–9:00 AM

En-gene-eering: An Engineering Design Challenge for Genetics

9:30–10:30 AM

Engineering Design

11:00 AM–12 Noon

Renewable Energy: Wind Power vs. Solar Power

2:00–3:00 PM

Whoa! Is It Windy?!? Engineering a Wind Detection Device

3:30–4:30 PM

Your Own Space Program: Engineering a Complete Rocket Launch/Flight/Analysis System from First Principles to Apogee

5:00–6:00 PM

Nanotechnology in the K–12 Classroom

Saturday, November 14

8:00–8:30 AM

Building Green: Designing Sustainable Solutions

9:30–10:30 AM

Understanding Car Crashes: Engineering Truly Impactful STEM Lessons



Join Master Scientist Grand Hank aka Tyraine Ragsdale Thursday night at 5:00 PM for An Evening of STEM, Energy, and Hip-Hop. See page 69 for details.

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, November 12

- 8:00–9:00 AM *It's Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12*
Solar Astronomy Experiences for the NGSS = Getting Ready for the Great American Eclipse
- 12:30–1:30 PM Teaching Science Through Integrating Children's Literature and Outdoor Investigations
- 2:00–3:00 PM *Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12*
- 3:30–4:30 PM Gardening with Books and Butterflies
- 5:00–6:00 PM Scientific Argumentation Classroom Activities

Friday, November 13

- 8:00–9:00 AM *Outdoor Science: A Practical Guide*
- 9:30–10:30 AM Teaching STEM Subjects to Students with Special Needs
- 2:00–3:00 PM NFTI Science: Building PD Upon the Foundation of an NSTA Press Book
- 3:30–4:30 PM *Teaching for Conceptual Understanding in Science—Building a Bridge Between Student Ideas and Scientific Concepts*

Saturday, November 14

- 9:30–10:30 AM *Earth Science Puzzles: Making Meaning from Data*

Meetings and Social Functions

Thursday, November 12

- PSTA Reception (*sponsored by the Pennsylvania Society for Biomedical Research*)
Franklin 3, Marriott..... 6:00–7:30 PM

Saturday, November 14

- Pennsylvania Earth Science Teachers Association (PAESTA) Annual Meeting
Preregistration required.
113A, Conv. Center 1:30–4:00 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, November 13, 8:00 AM–4:00 PM
Franklin 2, Marriott*

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

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

8:00–10:00 AM	Energy in Chemistry: A Macroscopic View
11:00 AM–1:00 PM	Energy in Chemistry: A Particulate View
2:00–4:00 PM	Energy in Chemistry: An Atomic View

Middle School Chemistry Day

Sponsored by the American Chemical Society

Middle School Chemistry— Big Ideas About the Very Small

*Friday, November 13, 8:00 AM–6:00 PM
Franklin 3, Marriott*

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

8:00–9:00 AM	Matter—Solids, Liquids, and Gases
9:30–10:30 AM	Changes of State—Evaporation and Condensation
11:00 AM–12 Noon	Density—A Molecular View
2:00–3:00 PM	The Periodic Table, Energy Levels, and Bonding
3:30–4:30 PM	Polarity of the Water Molecule and Its Consequences
5:00–6:00 PM	Chemical Change—Breaking and Making Bonds



Engineering Day at NSTA

Sponsored by the American Society for Engineering Education

Friday, November 13, 8:00 AM–4:30 PM
113 C, Convention Center

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 **Introducing Engineering to Elementary School**

9:30–10:30 AM **ASEE’s K–12 Outreach Program, eGFI: Engineering, Go For It! and TeachEngineering.org**

11:00 AM–12 Noon **Climate Change of a Different Nature—Carbon Capture Redesign in Biology**

2:00–3:00 PM **SENSE IT: Student-Constructed Water Quality Sensors**

3:30–4:30 PM **Teachers as Designers: Scaling and Designing Engineering Activities**

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REECHA PANDYA BioSci'15



Physics Day at NSTA

Sponsored by the American Association of Physics Teachers (AAPT) and the Southeast Pennsylvania Section of AAPT

Friday, November 13, 8:00 AM–6:00 PM
411/412, Marriott

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 Philadelphia is being organized by the Southeast Pennsylvania Section of the American Association of Physics Teachers.

8:00–8:30 AM	Problem Solving with Pi/Algebra/Physics	2:00–2:30 PM	Science Adventure
8:30–9:00 AM	Function for Force	2:30–3:00 PM	Five Laws of Physics in Five Seconds of Data Collection
9:30–10:00 AM	Perception and Reality	3:30–4:00 PM	Prediction in Physics
10:00–10:30 AM	Rolling Demonstrations	4:00–4:30 PM	Plane Physics
11:00 AM–12 Noon	Calculator Robots in Physics	5:00–6:00 PM	Expanding Universe



Need help navigating?

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

- **First-Timer Attendee Session • Thursday, November 12, 8:00–9:00 AM**
103 B/C, Pennsylvania Convention Center





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at University of the Sciences still sees chemistry as an experimental science. That is why our chemistry programs offer students the opportunity to choose from more than 20 experimental courses, to perform independent research as early as their first year, and to be a part of more than 60% of alumni who advance to graduate or professional schools. Through their research experience, ALL of our students contribute to scientific discovery and innovation. Our unique pharmaceutical chemistry program is positioned geographically, historically, and collaboratively for cutting-edge drug innovation. So our graduates are prepared to join the ranks of USciences alumni who are proven everywhere.

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Chemistry

Biochemistry

Pharmaceutical Chemistry


USciences
University of the Sciences

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.



Meeting the CCSS and NGSS Through Outdoor Studies (SC-1)

Bill Klein, Western Iowa Tech Community College, Sioux City
 Science Focus: LS
 Level: Grades 5–College
 Date: Thursday, November 12, 1:00–4:00 PM
 Location: Franklin 1, Marriott
 Ticket Price: \$50

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

Argumentation in the Secondary Classroom (SC-2)

Ellen Granger (granger@bio.fsu.edu) and **Todd Bevis** (bevis@bio.fsu.edu), Florida State University, Tallahassee
 Science Focus: GEN, SEP
 Level: Grades 6–College
 Date: Thursday, November 12, 1:00–4:30 PM
 Location: Franklin 8, Marriott
 Ticket Price: \$25

This short course will explore argumentation and argument-driven inquiry (ADI) as a new type of lab instruction for the science classroom. ADI provides a more authentic lab



Courtesy of Ellen Granger

Students record their Claim/Evidence/Reasoning on a whiteboard for a formal argumentation session (SC-2).

instruction while giving students the opportunity to engage in the practices of science, such as scientific thinking. Participants will experience an ADI activity and then examine it as a teaching practice. They will also explore how to scaffold argumentation activities for their students as they begin to introduce this practice into their classrooms. Argumentation encompasses all three dimensions (disciplinary core ideas, practices of science, and crosscutting concepts) of the NGSS. Bring materials to record notes and ideas.

Phenomenon-Based Learning: Fun, Hands-On Cooperative Learning of Science and ELA (SC-3)

Matt Bobrowsky (@DrMattB; matt@msb-science.com; mbobrowsky@desu.edu), Delaware State University, Dover
 Science Focus: ETS2, PS1.A, PS2, PS3.B, PS3.C, PS4.A, PS4.B, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP
 Level: Grades 3–College
 Date: Friday, November 13, 2:00–6:00 PM
 Location: 415, Marriott
 Ticket Price: \$80

Experience the kind of learning that propelled Finland to international leadership in education—not by memorizing facts but by using scientific exploration, discovery, and literacy. Phenomenon-Based Learning (PBL) promotes both science practices and content knowledge, while also developing literacy skills. With PBL, you teach broader concepts and useful thinking and performance skills (as with the NGSS and CCSS) rather than asking students to simply memorize facts and formulas. Participants will engage in hands-on activities and will leave with a copy of one of the NSTA Press® PBL books along with one or two of the fascinating gizmos that go with the book.

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

NSTA 2015 Philadelphia Area Conference Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the Philadelphia conference. Sessions/events such as exhibit hall visits may not be available for online evaluation. However, these events still qualify for professional development.

Beginning December 8, 2015, Philadelphia transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your Philadelphia Badge ID# and then clicking “My Profile” under the Welcome. Here you’ll find a “Certificates” tab, which you can use to access your transcript. Keep this form and use it to add the following activities to your Philadelphia 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 Philadelphia session browser: www.nsta.org/phillybrowser. You will need your badge number to evaluate sessions. See page 12 of the program for instructions. *Note: Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them. **And don’t forget, the more sessions you attend and evaluate, the more chances you have to win an Apple iPad mini 2!***

Sample Questions:

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ol style="list-style-type: none"> I. I selected this session: <ol style="list-style-type: none"> a. for immediate classroom use. b. based on the reputation of the speaker. c. to improve my personal pedagogical knowledge/skill. d. to improve my science content knowledge. | <ol style="list-style-type: none"> 2. The session met my needs. 3. The information presented was clear and well organized. 4. Safe practices were employed. 5. The session avoided commercial solicitation
(n/a for exhibitor workshops and NSTA Press® sessions). 6. The session should be repeated at another NSTA conference. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Sample Responses:

1=Strongly Agree 2=Agree 3=Neutral 4=Disagree 5=Strongly Disagree

Thursday, November 12 8:00 AM–7:00 PM

Start Time	End Time	Activity/Event Title
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We’re giving an Apple iPad mini 2 to one lucky attendee who evaluates sessions that he or she attends. The more sessions you attend and evaluate, the more chances you have to win!

Friday, November 13 8:00 AM–6:00 PM

Start Time	End Time	Activity/Event Title
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Saturday, November 14 8:00 AM–4:00 PM

Start Time	End Time	Activity/Event Title
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Free Hands-On Workshops

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8:00 – 9:00 am	Integrating Chromebook™ with Vernier Technology
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11:00 am – 12:00 pm	Biology with Vernier
12:30 – 1:30 pm	Integrating Chromebook™ with Vernier Technology
2:00 – 3:00 pm	Integrating iPad® with Vernier Technology
3:30 – 4:30 pm	Physics and Physical Science with Vernier

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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 Convention Center, 12th Street Tunnel, near the northwest corner of 12th and Arch streets, 15 minutes prior to departure time.



T-2: Dinosaurs, Butterflies, Mummies, and Reptiles: Visit One of America's Oldest Natural History Museums

—Photo courtesy of Nic D'Amico / The Academy of Natural Sciences of Drexel University

Urban Wildlife Refuge

\$27

#T-1 Thurs., Nov. 12 12:30–3:30 PM

John Heinz National Wildlife Refuge at Tinicum is America's first urban refuge and was established in 1972 for the purpose of preserving, restoring, and developing the natural area known as Tinicum Marsh. The refuge is a green respite nestled within the urban setting of the city of Philadelphia. Refuge lands are a thriving sanctuary teeming with a rich diversity of fish, wildlife, and plants native to the Delaware Estuary.

Participants will hike on refuge trails with a walk leader identifying plants and animals, and learn the history of the location with an emphasis on its urban setting. A discussion of the careers available at a wildlife refuge, and a tour of the visitor's center award-winning green features will be included. The refuge EE specialist will be on hand to discuss the urban EE program and the variety of resources that are available to teachers.

Note: Must be able to walk considerable distances. Be sure to wear comfortable hiking shoes and dress for being outdoors.

Dinosaurs, Butterflies, Mummies, and Reptiles: Visit One of America's Oldest Natural History Museums

\$40

#T-2 Thurs., Nov. 12 12:45–3:15 PM

Founded in 1812, the Academy of Natural Sciences of Drexel University is a leading natural history museum dedicated to advancing research, education, and public engagement in biodiversity and environmental science. Visitors to the Academy have the opportunity to get face-to-face with towering dinosaurs, meet live animals, and explore a tropical garden filled with live butterflies. Philadelphia's natural history museum offers surprises for all ages, from changing interactive science exhibits to a children's discovery center, a fossil dig, and opportunities to interact with real science experts.

The Academy's working scientists spend their days focusing on critical global issues in biodiversity, evolution, and environmental science.

Participants will visit Dinosaur Hall, see dioramas showcasing animals indigenous to North America, Africa, and Asia, see a real Mummy in Egyptian Hall, visit a live butterfly garden and the Outside In, a children's nature museum, as well as view the newest exhibit—*Reptiles: The Beautiful and the Deadly*. For more information, visit www.ansp.org.

Visit a 19th-Century Victorian Natural History Museum

\$47

#T-3 Thurs., Nov. 12 12:45–3:15 PM

The Wagner Free Institute of Science is a Victorian natural history museum and educational institution dedicated to providing free public education in science. Participants will visit the Wagner's 19th-century exhibit hall that houses a unique collection of specimens, including fossils, rocks, minerals, mollusks, insects, skeletons, and taxidermy. A highlight is the Saber-Toothed Cat Type Fossil, discovered in 1866 on a Wagner-sponsored expedition to Florida. William Wagner, the Institute's founder along with curators and faculty, gathered the collection during the 19th century.

The Wagner is a National Historic Landmark, and the exhibit is one of the largest systematically arranged collections on display in America.

This two-hour guided tour will include a presentation in the historic lecture hall, highlights of the building and collections, and time to explore the museum gallery with light refreshments provided. For more information, visit www.wagnerfreeinstitute.org.

Note: The exhibit hall is on the second floor of the building, so stairs are unavoidable at the Wagner. Photography is also prohibited.

Visit to Fairmount Water Works, America’s First Major Urban Water Supply System
\$23

#F-1 Fri., Nov. 13 9:45–11:45 AM

Situated on the east bank of the Schuylkill River between historic Boat House Row and the Philadelphia Museum of Art, the Fairmount Water Works opened its doors in 1815 as the nation’s first major urban water supply system. The Fairmount Water Works is a National Historic Landmark, a Civil Engineering Landmark, and a National Mechanical Engineering Landmark, and was designed and constructed to provide safe clean drinking water to a city on the cusp of remarkable growth.

Participants will learn about the new three-year watershed curriculum project, take a tour of the facility, including the lab and go behind the scenes for a tour of the pool area and other areas not accessible to the general public.

In 1909, the Water Works was decommissioned as a pumping station when the city moved to sand filtration for purification in response to industrial development and the resulting detrimental impact on the region’s water quality. Now the FWW has become the region’s premier urban environmental education destination and is recognized by the Pennsylvania Department of Environmental Protection as The Delaware River Basin’s Official Watershed Education Center and Gateway Center for the Schuylkill River National and State Heritage Area.

Note: Be sure to wear comfortable shoes for walking.

University of the Sciences: Where Health Care and Science Converge
\$10

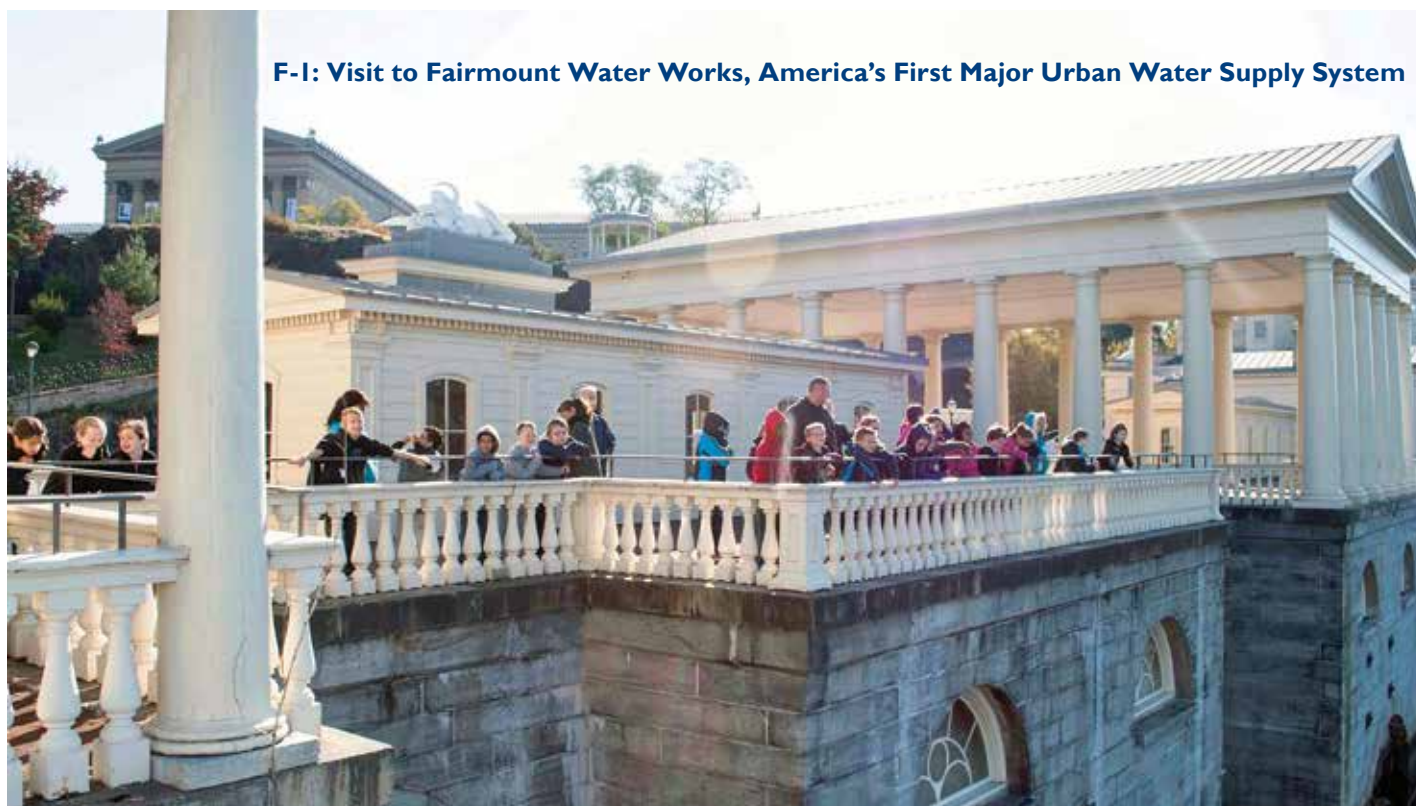
#F-2 Fri., Nov. 13 10:15 AM–3:30 PM

The mission of University of the Sciences in Philadelphia is to educate students to become leaders and innovators in the sciences, the health professions, and emerging related disciplines. Founded as the Philadelphia College of Pharmacy and the first of its kind in the Western Hemisphere, USciences provides the educational foundation for science-interested students to pursue a career in science or health care.

We invite you to join us on our campus for lunch and to tour our research and education facilities, see our research instrumentation in action, and hear about the programs and majors we offer—both at the undergraduate and graduate levels, as well as receive a \$10 Amazon gift card. You will hear about our many direct-entry and early assurance programs and find out firsthand how to help your science-focused students navigate the admission process.

Participants will then visit a variety of laboratories to see and use a wide range of sophisticated laboratory equipment (high-end microscopy, NMR, Mass-Spec, and more) and learn about undergraduate research opportunities at the University of the Sciences. Not only will you learn more about us, but we also look forward to providing you with lessons to take home and try in your schools.

NSTA wishes to thank the University of Sciences in Philadelphia for the complimentary lunch. Please let the facility know of any



F-1: Visit to Fairmount Water Works, America’s First Major Urban Water Supply System

—Photo courtesy of ©Fairmount Water Works

dietary restrictions for the lunch prior to arrival.

Note: Participants will be taking local transit. Be sure to wear comfortable walking shoes that are closed-toed for safety.

Storm Water Management: How the Natural and Human-Made Environments Interact **\$48**

#F-3 Fri., Nov. 13 12 Noon–4:45 PM

This educational trip has three parts: a nature walk, an indoor lecture, and a tour of several sites' storm water projects. First, participants will visit Tacony Creek Park and take a stream-monitoring walk, relating water quality to what is going on in the surrounding landscape. Participants will do stream monitoring, such as collecting algae, determining dissolved oxygen, determining how fast the creek is flowing, and other water chemistry tests.

After the stream-monitoring walk, the group will meet inside Friends Hospital (which is located just steps away from the creek) to learn more about storm water runoff, invasive plants, macro-invertebrates, wasteful water usage and riparian buffers, and local agencies working with watershed education. Participants will learn firsthand about the Green City Clean Waters program while visiting the facilities. Green City Clean Waters is a 25-year plan to transform the health of the city's creeks and rivers primarily through a land-based approach.

Then participants will board the bus to visit "The Big Green Block," a coalition of local nonprofits and community groups working on storm water projects that are designed to manage runoff in an urban setting, including Kensington High School of Creative and Performing Arts, the only platinum LEED-certified public school in the nation.

Note: Wear waterproof boots! We will be getting into the (shallow) stream to do stream monitoring and learn what an environmentalist does. We will be outside for about an hour. Dress for the weather. The second venue is a walk around a unique city block. The trip will take place rain or shine.

Learn About Climate Change at One of America's Oldest Science Museums **\$40**

#F-4 Fri., Nov. 13 12:45–3:45 PM

Founded in honor of America's first scientist, Benjamin Franklin, The Franklin Institute is one of the oldest and premier centers of science education and development in the country. Today, the Institute continues its dedication to public education and creating a passion for science by offering new and exciting access to science and technology in ways that would dazzle and delight its namesake.

The trip includes a private tour of the *Changing Earth* exhibit, led by The Franklin Institute's environmental scientist Raluca Ellis.

T-1: Urban Wildlife Refuge



—Photo courtesy of the U.S. Fish and Wildlife Service

Attendees will get a chance to try out the 20+ interactive activities in the exhibit, and learn about the way our Earth has always been changing, and the role that humans play within it. Participants will also take part in a 40-minute hands-on workshop developed for the Climate & Urban Systems Partnership that explores community-level solutions to local climate change impacts. The trip will conclude with a discussion of best practices for bringing the content and strategies presented throughout the workshop into the classroom. For more information, visit www.cuspproject.org and www.fi.edu.

Association for Multicultural Science Education (AMSE)

President: Robert Ferguson

Friday, November 13

3:30–5:00 PM	How Venice Is Confronting Relative Sea Level Rise with Engineering	Franklin 8, Marriott
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Association for Science Teacher Education (ASTE)

President: Lisa Martin–Hansen

Friday, November 13

3:30–4:00 PM	Issues in Science Education: A Global Perspective	Franklin 10, Marriott
4:00–4:30 PM	Connecting Communication and Integrated Science Models	Franklin 10, Marriott
5:00–6:00 PM	Science and Literacy—The 50-Cent Microscope/Foldscope	Franklin 10, Marriott

Council for Elementary Science International (CESI)

President: James T. McDonald

Friday, November 13

9:30–10:30 AM	From Explanation to Explanation and Reasoning	202A, Conv. Center
5:00–6:00 PM	Elementary Science Share-a-Thon	103 B/C, Conv. Center

Council of State Science Supervisors (CSSS)

President: Matt Krehbiel

Friday, November 13

2:00–2:30 PM	Presidential Awards for Excellence in Mathematics and Science Teaching	Franklin 10, Marriott
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Saturday, November 14

8:00–9:30 AM	Direction of Science Education in Pennsylvania	304/VIP, Conv. Center
10:00–11:30 AM	Direction of Science Education in Pennsylvania	304/VIP, Conv. Center

Conference Program • Affiliate Sessions

National Association for Research in Science Teaching (NARST)

President: Mary M. Atwater

Thursday, November 12

12:30–1:30 PM	Teaching Environmental Sustainability Using a Place-Based Watershed Modeling Application	Franklin 10, Marriott
2:00–3:00 PM	Measuring the Effectiveness of Teaching Interventions Aimed at Supporting Students' Analogical Reasoning Around Physical Models	Franklin 10, Marriott

National Middle Level Science Teachers Association (NMLSTA)

President: Diana Cost

Thursday, November 12

5:00–6:00 PM	Science and Special Education—Working Together	Franklin 10, Marriott
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Friday, November 13

11:00 AM–12 Noon	Increasing Student Engagement and Understanding Through Science Notebooks	Franklin 4, Marriott
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National Science Education Leadership Association (NSELA)

President: Elizabeth Mulkerrin

Friday, November 13

9:30–10:30 AM	Tools for Science Leaders, Part 1	Franklin 10, Marriott
11:00 AM–12 Noon	Tools for Science Leaders, Part 2	Franklin 10, Marriott

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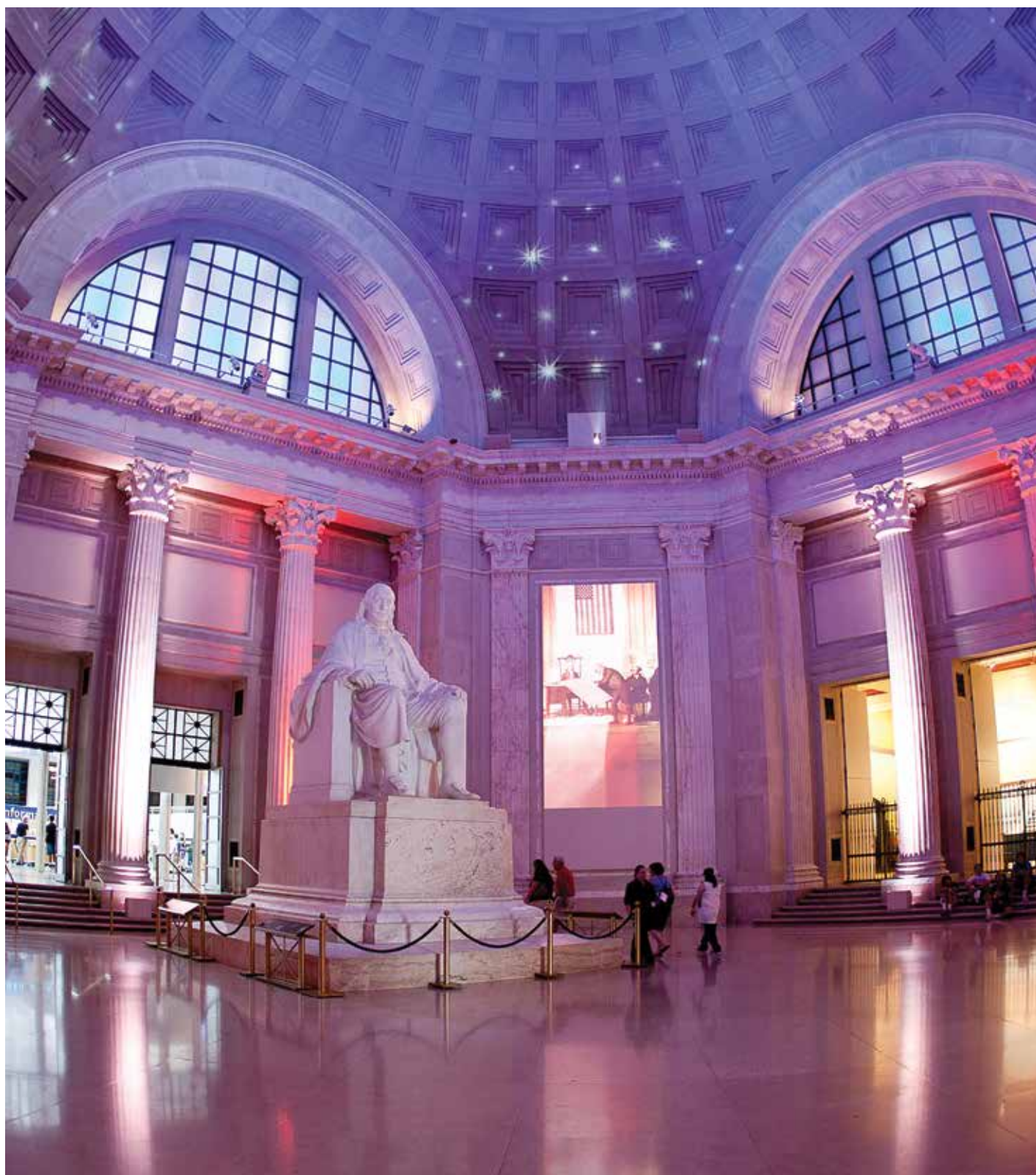
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—Photo courtesy of Paul Loftland/Philadelphia Convention & Visitors Bureau

In the rotunda of The Franklin Institute stands a 20-foot statue of inventor, statesman, and autodidact, Benjamin Franklin. See page 8 for information about a special offer from The Franklin Institute.

8:00–8:30 AM Presentations

Global Online Mentoring of Medical Science Students: A Feasibility Study

(College) 406, Marriott

Science Focus: LS, SEP8

Margaret Reece (mreece@centralny.twcbc.com), Reece Bio-medical Consulting LLC, Manlius, N.Y.

Can gatekeeper courses like human anatomy and physiology achieve higher success rates by undergraduate mentoring through websites with organic traffic?

Measuring Science Attitudes and Knowledge in Informal Settings

(Grades 3–9, College) 408, Marriott

Science Focus: INF

Andrea Drewes (adrewes@udel.edu), University of Delaware, Newark

Hear about successes and challenges of evaluation in informal science settings and gain ideas for how evaluation of learning may enhance your work as an informal science educator.



Leveraging Technology to Provide Students with the Autonomy to Differentiate Their Own Learning

(Grades 9–College) 411/412, Marriott

Science Focus: GEN, SEP

Kevin Quinn (kquinn85@gmail.com), Malvern Preparatory School, Malvern, Pa.

Educators have been told to differentiate instruction for years. Current technology can be used to put differentiated learning directly in the hands of students.



Imagining Reading/Writing: Big Ideas and Literacy in the Chemistry Classroom

(Grades 6–12) Franklin 11, Marriott

Science Focus: PS1.A, SEP4, SEP6, SEP7, SEP8

Joy Barnes-Johnson (@DrJoyBJo; drjoybjohnson@gmail.com), Princeton High School, Princeton, N.J.

In an age of “twitteracy,” shifts in instruction demand new pedagogies. Informational texts engage content reading and writing. Examples of NGSS–CCSS principle convergence will be shared.

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 145, 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

Glossary

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

Strands

The Philadelphia 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.



Technology: Teaching Revolutionary Science in the Digital Age



Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction



Revolutionizing Engineering for the Future

The following icon will be used throughout this program.



NSTA Press sessions

8:00–9:00 AM Presentations

Engaging and Nurturing the Curiosity of Young Children with Everyday Science That Surrounds Them

(Grades P–3)

202B, Convention Center

Science Focus: GEN, NGSS

Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.

Find out how to use everyday examples of science that comprise a young child’s world to create rich and engaging instruction and motivate students. Come learn how to get your students to observe, question, investigate, think, and talk about science.

Incorporating Ethics in STEM Education

(Grades 8–College)

403, Marriott

Science Focus: GEN

Terry Maksymowych (tmaksymowych@ndapa.org), Academy of Notre Dame de Namur, Villanova, Pa.

Hear how the study of STEM ethics can improve a student’s skills in critical thinking, problem solving, and scientific argumentation. New technologies require a knowledge of and respect for ethical codes of conduct.

Let’s Put the Fun Back in Fungi

(Grades 4–8)

404, Marriott

Science Focus: LS

Joan Gillman (joan.gillman@calhoun.org), The Calhoun School, New York, N.Y.

Cultivate new learning in your classroom with an innovative interdisciplinary unit around the topic of fungi. Handouts will be distributed, and student work will be showcased.

Sim City in the Real World: Modeling YOUR Neighborhood Environment

(Grades 6–College)

407, Marriott

Science Focus: ESS, SEP

Nanette Marcum-Dietrich (ndietrich@millersville.edu), Millersville University of Pennsylvania, Millersville

Carolyn Staudt ([@cjstaudt](mailto:cjstaudt); carolyn@concord.org), The Concord Consortium, Concord, Mass.

Melinda Daniels (mdaniels@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

Funded by NSF, this revolutionary and easy-to-use free online application let’s you explore, modify, and test the environmental conditions in YOUR neighborhood using real data.

Polymer Food Chemistry: Have Fun with Polymer Chemistry by Making Mountain DewViar

(Grades 4–12)

414, Marriott

Science Focus: PS, SEP

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

Polymers are found all around us. We will look at various myths people have about cooking and share how some of the “new techniques” of molecular gastronomy are done and how to create one in the classroom. Take home a CD with information.

NASA’s High-Energy Vision: Chandra and the X-Ray Universe

(Grades 6–College)

Franklin 2, Marriott

Science Focus: ESS1, ETS2, PS4.B, PS4.C

Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz.

From the Milky Way Galaxy to the outer limits of space-time, Chandra discoveries have significantly altered knowledge of black holes, pulsars, supernovas, and the universe.

A “Flipped” Classroom

(Grades 9–12)

Franklin 5, Marriott

Science Focus: GEN

Erin Pence (epence@wdeptford.k12.nj.us), West Deptford High School, Westville, N.J.

Sick of lecturing daily? Tired of kids not knowing how to do a homework problem, so just not doing it? Flip your classroom!

Overcoming Misconceptions in Evolution by Using Claims, Evidence, and Reasoning

(Grades 6–10)

Franklin 9, Marriott

Science Focus: LS3, LS4, CCC2, CCC7, SEP7

Greg Bartus (gregory.bartus@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Danielle Gianelos (@dgianelos; rlb723@aol.com), Howell Middle School South, Howell, N.J.

Student groups are given a claim regarding evolution and then are challenged to use evidence to argue in support of or to refute the claim.

The NGSS@NSTA Hub*(General)**Franklin 10, Marriott*

Science Focus: GEN, NGSS

Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.

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

Discover the NGSS: An Interactive Exploration of the Next Generation Science Standards*(Grades K–12)**Franklin 13, Marriott*

Science Focus: GEN, NGSS

Leisa Clark (lclark@nsta.org), Director/Producer of e-Learning Production, NSTA, Arlington, Va.

Come learn how to put the pieces of the NGSS together with help from NSTA's interactive e-book on the standards, *Discover the NGSS: Primer and Unit Planner*. The first 25 attendees receive free copies of this Enhanced E-book.

8:00–9:00 AM Hands-On Workshops**Welcome to Your First NSTA Conference***(General)**103 B/C, Convention Center*

Science Focus: GEN

NSTA Board and Council

This session is for conference first-timers and those who haven't come for a while. You'll explore the program, the conference app, and NSTA's supporting resources. The program is long and the opportunities amazing! Join us for tips on navigating. You'll also have a chance to meet your District Director, plus there will be door prizes!

NSTA Press® Session: It's Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12*(Grades K–12)**113B, Convention Center*

Science Focus: GEN, SEP4, SEP7

Sami Kahn (skahn@collegiateschool.org), Collegiate School, New York, N.Y.

During this interactive workshop, participants will model the use of controversial societal issues related to science to develop their students' scientific literacy.

Flinn Workshops

- **Fantastic Physical Science Demonstrations**

Thursday, November 12, 9:30 am – 10:30 am**Pennsylvania Convention Center, Room 109 A/B**

- **AP Physics 1 Advanced Inquiry Investigations**

Thursday, November 12, 2:00 pm – 3:00 pm**Pennsylvania Convention Center, Room 109 A/B**

- **Flinn Scientific Resources Prepare Students for AP Chemistry Success**

Friday, November 13, 8:00 am – 9:00 am**Pennsylvania Convention Center, Room 109 A/B**

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Visit Us in Booth #1501**“Flinn is Fantastic! Your workshops are the BEST!”***- Amy Mealing, Davidson Fine Arts Magnet School, Augusta, GA*

Design Thinking and Balloons Over Broadway

(Grades 1–4) 113C, Convention Center

Science Focus: GEN, SEP2, SEP6

Kimberly Mechling (mehlingk@theellisschool.org), **Terri Wilson** (wilsons@theellisschool.org), and **Petra Obley** (obleyp@theellisschool.org), The Ellis School, Pittsburgh, Pa.

Looking for ways to integrate science, literacy, and math? Hands-on challenges will focus on living in space, alternative energy sources, and the Macy's Day Parade!

STEM Is Elementary: Engaging Students with Engineering Investigations

(Grades K–5) 202A, Convention Center

Science Focus: ETS, SEP

Terri George (terrigeorge1@gmail.com), Metro RESA, Smyrna, Ga.

Through hands-on investigations, every K–5 student can participate in STEM engineering investigations that support the CCSS and NGSS!

Inquiry in Action: Identify Liquids by Their Physical Properties

(Grades 3–8) 401/402, Marriott

Science Focus: PS, CCC1, SEP1, SEP2, SEP3, SEP6

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

Conduct simple tests on four identical-looking household liquids to tell them apart. Videos model observations on the molecular level. Instructions and videos are free at www.inquiryinaction.org.

Using Web-Based and General Media Articles to Teach Critical Thinking of Science Content

(Grades 8–College) Franklin 4, Marriott

Science Focus: GEN, CCC, SEP

Margie Turrin, Lamont-Doherty Earth Observatory, Palisades, N.Y.

The media and web are filled with articles on every topic of science, and yet much is without scientific merit. Use these tools to teach critical analysis of the presented science.

NSTA Press® Session: Solar Astronomy Experiences for the NGSS = Getting Ready for the Great American Eclipse

(Grades 5–8)

Franklin 6, Marriott

Science Focus: ESS1.A, ESS1.B, CCC, SEP

Dennis Schatz (schatz@pacsci.org), NSTA Director, Informal Science, and Pacific Science Center, Seattle, Wash.

NSTA will soon publish a solar astronomy curriculum guide that supports NGSS instruction and can help prepare teachers and students for the 2017 total eclipse of the Sun. Come explore these learning experiences.

Microgravity in the Classroom: Bringing Out-of-This-World Concepts to Your Students

(Grades 6–10)

Franklin 7, Marriott

Science Focus: ESS

Meredith Swartzendruber (mlswartzendruber@gmail.com), Everett Meredith Middle School, Middletown, Del.

Have your students get a better grasp of microgravity as they work with toys in 1g and compare how the toys will function in weightlessness. Also, find out how your school can send a student experiment up to the International Space Station!

8:00–9:00 AM Exhibitor Workshops

Archaea and the Three Domains: Classification of Life for Middle School

(Grades 6–8) 104 A/B, Convention Center

Science Focus: LS

Sponsor: Delta Education/School Specialty Science–FOSS

Virginia Reid and **Jessica Penchos**, The Lawrence Hall of Science, University of California, Berkeley

Are you most like *E. coli* bacteria, Yellowstone extremophile archaea, or bread mold? Explore cell structures and current classification. Take home a set of student materials, overview instructional strategies for reading and science practices, and preview online activities and NGSS connections in the revised FOSS Diversity of Life Course.

Earth Science for Our Next Generation of Very Young Scientists

(Grades K–2)

105 A/B, Convention Center

Science Focus: ESS

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, FOSS, Midway, Ky.

Teaching science to early elementary students can be challenging. Delta Education helps make it easier by using Delta Science Modules and their corresponding content readers. In this workshop, you will cover weather, sky, sunshine, and shadows and the connections to the NGSS performance expectations.

CPO's Link™ Chemistry Models: Fun with Atom Building and the Periodic Table

(Grades 6–12) 107 A/B, Convention Center

Science Focus: PS

Sponsor: CPO Science/School Specialty Science

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

CPO's new Link Chemistry Models module is a STEM- and NGSS-based approach that lets students experience innovative activities to learn atomic structure and the periodic table. We'll use an experience-based learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity.

Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs

(Grades 6–12) 108A, Convention Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your instruction of mammalian structure and function with a real classroom autopsy! Participants dissect a Carolina's Perfect Solution pig by modeling the protocols of a forensic pathologist. Free materials and door prizes!

Gas Exchange

(Grades 6–8) 108B, Convention Center

Science Focus: LS1

Sponsor: LAB-AIDS®, Inc.

Deborah LaSala, Ridgefield Academy, Ridgefield, Conn. Students have many misconceptions about respiration. In this activity from the SEPUP middle level life science program, use an acid-base indicator to determine the relative amount of CO₂ gas in a sample of your exhaled breath and then consider differences in individual response, explore qualitative vs. quantitative measures, and examine the structure of the lungs and their role in the process of respiration.

8:30–9:00 AM Presentations

Incorporating Informational Texts into High School Science

(Grades 9–11)

Franklin 11, Marriott

Science Focus: GEN, SEP7, SEP8

Kathryn Scantlebury (kscantle@udel.edu) and **Susan Gleason** (sglea@udel.edu), University of Delaware, Newark
The NGSS and CCSS emphasize the need for students to read and interpret informational text. Discussion centers on how high school science teachers can produce text sets and incorporate literacy strategies into their science teaching.

Technology as a Tool: Increasing Engagement in Science Classrooms

(Grades 6–8)

Franklin 12, Marriott

Science Focus: GEN **CANCELED**
Ashley Bradley, Bertie Middle School, Windsor, N.C.
Get strategies that will make science learning stick. Leave with a wealth of tech tools to increase student engagement.



9:15–10:30 AM General Session

Good News on Energy and the Environment: The Fruits of STEM Education

(General)

Ballroom B, Convention Center

Science Focus: LS, PS



Richard Alley (*rba6@psu.edu*), Penn State, University Park, Pa.

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

Platform Guests: Richard B. Alley; Carolyn Hayes; Juliana Texley, NSTA Retiring President, and Science

Writer/Instructor, Boca Raton, Fla.; Mary Gromko, NSTA President-Elect, Colorado Springs, Colo.; Donald E. Kline, President, Pennsylvania Science Teachers Association, Program Strand Representative, NSTA Philadelphia Area Conference, and Associate Professor Emeritus, Lebanon Valley College, Annville, Pa.; Ambra Hook, Chairperson, NSTA Philadelphia Area Conference; and Hill Freedman World Academy, Philadelphia, Pa.; Christine Anne Royce, Program Coordinator, NSTA Philadelphia Area Conference; and Shippensburg University, Shippensburg, Pa.; Margaret (Peg) Monahan, Local Arrangements Coordinator, NSTA Philadelphia Area Conference; and School District of Philadelphia, Pa.; Mary Loesing, NSTA Director, District IV, and Connetquot Central School District, Bohemia, N.Y.; David L. Evans, NSTA Executive Director, Arlington, Va.

A few million hunter-gatherers may have overpopulated Earth, but we now are a few billion grower-builder-learner-teachers. Our well-being relies heavily on energy and we remain hunter-gatherers of this energy, with almost 85% from the fossil fuels we find, which we are burning about a million times faster than nature saved them for us. Fortunately, we now have the know-how to farm energy sustainably, building an economically favorable system supplying much more energy than we now use.

Richard Alley is Evan Pugh Professor of Geosciences and associate of the Earth and Environmental Systems Institute at Penn State. He has traveled from Antarctica to Greenland to help learn the history of Earth's climate and to study the great ice sheets to aid in prediction of future changes in climate and sea level.

Richard hosted the recent PBS miniseries Earth: The Operators' Manual, and has been compared to a cross between Woody Allen and Carl Sagan for his enthusiastic efforts to communicate the excitement and importance of the science to everyone.

9:30–10:30 AM Exhibitor Workshops

Science Practices: What Does Argumentation Look Like in an Elementary Classroom?

(Grades K–5)

104 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science—FOSS **Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS Next Generation program developers to learn about science practices within the context of active investigations. Experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson. Find out about transitioning to FOSS Next Generation.

Solving the Mystery of STEM Using Forensic Science

(Grades 6–12)

105 A/B, Convention Center

Science Focus: GEN

Sponsor: Frey Scientific/School Specialty Science

Kathleen Mills, Rosharon, Tex.

Conduct a number of STEM-focused forensic activities that link scientific investigations with analysis and investigative skills to solve multifaceted “cases” involving fingerprint, trace, DNA, and document evidence. Examine additional STEM-focused assets. See how the program software allows integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster

(Grades 6–12)

107 A/B, Convention Center

Science Focus: PS

Sponsor: CPO Science/School Specialty Science

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

Use CPO Science's Roller Coaster and DataCollector to analyze how mass, radius, and shape affect the linear speed of objects on a ramp. Learn how to evaluate qualitative and quantitative investigations in rotational motion and when each type of investigation is best for your students in an AP1 physics classroom.

How do you get students inspired by science?



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Bring Visual Science into K–5 Classrooms—It’s a Game Changer!

(Grades K–5)

108A, Convention Center

Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Spark student interest by combining visual, auditory, and hands-on learning techniques. Harvey Bagshaw discusses and models how he teaches science with videos and activities to support blended learning. Learn how to integrate compelling visuals and video and receive a one-year subscription to Carolina’s Tigtag online video-based learning program!

Modeling Convection Currents and Plate Motion

(Grades 6–8)

108B, Convention Center

Science Focus: ESS2

Sponsor: LAB-AIDS®, Inc.

Deborah LaSala, Ridgefield Academy, Ridgefield, Conn.

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

Fantastic Physical Science Demonstrations from Flinn Scientific

(Grades 7–12)

109 A/B, Convention Center

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

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

Amaze your students with quick demonstrations that teach common physical science topics, including density, motion, force and equilibrium, rotation, waves, light and color, energy, pressure, and scientific inquiry. More than a dozen effective demonstrations will be performed. Handouts!

Plate Tectonics: Continents on the Move

(Grades 6–12)

111B, Convention Center

Science Focus: ESS2.B

Sponsor: Simulation Curriculum Corp.

Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.

Join us as we use Simulation Curriculum’s Layered Earth Geology to investigate continental drift and the theory of plate tectonics. Classroom-ready STEM and NGSS lessons engage students with interactive simulations and learning activities, thought-provoking exercises, and historical links while displaying a contextual and interactive model of Earth.



Transformation Tips and Tricks

(Grades 9–College)

112 A/B, Convention Center

Science Focus: GEN

Sponsor: Edvotek Inc.

Brian Ell, Danielle Snowflack, and Lucia Dussan, Edvotek Inc., Washington, D.C.

Are transformations giving you trouble? Then this is the workshop for you! We will transform *E. coli* with plasmids that express brightly colored rainbow proteins. They can even glow fluorescent green with GFP! We’ll share tips and tricks along the way to ensure experimental success. Receive a free gift for attending.

Demystifying the NGSS with STEMscopes

(Grades P–11)

113A, Convention Center

Science Focus: GEN, NGSS

Sponsor: Accelerate Learning–STEMscopes

Terry Talley (ttalley@acceleratelearning.com), Accelerate Learning–STEMscopes, Houston, Tex.

There’s no doubt the NGSS are more rigorous and complex than past standards. But with an understanding of how the NGSS are aligned, implemented, and assessed, teachers can be successful in changing aspects of their instructional practices. STEMscopes lessons guide students to achievement based on the standards and effective instructional strategies.

11:00 AM–12 Noon Exhibitor Workshops

Engage Them Early: Engineering Experiences with FOSS

(Grades K–5)

104 A/B, Convention Center

Science Focus: PS

Sponsor: Delta Education/School Specialty Science–FOSS

Laurence Malone, Linda De Lucchi, and Diana Velez, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS Program developers as we illustrate a coherent sequence of experiences that develop core physical science concepts while engaging young minds in challenging science and engineering practices and developing academic language. We’ll use examples from kindergarten and second-grade FOSS modules. Find out about transitioning to FOSS Next Generation.

Engineering Design—Will It Sink or Float?*(Grades K–2)**105 A/B, Convention Center*

Science Focus: ETS1

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, FOSS, Midway, Ky.

Delta Education helps you send your students on a mission to answer this question. During the workshop, you will learn about buoyancy and whether the shape of an object can determine if it will sink or float. We will show how it connects to the NGSS performance expectations K-2-ETS1-1, 2, 3 (Engineering Design).

Constructing and Crossing Cell Membranes*(Grades 5–College)**106 A/B, Convention Center*

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

Sponsor: 3D Molecular Designs

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

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

Genetics: Crazy Traits and CPO's Link™ Learning Module*(Grades 6–12)**107 A/B, Convention Center*

Science Focus: LS

Sponsor: CPO Science/School Specialty Science

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

CPO's new Crazy Traits Link learning module uses STEM- and NGSS-based strategies in a real-time tablet-based learning environment to learn genetics. Concepts like traits, alleles, phenotypes, genotypes, and heredity will come alive as you create crazy creatures with a unique kit, and study probability, adaptation, dominance, and recession.

Hands-On Activities to Model Habitat Preference with Critters and LARGE Choice Chambers*(Grades 6–12)**108A, Convention Center*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Use inquiry to develop experiments to observe the habitat preference of bess beetles, hissing roaches, or millipedes. Then discuss the advantages and disadvantages of different sampling methods to estimate population size in habitats. Learn the basics of using choice chambers so your students can develop their own experiments. Door prizes!

Calling All Carbons*(Grades 9–12)**108B, Convention Center*

Science Focus: ESS2

Sponsor: LAB-AIDS®, Inc.

Oralia Gil, LAB-AIDS, Inc., Ronkonkoma, N.Y.

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.

The Case of the Missing Records*(Grades 9–College)**112 A/B, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack and **Lucia Dussan**, 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.

Engineering Design Process in the STEM Classroom*(Grades P–12)**113A, Convention Center*

Science Focus: ETS1, PS1, CCC4, SEP2, SEP3, SEP4, SEP7

Sponsor: Accelerate Learning–STEMscopes

Terry Talley (*ttalley@acceleratelearning.com*), Accelerate Learning–STEMscopes, Houston, Tex.

The “E” in STEM is about using the engineering design process to solve problems. Use the EDP to innovate a solution to design and build a barge. Join us for this interactive, engaging, and hands-on workshop involving consensus and collaboration.

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

NSTA Exhibits Entrance (Hall A), Convention Center

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

Welcoming Remarks: Ambra Hook, Chairperson, NSTA Philadelphia Area Conference; and Hill Freedman World Academy, Philadelphia, Pa.

Special Guests: Juliana Texley, NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.; Mary Gromko, NSTA President-Elect, Colorado Springs, Colo.; Donald E. Kline, President, Pennsylvania Science Teachers Association (PSTA), Program Strand Representative, NSTA Philadelphia Area Conference; and Associate Professor Emeritus, Lebanon Valley College, Annville, Pa.; Christine Anne Royce, Program Coordinator, NSTA Philadelphia Area Conference; and Shippensburg University, Shippensburg, Pa.; Margaret (Peg) Monahan, Local Arrangements Coordinator, NSTA Philadelphia Area Conference; and School District of Philadelphia, Pa.; Mary Loesing, NSTA Director, District IV, and Connetquot Central School District, Bohemia, N.Y.; David L. Evans, NSTA Executive Director, Arlington, Va.; Jason Sheldrake, Assistant Executive Director of Sales, NSTA, Arlington, Va.

Musical Entertainment: Hill-Freedman World Academy Wind/String Ensemble and The Hill Freedman World Academy Drum Line under the direction of Deborah Swiren and Jerry Nunley, respectively.

11:00 AM–12:15 PM Exhibitor Workshop

Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country

(Grades 9–College) 103A, Convention Center

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (tamica_stubbs@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Disease can spread like wildfire through populations. Become an epidemiologist in this hands-on workshop and track diseases like Ebola, bird flu, SARS, and HIV, to name a few. See if you can track down patient zero.

11:05 AM–5:00 PM Exhibits

Hall A, Convention Center

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

11:30 AM–12 Noon Exhibitor Workshop

The Change of Seasons

(Grades 5–8) Booth #1017, Exhibit Hall

Science Focus: ESS, SEP

Sponsor: Science First®/STARLAB®

Summer Price, Science First/STARLAB, Yulee, Fla.

Using the immersive learning technology of the portable dome and one of the lessons of *Starry Night*, we will demonstrate that the seasons are not generated by the difference in the Earth–Sun distance but by the imaginary axis of Earth, which doesn't stand straight.

12:30–1:00 PM Presentations

How to Implement Problem- and Project-Based Learning into the STEM Curriculum

(Grades 9–12) Franklin 11, Marriott

Science Focus: GEN

Taylor Fitzsimmons (@stemeducation; tfitzsimmons@purnell.org), Purnell School, Pottersville, N.J.

Leave with resources and lesson plans to implement Problem- and Project-Based Learning into your STEM curriculum.



Teaching Science Completely Online

(Grades 6–12) Franklin 12, Marriott

Science Focus: GEN

Galen Kreiser (@GKreiser21CCCS; galenkreiser@gmail.com) and **Heather Gowton** (@hgowton21CCCS; hgowton@21cccs.org), 21st Century Cyber Charter School, Downingtown, Pa.

What's it like teaching science for a cyber school? Is it possible to give the kids what they need to learn about science in that environment?

12:30–1:30 PM Presentations**How Is a Scientist Like a Poet? Connecting Literacy and Science***(Grades K–5)* 202B, Convention Center

Science Focus: GEN, NGSS

Sylvia Vardell (@SylviaVardell; *svardell@twu.edu*), Texas Woman's University, Denton**Janet Wong** (@janetwongauthor; *janet@janetwong.com*), Pomelo Books, Princeton, N.J.

Linking poetry and science offers opportunities to develop both literacy and content knowledge with an interdisciplinary approach that integrates both NGSS and CCSS skills.

Use Project Based Learning to Teach an Environmental Footprint Unit*(Grades 7–College)* 403, Marriott

Science Focus: GEN, NGSS

Carol Cao (@carolannecao; *carolannecao@gmail.com*), Summit View Valley School, North Hollywood, Calif.**Jacqueline Fernandez** (*jackief82002@yahoo.com*), LAYC Career Academy, Washington, D.C.

Project Based Learning (PBL) focuses on connecting the CCSS, NGSS, and 21st-century skills. Emphasis will be placed on how PBL works in the classroom, especially with English language learners, students with learning disabilities, and at-risk youth.

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials*(Grades 9–12)* 404, Marriott

Science Focus: GEN, NGSS

Patrice Pages (*p_pages@acs.org*), American Chemical Society, Washington, D.C.**Steve Long** (*stevejlong@gmail.com*), Rogers High School, Rogers, Ark.We will share inquiry lesson plans that meet the NGSS and CCSS and are based on successful past *ChemMatters* articles.**Inquiry—Without Reinventing the Wheel***(Grades 6–College)* 408, Marriott

Science Focus: GEN, SEP

Aaron Rudolph (@crowdedbeaker; *arudolph@pvsd.org*), Perkiomen Valley School District, Colleville, Pa.

Learn clear, practical ideas for transitioning existing lab activities and demonstrations into a more inquiry-based format.

Bringing Science Alive—Literally!*(Grades 1–12)*

Franklin 2, Marriott

Science Focus: INF, NGSS

Valerie May (@mpalalive; *valeriemay1326@yahoo.com*), Mpala Live!, Riderwood, Md.**Daniel Rubenstein** (*dir@princeton.edu*), Princeton University, Princeton, N.J.

Mpala Live! offers an interactive digital media science program for grades 1–12 students. At its core are live streaming video cameras at an African watering hole.

Climate Literacy → Climate Solutions*(Grades 6–12)*

Franklin 5, Marriott

Science Focus: ESS

June Teisan (@jlteisan; *june.teisan@noaa.gov*), Einstein Fellow, NOAA, Washington, D.C.

Want to teach climate literacy but don't know where to start? The National Oceanic and Atmospheric Administration (NOAA) offers a spectrum of online lesson plans, videos, data sets, webinars, and more that will inform and inspire students to engineer solutions to climate concerns.

Photosynthesis Through Inquiry*(Grades 6–12)*

Franklin 9, Marriott

Science Focus: LS

Ashley Meyer (*ameyer@hamiltonschools.us*), Hamilton Middle School, Hamilton, Mich.**Brad Stevens** (@brads2146; *bstevens@zps.org*), Creekside Middle School, Zeeland, Mich.

Obtain two fully developed middle school or high school inquiry lessons on photosynthesis. Teacher and student guides that address common student misconceptions will be provided.

NARST Session: Teaching Environmental Sustainability Using a Place-Based Watershed Modeling Application*(Grades 6–College)*

Franklin 10, Marriott

Science Focus: ESS, SEP

Nanette Marcum-Dietrich (*ndietrich@millersville.edu*), Millersville University of Pennsylvania, Millersville**Melinda Daniels** (*mdaniels@stroudcenter.org*), Stroud Water Research Center, Avondale, Pa.**Carolyn Staudt** (@cjstaudt; *carolyn@concord.org*), The Concord Consortium, Concord, Mass.

This free online application lets you explore, modify, and test environmental conditions in your neighborhood using the power of GIS technology, real data, and professional-grade watershed models.

12:30–1:30 PM Hands-On Workshops



NSTA Press® Session: Teaching Science Through Integrating Children’s Literature and Outdoor Investigations

(Grades K–5)

113B, Convention Center

Science Focus: GEN

Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University/PSTA, Shippensburg, Pa.

Steve Rich (@bflyguy; bflywriter@comcast.net), West GYSTC, Carrollton, Ga.

Engage in lessons that combine investigations in outdoor science topics with paired children’s literature to enhance the topic and integrate other discipline areas.

Linking Science and Literacy for Improved Student Outcomes

(Grades K–6)

113C, Convention Center

Science Focus: GEN

Bill Badders (@baddersb; baddersb@roadrunner.com), 2013–2014 NSTA President, Cleveland Heights, Ohio

Come explore strategies for linking science and literacy that support students’ abilities to read, write, and discuss in the context of science and inquiry-based learning using fiction and nonfiction texts. Hands-on examples of how science supports literacy and literacy supports science will be used.

Taking STEM Outside

(Grades K–8)

202A, Convention Center

Science Focus: ESS3, ETS1, PS3, CCC2, CCC3, CCC7, SEP1, SEP6

Martha Moore (mmoore@natlands.org), Natural Lands Trust, Media, Pa.

Jaclyn Stallard (jstallard@plt.org), Project Learning Tree, Washington, D.C.

Presider: Elizabeth Backman, Project Learning Tree, Washington, D.C.

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.

Using Modeling Activities in the High School Chemistry Class

(Grades 9–College)

411/412, Marriott

Science Focus: PS, SEP2, SEP6

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

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

Help! Is There a Forensics Expert in the House!?

(Grades 9–12)

Franklin 4, Marriott

Science Focus: LS

Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District

From helping to determine the time of a victim’s death to analyzing DNA samples from crime suspects, this session has it all! Come get your hands on some crime solving!

Put the “E” in STEM!

(Grades 7–College)

Franklin 6, Marriott

Science Focus: ETS1, PS

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

Implement STEM instruction in your physical science classroom. Join this “hands-on” workshop to learn how to include engineering and meet the NGSS Engineering Design core idea in your lessons. Handouts!



Critical Thinking in Earth Science: Using the Model-Evidence Link Diagram

(Grades 6–12)

Franklin 7, Marriott

Science Focus: ESS, SEP

Doug Lombardi (doug.lombardi@temple.edu) and **Janelle Bailey** (janelle.bailey@temple.edu), Temple University, Philadelphia, Pa.

Christine Girtain (cgirtain@trschools.com), Toms River High School South, Toms River, N.J.

Explore using model-evidence link diagrams for Earth science topics that help students critically evaluate connections between evidence and alternative scientific explanations.



This Efficient House

(Grades 6–8)

Franklin 13, Marriott

Science Focus: ETS1, CCC3, CCC5, SEP

Patricia Hillyer (@iHillyer; pjhillyer@gmail.com), Matawan-Aberdeen Middle School, Cliffwood, N.J.

Darrell Williams (@MrScience22; mrscience22@gmail.com), Fisher Middle School, Ewinj, N.J.

Take a journey of a PBL unit covering multiple NGSS ideas that uses materials from a middle school student’s home.

12:30–1:30 PM Exhibitor Workshops

Engineering in Elementary Science: Designing with FOSS

(Grades K–5)

104 A/B, Convention Center

Science Focus: ETS

Sponsor: Delta Education/School Specialty Science–FOSS

Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley

FOSS modules provide students with opportunities to engage in engineering experiences to develop solutions to problems using science knowledge and systems thinking. We'll describe and display the opportunities to design with science for grades 3–5 with new FOSS modules. Find out about transitioning to FOSS Next Generation.

High-Flying Connections with Science and Literacy

(Grades 3–5)

105 A/B, Convention Center

Science Focus: ETS1

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, FOSS, Midway, Ky.

Learn how your students can experience the enjoyment of learning science using the Flight and Rocketry Delta Science Module and its connection to the NGSS performance expectation 3-5-ETS1-1, 2, 3 (Engineering Design). See how our content readers are excellent literacy resources that can help to extend the learning experience.



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Of All the Nerve!

(Grades 9–College)

106 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: MSOE Center for BioMolecular Modeling

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

Join us in constructing a neuronal synapse model—complete with sodium-potassium pump and calcium, sodium, and potassium channels! Explore the role of these ions in action potential generation and neurotransmitter release. Visualize how drugs target and interact with these channels using models produced with 3D printing technology. Handouts!

CPO's Link™ Wind Turbine Learning Module: A STEM Approach to Engineering and Design

(Grades 6–12)

107 A/B, Convention Center

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

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

CPO's new Link Wind Turbine learning module lets students learn in a tablet-based learning environment and engineer a wind turbine. Students build, test, and revise their designs. Link uses STEM activities and an NGSS approach to give students an understanding of how to apply the engineering cycle in science class.

Prospecting for Mineral Ore

(Grades 9–12)

108B, Convention Center

Science Focus: ESS3

Sponsor: LAB-AIDS®, Inc.

Oralia Gil, LAB-AIDS, Inc., Ronkonkoma, N.Y.

How do geologists look for mineral ore? In this activity from EDC Earth Science, we will search for a layer of rock that contains a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems—gathering data to decide where the deposit is located.

Human Anatomy Lab—Building from the Inside Out

(Grades 8–College)

111B, Convention Center

Science Focus: LS

Sponsor: ANATOMY IN CLAY® Learning System

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

Explore a hands-on technique for building human anatomy in clay on handheld skeletal models. This interactive experience promotes innovation, values different learning styles, and prepares all students for success. This approach is a perfect fit to integrate NGSS and STEM practices into your classroom.

Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR

(Grades 9–College)

112 A/B, Convention Center

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell, **Danielle Snowflack**, and **Lucia Dussan**, Edvotek Inc., Washington, D.C.

Explore the relationship between genotype and phenotype using Phenylthiocarbamide (PTC). Some think PTC tastes bitter, while others find it tasteless. The ability to taste PTC has been linked to variations in a taste receptor gene. In this workshop, you will learn to use PCR to distinguish between PTC alleles. Receive a free gift for attending.

“Hard” Doesn't Mean “Bad”

(Grades 6–9)

113A, Convention Center

Science Focus: GEN

Sponsor: Army Educational Outreach Program

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

Help your students learn that challenges and even failure can be productive if handled properly. Also, hear about the free online STEM competition eCYBERMISSION and how you and your students can participate.

1:00–1:30 PM Presentation

Using Career Academies to Integrate STEM in Real-World Applications

(Grades 9–12)

401/402, Marriott

Science Focus: INF

Alicia Pressel, St. Johns County School District, St. Augustine, Fla.

The Academy of Environmental and Urban Planning is a STEM Academy that teaches students environmental science, technology, and engineering. Students have opportunities to earn industry certifications, gain real-world experience through Project Based Learning, and have internships through community partnerships.

1:00–4:00 PM Short Course



Meeting the CCSS and NGSS Through Outdoor Studies (SC-1)

(Grades 5–College) Tickets Required; \$50 Franklin 1, Marriott

Science Focus: LS

Bill Klein, Western Iowa Tech Community College, Sioux City

For description, see page 32.

1:00–4:30 PM Short Course

Argumentation in the Secondary Classroom (SC-2)

(Grades 6–College) Tickets Required; \$25 Franklin 8, Marriott

Science Focus: GEN, SEP

Ellen Granger (granger@bio.fsu.edu) and **Todd Bevis** (bevis@bio.fsu.edu), Florida State University, Tallahassee

For description, see page 32.

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2:00–3:00 PM Featured Presentation



Scientific Literacy and the Survival of Our Species

(General)

Ballroom B, Convention Center

Science Focus: GEN



Damon Bradley, DSP Technology Group Leader, NASA Goddard Space Flight Center, Greenbelt, Md.

Presider: Barbara R. Pietrucha, Strand Leader, Revolutionizing Engineering for the Future, NSTA Philadelphia Area Conference, and Earth/Environmental Science Educator, Point Pleasant, N.J.

As an adult in 21st-century United States, scientific literacy—or the basic understanding of scientific theories, concepts, and methods for personal decision making—is ever more crucial to have. Young children are inherently curious and are eager to learn science, yet somehow as they age, they lose interest, become distracted, and eventually become disengaged in science. It is fundamentally important as a society to have individuals conversant in the sciences so that we are equipped to handle issues such as climate change, our own health, genetic engineering, and information security. As stewards of the only home we know, we need to learn as much as we can about science, engineering, and technology so that we can become responsible decision-making adults to ensure the survival of our species.

Dr. Bradley will share his own experiences growing up in the dangerous neighborhoods of South Philadelphia, and how, through learning discipline and hard work from his family, he became a research engineer at NASA. From these experiences, he will present some ideas for keeping students and adults engaged and helping to raise the overall scientific consciousness of American society...and why this is imperative for our own survival.

Damon Bradley is a research engineer at the NASA Goddard Space Flight Center. Damon has simultaneously worked for 14 years in the NASA Goddard Instrument Electronics Development Branch researching and developing science instrument signal processing systems while attending graduate school and working as an independent engineering consultant with various university graduate laboratories for signal processing and digital logic design.

Damon founded the Digital Signal Processing Technology Group in 2008 within the Instrument Electronics Development Branch at NASA Goddard. The group has recently received the NASA Applied Engineering Technology Directorate Win New Work Award, having achieved 10 Internal Research and Development wins over a four-year period with only five group members.

2:00–3:00 PM Presentations

Using the Design-Thinking Process as a Tool in Science Class for Elementary Students

(Grades P–5)

202B, Convention Center

Science Focus: ETS, SEP6

Rebecca Lewis (rlewis@baldwinschool.org), The Baldwin School, Bryn Mawr, Pa.

Do you want to learn more about the design-thinking process? Learn ways you can incorporate the design-thinking process in science class and create dynamic innovative projects.

Algae to Biofuel—A Pipeline for Integrating and Teaching Crosscutting STEM Concepts

(Grades 7–College)

403, Marriott

Science Focus: ETS, CCC, SEP

Tiffany Fleming (@BTIScience; pgrp-outreach@cornell.edu) and **Becky Sims** (@BTIScience; pgrp-outreach@cornell.edu), Boyce Thompson Institute for Plant Research, Ithaca, N.Y. Engineering solutions integrating biological, economic, and environmental science are required to advance algae-to-biofuel technologies—STEM students will lead the way!

Explorations of Stream Health and Relative Dating Using Fossils

(Grade 6)

404, Marriott

Science Focus: ESS1, LS2, SEP

Joanna Richison (richisonj@ghaps.org), White Pines Intermediate School, Grand Haven, Mich.

Tim Olson (@fishcrazyteach; olsont@westottawa.netA), Macatawa Bay Middle School, Holland, Mich.

Engage and excite middle school science students through inquiry-based Earth and life science explorations. We will share activities, facilitation tips, and student results.

Small World, Big Ideas, Great Possibilities

(Grades 6–College)

406, Marriott

Science Focus: GEN, NGSS

Joann Blumenfeld (jblumenfeld@wcpss.net), Dillard Drive Middle School, Raleigh, N.C.

Come learn how to teach students with disabilities cutting-edge science in nanotechnology and research, pick up a wide range of teaching strategies and resources, and discover a summer and school-year program at NC Science House. Catalyst is funded by Biogen Foundation and sponsored and developed through a high-quality team from the College of Sciences at North Carolina State University, NC Science House, Wake Technical Community College, North Carolina Museum of Natural Science, and US2020.

Spark Students' Curiosity with Chemistry!

(Grades K–12) 408, Marriott

Science Focus: PS

Karen Kaleuati, American Chemical Society, Washington, D.C.

The American Chemical Society (ACS) offers many free resources from kindergarten to beyond postdoc. Learn about numerous resources available in print and online for grades K–12, including animations, books, lesson plans, grants, and so much more.

Demos for the Holidays! Excite Students with Chemical Demonstrations

(Grades 6–12) 414, Marriott

Science Focus: PS, SEP1, SEP2, SEP4, SEP6, SEP7, SEP8

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

Learn how to put on some demonstrations to spice up your classroom...especially around various holidays. Handouts!

Dazzling Deceptions: Discrepant Events That Delight and Mystify!

(Grades 3–College) Franklin 2, Marriott

Science Focus: GEN

Alan McCormack (amccorma@mail.sdsu.edu), 2010–2011 NSTA President, and San Diego State University, San Diego, Calif.

Science experiences that seem contrary to “common sense” are great motivators and gateways to science and engineering practices and the development of concepts.

Alternative Energy Field Trip: Collaborating with Preservice Teachers on Designing Curriculum

(Grades 7–12) Franklin 5, Marriott

Science Focus: ETS1, PS3

Kathleen Jones (jones@juniata.edu), Juniata College, Huntingdon, Pa.

Alternative energies are an exciting opportunity to explore, and even more engaging when you can combine it with a field trip run by preservice teachers.

Evaluate Your Sessions Online!

This year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See pages 12 and 63 for details.)

Bring on the Online Learning!

(Grades 6–12)

Franklin 9, Marriott

Science Focus: GEN, SEP2

Marilyn Steneken (msteneken@yahoo.com), Sparta Middle School, Sparta, N.J.

Let students take the lead through NGSS-focused labs in an engaging online format while discovering concepts through inquiry.

NARST Session: Measuring the Effectiveness of Teaching Interventions Aimed at Supporting Students' Analogical Reasoning Around Physical Models

(Grades 7–12)

Franklin 10, Marriott

Science Focus: PS, SEP2

Alison Miller (amiller2@bowdoin.edu), Bowdoin College, Brunswick, Maine

Kim Kastens (kastens@ldeo.columbia.edu), Lamont-Doherty Earth Observatory, Palisades, N.Y.

Join us as we evaluate teaching interventions that support students' analogical reasoning around physical models making connections to the NGSS practice of developing and using models.



NASA's "Eyes on the Solar System": Bringing Planets into Your Classroom

(Grades 3–12)

Franklin 12, Marriott

Science Focus: ESS1.B, ETS2.A, CCC3, CCC4, SEP2, SEP4

Rachel Zimmerman Brachman (@RachelZBrachman; rachel.zimmerman-brachman@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Bring the solar system to your classroom using this free online tool from NASA. Explore planets, spacecraft, and more!

Science and Engineering Practices Share Session

(Grades 9–12)

Franklin 13, Marriott

Science Focus: ETS1, SEP

Eric Wilson (wilsone@rlasd.net), Red Lion (Pa.) Area School District

Christopher Nilsen (c.n.nilsen@gmail.com), Pascack Valley High School, Hillsdale, N.J.

Lauren Case (casel@martin.k12.fl.us), South Fork High School, Stuart, Fla.

Come to this share session for a smorgasbord of lessons, activities, and ideas covering all disciplines springboarding from the science and engineering practices of the NGSS.

2:00–3:00 PM Hands-On Workshops



NSTA Press® Session: *Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12*

(Grades 6–College) 113B, Convention Center

Science Focus: LS, PS, CCC, SEP

Victor Sampson (@drvicsampson; victor.sampson@gmail.com), The University of Texas at Austin

Jonathon Grooms (@drjongrooms; jgrooms@gwu.com), The George Washington University, Washington, D.C.

Receive a brief overview of argument-driven inquiry and how it can be used to address both the NGSS and CCSS ELA as an innovative approach to laboratory instruction.

Feeding Our Feathered Friends

(Grades K–8) 113C, Convention Center

Science Focus: LS

Lindsay Glasner (@BirdSleuth; lig27@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.

Rosanne Mistretta (@rmistretta; rmistretta@abingtonfriends.net), Abington Friends School, Jenkintown, Pa.

Come get your free window bird feeder and discover how to use it to attract birds and student interest!

Developing Engineers Through Children’s Literature

(Grades K–6) 202A, Convention Center

Science Focus: ETS, SEP

Angela Stanford (agstanford@saumag.edu) and **Susan Johnson** (sjohnson@saumag.edu), Southern Arkansas University, Magnolia

Experience hands-on engineering activities that are connected to children’s literature. CCSS ELA strategies are identified and modeled to go along with each activity.

Trebuchets: An Interdisciplinary STEM Unit

(Grades 4–8) 401/402, Marriott

Science Focus: ETS

David Lisnitzer (dlistnitzer@gmail.com), P.S. 124 Osmond A. Church, South Ozone Park, N.Y.

Build a trebuchet, a Medieval counterweight catapult, using common classroom materials. Take home the unit plan, which incorporates math, social studies, science, and writing.

Redefining HIV/AIDS Education Using Molecular Science–Based Curricula

(Grades 9–College) 411/412, Marriott

Science Focus: ETS, LS1, LS3, CCC1, CCC2, CCC3, CCC4, CCC6, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Shuchismita Dutta (sdutta@rcsb.rutgers.edu), RCSB Protein Data Bank, Piscataway, N.J.

Anne Sanelli (ssanelli@ebnet.org), East Brunswick High School, East Brunswick, N.J.

William Mott (william.mott@narlington.k12.nj.us), North Arlington High School, North Arlington, N.J.

Introduce your general and AP biology students to a molecular view of HIV/AIDS using new curricula, collaboratively developed by teachers, educators, clinicians, and scientists.

3D Printing Shaping Experimentation Design in Physics

(Grades 9–12) Franklin 4, Marriott

Science Focus: PS3.B, CCC3, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5

Jacklyn Bonneau (bonneau@wpi.edu), Massachusetts Academy of Math & Science at WPI, Worcester

See how we can use CAD and 3D printing to design and build equipment used for exploration in physics—giving significance to both classes.

The Game of Energy

(Grades K–12) Franklin 6, Marriott

Science Focus: PS

Jennifer Mitchell-Winterbottom (psugrad1@msn.com), Pottstown Middle School, Pottstown, Pa.

Support science and literacy strategies in your classroom through creation and participation in energy games.

Using Inquiry to Tackle Student Misconceptions About Kinematics and Newton’s Laws

(Grades 6–12) Franklin 7, Marriott

Science Focus: PS2.A, SEP1, SEP2, SEP7

Erin Berryhill (eberryhill@nvps.net) Northview High School, Grand Rapids, Mich.

Joseph Lutz (lutz4k@yahoo.com) and **Kevin Sylvester** (sylvesterk@ghaps.org), Lakeshore Middle School, Grand Haven, Mich.

Experience inquiry activities designed and classroom tested by current physics teachers. Discussion centers on how to facilitate these activities to effectively address common student misconceptions.

2:00–3:00 PM Exhibitor Workshops**What to Look for in Science Learning Progressions: Experience FOSS Next Generation***(Grades K–5)**104 A/B, Convention Center*

Science Focus: PS

Sponsor: Delta Education/School Specialty Science—FOSS
Kathy Long and **Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

Are you looking for coherent curricular direction in your elementary science program? Join FOSS curriculum developers to investigate learning progressions in grades K–5 using physical science modules from the new FOSS Next Generation program. Find out about transitioning to the newly released FOSS program modules.

Solving the Mystery of STEM Using Forensic Science*(Grades 6–12)**105 A/B, Convention Center*

Science Focus: GEN

Sponsor: Frey Scientific/School Specialty Science

Kathleen Mills, Rosharon, Tex.

Conduct a number of STEM-focused forensic activities that link scientific investigations with analysis and investigative skills to solve multifaceted “cases” involving fingerprint, trace, DNA, and document evidence. Examine additional STEM-focused assets. See how the program software allows integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

Genes, Schemes, and Molecular Machines*(Grades 6–College)**106 A/B, Convention Center*

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

Sponsor: 3D Molecular Designs

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

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

Building an Electric Motor the STEM Way with CPO’s Link™ Learning Module*(Grades 6–12)**107 A/B, Convention Center*

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

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

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

STEM: Investigating Touch-Screen Devices*(Grades K–8)**108A, Convention Center*

Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Have you wondered how a touch-screen device works? Join the Smithsonian and Carolina to investigate static electricity and capacitive touch screens. Design a prototype stylus, and then test and evaluate your design with other participants. Walk away with material and a STEM experience to share in your classroom next week!

Reclaiming the Metal*(Grades 6–8)**108B, Convention Center*

Science Focus: PS1

Sponsor: LAB-AIDS®, Inc.

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

AP Physics 1 Advanced Inquiry Investigations from Flinn Scientific

(Grades 9–12)

109 A/B, Convention Center

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Gus Alvarez, Flinn Scientific, Inc., Batavia, Ill.

As the first school year of the new AP Physics 1 course, Flinn Scientific is sharing experiments correlated to this new curriculum framework. We will present two of our 16 new guided inquiry physics kit experiments. Each experiment features prelab preparation and activities optimized to help you effectively guide students and provide maximum opportunities for inquiry. Handouts!

Meeting (and Exceeding) Proficiency-Based Requirements Through Aquaculture Education

(Grades 8–12)

110 A/B, Convention Center

Science Focus: ETS1, ETS2.B, LS1.B, LS2.A, LS2.B, LS2.C

Sponsor: Hurricane Island Foundation

Phoebe Jekielek and **Jennifer Page**, Hurricane Island Foundation, Rockland, Maine

From classroom-based experiences to actual implementation, aquaculture can be instrumental in helping teachers meet CCSS and NGSS requirements. Come experience the curriculum being created and piloted by the Hurricane Island Center for Science and Leadership and receive resources to help you implement experiential aquaculture curriculum in your own classroom.

Stellar Evolution Made Easy

(Grades 6–12)

111B, Convention Center

Science Focus: ESS1.A

Sponsor: Simulation Curriculum Corp.

Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.

Where do stars come from? What happens during their life cycle? How do we know a star is dying? Where are stellar graveyards? Join us as we answer these and other questions using Simulation Curriculum's award-winning Starry Night lessons and learn how to access a free classroom-ready lesson.



Diagnosing the Flu

(Grades 9–College)

112 A/B, Convention Center

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell, **Lucia Dussan**, and **Danielle Snowflack**, Edvotek Inc., Washington, D.C.

The yearly seasonal flu epidemic is caused by the Influenza-virus. As a general rule, symptoms of the flu are enough to warrant its diagnosis during flu season. However, further testing may be necessary to rule out serious conditions like pneumonia. In this simulation, two common tests (ELISA, RT-PCR) are performed to diagnose the flu in a clinical setting. Receive a free gift for attending.

Navigating the Shifts: Making the Transition to the Next Generation Science Standards with Leaders from The Lawrence Hall of Science

(Grades K–8)

113A, Convention Center

Science Focus: GEN, NGSS

Sponsor: Amplify

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

How can district leadership support systematic transition to the NGSS? Examine critical pedagogical and content shifts, including the convergence with *Common Core State Standards*, in English language arts and mathematics. Experience an NGSS curriculum exemplar from Amplify Science to envision the next generation classrooms you support.



3:30–4:00 PM Presentation

Using Math Manipulatives for Creating Models to Introduce or Reinforce Life Science Concepts


(Grades K–3) 202B, Convention Center
 Science Focus: LS1.A, LS1.D, CCC4, CCC6, SEP2, SEP3, SEP5, SEP8

Susan Coletta (*coletta@waksman.rutgers.edu*), Waksman Institute of Microbiology, Piscataway, N.J.

Nina Visconti-Phillips (@NNjPhillips; *ninavp@ymail.com*), Science Education Specialist, Cranbury, N.J.

Explore characteristics of living organisms using science and mathematics—students use tangram shapes to create unique models and question their own understanding.

3:30–4:30 PM Presentations

 **NSTA Press® Session: Gardening with Books and Butterflies**

(Grades P–5) 113B, Convention Center
 Science Focus: GEN

Steve Rich (@bflyguy; *bflywriter@comcast.net*), West GYSTC, Carrollton, Ga.

Discover the author’s strategies for integrating multiple subjects with the NSTA Kids books *My School Yard Garden* and *Mrs. Carter’s Butterfly Garden*, indoors and out.

Explore, Create, and Investigate with Primary Science

(Grades P–2) 202A, Convention Center
 Science Focus: GEN

Jennifer Snow (*jsnow@ojrsd.com*), **Betsy Palumbo** (*epalumbo@ojrsd.com*), and **Jennifer Umstead** (*jumstead@ojrsd.com*), East Coventry Elementary School, Pottstown, Pa.

Discover 10 teacher-created science kits designed to offer the opportunity to explore, investigate, and create through the eyes of a young scientist. Door prizes! *Note:* The first 75 attendees will each receive a goodie bag with books.

Teaching Biology in the Digital Age

(Grades 10–College) 403, Marriott
 Science Focus: LS, SEP7, SEP8

Shari Weaver, Massachusetts Academy of Math & Science at WPI, Worcester

From social media to virtual dissections, there are many free digital resources available to enhance your biology classroom.

Facilitating a Successful Science and Engineering Fair

(Grades 1–12) 406, Marriott
 Science Focus: INF, NGSS

Indira Sukhraj (*isukhraj@fpoly.org*), Florida Industrial and Phosphate Research Institute, Bartow

Take the fear and frustration out of the process of creating a science and engineering fair. Discussion centers on the importance of a science and engineering fair as it prepares students for future STEM careers and tips to put one on yourself.

Common Performance Assessments: Making Thinking Visible

(Grades K–12) 407, Marriott
 Science Focus: GEN, SEP7

Michelle Kutch (@mpkutch; *michelle.kutch@bsd.k12.de.us*), Brandywine School District, Wilmington, Del.

Learn how to create science-based SBAC/PARCC–like performance assessments to help students engage in scientific arguments using evidence. Leave with resources to use with teachers, administrators, PLCs, and departments.

Fun Forensic Apps: Inexpensive, Interesting Ways to Integrate MST

(Grades 7–College) 408, Marriott
 Science Focus: GEN, SEP2, SEP4, SEP8

Anthony Bertino (*abertino@nycap.rr.com*) and **Patricia Bertino** (*nolanp@nycap.rr.com*), Retired Educators, Schenectady, N.Y.

Solve real-life problems integrating math, science, and technology using free or inexpensive apps for time of death, anthropology, facial recognition, ballistics, crime scene documentation, and more.



The NSTA Learning Center: A Tool to Develop Pre-service Teachers

(College) *414, Marriott*
Science Focus: GEN

Flavio Mendez (flavio_m@nsta.org), Senior Director, NSTA Learning Center, 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.

Do You Need a New Science Lab?

(Grades 6–12) *Franklin 5, Marriott*
Science Focus: GEN

Ruth Ruud (ruth.ruud@yahoo.com), Cleveland State University, Cleveland, Ohio

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

Science Professional Development Through Blended Learning

(Grades 6–12) *Franklin 9, Marriott*
Science Focus: ESS3.D, CCC4, CCC5, SEP8

Patricia Harcourt (pharcourt@gmail.com), MADE CLEAR, Annapolis, Md.

Melissa Rogers (@ClimatMADECLEAR; mrogers@umces.edu), University of Maryland Center for Environmental Science, Cambridge

Andrea Drewes (adrewes@udel.edu), University of Delaware, Newark

Professional development is an essential component of science teaching practice. We will describe an approach that incorporates in-person and online learning for climate change education.

Cars: A Fun and Relevant Way to Teach Science Concepts

(Grades 9–12) *Franklin 11, Marriott*
Science Focus: PS, CCC, SEP

Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.

Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.

The auto is a rolling science and physics lab. So if kids love cars and hate science labs—let's use the car to introduce concepts that teach principles of interest to students.



Teaching Engineering with the Staple Light Bulb Challenge

(Grades 9–12) *Franklin 12, Marriott*
Science Focus: ETS, SEP3, SEP4

Ross Gunderson (rgunderson@dccs.org), Delaware County Christian School, Newtown Square, Pa.

President: Robin Zecca (rzecca@dccs.org), Delaware County Christian School, Newtown Square, Pa.

Generate new learning in your classroom through a challenge activity, where students are given ordinary staples and a power supply and are asked to make a light bulb.

3:30–4:30 PM Hands-On Workshops

Portable, Affordable Simple STEM (PASS)

(Grades P–2) *113C, Convention Center*

Science Focus: GEN

Renee O’Leary, Holy Angels School, Newark, Del.

Presider: Marguerite Vavalla, Retired Educator, Wilmington, Del.

P.A.S.S. (K–2) provides teachers of early learners with developmentally appropriate, integrated materials to introduce STEM concepts using simple multisensory childhood/elementary explorations delivered in zippered plastic bags with take-home and multidisciplinary follow-up. Walk away with sample lesson plans and material bags.

Phone Apps Empower “Revolutionary Optimists” in STEM at St. Ann School

(Grades 6–12)

401/402, Marriott

Science Focus: ETS1, ETS2.B, LS2.C, LS2.D, SEP1, SEP3, SEP4, SEP7, SEP8

Cliff Cockerham, Metro Nashville (Tenn.) Public Schools
 BYO Android! Download/try phone apps that empowered St. Ann’s middle school STEM students to drive multidisciplinary PBLs into authentic inquiry addressing real community issues. Also, hear about an ongoing partnership with local Sierra Club volunteers as environmentalist mentors.

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Science as a Human Endeavor: Analyzing Historical Primary Sources from the Library of Congress

(Grades K–12) *411/412, Marriott*
Science Focus: ETS2, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Michael Apfeldorf (@TeachingLC; *mapf@loc.gov*) and **John Smith**, Library of Congress, Washington, D.C.

Bring to life the practices of scientists, as well as the connections between science and society, with hands-on strategies that engage students with firsthand accounts about science.

Analyzing Supernova Remnants Using Spectroscopy, NASA Data, and STEM

(Grades 10–College) *Franklin 4, Marriott*
Science Focus: ESS

Donna Young (*dlyoung.nso@gmail.com*), NASA Astrophysics Division, Bullhead City, Ariz.

Identify elements in the spectra of supernova remnants to determine the properties of collapsed and exploded stars using NASA X-ray archived data and analysis tools.

Forget Gloom and Doom! Communicating Climate Change with Youth

(Grades 3–College) *Franklin 6, Marriott*
Science Focus: ESS

Kimberly Dixon (*kim@tubas.net*), University of Maryland Extension, Carroll County, Westminster

Learn techniques to teach about our changing climate that will reduce fear, uncertainty, doubt, and debate.

Mitigating the Effects of Climate Change in Urban Settings

(Grades 3–10) *Franklin 7, Marriott*
Science Focus: ESS

Anita Brook-Dupree (*abdupree@comcast.net*), Science Is My Specialty Educational Consulting, Philadelphia, Pa.

Learn how cities are especially impacted by climate change and techniques to mitigate the effects of climate change. Engage in an activity involving green infrastructure best management practices that exemplifies these techniques.



An Interactive Exploration of Hurricane-Associated Storm Surge Using Google Earth

(Grades 9–College) *Franklin 13, Marriott*
Science Focus: ESS2.D, ESS3.B, CCC4, SEP2, SEP4

JoAnn Moody (*jmoody@disl.org*) and **Tina Miller-Way** (*tmiller-way@disl.org*), Dauphin Island Sea Lab, Dauphin Island, Ala.

Create a groundswell of interest in your science students with a Google Earth–based lesson on coastal flooding and storm surge. Join us as we hit the Gulf of Mexico coast with a virtual hurricane!

3:30–4:30 PM Exhibitor Workshops

Floods, Heat Waves, and Hurricanes—Analyzing Evidence for a Changing Climate

(Grades 6–8) *104 A/B, Convention Center*
Science Focus: ESS, SEP

Sponsor: Delta Education/School Specialty Science–FOSS
Virginia Reid and **Jessica Penchos**, The Lawrence Hall of Science, University of California, Berkeley

What is the current scientific evidence for climate change? Engage in hands-on activities and multimedia from the newly revised FOSS Weather and Water Course for Middle School to explore causes and implications of climate change and identify connections to NGSS science and engineering practices. New program features will be shown.

Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism

(Grades 3–5) *105 A/B, Convention Center*
Science Focus: PS2.B, CCC

Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, FOSS, Midway, Ky.

Argumentation is an important component of the science reform movement. Learn how to help students conduct investigations using claims and defend them with evidence, and to construct explanations doing activities using magnets and electromagnetism. The activities in this workshop relate to the NGSS performance expectation 3-PS2-3, Motion and Stability: Forces and Interactions.

Making Critical Thinking More Than Just a Cliché Using Three-Dimensional Learning

(Grades 6–8) 106 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Activate Learning

Marilyn Schmidt, Activate Learning, Aurora, Colo.

Come engage in a sequence of investigations where middle school students experience phenomena, construct explanations, and argue from evidence. Teach students to think like scientists as they apply a claim, evidence, reasoning framework to make sense of investigations.

CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster

(Grades 6–12) 107 A/B, Convention Center

Science Focus: PS

Sponsor: CPO Science/School Specialty Science

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

Use CPO Science's Roller Coaster and DataCollector to analyze how mass, radius, and shape affect the linear speed of objects on a ramp. Learn how to evaluate qualitative and quantitative investigations in rotational motion and when each type of investigation is best for your students in an AP1 physics classroom.

Engineer Excitement in Your Classroom with a Carolina STEM Challenge®

(Grades 6–12) 108A, Convention Center

Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

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

Using Slooh in the Classroom

(Grades 4–8) 110 A/B, Convention Center

Science Focus: GEN

Sponsor: Slooh, LLC

Kerry Dorton, Slooh, Washington Depot, Conn.

Join us as we introduce you to Slooh and guide you through how best to use telescopes and educational activities to enhance science and math learning in the classroom.



Leap Into the 21st-Century Science Class

(Grades 4–College) 111B, Convention Center

Science Focus: LS, SEP1, SEP2, SEP3

Sponsor: Animalearn

Katherine Lewis (kewis@animalearn.org) and **Nicole Green** (ngreen@animalearn.org), Animalearn, Jenkintown, Pa.

Join us as we examine the use of animals to teach anatomy and explore how we can conserve resources, eliminate harmful chemicals, and promote habitat protection by using innovative technologies. Participants will try the latest dissection alternatives, including iPad apps, online programs, and realistic models! One attendee will win dissection software!

The Drunken Worms: Exploring Gene Function with *C. elegans*

(Grades 9–College) 112 A/B, Convention Center

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell, **Danielle Snowflack**, and **Lucia Dussan**, Edvotek Inc., Washington, D.C.

Model organisms allow us to study fundamental questions in biology that are difficult to study in humans. In this workshop, you will learn how to culture the nematode *C. elegans* in your classroom. Next, we'll explore how mutations affect alcohol metabolism using a simple locomotion assay. Data is collected and analyzed using statistics. Receive a free gift for attending!

3:30–5:00 PM Exhibitor Workshop

Effortlessly Integrate Inquiry with Glowing Bacteria (AP Big Idea 3)

(Grades 9–College)

103A, Convention Center

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (tamica_stubbs@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

How comfortable do your students feel about engaging in inquiry? Join us to learn new ways to advance inquiry in the classroom—from guided to open inquiry—by establishing a strategy that integrates essential and real-world science practices that can encourage students to direct the scientific investigation. From generating scientifically reasonable questions to developing the procedure for interpreting the data, the glowing bacteria from pGLO™ will lead the way.



5:00–5:30 PM Presentations



Science Current Events Journals: Real Science and Media Literacy

(Grades 6–9)

202B, Convention Center

Science Focus: GEN, SEP8

Elizabeth Weissman (weissmane@ramaz.org) and **Lois Nyren** (nyren@ramaz.org), The Ramaz School, New York, N.Y.

Use the news to teach science content, media literacy, analytical thinking, and to reinforce language arts. Find out how “Science Current Events Journals” bring real science into the classroom.

Designing Mathematics and Science Project-Based Environments: Spanning Astronomical and Atomic Spaces (SAAS)

(Grades 6–8)

404, Marriott

Science Focus: ESS

Merryn Cole (@merryncole; merrynjanzen@gmail.com), **Jennifer Wilhelm** (jennifer.wilhelm@uky.edu), and **Lauren Moorhead** (laurenschw@gmail.com), University of Kentucky, Lexington

Victoria Aurelius (victoria.aurelius@fayette.kyschools.us), Jessie Clark Middle School, Lexington, Ky.

Join us for an overview of Project SAAS, an integrated mathematics/science curriculum, and review findings of its effectiveness and how to participate.



A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning

(Grades 9–11)

Franklin 12, Marriott

Science Focus: ETS1.B, ETS2.B, LS1.C, LS2.A, LS2.B, LS2.C, PS1.A, PS1.B, CCC, SEP

Alexis Custer (alexis.bizzaro@gmail.com), Princeton High School, Princeton, N.J.

Jennifer Alessio (jmallessio@gmail.com), Robbinsville High School, Robbinsville, N.J.

Discover how students can embark on a self-paced, cross-curricular unit by solving a lead poisoning case study using chemical, biological, ecological, and mathematical concepts.

5:00–6:00 PM Presentations**Genetics, Adaptation, Evolution—for Elementary Students? Oh My!***(Grades 3–6)*

202A, Convention Center

Science Focus: LS

Laura Trout (laurajtrout@comcast.net), Lancaster Country Day School, Lancaster, Pa.

Hear about a nine-week unit developed for grade 3 students to teach the basic ideas of genetics, adaptations, and evolution.

Debating Science: Critical Analysis of the Nature and Value of Science*(Grades 9–College)*

403, Marriott

Science Focus: ETS2.B, CCC2, SEP1, SEP6, SEP7, SEP8

John Nugent (@nugentsj; frnugent@bc.edu), Boston College, Chestnut Hill, Mass.

Join me for lesson plans for challenging students' misconceptions and assumptions regarding the scientific method. I'll share several assessments that can keep your students arguing long after class ends!

An Ice Core Classroom Investigation That Connects the Three Dimensions of the NGSS with CCSS*(Grades 8–College)*

406, Marriott

Science Focus: ESS1, ESS2.A, ESS2.B, ESS3.C, ETS2, PS1.B, PS2.C, PS3.B, PS4.B, CCC1, CCC2, CCC4, CCC5, CCC7, SEP2, SEP4, SEP5, SEP7, SEP8

Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz.

Experience a unique open-ended STEM investigation that incorporates absolute and relative dating, history, volcanoes, solar proton events, energy cycles, Earth systems, terrestrial events, and supernovas.

Leveraging Informal Science Education in Formal Educational Settings*(General)*

407, Marriott

Science Focus: INF

Matthew VanKouwenberg (mvankouwenberg@science-leadership.org), Science Leadership Academy, Philadelphia, Pa. Experts from The Franklin Institute as well as local schools and universities will discuss how informal educational opportunities are leveraged in schools, both in person and from a distance.**Building a Sustainable Science and Teacher Collaborative: A Three-Year Model for Developing Teacher Efficacy and Replicability in STEM Outreach***(General)*

408, Marriott

Science Focus: INF

Valerie Butler (@bioeyes; butler@ciwemb.edu), Carnegie Institution for Science, Baltimore, Md.**Jamie Shuda** (jshuda@sas.upenn.edu), The University of Pennsylvania, Philadelphia

Hear about BioEYES, a K–12 informal science education program and its three-year teacher professional development model that results in better teacher preparedness and increases in students' scientific literacy.

The NSTA Learning Center: Free Professional Learning Resources and Opportunities for Educators*(General)*

414, Marriott

Science Focus: GEN

Flavio Mendez (flavio_m@nsta.org), Senior Director, NSTA Learning Center, 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!

Exploring the Science and Engineering Practices*(General)*

Franklin 2, Marriott

Science Focus: GEN, SEP

Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.Come explore science and engineering practices (such as constructing explanations and developing models) that are central to the vision of education described in the *Framework* and the NGSS.

Developing a Medical Exploration Program on a Shoestring

(Grades 9–12)

Franklin 5, Marriott

Science Focus: ETS2

Terrence Grant (tgrant@thecatholichighschool.org), The Catholic High School of Baltimore, Md.

Colleen Sedney, and **Despina Thomas**, and **Daijah Wedington**, Students, The Catholic High School of Baltimore, Md.

Hear from students from a magnet program for those interested in medical or medical research careers. The program highlights career options; independent research; and course work in epidemiology, microbiology, chemistry, and bioethics. Students write curricula, choose the direction of individual courses, and critique existing elements.

Developing 21st-Century Reasoning Skills Through an Authentic Interdisciplinary STEM Research Experience

(Grades 6–12)

Franklin 9, Marriott

Science Focus: INF, CCC, SEP

Robert Mayes (rmayes@georgiasouthern.edu), Georgia Southern University, Statesboro

Hear how teachers are using place-based education, Problem-Based Learning, and UbD to design authentic real-world experiences that develop 21st-century reasoning skills.

NMLSTA Session: Science and Special Education—Working Together

(Grades 5–10)

Franklin 10, Marriott

Science Focus: GEN, SEP

Kathleen Brooks, Retired Educator/Educational Consultant, Westbrook, Conn.

Emphasis will be placed on strategies for science teachers working with special education teachers who do not have a strong knowledge of science.



Infusing Literacy Strategies into Established State Science Prompts

(Grades 9–12)

Franklin 11, Marriott

Science Focus: GEN, SEP4, SEP7, SEP8

Susan Meabh Kelly, University of Maryland Eastern Shore, Princess Anne

Compare student prompts, resources, and student products of a decade-old state science prompt with an enhanced literacy-infused task. Strategies applied will be reviewed.

5:00–6:00 PM Hands-On Workshops



NSTA Press® Session: Scientific Argumentation Classroom Activities

(Grades 5–College)

113B, Convention Center

Science Focus: GEN, NGSS

Sharon Schleigh (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.

Engage in an activity that encourages scientific argumentation in the classroom, and review different models and examples of activities from various disciplines.

Science and Literacy: A “Symbiotic” Relationship

(Grades 1–5)

113C, Convention Center

Science Focus: GEN

Christine Hypolite (christine.hypolite@yahoo.com), Our Lady of Holy Cross College, New Orleans, La.

Explore the relationship between science and literacy. Hands-on activities will provide strategies in reading, writing, and communicating, showing how science supports literacy and vice versa.

Using Model Chromosomes to Help Students Understand Mitosis, Meiosis, Fertilization, and Genetics

(Grades 7–College)

401/402, Marriott

Science Focus: LS3, SEP2

Ingrid Waldron (iwaldron@sas.upenn.edu) and **Lori Spindler** (spindler@sas.upenn.edu), The University of Pennsylvania, Philadelphia

Easy-to-make model chromosomes can help students understand mitosis, meiosis, fertilization, how genes are transmitted from parents to offspring, and other important genetics concepts.

Teaching Chemical Reactions Through a Variety of Modalities

(Grades 9–College)

411/412, Marriott

Science Focus: PS1.B, SEP2, SEP6

Michael Mury (m_mury@acs.org), American Chemical Society, Washington, DC.


Chemical reactions are a very important topic in chemistry. We will share a variety of instructional modalities from the particulate to macroscopic perspective.

From Makers to Changemakers: Design Engineering and Social Entrepreneurship as a Pathway to Student Agency

(Grades 2–12) *Franklin 6, Marriott*
 Science Focus: INF, NGSS

Steven Compton (*steve.compton@westtown.edu*), Westtown School, West Chester, Pa.

“Changemaker” teaching and learning happens iteratively and collaboratively with students and by culture shifts within ourselves and our schools, leading to increased student agency.

 **STEM Full Circle**

(Grades 5–8) *Franklin 13, Marriott*
 Science Focus: ETS1, CCC3, CCC4, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Lindsey Dahl (*@dahl_ldahl; ldahl@eriesd.org*) and **Cynthia Pomorski** (*cynthiapomorski@eriesd.org*), Woodrow Wilson Middle School, Erie, Pa.

Leave this session with four STEM lessons that meet the NGSS. Emphasis will be placed on redesigning a piece of the engineering design process.

5:00–6:30 PM Hands-On Workshop

The “E” in STEM: Make-It, Use-It, IMPROVE-IT, and Take It Back to Your Classroom

(Grades 5–College) *Franklin 4, Marriott*
 Science Focus: GEN, CCC

Mitchell Batoff (*mbatoff@aol.com*), Professor Emeritus, New Jersey City University, Nutley

In this engineering revision of a very popular workshop—one of my best—you will construct a Rockcastle-type balance, solve the banana and raisin problems, and experience SIX SURPRISES and a BIG IDEA that pervades all measurement in every branch of science and engineering. Substantial handout! Get there early—the first 28 attendees receive a set of materials.

5:30–6:00 PM Presentation

 **Sustainability and Storytelling: iPads in the Outdoors**
 (General) *Franklin 12, Marriott*
 Science Focus: INF

Kathleen Fadigan (*kxf24@psu.edu*), Penn State, Abington, Pa.

Encounter a method for helping students find a balance between technology use and spending time outdoors in nature.

5:00–7:00 PM Featured Presentation

An Evening of STEM, Energy, and Hip-Hop Presented by Master Scientist Grand Hank

(General) *Ballroom B, Convention Center*
 Science Focus: GEN



Tyraine “Grand Hank” Ragsdale (*@Grandhank*), Grandmaster of Science and President, Grand Hank Productions, Inc., Philadelphia, Pa.

Presider: Ambra Hook, Chairperson, NSTA Philadelphia Area Conference, and Hill Freedman World Academy, Philadelphia, Pa.

This high-energy, interactive presentation will provide you with tools and strategies on how to use exciting STEM and energy demonstrations combined with the superpower of hip-hop music to pique the interest of “hard-to-reach” and even “harder-to-interest” students. This creative out-of-the-box approach will show you firsthand how to use music and movement to turn students on to STEM and energy. This special session is presented by internationally renowned, award-winning Master Scientist and Rap Educator Grand Hank whose engaging multimedia production garners praise by teachers and students globally.

Founder and president of Grand Hank Productions, Tyraine Ragsdale is a former research chemist for the Johnson & Johnson Family of Companies. Since founding Grand Hank Productions in 1989, Tyraine (aka Grand Hank) has had a profound impact on STEM education, reaching more than 10 million students, parents, and teachers across the United States and South Africa.

Grand Hank cofounded the Science of Philadelphia and Science Lab of Grand Hank television series in collaboration with The School District of Philadelphia’s PSTV Network. His scientific background has given him a leading edge in modern technology and the insight on how to organize and arrange ideas.

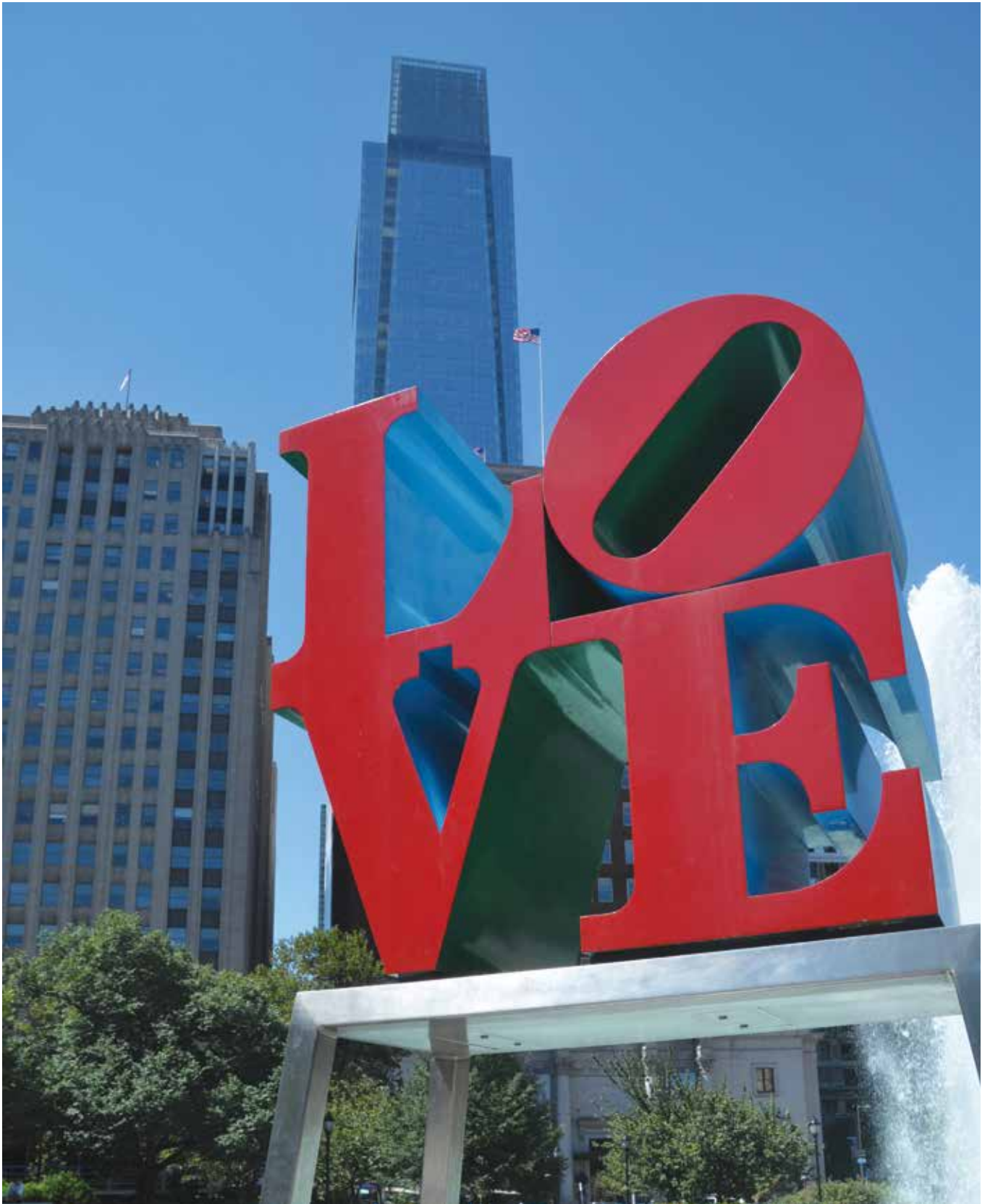
6:00–7:30 PM Networking Opportunity

PSTA Reception

Franklin 3, Marriott

Join fellow PSTA members for an opportunity to network and share information about science in your districts.

This reception is sponsored by the Pennsylvania Society for Biomedical Research.



—Photo courtesy of Edward Savaria, Jr. /Philadelphia Convention &Visitors Bureau
Philadelphia tourists and locals alike “love” LOVE, the Robert Indiana sculpture in John F. Kennedy Plaza, northwest of City Hall.

8:00–8:30 AM Presentation

Google Earth, ImageJ, and GIS: Tools to Investigate Environmental Change

(Grades 8–12)

403, Marriott

Science Focus: ESS2, ESS3, ETS2.A, CCC2, SEP4, SEP5, SEP8

Susan Meabh Kelly, University of Maryland Eastern Shore, Princess Anne

Vincent Urbanowski (vurbanowski@aitestamford.org), Academy of Information Technology & Engineering, Stamford, Conn.

Learn about free software that will support your students' ability to measure environmental change. NGSS connections and samples of student investigations will be highlighted.

8:00–8:30 AM Hands-On Workshop

AAPT Session: Problem Solving with Pi/Algebra/Physics

(Grades 7–College)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (bagleyjay@yahoo.com), Rowan College at Gloucester County, Sewell, N.J.

Measure different size cans with strings, meter rules, and calculators to explore how circular measurements are used in STEM. Foster better understanding of Pi with this hands-on activity.

8:00–9:00 AM Presentations

The 10-Point on NGSS: How to Talk About the Next Generation Science Standards in Your School and Community

(Grades K–12)

202B, Convention Center

Science Focus: GEN, NGSS

Cindy Workosky (@Cindy_NSTA; cindy_w@nsta.org), Communications Specialist, NSTA, Arlington, Va.

Talking about education standards is an expected task of teachers and administrators. It's an opportunity to help parents and others know what teachers will be teaching and what students will be learning. Join me and learn more about the goals of the *Next Generation Science Standards* and get 10 tips for how you can talk about NGSS in your school and community.

The NASA ICESat-2 Satellite—From GLAS to ATLAS: Engineering and Laser Technology

(Grades 8–12)

304/VIP, Convention Center

Science Focus: ETS

Brian Campbell (brian.a.campbell@nasa.gov), Sigma Space Corp., Wallops Island, Va.

The NASA ICESat-2 satellite, slated for launch in 2017, will have onboard a new, advanced laser altimeter system called ATLAS! Hear about the technology that went into designing this new laser system.

A Polymer Primer for Elementary and Middle Grades

(Grades 3–9)

404, Marriott

Science Focus: PS

Caryn Jackson, Tolles Career & Technical Center, Plain City, Ohio

Gak, oobleck, slime! Polymers can be fun and educational. Learn recipes and connections to try with your students as well as the science behind them.

Implementing Global Collaborative Projects in the Science Classroom

(Grades 4–College)

407, Marriott

Science Focus: GEN, SEP

Carol Cao (@carolannecao; carolannecao@gmail.com), Summit View Valley School, North Hollywood, Calif.

Aletha Williams (aletha.williams@ttu.edu), Jane Long Futures Academy, Houston, Tex.

Joseph Isaac (@EinsteinQue; bootneylee2000@gmail.com), Texas Tech University, Lubbock

Global collaboration links students with others around the world, where they engage in real-life science inquiry and investigations focusing on CCSS, NGSS, and 21st-century skills.



Edutainment: STEM Content Dissemination Using Media and Video Instruction

(Grades K–12) 408, Marriott
Science Focus: INF, PS2, PS3

William Robertson (@drskateboard; robertson@utep.edu), The University of Texas at El Paso
Dubbed “edutainment,” we will chronicle different interactions with students, teachers, and community members who used live action to video as methods of capturing relevant content in student-centered contexts.

Newton’s Laws Across the Curriculum

(Grades 6–College) 410, Marriott
Science Focus: PS1, PS2, CCC1, CCC2, CCC3, CCC4

Daryl Taylor (@DarylScience; daryl261@gmail.com), Retired Educator, Naugatuck, Conn.

Think Newton is too advanced for your class? Think again! Help your students discover true inquiry learning through true hands-on practice. Free Newton 4-Poster Set for attendees!

Teaching STEM Using Underwater Robotics with LEGO®

(Grades 6–10) Franklin 5, Marriott
Science Focus: GEN, NGSS

Adam Scribner (@JAScribner; jscribne@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Delve into new learning in your classroom with WaterBotics, an underwater robotics curriculum developed with NSF funding that uses the LEGO MINDSTORMS system and targets middle school and high school students.

Authors Needed! Share Your Teaching Ideas in an NSTA Journal

(General) Franklin 9, Marriott
Science Focus: GEN

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

Meet with NSTA journal editors to learn how to successfully prepare and submit an article for publication.

Alliance of Affiliates Session: The 3Rs—Research, Resources, and Relationships

(General) Franklin 10, Marriott
Science Focus: GEN, PS2

Todd Hoove (tthoove2@bloomu.edu), Bloomsburg University of Pennsylvania

Come connect with NSTA affiliates to learn about research and resources and form relationships to support your work in science education.

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

(Grades 6–12) Franklin 11, Marriott
Science Focus: ESS, INF

Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, 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.



Mitosis Lab Instruction Using Smartphones and Tablets

(Grades 9–College) Franklin 12, Marriott
Science Focus: LS1, CCC1, CCC3, CCC4, SEP1, SEP2, SEP4, SEP6

Patrick Wells (patrickwells@nlesd.ca), Holy Spirit High School, Conception Bay South, Newfoundland, Canada
Come learn how mitosis labs using smartphones and tablets improved collaboration, communication, and evaluation with reduction of the typical student issues of a microscope activity.

8:00–9:00 AM Hands-On Workshops**NESTA Shares: Innovative Ways to Teach About Climate and Climate Change**

(Grades 6–College) 103 B/C, Convention Center
Science Focus: ESS

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.

Lisa Alter (alterl@yahoo.com), National Earth Science Teachers Association, Hamden, Conn.

Members from the National Earth Science Teachers Association will share strategies to enhance your studies of climate, climate change, and human impact to help implement NGSS and state curricular standards.

**NSTA Press® Session: Outdoor Science: A Practical Guide**

(Grades K–8) 113B, Convention Center
Science Focus: GEN

Steve Rich (@bflyguy; bflywriter@comcast.net), West GYSTC, Carrollton, Ga.

Explore STEM in the school yard with NSTA Press books, and find out how birds and students can “engineer” with sticks and stems. Free seeds.

ASEE Session: Introducing Engineering to Elementary School

(Grades K–5) 113C, Convention Center
Science Focus: ETS, CCC, SEP

Steve O’Brien (obriens@tcnj.edu), The College of New Jersey, Trenton

Engineering is natural in elementary school. Learn about tools such as the Engineering is Elementary® program and other ways to introduce engineering in K–5.

Bringing Science and Literacy Together (BLAST)

(Grades 2–5) 202A, Convention Center
Science Focus: GEN

Renee O’Leary, Holy Angels School, Newark, Del.

Presider: Marguerite Vavalla, Retired Educator, Wilmington, Del.

Discover simple multisensory, hands-on elementary (grades 2–5) explorations using fairy tales as catalysts with take-home and language arts follow-up. Receive sample plans and materials.

Data-Based Science in Middle School

(Grades 6–8) 401/402, Marriott
Science Focus: ESS, LS, CCC1, SEP4, SEP7

Brenda Paul (@brzpaul; brenda.r.paul@gmail.com), Autrey Mill Middle School, Alpharetta, Ga.

Jennifer Rockecharlie (jrockecharlie@gmail.com), Henderson Middle School, Chamblee, Ga.

Explore using real-world data to guide students toward understanding different concepts in middle school science.

PECO and United Way’s Energizing Education Program for After School

(Grades 1–12) Franklin 1, Marriott
Science Focus: PS

Jennifer Mitchell-Winterbottom (psugrad1@msn.com), Pottstown Middle School, Pottstown, Pa.

Emily Hawbaker (@NEED_project; ehawbaker@need.org), The NEED Project, Manassas, Va.

Mentor teachers and leaders in Philadelphia area after-school programs share successes and strategies that motivate their students to become energy experts.

ACS Middle Level Session: Matter—Solids, Liquids, and Gases

(Grades 6–8) Franklin 3, Marriott
Science Focus: PS1.A

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

Explore solids, liquids, and gases through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

Local, Relevant, Real—Environmental Videos That Tell Stories That Change the World

(Grades 4–12) Franklin 4, Marriott
Science Focus: LS2

Anita Brook-Dupree (abdupree@greentreks.tv), Science Is My Specialty Educational Consulting, Philadelphia, Pa.

Learn about EcoExpress, a free, environmentally focused, searchable video service for educators. Then perform an example of a hands-on activity associated with one of the videos.

Captivate Students' Interests Beyond the Classroom with Chemistry

(Grades 9–12)

Franklin 6, Marriott

Science Focus: PS, INF

Karen Kaleuati (@ACSCChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, D.C.

The ACS ChemClub program provides—at no cost to schools—fun, valuable resources. Learn about the program, experience a meeting, and take home a copy of the resources.



Chapter Books at the Crossroads of the NGSS and CCSS

(Grades 6–9)

Franklin 7, Marriott

Science Focus: GEN, NGSS

Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University/PSTA, Shippensburg, Pa.

Examine different chapter book units that can help to integrate the components of the NGSS and elements of the CCSS.

Data Sets in Real-Time: Accessing Information from the Internet for Classroom Investigations

(Grades 4–College)

Franklin 8, Marriott

Science Focus: GEN, NGSS

Sharon Schleigh (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.

Learn about the use and implementation of datasets that bring real-world science data into your classroom investigations to meet the NGSS dimensions. Bring a computer or tablet, if possible.



En-gene-eering: An Engineering Design Challenge for Genetics

(Grades 3–8)

Franklin 13, Marriott

Science Focus: ETS, LS3

Amanda Laurier (alaurier@jhu.edu), Johns Hopkins University, Baltimore, Md.

Katya Denisova (kdenisova@gmail.com), Baltimore (Md.) City Public Schools

Connect engineering practices to life science content in your classroom. Engage in hands-on activities from an elementary genetics unit, including an engineering design challenge.

8:00–9:00 AM Exhibitor Workshops

Integrating Chromebook with Vernier Technology

(Grades 3–12)

104 A/B, Convention Center

Science Focus: GEN, SEP

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with Chromebook and Vernier technology, including LabQuest Mini. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

Using Problem-Based Learning to Up Your NGSS Game

(Grades K–12)

105 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Pearson

Michael Padilla, 2005–2006 NSTA President, and Professor Emeritus, Clemson University, Clemson, S.C.

One of the biggest shifts with the NGSS is the movement to incorporate more scenario-based and Problem-Based Learning. To help prepare for 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.

Lights, Camera...Enzymes in Action!

(Grades 6–College)

106 A/B, Convention Center

Science Focus: ETS1, LS1.A, PS1, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6

Sponsor: MSOE Center for BioMolecular Modeling

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

Using 3-D physical representations, students discover that proteins are linear sequences of amino acids that spontaneously fold into complex shapes following basic principles of chemistry. This hands-on workshop explores a variety of models of enzymes to introduce the concepts of substrate, active site, specificity, and competitive/noncompetitive inhibition.

Active Physics and Active Chemistry: Leading Project-Based High School Physics and Chemistry Programs Capturing the Essence of the NGSS and STEM

(Grades 9–12)

107 A/B, Convention Center

Science Focus: PS

Sponsor: It's About Time

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

Learn from author Arthur Eisenkraft how you can implement STEM and NGSS in your chemistry, physics, or physical science classroom with Active Chemistry and Active Physics. Learn how physicists, chemists, chemical engineers, and science educators collaborated to design innovative project-driven curricula that are now demonstrating significant success in engaging all students and increasing student performance. New resources include robust Active Chemistry and Active Physics 24/7 online communities for teachers.

Hands-On Science with Classroom Critters

(Grades K–12)

108A, Convention Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Add action and excitement to your science class with live organisms! Discover simple hands-on activities featuring pill/sow bugs, termites, bessbugs, and butterflies. Learn about care and handling, as well as easy ways to introduce inquiry to your labs. Free product samples and literature.

pH Scale and Math Modeling

(Grades 9–12)

108B, Convention Center

Science Focus: PS1

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.

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.

Flinn Scientific Resources Prepare Students for AP Chemistry Success

(Grades 9–12)

109 A/B, Convention Center

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Mike Marvel, Flinn Scientific, Inc., Batavia, Ill.

Join Flinn Scientific for resources and strategies to help students succeed on the AP Chemistry exam. Prepare students for the first day of class with FlinnPREP™, a new online review of foundational chemistry concepts. Learn how easy it is to teach the integrated learning objectives and applied science skills using Flinn's AP Chemistry Kits, including Flinn's free-response questions before the exam. Handouts!

Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics!

(Grades 9–College)

110 A/B, Convention Center

Science Focus: LS, PS

Sponsor: PASCO scientific

Fran Zakutansky, Retired Educator, Montvale, N.J.

Use PASCO's new Wireless Spectrometer and free Spectrometry software to perform introductory spectroscopy experiments for chemistry, biology, and physics on computers and iPads. In this hands-on workshop, you'll analyze emission spectra, absorbance/transmittance spectra, solution concentration data, and reaction kinetics data.

Creating to Understand: Come Build Your Muscles in Clay!

(Grades 8–College)

111B, Convention Center

Science Focus: LS

Sponsor: ANATOMY IN CLAY® Learning System

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

In this interactive workshop, you will be introduced to a new method of learning anatomy and physiology. We will discuss how to teach skeletal, muscular, and other body systems in a powerful kinesthetic way using clay. In this workshop, you will learn how to build body systems, such as the cardiovascular system. You can even take your built heart with you!

Engineering Design in the Middle School Classroom

(Grades 6–9) *113A, Convention Center*

Science Focus: ETS1, SEP1, SEP2, SEP6

Sponsor: Army Educational Outreach Program

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

Learn about the engineering design process and how to help students become engineers in the science classroom. Also, hear about the free online STEM competition eCYBERMISSION and learn how you and your students can participate.

8:00–9:30 AM Exhibitor Workshop

How to Use Pop Culture Science in Your Classes

(Grades 9–College) *103A, Convention Center*

Science Focus: GEN

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (*tamica_stubbs@bio-rad.com*), Bio-Rad Laboratories, Hercules, Calif.

Use popular science to engage students, increase science literacy, and link literacy standards in your classroom. Learn how to connect real-world discoveries and issues to hands-on labs and increase student involvement and understanding.

8:00–10:00 AM Hands-On Workshop

ACS Session One: Energy in Chemistry: A Macroscopic View

(Grades 9–12) *Franklin 2, Marriott*

Science Focus: PS3, CCC, SEP6

Marta Gmurczyk (*m_gmurczyk@acs.org*), American Chemical Society, Washington, D.C.

Engage in “design activities” that can help students meaningfully understand energy transfer between systems with different temperatures by designing devices with specific properties and testing their 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

AAPT Session: Function for Force

(Grades 7–College) *411/412, Marriott*

Science Focus: ETS, PS2, CCC1, CCC2

Keri Parry (*@phillyphysics*; *kparry@philasd.org*), The LINC, Philadelphia, Pa.

Caitlin Matyas (*cmatyas@philasd.org*), The Arts Academy at Benjamin Rush, Philadelphia, Pa.

Discussion centers on hands-on activities on force dynamics that foster a greater understanding of physics while ranking and comparing tasks.

9:00 AM–3:00 PM Exhibits

Hall A, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 12 Noon to 2:00 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

9:30–10:00 AM Presentations

AAPT Session: Perception and Reality

(Grades 7–College) *411/412, Marriott*

Science Focus: ETS, PS1, CCC1, CCC2

Ron Pedelty (*rpedelty@wcasd.net*), West Chester East High School, West Chester, Pa.

Help your students acquire not only scientific content, but also tools to evaluate the world critically. We will explore the relationship between perception/reality, belief/knowledge, and evidence/proof with activities involving music, art, and popular culture, as well as the physical sciences.



Using the Cyberinfrastructure to Conduct Bioinformatics Research in Your Classroom

(Grades 9–College) *Franklin 12, Marriott*

Science Focus: LS1.A, LS3.A, LS4.A

Andrew Vershon (*vershon@waksman.rutgers.edu*) and **Susan Coletta** (*coletta@waksman.rutgers.edu*), Waksman Institute of Microbiology, Piscataway, N.J.

Learn how all your students can contribute to a bioinformatics research project that employs the same online tools and technologies used by practicing scientists.

9:30–10:30 AM Featured Presentation**The Ever-Evolving Literacy Within the Sciences***(Grades 6–12)**Ballroom A, Convention Center*

Science Focus: GEN

**Dennis Creedon** (*creedond@mahopac.k12.ny.us*), Superintendent of Schools, Mahopac (N.Y.) Central School District

President: Donald E. Kline, Strand Leader, Integrating Literacy Strategies to Revolutionize PreK–12 Science Instruction, and Associate Professor Emeritus, Lebanon Valley College, Annville, Pa.

Literacy education is the most critical component needed in building literacy in the sciences. The development of students' knowledge of and use of scientific academic language is a foundational requirement for reading mastery in this area. In addition, *Common Core State Standards for ELA and Literacy*—and the instructional shifts called for by them—call on educators to build ownership and depth of understanding within the field. Join Dennis Creedon as he presents an integrated vision on how educators can move forward in our ever-evolving landscape of building creativity, discoveries, and literacies in and through the sciences.

For more than 20 years, Dennis W. Creedon has been a lead liaison between the School District of Philadelphia and the city's Arts and Cultural Community. On March 1, 2014, Education Week identified him as a national Leader to Learn From.

Dr. Creedon is currently superintendent of Mahopac Central School District. In the recent past, he was a deputy chief academic officer in the School District of Philadelphia and oversaw the Office of Academic Enrichment and Support. In 1990, as a classroom teacher, Dennis developed the award-winning literacy-based Sounds of Learning program for Opera Philadelphia. Soon he functioned as its director of Education while he also served as the content specialist for Theater Education in the Central Curriculum Office. In 1997, the Commonwealth of Pennsylvania's Department of Education recognized the Sounds of Learning program as a Best Practice Site in Arts Integration.

9:30–10:30 AM Presentations**NSTA Press® Session: Teaching STEM Subjects to Students with Special Needs***(Grades 4–12)**113B, Convention Center*

Science Focus: GEN

Ed Linz (*@bigbaddog65; erlinz@fcps.edu*), Teacher/Author, Springfield, Va.**Mary Jane Heater** (*mjheater@ymail.com*), West Springfield High School, Springfield, Va.

Explore PROVEN strategies to improve performance for ALL students in STEM courses!

Strengthening Elementary Science: Increasing Science Literacy, Inquiry, Critical Thinking, and Engagement While Meeting the CCSS*(Grades P–6)**202B, Convention Center*

Science Focus: GEN, NGSS

Donna Knoell (*dknoell@sbcglobal.net*), Educational Consultant, Overland Park, Kans.

Emphasis will be placed on strategies to engage K–6 science students while teaching science literacy skills and hands-on explorations in tandem, stimulating inquiry, and developing student competence. Handouts!

Meeting Standards Through Citizen Science and Schoolyard Investigations*(Grades K–8)**303A, Convention Center*

Science Focus: GEN, NGSS

Lindsay Glasner (*@BirdSleuth; lig27@cornell.edu*), The Cornell Lab of Ornithology, Ithaca, N.Y.

Meeting the NGSS and CCSS goes hand in hand with student research projects and contributing data to citizen science. Motivate your students with schoolyard inquiry and real data. Get inspired with ideas and resources!

Problems and Projects to Promote Literacy in the High School Chemistry Class*(Grades 9–12)**403, Marriott*

Science Focus: PS, CCC, SEP

Jeannette Adkins (*jadkins@st.catherines.org*), St. Catherine's School, Richmond, Va.

The integration of problems and projects into a high school chemistry course will be introduced to encourage science literacy while moving toward incorporation of the NGSS.

Two Middle School Teachers' Experiences in Adapting and Implementing an Integrated Mathematics–Science Curriculum

(Grades 6–8) 404, Marriott

Science Focus: ESS

Victoria Aurelius (victoria.aurelius@fayette.kyschools.us), Jessie Clark Middle School, Lexington, Ky.

Jennifer Wilhelm (jennifer.wilhelm@uky.edu), **Merryn Cole** (@merryncole; merrynjanzen@gmail.com), and **Lauren Moorhead** (laurenschw@gmail.com), and University of Kentucky, Lexington

Receive an overview of REAL, an integrated mathematics–science curriculum that meets the NGSS. Hear from two teachers about a REAL lesson and how they adapted it.

Coral Reefs: Fragile Wonders Under Threat

(Grades 5–12) 407, Marriott

Science Focus: ESS

June Teisan (@jlteisan; june.teisan@noaa.gov), Einstein Fellow, NOAA, Washington, D.C.

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

Practicing It: Deeper Understanding of the Science and Engineering Practices as well as Math Practice Standards

(Grades K–12) 408, Marriott

Science Focus: GEN, SEP

Jewlana Smith-Hunter (ithinklearn@gmail.com), iThinkLearn Educational Consulting, LLC, Norcross, Ga. Gain a deeper understanding of the math practice standards as well as the science and engineering practices. Leave with instructional tools and resources to support your school's implementation.

Hollywood BAD Science

(Grades 6–College) 410, Marriott

Science Focus: GEN, CCC

Daryl Taylor (@DarylScience; daryl261@gmail.com), Retired Educator, Naugatuck, Conn.

How often does Hollywood influence BAD science ideas? Way too often! Come arm yourself with examples of popular media gone wrong! Video clips are available and freebies from NASA for all!

Experiential Learning in Biology Using Authentic Research

(Grades 9–12)

Franklin 5, Marriott

Science Focus: LS

William Wallace (wwallace@gds.org), Georgetown Day School, Washington, D.C.

High school students are taught to think like scientists in this investigation-based course that uses original research initiated by the students.

So We're Retired...What Can We Do Now?

(General)

Franklin 9, Marriott

Science Focus: GEN

Linda Smith (elementaryscienceteacher@earthlink.com), Retired Educator, Elmer, Neb.

The NSTA Retired Advisory Board invites you to a vibrant and useful information sharing session. Join us to explore avenues to pursue in science education.

NSELA Session: Tools for Science Leaders, Part 1

(General)

Franklin 10, Marriott

Science Focus: GEN

Elizabeth Mulkerrin (@nselescience; elizabethm@omahazoo.com), NSELA President, and Omaha's Henry Doorly Zoo and Aquarium, Omaha, Neb.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

Chytrid and Frogs—Ecology or Immunology?

(Grades 8–12)

Franklin 11, Marriott

Science Focus: LS1.A, LS1.B, LS2.A, CCC2, SEP4, SEP7

Susan Dodge (lalimule@verizon.net), The New School of Lancaster, Pa.

Stephanie Gervasi (@StephGervasi; steph.gervasi@gmail.com), University of South Florida, Tampa

Use data-rich activities about chytrid fungus, one cause of amphibian declines worldwide, to integrate ecological concepts with immunology basics, from middle grades to AP biology.

9:30–10:30 AM Hands-On Workshops**NESTA Shares: Applications of Satellite Imagery, Remote Sensing, and Computer Visualizations: Earth System***(Grades 6–College) 103 B/C, Convention Center*

Science Focus: ESS, SEP1, SEP2, SEP3, SEP4

Michael Passow (*michael@earth2class.org*), Dwight Morrow High School, Englewood, N.J.**Peter Dorofy** (*pdorofy@bcbridges.org*), National Earth Science Teachers Association, Palmyra, N.J.**Victoria Gorman** (*@GormanV; vgorman@medford.k12.nj.us*), Medford Memorial Middle School, Medford, N.J.**John D. Moore** (*mr.moore.john@gmail.com*), The GLOBE Program, Boulder, Colo.

NESTA members will share strategies to enhance inclusions of satellite imagery, remote sensing, and computer visualizations to help implement NGSS and state curricular standards.

ASEE Session: ASEE's K–12 Outreach Program, eGFI: Engineering, Go For It and TeachEngineering.org*(Grades K–12) 113C, Convention Center*

Science Focus: ETS, CCC, SEP

Steve O'Brien (*obriens@tcnj.edu*), The College of New Jersey, Trenton

The American Society for Engineering Education (ASEE) and its K–12 division will introduce you to innovative ways to add engineering into your K–12 classroom.

CESI Session: From Explanation to Explanation and Reasoning*(Grades K–8) 202A, Convention Center*

Science Focus: GEN, SEP

Jim McDonald (*@jimscienceguy; jim.mcdonald@cmich.edu*), CESI President, and Central Michigan University, Mount Pleasant

Join me for a hands-on workshop on how to connect the NGSS to CCSS by including purposeful strategies that find out students' reasoning. Handouts!

Explore hands-on models and molecular kits with us!**WORKSHOPS in 106 A/B~ BOOTH at #1617**

Thursday	11:00 AM - NOON	Constructing and Crossing Cell Membranes
Thursday	12:30 PM - 1:30 PM	Of All The Nerve!
Thursday	2:00 PM - 3:00 PM	Genes, Schemes and Molecular Machines
Friday	8:00 AM - 9:00 AM	Lights, Camera, Enzymes in Action!
Friday	11:00 AM - NOON	Let's Get Helical
Friday	12:30 PM - 1:30 PM	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication



Workshop descriptions



cbm.msoe.edu

Increasing Science and Literacy Skills: NASA Earth Science Missions Are Following Earth's Water

(Grades 6–8)

304/VIP, Convention Center

Science Focus: ESS2.C, CCC4, CCC5, SEP2, SEP4, SEP5

Dorian Janney (@JanneyDorian; dorian.w.janney@nasa.gov), NASA Goddard Space Flight Center, Greenbelt, Md.

Get NASA educational resources and learn how to integrate science and literacy strategies as we focus on how water moves through Earth's interconnected systems.

What Not to Eat at Sea

(Grades 3–College)

401/402, Marriott

Science Focus: GEN

Sarah Weldon, Oceans Project, London, England, U.K.

Join me for this hands-on virtual workshop that demonstrates how unusual settings can be utilized to bring STEM subjects to life for 21st-century learners. Learn about the different foods needed for a Guinness World Record–setting ocean row, get to taste some expedition foods, and work out exactly how you are going to pack 14 weeks' worth of food into the cabin of a 20-foot-long, 6-foot-wide ocean rowing boat. Get it wrong and your ocean rower might just starve to death...no pressure! The session ends with a short satellite phone call with Ocean Rower and Science Communicator Sarah live from her 3,000 mile Atlantic Ocean row from Portugal to Guyana, South America, as she raises funds to provide STEM education to some of the most disadvantaged students worldwide, many of whom have no access to any form of education.

ACS Middle Level Session: Changes of State—Evaporation and Condensation

(Grades 6–8)

Franklin 3, Marriott

Science Focus: PS1.A

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

Explore evaporation and condensation through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

Teach with Student-Friendly Climate Data

(Grades 6–12)

Franklin 6, Marriott

Science Focus: ESS3.D, LS2.B, PS3.B, CCC3, CCC5

Patricia Harcourt (pharcourt@gmail.com), MADE CLEAR, Annapolis, Md.

Amy Truth-Nare (@amy_nare; anare@udel.edu), University of Delaware, Newark

Climate science provides a great context for students to practice data interpretation skills. We will model lessons with climate data that are easy to access.

“Seeing” the Invisible: Making the EMS Spectrum Concrete

(Grades 7–10)

Franklin 7, Marriott

Science Focus: ESS, PS3

Christine Anne Royce (@caroyce; caroyce@aol.com), Shippensburg University/PSTA, Shippensburg, Pa.

How do we “see” something that exists but is not visible? Walk away with concrete ways to explore the EMS that engage participants.

Engineering Design

(Grades 9–12)

Franklin 13, Marriott

Science Focus: ESS3, ETS1, CCC1, CCC2, CCC7, SEP1, SEP2, SEP4, SEP7, SEP8

Jacklyn Bonneau (bonneau@wpi.edu), Massachusetts Academy of Math & Science at WPI, Worcester

See the power of the decision matrix as we explore a topic in conservation and sustainability. The matrix is a tool in the design process but can also be adapted elsewhere.



9:30–10:30 AM Exhibitor Workshops**Chemistry with Vernier***(Grades 8–College)**104 A/B, Convention Center*

Science Focus: PS, SEP

Sponsor: Vernier Software & Technology

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

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

Solar One’s CleanTech: Cool Activities for a Warming Planet*(Grades 3–12)**105 A/B, Convention Center*

Science Focus: ETS, CCC2, CCC3, CCC4, CCC5, CCC7, SEP

Sponsor: Solar One

Karen Alsen, Solar One, New York, N.Y.

Participate in fun NGSS-focused activities that are easy to replicate in the classroom. Solar One’s CleanTech for K–12 educators investigates environmental sustainability and climate change through hands-on interactive labs. Join us and conduct an energy audit, build batteries, design wind turbines, and receive lesson plans and curricular resources.

Integrating Literacy and Science—The Wow Factor*(Grades P–5)**106 A/B, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Activate Learning

Lynn Weber and **Marilyn Schmidt**, Activate Learning, Aurora, Colo.

Come engage in a hands-on investigation where your students explore, read, write, talk, and think critically about science. Address reading, writing, and math through science investigations. Create data tables and argue from evidence as you give your students a reason to write beyond just “fill in the blank.”

Project-Based Inquiry Science™ (PBIS): Creating “Coherence and Science Storylines” for Middle School Science: Grades 6–8*(Grades 6–8)**107 A/B, Convention Center*

Science Focus: GEN, NGSS

Sponsor: It’s About Time

Jean Pennycook, SAM Academy, Sanger, Calif.

Explore the power of clearly articulated middle school science content storylines developed around answering a Big Question and addressing a Big Challenge. Join us and investigate the storyline for the *Project-Based Inquiry Science* unit “Living Together,” an ecology/water quality unit, and discuss the nature of carefully ordered investigations that help students to actively engage. Formative and summative assessments included.

Engineering Design for Grades K–2*(Grades K–2)**108A, Convention Center*

Science Focus: ETS1

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Students in K–2 can ask questions, make observations, and gather information to define a simple problem and solve it with a new or improved object or tool. We’ll cover NGSS K–2-ETS1-1 and K–2-ETS1-2, Engineering Design, and provide lesson examples and strategies for engineering design in K–2 classrooms in this hands-on workshop.

Chemical Formula and Amino Acids*(Grades 9–12)**108B, Convention Center*

Science Focus: PS1

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, N.Y.

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.

Cool! Can We Do That Again?!

(Grades 2–8) 109 A/B, Convention Center

Science Focus: PS1, PS4, SEP1

Sponsor: Educational Innovations, Inc.

Jeffrey Feidler, Consultant, Wilmington, Del.

Tired of hearing “Do we have to do that!?” from your students? Come check out some of the coolest activities involving polymers, color, and light. Your students will be asking if they can do that again—and again! Door prizes, freebies, and fun!

Adapting Traditional Biology Labs to Sensor Technology

(Grades 9–College) 110 A/B, Convention Center

Science Focus: LS

Sponsor: PASCO scientific

Fran Zakutansky, Retired Educator, Montvale, N.J.

Conduct hands-on inquiry investigations on enzyme activity and cellular respiration using PASCO sensors and SPARKvue software. See how sensors can transform tedious qualitative labs into short data-driven learning experiences for standards-based labs for grades 9–12 general, AP, and IB courses.

Pluto: New Horizons

(Grades 6–12) 111B, Convention Center

Science Focus: ESS1.B

Sponsor: Simulation Curriculum Corp.

Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.

Using Simulation Curriculum’s award-winning interactive Starry Night, let’s learn about Pluto and other denizens of the Kuiper Belt. On the Big Screen, we’ll watch the New Horizons space probe approach Pluto and its moon Charon and examine how the probe’s findings add to our knowledge of this dwarf planet.

Detecting the Silent Killer: Clinical Detection of Diabetes

(Grades 9–College) 112 A/B, Convention Center

Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack, Brian Ell, and Lucia Dussan, Edvotek Inc., Washington, D.C.

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

Meet the NGSS Using Amplify Science, the Newest Curriculum from UC Berkeley’s The Lawrence Hall of Science and Amplify

(Grades 6–8) 113A, Convention Center

Science Focus: GEN, NGSS

Sponsor: Amplify

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

Experience our field-tested, technology-enhanced, 100% NGSS–designed K–8 curriculum. Built around argumentation, digital simulations, modeling tools, hands-on investigations, and explicit disciplinary literacy instruction, Amplify Science engages students with deep dives into understanding the natural and designed worlds. This workshop, focusing on middle school units, provides a sneak peek at this new curriculum.

10:00–10:30 AM Presentations

AAPT Session: Rolling Demonstrations

(Grades 7–College) 411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Jeffrey Wetherhold (wetherholdj@parklandsd.org), Parkland High School, Allentown, Pa.

Join me for a few thought-provoking rolling demonstrations and illusions.



Physics at the Philadelphia Museum of Art

(Grades 6–10) Franklin 12, Marriott

Science Focus: INF, PS2, PS3, PS4

Mary Jo Grdina (mfg29@drexel.edu), Drexel University, Philadelphia, Pa.

Hear about the development and use of an iPad app that supports the exploration of physics in art. The four learning activities tested focus on Newton’s third law, center of mass, rotational equilibrium, and the nature of color.

11:00 AM–12 Noon Featured Presentation**Bundling the NGSS Performance Expectations***(General)**Ballroom A, Convention Center*

Science Focus: GEN, NGSS



Peter McLaren (@PeterJMcLaren; pmclaren@achieve.org), Director, State and District Support for Science, Achieve, Inc., Washington, D.C.

President: David L. Evans, NSTA Executive Director, Arlington, Va.

“Bundling” is a term used to describe the process of grouping related NGSS performance expectations to build sequences of instruction to maximize learning for students. Join Peter McLaren as he shares the what, why, and how behind the bundling process to promote cohesive instruction to support students’ investigations of phenomena and solving problems.

Peter McLaren is currently director of State and District Support for Science at Achieve, Inc. Before joining Achieve, he was the science and technology specialist for the Rhode Island Department of Education (RIDE) where he supported districts in matters pertaining to standards and policy issues on K–12 science curriculum, instruction, and assessment as well as technology education. From 2010 to 2013, Peter served as president of the Council of State Science Supervisors (CSSS). In addition, he was a member of the National Academy of Science Committee for Developing Assessments of Science Proficiency in K–12 Education and the National Academy of Engineering Committee on Guiding Implementation of K–12 Engineering Education. He has also served as a member of the national writing committee for the Next Generation Science Standards.

Before joining RIDE in 2005, Peter was a science teacher for 13 years at both the high school and middle school levels. His recognitions include the Milken Family Foundation National Educator Award (2001) and the Rhode Island Science Teacher of the Year (1995) by the MIT-sponsored Network of Educators of Science and Technology.

11:00 AM–12 Noon Presentations**NESTA and CIESIN Share: Exploring a Compendium of Online Resources for Teaching Earth Science***(Grades 6–College)**103 B/C, Convention Center*

Science Focus: ESS

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.

Lisa Alter (alterl@yahoo.com), National Earth Science Teachers Association, Hamden, Conn.

Victoria Gorman (@GormanV; vgorman@medford.k12.nj.us), Medford Memorial Middle School, Medford, N.J.

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

Encouraging Curiosity with NLM’s Online Toybox: Free and Reliable Health and Science Resources for K–5 Students*(Grades K–5)**202B, Convention Center*

Science Focus: GEN

Lydia Collins (lydia@pitt.edu), University of Pittsburgh, Pa. Foster your elementary students’ natural curiosity through the use of free and reliable health and science resources from the National Library of Medicine (NLM/NIH).

University STEM Faculty and K–8 Teachers: A Winning Partnership for STEM Education*(Grades K–8)**303A, Convention Center*

Science Focus: GEN

Jonathan Wilson (jonathan.wilson@morgan.edu), Morgan State University, Baltimore, Md.

Come gain successful strategies for providing content and resources that develop confidence to effectively teach elementary–middle school science in public and private schools.

Data Visualization Made Easy Through the MY NASA DATA Live Access Server*(Grades K–12)**304/VIP, Convention Center*

Science Focus: ESS

Preston Lewis (preston.lewis@nasa.gov) and **Daniel Oostra** (@daniel.oostra; daniel.h.oostra@nasa.gov), NASA Langley Research Center, Hampton, Va.

Using MY NASA DATA, your students will have the data to answer their Earth science questions through data visualizations all in one place.

The Physics and Chemistry of Photography: A Project-Based Approach

(Grades 9–12)

403, Marriott

Science Focus: PS

David Streib, New Roots Charter School, Ithaca, N.Y.

Develop new learning in your classroom by having your students build a functional pinhole camera and use it to make photographs! Use this project to teach chemical reactions and waves from the NGSS.

STeAMing Ahead

(Grades 5–8)

404, Marriott

Science Focus: GEN

Stephanie Sassetti (ssassetti@oda.edu), The Out-of-Door Academy, Middle & Upper School, Sarasota, Fla.

The government has put a great deal of funding for schools to teach STEM. What they haven't told you is how. Let me show you how to STeAM your school ahead.

GMOs: How to Introduce Students to the Facts and Fiction of Genetically Modified Organisms

(Grades 7–College)

407, Marriott

Science Focus: ETS2.B

Kathleen Jones (jones@juniata.edu), Juniata College, Huntingdon, Pa.

Genetically Modified Organisms (GMOs) are sometimes called “frankenfoods,” but should we fear them or embrace them? Join the discussion and learn the facts.

NASA's Goldstone Apple Valley Radio Telescope (GAVRT) Project

(Grades 4–College)

408, Marriott

Science Focus: ESS

Shannon McConnell, NASA Jet Propulsion Laboratory, Pasadena, Calif.

Join NASA's GAVRT student program. See how students can team with NASA scientists to collect data operating a 34-meter radio telescope from your classroom computer.

Leadership Pathways for Exemplary K–12 STEM Teachers

(General)

410, Marriott

Science Focus: GEN

Marilyn Suiter ([#PAEMST](https://twitter.com/PAEMST); info@paemst.org) and **Nafeesa Owens** ([#PAEMST](https://twitter.com/PAEMST); nowens@nsf.gov), National Science Foundation, Arlington, Va.

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

Making Complex Connections in Anatomy and Physiology Simple Using Student-Created Schematics

(Grades 9–12)

414, Marriott

Science Focus: LS1, CCC1, CCC2, CCC4, CCC5, CCC6

Michael Lazaroff (mjvlazaroff@gmail.com), Westport (Conn.) Public Schools

Learn how to have students construct larger-than-life schematics of the body systems, illustrating anatomical connections and their physiological implications to greatly increase your students' understanding.

NSELA Session: Tools for Science Leaders, Part 2

(General)

Franklin 10, Marriott

Science Focus: GEN

Elizabeth Mulkerrin ([@nselascience](https://twitter.com/nselascience); elizabethm@omahazoo.com), NSELA President, and Omaha's Henry Doorly Zoo and Aquarium, Omaha, Neb.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

Magical Illusions and Scintillating Simulations for Science—It's Showtime!

(Grades 3–College)

Franklin 11, Marriott

Science Focus: LS, PS

Alan McCormack (amccorma@mail.sdsu.edu), 2010–2011 NSTA President, and San Diego State University, San Diego, Calif.

Storylines, discrepant events, and magic develop concepts in both physical and biological sciences, pique students' interest and imagination, and build creative and logical thinking skills.



Science 2.0—Putting Web 2.0 into the Science Classroom

(Grades 3–College)

Franklin 12, Marriott

Science Focus: GEN, NGSS

Ben Smith ([@edtechben](https://twitter.com/edtechben); ben@edtechinnovators.com), Red Lion Area Senior High School, Red Lion, Pa.

Web 2.0 tools allow for students to create products online, all while focusing upon collaboration and creativity. Grouping and associating these products through “tagging” allow students to join the conversation with students of similar interests and ideas. Find out the best free web tools to add to your teacher toolkit.

Connecting Teens to Nature: Activities and Resources for Middle School and High School

(Grades 7–12)

Franklin 5, Marriott

Science Focus: ESS3, ETS2

Michael L. Bentley, Retired Associate Professor of Science Education, Salem, Va.

George Ambrose (gambrose@wpsd.k12.pa.us), Penn Wood High School, Green Avenue Campus, Lansdowne, Pa.

Given today's global environmental trends and our technology-obsessed youth, many afflicted with Louv's Nature Deficit Disorder, connecting kids to nature must become a priority in education. We'll share practical activities and resources from our book.



Take your students to the next level with **PreK to AP teacher resource materials** for plant and soil science and crop nutrients.

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11:00 AM–12 Noon Hands-On Workshops

ASEE Session: Climate Change of a Different Nature—Carbon Capture Redesign in Biology

(Grades 9–12)

113C, Convention Center

Science Focus: ETS, LS, SEP

Kathy Kennedy (*kkenned3@stevens.edu*), Stevens Institute of Technology, Hoboken, N.J.

Infuse engineering into the biology units of photosynthesis and the carbon cycle. Participants will redesign a carbon capture system used within an algae farm design.

Let's Get Physical—From Force and Friction to Water and Weather

(Grades P–3)

202A, Convention Center

Science Focus: PS

Ruth Ruud (*ruth.ruud@yahoo.com*), Cleveland State University, Cleveland, Ohio

Juliana Texley (*@JulianaTexley*; *jtexley@att.net*), NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.

Don't look now, but the CCSS asks that you teach physical sciences as early as kindergarten, and the NGSS have very specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

NGSS: A Model for the Engineering Design Process

(Grades 4–8)

401/402, Marriott

Science Focus: ETS1

Karen Ostlund (*klostlund@utexas.edu*), 2012–2013 NSTA President, and The University of Texas at Austin

Experience a model for the engineering design process developed to articulate the three dimensions of the NGSS.

AAPT Session: Calculator Robots in Physics

(Grades 7–College)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (*bagleyjay@yahoo.com*), Rowan College at Gloucester County, Sewell, N.J.

Challenge your students as they control a robot using a Texas Instruments TI-84 graphing calculator. Students create programs in TI-BASIC. Using the robot as a distance finder, students can send their robots on inquiry-based “missions” to navigate a maze or explore Mars-like terrain.

Supporting English Language Learners in High School Science Through CCSS and Language Acquisition Strategies

(Grades 9–12)

Franklin 1, Marriott

Science Focus: GEN

Brooke Paul (*brooke.a.mcintosh@gmail.com*), Pasco High School, Pasco, Wash.

Julia Jones (*jjones@psd1.org*), Pasco (Wash.) School District
Join us and use brain-based learning strategies to teach reading and writing standards for literacy in science while scaffolding for English language learners.

ACS Middle Level Session: Density—A Molecular View

(Grades 6–8)

Franklin 3, Marriott

Science Focus: PS1.A

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

Explore the density of different materials through hands-on activities and molecular models from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

NMLSTA Session: Increasing Student Engagement and Understanding Through Science Notebooks

(Grades K–8)

Franklin 4, Marriott

Science Focus: LS3, SEP

Patty McGinnis (*pattymcginnis1@gmail.com*), Arcola Intermediate School, Eagleville, Pa.

Darlene Balaguer-Piernock (*@DarleneBalaguer*; *dbplion@comcast.net*), Audubon Elementary School, Norristown, Pa.

Science notebooks expose student understandings and misconceptions, making them excellent formative assessment tools. Learn how to implement this tool while creating your own science notebook.

Promoting Horticulture in the Classroom: Creating Authentic Learning Experiences for Students of All Ages

(Grades K–12)

Franklin 6, Marriott

Science Focus: LS

Lori Trexler (*ltrexler@longwoodgardens.org*) and **Michelle Cugini** (*mcugini@longwoodgardens.org*), Longwood Gardens, Kennett Square, Pa.

Bring plant science to life during this interactive hands-on presentation of ideas, activities, and resources. Find out how horticulture can be integrated into your curriculum to provide authentic learning experiences inside and outside of the classroom.

Differentiated Instruction That Will Engage Everyone in Your Classroom*(Grades 6–12)**Franklin 7, Marriott*

Science Focus: GEN, SEP

Brenda LaFayette (*brendalafayette54@gmail.com*), LaFayette Educational Consulting, LLC, Creedmoor, N.C.

Learn time-tested differentiated instruction strategies you can use next week. These strategies will stimulate academic interest and engage ALL of your students, while maximizing student achievement.

Hands-On Science Using Writing, Literacy, and Models*(Grades 3–12)**Franklin 8, Marriott*

Science Focus: GEN, NGSS

Judith Lucas-Odom (*judyps23@yahoo.com*), Toby Farms Elementary School, Brookhaven, Pa.

Discover ways to connect strategies to make the CCSS and NGSS more engaging with real-world hands-on activities.

**Renewable Energy: Wind Power vs. Solar Power***(Grades 4–8)**Franklin 13, Marriott*

Science Focus: PS

David Lisnitzer (*dslisnitzer@gmail.com*), P.S. 124 Osmond A. Church, South Ozone Park, N.Y.

Design, build, and test wind turbine blades and experiment with solar panels. Take home the entire unit plan, which includes worksheets, rubrics, and writing prompts.

11:00 AM–12 Noon Exhibitor Workshops**Biology with Vernier***(Grades 8–College)**104 A/B, Convention Center*

Science Focus: LS, SEP

Sponsor: Vernier Software & Technology

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

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

Teach Science—Get to Know Uncommon Schools!*(Grades K–12)**105 A/B, Convention Center*

Science Focus: GEN

Sponsor: Uncommon Schools

Kevin Bryant (*kbryant@uncommonschoools.com*), Uncommon Schools, New York, N.Y.

Applying to a high-performing charter school network can be challenging and a bit unique. Join us and learn more about this process and get the inside scoop on lots of upcoming K–12 science teaching positions.

Let's Get Helical*(Grades 6–College)**106 A/B, Convention Center*

Science Focus: ETS1.A, ETS1.B, ETS2, LS1.A, LS1.B, LS3, LS4.A, LS4.D, CCC1, CCC2, CCC6, CCC7, SEP1, SEP2

Sponsor: 3D Molecular Designs

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

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

Engineering in the NGSS: Grades 9–12*(Grades 9–12)**107 A/B, Convention Center*

Science Focus: ETS, SEP

Sponsor: It's About Time

Cary Sneider, Portland State University, Portland, Ore.

The NGSS breaks from previous documents by including science and engineering standards. This workshop—led by Cary Sneider, NGSS writing team leader—will illustrate how an innovative, project-based high school curriculum “Engineering the Future: Science, Technology, and the Design Process” can help students develop their abilities to argue from evidence and learn core ideas about energy through engaging hands-on activities and can help you create your NGSS/STEM classroom.

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

(Grades 9–12) 108A, Convention Center

Science Focus: PS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that are sure to produce a reaction from your students. Whether you're new to chemistry or feeling out of your element, you'll learn new ways to create excitement. Free materials and giveaways!

What Is a Species?

(Grades 9–12) 108B, Convention Center

Science Focus: LS4

Sponsor: LAB-AIDS®, Inc.

Brian Gross, Delcastle Technical High School, Wilmington, Del.

In this activity from the SEPUP high school biology program, learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. We will then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

Observing and Inferring in the Science Classroom: New Tips and Tools from Dinah Zike's Notebooking Central

(General) 109 A/B, Convention Center

Science Focus: GEN

Sponsor: *Dina.com*

Robert Stremme, Retired Educator, Plymouth Meeting, Pa.

Leave with new Notebooking Central templates for classroom (and real life) observations and inference to help students learn to see and think like scientists. Build a mini-notebook of ideas and applications ready to use on Monday. Join us for brain-engaging, research-based interactive activities for observation and inference.

Physics with PASCO scientific—Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics

(Grades 9–College) 110 A/B, Convention Center

Science Focus: PS

Sponsor: PASCO scientific

Ronn Fieldhouse, PASCO scientific, Roseville, Calif.

Get hands on with the most sophisticated and flexible physics software available today—PASCO Capstone—with advanced

physics analysis features, including video analysis. See how using PASCO probeware, software, and equipment can enhance your physics demonstrations and labs.

Zombie Apocalypse!

(Grades 6–12) 111B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Texas Instruments, Inc.

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

An airborne contagion! A devastating pandemic! What are we going to do? Scenario-based lessons are a great way to engage students and present concepts in context. STEM Behind Hollywood is a free program from TI and The Science and Entertainment Exchange. Visit www.STEMhollywood.com for more details.

Using the Polymerase Chain Reaction to Identify GM Foods

(Grades 9–College) 112 A/B, Convention Center

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell, Danielle Snowflake, and Lucia Dussan, 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!

National Geographic Explorers: Ideal Role Models of STEM

(Grades 3–12) 113A, Convention Center

Science Focus: ETS1.A, ETS1.B, SEP1, SEP3, SEP4, SEP8

Sponsor: National Geographic Learning

Tom Hinojosa, National Geographic Learning/Cengage Learning, Littleton, Colo.

See how National Geographic provides students with exciting examples of an integration of disciplines that remove the traditional barriers between Science, Technology, Engineering, and Mathematics, and instead focuses on innovation and the applied process of addressing questions and designing solutions to complex contextual problems using current tools and technologies.

11:00 AM—12:15 PM Exhibitor Workshop**Investigate Photosynthesis and Cellular Respiration with Algae Beads***(Grades 9–College)**103A, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (*tamica_stubbs@bio-rad.com*), Bio-Rad Laboratories, Hercules, Calif.

In this hands-on workshop, learn how algae can be used in authentic inquiry investigations to study both photosynthesis and cellular respiration (AP Biology Big Idea 2: Labs 5 and 6). You will use encapsulated algae beads in a colorimetric assay to examine the consumption and release of CO₂ that occurs during photosynthesis and cellular respiration. All measurements will be qualitative and quantitative. Then learn how to extend this experiment into an open or guided inquiry investigation for your students.

11:00 AM—1:00 PM Hands-On Workshop**ACS Session Two: Energy in Chemistry: A Particulate View***(Grades 9–12)**Franklin 2, Marriott*

Science Focus: PS, CCC

Marta Gmurczyk (*m_gmurczyk@acs.org*), American Chemical Society, Washington, D.C.

Engage in “modeling activities” to help students better understand energy transfer during physical/chemical processes by building and analyzing particulate models of matter. These activities are designed to deepen conceptual understanding of how the kinetic and potential energy of particles change during phases and in chemical reactions, and how this information can be used to analyze changes in our surroundings.



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11:30 AM–12 Noon Exhibitor Workshop

The Solid Earth

(Grades 5–8)

Booth #1017, Exhibit Hall

Science Focus: ESS

Sponsor: Science First®/STARLAB®

Summer Price, Science First/STARLAB, Yulee, Fla.

Using the immersive learning environment of the portable dome and a lesson from the Earth science software *The Layered Earth*, we will discuss topics such as Earth’s interior layers and surface features.

12:30–1:30 PM Exhibitor Workshops

Integrating Chromebook with Vernier Technology

(Grades 3–12)

104 A/B, Convention Center

Science Focus: GEN, SEP

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with Chromebook and Vernier technology, including LabQuest Mini. Experiments such as Boyle’s Law, Grip Strength Comparison, and Ball Toss will be conducted.

Double (Helix) Trouble: Maintaining Fidelity in DNA Replication

(Grades 6–College)

106 A/B, Convention Center

Science Focus: ETS1.B, LS1.A, LS3, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6

Sponsor: MSOE Center for BioMolecular Modeling

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

DNA replication is an essential process to ensure that accurate genetic information is passed down to future generations. We will explore this process using an interactive representation of the replication fork that simulates the process of DNA synthesis and 3-D models of the critical proteins that keep it in check.

PBIS Roundtables: Discussions to Support Successful Implementation

(Grades 6–8)

107 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: It’s About Time

Amanda Wilson, It’s About Time, Mount Kisco, N.Y.

Join the *Project-Based Inquiry Science*TM (PBIS) community to

12 Noon–12:45 PM Special Session

Meet the Presidents and Board/Council

(General) NSTA Exhibits (Hall A) Entrance, Convention Center

Science Focus: GEN

Be sure to stop by for this special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

learn best practices from teachers, school-based administrators, program developers, and support staff. Find tools to support implementation and face-to-face teacher support, and online tools that provide a blended approach to professional learning for successful implementation of PBIS in your classroom and school.

Cell Differentiation and Gene Expression

(Grades 9–12)

108B, Convention Center

Science Focus: LS1

Sponsor: LAB-AIDS®, Inc.

Brian Gross, Delcastle Technical High School, Wilmington, Del.

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

A Matter of Life and Death

(Grades 6–12)

111B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Texas Instruments, Inc.

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

Disease affects all of us. Learning the science and math behind the mechanisms, treatments, and the STEM careers involved is a powerful way to engage students and put context around the concepts students are required to learn. STEM Behind Health is a free program from TI and Sanford Research.

The Case of the Missing Records*(Grades 9–College)**112 A/B, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack and **Lucia Dussan**, 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.

The Secrets to Successful PBL*(Grades 3–12)**113A, Convention Center*

Science Focus: PS2.C, CCC4, SEP2, SEP3

Sponsor: Accelerate Learning–STEMscopes

Terry Talley (ttalley@acceleratelearning.com), Accelerate Learning–STEMscopes, Houston, Tex.

Project Based Learning can be challenging the first time you implement it. Come experience a hands-on engaging PBL that reveals the strategies for seamless facilitation. Allow your students the autonomy to solve problems that interest them and see high levels of engagement that lead to high levels of learning.



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2:00–2:30 PM Presentations

AAPT Session: Science Adventure

(Grades 6–10)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (bagleyjay@yahoo.com), Rowan College at Gloucester County, Sewell, N.J.

Physics Quest is a science adventure on light and optics in the year of light. Spectra need help from your middle school students to defeat the evil Miss Alignment. Four activities must be completed successfully in order to solve the mystery.

CSSS Session: Presidential Awards for Excellence in Mathematics and Science Teaching

(Grades K–12)

Franklin 10, Marriott

Science Focus: ESS, LS, PS

David Bauman (davbauman@pa.gov), Pennsylvania Dept. of Education, Harrisburg

Join me as I provide application information for the Presidential Awards for Excellence in Mathematics and Science Education program as well as answer questions concerning nominations and eligibility.

Bringing Primary Scientific Literature into the Classroom

(Grades 9–College)

Franklin 11, Marriott

Science Focus: GEN, NGSS

Melissa McCartney (mmccartn@aaas.org), Science/AAAS, Washington, D.C.

Hear about *Science in the Classroom*, a collection of annotated science papers designed to help high school to undergraduate students understand the structure and workings of scientific research.

2:00–3:00 PM Featured Presentation



Beyond Googling—Building the Conditions for Structured Inquiry

(General)

Ballroom A, Convention Center

Science Focus: GEN



Chris Lehmann (@chrislehmann; chris@practicaltheory.org), Founding Principal, Science Leadership Academy, Philadelphia, Pa.

President: Todd Hoover, Strand Leader, Technology: Teaching Revolutionary Science in the Digital Age, and Bloomsburg University of Pennsylvania, Bloomsburg

Over the journey that has been the Science Leadership Academy, we've become deeply aware of how inquiry is a process. The five core values of Inquiry, Research, Collaboration, Presentation, and Reflection are at the heart of the inquiry process for me...and it is an iterative process that we engage in. Also at the heart of the inquiry process is that the person engaging in the inquiry—the learner—actually cares about the questions they are asking.

Chris Lehmann is the founding principal of the Science Leadership Academy (SLA), a progressive science and technology high school in Philadelphia. The Science Leadership Academy is an inquiry-driven, project-based, 1:1 laptop school that is considered to be one of the pioneers of the School 2.0 movement nationally and internationally. In September 2013, he opened Science Leadership Academy @ Beeber campus, the second campus in the SLA model. Chris returned to his native Philadelphia after nine years as an English teacher and technology coordinator at the Beacon School in New York City.

Chris has earned a number of prestigious honors, including the 2014 Harold W. McGraw, Jr. Prize in Education, the 2013 ISTE Outstanding Leader Award, Dell's #Inspire100 in 2012 (one of the 100 people changing the world using social media), and the 2012 Lindback Award for Distinguished Principal Leadership. In September 2011, he was honored by the White House as a Champion of Change for his work in education reform.

Chris has written for a number of education publications, including Principal Leadership Magazine, Learning & Leading with Technology Magazine, and the School Library Journal. He is co-editor of What School Leaders Need to Know About Digital Technologies and Social Media and author of the education blog "Practical Theory."

2:00–3:00 PM Presentations**NSTA Press® Session: NFTI Science: Building PD Upon the Foundation of an NSTA Press Book***(Grades 3–5)**113B, Convention Center*

Science Focus: LS1.A, SEP1, SEP7

Terry Shiverdecker (*tshiverdecker.1@gmail.com*), Ohio Resource Center, ColumbusCome learn how the book *Inquiring Scientists, Inquiring Readers* became the foundation for a mathematics and science partnership professional development program and two-day conference.**Using Argument-Driven Inquiry with Science Writing in the K–5 Classroom***(Grades K–5)**202A, Convention Center*

Science Focus: GEN, SEP4, SEP6, SEP7, SEP8

David Johnson (*johnson.david@outlook.com*), Perkiomen Valley School District, Collegeville, Pa.

Can argument-driven inquiry drive science writing in an elementary classroom? This presentation will showcase writing strategies focused on justifying claims with evidence and reasoning.

Building a Community Science Out-of-School Program*(Grades 2–5)**202B, Convention Center*

Science Focus: INF

Danielle Haney, Science Education Academy Inc., Philadelphia, Pa.

Hear about building a community science program in an urban setting as a community partnership between a faith institution and the university.

Water Science for Elementary Students*(Grades P–7)**303A, Convention Center*

Science Focus: ESS

David Purvis (*dvdprvs2@yahoo.com*), Richmond Consolidated School, Richmond, Mass.

An impressive number of activities for elementary teachers will be presented that use water and water-based liquids.

Implementing Inquiry—Cookbook to Inquiry*(Grades 9–12)**403, Marriott*

Science Focus: GEN, SEP1, SEP3, SEP4

Kristy Rieger (*krieger@gpsbulldogs.org*), Grandville High School, Grandville, Mich.**Jennifer Glombowski** (*jglombowski@muskegonisd.org*), Muskegon Area Career Tech Center, Muskegon, Mich.

Take your labs to a higher level using inquiry techniques. Walk away with ideas for modifying high school science labs to incorporate student-centered inquiry.

Middle School Madness?!*(Grades 4–8)**404, Marriott*

Science Focus: ESS, LS, PS

Robin Zecca (*rzecca@dcs.org*) and **Jubilee Hsieh** (*jhsieh@dcs.org*), Delaware County Christian School, Newtown Square, Pa.**Dayna Torrieri** (*dtorrieri@palcs.org*), Pennsylvania Leadership Charter School, West Chester

Join us to hear about fun, classroom-tested middle school labs and activities covering multiple disciplines. Handouts!

Engage in NOAA Science*(Grades 4–College)**408, Marriott*

Science Focus: ESS

John McLaughlin (*john.mclaughlin@noaa.gov*), NOAA Office of Education, Washington, D.C.**Bart Merrick** (*@bammerick; snowgoose46@gmail.com*), NOAA Chesapeake Bay Office Headquarters, Annapolis, Md.**June Teisan** (*@jlteisan; june.teisan@noaa.gov*), Einstein Fellow, NOAA, Washington, D.C.

Citizen science opportunities from the National Oceanic and Atmospheric Administration (NOAA) offer you the opportunity to join in the study of ocean, coastal, great lakes, weather, and climate systems.

Demonstrations as Inquiry*(Grades 6–12)**410, Marriott*

Science Focus: GEN, SEP

Aaron Rudolph (*@crowdedbeaker; arudolph@pvpsd.org*), Perkiomen Valley School District, Collegeville, Pa.

Hear how to use demonstrations to promote questioning and inquiry in the science classroom. When done correctly, science demonstrations can be elevated beyond traditional “showing” activities into legitimate inquiry-based exercises.

Green Module: Center for Green Education*(Grades 7–12)**Franklin 5, Marriott*

Science Focus: LS, PS

Elias Kalambokis (*ebokis@anatolia.edu.gr*), Anatolia High School, Thessaloniki, Greece

Plant seeds of genuine environmental awareness in your students. Hear about a Green Module to cultivate the environmental awareness in K–12 students in Greece (to be integrated into existing school chemistry, physics, and biology labs).

How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions

(Grades K–12)

Franklin 9, Marriott

Science Focus: GEN, NGSS

Acacia McKenna (amckenna@nsta.org), Director, Competitions, NSTA, Arlington, Va.

Hear from NSTA on how various competitions can help bring STEM and NGSS into the classroom, and give students and teachers a chance to earn prizes.

sTem: You've Never Seen Student Technology Work Like This

(Grades 3–College)

Franklin 12, Marriott

Science Focus: GEN, SEP1, SEP3, SEP4, SEP5, SEP7, SEP8

Ben Smith (@edtechben; ben@edtechinnovators.com), Red Lion Area Senior High School, Red Lion, Pa.

Come see how to tap into your students' creative side. Including student examples, I'll demonstrate how to enhance your classroom using technology.

2:00–3:00 PM Hands-On Workshops

NESTA Shares: Rocks, Minerals, and Natural Resources for a Sustainable Future

(Grades 6–12)

103 B/C, Convention Center

Science Focus: ESS2.A, ESS3.A, ETS2.B, CCC5, SEP3, SEP8, SEP7

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Susan Meabh Kelly, University of Maryland Eastern Shore, Princess Anne

Get ready to use blended NGSS-related activities focused on acquisition and sustainable use of our natural resources.

ASEE Session: SENSE IT: Student-Constructed Water Quality Sensors

(Grades 7–College)

113C, Convention Center

Science Focus: ETS, SEP

Liesl Hotaling (lieslhotaling@yahoo.com), Eidos Education, Highlands, N.J.

The SENSE IT program challenges students to construct, deploy, and interpret data from their own water quality sensors. Demystify sensors by having your students build them from scratch.

S'COOL: Inspiring the Next Generation of STEM Professionals and Improving STEM Literacy

(Grades P–6)

304/VIP, Convention Center

Science Focus: ESS2, PS1, PS4

Sarah Crecelius (@NASASCOOL; sarah.a.crecelius@nasa.gov), SSAI/NASA Langley Research Center, Hampton, Va.

Preston Lewis (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.

Receive an overview and engage in activities from Students' Cloud Observations On-Line (S'COOL), a K–12 hands-on project that supports NASA research to understand Earth's climate.

Teaching Systems Through Structure and Function

(Grades 2–6)

401/402, Marriott

Science Focus: ETS1, LS1

Linda Burroughs (burrough@tcnj.edu), The College of New Jersey, Trenton

Linkages and lever activities in insects and animals, as well as engineering approaches to problem solving, will be worked to better understand constraints and criteria.

Working Together with Composite Materials

(Grades 7–12)

Franklin 1, Marriott

Science Focus: GEN

Caryn Jackson, Tolles Career & Technical Center, Plain City, Ohio

Investigate composites that we encounter every day and learn several cheap and effective hands-on activities with composites to take back to your classroom.

ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding

(Grades 6–8)

Franklin 3, Marriott

Science Focus: PS1.A

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

Explore the periodic table and bonding through a card game, molecular model animations, and videos of chemical reactions from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

STEM Behind Medicine: Curing Type 1 Diabetes*(Grades 9–College)**Franklin 4, Marriott*

Science Focus: LS

Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District

What once was “pie in the sky” is becoming more real by the day. Top researchers are making strides in the treatment and cure of Type 1 diabetes. We’ll look at the heroics of today’s research scientists.

Real World: Fly Lab*(Grades 10–12)**Franklin 6, Marriott*

Science Focus: LS1.B, LS1.D, LS3, LS4.B, LS4.C, SEP3

Dara Ruiz-Whalen (@ISP_lab; immersionsscience.foxchase@fcc.edu), **Christopher Aichele**, and **Alana O’Reilly** (alana.oreilly@fcc.edu), Fox Chase Cancer Center, Philadelphia, Pa.

Use flies in the classroom to teach basic genetics using various fruit fly lines. Experience hands-on immersion techniques that model real laboratory practices, bringing inquiry-based lessons from the lab-bench to the classroom.

**Whoa! Is It Windy?!? Engineering a Wind Detection Device***(Grades P–1)**Franklin 13, Marriott*

Science Focus: ESS2.D, ETS, SEP2, SEP3, SEP4, SEP8

Sheri Geitner (sgeitner@windham.k12.ct.us), **Marielle Slappe** (msslappe@windham.k12.ct.us), and **Kristen Schmalbach** (kschmalbach@windham.k12.ct.us), Charles H. Barrows STEM Academy, North Windham, Conn.

Engage in an engineering performance task based on the kindergarten NGSS Weather and Climate disciplinary core ideas. Lesson plan references provided.

2:00–3:00 PM Exhibitor Workshops**The GMO Debate Rages On!***(Grades 9–College)**103A, Convention Center*

Science Focus: PS

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (tamica_stubbs@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Are GM crops a good thing? Do you feel that genetic modifications create Frankenfoods or do they help produce safe food to feed the ever-expanding world population? Do all countries have the same GM food-labeling requirements? Learn more about GMOs 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.

Integrating iPad with Vernier Technology*(Grades 3–12)**104 A/B, Convention Center*

Science Focus: GEN, SEP

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. This hands-on workshop will address data collection with iPads and Vernier technology, including our new Go Wireless Link. Experiments such as Boyle’s Law and Grip Strength Comparison will be conducted.



Through My Window: 21st-Century Engineering Education Through Narrative

(Grades 4–8) 105 A/B, Convention Center

Science Focus: ETS, SEP1, SEP3, SEP6, SEP7, SEP8

Sponsor: Through My Window

Isabel Huff (ishuff@stcc.edu), Through My Window, Springfield, Mass.

Explore a free cutting-edge multimedia engineering curriculum called Through My Window that includes a young adult STEM novel, companion interactive website, and engaging off-line enrichment activities. This curriculum, which appeals to both girls and boys, is aligned with 21st-century STEM initiatives and designed for both formal and informal educational settings.

Environmental Study: A Real-World Investigation

(Grades 10–College) 106 A/B, Convention Center

Science Focus: ESS, CCC

Sponsor: Fisher Science Education

Robert Marshall (robert.marshall@thermofisher.com), Fisher Science Education, Pittsburgh, Pa.

How do real environmentalists determine water quality? Use field tools, laboratory equipment, and chemistry to investigate a real-world water quality case study. Convince your students by showing the power of hands-on data collection and the story it will uncover.

Debunking the Myths of Project Based Learning: Yes We CAN!

(Grades 6–12) 107 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: It's About Time

Amanda Wilson, It's About Time, Mount Kisco, N.Y.

Skeptical of Project Based Learning? Concerned about the time and resources required? Join us in debunking the myths of PBL. We will explore how common concerns are just myths and how PBL can be the teaching style that works for you and your students.

Introduction to Wisconsin Fast Plants®

(Grades K–12) 108A, Convention Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants are ideal classroom tools for all learning levels. Learn the basics for successful planting, flower dissections, and pollination. Integrate plant development, life cycle, environmental effects, genetics, and evolution into your class with these amazing plants. Door prizes!

Energy Flow Through an Ecosystem

(Grades 9–12) 108B, Convention Center

Science Focus: LS2, LS3, LS4

Sponsor: LAB-AIDS®, Inc.

Brian Gross, Delcastle Technical High School, Wilmington, Del.

Come use an interactive card sort with organism cards and ecosystem events to predict the effect of different events on the food web and ecosystem. We'll then construct an energy pyramid to examine how much energy is stored at each level of a food web.

STEM the NGSS Tide

(Grades K–8) 109 A/B, Convention Center

Science Focus: GEN, NGSS

Sponsor: Pearson

Chuck McMillan, Pearson, Chicago, Ill.

Whether you're looking for more science and engineering practices to support a transition to the NGSS or just trying to find more Problem-Based Learning to beef up the STEM component in your classroom, you'll want to take a look at Pearson's "Project STEM." We'll try some of the activities and look at Pearson's new K–8 STEM Quests. Leave with samples for classroom use and access to a demo site at Pearson Realize.

Stream Ecology: Slimy Leaves for Healthy Streams

(Grades 4–College) 110 A/B, Convention Center

Science Focus: ESS3.A, ESS3.C, SEP3, SEP4, SEP5, SEP6, SEP8

Sponsor: LaMotte Co.

Tara Muenz (tmuenz@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

Observe aquatic macroinvertebrate specimens, conduct experiments, learn classification skills, and calculate a biotic index in this hands-on introduction to stream ecology. Come learn from a Stroud Water Research Center scientist. Takeaways and door prize!

Weather and Climate Change—Are We Doomed?

(Grades 6–12) 111B, Convention Center

Science Focus: ESS2.D

Sponsor: Simulation Curriculum Corp.

Herb Koller, Simulation Curriculum Corp., Minnetonka, Minn.

Join us as we use Simulation Curriculum's Layered Earth Meteorology to investigate weather and climate using STEM and NGSS-ready lessons. This interactive model of Earth and thought-provoking exercises allows students to distinguish between weather and climate and study climate change and its effect on our planet.

Teaching STEM Using Agarose Gel Electrophoresis*(Grades 6–College)**112 A/B, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Brian Ell, Danielle Snowflack, and Lucia Dussan,
Edvotek Inc., Washington, D.C.

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

Navigating the Shifts: Making the Transition to the Next Generation Science Standards with Leaders from The Lawrence Hall of Science*(Grades K–8)**113A, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

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

How can district leadership support systematic transition to the NGSS? Examine critical pedagogical and content shifts, including the convergence with *Common Core State Standards*, in English language arts and mathematics. Experience an NGSS curriculum exemplar from Amplify Science to envision the next generation classrooms you support.

EARN 1 GRADUATE CREDIT

NSTA's Area Conference on Science Education

Ongoing professional development for science teachers.

Shippensburg University's Office of Professional, Continuing and Distance Education (ShipPCDE) offers science teachers the opportunity to receive one graduate-level credit for participating in the National Science Teachers Association's (NSTA) Area Conference on Science Education in Philadelphia: November 12-14, 2015.

The NSTA's Area Conference on Science Education is an unique learning experience for science teachers to enhance their expertise and deepen their understanding of science education – resulting in improved learning experiences for their students.

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2:00–4:00 PM Hands-On Workshop

ACS Session Three: Energy in Chemistry: An Atomic View

(Grades 9–12)

Franklin 2, Marriott

Science Focus: PS, CCC

Marta Gmurczyk (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.

Engage in “argumentation activities” to help students understand energy transfer at the atomic level by building arguments based on evidence and scientific models and ideas. These activities are designed to deepen conceptual understanding about atomic models of matter, quantization of energy, and atomic emission spectroscopy.



2:00–6:00 PM Short Course

Phenomenon-Based Learning: Fun, Hands-On Cooperative Learning of Science and ELA (SC-3)

(Grades 3–College) Ticket Required; \$80 415, Marriott

Science Focus: ETS2, PS1.A, PS2, PS3.B, PS3.C, PS4.A, PS4.B, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP

Matt Bobrowsky (@DrMattB; matt@msb-science.com; mbobrowsky@desu.edu), Delaware State University, Dover

For description, see page 32.

2:30–3:00 PM Presentation

AAPT Session: Five Laws of Physics in Five Seconds of Data Collection

(Grades 7–12)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Barry Feerman (bhfeier@gmail.com), Retired Educator, Westtown, Pa.

Have your students apply Newton’s second law with activities involving an oscillating spring and motion sensor. Add inertia to your students’ learning of physics through explorations using data collection.

3:30–4:00 PM Presentations

AAPT Session: Prediction in Physics

(Grades 7–College)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (bagleyjay@yahoo.com), Rowan College at Gloucester County, Sewell, N.J.

Jeffrey Wetherhold (wetherholdj@parklandsd.org), Parkland High School, Allentown, Pa.

Explore how physics is used for landings on planetary moving objects such as the Moon, planets, and space materials. Participants will work in groups to make predictions about colliding cars as a model for these landings.

ASTE Session: Issues in Science Education: A Global Perspective

(General)

Franklin 10, Marriott

Science Focus: SEP

Presenter to be announced

Examine science curricula in different countries from an international perspective. Attention will be paid to research that is currently being done at the University of Johannesburg in South Africa on the establishment of teaching schools and how to better prepare preservice teachers.

CANCELED



3:30–4:30 PM Presentations



NSTA Press® Session: *Teaching for Conceptual Understanding in Science—Building a Bridge Between Student Ideas and Scientific Concepts*

(General)

113B, Convention Center

Science Focus: GEN

Richard Konicek-Moran (rkonicek@gmail.com), Professor Emeritus, UMass Amherst, Mass.

What does it mean to teach for conceptual understanding? Learn how you can use the author's new book, *Teaching for Conceptual Understanding in Science*, to transform and guide teaching and foster deeper conceptual learning of science. Engage in activities from the book that aid teaching for deeper meaning.

Stellaluna: A Lesson on Appreciating Diversity Through Science and Literacy

(Grades P–5)

202B, Convention Center

Science Focus: ESS2.D, LS4.C, LS4.D, CCC6

Eva Ogens (eogens@ramapo.edu), Ramapo College of New Jersey, Mahwah

The children's book *Stellaluna* provides an opportunity to address science and literacy standards while integrating science, language arts, geography, health, math, civics, and appreciation of diversity.

Teach Engineering Principles on the Cheap with Concrete

(Grades 9–12)

403, Marriott

Science Focus: ETS, CCC2, CCC6, SEP1, SEP3, SEP4, SEP6

Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.

Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.

Solidify new learning in your classroom by teaching engineering with concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. NGSS correlations shared.

Preparing for the NGSS Through a K–12 and Higher Education Collaboration: Insights from District Administrators and Teachers

(General)

407, Marriott

Science Focus: GEN, NGSS

Cathlene Leary-Elderkin (clearyelder@rider.edu) and **Kathleen Browne** (browne@rider.edu), Rider University, Lawrenceville, N.J.

Anne Catena (acatena@princeton.edu), Princeton University, Princeton, N.J.

Wil Van der Veen (wil.vanderveen@raritanval.edu), Raritan Valley Community College, North Branch, N.J.

Learn about an NGSS Gap Analysis project designed to prepare New Jersey schools for the NGSS. Key results and strategies for district-level planning will be shared.

CAEP Elementary Standards: A First Look

(College)

410, Marriott

Science Focus: GEN

Bill Badders ([@baddersb](https://twitter.com/baddersb); baddersb@roadrunner.com), 2013–2014 NSTA President, Cleveland Heights, Ohio

The Council for the Accreditation of Educator Preparation (CAEP) is, for the first time, developing standards for elementary teacher preparation. The first draft of those standards is now available. This session will introduce those standards and provide time for review and feedback.

Girls and Engineering

(General)

Franklin 5, Marriott

Science Focus: ETS, CCC1, CCC2

Mariel Kolker ([@marielkolker](https://twitter.com/marielkolker); mariel.kolker@msdk12.net), Morristown High School, Morristown, N.J.

What is causing the gender gap in STEM? Hear current research into what is driving the problem and leave with concrete steps to close the gap.

 **Game On! Using Game Design to Engage Students in Natural Science and Literacy**


(Grades 5–8) *Franklin 11, Marriott*
Science Focus: ESS2.E, LS2, LS4, INF, CCC1, CCC2, CCC6, SEP2, SEP8

Ron Houston, Henry C. Lea Elementary School, Philadelphia, Pa.

John Smith (@jfrey; jf.trey.smith@gmail.com), Boys Latin of Philadelphia Charter School, Philadelphia, Pa.

Mariah Romaninsky (@acadnatsci; mjr377@drexel.edu) and **Allison Krisch** (@AcadNatSci; ais42@drexel.edu), The Academy of Natural Sciences of Drexel University, Philadelphia, Pa.

Hear how middle-schoolers in after-school programs design games after visiting the Academy of Natural Sciences of Drexel University for inspiration.

 **Your Own Space Program: Engineering a Complete Rocket Launch/Flight/Analysis System from First Principles to Apogee**

(Grades 8–12) *Franklin 12, Marriott*
Science Focus: PS2.A, PS3.D, CCC3, CCC4, SEP1, SEP2, SEP4, SEP5, SEP6, ESS, ETS1

Vincent Urbanowski (vurbanowski@aitestamford.org), Academy of Information Technology & Engineering, Stamford, Conn.

Hear about a sequence of design/build projects around controlled, modeled, and measured model rocket flight in which each step uses tools designed and built into the previous step, culminating in an impressive digital portfolio.

3:30–4:30 PM Hands-On Workshops

NESTA Shares: Rock, Mineral, and Fossil Raffle

(General) *103 B/C, Convention Center*
Science Focus: ESS

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, N.J.

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, N.J.

Lisa Alter (alterl@yahoo.com), National Earth Science Teachers Association, Hamden, Conn.

Victoria Gorman (@GormanV; vgorman@medford.k12.nj.us), Medford Memorial Middle School, Medford, N.J.

Peter Dorofy (pdorofy@bcbridges.org), National Earth Science Teachers Association, Palmyra, N.J.

The National Earth Science Teachers Association offers a chance to win one or more display- and classroom-quality rock, mineral, and fossil specimens, as well as other Earth science-related materials.

ASEE Session: Teachers as Designers: Scaling and Designing Engineering Activities

(Grades 6–12) *113C, Convention Center*
Science Focus: ETS, SEP, CCC.

Steve O'Brien (obriens@tcnj.edu) and **Chris Anderson** (NjISTEM; canderso@tcnj.edu), The College of New Jersey, Trenton

Alek Sadiwnyk (asadiwnyk@livingston.org), Mt. Pleasant Middle School/The College of New Jersey, Livingston

Join us for an overview of how to design (begin and scale) authentic engineering design experiences as well as examples of several engineering-centric NGSS activities.

“Can a Porcupine Get Hurt by a Cactus?” Finding the Science in Children’s Observations, Questions, and Actions

(Grades P–5) *202A, Convention Center*
Science Focus: GEN

Safiya Sabir and **Jane Kloecker** (science&nature@amnh.org), American Museum of Natural History, New York, N.Y. Discover how to construct meaning from the things that young children say and do! Learn to examine evidence from multiple assessment sources, including records of children’s thoughts and questions, student work samples, and parent reflections from in-depth interviews and surveys.

Become a Sky Color Investigator Through New Science Literacy Resources

(Grades K–8) *304/VIP, Convention Center*
Science Focus: ESS2.D, ESS3.A, ESS3.C, PS4.B, CCC1, CCC2, SEP1, SEP3, SEP4, SEP7, SEP8

Jessica Taylor (jessica.e.taylor@nasa.gov) and **Preston Lewis** (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.

Sarah Crecelius (sarah.a.crecelius@nasa.gov), SSAI/NASA Langley Research Center, Hampton, Va.

Engage students in authentic science practices with NASA’s new *Sky Color Storybook*. This free book integrates science inquiry and literacy to inspire amateur sky observers.

Straw Rockets Are Out of This World*(Grades 4–8)**401/402, Marriott*

Science Focus: ETS1, PS2

Joan Gillman (*joan.gillman@calhoun.org*), The Calhoun School, New York, N.Y.

Launch your students' imaginations as you have them design, build, and test their own straw rockets. STEM skills will be emphasized as we further explore this fascinating topic.

Revolutionary Teaching: Making Science Relevant for ELLs*(Grades 7–College)**Franklin 1, Marriott*

Science Focus: GEN, SEP

Diane Carter (*dhcarter@iupui.edu*), Retired Educator, Indianapolis, Ind.

Relevancy, experiences, and previous knowledge enhance understanding and increase secondary English language learners' ability to communicate scientific concepts. Learn techniques to foster comprehension and improve test scores.

ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences*(Grades 6–8)**Franklin 3, Marriott*

Science Focus: PS1.A

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

Explore water characteristics and what makes water a polar molecule through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.



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Selecting and Using the Best in Trade Books

(General)

Franklin 4, Marriott

Science Focus: GEN

Juliana Texley (jtexley@att.net), NSTA Retiring President, and Science Writer/Instructor, Boca Raton, Fla.

Suzanne Flynn (suzannemflynn@earthlink.net), Lesley University and Cambridge College, Cambridge, Mass.

Come learn about the two systems by which NSTA identifies good and great science books for learning. Get a chance to judge the books and explore ways to use them. Find out how NSTA provides reviews of science materials, NSTA Recommends, and the Children's Book Council Outstanding Trade Book competition. Door prizes—books, of course!

Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data

(Grades 9–12)

Franklin 6, Marriott

Science Focus: ESS2.B, ESS3.B, ESS3.C, SEP4, SEP7

Patrick McQuillan (pmcquillan@lsc.org), Liberty Science Center, Jersey City, N.J.

Enhance plate tectonics, natural hazards, and human impact lessons using real earthquake data. A free online global earthquake database will be explored using NGSS-focused lessons.

Talking Points: The Role of Talk in the Science Classroom

(Grades 6–12)

Franklin 7, Marriott

Science Focus: GEN, SEP4, SEP7, SEP8

Erica Johnson (ejohnson@k12k.com) and **Marsha Buck** (@sciencediva00; mbuck@k12k.com), Ross N. Robinson Middle School, Kingsport, Tenn.

Walk away with “paired passages” after participating in this fast-paced interactive session that integrates an ELA strategy to engage students in CCSS-focused scientific argument.



iPad: Realize Its Full Potential in Your Classroom!

(Grades 7–College)

Franklin 13, Marriott

Science Focus: PS4, SEP2

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

Assist students in Developing and Using Models (an NGSS science and engineering practice) using iPad simulations. Join this “hands-on” workshop to learn how to redesign your physical science classroom to make it truly digital and meet NGSS HS-PS4. Handouts!

3:30–4:30 PM Exhibitor Workshops

Physics and Physical Science with Vernier

(Grades 8–College)

104 A/B, Convention Center

Science Focus: PS, SEP

Sponsor: Vernier Software & Technology

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

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

EarthComm and Biocomplexity—Designed to Explore Human-Earth Interactions

(Grades 9–12)

107 A/B, Convention Center

Science Focus: ESS

Sponsor: It's About Time

Amanda Wilson, It's About Time, Mount Kisco, N.Y.

Explore the design and philosophy of Project Based Learning through EarthComm and the “flipped classroom” approach of biocomplexity. Each program involves students in designing solutions to problems based on real-world issues. Learn how students investigate human interactions with Earth systems by combining inquiry and technology.

Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens

(Grades 6–12)

108A, Convention Center

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Explore animal diversity by comparing and contrasting anatomical adaptations of the pig, rat, dogfish, and frog. Participants use dissection to identify characteristics of these popular vertebrates. This is an excellent comparative activity featuring our very best Carolina's Perfect Solution specimens. Free dissection supplies and great door prizes.

Stream Ecology: Slimy Leaves for Healthy Streams*(Grades 4–College)**110 A/B, Convention Center*

Science Focus: ESS

Sponsor: LaMotte Co.

Tara Muenz (tmuenz@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

Observe aquatic macroinvertebrate specimens, conduct experiments, learn classification skills, and calculate a biotic index in this hands-on introduction to stream ecology. Come learn from a Stroud Water Research Center scientist. Take-aways and door prize!

Using Biotechnology to Diagnose HIV/AIDS*(Grades 9–College)**112 A/B, Convention Center*

Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack, Brian Ell, and Lucia Dussan, 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. Take home a free gift!

Meet the NGSS Using Amplify Science, the Newest Grades K–5 Curriculum from UC Berkeley's Lawrence Hall of Science and Amplify*(Grades K–5)**113A, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

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

Experience our field-tested, technology-enhanced, 100% NGSS–designed K–8 curriculum. Built around argumentation, digital simulations, modeling tools, hands-on investigations, and explicit disciplinary literacy instruction, Amplify Science engages students with deep dives into understanding the natural and designed worlds. This workshop, focusing on units for grades K–5, provides a sneak peek at this new curriculum.

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3:30–5:00 PM Hands-On Workshop

AMSE Session: How Venice Is Confronting Relative Sea Level Rise with Engineering

(Grades P–12)

Franklin 8, Marriott

Science Focus: ETS

Lovelle Ruggiero (@DrRuggiero; lovelleruggiero@mac.com), Consultant/Content Specialist, New Rochelle, N.Y.

Can coastal areas like Venice sustain in this environmentally changing world? Engineers are needed. Success toward a sustainable planet must embrace ideas from all perspectives.

3:30–5:00 PM Exhibitor Workshop

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

(Grades 5–12)

103A, Convention Center

Science Focus: SEP, GEN

Sponsor: Bio-Rad Laboratories

Tamica Stubbs (tamica_stubbs@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Engage with curriculum training specialist Tamica Stubbs as she presents an NGSS-focused science experience for high school students. Developed collaboratively with Kirk Brown—a master teacher, curriculum expert, and a lead writer of the revised California science framework—this presentation encourages audience participation in an engaging activity focused on understanding the mechanism underlying size exclusion chromatography (SEC). Practical measures and insights included for encouraging three-dimensional learning and assessment in your classroom.

4:00–4:30 PM Presentations

AAPT Session: Plane Physics

(Grades 7–College)

411/412, Marriott

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (bagleyjay@yahoo.com), Rowan College at Gloucester County, Sewell, N.J.

Have your physics students use kinematics to find the position of objects that fly through the air. Solve a planar motion problem with variables in this hands-activity on acceleration sans the projectiles.

ASTE Session: Connecting Communication and Integrated Science Models

(Grades 9–College)

Franklin 10, Marriott

Science Focus: GEN, NGSS

Margery Gardner (magard01@syr.edu), Syracuse University, Syracuse, N.Y.

John Tillotson (@johnwtillotson; jwtillot@syr.edu), NSTA Director, Research, and Syracuse University, Syracuse, N.Y. Review findings from an integrated lab instruction model with a communication focus for first-year undergraduate science majors.

5:00–5:30 PM Presentation



BioCONNECT (Biology and Cancer Online Education Connecting Teens)

(Grades 8–12)

Franklin 12, Marriott

Science Focus: LS

Presenter to be announced

Hear about BioCONNECT, a curriculum supplement for biology courses that is designed to increase cancer awareness. Students develop problem-solving skills with real-life connections, expand understanding of genetics, explore relationships between science and technology, and learn about science-based careers.



2015 NSTA Regional Conference Workshops

Philadelphia, PA • November 12–14, 2015

FOSS Workshop Schedule Room 104A/B

8:00–9:00

Archaea and the Three Domains:
Classification of Life for
Middle School

9:30–10:30

Scientific Practices: What Does
Argumentation Look Like in an
Elementary Classroom?

11:00–12:00

Engage Them Early—Engineering
Experiences with FOSS

12:30–1:30

Engineering in Elementary
Science: Designing with FOSS

2:00–3:00

What to Look for in Science
Learning Progressions—
Experience FOSS Next Generation

3:30–4:30

Floods, Heat Waves, and
Hurricanes: Analyzing Evidence
for a Changing Climate

Delta Workshop Schedule Room 105A/B

8:00–9:00

Earth Science for our Next
Generation of Very Young
Scientists

11:00–12:00

Engineering Design: Will It Sink
or Float?

12:30–1:30

High Flying Connections with
Science and Literacy

3:30–4:30

Crosscutting Concepts and
Argumentation Using Magnets
and Electromagnetism

Frey Workshop Schedule Room 105A/B

9:30–10:30

Solving the Mystery of STEM using
Forensic Science

2:00–3:00

Solving the Mystery of STEM using
Forensic Science



CPO Workshop Schedule Room 107A/B

8:00–9:00

CPO Science Link Chemistry
Models: Fun with Atom Building
and the Periodic Table

9:30–10:30

CPO's new Physics AP1 Link
Module: Rotational Motion with
the CPO Roller Coaster

11:00–12:00

Genetics: Crazy Traits and CPO's
Link Learning Module

12:30–1:30

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

2:00–3:00

Building an Electric Motor the
STEM Way with CPO's Link
Learning Module

3:30–4:30

CPO's new Physics AP1 Link
Module: Rotational Motion with
the CPO Roller Coaster

5:00–6:00 PM Presentations

Using NASA Resources to Teach About Earth's Energy Budget

(Grades 6–College) 304/VIP, Convention Center
Science Focus: ESS2.D, ESS3.C, ESS3.D, LS2.B, CCC5, SEP4, SEP8

Preston Lewis (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.

Sarah Crecelius (sarah.a.crecelius@nasa.gov), SSAI/NASA Langley Research Center, Hampton, Va.

Learn how you can use education resources based on NASA satellite data to help your students understand this critical and challenging Earth science concept.

Developing Spatial Reasoning Through 3-D Representations of the Universe

(Grades 8–College) 403, Marriott
Science Focus: ESS1.A, SEP2

Frank Summers (@drfranksummers; summers@stsci.edu), Space Telescope Science Institute, Baltimore, Md.

Employing inquiry-based methods, participants will examine the 3-D interpretations of 2-D imagery from NASA, and learn strategies for incorporating scientific visualizations in the classroom setting.

Sport Science in the Urban Environment: Using Sports as a Creative Way to Teach Science

(Grades 5–9) 404, Marriott
Science Focus: PS2, PS3

Penny Hammrich (plh33@drexel.edu), Drexel University, Philadelphia, Pa.

Take your science classroom on a new trajectory. Explore science principles by using sports as a creative vehicle for learning science and mathematical principles.

Using Flipping to Create a Student-Centered Classroom

(Grades 6–College) 407, Marriott
Science Focus: GEN, SEP

Kammas Murphy (@KammasMurphy; kmurphy@viking.pvt.k12.de.us), St. Elizabeth High School, Wilmington, Del. Learn how to use flipping to help transform your classroom from lecture based to student centered while focusing on the NGSS science and engineering practices.

Literacy Tools in Action: Lessons from the Implementation and Scale-Up of the Literacy Design Collaborative in Science Classrooms

(Grades K–12) 408, Marriott
Science Focus: GEN, NGSS

Rebecca Reumann-Moore (@Research4Action; rreumannmoore@researchforaction.org), Research for Action, Philadelphia, Pa.

Tara Clopper (tclopper@gcasd.org), Greencastle-Antrim High School, Greencastle, Pa.

Review findings from three years of studying the Literacy Design Collaborative initiative, which helps science teachers implement the literacy *Common Core State Standards*.

Science in the Summer: Engaging in Teacher Professional Development

(General) 414, Marriott
Science Focus: INF

Caitlin Fritz (@grassrootsgrl; cfritz@sju.edu) and **Karen Snetselaar** (ksnetsel@sju.edu), Saint Joseph's University, Philadelphia, Pa.

Dana Semos (semos@wagnerfreeinstitute.org), Wagner Free Institute of Science, Philadelphia, Pa.

Learn best practices for engaging teachers in science-related professional development and how this process can strengthen a collaborative community-school partnership.

Using Word Webs to Build Essays in Science

(Grades 6–12) Franklin 5, Marriott
Science Focus: GEN

Kelly Ramey (@kellyramey; kramay@tnitech.edu), Tennessee Tech University, Cookeville

Attention will be paid to using word banks, word webs, and essays to promote the CCSS in science classes while focusing on the content. Discussion centers on the potential for writing, listening, and speaking activities.

Engage, Encourage, and Enable Health and Science Exploration Through Literacy: Free Resources from the National Library of Medicine

(Grades 6–College) Franklin 9, Marriott
Science Focus: GEN

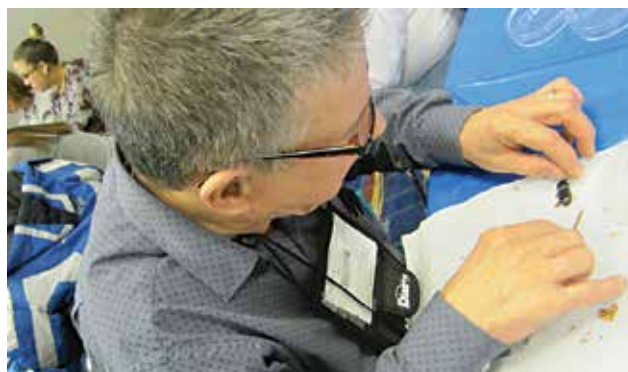
Lydia Collins (lydia@pitt.edu), University of Pittsburgh, Pa. Looking for materials to supplement curriculum, use in-between modules, or just engage students in science and literacy? Then come learn what free resources NLM/NIH has for you.

ASTE Session: Science and Literacy—The 50-Cent Microscope/Foldscope*(Grades 5–College)**Franklin 10, Marriott*

Science Focus: GEN, NGSS

Judith Bazler (jbazler@monmouth.edu) and **Carleigh Engstrom** (s0822221@monmouth.edu), Monmouth University, West Long Branch, N.J.

Two years ago, Manu Prakash, a professor at Stanford University, invented the foldscope. We are one of 10,000 researchers in 130+ countries who are exploring the use of these microscopes.

**5:00–6:00 PM Hands-On Workshops****CESI Session: Elementary Science Share-a-Thon***(Grades K–8)**103 B/C, Convention Center*

Science Focus: GEN

Jim McDonald (@jimsciencguy; jim.mcdonald@cmich.edu), CESI President, and Central Michigan University, Mount Pleasant

Come see a variety of elementary science ideas that can be integrated with other subjects presented by CESI members. Walk away with handouts to implement in your classroom.

Crosscutting STEM (and STEAM) into Picture Books for Elementary Students*(Grades K–5)**202A, Convention Center*

Science Focus: GEN, NGSS

Ava Pugh (apugh@ulm.edu), **Rhonda Mann** (mann@ulm.edu), and **Dorothy Schween** (schween@ulm.edu), University of Louisiana at Monroe

This STEM workshop provides hands-on activities for Science inferencing, Technology implementation, Engineering by Synectics, and Math tessellations featuring the trade book *Brown Bear, Brown Bear*.

Literacy Approaches Enrich and Extend STEM at St. Ann School*(Grades 7–8)**401/402, Marriott*

Science Focus: ETS2.B, LS2.C, LS2.D, SEP1, SEP4, SEP7, SEP8

Cliff Cockerham, Metro Nashville (Tenn.) Public Schools Engage in hands-on labs based on oceanography. Explore how literacy strategy integration deepens meaning, transfers intrinsic motivation, and taps additional abilities with synergistic effects. Also, hear about an ongoing partnership with local Sierra Club volunteers as environmentalist mentors.

AAPT Session: Expanding Universe*(Grades 7–College)**411/412, Marriott*

Science Focus: ETS, PS, CCC1, CCC2

Eldred (Jay) Bagley (bagleyjay@yahoo.com), Rowan College at Gloucester County, Sewell, N.J.

Explore a hands-on inquiry activity on dark matter and the expansion of the universe. Emphasis will be placed on understanding the nature of our universe and how galaxies farther away appear to be moving faster than those closer to Earth.

ACS Middle Level Session: Chemical Change—Breaking and Making Bonds*(Grades 6–8)**Franklin 3, Marriott*

Science Focus: PS1.B

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

Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations from the free, completely developed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at www.middleschoolchemistry.com.

Beyond the Science Fair—Designing Interdisciplinary Projects*(Grades 7–College)**Franklin 4, Marriott*

Science Focus: ETS, SEP

Christalee Bieber (@WorkshopSchool; christalee.bieber@gmail.com) and **Simon Hauger** (@workshopschool; simon.hauger@workshopschool.org), The Workshop School, Philadelphia, Pa.

Taking a project-based approach to science can be daunting and resource intensive. Hear about our challenges and successes and then try it yourself!

Modeling Stellar Evolution on the H-R Diagram with NASA Data

(Grades 9–12)

Franklin 6, Marriott

Science Focus: ESS1, PS1.C, PS2.C, PS4.B, PS4.C, CCC1, CCC2, CCC4, CCC5, CCC7, SEP2, SEP4, SEP5, ETS2

Donna Young (dlyoung.nso@gmail.com), NASA Astrophysics Division, Bullhead City, Ariz.

Plot pulsating variable stars on an H-R diagram to determine instability regions where stars are transitioning from main sequence stars to red giants and supergiants.

Hands On/Minds On: Transforming Traditional Labs into Inquiry-Based Activities

(Grades 7–12)

Franklin 7, Marriott

Science Focus: LS, PS, SEP1, SEP3, SEP4, SEP5, SEP8

Ilana Saxe (isaxe@lawrenceville.org), The Lawrenceville School, Lawrenceville, N.J.

April Bross (abross@verizon.net), The College of New Jersey, Trenton

Bring a copy of your own traditional lab and leave with an inquiry activity and a better understanding of how to make what students learn “stick.”

Nanotechnology in the K–12 Classroom

(Grades 6–12)

Franklin 13, Marriott

Science Focus: ETS2, LS1.A, PS1.A, PS2.B, CCC3, CCC6

Manuel Figueroa (manuel.figueroa@tcnj.edu), The College of New Jersey, Trenton

Matthew VanKouwenberg (mvankouwenberg@scienceleadership.org), Science Leadership Academy, Philadelphia, Pa.

Explore the next frontier in science: nanotechnology. Find out about nanotechnology-based activities that can be implemented in a STEM classroom, as well as engage in a hands-on activity on hydrophobic surfaces.

5:30–6:00 PM Presentation



Bringing Medical Imaging into the Physics Classroom

(Grades 9–12)

Franklin 12, Marriott

Science Focus: ETS, PS, SEP

Ross Gunderson (rgunderson@dccs.org), Delaware County Christian School, Newtown Square, Pa.

President: Robin Zecca, Delaware County Christian School, Newtown Square, Pa.

Engage in hands-on activities to help students understand how CT and PET scans function. These activities were originally developed for a high school physics class and use a simple light sensor and some lasers/LEDs.

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

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HTML



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

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New engaging and fun science Gizmos



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Completed in 1753, Independence Hall is where both the United States Declaration of Independence and the United States Constitution were adopted.

8:00–8:30 AM Presentations

PAESTA Session: Leveraging the Year of Pluto to Highlight the Practices of Astronomy and Planetary Science

(Grades 4–College)

113A, Convention Center

Science Focus: ESS1.B, SEP3, SEP4

Christopher Palma (@dfrctionslikes; cpalma@psu.edu), Penn State, University Park, Pa.

In July 2015, the New Horizons mission will fly by Pluto. We'll probe how to use this high-interest NASA research to highlight the science practices unique to astronomy.



Building Green: Designing Sustainable Solutions

(Grades 5–10)

Franklin 12, Marriott

Science Focus: ETS1, PS3.B, PS3.D, SEP1, SEP2, SEP6, SEP8

Liza Esser (lessor@chds.org), Capitol Hill Day School, Washington, D.C.

Experience a solutions-oriented environmental science unit in which students design a model “green” home while learning about engineering, architecture, design, energy, and sustainability.

8:00–9:00 AM Presentations

Science and Literature: The Pitfalls and the Pendulum

(General)

403, Marriott

Science Focus: GEN

Caryn Jackson, 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.

Entertainment Physics in Philadelphia Using the City to Engage Students in STEM

(Grades 6–9)

404, Marriott

Science Focus: PS2, PS3, PS4, INF

Mary Jo Grdina (mfjg29@drexel.edu) and **Penny Hammrich** (plh33@drexel.edu), Drexel University, Philadelphia, Pa.

Hear how city venues can be used to engage urban students in STEM. We will share NGSS lesson ideas for using sports, parks, museums, department stores, and more.

Playhouses for PreK: An Engineering Education Collaboration

(Grades P/9–College)

408, Marriott

Science Focus: ETS

Kathleen Fadigan (kxf24@psu.edu) and **Janice Margle** (jmm8@psu.edu), Penn State Abington, Pa.

Walk away with step-by-step details on implementing an engineering and education collaboration and playhouse engineering design project for replication in secondary or college classrooms.

Bridging the Content Gap with Notable Nonfiction

(Grades P–8)

410, Marriott

Science Focus: GEN, NGSS

Deborah Ford (@jlgdeborahford; dford@juniorlibraryguild.com), Junior Library Guild, Plain City, Ohio

Connecting NGSS and CCSS has never been easier with the integration of new science nonfiction trade books. From free online resources that include ready-to-use lesson plans to using technology to evaluate the student learning experience, you'll leave this session with a game plan to use next week.

Teaching Environmental Sustainability Using Model My Watershed

(Grades 6–College)

415, Marriott

Science Focus: ESS, SEP

Nanette Marcum-Dietrich (ndietrich@millersville.edu), Millersville University of Pennsylvania, Millersville

Carolyn Staudt (@cjstaudt; carolyn@concord.org), The Concord Consortium, Concord, Mass.

Melinda Daniels (mdaniels@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

Model My Watershed is a free web-based application that invites students to explore the condition of their local watershed with a scientifically valid watershed model.

The Dark Universe

(Grades 8–College)

Franklin 2, Marriott

Science Focus: ESS, CCC

Daryl Taylor (@DarylScience; daryl261@gmail.com), Retired Educator, Naugatuck, Conn.

Just what is all this “dark” matter and energy, anyway? Through a semi-humorous look at recent discoveries and theories, learn the basics of these two mysterious things. No scary math; no 10-dimensional diagrams. Freebies for all!

Teaching Environmental Awareness in Maryland (TEAM): Watershed Education Inside and Outside the Classroom

(Grades 3–8) *Franklin 5, Marriott*

Science Focus: LS2.A, LS2.C, CCC2, CCC7, CCC6

Sarah Haines (*shaines@towson.edu*), Towson University, Towson, Md.

Christine Hintz (*christine.hintz@maryland.gov*), Maryland Dept. of Natural Resources, Annapolis

Come hear about a program provided by the Maryland Department of Natural Resources that engages students in meaningful watershed education experiences from their own classrooms and school grounds.

Using iPads to Create Innovative Scientists

(Grades 3–College)

Franklin 10, Marriott

Science Focus: GEN, SEP

Ben Smith (*@edtechben*; *ben@edtechinnovators.com*), Red Lion (Pa.) Area Senior High School

Whether you have one device or a classroom set, you will leave with ideas on how to leverage these tools for finding information, collecting and analyzing data, and communicating students' learning.

8:00–9:00 AM Hands-On Workshops

Addressing the Challenge of Science Anxiety for Elementary Teachers

(Grades K–5) *113C, Convention Center*

Science Focus: GEN, NGSS

Kristi Zenchak (*zenchak@oakton.edu*), Oakton Community College, Des Plaines, Ill.

Chris Cullen (*ccullen@district95.org*), Brook Park Elementary School, La Grange Park, Ill.

Science anxiety is a common challenge for many elementary teachers. Participate in inquiry-based activities that will increase your comfort and confidence in teaching science.

Science Teaching Practices for Early Childhood Classrooms

(Grades P–2) *202A, Convention Center*

Science Focus: GEN

Andrea Drewes (*adrewes@udel.edu*) and **Jennifer Gallo-Fox** (*gallofox@udel.edu*), University of Delaware, Newark

Leave with examples of standards-based, integrated hands-on experiential curricula and activities that can be easily implemented in preK–grade 2 classrooms.

Soaring Through the NGSS with PBL: Taking Flight

(Grades 6–8) *401/402, Marriott*

Science Focus: ETS1, SEP

Patricia Hillyer (*@iHillyer*; *pjhillyer@gmail.com*), Matawan-Aberdeen Middle School, Cliffwood, N.J.

Darrell Williams (*@MrScience22*; *mrscience22@gmail.com*), Fisher Middle School, Ewinj, N.J.

Join us for a journey of a Project Based Learning unit that covers multiple *Next Generation Science Standards* using simple materials. Ready to build things that fly?

Learning From Light—NASA Science Activities for You

(Grades 5–10)

Franklin 4, Marriott

Science Focus: ESS, PS.1.B, PS4.C

Sarah Eyermann (*sarah.e.eyermann@nasa.gov*) and **Sara Mitchell** (*sara.mitchell@nasa.gov*), Syneren Technologies and NASA Goddard Space Flight Center, Greenbelt, Md.

Experience hands-on activities that simulate the ways scientists use light to study space objects that are too far away to visit or touch.

Earth Observations Using Satellites and Remote Sensing in the K–12 Classroom

(Grades K–12)

Franklin 6, Marriott

Science Focus: ESS, CCC, SEP4

John D. Moore (*mr.moore.john@gmail.com*), The GLOBE Program, Boulder, Colo.

Victoria Gorman (*@GormanV*; *vgorman@medford.k12.nj.us*), Medford Memorial Middle School, Medford, N.J.

Discover how to incorporate authentic science and STEM practices into the classroom through the use of satellites and remote-sensing technology.

An Infrared Exposé: Exposing the Mysteries of Our Universe

(Grades 6–12)

Franklin 7, Marriott

Science Focus: ESS1.A, ESS1.B, CCC1, CCC2, SEP2, SEP4, SEP7

Margaret Holzer (*mholzer@monmouth.com*), Chatham High School, Chatham, N.J.

Nathan Mahoney (*@nathanmahoney*; *nathan.majoney@pinecrest.edu*), Pine Crest School, Fort Lauderdale, Fla.

From the birth of stars to evidence of planet formation, infrared astronomy provides answers to astronomy’s difficult questions. Infrared astronomy demonstrations and activities will be shared.

Where Literacy and Science Meet: Using Trade Books in Inquiry-Based Science Teaching

(Grades K–7)

Franklin 8, Marriott

Science Focus: GEN, NGSS

Tina Glover (*tglover@amnh.org*) and **Allyson Nusser** (*anusser@amnh.org*), American Museum of Natural History, New York, N.Y.

Engage in a BSCS 5E (Engage, Explore, Explain, Elaborate, and Evaluate) hands-on exploration of owl pellets and an interactive read-aloud using a trade book in order to learn about food webs.

The graphic features a portrait of Thomas Jefferson in the background. At the top left is the APS Museum logo, which includes the text 'APS museum' and 'AMERICAN PHILOSOPHICAL SOCIETY'. A curved banner across the middle contains the text 'Free Admission | www.apsmuseum.org'. Below this, three horizontal banners contain the text 'JEFFERSON,', 'SCIENCE, AND', and 'EXPLORATION'. At the bottom, a dark box contains the address '104 South 5th Street'. On the left side, a vertical banner reads 'Adjacent to Independence Hall'.



Nature's Notebook: A Modern Spin on an Age-Old Process

(Grades 6–College)

Franklin 13, Marriott

Science Focus: ESS, LS, CCC1, CCC3, CCC4, CCC7, SEP1, SEP3, SEP4, SEP8

LoriAnne Barnett (@loriannebarnett; lorianne@usanpn.org), USA National Phenology Network, Tucson, Ariz.

Learn how to implement a long-term phenology-monitoring program that appeals to student interests and desires to be connected to the natural and cyber world.

8:00–9:00 AM Exhibitor Workshop

Photosynthesis and Respiration—It's a Plant's Life! DuPont Agriscience Institute

(Grades 9–12)

108B, Convention Center

Science Focus: LS1

Sponsor: LAB-AIDS®, Inc.

Presenter to be announced

Help your students sprout and grow with a different approach to teaching photosynthesis and respiration. Learn how to captivate students through inquiry activities that can challenge and excite them. Easily implement activities into your current horticulture or plant science class.



8:00–9:30 AM Presentation

CSSS Session: Direction of Science Education in Pennsylvania

(General)

304/VIP, Convention Center

Science Focus: GEN, NGSS

David Bauman (davbauman@pa.gov), Pennsylvania Dept. of Education, Harrisburg

Pennsylvania's newly developed science framework will be highlighted along with an informal Q&A session regarding science education and the Pennsylvania Department of Education.

8:30–9:00 AM Presentation

PAESTA Session: Earth and Mars: Evidence of Tectonic Movement on Other Planets

(Grades 6–7)

113A, Convention Center

Science Focus: ESS

Kathleen Tait, Julia R. Masterman Laboratory and Demonstration School, Philadelphia, Pa.

Landforms viewed on Earth as a result of tectonic plates also appear on the planet Mars. By looking and comparing these formations on both planets, students will be able to see similarities on how they were formed.

9:00 AM–12 Noon Exhibits

Hall A, Convention Center

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

9:30–10:00 AM Presentations

PLC...The Final Frontier in Teacher Collaboration

(Grades 1–12) *113A, Convention Center*

Science Focus: GEN

Gerard Tyson, Northwest Middle School, Reading, Pa.

It is important for people in the science community to lean on each other for assistance. PLC is the way to achieve this.

Huddling Up: Improving Students' Science Learning During Lesson Enactment

(Grades 6–12)

403, Marriott

Science Focus: GEN

Kathryn Scantlebury (*kscantle@udel.edu*) and **Susan Gleason** (*sglea@udel.edu*), University of Delaware, Newark
Matthew Juck (*matthew.juck@appo.k12.de.us*), Middletown High School, Middletown, Del.

Huddles occur during the science lesson when two or more teachers meet briefly to focus on the lesson's implementation. How do they apply?



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9:30–10:30 AM Presentations

Using Children's Books to Teach Systems and Systems Thinking

(Grades 3–5) 202B, Convention Center
Science Focus: GEN, CCC4, SEP2

Greg Bartus (gregory.bartus@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Katherine Lenetti-Lynch (tlynch1402@comcast.net), Newbury Elementary School, Howell, N.J.

Kimberley Khouzam (kimberleyq2003@yahoo.com), Aldrich School, Howell, N.J.

Join us as we share experiences and a practical guide to how you can use children's books to integrate systems thinking into literacy.

Building Underwater Robots (ROVs) in the Classroom

(Grades 6–9) 404, Marriott
Science Focus: ETS

Maureen Barrett (mbluebird@aol.com), Thomas E. Harrington Middle School, Mount Laurel, N.J.

Get an in-depth look at remotely operated vehicles (ROVs) resources and discover how middle school students are exploring ocean technology by building ROVs in a STEM classroom. Handouts!



Forensic Science and Biology: Fun Forensic Inquiry Entomology Activities to Estimate Time of Death

(Grades 7–College) 408, Marriott
Science Focus: ETS1.A, LS1, PS1, CCC, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Patricia Bertino (nolanp@nycap.rr.com) and **Anthony Bertino** (abertino@nycap.rr.com), Retired Educators, Schenectady, N.Y.

Discover how to estimate time of death (PMI) using live and preserved insects—rigor, algor, and livor mortis. We will share student-designed projects/technology, alternative assessments, case studies, literacy, development, succession, and inexpensive hands-on inquiry activities. Handouts!

Lotions, Potions, and Scrubs—Polymer Science in Cosmetics

(Grades 6–12) 410, Marriott
Science Focus: PS

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

Examine the various chemicals and chemistry behind some of the most common cosmetic products. Learn how to make various cosmetics as well as the polymer science behind them. Handouts!

Reimaging Science Content Delivery for the 21st Century

(General) 414, Marriott
Science Focus: GEN

Eric Walters (ewalters@marymountnyc.org) and **Katherine Krueger** (katie.j.krueger@gmail.com), Marymount School of New York, N.Y.

As teaching and learning continues to be transformed in the 21st century, so does content delivery. Come find out how devices such as iBeacons are leading the charge.

TOTALITY 2017: Using the 2017 Total Solar Eclipse to Integrate All Content Areas into Science Curricula

(General) 415, Marriott
Science Focus: ESS

Stephanie Burns, Connetquot High School, Bohemia, N.Y. The 2017 Total Solar Eclipse path will cut across the entire U.S., providing an unprecedented opportunity to integrate virtually every content area into science lessons.

Skydiving from the Stratosphere

(Grades 6–12) Franklin 5, Marriott
Science Focus: GEN, SEP2

Jason Petula (jpetula@millersville.edu), Millersville University of Pennsylvania, Millersville

The current world record for the highest skydive is 135,852 feet. Case studies will explore the record and other high-altitude efforts.

The Digital Lab Experience

(Grades 3–College) Franklin 10, Marriott
Science Focus: GEN, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Ben Smith (@edtechben; ben@edtechinnovators.com), Red Lion Area Senior High School, Red Lion, Pa.

Science journals are a foundation of experimental work. Come learn how to have your students leverage technology to keep track of their work.

CANCELED

Inventing Photography: Making Pictures and Measuring Light*(Grades 9–12)**Franklin 11, Marriott*

Science Focus: ETS2, PS3.C, CCC3, SEP1, SEP3, SEP4, SEP5, SEP8

Vincent Urbanowski (*vurbanowski@aitestamford.org*), Academy of Information Technology & Engineering, Stamford, Conn.

Develop student interest in science. Using inexpensive electronic components, cardboard boxes, and engineering rigor, your students will build pinhole cameras, calibrate them, and use science to achieve consistent, beautiful photographs.

**Understanding Car Crashes: Engineering Truly Impactful STEM Lessons***(Grades 4–12)**Franklin 12, Marriott*

Science Focus: ETS, SEP

Griff Jones (*@JonesGriff*; *gjones@coe.ufl.edu*), University of Florida, Gainesville**Pini Kalnite**, Insurance Institute for Highway Safety, Arlington, Va.

Use free web-based crash-testing videos, classroom STEM activities, and behind-the-scenes tours of a crash research center to integrate STEM practices and promote career awareness.

9:30–10:30 AM Hands-On Workshops**NSTA Press® Session: Earth Science Puzzles: Making Meaning from Data***(Grades 7–12)**113B, Convention Center*

Science Focus: ESS2.A, ESS2.D, ESS3.C, CCC1, CCC2, CCC4, CCC5, SEP

Margie Turrin (*mkt@ldeo.columbia.edu*), Lamont-Doherty Earth Observatory, Palisades, N.Y.

Data is the foundation of science. Teach your students to work with real Earth data to build an understanding of Earth processes.

Engineering for Kindergarten? You Bet!*(Grades P–1)**113C, Convention Center*

Science Focus: ETS

Linda Smith (*elementary.science.teacher@gmail.com*), Retired Educator, Elmer, N.J.

Yes, kindergartners can master the “E” in STEM. Come complete a variety of engineering projects specifically designed for kindergartners and the NGSS.

iLIVE: investigating Life In Various Environments™ with George Washington Carver*(Grades P–8)**202A, Convention Center*

Science Focus: LS, INF

Akil Rahim (*@AkilsCreations*; *akrahim@mac.com*), AC Learning Design Studios, LLC, Ellicott City, Md.

iLIVE is a national biodiversity project of George Washington Carver InVenTures Institute for STEAM. Join me and create a citizen science phenology studies digital project that can engage your students in multiple integrated science, technology, engineering, art, and math InVenTures.

NASA Astrobiology: The Search for Life Beyond Earth*(Grades 5–College)**401/402, Marriott*

Science Focus: ESS1.A, ESS1.B, ESS2.E, LS4.C, CCC4, SEP2, SEP4

Rachel Zimmerman Brachman (*@RachelZBrachman*; *rachel.zimmerman-brachman@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Astrobiologists seek answers to the fundamental question, “Are we alone?” Learn how astrobiologists at NASA’s Jet Propulsion Laboratory search for signs of life on icy moons of our solar system.

Life Jackets: Density and STEM*(Grades 6–10)**Franklin 3, Marriott*

Science Focus: ETS1, PS1.A, CCC2

Terri George (*terrigeorgel@gmail.com*), Metro RESA, Smyrna, Ga.

In this STEM activity, you will design life jackets for a toy soldier. Application of density and the inverse relationship between volume and density will be explored.

Students’ Cloud Observations On-Line (S’COOL)—From Observing to Understanding Through Classroom-Ready Games!*(Grades K–12)**Franklin 4, Marriott*

Science Focus: ESS

Sarah Crecelius (*sarah.a.crecelius@nasa.gov*), SSAI/NASA Langley Research Center, Hampton, Va.**Preston Lewis** (*preston.lewis@nasa.gov*), NASA Langley Research Center, Hampton, Va.

Precipitate new learning in your classroom by having your students make cloud and weather observations for NASA. Discover how your students will gain a better understanding of clouds and have fun at the same time!

Stretch Your Legs for Science!

(Grades P–12)

Franklin 6, Marriott

Science Focus: GEN

Lindsay Glasner (@BirdSleuth; lig27@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.

Rosanne Mistretta (@rmistretta; rmistretta@abington-friends.net), Abington Friends School, Jenkintown, Pa.

Care for a little more exercise than running between sessions? Join us to explore citizen science via a mini bird walk! After a tutorial on bird identification, we'll head outside so you can experience just how engaging and easy it is!



Science Has Many Stories to Tell: NASA Literacy Resources for Your Students

(Grades 7–12)

Franklin 7, Marriott

Science Focus: GEN, SEP1, SEP7, SEP8

Sara Mitchell (sara.mitchell@nasa.gov) and **Sarah Eyer-mann** (sarah.e.eyermann@nasa.gov), Syneren Technologies and NASA Goddard Space Flight Center, Greenbelt, Md.

Introduce students to scientific discoveries and tell the story of how science is done with readings and hands-on activities.

CANCELED

Create Your Own NASA Portal to NGSS with NASA Wavelength

(Grades P–12)

Franklin 8, Marriott

Science Focus: ESS

Cassie Soeffing (cassie_soeffing@strategies.org) and **Liz Burck** (lizburck@gmail.com), Institute for Global Environmental Strategies, Arlington, Va.

Bring your laptop or tablet and create your own “bundles” of NGSS-focused NASA science lessons using NASA’s Wavelength website.

Where Does the Forensic Evidence Take You?

(Grades 9–12)

Franklin 13, Marriott

Science Focus: GEN, CCC1, CCC2, SEP

Michael Lazaroff (mjvlazaroff@gmail.com), Westport (Conn.) Public Schools

By learning from their own mistakes, teach your student detectives to ask the right questions, leading them to suspects, so they’ll ultimately solve the crime!

9:30–10:30 AM Exhibitor Workshop

Adding Some Color to Plant Science: DuPont Agriculture Institute

(Grades 9–12)

108B, Convention Center

Science Focus: LS, CCC3

Sponsor: LAB-AIDS®, Inc.

Presenter to be announced

Trees have secret pasts that can be discovered using dendrochronology. Become a tree detective and learn how you can get your students engaged in an inquiry-based activity that they are sure to dig.

10:00–10:30 AM Presentation

PAESTA Session: Policy Matters for Science Educators

(General)

113A, Convention Center

Science Focus: GEN, CCC2, CCC4, SEP4, SEP7, SEP8

Gregory Collins (gcollins@gse.upenn.edu), Penn Graduate School of Education, Philadelphia, Pa.

Review recent science and education policy research and explore ideas on using policy matters to increase student engagement in classroom learning.

10:00–11:30 AM Presentation

CSSS Session: Direction of Science Education in Pennsylvania

(General)

304/VIP, Convention Center

Science Focus: GEN, NGSS

David Bauman (davbauman@pa.gov), Pennsylvania Dept. of Education, Harrisburg

Pennsylvania’s newly developed science framework will be highlighted along with an informal Q&A session regarding science education and the Pennsylvania Department of Education.

12:30–1:00 PM Presentation

PAESTA Session: Breaking Down the Silos: Practical Application of Literacy in STEM

(Grades 4–12)

113A, Convention Center

Science Focus: GEN, SEP7, SEP8

Heather Spotts (hspotts@ciul0.org), Central Intermediate Unit #10, West Decatur, Pa.

Presenter: Anu Gokhale (aagokhale@ilstu.edu), Illinois State University, Normal

Engage in strategies to support and encourage Claims-Evidence-Reasoning (CER), close reading of text, argumentative discourse, and citation of text-based evidence and reasoning.

12:30–1:30 PM Presentations

Experiencing Online Simulations in Physics

(Grades 8–12)

403, Marriott

Science Focus: PS

Deborah Cotner-Davis (dcdavis@pennridge.org), Pennridge High School, Perkasie, Pa.

Online simulations can be used to engage students through technology and to help them comprehend both basic and advanced concepts in physics.

Oh SNAP! Science and Art Come Together in Out-of-School Time

(Grades 5–8)

404, Marriott

Science Focus: ESS, LS, INF, CCC1, CCC4, CCC6, SEP1, SEP2

Holly Clark (clark@wagnerfreeinstitute.org), Wagner Free Institute of Science, Philadelphia, Pa.

Deborah Hansen (debshansen@hotmail.com), General George G. Meade School, Philadelphia, Pa.

Martha Knox (marfknox@gmail.com), Teaching Artist, Philadelphia, Pa.




Karen Snetselaar (ksnetsel@sju.edu), Saint Joseph's University, Philadelphia, Pa.

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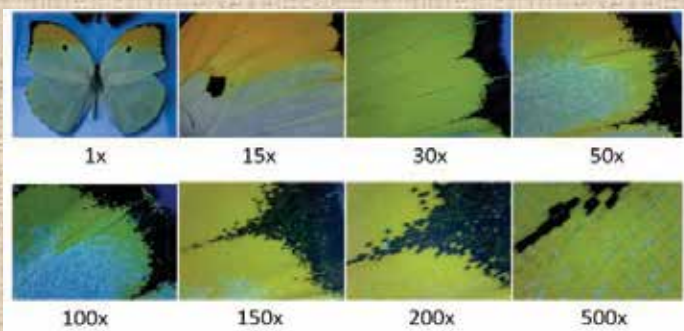




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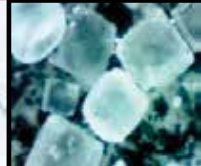



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12:30–1:30 PM Hands-On Workshops

Children as Scientists: Investigating the Nature of Science in Your Elementary Classroom

(Grades 3–5) 113C, Convention Center

Science Focus: ETS

Steven Bernhisel (steveb@linfield.edu), Linfield College, McMinnville, Ore.

Let's explore what is science—using engaging, inexpensive, and safe activities designed to teach elementary children about how science is conducted.

Developing the Mind-Set for Engineering: STEM in the Early Childhood Classroom

(Grades P–2) 202A, Convention Center

Science Focus: ETS1, SEP

Cheryl Everett (cheryle@cciu.org) and **Kate Lange** (katel@cciu.org), Chester County Intermediate Unit, Downingtown, Pa.

STEM exploration is crucial in the early years. Join us as we explore the components of a STEM lesson for the early childhood/early elementary classroom. Leave this workshop with STEM lessons that can be implemented tomorrow.

Texting and Walking

(Grades K–12) 401/402, Marriott

Science Focus: PS, INF

Jennifer Mitchell-Winterbottom (psugrad1@msn.com), Pottstown Middle School, Pottstown, Pa.

Use energy as the topic to encourage synthesis of nonfiction text through a hands-on, cooperative learning museum-walk activity.

1:00–1:30 PM Presentation

PAESTA Session: Using Fiction and Nonfiction Reading to Enhance Science Literacy

(Grades 6–12) 113A, Convention Center

Science Focus: ESS

Kelly Hunter (khunter@bbsd.org), Snyder-Girotti Elementary School, Bristol, Pa.

Emphasis will be placed on examples of both fiction and nonfiction readings that can be used in your Earth science classroom. We will explore how both styles of reading can be used in science and reading classes to enhance science literacy.

1:30–4:00 PM Meeting

Pennsylvania Earth Science Teachers Association (PAESTA) Annual Meeting

113A, Convention Center

Come connect with fellow K–12 Earth and space science teachers in discussions on teacher leadership and ESS content. Attendance is free, however preregistration is required at bit.ly/1NiSBFX.

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

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Professional Development	PD
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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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Penn State Eberly College of
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814-865-0083 (Eberly Science Outreach)
E-mails: ajs398@psu.edu (CSATS)
mjz120@psu.edu (Eberly Science Outreach)
Websites: www.csats.psu.edu, science.psu.edu/outreach

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Penn State Center for Science and the Schools and the Eberly College of Science Outreach offer multiple teacher professional development programs and K–12 student opportunities in collaboration with STEM researchers and engineers. For more information, visit www.csats.psu.edu and science.psu.edu/outreach.

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Pennsylvania Earth Science Teachers Association

209 Boucke Bldg.
University Park, PA 16802
Phone: 814-867-4598
E-mail: paesta@psu.edu
Website: www.paesta.org

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EA
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The Pennsylvania Earth Science Teachers Association aims to facilitate and advance excellence in Earth science education across the Commonwealth.

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Website: www.renaissance.com

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Website: www.sciencefirst.com

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Phone: 212-840-2244, x26
E-mail: azych@sciencefriday.com
Website: www.sciencefriday.com

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Phone: 813-918-5246
E-mail: bill.street@seaworld.com
Website: www.seaworld.com

The SeaWorld and Busch Gardens parks have online education programs and free educator resources that you can use in the classroom. Join the new SeaWorld myActions program and inspire your students to make wise decisions about the environment by tracking their daily behaviors that benefit wildlife.

Shell Science Lab Challenge #1422
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Arlington, VA 22201 6–12
Phone: 703-312-9378
E-mail: shellsciencelab@nsta.org
Website: www.nsta.org/shellsciencelab

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Simulation Curriculum #1315
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Minnetonka, MN 55305 K–12, College
Phone: 952-653-0493
E-mail: mgoodman@simcur.com
Website: www.simulationcurriculum.com

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

Slooh, LLC #1005
176 W. Morris Rd. EA
Washington Depot, CT 06794 4–8
Phone: 860-619-0115
E-mail: mike@slooh.com
Website: www.slooh.com

Since 2003, Slooh's global telescope network and automated imaging software have enabled real-time star gazing from home or classroom. Slooh recently released science and math curricula for grades 4–8 to power classroom Space Labs.

Society for Science & the Public #1600
1719 N St. NW All
Washington, DC 20036 PreK–12, College
Phone: 202-785-2255
E-mail: ssnyder@societyforscience.org
Website: www.societyforscience.org

Society for Science & the Public (SSP) is a nonprofit 501(c)(3) membership organization dedicated to public engagement in scientific research and education.

Solar One #1525
37 W. 26th St., Suite 209 EN
New York, NY 10010 K–12
E-mail: education@solar1.org
Website: www.solar1.org

The Green Design Lab™ is Solar One's K–12 environmental education program. Through hands-on activities, GDL fosters sustainable behaviors and student-led solutions to real-world issues focused on energy, air, water, materials, and food. Using the school building as a learning opportunity, students apply STEM skills to green their schools.

Exhibitors

STR School & Science Technology Resources #1408
B, EA, EN, G
6630 Hwy. 9, Suite 201 PreK–12, College
Felton, CA 95018
Phone: 831-430-9061
E-mail: bhoffman@strscopes.com
Website: www.schooltr.com

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Sustainable Energy Fund #1524
1005 Brookside Rd., Suite 210 T
Allentown, PA 18106 7–12, College
Phone: 610-264-4440
E-mail: kmccartney@thesef.org
Website: www.thesef.org

Sustainable Energy Fund is a nonprofit organization that assists energy users in overcoming educational and financial barriers to a sustainable energy future: a future in which energy is harvested, converted, distributed, and utilized in a manner that allows all to meet their energy needs without compromising the ability of their children and grandchildren to meet their needs.

Swift Optical Instruments Inc. #1311
6508 Tri-County Pkwy. B, G, T
Schertz, TX 78154 6–12, College
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Springfield, MA 01102 4–8
Phone: 413-755-4591
E-mail: teamthroughmywindow@gmail.com
Website: www.throughmywindow.org

Through My Window is free engineering curriculum funded by NSF. Combining engineering, literacy, technology, and the arts, Through My Window has three components: the young-adult mystery novel *Talk to Me* that integrates engineering concepts like design and artificial intelligence; online, interactive, narrative-based engineering “learning adventures”; and offline idea-centered enrichment activities.

Toshiba/NSTA ExploraVision #1423
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Arlington, VA 22201 K–12
Phone: 800-Explor9
E-mail: exploravision@nsta.org
Website: 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 Bioenergy Technologies Office #1100
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Washington, DC 20585
Phone: 202-586-5188
E-mail: eere_bioenergy@ee.doe.gov
Website: www.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.

UC Davis #1704
1 Shields Ave. B
Davis, CA 95616 K–12
Phone: 530-754-5287
E-mail: sbce@iamstem.ucdavis.edu
Website: sbcesepa.org

Two K–12 science education programs, funded by the National Institutes of Health’s SEPA program, share their free online tools, games, and nationally tested lessons. Data visualization, epigenetics, health and disease topics covered. Demo free tools designed to help students interpret data. All materials are free for classrooms and beyond!

Uncommon Schools #1110
826 Broadway B, C, EA, EN, G, PH, PD
New York, NY 10003 K–12
Phone: 646-842-0793
E-mail: kbryant@uncommonschoools.org
Website: www.uncommonschoools.org

Uncommon Schools starts and manages outstanding urban charter public schools that close the achievement gap and prepare low-income students to graduate from college. We operate 44 schools in New York, New Jersey, and Massachusetts.

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**Virginia Commonwealth
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E-mail: jemcneil@vcu.edu
Website: www.sosq.vcu.edu

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Secrets of the Sequence is a free online video series available for teachers to download or stream. Fifty best segments from this PBS series—plus new videos, with accompanying lesson plans—have been assembled by Virginia Commonwealth University to assist teachers in infusing life sciences research across the biology curriculum.



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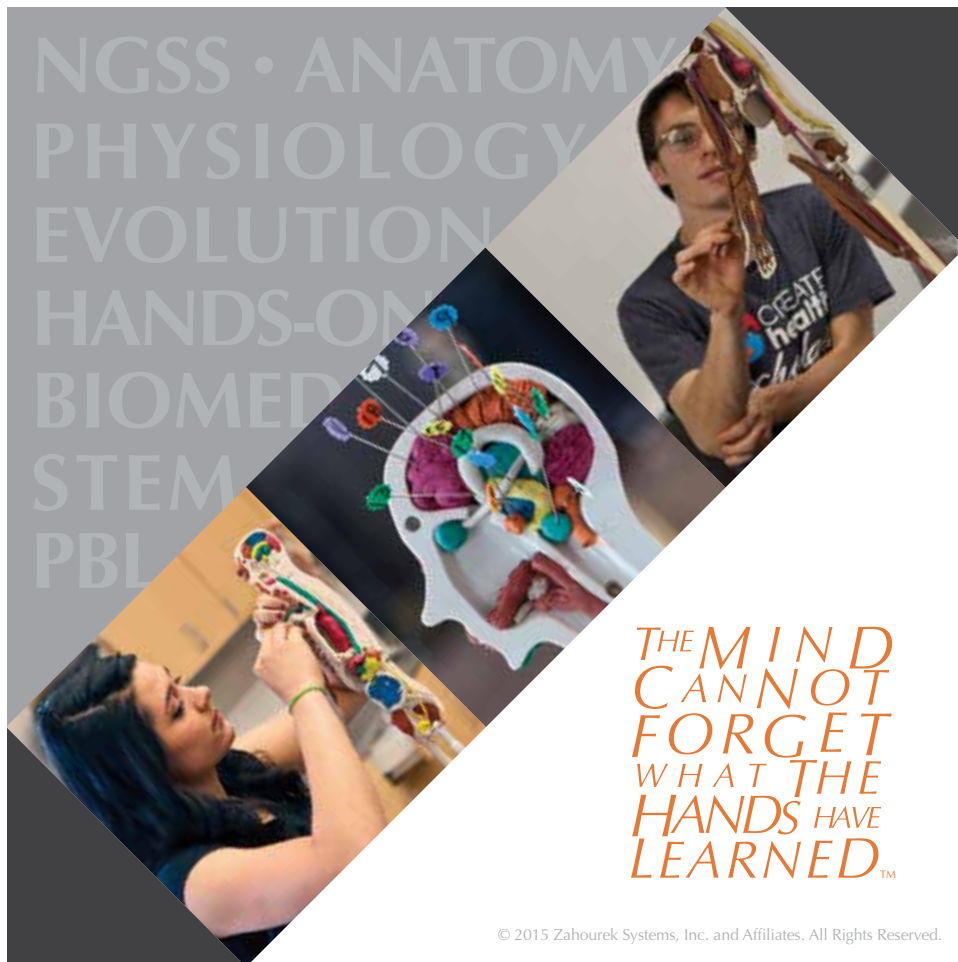
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3D Molecular Designs (Booth #1617)

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Accelerate Learning—STEMscopes (Booth #1308)

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LAB-AIDS®, Inc. (Booth #1109)

Thursday, Nov 12	8:00–9:00 AM	108B, Conv. Center	Gas Exchange (p. 45)
Thursday, Nov 12	9:30–10:30 AM	108B, Conv. Center	Modeling Convection Currents and Plate Motion (p. 47)
Thursday, Nov 12	11:00 AM–12 Noon	108B, Conv. Center	Calling All Carbons (p. 49)
Thursday, Nov 12	12:30–1:30 PM	108B, Conv. Center	Prospecting for Mineral Ore (p. 54)
Thursday, Nov 12	2:00–3:00 PM	108B, Conv. Center	Reclaiming the Metal (p. 59)
Friday, Nov 13	8:00–9:00 AM	108B, Conv. Center	pH Scale and Math Modeling (p. 75)
Friday, Nov 13	9:30–10:30 AM	108B, Conv. Center	Chemical Formula and Amino Acids (p. 81)
Friday, Nov 13	11:00 AM–12 Noon	108B, Conv. Center	What Is a Species? (p. 88)
Friday, Nov 13	12:30–1:30 PM	108B, Conv. Center	Cell Differentiation and Gene Expression (p. 90)
Friday, Nov 13	2:00–3:00 PM	108B, Conv. Center	Energy Flow Through an Ecosystem (p. 96)
Saturday, Nov 14	8:00–9:00 AM	108B, Conv. Center	Photosynthesis and Respiration—It’s a Plant’s Life! DuPont Agriscience Institute (p. 114)
Saturday, Nov 14	9:30–10:30 AM	108B, Conv. Center	Adding Some Color to Plant Science: DuPont Agriscience Institute (p. 118)

LaMotte Co. (Booth #1504)

Friday, Nov 13	2:00–3:00 PM	110 A/B, Conv. Center	Stream Ecology: Slimy Leaves for Healthy Streams (p. 96)
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MSOE Center for BioMolecular Modeling (Booth #1619)

Thursday, Nov 12	12:30–1:30 PM	106 A/B, Conv. Center	Of All the Nerve! (p. 54)
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Friday, Nov 13	12:30–1:30 PM	106 A/B, Conv. Center	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 90)

National Geographic Learning (Booth #1122)

Friday, Nov 13	11:00 AM–12 Noon	113A, Conv. Center	National Geographic Explorers: Ideal Role Models of STEM (p. 88)
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PASCO scientific (Booth #1700)

Friday, Nov 13	8:00–9:00 AM	110 A/B, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 75)
Friday, Nov 13	9:30–10:30 AM	110 A/B, Conv. Center	Adapting Traditional Biology Labs to Sensor Technology (p. 82)
Friday, Nov 13	11:00 AM–12 Noon	110 A/B, Conv. Center	Physics with PASCO scientific—Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics (p. 88)

Pearson (Booth #1113)

Friday, Nov 13	8:00–9:00 AM	105 A/B, Conv. Center	Using Problem-Based Learning to Up Your NGSS Game (p. 74)
Friday, Nov 13	2:00–3:00 PM	109 A/B, Conv. Center	STEM the NGSS Tide (p. 96)

Science First®/STARLAB® (Booth #1017)

Thursday, Nov 12	11:30 AM–12 Noon	Booth #1017, Exhibit Hall	The Change of Seasons (p. 50)
Friday, Nov 13	11:30 AM–12 Noon	Booth #1017, Exhibit Hall	The Solid Earth (p. 90)

Simulation Curriculum Corp. (Booth #1315)

Thursday, Nov 12	9:30–10:30 AM	111B, Conv. Center	Plate Tectonics: Continents on the Move (p. 48)
Thursday, Nov 12	2:00–3:00 PM	111B, Conv. Center	Stellar Evolution Made Easy (p. 60)
Friday, Nov 13	9:30–10:30 AM	111B, Conv. Center	Pluto: New Horizons (p. 82)
Friday, Nov 13	2:00–3:00 PM	111B, Conv. Center	Weather and Climate Change: Are We Doomed? (p. 96)

Slooh, LLC (Booth #1005)

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Solar One (Booth #1525)

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Texas Instruments, Inc. (Booth #1215)

Friday, Nov 13	11:00 AM–12 Noon	111B, Conv. Center	Zombie Apocalypse! (p. 88)
Friday, Nov 13	12:30–1:30 PM	111B, Conv. Center	A Matter of Life and Death (p. 90)

Through My Window (Booth #1001)

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Uncommon Schools (Booth #1110)

Friday, Nov 13	11:00 AM–12 Noon	105 A/B, Conv. Center	Teach Science—Get to Know Uncommon Schools! (p. 87)
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Vernier Software & Technology (Booth #1401)

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Thursday, Nov. 12, 2015 • Pennsylvania Convention Center, 112 A/B

9:30-10:30 AM	Transformation Tips and Tricks
11:00-12:00 PM	Case of the Missing Records
12:30-1:30 PM	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR
2:00-3:00 PM	Diagnosing the Flu
3:30-4:30 PM	Drunken Worms: Exploring Gene Function with <i>C.elegans</i>

Thursday, Nov. 13, 2015 • Pennsylvania Convention Center, 112 A/B

9:30-10:30 AM	Detecting the Silent Killer: Clinical Detection of Diabetes
11:00-12:00 PM	Using the Polymerase Chain Reaction to Identify GM Foods
12:30-1:30 PM	Case of the Missing Records
2:00-3:00 PM	Teaching STEM Using Agarose Gel Electrophoresis
3:30-4:30 PM	Using Biotechnology to Diagnose HIV/AIDS

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Earth and Space Science

Thursday

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9:30–10:30 AM	6–8	108B, Conv. Center	Modeling Convection Currents and Plate Motion (p. 47)
9:30–10:30 AM	6–12	111B, Conv. Center	Plate Tectonics: Continents on the Move (p. 48)
11:00 AM–12 Noon	9–12	108B, Conv. Center	Calling All Carbons (p. 49)
11:00 AM–12 Noon	5–C	106 A/B, Conv. Center	Constructing and Crossing Cell Membranes (p. 49)
11:30 AM–12 Noon	5–8	Booth #1017, Exhibit Hall	The Change of Seasons (p. 50)
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12:30–1:30 PM	6–C	Franklin 10, Marriott	NARST Session: Teaching Environmental Sustainability Using a Place-Based Watershed Modeling Application (p. 51)
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2:00–3:00 PM	3–12	Franklin 12, Marriott	NASA's "Eyes on the Solar System": Bringing Planets into Your Classroom (p. 57)
2:00–3:00 PM	6–12	111B, Conv. Center	Stellar Evolution Made Easy (p. 60)
3:30–4:30 PM	6–12	Franklin 9, Marriott	Science Professional Development Through Blended Learning (p. 62)
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5:00–6:00 PM	8–C	406, Marriott	An Ice Core Classroom Investigation that Connects the Three Dimensions of the NGSS with CCSS (p. 67)

Friday

8:00–8:30 AM	8–12	403, Marriott	Google Earth, ImageJ, and GIS: Tools to Investigate Environmental Change (p. 71)
8:00–9:00 AM	6–12	Franklin 11, Marriott	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 72)
8:00–9:00 AM	6–C	103 B/C, Conv. Center	NESTA Shares: Innovative Ways to Teach About Climate and Climate Change (p. 73)
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9:30–10:30 AM	6–C	103 B/C, Conv. Center	NESTA Shares: Applications of Satellite Imagery, Remote Sensing, and Computer Visualizations: Earth System (p. 79)
9:30–10:30 AM	6–8	404, Marriott	Two Middle School Teachers' Experiences in Adapting and Implementing an Integrated Mathematics–Science Curriculum (p. 78)

Schedule at a Glance Earth and Space Science

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2:00–3:00 PM	10–C	106 A/B, Conv. Center	Environmental Study: A Real-World Investigation (p. 96)
2:00–3:00 PM	4–C	110 A/B, Conv. Center	Stream Ecology: Slimy Leaves for Healthy Streams (p. 96)
2:00–3:00 PM	6–12	111B, Conv. Center	Weather and Climate Change: Are We Doomed? (p. 96)
3:30–4:30 PM	5–8	Franklin 11, Marriott	Game On! Using Game Design to Engage Students in Natural Science and Literacy (p. 100)
3:30–4:30 PM	P–5	202B, Conv. Center	Stellaluna: A Lesson on Appreciating Diversity Through Science and Literacy (p. 99)
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3:30–4:30 PM	K–8	304/VIP, Conv. Center	Become a Sky Color Investigator Through New Science Literacy Resources (p. 100)
3:30–4:30 PM	8–12	Franklin 12, Marriott	Your Own Space Program: Engineering a Complete Rocket Launch/Flight/Analysis System from First Principles to Apogee (p. 100)
3:30–4:30 PM	9–12	Franklin 6, Marriott	Teaching the High School NGSS Disciplinary Core Ideas: Earth Systems and Human Sustainability Using Real Earthquake Location Data (p. 102)
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8:00–9:00 AM	6–12	Franklin 7, Marriott	An Infrared Exposé: Exposing the Mysteries of Our Universe (p. 113)
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8:00–9:00 AM	6–C	Franklin 13, Marriott	Nature's Notebook: A Modern Spin on an Age-Old Process (p. 114)
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Engineering, Technology, and the Application of Science

Thursday

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Friday

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

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9:30–10:30 AM	3–12	105 A/B, Conv. Center	Solar One’s CleanTech: Cool Activities for a Warming Planet (p. 81)
10:00–10:30 AM	7–C	411/412, Marriott	AAPT Session: Rolling Demonstrations (p. 82)
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11:00 AM–12 Noon	9–12	107 A/B, Conv. Center	Engineering in the NGSS: Grades 9–12 (p. 87)
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2:00–6:00 PM	3–C	415, Marriott	SC-3: Phenomenon-Based Learning: Fun, Hands-On Cooperative Learning of Science and ELA (p. 98)
2:30–3:00 PM	7–12	411/412, Marriott	AAPT Session: Five Laws of Physics in Five Seconds of Data Collection (p. 98)
3:30–4:00 PM	7–C	411/412, Marriott	AAPT Session: Prediction in Physics (p. 98)
3:30–4:30 PM	G	Franklin 5, Marriott	Girls and Engineering (p. 99)
3:30–4:30 PM	8–12	Franklin 12, Marriott	Your Own Space Program: Engineering a Complete Rocket Launch/Flight/Analysis System from First Principles to Apogee (p. 100)
3:30–4:30 PM	9–12	403, Marriott	Teach Engineering Principles on the Cheap with Concrete (p. 99)
3:30–4:30 PM	6–12	113C, Conv. Center	ASEE Session: Teachers as Designers: Scaling and Designing Engineering Activities (p. 100)
3:30–4:30 PM	4–8	401/402, Marriott	Straw Rockets Are Out of This World (p. 101)
3:30–5:00 PM	P–12	Franklin 8, Marriott	AMSE Session: How Venice Is Confronting Relative Sea Level Rise with Engineering (p. 104)
4:00–4:30 PM	7–C	411/412, Marriott	AAPT Session: Plane Physics (p. 104)
5:00–6:00 PM	7–C	411/412, Marriott	AAPT Session: Expanding Universe (p. 107)
5:00–6:00 PM	7–8	401/402, Marriott	Literacy Approaches Enrich and Extend STEM at St. Ann School (p. 107)
5:00–6:00 PM	7–C	Franklin 4, Marriott	Beyond the Science Fair: Designing Interdisciplinary Projects (p. 107)
5:00–6:00 PM	6–12	Franklin 13, Marriott	Nanotechnology in the K–12 Classroom (p. 108)
5:30–6:00 PM	9–12	Franklin 12, Marriott	Bringing Medical Imaging into the Physics Classroom (p. 108)

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

Saturday

8:00–8:30 AM	5–10	Franklin 12, Marriott	Building Green: Designing Sustainable Solutions (p. 111)
8:00–9:00 AM	P/9–C	408, Marriott	Playhouses for PreK: An Engineering Education Collaboration (p. 111)
8:00–9:00 AM	6–8	401/402, Marriott	Soaring Through the NGSS with PBL: Taking Flight (p. 112)
9:30–10:30 AM	6–9	404, Marriott	Building Underwater Robots (ROVs) in the Classroom (p. 116)
9:30–10:30 AM	7–C	408, Marriott	Forensic Science and Biology: Fun Forensic Inquiry Entomology Activities to Estimate Time of Death (p. 116)
9:30–10:30 AM	P–1	113C, Conv. Center	Engineering for Kindergarten? You Bet! (p. 117)
9:30–10:30 AM	4–12	Franklin 12, Marriott	Understanding Car Crashes: Engineering Truly Impactful STEM Lessons (p. 117)
9:30–10:30 AM	6–10	Franklin 3, Marriott	Life Jackets: Density and STEM (p. 117)
9:30–10:30 AM	9–12	Franklin 11, Marriott	Inventing Photography: Making Pictures and Measuring Light (p. 117)
12:30–1:30 PM	3–5	113C, Conv. Center	Children as Scientists: Investigating the Nature of Science in Your Elementary Classroom (p. 120)
12:30–1:30 PM	P–2	202A, Conv. Center	Developing the Mind-Set for Engineering: STEM in the Early Childhood Classroom (p. 120)

General Science Education

Thursday

8:00–8:30 AM	9–C	411/412, Marriott	Leveraging Technology to Provide Students with the Autonomy to Differentiate Their Own Learning (p. 41)
8:00–9:00 AM	G	Franklin 10, Marriott	The NGSS@NSTA Hub (p. 43)
8:00–9:00 AM	K–12	Franklin 13, Marriott	Discover the NGSS: An Interactive Exploration of the <i>Next Generation Science Standards</i> (p. 43)
8:00–9:00 AM	P–3	202B, Conv. Center	Engaging and Nurturing the Curiosity of Young Children with Everyday Science That Surrounds Them (p. 42)
8:00–9:00 AM	8–C	403, Marriott	Incorporating Ethics in STEM Education (p. 42)
8:00–9:00 AM	G	103 B/C, Conv. Center	Welcome to Your First NSTA Conference (p. 43)
8:00–9:00 AM	K–12	113B, Conv. Center	NSTA Press® Session: It’s Debatable: Using Socioscientific Issues to Develop Scientific Literacy, K–12 (p. 43)
8:00–9:00 AM	8–C	Franklin 4, Marriott	Using Web-based and General Media Articles to Teach Critical Thinking of Science Content (p. 44)
8:00–9:00 AM	6–10	Franklin 9, Marriott	Overcoming Misconceptions in Evolution by Using Claims, Evidence, and Reasoning (p. 42)
8:00–9:00 AM	9–12	Franklin 5, Marriott	A “Flipped” Classroom (p. 42)
8:00–9:00 AM	1–4	113C, Conv. Center	Design Thinking and Balloons Over Broadway (p. 44)
8:30–9:00 AM	9–11	Franklin 11, Marriott	Incorporating Informational Texts into High School Science (p. 45)
9:30–10:30 AM	P–11	113A, Conv. Center	Demystifying the NGSS with STEMscopes (p. 48)
9:30–10:30 AM	6–12	105 A/B, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 46)
9:30–10:30 AM	K–5	104 A/B, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 46)
9:30–10:30 AM	K–5	108A, Conv. Center	Bring Visual Science into K–5 Classrooms—It’s a Game Changer! (p. 47)
9:30–10:30 AM	9–C	112 A/B, Conv. Center	Transformation Tips and Tricks (p. 48)
12:30–1:00 PM	6–12	Franklin 12, Marriott	Teaching Science Completely Online (p. 50)
12:30–1:00 PM	9–12	Franklin 11, Marriott	How to Implement Problem and Project Based Learning into STEM Curriculum (p. 50)
12:30–1:30 PM	9–C	106 A/B, Conv. Center	Of All the Nerve! (p. 54)
12:30–1:30 PM	6–9	113A, Conv. Center	“Hard” Doesn’t Mean “Bad” (p. 54)
12:30–1:30 PM	7–C	403, Marriott	Use Project-Based Learning (PBL) to Teach an Environmental Footprint Unit (p. 51)
12:30–1:30 PM	6–C	408, Marriott	Inquiry—Without Reinventing the Wheel (p. 51)

Schedule at a Glance General Science Education

12:30–1:30 PM	9–12	404, Marriott	Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials (p. 51)
12:30–1:30 PM	K–5	113B, Conv. Center	NSTA Press® Session: Teaching Science Through Integrating Children’s Literature and Outdoor Investigations (p. 52)
12:30–1:30 PM	K–6	113C, Conv. Center	Linking Science and Literacy for Improved Student Outcomes (p. 52)
12:30–1:30 PM	K–8	202A, Conv. Center	Taking STEM Outside (p. 52)
12:30–1:30 PM	K–5	202B, Conv. Center	How Is a Scientist Like a Poet? Connecting Literacy and Science (p. 51)
1:00–4:30 PM	6–C	Franklin 8, Marriott	SC-2: Argumentation in the Secondary Classroom (p. 55)
2:00–3:00 PM	6–12	Franklin 9, Marriott	Bring on the Online Learning! (p. 57)
2:00–3:00 PM	3–C	Franklin 2, Marriott	Dazzling Deceptions: Discrepant Events That Delight and Mystify! (p. 57)
2:00–3:00 PM	6–C	406, Marriott	Small World, Big Ideas, Great Possibilities (p. 56)
2:00–3:00 PM	K–8	108A, Conv. Center	STEM: Investigating Touch-Screen Devices (p. 59)
2:00–3:00 PM	6–12	105 A/B, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 59)
2:00–3:00 PM	K–8	113A, Conv. Center	Navigating the Shifts: Making the Transition to the <i>Next Generation Science Standards</i> with Leaders from The Lawrence Hall of Science (p. 60)
2:00–3:00 PM	G	Ballroom B, Conv. Center	Featured Presentation: Scientific Literacy and the Survival of Our Species (p. 56)
3:30–4:30 PM	4–8	110 A/B, Conv. Center	Using Slooh in the Classroom (p. 65)
3:30–4:30 PM	7–C	408, Marriott	Fun Forensic Apps: Inexpensive, Interesting Ways to Integrate MST (p. 61)
3:30–4:30 PM	P–5	113B, Conv. Center	NSTA Press® Session: Gardening with Books and Butterflies (p. 61)
3:30–4:30 PM	P–2	202A, Conv. Center	Explore, Create, and Investigate with Primary Science (p. 61)
3:30–4:30 PM	6–12	Franklin 5, Marriott	Do You Need a New Science Lab? (p. 62)
3:30–4:30 PM	P–2	113C, Conv. Center	Portable, Affordable Simple STEM (PASS) (p. 63)
3:30–4:30 PM	K–12	407, Marriott	Common Performance Assessments: Making Thinking Visible (p. 61)
3:30–4:30 PM	C	414, Marriott	The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 62)
3:30–4:30 PM	6–8	106 A/B, Conv. Center	Making Critical Thinking More Than Just a Cliché © Using Three-Dimensional Learning (p. 65)
3:30–4:30 PM	6–12	108A, Conv. Center	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 65)
5:00–5:30 PM	6–9	202B, Conv. Center	Science Current Events Journals: Real Science and Media Literacy (p. 65)
5:00–6:00 PM	1–5	113C, Conv. Center	Science and Literacy: A “Symbiotic” Relationship (p. 68)
5:00–6:00 PM	5–10	Franklin 10, Marriott	NMLSTA Session: Science and Special Education: Working Together (p. 68)
5:00–6:00 PM	5–C	113B, Conv. Center	NSTA Press® Session: Scientific Argumentation Classroom Activities (p. 68)
5:00–6:00 PM	G	414, Marriott	The NSTA Learning Center: Free Professional Learning Resources and Opportunities for Educators (p. 67)
5:00–6:00 PM	9–12	Franklin 11, Marriott	Infusing Literacy Strategies into Established State Science Prompts (p. 68)
5:00–6:00 PM	G	Franklin 2, Marriott	Exploring the Science and Engineering Practices (p. 67)
5:00–6:30 PM	5–C	Franklin 4, Marriott	The “E” in STEM: Make-It, Use-It, IMPROVE-IT, and Take It Back to Your Classroom (p. 69)
5:00–7:00 PM	G	Ballroom B, Conv. Center	Featured Presentation: An Evening of STEM, Energy, and Hip-Hop Presented by Master Scientist Grand Hank (p. 69)

Friday

8:00–9:00 AM	3–12	104 A/B, Conv. Center	Integrating Chromebook with Vernier Technology (p. 74)
8:00–9:00 AM	6–9	Franklin 7, Marriott	Chapter Books at the Crossroads of the NGSS and CCSS (p. 74)
8:00–9:00 AM	4–C	Franklin 8, Marriott	Data Sets in Real-Time: Accessing Information from the Internet for Classroom Investigations (p. 74)
8:00–9:00 AM	G	Franklin 9, Marriott	Authors Needed! Share Your Teaching Ideas in an NSTA Journal (p. 72)
8:00–9:00 AM	6–10	Franklin 5, Marriott	Teaching STEM Using Underwater Robotics with LEGO® (p. 72)
8:00–9:00 AM	4–C	407, Marriott	Implementing Global Collaborative Projects in the Science Classroom (p. 71)
8:00–9:00 AM	K–8	113B, Conv. Center	NSTA Press® Session: Outdoor Science: A Practical Guide (p. 73)
8:00–9:00 AM	K–12	202B, Conv. Center	The 10-Point on NGSS: How to Talk About the <i>Next Generation Science Standards</i> in Your School and Community (p. 71)
8:00–9:00 AM	K–12	105 A/B, Conv. Center	Using Problem-Based Learning to Up Your NGSS Game (p. 74)
8:00–9:30 AM	9–C	103A, Conv. Center	How to Use Pop Culture Science in Your Classes (p. 76)

Schedule at a Glance General Science Education

9:30–10:30 AM	6–C	410, Marriott	Hollywood BAD Science (p. 78)
9:30–10:30 AM	4–12	113B, Conv. Center	NSTA Press® Session: Teaching STEM Subjects to Students with Special Needs (p. 77)
9:30–10:30 AM	G	Franklin 10, Marriott	NSELA Session: Tools for Science Leaders, Part 1 (p. 78)
9:30–10:30 AM	K–8	202A, Conv. Center	CESI Session: From Explanation to Explanation/Reasoning (p. 79)
9:30–10:30 AM	P–6	202B, Conv. Center	Strengthening Elementary Science: Increasing Science Literacy, Inquiry, Critical Thinking, and Engagement while Meeting the CCSS (p. 77)
9:30–10:30 AM	K–8	303A, Conv. Center	Meeting Standards Through Citizen Science and Schoolyard Investigations (p. 77)
9:30–10:30 AM	K–12	408, Marriott	Practicing It: Deeper Understanding of the Science and Engineering Practices as well as Math Practice Standards (p. 78)
9:30–10:30 AM	6–8	113A, Conv. Center	Meet the NGSS Using Amplify Science, the Newest Curriculum from UC Berkeley’s The Lawrence Hall of Science and Amplify (p. 82)
9:30–10:30 AM	6–8	107 A/B, Conv. Center	Project-Based Inquiry Science™ (PBIS): Creating “Coherence and Science Storylines” for Middle School Science: Grades 6–8 (p. 81)
9:30–10:30 AM	6–12	Ballroom A, Conv. Center	Featured Presentation: The Ever-Evolving Literacy Within the Sciences (p. 77)
9:30–10:30 AM	P–5	106 A/B, Conv. Center	Integrating Literacy and Science—The Wow Factor (p. 81)
11:00 AM–12 Noon	3–C	Franklin 12, Marriott	Science 2.0—Putting Web 2.0 into the Science Classroom (p. 84)
11:00 AM–12 Noon	6–12	Franklin 7, Marriott	Differentiated Instruction That Will Engage Everyone in Your Classroom (p. 87)
11:00 AM–12 Noon	3–12	Franklin 8, Marriott	Hands-On Science Using Writing, Literacy, and Models (p. 87)
11:00 AM–12 Noon	G	109 A/B, Conv. Center	Observing and Inferring in the Science Classroom: New Tips and Tools from Dinah Zike’s Notebooking Central (p. 88)
11:00 AM–12 Noon	K–8	303A, Conv. Center	University STEM Faculty and K–8 Teachers: A Winning Partnership for STEM Education (p. 83)
11:00 AM–12 Noon	9–12	Franklin 1, Marriott	Supporting English Language Learners in High School Science Through CCSS and Language Acquisition Strategies (p. 86)
11:00 AM–12 Noon	G	410, Marriott	Leadership Pathways for Exemplary K–12 STEM Teachers (p. 84)
11:00 AM–12 Noon	G	Franklin 10, Marriott	NSELA Session: Tools for Science Leaders, Part 2 (p. 84)
11:00 AM–12 Noon	5–8	404, Marriott	STeAMing Ahead (p. 84)
11:00 AM–12 Noon	K–5	202B, Conv. Center	Encouraging Curiosity with NLM’s Online Toybox: Free and Reliable Health and Science Resources for K–5 Students (p. 83)
11:00 AM–12 Noon	K–12	105 A/B, Conv. Center	Teach Science—Get to Know Uncommon Schools! (p. 87)
11:00 AM–12 Noon	6–12	111B, Conv. Center	Zombie Apocalypse! (p. 88)
11:00 AM–12 Noon	G	Ballroom A, Conv. Center	Featured Presentation: Bundling the NGSS Performance Expectations (p. 83)
12 Noon–12:45 PM	G	NSTA Exhibits Entrance	Meet the Presidents and Board/Council (p. 90)
12:30–1:30 PM	6–12	111B, Conv. Center	A Matter of Life and Death (p. 90)
12:30–1:30 PM	6–8	107 A/B, Conv. Center	PBIS Roundtables: Discussions to Support Successful Implementation (p. 90)
12:30–1:30 PM	3–12	104 A/B, Conv. Center	Integrating Chromebook with Vernier Technology (p. 90)
2:00–2:30 PM	9–C	Franklin 11, Marriott	Bringing Primary Scientific Literature into the Classroom (p. 92)
2:00–3:00 PM	9–12	403, Marriott	Implementing Inquiry: Cookbook to Inquiry (p. 93)
2:00–3:00 PM	3–C	Franklin 12, Marriott	sTem: You’ve Never Seen Student Technology Work Like This (p. 94)
2:00–3:00 PM	K–5	202A, Conv. Center	Using Argument-Driven Inquiry with Science Writing in the K–5 Classroom (p. 93)
2:00–3:00 PM	3–12	104 A/B, Conv. Center	Integrating iPad with Vernier Technology (p. 95)
2:00–3:00 PM	7–12	Franklin 1, Marriott	Working Together with Composite Materials (p. 94)
2:00–3:00 PM	K–12	Franklin 9, Marriott	How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions (p. 94)
2:00–3:00 PM	K–8	109 A/B, Conv. Center	STEM the NGSS Tide (p. 96)
2:00–3:00 PM	K–8	113A, Conv. Center	Navigating the Shifts: Making the Transition to the <i>Next Generation Science Standards</i> with Leaders from The Lawrence Hall of Science (p. 97)
2:00–3:00 PM	6–12	107 A/B, Conv. Center	Debunking the Myths of Project-Based Learning: Yes We CAN! (p. 96)
2:00–3:00 PM	G	Ballroom A, Conv. Center	Featured Presentation: Beyond Googling—Building the Conditions for Structured Inquiry (p. 92)
2:00–3:00 PM	6–12	410, Marriott	Demonstrations as Inquiry (p. 93)
3:30–4:00 PM	G	Franklin 10, Marriott	ASTE Session: Issues in Science Education: A Global Perspective (p. 98)
3:30–4:30 PM	G	113B, Conv. Center	NSTA Press® Session: Teaching for Conceptual Understanding in Science—Building a Bridge Between Student Ideas and Scientific Concepts (p. 99)

Schedule at a Glance General Science Education

3:30–4:30 PM	P–5	202A, Conv. Center	“Can a Porcupine Get Hurt by a Cactus?” Finding the Science in Children’s Observations, Questions, and Actions (p. 100)
3:30–4:30 PM	G	Franklin 4, Marriott	Selecting and Using the Best in Trade Books (p. 102)
3:30–4:30 PM	6–12	Franklin 7, Marriott	Talking Points: The Role of Talk in the Science Classroom (p. 102)
3:30–4:30 PM	G	407, Marriott	Preparing for the NGSS Through a K–12 and Higher Education Collaboration: Insights from District Administrators and Teachers (p. 99)
3:30–4:30 PM	K–5	113A, Conv. Center	Meet the NGSS Using Amplify Science, the Newest Grades K–5 Curriculum from UC Berkeley’s Lawrence Hall of Science and Amplify (p. 103)
3:30–4:30 PM	7–C	Franklin 1, Marriott	Revolutionary Teaching: Making Science Relevant for ELLs (p. 101)
3:30–4:30 PM	C	410, Marriott	CAEP Elementary Standards: A First Look (p. 99)
3:30–5:00 PM	5–12	103A, Conv. Center	Fostering High School Science Engagement Using an NGSS-Focused Interactive Experience (p. 104)
4:00–4:30 PM	9–C	Franklin 10, Marriott	ASTE Session: Connecting Communication and Integrated Science Models (p. 104)
5:00–6:00 PM	K–8	103 B/C, Conv. Center	CESI Session: Elementary Science Share-a-Thon (p. 107)
5:00–6:00 PM	5–C	Franklin 10, Marriott	ASTE Session: Science and Literacy—The 50-Cent Microscope/Foldscope (p. 107)
5:00–6:00 PM	6–C	Franklin 9, Marriott	Engage, Encourage, and Enable Health and Science Exploration Through Literacy: Free Resources from the National Library of Medicine (p. 106)
5:00–6:00 PM	6–C	407, Marriott	Using Flipping to Create a Student-centered Classroom (p. 106)
5:00–6:00 PM	K–5	202A, Conv. Center	Crosscutting STEM (and STEAM) into Picture Books for Elementary Students (p. 107)
5:00–6:00 PM	K–12	408, Marriott	Literacy Tools in Action: Lessons from the Implementation and Scale-Up of the Literacy Design Collaborative in Science Classrooms (p. 106)
5:00–6:00 PM	6–12	Franklin 5, Marriott	Using Word Webs to Build Essays in Science (p. 106)

Saturday

8:00–9:00 AM	K–7	Franklin 8, Marriott	Where Literacy and Science Meet: Using Trade Books in Inquiry-Based Science Teaching (p. 113)
8:00–9:00 AM	G	403, Marriott	Science and Literature: The Pitfalls and the Pendulum (p. 111)
8:00–9:00 AM	P–8	410, Marriott	Bridging the Content Gap with Notable Nonfiction (p. 111)
8:00–9:00 AM	K–5	113C, Conv. Center	Addressing the Challenge of Science Anxiety for Elementary Teachers (p. 112)
8:00–9:00 AM	3–C	Franklin 10, Marriott	Using iPads to Create Innovative Scientists (p. 112)
8:00–9:00 AM	P–2	202A, Conv. Center	Science Teaching Practices for Early Childhood Classrooms (p. 112)
8:00–9:30 AM	G	304/VIP, Conv. Center	CSSS Session: Direction of Science Education in Pennsylvania (p. 114)
9:30–10:00 AM	1–12	113A, Conv. Center	PLC: The Final Frontier in Teacher Collaboration (p. 115)
9:30–10:00 AM	6–12	403, Marriott	Huddling Up: Improving Students’ Science Learning During Lesson Enactment (p. 115)
9:30–10:30 AM	7–12	Franklin 7, Marriott	Science Has Many Stories to Tell: NASA Literacy Resources for Your Students (p. 118)
9:30–10:30 AM	6–12	Franklin 5, Marriott	Skydiving from the Stratosphere (p. 116)
9:30–10:30 AM	3–C	Franklin 10, Marriott	The Digital Lab Experience (p. 116)
9:30–10:30 AM	P–12	Franklin 6, Marriott	Stretch Your Legs for Science! (p. 118)
9:30–10:30 AM	9–12	Franklin 13, Marriott	Where Does the Forensic Evidence Take You? (p. 118)
9:30–10:30 AM	G	414, Marriott	Reimagining Science Content Delivery for the 21st Century (p. 116)
9:30–10:30 AM	3–5	202B, Conv. Center	Using Children’s Books to Teach Systems and Systems Thinking (p. 116)
10:00–10:30 AM	G	113A, Conv. Center	PAESTA Session: Policy Matters for Science Educators (p. 118)
10:00–11:30 AM	G	304/VIP, Conv. Center	CSSS Session: Direction of Science Education in Pennsylvania (p. 118)
12:30–1:00 PM	4–12	113A, Conv. Center	PAESTA Session: Breaking Down the Silos: Practical Application of Literacy in STEM (p. 118)

Schedule at a Glance Informal Science Education

Informal Science Education

Thursday

8:00–8:30 AM	3–9/C	408, Marriott	Measuring Science Attitudes and Knowledge in Informal Settings (p. 41)
12:30–1:30 PM	1–12	Franklin 2, Marriott	Bringing Science Alive—Literally! (p. 51)
1:00–1:30 PM	9–12	401/402, Marriott	Using Career Academies to Integrate STEM in Real-World Applications (p. 55)
3:30–4:30 PM	1–12	406, Marriott	Facilitating a Successful Science and Engineering Fair (p. 61)
5:00–6:00 PM	K–12	408, Marriott	Building a Sustainable Science and Teacher Collaborative: A Three-Year Model for Developing Teacher Efficacy and Replicability in STEM Outreach (p. 67)
5:00–6:00 PM	2–12	Franklin 6, Marriott	From Makers to Changemakers: Design Engineering and Social Entrepreneurship as a Pathway to Student Agency (p. 69)
5:00–6:00 PM	6–12	Franklin 9, Marriott	Developing 21st-Century Reasoning Skills Through an Authentic Interdisciplinary STEM Research Experience (p. 68)
5:00–6:00 PM	G	407, Marriott	Leveraging Informal Science Education in Formal Educational Settings (p. 67)
5:30–6:00 PM	G	Franklin 12, Marriott	Sustainability and Storytelling: iPads in the Outdoors (p. 69)

Friday

8:00–9:00 AM	6–12	Franklin 11, Marriott	Science Olympiad Coaches Clinic: Astronomy and Reach for the Stars Events (p. 72)
8:00–9:00 AM	K–12	408, Marriott	Edutainment: STEM Content Dissemination Using Media and Video Instruction (p. 72)
10:00–10:30 AM	6–10	Franklin 12, Marriott	Physics at the Philadelphia Museum of Art (p. 82)
2:00–3:00 PM	2–5	202B, Conv. Center	Building a Community Science Out-of-School Time Program (p. 93)
3:30–4:30 PM	5–8	Franklin 11, Marriott	Game On! Using Game Design to Engage Students in Natural Science and Literacy (p. 100)
5:00–6:00 PM	G	414, Marriott	Science in the Summer: Engaging in Teacher Professional Development (p. 106)

Saturday

8:00–9:00 AM	6–9	404, Marriott	Entertainment Physics in Philadelphia Using the City to Engage Students in STEM (p. 111)
9:30–10:30 AM	P–8	202A, Conv. Center	iLIVE: Investigating Life In Various Environments™ with George Washington Carver (p. 117)
12:30–1:30 PM	K–12	401/402, Marriott	Texting and Walking (p. 120)
12:30–1:30 PM	5–8	404, Marriott	Oh SNAP! Science and Art Come Together in Out-of-School Time (p. 119)

Life Science

Thursday

8:00–8:30 AM	C	406, Marriott	Global Online Mentoring of Medical Science Students, a Feasibility Study (p. 41)
8:00–9:00 AM	4–8	404, Marriott	Let's Put the Fun Back in Fungi (p. 42)
8:00–9:00 AM	6–8	104 A/B, Conv. Center	Archaea and the Three Domains: Classification of Life for Middle School (p. 44)
8:00–9:00 AM	6–8	108B, Conv. Center	Gas Exchange (p. 45)
8:00–9:00 AM	6–12	108A, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 45)
9:15–10:30 AM	G	Ballroom B, Conv. Center	General Session: Good News on Energy and the Environment: The Fruits of STEM Education (p. 46)
11:00 AM–12 Noon	6–12	108A, Conv. Center	Hands-On Activities to Model Habitat Preference with Critters and LARGE Choice Chambers (p. 49)

Schedule at a Glance Life Science

11:00 AM–12 Noon	9–C	112 A/B, Conv. Center	The Case of the Missing Records (p. 49)
11:00 AM–12 Noon	6–12	107 A/B, Conv. Center	Genetics: Crazy Traits and CPO's Link™ Learning Module (p. 49)
11:00 AM–12 Noon	5–C	106 A/B, Conv. Center	Constructing and Crossing Cell Membranes (p. 49)
11:00 AM–12:15 PM	9–C	103A, Conv. Center	Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country (p. 50)
12:30–1:30 PM	9–C	112 A/B, Conv. Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR (p. 54)
12:30–1:30 PM	8–C	111B, Conv. Center	Human Anatomy Lab: Building from the Inside Out (p. 54)
12:30–1:30 PM	6–12	Franklin 9, Marriott	Photosynthesis Through Inquiry (p. 51)
12:30–1:30 PM	9–12	Franklin 4, Marriott	Help! Is There a Forensics Expert in the House?! (p. 52)
1:00–4:00 PM	5–C	Franklin 1, Marriott	SC-1: Meeting the CCSS and NGSS Through Outdoor Studies (p. 55)
2:00–3:00 PM	8–12	110 A/B, Conv. Center	Meeting (and Exceeding) Proficiency-based Requirements Through Aquaculture Education (p. 60)
2:00–3:00 PM	9–C	112 A/B, Conv. Center	Diagnosing the Flu (p. 60)
2:00–3:00 PM	6–C	106 A/B, Conv. Center	Genes, Schemes, and Molecular Machines (p. 59)
2:00–3:00 PM	K–8	113C, Conv. Center	Feeding Our Feathered Friends (p. 58)
2:00–3:00 PM	9–C	411/412, Marriott	Redefining HIV/AIDS Education Using Molecular Science-Based Curricula (p. 58)
2:00–3:00 PM	6	404, Marriott	Explorations of Stream Health and Relative Dating Using Fossils (p. 56)
2:00–3:00 PM	6–C	113B, Conv. Center	NSTA Press® Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12 (p. 58)
3:30–4:30 PM	6–12	401/402, Marriott	Phone Apps Empower “Revolutionary Optimists” in STEM at St. Ann School (p. 63)
3:30–4:00 PM	K–3	202B, Conv. Center	Using Math Manipulatives for Creating Models to Introduce or Reinforce Life Science Concepts (p. 61)
3:30–4:30 PM	9–C	112 A/B, Conv. Center	The Drunken Worms: Exploring Gene Function with <i>C. elegans</i> (p. 65)
3:30–4:30 PM	4–C	111B, Conv. Center	Leap into the 21st-Century Science Class (p. 65)
3:30–5:00 PM	9–C	103A, Conv. Center	Effortlessly Integrate Inquiry with Glowing Bacteria (AP Big Idea 3) (p. 66)
5:00–5:30 PM	9–11	Franklin 12, Marriott	A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 66)
5:00–6:00 PM	3–6	202A, Conv. Center	Genetics, Adaptation, Evolution—for Elementary Students? Oh My! (p. 67)
5:00–6:00 PM	7–C	401/402, Marriott	Using Model Chromosomes to Help Students Understand Mitosis, Meiosis, Fertilization, and Genetics (p. 68)

Friday

8:00–9:00 AM	4–12	Franklin 4, Marriott	Local, Relevant, Real: Environmental Videos that Tell Stories that Change the World (p. 73)
8:00–9:00 AM	6–8	401/402, Marriott	Data-based Science in Middle School (p. 73)
8:00–9:00 AM	9–C	Franklin 12, Marriott	Mitosis Lab Instruction Using Smartphones and Tablets (p. 72)
8:00–9:00 AM	3–8	Franklin 13, Marriott	En-gene-eering: An Engineering Design Challenge for Genetics (p. 74)
8:00–9:00 AM	6–C	106 A/B, Conv. Center	Lights, Camera, Enzymes in Action! (p. 74)
8:00–9:00 AM	8–C	111B, Conv. Center	Creating to Understand: Come Build Your Muscles in Clay! (p. 75)
8:00–9:00 AM	K–12	108A, Conv. Center	Hands-On Science with Classroom Critters (p. 75)
8:00–9:00 AM	9–C	110 A/B, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 75)
9:30–10:00 AM	9–C	Franklin 12, Marriott	Using the Cyberinfrastructure to Conduct Bioinformatics Research in Your Classroom (p. 76)
9:30–10:30 AM	9–C	112 A/B, Conv. Center	Detecting the Silent Killer: Clinical Detection of Diabetes (p. 82)
9:30–10:30 AM	6–12	Franklin 6, Marriott	Teach with Student-friendly Climate Data (p. 80)
9:30–10:30 AM	9–C	110 A/B, Conv. Center	Adapting Traditional Biology Labs to Sensor Technology (p. 82)
9:30–10:30 AM	9–12	Franklin 5, Marriott	Experiential Learning in Biology Using Authentic Research (p. 78)
9:30–10:30 AM	8–12	Franklin 11, Marriott	Chytrid and Frogs: Ecology or Immunology? (p. 78)
11:00 AM–12 Noon	9–C	112 A/B, Conv. Center	Using the Polymerase Chain Reaction to Identify GM Foods (p. 88)
11:00 AM–12 Noon	K–8	Franklin 4, Marriott	NMLSTA Session: Increasing Student Engagement and Understanding Through Science Notebooks (p. 86)
11:00 AM–12 Noon	3–C	Franklin 11, Marriott	Magical Illusions and Scintillating Simulations for Science: It's Showtime! (p. 84)

11:00 AM–12 Noon	K–12	Franklin 6, Marriott	Promoting Horticulture in the Classroom: Creating Authentic Learning Experiences for Students of All Ages (p. 86)
11:00 AM–12 Noon	9–12	113C, Conv. Center	ASEE Session: Climate Change of a Different Nature—Carbon Capture Redesign in Biology (p. 86)
11:00 AM–12 Noon	9–12	414, Marriott	Making Complex Connections in Anatomy and Physiology Simple Using Student-Created Schematics (p. 84)
11:00 AM–12 Noon	6–C	106 A/B, Conv. Center	Let's Get Helical (p. 87)
11:00 AM–12 Noon	8–C	104 A/B, Conv. Center	Biology with Vernier (p. 87)
11:00 AM–12 Noon	9–12	108B, Conv. Center	What Is a Species? (p. 88)
11:00 AM–12:15 PM	9–C	103A, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 89)
12:30–1:30 PM	9–C	112 A/B, Conv. Center	The Case of the Missing Records (p. 91)
12:30–1:30 PM	9–12	108B, Conv. Center	Cell Differentiation and Gene Expression (p. 90)
12:30–1:30 PM	6–C	106 A/B, Conv. Center	Double (Helix) Trouble: Maintaining Fidelity in DNA Replication (p. 90)
2:00–2:30 PM	K–12	Franklin 10, Marriott	CSSS Session: Presidential Awards for Excellence in Mathematics and Science Teaching (p. 92)
2:00–3:00 PM	6–C	112 A/B, Conv. Center	Teaching STEM Using Agarose Gel Electrophoresis (p. 97)
2:00–3:00 PM	9–12	108B, Conv. Center	Energy Flow Through an Ecosystem (p. 96)
2:00–3:00 PM	2–6	401/402, Marriott	Teaching Systems Through Structure and Function (p. 94)
2:00–3:00 PM	7–12	Franklin 5, Marriott	Green Module: Center for Green Education (p. 93)
2:00–3:00 PM	3–5	113B, Conv. Center	NSTA Press® Session: NFTI Science: Building PD Upon the Foundation of a NSTA Press Book (p. 93)
2:00–3:00 PM	4–8	404, Marriott	Middle School Madness?! (p. 93)
2:00–3:00 PM	9–C	Franklin 4, Marriott	STEM Behind Medicine: Curing Type 1 Diabetes (p. 95)
2:00–3:00 PM	10–12	Franklin 6, Marriott	Real World: Fly Lab (p. 95)
2:00–3:00 PM	K–12	108A, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 96)
3:30–4:30 PM	5–8	Franklin 11, Marriott	Game On! Using Game Design to Engage Students in Natural Science and Literacy (p. 100)
3:30–4:30 PM	P–5	202B, Conv. Center	Stellaluna: A Lesson on Appreciating Diversity Through Science and Literacy (p. 99)
3:30–4:30 PM	6–12	108A, Conv. Center	Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 102)
3:30–4:30 PM	9–C	112 A/B, Conv. Center	Using Biotechnology to Diagnose HIV/AIDS (p. 103)
5:00–5:30 PM	8–12	Franklin 12, Marriott	BioCONNECT (Biology and Cancer Online Education Connecting Teens) (p. 104)
5:00–6:00 PM	6–C	304/VIP, Conv. Center	Using NASA Resources to Teach About Earth's Energy Budget (p. 106)
5:00–6:00 PM	7–8	401/402, Marriott	Literacy Approaches Enrich and Extend STEM at St. Ann School (p. 107)
5:00–6:00 PM	7–12	Franklin 7, Marriott	Hands On/Minds On: Transforming Traditional Labs into Inquiry-Based Activities (p. 108)
5:00–6:00 PM	6–12	Franklin 13, Marriott	Nanotechnology in the K–12 Classroom (p. 108)

Saturday

8:00–9:00 AM	9–12	108B, Conv. Center	Photosynthesis and Respiration—It's a Plant Life! DuPont Agriscience Institute (p. 114)
8:00–9:00 AM	3–8	Franklin 5, Marriott	Teaching Environmental Awareness in Maryland (TEAM): Watershed Education Inside and Outside the Classroom (p. 112)
8:00–9:00 AM	6–C	Franklin 13, Marriott	Nature's Notebook: A Modern Spin on an Age-Old Process (p. 114)
9:30–10:30 AM	P–8	202A, Conv. Center	iLIVE: investigating Life In Various Environments™ with George Washington Carver (p. 117)
9:30–10:30 AM	7–C	408, Marriott	Forensic Science and Biology: Fun Forensic Inquiry Entomology Activities to Estimate Time of Death (p. 116)
9:30–10:30 AM	9–12	108B, Conv. Center	Adding Some Color to Plant Science: DuPont Agriscience Institute (p. 118)
9:30–10:30 AM	5–C	401/402, Marriott	NASA Astrobiology: The Search for Life Beyond Earth (p. 117)
12:30–1:30 PM	5–8	404, Marriott	Oh SNAP! Science and Art Come Together in Out-of-School Time (p. 119)

Schedule at a Glance Physical Science

Physical Science

Thursday

8:00–8:30 AM	6–12	Franklin 11, Marriott	Imagining Reading/Writing: Big Ideas and Literacy in the Chemistry Classroom (p. 41)
8:00–9:00 AM	6–C	Franklin 2, Marriott	NASA's High-Energy Vision: Chandra and the X-Ray Universe (p. 42)
8:00–9:00 AM	6–12	107 A/B, Conv. Center	CPO's Link™ Chemistry Models: Fun with Atom Building and the Periodic Table (p. 45)
8:00–9:00 AM	3–8	401/402, Marriott	Inquiry in Action: Identify Liquids by Their Physical Properties (p. 44)
8:00–9:00 AM	4–12	414, Marriott	Polymer Food Chemistry: Have Fun with Polymer Chemistry by Making Mountain DewViar (p. 42)
9:15–10:30 AM	G	Ballroom B, Conv. Center	General Session: Good News on Energy and the Environment: The Fruits of STEM Education (p. 46)
9:30–10:30 AM	6–12	107 A/B, Conv. Center	CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 46)
9:30–10:30 AM	7–12	109 A/B, Conv. Center	Fantastic Physical Science Demonstrations from Flinn Scientific (p. 48)
11:00 AM–12 Noon	P–12	113A, Conv. Center	Engineering Design Process in the STEM Classroom (p. 49)
11:00 AM–12 Noon	5–C	106 A/B, Conv. Center	Constructing and Crossing Cell Membranes (p. 49)
11:00 AM–12 Noon	K–5	104 A/B, Conv. Center	Engage Them Early: Engineering Experiences with FOSS (p. 48)
12:30–1:30 PM	9–C	411/412, Marriott	Using Modeling Activities in the High School Chemistry Class (p. 52)
12:30–1:30 PM	7–C	Franklin 6, Marriott	Put the "E" in STEM! (p. 52)
2:00–3:00 PM	6–12	Franklin 7, Marriott	Using Inquiry to Tackle Student Misconceptions About Kinematics and Newton's Laws (p. 58)
2:00–3:00 PM	9–12	Franklin 4, Marriott	3D Printing Shaping Experimentation Design in Physics (p. 58)
2:00–3:00 PM	7–12	Franklin 10, Marriott	NARST Session: Measuring the Effectiveness of Teaching Interventions Aimed at Supporting Students' Analogical Reasoning around Physical Models (p. 57)
2:00–3:00 PM	6–C	113B, Conv. Center	NSTA Press® Session: Argument-Driven Inquiry in Biology and Chemistry: Lab Investigations for Grades 9–12 (p. 58)
2:00–3:00 PM	K–12	408, Marriott	Spark Students' Curiosity with Chemistry! (p. 57)
2:00–3:00 PM	K–12	Franklin 6, Marriott	The Game of Energy (p. 58)
2:00–3:00 PM	6–12	414, Marriott	Demos for the Holidays! Excite Students with Chemical Demonstrations (p. 57)
2:00–3:00 PM	6–8	108B, Conv. Center	Reclaiming the Metal (p. 59)
2:00–3:00 PM	7–12	Franklin 5, Marriott	Alternative Energy Field Trip: Collaborating with Preservice Teachers on Designing Curriculum (p. 57)
2:00–3:00 PM	6–C	106 A/B, Conv. Center	Genes, Schemes, and Molecular Machines (p. 59)
2:00–3:00 PM	9–12	109 A/B, Conv. Center	AP Physics 1 Advanced Inquiry Investigations from Flinn Scientific (p. 60)
2:00–3:00 PM	K–5	104 A/B, Conv. Center	What to Look for in Science Learning Progressions: Experience FOSS Next Generation (p. 59)
3:30–4:30 PM	6–12	107 A/B, Conv. Center	CPO's New Physics AP1 Link™ Module: Rotational Motion with the CPO Roller Coaster (p. 65)
3:30–4:30 PM	3–5	105 A/B, Conv. Center	Crosscutting Concepts and Argumentation Using Magnets and Electromagnetism (p. 64)
3:30–4:30 PM	9–12	Franklin 11, Marriott	Cars: A Fun and Relevant Way to Teach Science Concepts (p. 62)
5:00–5:30 PM	9–11	Franklin 12, Marriott	A Cross-Curricular Contamination Case: Integrating Core Content Through Self-Paced Learning (p. 66)
5:00–6:00 PM	9–C	411/412, Marriott	Teaching Chemical Reactions through a Variety of Modalities (p. 68)
5:00–6:00 PM	8–C	406, Marriott	An Ice Core Classroom Investigation that Connects the Three Dimensions of the NGSS with CCSS (p. 67)

Friday

8:00–8:30 AM	7–C	411/412, Marriott	AAPT Session: Problem Solving with Pi/Algebra/Physics (p.71)
8:00–9:00 AM	9–12	108B, Conv. Center	pH Scale and Math Modeling (p. 75)

Schedule at a Glance Physical Science

8:00–9:00 AM	6–C	410, Marriott	Newton’s laws Across the Curriculum (p. 72)
8:00–9:00 AM	K–12	408, Marriott	Edutainment: STEM Content Dissemination Using Media and Video Instruction (p. 72)
8:00–9:00 AM	6–C	106 A/B, Conv. Center	Lights, Camera, Enzymes in Action! (p. 74)
8:00–9:00 AM	9–12	109 A/B, Conv. Center	Flinn Scientific Resources Prepare Students for AP Chemistry Success (p. 75)
8:00–9:00 AM	1–12	Franklin 1, Marriott	PECO and United Way’s Energizing Education Program for After School (p. 73)
8:00–9:00 AM	9–12	Franklin 6, Marriott	Captivate Students’ Interests Beyond the Classroom with Chemistry (p. 74)
8:00–9:00 AM	6–8	Franklin 3, Marriott	ACS Middle Level Session: Matter—Solids, Liquids, and Gases (p. 73)
8:00–9:00 AM	3–9	404, Marriott	A Polymer Primer for Elementary and Middle Grades (p. 71)
8:00–9:00 AM	9–C	110 A/B, Conv. Center	Spectrometry to Investigate Light Emission, Colored Solutions, Plant Pigments, Solution Concentration, and Reaction Kinetics! (p. 75)
8:00–9:00 AM	9–12	107 A/B, Conv. Center	Active Physics and Active Chemistry: Leading Project-based High School Physics and Chemistry Programs Capturing the Essence of the NGSS and STEM (p. 75)
8:00–10:00 AM	9–12	Franklin 2, Marriott	ACS Session One: Energy in Chemistry: A Macroscopic View (p. 76)
8:30–9:00 AM	7–C	411/412, Marriott	AAPT Session: Function for Force (p. 76)
9:30–10:00 AM	7–C	411/412, Marriott	AAPT Session: Perception and Reality (p. 76)
9:30–10:30 AM	6–12	Franklin 6, Marriott	Teach with Student-friendly Climate Data (p. 80)
9:30–10:30 AM	2–8	109 A/B, Conv. Center	Cool! Can We Do That Again!?! (p. 82)
9:30–10:30 AM	9–12	108B, Conv. Center	Chemical Formula and Amino Acids (p. 81)
9:30–10:30 AM	9–12	403, Marriott	Problems and Projects to Promote Literacy in the High School Chemistry Class (p. 77)
9:30–10:30 AM	6–8	Franklin 3, Marriott	ACS Middle Level Session: Changes of State—Evaporation and Condensation (p. 80)
9:30–10:30 AM	7–10	Franklin 7, Marriott	“Seeing” the Invisible: Making the EMS Spectrum Concrete (p. 80)
9:30–10:30 AM	8–C	104 A/B, Conv. Center	Chemistry with Vernier (p. 81)
10:00–10:30 AM	6–10	Franklin 12, Marriott	Physics at the Philadelphia Museum of Art (p. 82)
10:00–10:30 AM	7–C	411/412, Marriott	AAPT Session: Rolling Demonstrations (p. 82)
11:00 AM–12 Noon	3–C	Franklin 11, Marriott	Magical Illusions and Scintillating Simulations for Science: It’s Showtime! (p. 84)
11:00 AM–12 Noon	9–12	403, Marriott	The Physics and Chemistry of Photography: A Project-Based Approach (p. 84)
11:00 AM–12 Noon	7–C	411/412, Marriott	AAPT Session: Calculator Robots in Physics (p. 86)
11:00 AM–12 Noon	4–8	Franklin 13, Marriott	Renewable Energy: Wind Power vs. Solar Power (p. 87)
11:00 AM–12 Noon	6–8	Franklin 3, Marriott	ACS Middle Level Session: Density—A Molecular View (p. 86)
11:00 AM–12 Noon	P–3	202A, Conv. Center	Let’s Get Physical—From Force and Friction to Water and Weather (p. 86)
11:00 AM–12 Noon	9–C	110 A/B, Conv. Center	Physics with PASCO scientific—Featuring PASCO Capstone™, the Ultimate Data Collection and Analysis Software for Physics (p. 88)
11:00 AM–12 Noon	9–12	108A, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 88)
11:00 AM–1:00 PM	9–12	Franklin 2, Marriott	ACS Session Two: Energy in Chemistry: A Particulate View (p. 89)
12:30–1:30 PM	3–12	113A, Conv. Center	The Secrets to Successful PBL (p. 91)
2:00–2:30 PM	6–10	411/412, Marriott	AAPT Session: Science Adventure (p. 92)
2:00–2:30 PM	K–12	Franklin 10, Marriott	CSSS Session: Presidential Awards for Excellence in Mathematics and Science Teaching (p. 92)
2:00–3:00 PM	P–6	304/VIP, Conv. Center	S’COOL: Inspiring the Next Generation of STEM Professionals and Improving STEM Literacy (p. 94)
2:00–3:00 PM	7–12	Franklin 5, Marriott	Green Module: Center for Green Education (p. 93)
2:00–3:00 PM	6–8	Franklin 3, Marriott	ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (p. 94)
2:00–3:00 PM	4–8	404, Marriott	Middle School Madness?! (p. 93)
2:00–3:00 PM	9–C	103A, Conv. Center	The GMO Debate Rages On! (p. 95)
2:00–4:00 PM	9–12	Franklin 2, Marriott	ACS Session Three: Energy in Chemistry: An Atomic View (p. 98)
2:00–6:00 PM	3–C	415, Marriott	SC-3: Phenomenon-Based Learning: Fun, Hands-On Cooperative Learning of Science and ELA (p. 98)
3:30–4:30 PM	K–8	304/VIP, Conv. Center	Become a Sky Color Investigator Through New Science Literacy Resources (p. 100)
2:30–3:00 PM	7–12	411/412, Marriott	AAPT Session: Five Laws of Physics in Five Seconds of Data Collection (p. 98)
3:30–4:00 PM	7–C	411/412, Marriott	AAPT Session: Prediction in Physics (p. 98)
3:30–4:30 PM	4–8	401/402, Marriott	Straw Rockets Are Out of This World (p. 101)

Schedule at a Glance Physical Science

3:30–4:30 PM	8–12	Franklin 12, Marriott	Your Own Space Program: Engineering a Complete Rocket Launch/Flight/Analysis System from First Principles to Apogee (p. 100)
3:30–4:30 PM	8–C	104 A/B, Conv. Center	Physics and Physical Science with Vernier (p. 102)
3:30–4:30 PM	7–C	Franklin 13, Marriott	iPad: Realize Its Full Potential in Your Classroom! (p. 102)
3:30–4:30 PM	6–8	Franklin 3, Marriott	ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (p. 101)
4:00–4:30 PM	7–C	411/412, Marriott	AAPT Session: Plane Physics (p. 104)
5:00–6:00 PM	5–9	404, Marriott	Sport Science in the Urban Environment: Using Sports as a Creative Way to Teach Science (p. 106)
5:00–6:00 PM	7–C	411/412, Marriott	AAPT Session: Expanding Universe (p. 107)
5:00–6:00 PM	9–12	Franklin 6, Marriott	Modeling Stellar Evolution on the H-R Diagram with NASA Data (p. 108)
5:00–6:00 PM	6–8	Franklin 3, Marriott	ACS Middle Level Session: Chemical Change—Breaking and Making Bonds (p. 107)
5:00–6:00 PM	7–12	Franklin 7, Marriott	Hands On/Minds On: Transforming Traditional Labs into Inquiry-Based Activities (p. 108)
5:00–6:00 PM	6–12	Franklin 13, Marriott	Nanotechnology in the K–12 Classroom (p. 108)
5:30–6:00 PM	9–12	Franklin 12, Marriott	Bringing Medical Imaging into the Physics Classroom (p. 108)

Saturday

8:00–8:30 AM	5–10	Franklin 12, Marriott	Building Green: Designing Sustainable Solutions (p. 111)
8:00–9:00 AM	5–10	Franklin 4, Marriott	Learning from Light—NASA Science Activities for You (p. 112)
8:00–9:00 AM	6–9	404, Marriott	Entertainment Physics in Philadelphia Using the City to Engage Students in STEM (p. 111)
9:30–10:30 AM	6–12	410, Marriott	Lotions, Potions, and Scrubs—Polymer Science in Cosmetics (p. 116)
9:30–10:30 AM	6–10	Franklin 3, Marriott	Life Jackets: Density and STEM (p. 117)
9:30–10:30 AM	7–C	408, Marriott	Forensic Science and Biology: Fun Forensic Inquiry Entomology Activities to Estimate Time of Death (p. 116)
9:30–10:30 AM	9–12	Franklin 11, Marriott	Inventing Photography: Making Pictures and Measuring Light (p. 117)
12:30–1:30 PM	K–12	401/402, Marriott	Texting and Walking (p. 120)
12:30–1:30 PM	8–12	403, Marriott	Experiencing Online Simulations in Physics (p. 119)

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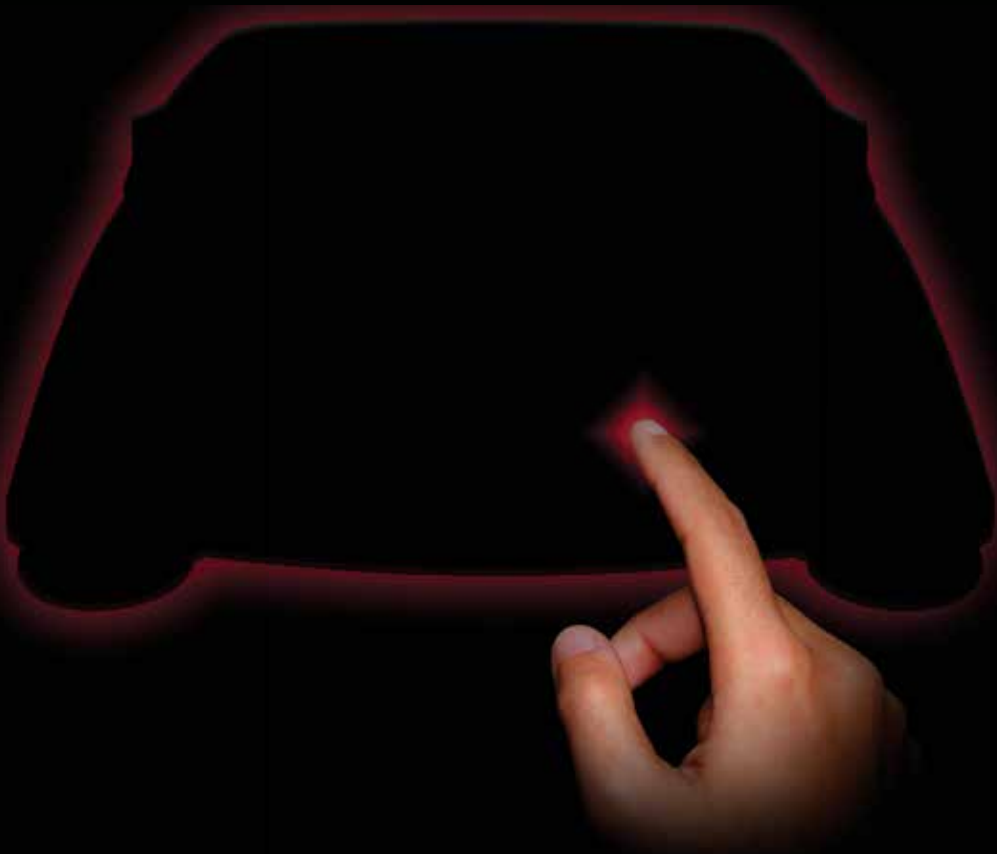
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