

Phoenix

Honor the Past; Prepare the Future



NSTA National
Science
Teachers
Association

NSTA 2012 Area Conference on Science Education

Meet LabQuest[®] 2

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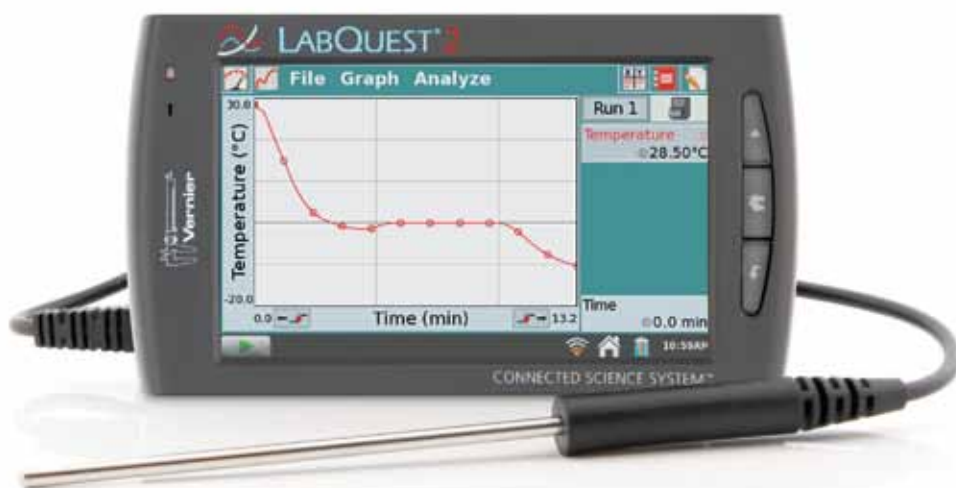
AWARD-WINNING TECHNOLOGY



LabQuest 2 and the Connected Science System win Worlddidac Award



LabQuest 2 wins a Readers' Choice Award from eSchool Media



READ THE REVIEWS:

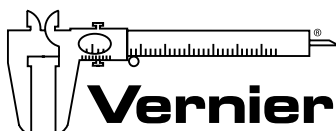
Tech & Learning – “Vernier’s LabQuest 2 can build interest in science, make experiments come alive, and deepen understanding of complex concepts. The affordable handheld tool supports student-centered, inquiry-based learning...and critical analysis as budding scientists use real tools to conduct real-time investigations....” – Carol S. Holzberg, Ph.D.

Scholastic Administrator’s Tech Tools – Grade: A, “A bargain. LabQuest is a modern-day science lab that fits in the palm of a hand.” – Brian Nadel

Assistive Technology – “With the LabQuest 2, Vernier has transformed the way teachers need to think about teaching science in the classroom and provided them with an easy and powerful solution for capturing data in real time.” – Brian Friedlander Ph.D.

NSTA Blog – “It seemed obvious that the LabQuest 2 would be a real game changer in the data collection space, but after our field test, it seems more that the LabQuest 2 has invented an entirely new game.” – Martin Horejsi

Read the full reviews of LabQuest 2 and the Connected Science System at www.vernier.com/labq2



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Science
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HANDS-ON WORKSHOPS

Friday, December 7 • Room 222C

8:00am - 9:15am	Equip Your iPad® for Science with SPARKvue® HD, a Full-Featured Science Application for the iPad
10:00am - 11:15am	Achievable Inquiry in AP® Biology and Chemistry
12:00pm - 1:15pm	STEM: Meeting the Standards in Your Classroom
2:00pm - 3:15pm	Investigating Motion: Understanding and Interpreting Graphs
4:00pm - 5:15pm	Exploring Renewable Energy: A Hands-On STEM Investigation



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HONOR THE
PAST PREPARE THE
FUTURE
PHOENIX AREA CONFERENCE
DECEMBER 6-8, 2012

NSTA 2012 Area Conference on Science Education

Phoenix, Arizona • December 6–8, 2012

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Cover Photo

Photo courtesy of Steve Coe,
Saguaro Astronomy Club of Phoenix.
Taken in 1996, the photo shows the
Comet Hale-Bopp. Located about
30 miles from Gila Bend, the cactus
is spoken of as the saguaro with the
most arms in all of Arizona.

National Science Teachers Association

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

NSTA Affiliates

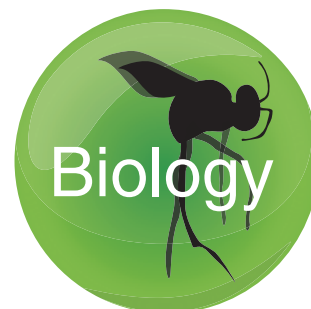
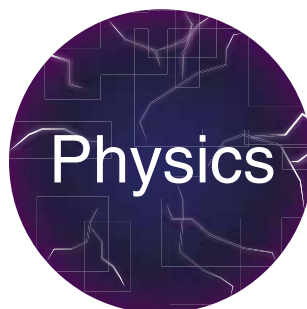
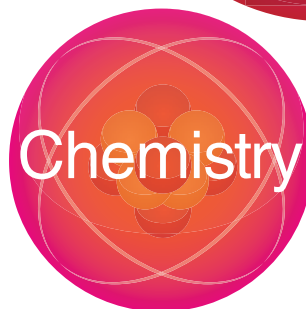
Association for Multicultural Science Education (AMSE)
Association for Science Teacher Education (ASTE)
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Council for Elementary Science International (CESI)
Council of State Science Supervisors (CSSS)
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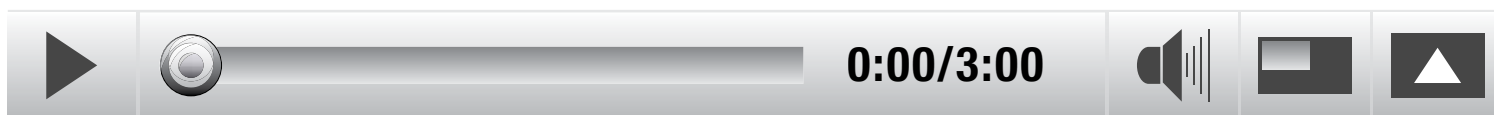
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Welcome to Phoenix



Janey Kaufmann, Cheryl Dunham, and John A. Giacobbe

Welcome to Phoenix! The Conference Committee is very excited that you have chosen to attend this area conference. Never before in our history has the importance of science education been more pressing. The theme for this conference—*Honor the Past; Prepare the Future*—sends a strong message for science educators. The Arizona Conference Committee has planned a wide range of professional learning experiences that are as diversified in their intended audiences as in their science topics. Elementary, middle level, and secondary teachers; coordinators; and administrators as well as university representatives and community members will find sessions and workshops that will enhance their work in science education. In addition, the opportunity to meet

and share with other science educators is always a very valuable part of a conference.

The conference is organized around the three strands: “The STEM Puzzle—Putting It Together”; “Sustainability: Growing, Nurturing, and Ensuring Our Future”; and “Literacy: Communicating and Understanding Science.” Within each of these strands are content sessions and workshops developed for all levels. Each strand also has a featured presentation by a leading researcher...and an outstanding keynote speaker—Col. Eileen Collins, first woman to pilot and command an American spacecraft!

A wide range of field trips within the state of Arizona are offered and are as diversified as the state, itself. From the Grand Canyon to the Biosphere 2 in the Sonoran Desert, the views are spectacular and the science is extraordinary.

We would like to thank all of the committee members who have worked so hard to produce this wonderful conference for you. It was a labor of love as its purpose was guided by the symbol of the Phoenix bird rising as the understanding of science takes the forefront in preparing our young people for their world.

2012 Phoenix Conference Committee Leaders
Janey Kaufmann, John A. Giacobbe, and Cheryl Dunham

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

Conference Chairperson

Janey Kaufmann

NSELA Past President and PD Coordinator
PreK–12 Science Academic Coach
Coronado PDC at Coronado High School
7501 E. Virginia
Scottsdale, AZ 85257
jkaufmann@susd.org

Program Coordinator

John A. Giacobbe

Science Department Chair
South Pointe High School
8325 S. Central Ave.
Phoenix, AZ 85042
jgiacobbe_southpointe@cox.net

Local Arrangements Coordinator

Cheryl Dunham

ASTA Past President
K–12 Science Education Program
Specialist
Arizona Dept. of Education
1535 W. Jefferson St.
Phoenix, AZ 85007
cheryl.dunham@azed.gov

Phoenix Conference Committee

Program Committee

Strand Leaders: The STEM Puzzle—Putting It Together

Vicki Massey
ASTA President
NSTA Director, District XIV
Mesa Public Schools
Mesa, AZ

Sara Torres
Arizona Science Teachers Association
Phoenix, AZ

Strand Leaders: Sustainability: Growing, Nurturing, and Ensuring Our Future

Bev DeVore-Wedding
Meeker High School
Meeker, CO

Pita Martinez-McDonald
Retired Elementary Educator
La Jara, NM

Strand Leader: Literacy: Communicating and Understanding Science

Lacey Wieser
Arizona Dept. of Education
Phoenix, AZ

Local Arrangements Committee

Field Trips Manager

Carol Tichio
Arcadia High School
Phoenix, AZ

Guides Manager

Haley Peebles
Grand Canyon University
Phoenix, AZ

Manager of Services for People with Disabilities

Linda Coyle
The Center for Research in Engineering,
Science, and Technology (CREST)
Phoenix, AZ

Volunteers Manager

Joan Gilbert
Tucson Unified School District
Regional Science Center
Tucson, AZ

NSTA Membership

Become the Best Teacher You Can Be

Membership in NSTA delivers all the best professional development and resources a science educator needs.

- Members select one or more of the idea-packed, peer-reviewed journals designed for all grade levels. *Science and Children* (grades K–6); *Science Scope* (grades 6–9); *The Science Teacher* (grades 9–12), or *Journal of College Science Teaching*.
- **NSTA National and Area Conferences** are the world's largest gathering of science educators—an unparalleled professional development opportunity.
- **The NSTA Learning Center** offers year-round, face-to-face and online-learning opportunities with leading education providers.
- **NSTA Listserver Email Subscriptions** allow members to join any of 13 electronic lists to gain knowledge from industry professionals who gather online to share valuable information.
- **Members save with discounts** on insurance, Learning Center products, books, digital content and conference registration.
- **And stay informed with our publications; *NSTA Reports*, *NSTA Book Beat*, *SciLinks* web content and our E-newsletters.**



For more information or to become a member,
visit www.nsta.org/membership or call 1.800.722.6782

President's Welcome

Build the Scaffolding for 21st-Century Science Literacy



Welcome to the NSTA Phoenix Area Conference on Science Education! This conference promises to be an exemplary professional development experience for you. The conference provides the opportunity to gain cutting-edge science content knowledge along with effective classroom instructional strategies. You will be able to document your attendance

through our evaluation process in order to build your professional portfolio. I hope you will be able to acquire new tools, resources, and understandings to bring back to your colleagues and students as a result of attending this conference.

I believe your experiences here will support my presidential theme—*Build the Scaffolding for 21st-Century Science Literacy*. It is important to build on the existing foundation of scientific and engineering practices, crosscutting concepts, and core disciplinary ideas to prepare our students to become scientifically literate. The Conference Committee has built the conference program around the theme, *Honor the Past; Prepare the Future*. The professional development strands supporting this theme focus on the following topics: “The STEM Puzzle—Putting It Together,” “Sustainability: Growing, Nurturing, and Ensuring Our Future,” and “Literacy: Communicating and Understanding Science.” The

conference offers an impressive array of workshops, featured speakers, field trips, exhibits, and networking opportunities. There are also a variety of special programs and ticketed events to choose from to enhance your professional development experience.

We are at a pivotal point to move science education forward in the 21st century with the publication of the NRC *Framework* and the pending release of the Next Generation Science Standards. These momentous documents have the potential to impact the teaching and learning of science in significant ways. Be part of the change process by participating in the conversation during this conference. As science educators, we need to ensure that every child acquires the skills and knowledge to survive and thrive in the 21st century. Let's become equipped with the tools necessary to meet the challenges and take advantage of the opportunities to inspire our diverse student population to achieve success in the 21st century. After the conference, I hope you will be energized with science knowledge and instructional strategies that will provide the scaffolding for your efforts to help all students attain 21st-century science literacy.

I look forward to meeting you and sharing thoughts and ideas throughout the conference to see how we can work together to build the scaffolding for 21st-century science literacy for all!

Karen L. Ostlund
2012–2013 NSTA President

Contributors to the Phoenix Conference

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

American Association of Physics Teachers and the American Modeling Teachers Association (AMTA)

American Chemical Society

American Society for Engineering Education (ASEE)

Arizona Science Teachers Association

Carolina Biological Supply

National Association of Biology Teachers (NABT)

Southwest Airlines Co.

Texas Instruments, Inc.



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

NSTA Conferences Go Green!

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

Conference Previews

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

Online Conference Information and Personal Scheduler

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

Final Conference Programs by E-Mail

Conference registrants are now given the option of receiving an electronic version (PDF) of the final conference program by e-mail approximately two weeks prior to the conference, further reducing printing and shipping requirements.

Recycled Paper and Sustainable Print Services

Conference previews and final conference programs are now printed on recycled paper. In addition, Walsworth Print Group, the printer for our conference materials, is in strict compliance with all environmental laws and exceeds these standards in many areas. Wherever possible, Walsworth Print Group works to reduce and recycle waste, use reduced or low-VOC chemicals, increase the recycled content of raw materials, and use soy- and/or vegetable-based inks. Walsworth Print Group has also obtained chain-of-custody certification for paper products to ensure they are being harvested from environmentally responsible sources.

Green Initiatives at the Phoenix Convention Center

One of the greenest convention centers in the world, the Phoenix Convention Center is certified by the U.S. Green Building Council with LEED silver rating. A photovoltaic solar energy plant is installed atop the West Building, which generates enough electricity to power 12–14 Phoenix homes per year. The plant will reduce the Convention Center's carbon dioxide emissions by 95 metric tons per year.

The facility is constructed using wood products that encourage environmentally responsible forest management practices; carpets, paint, and other products with low emissions of volatile organic compounds; Energy Star-compliant roofing and underground parking; and curbside access to public transportation. The facility uses mechanical and electrical equipment that dramatically reduces the building's energy consumption. Low-flow lavatories and water-saving landscaping reduce the facility's impact on scarce water resources.

The Convention Center practices comprehensive recycling that includes the collection of paper, plastic, cardboard, and glass materials. In addition, biodegradable and recycled materials are used in daily operations and work with clients.

Eco-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.

"Go Green" at the Phoenix 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.
- 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.
- In advance of the conference, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- Evaluate sessions attended via your smartphone or online.

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NSTA

Registration, Travel, and Hotels



—Photo courtesy of www.peterjordanphoto.com / Greater Phoenix Convention and Visitors Bureau

Meeting Location and Times

The conference headquarters hotel is the Sheraton Phoenix Downtown Hotel. Conference registration, the exhibits, NSTA Avenue, the Science Bookstore, and most sessions will be located at the Phoenix Convention Center. Short courses and networking events will be held at the Sheraton. The conference will begin on Thursday, December 6, at 8:00 AM, and end on Saturday, December 8, at 12 Noon.

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 (e.g., short courses, field trips, and networking events).

The NSTA Registration Area located in Exhibit Hall 5 of the Convention Center will be open during the following hours:

Wed., Dec. 5	5:00–7:00 PM
Thu., Dec. 6	7:00 AM–5:00 PM
Fri., Dec. 7	7:00 AM–5:00 PM
Sat., Dec. 8	7:30 AM–12 Noon

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

Purchasing Ticketed Events

The Phoenix Conference 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 NSTA Registration Area. See the Conference Program section (starting on page 26) for details. Note that some events may have required advance registration.

Ground Transportation to/from Airport

Phoenix Sky Harbor International (PHX) is located four miles from the Convention Center. Rates for a one-way taxi fare to downtown from the airport are \$16–\$20. For more information on getting to the airport, ask your concierge or visit the Sky Harbor website (<http://skyharbor.com>).

Getting Around Town

Ground transportation options include taxis and SuperShuttle®. Also, a METRO light rail stop is conveniently located close to the Convention Center. The Phoenix METRO light rail, the bus system, DASH (Downtown Area Shuttle), and DEE (Downtown Evening Express) make it easy to get where you need to be. For a map and other details, visit www.downtownphoenix.com/getting-around.

Parking

Downtown Phoenix boasts more than 25,000 parking spaces, making it a very car-friendly city center. Besides public parking garages, there are numerous parking meter spots. Go to <http://bit.ly/UGOe80> for a map of parking.

Airlines

NSTA has made arrangements with several major airlines to offer discounted fares to Phoenix conference attendees. Visit <http://bit.ly/U7jLWi> for details.

Discounted Rental Cars

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

Enterprise 800-593-0505 16AH230

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



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DECEMBER 6-8, 2012

**1. Sheraton Phoenix Downtown Hotel
(Headquarters Hotel)**

340 N. Third St.

2. Hyatt Regency Phoenix

122 N. Second St.



NSTA can help you become the best teacher you can be. Stop by NSTA Avenue (Booth #222) for details on all that NSTA offers teachers.

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. A complete list of exhibitors and contact information starts on page 119.

Exhibit Hall Hours. Located in Exhibit Hall 5 of the Convention Center, exhibits will be open for viewing during the following hours:

Thu., Dec. 6	11:00 AM–5:00 PM
Fri., Dec. 7	9:00 AM–5:00 PM
Sat., Dec. 8	9:00 AM–12 Noon

Ribbon Cutting. An opening ceremony is scheduled on Thursday at 11:00 AM at the entrance to the NSTA exhibits, Exhibit Hall 5.

Leads Retrieval. NSTA exhibitors use leads retrieval, a paperless tracking system that allows them to receive fast, accurate information about conference attendees who have visited their booths. With the leads 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 134 for a complete listing of exhibitor workshops.

NSTA Avenue

Stop by the NSTA Avenue and learn about NSTA's benefits, products, services, programs, and partners...and free gifts, too! Share with others, expand your knowledge, and earn rewards for you and your students. See page 129 for a complete list of NSTA services and programs.

NSTA Science Bookstore

Award-winning professional development titles; the newest books for 2012; and "I Love Science" T-shirts, mugs, and gifts galore stock the shelves in NSTA's bookstore. Located directly opposite registration, you're invited to examine some of our latest books—*Integrating Engineering and Science in Your Classroom*; *The Everyday Science Sourcebook, Revised 2nd Edition*; and *Teaching Science Through Trade Books*—and check out our brand-new line of children's books. Don't forget—all conference attendees enjoy a 20% discount on NSTA Press® titles along with free shipping for online orders placed during the conference.

Meet the Presidents and Board/Council

Be sure to stop by Thursday from 11:15 AM to 12 Noon at the entrance to the Exhibit Hall 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!

Downtown Phoenix Visitor Information Center

The Downtown Phoenix Visitor Information Center located at the Convention Center West Building (across from Hyatt Regency) will be open Monday–Friday, 8:00 AM–5:00 PM. They can assist with making restaurant reservations as well as providing maps, travel guides, tickets to local attractions, and information on what there is to do in the city. Stop by or call 877-CALL-PHX.

Housing Questions or Concerns?

If you have any questions or concerns about your housing, please contact the NSTA Housing Bureau at 602-452-6269.

ASTA Booth

The **Arizona Science Teachers Association (ASTA)** booth is located in the NSTA Registration Area. Stop by for information about Phoenix and the state of Arizona and the benefits of becoming a member of ASTA. Membership forms and information on association activities will be available. This is your opportunity to update your information, renew your membership, or become a member. Find out what is happening in science education in Arizona!

Graduate Credit Opportunity

Phoenix conference attendees can earn one graduate-level credit in professional development through Grand Canyon University™ for a fee of \$100. Details and registration forms are available at the Arizona Science Teachers Association booth as well as at www.nsta.org/phoenixgraduatecredit. An NSTA transcript is required. *Note:* Credit is by pass/fail option only.

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.

Wi-Fi in Convention Center

The Convention Center offers complimentary wireless internet in designated public areas—West Building Atrium and North Building Metro Marché (food court). You must have a 80211g wireless network interface card installed and configured on your laptop, PDA, or other wireless device. Connect to the Phoenix Convention Center wireless network “PCCWiFi”; no access code required.

NSTA Mobile Website

We invite you to visit the NSTA Mobile Website, m.nsta.org, the best way to keep

track of what’s happening at the conference from your phone. The mobile website features a slimmed-down version of our popular session browser tool, allowing you to view sessions by Date/Time, Session Format, Subject, and Keyword, and to evaluate those you have attended. The site also includes a map of Phoenix with bookmarks for the conference hotels and Convention Center, a link to the #nsta Twitter feed, NSTA news, and other important information. Please note that the site has been optimized for use with iPhone and Android devices.

If you have a barcode reader installed, point your phone’s camera at the image in the ad below to go directly to the NSTA mobile site.

We welcome your feedback about the conference mobile website. (*Note: This is not an app; it is a website optimized for viewing on phones.*)

Conference Evaluation

All conference attendees are invited to complete a conference evaluation form online at <http://svy.mk/S8UIGx>.

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 (an LCD projector and screen). For any last-minute AV needs, presenters must arrange and pay for their own equipment. Technology Express, the designated AV company on-site, will be located in the following rooms:

- Room 131A, Convention Center
- Arcadia Boardroom, Sheraton

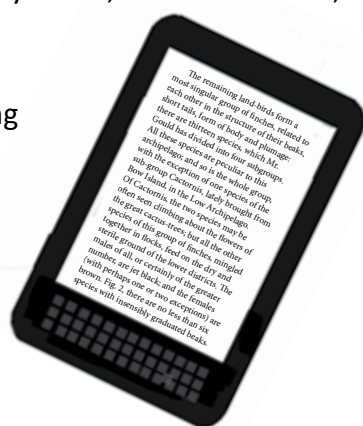
Help us with your feedback...and get a chance for a free Kindle Fire HD 8.9"

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

When you log on to www.nsta.org/evaluations and fill out an evaluation, you get entered into a drawing for a chance to win a Kindle Fire HD 8.9", Dolby Audio, Dual-Band Wi-Fi, 16 GB, *courtesy of the NSTA Conferences Department.*

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

• KINDLE FIRE HD 8.9" GIVEAWAY



• MOBILE WEBSITE



- You can also evaluate sessions via your smartphone at m.nsta.org.



NSTA National Science Teachers Association



First Aid Services

The First Aid room is located in Exhibit Hall 5 near the roll-up door on the loading dock side (Fifth Street) of the hall. Look for the “red cross.”

Lost and Found

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

Message Center

A Message Center for conference attendees is available in the NSTA Registration Area. No messages, except extreme emergencies, can be broadcast over the public address system.

Business Services

The UPS Store®, located in the Convention Center, offers complete business services, including photocopying and printing, document finishing, fax services, and packing and shipping. Self-serve copies are also available. The UPS Store is located in the West Building in Suite 110 and is open Monday–Friday, 7:00 AM–6:00 PM, and Saturday, 8:00 AM–2:00 PM. For more information, call 602-251-0135 or visit the store online at www.theupsstorelocal.com/5750.

Located in the Sheraton Phoenix Downtown Hotel, FedEx Office offers packing, shipping, copying, and office supplies. Hours are daily, 7:00 AM–7:00 PM. For more information, call 602-258-0266 or e-mail usa5048@fedexkinkos.com.

NEW! Online Session Evaluations and Tracking Professional Development

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

Help NSTA's **GREEN** efforts by completing session evaluations online December 6–19, 2012, via your smartphone (m.nsta.org) while the session is fresh in your mind! Or attendees can visit www.nsta.org/evaluations at a later time to complete a short online session evaluation for each session they attend. **And this year, we're giving away a Kindle Fire HD 8.9" to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!**

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

To evaluate a session via www.nsta.org/evaluations:

- Enter your badge number (if you don't remember your badge number, click “help me find my badge number”).
- Type the beginning of the session title in the “Lookup Session” field, scroll down to find the correct session, and click “Submit Session.” The session information will appear and you can begin to evaluate the session.
- When finished evaluating the session, click “Submit Evaluation.”
- Repeat this process for each session attended.

To evaluate a session via your smartphone, visit m.nsta.org and:

- Locate the appropriate session by schedule, format, subject, or keyword search from the home page and click on “Evaluate This Session.”
- Enter your badge number at the top of the form and then answer the nine questions.

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

Beginning January 3, 2013, an attendee can view his or her transcript at the NSTA Learning Center (learningcenter.nsta.org) by clicking on “My PD Record and Certificates.” Attendees can also document credit for activities that are not being evaluated (e.g., short courses, Exhibit Hall visits, featured speakers, meetings, etc.). 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.



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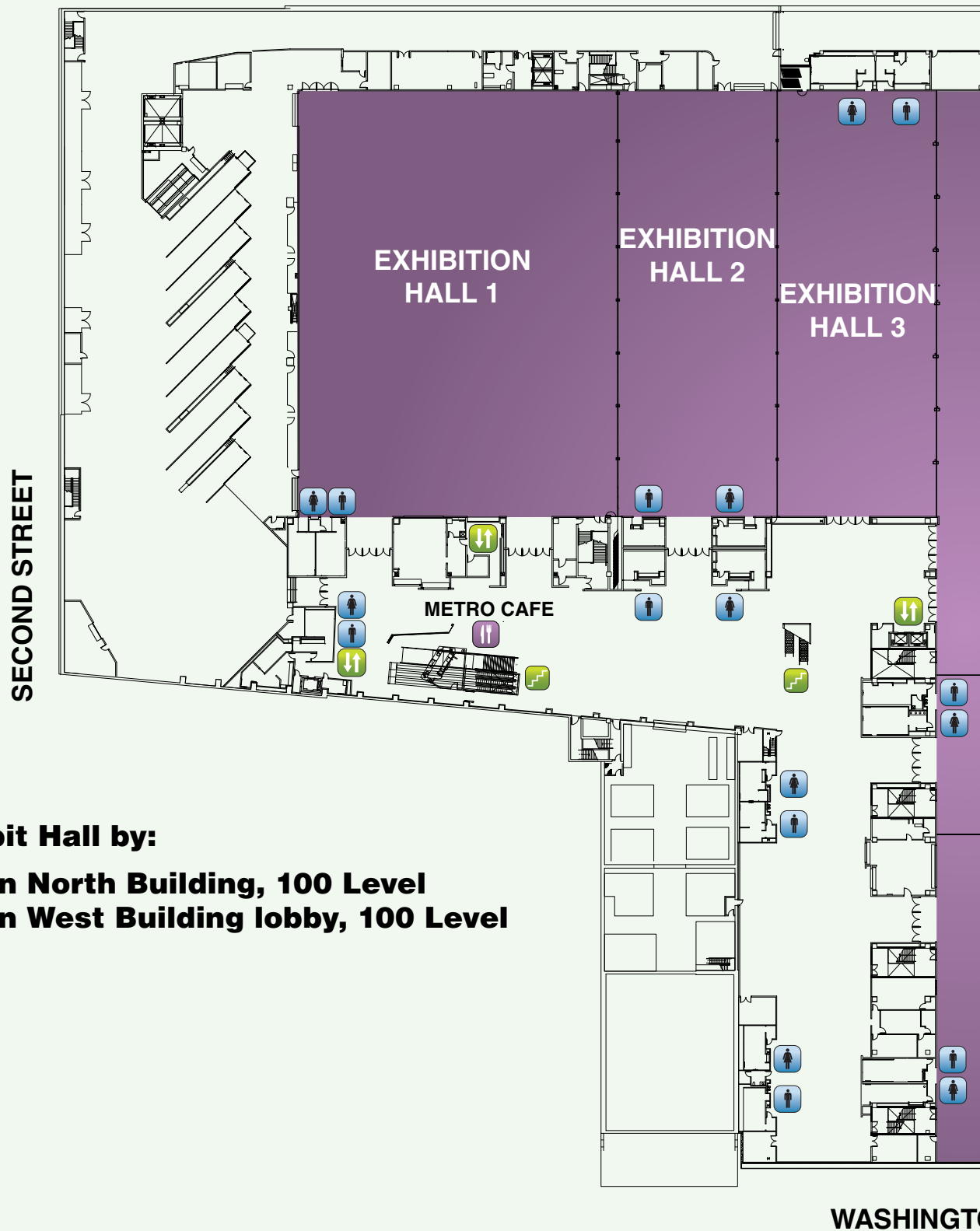
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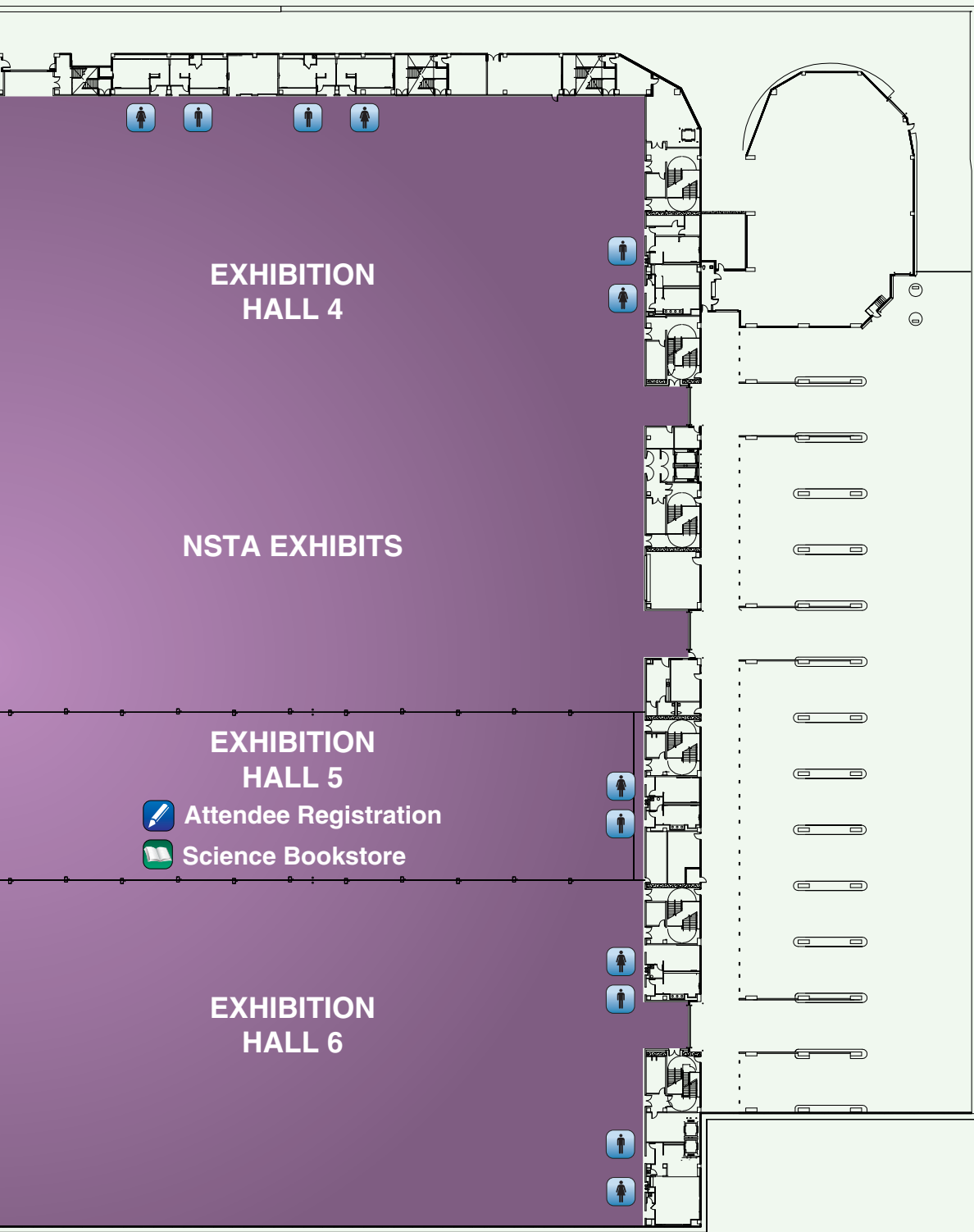


**Access Exhibit Hall by:**

- escalator in North Building, 100 Level
- escalator in West Building lobby, 100 Level

Lower Level

STREET



FIFTH STREET

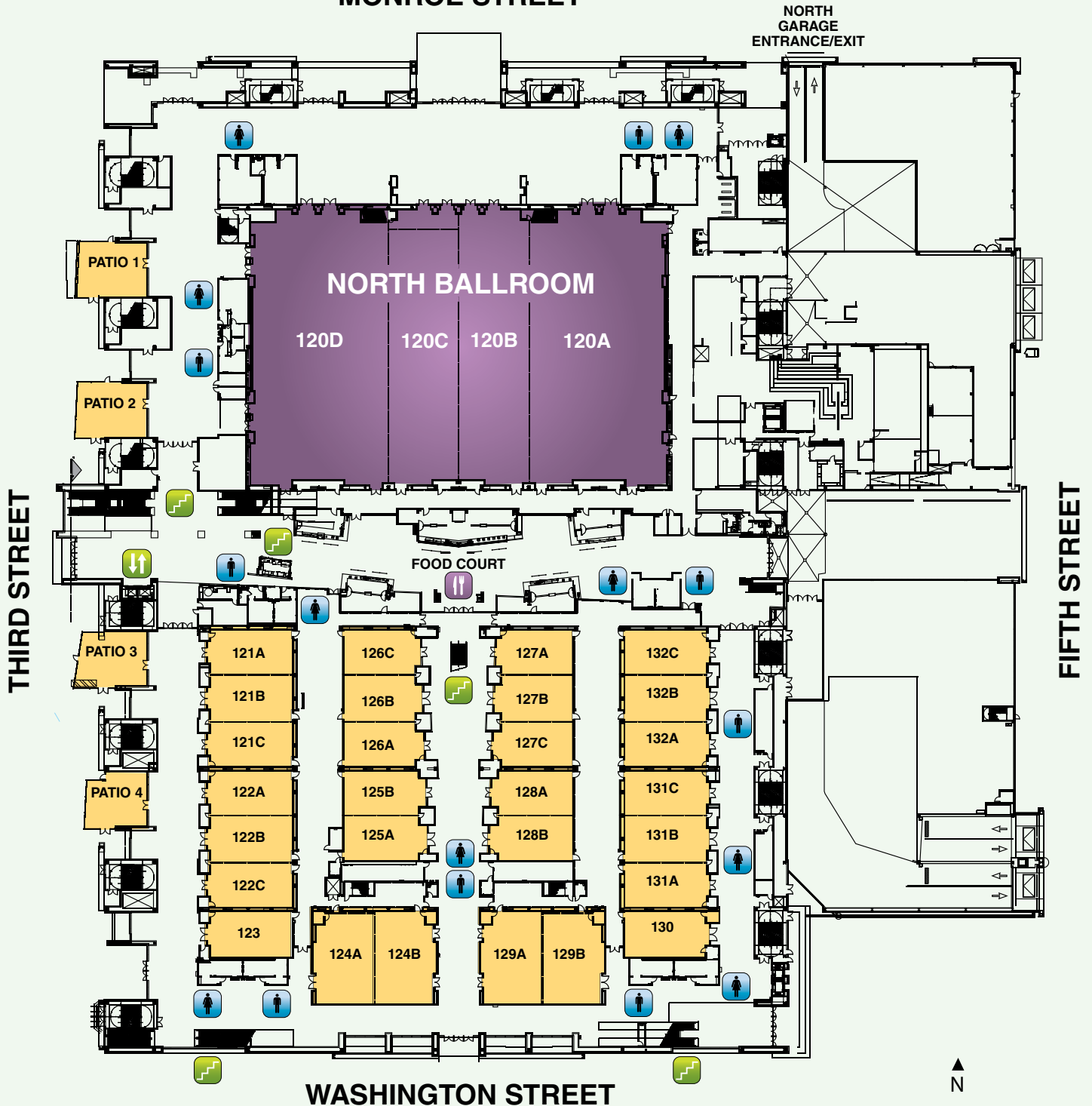


ON STREET

Phoenix Convention Center

North Building, 100 Level

MONROE STREET



Phoenix Convention Center

North Building, 200 Level



Sheraton Phoenix Downtown

Second Level

KEY

ROOM 1: *VALLEY OF THE SUN*

ROOM 2: *ARCADIA*

ROOM 3: *AHWATUKEE*

ROOM 4: *LAVEEN*

ROOM 5: *SOUTH MOUNTAIN*

ROOM 6: *ENCANTO*

ROOM 7: *MARYVALE*

ROOM 8: *ESTRELLA*

ROOM 9: *CAMELBACK*

ROOM 10: *ALHAMBRA*

ROOM 11: *DEER VALLEY*

ROOM 12: *PARADISE VALLEY*

ROOM 13: *NORTH MOUNTAIN*

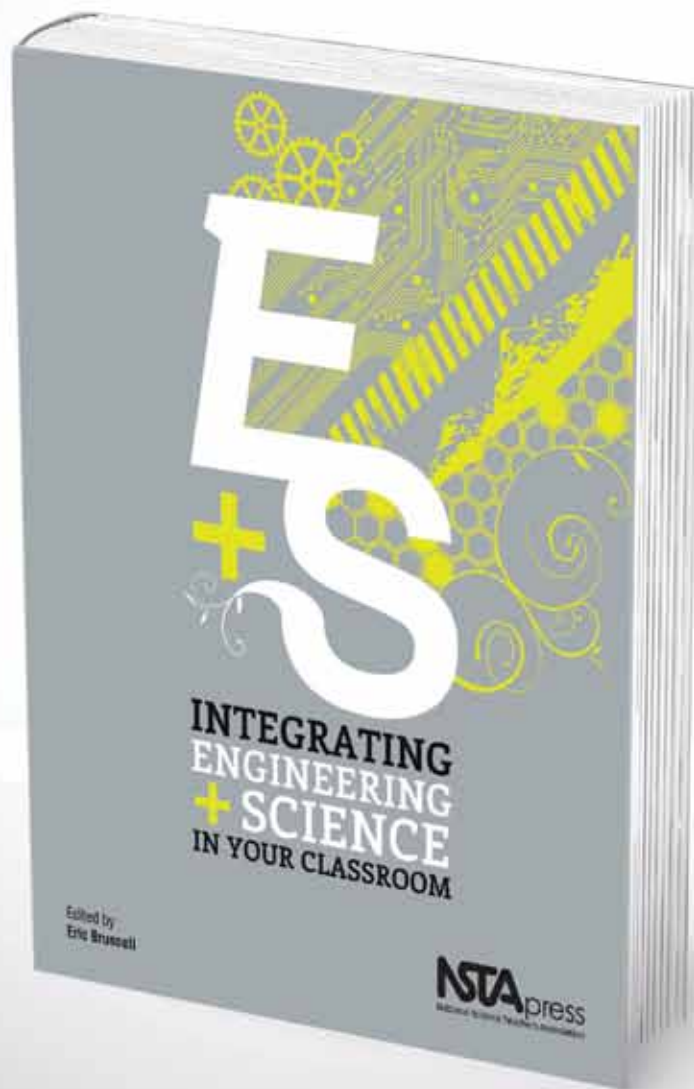


Lightsabers, Potatoes, Eggs ...

What do these have in common?

All are included in design challenges in NSTA Press's **NEW** book
Integrating Engineering and Science in Your Classroom.

Its 30 chapters include STEM lessons to help K–12 teachers blend authentic and meaningful engineering activities into instruction. The lessons reinforce important skills and science content while illustrating a wide range of STEM skills and opportunities.



To order, learn more, or check out our other STEM books, visit
www.nsta.org/store

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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

San Antonio, Texas
April 11–14, 2013

Boston, Massachusetts
April 3–6, 2014

Chicago, Illinois
March 26–29, 2015

2013 STEM Forum & Expo

St. Louis, Missouri
May 15–18

Area Conferences on Science Education

2013 Area Conferences

Portland, Oregon—October 24–26
Charlotte, North Carolina—November 7–9
Denver, Colorado—December 12–14

2014 Area Conferences

Richmond, Virginia—October 16–18
Orlando, Florida—November 6–8
Long Beach, California—December 4–6



Macro or Micro
Share Your Know-How

**Submit a session proposal
for an NSTA conference**

2013 Area Conferences on Science Education
Proposal Deadline: January 15, 2013
Portland, Oregon • October 24–26, 2013
Charlotte, North Carolina • November 7–9, 2013
Denver, Colorado • December 12–14, 2013

2014 National Conference on Science Education
Proposal Deadline: April 15, 2013
Boston, Massachusetts • April 3–6, 2014

www.nsta.org/conferences

NSTA National Science Teachers Association

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NSTA NATIONAL CONFERENCE

on

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SAN ANTONIO, TEXAS

— APRIL 11-14, 2013 —

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EVERYTHING'S
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PROFESSIONAL DEVELOPMENT STRANDS

- Next Generation Assessments: Effectively Measuring Student Learning
- Next Generation Elementary Science: Building the Foundation
- Next Generation Special Populations: Improving Science Instruction to Meet the Needs of Diverse Learners
- Next Generation Technology: Putting the "T" in STEM

ATTENDEES CAN ACCESS:

- A wide range of Science, Technology, Engineering, and Math (STEM); Next Generation Science Standards (NGSS); and Common Core sessions
- 2,000 sessions, workshops, field trips, and short courses for K–16 educators
- Content development and ready-to-use teaching techniques
- Exhibit Hall featuring new products and giveaways from more than 400 exhibitors
- NSTA Science Bookstore with 100s of professional development books; attendees receive a 20% discount



—Photo courtesy of Greater Phoenix Convention and Visitors Bureau

Questions on the New Standards?

Visit page 54 for a list of standards-related sessions.

Is This Your First NSTA Conference?

Yes, you say? Then you are invited to attend a special session on Thursday from 8:00 to 9:00 AM. Learn how you can gain the most from your conference experience and have fun doing it! See page 46 for details.

Wednesday, December 5

8:30 AM–3:30 PM Picture-Perfect Science Preconference Workshop (C-1) 43

Thursday, December 6

8:00–9:00 AM First-Timers Conference Attendees' Orientation 46
(Is This Your First NSTA Conference?)
9:15–10:30 AM General Session: Col. Eileen Collins 50
11:00–11:05 AM Ribbon Cutting Ceremony/Exhibits Opening 52
11:05 AM–5:00 PM Exhibits 53
11:15 AM–12 Noon Meet the Presidents and Board/Council 53
2:00–3:00 PM Featured Presentation: Jo Anne Vasquez 59
5:30–8:30 PM ASTA Annual Meeting and Social 70

Friday, December 7

8:00 AM–1:00 PM Symposium: Flight of the Monarch Butterflies (SYM-1) . . 35, 78
8:00 AM–4:30 PM Engineering Day 30
8:00 AM–4:30 PM Chemistry Day (For Grades 9–12) 31
8:00 AM–4:30 PM Middle School Chemistry Day 31
8:00 AM–4:30 PM Biology Day 32
8:00 AM–6:00 PM Physics Day 32
9:00–11:00 AM NSTA ESP Symposium 30, 79
9:00 AM–5:00 PM Exhibits 79
9:30–10:30 AM Featured Presentation: James J. Elser 80
11:00 AM–12 Noon Featured Presentation: Stephen L. Pruitt 86
2:00–3:00 PM Featured Presentation: Diandra L. Leslie-Pelecky 96

Saturday, December 8

8:30–10:30 AM CESI Breakfast (M-1) (Speaker: Julie Thomas) 113
9:00 AM–12 Noon Exhibits 114

Win a round-trip Southwest travel scholarship to the San Antonio conference

Thanks to the generosity of Southwest Airlines, we're giving away two Southwest Airlines travel scholarships to the NSTA San Antonio National Conference on Science Education, April 11–14, 2013!

The drawings will be held at 3:00 PM on Dec. 6 and Dec. 7 during the conference. The winners will be posted at the Development booth on the NSTA Avenue. Stop by their booth in the Exhibit Hall for all the details!



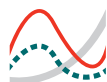


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USING VERNIER DATA-COLLECTION TECHNOLOGY

FRIDAY, DECEMBER 7 th – ROOM 223	
8:00 – 9:30 am	Integrating Your iPad® or Mobile Device with Vernier Technology
10:00 – 11:30 am	Introducing the Vernier LabQuest® 2!
12:00 – 1:30 pm	Chemistry and Biology with Vernier
2:00 – 3:30 pm	Physics and Physical Science with Vernier

Stop by our **booth 208**
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LABQUEST® 2

The Phoenix 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.



The STEM Puzzle—Putting It Together

There are many pieces of the preK–20 STEM puzzle, including integration of the disciplines, policy, partnerships, college and career readiness, workforce pathways, classroom implementation, and real-world application. This strand will explore the different facets of STEM education, focusing on the practice and practicality within the classroom.



Sustainability: Growing, Nurturing, and Ensuring Our Future

Increased pollution, habitat destruction, energy utilization, competition for limited resources, and decreased ecological diversity are a few of our current global challenges. Today's students will be responsible for designing and innovating new solutions for these and future global challenges. Students need knowledge and the ability to think creatively to have a positive impact on the quality of the planet. This strand will focus on how to expose students to the wonder of nature, provide opportunities for students to analyze environmental degradation occurring around the globe, discover current research on sustainability, model the scientific and engineering practices behind the solutions, and explore career options within the discipline of environmental science.



Literacy: Communicating and Understanding Science

Communication is critical in a global society. Students need to acquire and practice skills necessary to effectively communicate. Literacy tools (reading, writing, listening, and speaking) empower students to make sense of science content and concepts, and to deepen conceptual understanding about the world. This strand will improve participants' skills to plan opportunities for students to process their learning through literacy tools and will focus on learning protocols for accountable exchanges, citing claims and evidence, argumentation and scientific discourse, and critical thinking/questioning.

The STEM Puzzle—Putting It Together

Thursday, December 6

8:00–9:00 AM

Building a STEM Program: Successes and Challenges

12:30–1:30 PM

STEM Immersion Matrix: A Guide to STEM Program Development and Implementation

12:30–3:00 PM

SC-1: SANITY, BLAST, and Research Methods: Programs That Engage Students in Science!
(Tickets required: \$25)

2:00–3:00 PM

Featured Presentation: STEM Curriculum—Moving Beyond the Acronym and into Classroom Practice
(Speaker: Jo Anne Vasquez)

Engineers Serving Education

5:00–6:00 PM

What You Can Gain from Genetic Testing in Your Classroom

Friday, December 7

8:00–9:00 AM

It Can Be Done

8:30 AM–3:30 PM

SC-2: Integrating Mathematics and Science Through a Problem-solving Approach with LEGO® Robotics
(Tickets required: \$34)

9:30–10:30 AM

Developing Critical Thinkers Through the Water Investigations Program: Connecting Classroom Practice to Real-World Application

11:00 AM–12 Noon

GIS: Is It the Last Piece of the STEM Puzzle?

12:30–1:30 PM

Teaching Engineering Design to Middle School and High School Students Using Chain Reaction STEAM Machines™

2:00–3:00 PM

Developing a Steady Diet of STEM Education Is E.A.S.I.

5:00–6:00 PM

Understanding Nuclear Energy

Saturday, December 8

8:00–9:00 AM

Teaching Problem-solving Strategies in the Elementary Classroom: Helping Students See the Interconnectedness of Science, Technology, Engineering, and Mathematics

9:30–10:30 AM

STEM Activities: Animal Pictures, WebQuest, Boat Constructions, and Pumpkins

11:00 AM–12 Noon

Robotics in Middle School: How Do We Make That Work?

Sustainability: Growing, Nurturing, and Ensuring Our Future

Thursday, December 6

8:00–9:00 AM

Growing Sustainability in the High School from the Grass Roots

2:00–3:00 PM

Plants—From Seed to Seed

3:30–4:30 PM

Developing Simple Sustainability Lessons
Toward a Framework for Integrated Science
Collaboration: High School/University Partnerships

5:00–6:00 PM

Camp Colley Goes Green: An Energy Lesson Plan

Friday, December 7

8:00–9:00 AM

Forests, Carbon, and Climate Change

9:30–10:30 AM

Featured Presentation: Phosphorus, Food, and Our Future
(Speaker: James J. Elser)

Teaching Younger Students About Energy Outside the Science Classroom

11:00 AM–12 Noon

Teaching Sustainability Competencies Through Community Projects

12:30–1:30 PM

Inquiry-based Sustainability Activities

2:00–5:00 PM

SC-4: Developing a “Naturalist” Approach in the Teaching of Science Concepts and Inquiry
(Tickets required: \$76)

3:30–4:30 PM

Facing the Future: Fueling the Future

5:00–6:00 PM

Facing the Future: Global Connections and Sustainability

Saturday, December 8

8:00–9:00 AM

How Does Your Garden Grow?

9:30–10:30 AM

Teaching Climate and Energy with the CLEAN Collection: Peer-reviewed Climate and Energy Resources at Your Fingertips!

11:00 AM–12 Noon

Concept Mapping Environmental Sciences

Literacy: Communicating and Understanding Science

Thursday, December 6

8:00–9:00 AM

Building Academic Vocabulary Through Science

12:30–1:30 PM

Discussion and Writing: Making Meaning of Science Learning Activities

2:00–3:00 PM

Why’d You Change Your Thinking? Science Notebooks: Analysis, Feedback, and Discourse

3:30–4:30 PM

Kindergarten Science and Literacy

5:00–6:00 PM

Kindergarten Science Illustrations and Recordings

Friday, December 7

9:30–10:30 AM

Authentic Writing in Science: Get Kids to Write Children’s Books

11:00 AM–12 Noon

The Role of “Drawing” in Supporting Critical Thinking and Science Processes

12:30–1:30 PM

Using NASA Press Releases to Develop Literacy in Integrated Science Lessons

2:00–3:00 PM

Featured Presentation: Building SPEED: Science in the Real World (at 200 mph)
(Speaker: Diandra L. Leslie-Pelecky)
Big Cat Controversy: Issues Provide Context for Rich Learning and Community Building

2:00–5:00 PM

SC-3: Literacy Tools for Science Learning
(Tickets required: \$21)

3:30–4:30 PM

Engaging K–6 Science Students with Scientific Inquiry—Supported by Science Literacy Skills and Extraordinary Print Resources

Saturday, December 8

8:00–9:00 AM

Science + Literacy = Student Achievement

11:00 AM–12 Noon

Science Literacy and Those Accountable Lines of Communication

Engineering Day at NSTA

*Sponsored by the American Society
for Engineering Education*



*Friday, December 7, 8:00 AM–4:30 PM
128A, Convention Center*

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

8:00–9:00 AM	ASEE's K–12 Outreach Program eGFI: Engineering, Go For It and the Marshmallow Challenge (p. 75)
9:30–10:30 AM	Engineering the Future with <i>TeachEngineering.org</i> (p. 83)
11:00 AM–12 Noon	Putting It Together with Solar Robots (p. 89)
12:30–1:30 PM	Introducing Engineering to Elementary School Students (p. 94)
2:00–3:00 PM	NASA's BEST Students (Beginning Engineering, Science, and Technology) Build a Buggy to Explore Mars! (p. 98)
3:30–4:30 PM	Developing and Publishing Standards for Professional Development for K–12 Teachers of Engineering (p. 104)

NSTA Exemplary Science Program (ESP)

Science Education Reform



More Emphasis . . . Less Emphasis

Unique Features of Programs That Meet "More Emphasis" Features in the NSES

*Friday, December 7, 9:00–11:00 AM
124A, Convention Center*

The National Science Education Standards offered four goals/justifications for science in K–6 settings, namely that all students would: 1) Experience the richness and excitement of knowing about and understanding the natural world; 2) Use appropriate scientific processes and principles in making personal decisions; 3) Engage intelligently in public discourse and debate about matters of scientific and technological concern; and 4) Increase their economic productivity through the use of the knowledge, understandings, and skills of the scientifically literate person in their careers.

The ESP series identifies people and places where the reforms recommended have emerged, including 1) Exemplary Science in Grades PreK–4; 2) Exemplary Science in Grades 5–8; 3) Exemplary Science in Grades 9–12; 4) Exemplary Science: Best Practices in Professional Development; 5) Inquiry: The Key to Exemplary Science; 6) Exemplary Science in Informal Education Settings; and 7) Exemplary Science for Resolving Societal Challenges.

The series was conceived by Robert E. Yager (1982–1983 NSTA President), who continues ESP searches and ways of recognizing classroom successes while also encouraging more to try!

Coordinator: *Thomas R. Lord, Indiana University of Pennsylvania, Indiana*

Symposium Participants:

Developing Students' Authentic Inquiry Skills

Judith A. Scheppler, Illinois Mathematics and Science Academy, Aurora

Success with Science Outdoors

Beth Ann Krueger, Central Arizona College–Aravaipa Campus, Winkelman

Why STEM? Why Now?

Brenda Wojnowski, WAI Education Solutions, Dallas, Tex.

Graduate Distance Education Programs: An Evolving Concept with Practical Applications

Oliver Grundmann, University of Florida, Gainesville



ACS
Chemistry for Life™

Chemistry Day at NSTA

Equilibrium, Le Chatelier, and Rate

For Grades 9–12

Friday, December 7, 8:00 AM–4:30 PM

125 A/B, Convention Center

Sponsored by the American Chemical Society

Engage in activities, discussion, analyses, and assessment that help understanding of the relationships among equilibria, Le Chatelier's principle, and rates and their roles in moving toward a more sustainable use of Earth's resources.

Education research indicates a positive correlation between teacher content knowledge and student learning. The goals of this workshop are to enhance and enrich secondary chemistry teachers' knowledge of and interrelationships among equilibria, Le Chatelier, and rates through engagement in activities, discussion, and analyses that demonstrate how lessons on these concepts can be presented in a way that stimulates student thinking and prompts exploration of the complexity of the concepts as they relate to sustainability.

The content and structure of the workshop draws on several decades of experience the American Chemical Society has in activity-based curricula development that include incorporation of sustainability and Green Chemistry principles. The workshop is a daylong series of lessons on equilibria, Le Chatelier's principle, and rates—topics central to understanding the behavior of matter and chemical change. A complementary theme of the workshop is incorporating activities as part of the assessment of student learning.

8:00–9:00 AM	Equilibrium and Concentration (p. 74)
9:30–10:30 AM	Equilibrium and Energy (p. 82)
11:00 AM–12 Noon	Rate (p. 88)
12:30–1:30 PM	Catalysis (p. 94)
2:00–3:00 PM	Light as a Reactant and/or Product (p. 98)
3:30–4:30 PM	Half-Life (p. 104)

Middle School Chemistry Day

Big Ideas About the Very Small

Friday, December 7, 8:00 AM–4:30 PM

128B, Convention Center

Sponsored by the American Chemical Society

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 new 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	Solids, Liquids, and Gases: The Kinetic-molecular Theory of Matter (p. 75)
9:30–10:30 AM	Changes of State: Evaporation and Condensation (p. 83)
11:00 AM–12 Noon	Density: A Molecular View (p. 89)
12:30–1:30 PM	The Periodic Table, Energy Levels, and Bonding (p. 94)
2:00–3:00 PM	The Polarity of the Water Molecule and Its Consequences (p. 98)
3:30–4:30 PM	Chemical Change: Breaking and Making Bonds (p. 105)

Biology Day at NSTA

*Sponsored by the National Association
of Biology Teachers*



*Friday, December 7, 8:00 AM–4:30 PM
124B, Convention Center*

NABT is proud to present Biology Day. Join us for hands-on and informative sessions that highlight the resources and tools you need to excel as a biology and life science teacher. Sessions will include activities on biodiversity, evolution, and the revised AP Biology course.

From free resources to expert tips, Biology Day provides relevant information and pedagogy for every biology teacher at every level. Enhance your teaching, engage your students, and enjoy NABT Biology Day in Phoenix!

8:00–9:00 AM	Free Classroom Resources for Teaching Evolution (p. 74)
9:30–10:30 AM	Using HHMI's <i>The Making of the Fittest: Natural Selection and Adaptation</i> in Your Classroom (p. 82)
11:00 AM–12 Noon	Using HHMI's <i>Bones, Stones, and Genes: The Origin of Modern Humans</i> (p. 88)
12:30–1:30 PM	The Revised AP Biology Course: Understanding the Changes in the Course Audit and New Exam (p. 92)
2:00–3:00 PM	AP Open Forum (p. 96)
3:30–4:30 PM	Creating Student Excitement for the Nature of Science (p. 104)

Physics Day at NSTA

*Sponsored by the American Association
of Physics Teachers (AAPT) and the American Modeling
Teachers Association (AMTA)*



*Friday, December 7, 8:00 AM–6:00 PM
122B, Convention Center*

The American Association of Physics Teachers offers a full day of physics content. Physics Day consists of presentations on physics topics of current interest, physics demonstrations for the precollege classroom, and a make-and-take session where participants can construct a piece of physics apparatus for use as a demonstration or laboratory experiment. Physics Day in Phoenix is being organized by the American Modeling Teachers Association.

8:00–9:00 AM	Using Physics “Challenge Days” to Help Motivate Freshman Students (p. 74)
9:00–11:00 AM	An Introduction to Modeling Instruction in Physics (p. 79)
11:00 AM–12 Noon	The Physics Bus (p. 88)
12 Noon–1:00 PM	Ranking Tasks in Physics (p. 90)
1:00–3:00 PM	Modeling Energy and Systems in Physics (p. 95)
3:00–4:00 PM	Engineering Wind Turbines: A STEM Application for Physics and Engineering Students (p. 101)
4:00–5:00 PM	The Box Game: Modeling Simple Nonlinear Systems Using Cellular Automata (p. 105)
5:00–6:00 PM	Solving Kinematics Problems Using Graphical Methods (p. 108)

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

NSTA 2012 Phoenix 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 Phoenix conference. Sessions/events such as field trips, short courses, meetings, and exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

Beginning January 3, 2013, Phoenix transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your Phoenix Badge ID# and then clicking on "My PD Record and Certificates." Keep this form and use it to add the following activities to your Phoenix 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#** _____

Visit m.nsta.org to evaluate sessions via your smartphone, or go to www.nsta.org/evaluations to evaluate sessions (workshops, presentations, and exhibitor workshops) online. See page 14 of the conference program for instructions. ***And don't forget, the more sessions you attend and evaluate, the more chances you have to win a Kindle Fire HD 8.9"!***

Sample Questions:

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

Sample Responses:

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

Wednesday, December 5 8:30 AM–3:30 PM

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

We're giving a Kindle Fire HD 8.9" 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!

Thursday, December 6 8:00 AM–6:00 PM

Start Time	End Time	Activity/Event Title

Friday, December 7 5:45 AM–9:00 PM

Start Time	End Time	Activity/Event Title

Saturday, December 8 8:00 AM–12 Noon

Start Time	End Time	Activity/Event Title

NSTA Press Sessions

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

Thursday, December 6

8:00–9:00 AM	Uncovering Physical Science Core Ideas in the NGSS Using Formative Assessment Probes (p. 45)
12:30–1:30 PM	Using Science Mystery Stories—The Details (p. 56)
2:00–3:00 PM	Uncovering Earth and Space Science Core Ideas in the NGSS Using Formative Assessment Probes (p. 60)
3:30–4:30 PM	<i>Rise and Shine: A Practical Guide for the Beginning Science Teacher</i> (p. 65)
5:00–6:00 PM	Authors Share Favorite Lessons from <i>Teaching Science Through Trade Books</i> (p. 70)

Friday, December 7

8:00–9:00 AM	<i>Teaching and Learning Biology Through Scientific Argumentation</i> (p. 75)
9:30–10:30 AM	<i>Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, 3–6</i> (p. 83)
11:00 AM–12 Noon	Classroom Activities for <i>Stop Faking It! Energy</i> (p. 89)
12:30–1:30 PM	<i>Stop Faking It! Finally Understand Chemistry Basics So You Can Teach Them</i> (p. 94)
2:00–3:00 PM	<i>Bringing Outdoor Science In</i> (p. 97)
3:30–4:30 PM	Writing Stories for Teaching Science Practices (p. 105)

Saturday, December 8

8:00–9:00 AM	Classroom Activities for <i>Stop Faking It! Force & Motion</i> (p. 112)
11:00 AM–12 Noon	<i>More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4</i> (p. 117)



Thursday, December 6

Arizona Science Teachers Association Annual Meeting and Social
Sponsored by Salt River Project and Helios Education Foundation
Off-site (Audubon Center)..... 5:30–8:30 PM

Friday, December 7

Informal Science Meeting
Laveen A, Sheraton8:30–10:30 AM

NSTA Committee on Multicultural/Equity in Science Education
Area Meeting
Laveen A, Sheraton 11:00 AM–12:30 PM

Saturday, December 8

CESI Breakfast
(Tickets required: M-1; \$41)
Speaker: Julie Thomas
Camelback A, Sheraton8:30–10:30 AM

Enjoy a Wealth of FREE PD Resources to Build Content Knowledge

The NSTA Learning Center

- “Science Objects” (inquiry-based interactive, content modules)
- More than 120 interactive live web seminars
- More than 600 award-winning journal articles
- More than 100 book chapters
- Monthly special offers
- Searchable by subject, grade level, and state standards



Register for a free Learning Center account at <http://learningcenter.nsta.org>.

Picture-Perfect Science Preconference Workshop (C-1)

Tickets for this preconference workshop were available by preregistration only.



Karen Ansberry

Karen Ansberry (karen@pictureperfectscience.com) and **Emily R. Morgan** (emily@pictureperfectscience.com), Classroom Veterans and Award-winning Authors of *Picture-Perfect Science Lessons, Expanded 2nd Edition: Using Children's Books to Guide Inquiry, 3–6* and *More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4*



Emily R. Morgan

Level: Elementary
Date: Wednesday, December 5
Time: 8:30 AM–3:30 PM
Location: Maryvale B, Sheraton

STEM education begins in elementary school, but it can be difficult for elementary teachers to fit science into the school day. Picture-Perfect Science integrates science and reading in a meaningful way, so you can teach both subjects at once. In this work-



—Courtesy of Emily R. Morgan

shop, you will participate in model lessons that integrate science and reading, learn the benefits and cautions of using children's picture books in science, become familiar with the BSCS 5E model, and receive a bibliography of recommended science-related picture books. All attendees will also receive a copy of *Picture-Perfect Science Lessons, Expanded 2nd Edition: Using Children's Books to Guide Inquiry, 3–6*, a \$36.95 value containing 20 classroom-ready lessons for grades 3–6. Come to this Picture-Perfect Science Workshop and rejuvenate elementary science instruction in your district or school!

Symposium: Flight of the Monarch Butterflies (SYM-1)

Jim O'Leary (oleary@mdsci.org), Maryland Science Center, Baltimore

Dolores Cansler (decansler@gmail.com) and **Ann Hobbie**, University of Minnesota Dept. of Fisheries, Wildlife, and Conservation Biology, St. Paul

Level: Grades K–12

Date: Friday, December 7, 8:00 AM–1:00 PM

Location: Off-site (Arizona Science Center)

Registration Fee: \$54

Join us at the Arizona Science Center to view the latest IMAX film *Flight of the Butterflies* and engage in classroom activities focused on the monarchs' amazing migration across North America, as well as their habitats and life cycle. Hear from experts in the field of monarch study about how you and your students can become involved in citizen science projects to help the monarchs. Educational materials will be provided for classroom use, and a drawing for door prizes will take place at the end of the program. Breakfast will be served! Each participant will receive a \$75 stipend for attendance.

The Arizona Science Center is located in the Heritage and Science Park on the northwest corner of Seventh and Washington streets.



—Courtesy of Jim O'Leary/Maryland Science Center

Participants should plan to meet at 7:50 AM in the lobby of the Arizona Science Center.

Symposium Follow-Up Sessions:

2:00–3:00 PM	Monarch Life Cycles and Raising Monarchs in Captivity (p. 99)
3:30–4:30 PM	Classroom Lessons with Monarchs (p. 105)



SANITY, BLAST, and Research Methods: Programs That Engage Students in Science! (SC-1)

Margaret Wilch (margaret.wilch@tusd1.org), Tucson High Magnet School, Tucson, Ariz.

Level: High School–College

Date/Time: Thursday, December 6, 12:30–3:00 PM

Location: Laveen A, Sheraton

Registration Fee: \$25

Frustrated that your students do not get outside and explore the natural world? This short course will focus on three Tucson High Magnet School programs that bring students together to ask relevant and novel research questions and then use available resources to scientifically answer those questions. For the past six summers, more than a hundred students have participated in Science and Nature in Tandem for Youth (SANITY) and a summer course called “Genes, Biotechnology, and the Environment,” taught through the Biotechnology Laboratory for Arizona Students and

Admission to NSTA short courses is by ticket only. Tickets, if still available, can be purchased at the Ticket Sales Counter in the NSTA Registration Area.

Teachers (BLAST). These programs get students outside, learning about their environment, and into the laboratory where they use molecular techniques to answer real-world questions. Both programs help prepare students for a year-long capstone course called Honors Research Methods. Research students present their work at regional, state, and national science competitions. Learn how to develop similar programs and receive strategies for funding and supporting such programs and for collaborating with universities. Walk away with ideas for creating innovative Project Based Learning (PBL) experiences at your school.

—Photo courtesy of Tucson High Magnet School



A Tucson High Magnet School student collects pea aphids after heat shock treatment during a “Genes, Biotechnology, and the Environment” course, exploring the effects of bacterial endosymbionts on heat tolerance in pea aphids. SC-1: SANITY, BLAST, and Research Methods: Programs That Engage Students in Science!



Integrating Mathematics and Science Through a Problem-solving Approach with LEGO® Robotics (SC-2)

Erik Von Burg (elvonbur@mpsaz.org), MacArthur Elementary School, Mesa, Ariz.

Michael Little Crow and **William A. Johnson**, Scottsdale Community College, Scottsdale, Ariz.

Level: Grades K–12

Date/Time: Friday, December 7, 8:30 AM–3:30 PM

Location: Camelback A, Sheraton

Registration Fee: \$34

This short course will illustrate methods to integrate LEGO Mindstorms® NXT robots with a thought process-based problem-solving approach to teach a wide variety of curricula, including mathematics, physics, and engineering. Participants will collaboratively build a robot, program it with Mindstorms' software, and learn how to predictably and accurately move their robot by creating various multi-level mathematical models. Various challenges will test their skills. Practical methods to implement a robotics curriculum will be discussed, including gathering materials, fostering a problem-solving approach, tailoring it to various ages, creating cross-curricular connections, and determining evaluation tools. Bring your laptop if possible, although not necessary.



SC-2: Integrating Mathematics and Science Through a Problem-solving Approach with LEGO Robotics



Literacy Tools for Science Learning (SC-3)

Joan Gilbert (joan.gilbert@tusd1.org) and **Marleen L. Lyon** (marleen.lyon@tusd1.org), Tucson (Ariz.) Unified School District

Level: Grades K–8

Date/Time: Friday, December 7, 2:00–5:00 PM

Location: Camelback B, Sheraton

Registration Fee: \$21

Literacy supports the development of conceptual understandings in science. Join us as we explore several strategies. Find out how science notebooks can develop reading, writing, listening, and speaking skills as well as provide a jump-start for several genres of formal writing. We will examine academic vocabulary development and group discussions that build argumentation, evidence, and critical thinking. We'll also look into the use of graphic organizers to assist students in determining important concepts in science texts. Take away scaffolded reading strategies that provide multiple ways to actively engage in text.



Developing a "Naturalist" Approach in the Teaching of Science Concepts and Inquiry (SC-4)

William J. Klein (wjmsklein@aol.com), Western Iowa Tech Community College, Sioux City

Level: General

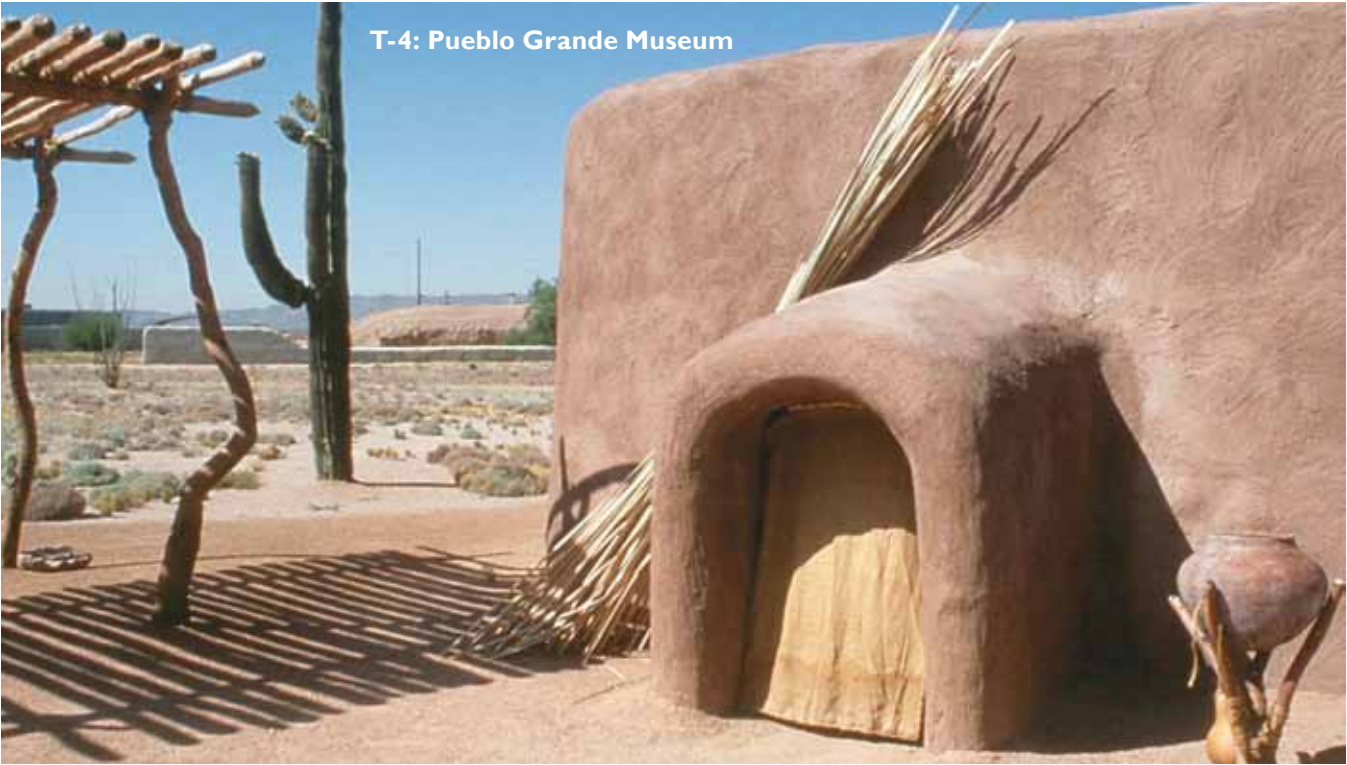
Date/Time: Friday, December 7, 2:00–5:00 PM

Location: Estrella, Sheraton

Registration Fee: \$76

Many of today's students lack knowledge of the natural world with some educators labeling them "nature deficient." Because they have never studied firsthand the most common organisms, students frequently have difficulty correlating concepts described in their texts with actual life cycles, adaptations/behaviors of living organisms. This short course describes hands-on inquiry activities and strategies, which research has validated as effective, to enhance comprehension of science concepts for all learners: visual, aural, tactile, and ELL. Students employ basic science process skills and experience concepts in the context of their meaning. The knowledge and skills gained through interaction with the natural world of lawns, gardens, waters, and creatures will benefit students the rest of their lives. Handouts, teaching strategies, and a CD are provided.

Courtesy of Pueblo Grande Museum / Greater Phoenix Convention and Visitors Bureau



Tickets for field trips may be purchased (space permitting) at the Ticket Sales Counter in the NSTA Registration Area. Meet your field trip leader at the pull-in area in front of the Convention Center North Building on Third Street 15 minutes before departure time.

Phoenix Crime Lab **\$15**

#T-1 Thursday, Dec. 6 9:15–11:45 AM

Take a look inside the Phoenix Police Department’s Crime Laboratory. See forensic scientists at work as they analyze fingerprints and other biological evidence. FTIR spectroscopy, capillary electrophoresis, general X-ray theory, and polarized light microscopy are among the scientific principles factoring into their analysis. Randy Leister, our tour guide, works at the lab as a forensic scientist supervisor and will provide a Q&A.

Note: All attendees must bring a valid government-issued photo ID, i.e., a driver’s license. Participants will walk to/ from the Phoenix Police Department.

Biosphere 2 **\$34**

#T-2 Thursday, Dec. 6 11:15 AM–6:15 PM
#F-4 Friday, Dec. 7 9:15 AM–4:15 PM

Biosphere 2 was opened to the public in 1990. This unique structure was created to better understand how natural environments create habitable conditions for human sustainability. It is a unique facility that can be used to understand the role of life on Earth and the effects of climate change. Biosphere 2 contains re-creations of five of Earth’s biomes, plus a human habitat and a large ecological experiment facility. Sorry, no pets are allowed at Biosphere 2. Bring your lunch or grab a snack at Biosphere 2 from the Snack Shop. NSTA will provide bottled waters to participants. Travel time is two hours each way.

Note: Be sure to wear a hat and comfortable shoes. Participants will be walking 1.5 miles, including inclines and stairs in warm and humid conditions. The Biosphere 2 is not walker, stroller, or wheelchair accessible.

Cadaver and DNA Lab **\$24**

#T-3 Thursday, Dec. 6 12:15–4:15 PM
#F-2 Friday, Dec. 7 8:15 AM–12:15 PM

Grand Canyon University™ is offering the unique opportunity to tour the University’s brand-new state-of-the-art Forensic DNA Analysis Laboratory and established cadaver lab. The DNA lab opened in August 2012; the lab is built

according to the requirements set forth by the Federal Bureau of Investigation and includes two separate analysis rooms. The lab also contains new instrumentation allowing students to obtain hands-on experience with the instruments they will encounter while working in their new profession. Participants will have the opportunity to analyze a garment in an attempt to identify an unknown biological stain and become familiar with the layout, instrumentation, and sample processing within forensic DNA labs. In addition, participants will tour the cadaver lab, which has 12 cadavers. An anatomy presentation of the cadavers and discussion on the use of cadavers in undergraduate degree programs will follow.

Pueblo Grande Museum \$28

#T-4 Thursday, Dec. 6 1:30–4:30 PM

A National Historic Landmark, the 1,500-year-old Hohokam village ruin is a fascinating glimpse of an ancient people who used extensive canal irrigation to cultivate varieties of cotton, tobacco, maize, beans, squash, and an assortment of wild plants and later used dry-farming systems to grow agave. For more than 80 years, the Pueblo Grande Museum has been dedicated to the study and interpretation of the Hohokam culture. Visitors can explore the ruin of an 800-year-old platform mound possibly used by the Hohokam for ceremonies or as an administrative center. An excavated ballcourt and two full-scale reproductions of prehistoric Hohokam homes can be viewed along the ruin trail. The site also includes remnants of Hohokam irrigation canals.

Grand Canyon Railway Resort and Bus Tour \$169

#F-1 Friday, Dec. 7 5:45 AM–9:00 PM

All aboard to Grand Canyon National Park! The Grand Canyon Railway made its first journey to the South Rim of the Grand Canyon in 1901, long before Arizona was dubbed “The Grand Canyon State.” Today, you can travel to the Grand Canyon along the same rail line as these early visitors and enjoy one-of-a-kind vintage train service. The railway now carries well over 200,000 people to the canyon each year. We’ll depart from historic Williams Depot, the southern terminus of the railway, and travel north across 65 miles of classic Wild West territory, including high-desert plains, arroyos, and ponderosa pine forest. Our destination is the Grand Canyon Depot, the last operating log depot in the United States. A Wild West shootout at the Williams Depot starts our adventure off with a bang. Aboard the train we’ll enjoy live-action Wild West entertainment, including strolling musicians and a train robbery by the infamous Cataract Creek Gang. At the canyon we’ll board a bus for a narrated rim tour of canyon highlights and enjoy a hot

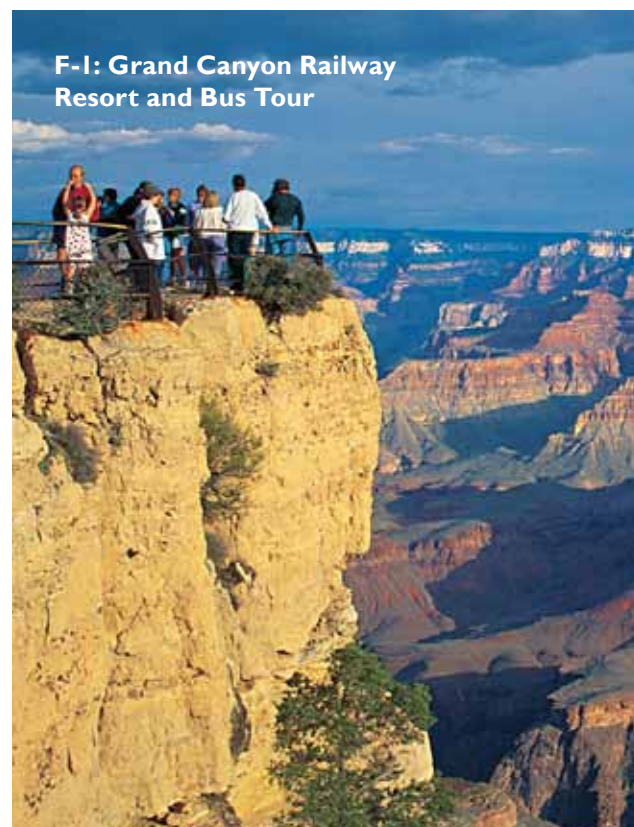
buffet lunch, included in the tour price, at Maswik Lodge. Nestled in a forest of pines, the lodge is just a quarter mile from the canyon’s edge. Don’t forget your camera! NSTA will provide a breakfast snack with juice. Travel time from the Convention Center to Williams Depot is three hours each way.

Lost Dutchman State Park and Day Hike \$57

#F-3 Friday, Dec. 7 8:45 AM–2:15 PM

The Superstition Mountains have been a source of mystery and legend since early times. Named after a fabled lost gold mine, Lost Dutchman State Park is located in the Sonoran Desert, 40 miles east of Phoenix. Several trails lead from the park into the Superstition wilderness and surrounding Tonto National Forest. Take a two- to three-hour guided stroll along one of the many trails and learn about native plants, animals, and the legends of the Superstition Mountains. A variety of desert animals inhabit the park. Keep your eye out for deer, coyote, javelina, bobcat, lizards, snakes, and jackrabbits. Be sure to bring your camera! Box lunch included. Travel time is 60 minutes each way.

Note: Make sure you wear comfortable shoes and dress in layers. Hiking boots or walking shoes are recommended. Bring a water bottle.



—Photo courtesy of Greater Phoenix Convention and Visitors Bureau

Conference Program • Affiliate Sessions

Association for Multicultural Science Education (AMSE)

President: Eddie A. Chevis

Thursday, December 6

2:00–3:00 PM	Science Education Equity Discoveries (SEEDs): Transforming Teaching by Enacting Research on Classroom Equity	122A, Convention Center
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Council for Elementary Science International (CESI)

President: Barbara Z. Tharp

Thursday, December 6

12:30–1:30 PM	Experimental Design Just for PreK–5	132 A–C, Convention Center
2:00–3:00 PM	Council for Elementary Science International Share-a-Thon	132 A–C, Convention Center

Saturday, December 8

8:30–10:30 AM	CESI Breakfast (Tickets required: M-1; \$41) Speaker: Julie Thomas, Oklahoma State University, Stillwater	Camelback A, Sheraton
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Council of State Science Supervisors (CSSS)

President: Peter McLaren

Thursday, December 6

12:30–1:30 PM	Implementing the Common Core State Standards in the Secondary Science Classroom	127B, Convention Center
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National Association for Research in Science Teaching (NARST)

President: Sharon Lynch

Friday, December 7

8:00–9:00 AM	The Effect of Instructional Framing on Learning and Transfer of Experimental Design Skills Microcosmos: A Culturally Relevant Science Learning Environment for Second-Generation Latino Elementary Students	126C, Convention Center
9:30–10:30 AM	Analyzing Curriculum Materials with Preservice and Mentor Elementary Teachers: Bridging Science Methods and Field Placement Settings How Can We Prepare Students to Recognize Errors of Inquiry During Work with Virtual Environments?	126C, Convention Center

National Science Education Leadership Association (NSELA)

President: Elizabeth Allan

Friday, December 7

11:00 AM–12 Noon	Tools for Leaders, Part I	126C, Convention Center
12:30–1:30 PM	Tools for Leaders, Part II	126C, Convention Center

Society for College Science Teachers (SCST)

President: Brian Shmaefsky

Friday, December 7

12:30–2:30 PM	Science Through Application: How Forensic Science Can Get Kids Interested	124A, Convention Center
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www.nsta.org/2013stemforum

Meet you in St. Louis

Save the Date

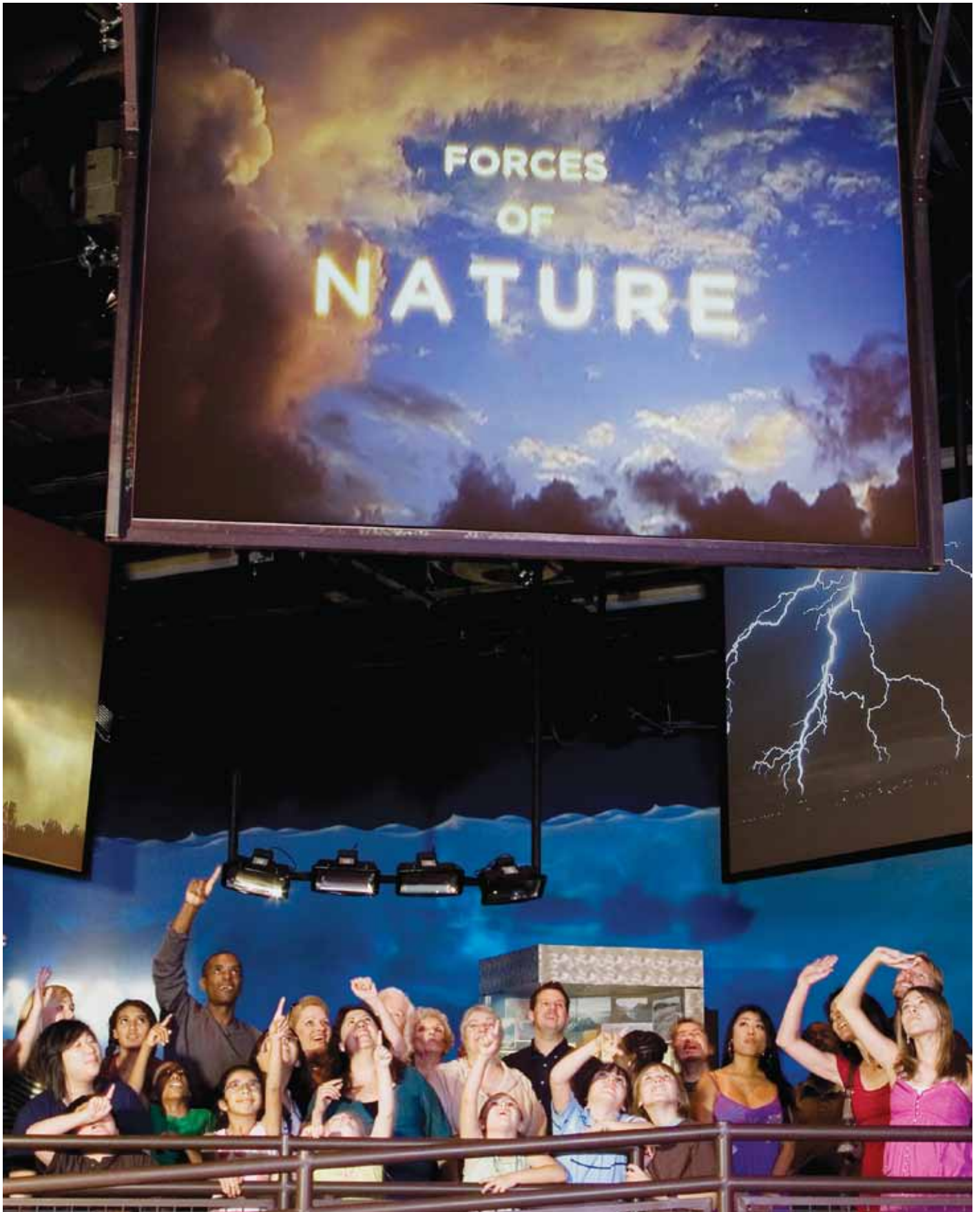
2013 STEM Forum & Expo

St. Louis, Missouri

• May 15–18, 2013

May 15—Exclusive evening exhibits preview followed by keynote address by self-proclaimed Science Evangelist Ainissa Ramirez

NSTA National Science Teachers Association



—Photo courtesy of Arizona Science Center

8:30 AM–3:30 PM Preconference Workshop

Picture-Perfect Science Preconference Workshop (C-1)

(Elementary)

Maryvale B. Sheraton

By Preregistration Only

Karen Ansberry (karen@pictureperfectscience.com) and **Emily R. Morgan** (emily@pictureperfectscience.com), Classroom Veterans and Award-winning Authors of *Picture-Perfect Science Lessons, Expanded 2nd Edition: Using Children's Books to Guide Inquiry, 3–6* and *More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4*

For description, see page 35.

Emily R. Morgan is a consultant for Picture-Perfect Science, LLC where she facilitates elementary science workshops for teachers nationwide. She feels that tapping into students' fascination with science will give them the motivation to read about it. Emily has a bachelor's degree in education from Wright State University and a master's in education from the University of Dayton. She taught seventh-grade science at Northridge Local Schools in Dayton, Ohio, and grades 2–4 science lab at Mason City Schools in Mason, Ohio. She has served as a science consultant for the Hamilton County Educational Service Center in Cincinnati, and as the science leader for the High AIMS Consortium. Emily is the co-author of the Picture-Perfect Science series published by NSTA Press, and the author of the Next Time You See... children's books series from NSTA Press.

Karen Ansberry is the elementary science curriculum leader for Mason City Schools in Mason, Ohio. As a former classroom teacher, she understands that teachers are crunched for time and need high-interest, ready-to-use lessons that integrate literature, reading strategies, and science. After graduating from Xavier University in Cincinnati with a bachelor's degree in biology, she completed an internship in the Cincinnati Zoo's education department. This experience inspired her to change her career focus from wildlife biology to elementary education, and after earning an MA in teaching from Miami University in Oxford, Ohio, she began teaching grades 5–6 science at Mason City Schools. Karen is the co-author of NSTA's Picture-Perfect Science series.

Emily and Karen are also the co-authors of the "Teaching Through Trade Books" column from NSTA's journal Science & Children and co-authors of the book Teaching Science Through Trade Books published by NSTA Press.

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 in heavy type at the right immediately following the session title. On page 139, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

(Bio)	=	Biology/Life Science
(Chem)	=	Chemistry/Physical Science
(Earth)	=	Earth/Space Science
(Env)	=	Environmental Science
(Gen)	=	Integrated/General Science
(Phys)	=	Physics/Physical Science

Glossary

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

Strands

The Phoenix 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 28.



The STEM Puzzle—Putting It Together



Sustainability: Growing, Nurturing, and Ensuring Our Future



Literacy: Communicating and Understanding Science

The following icon will be used throughout this program.



NSTA Press® Sessions



—Photo courtesy of Babe Sarver, Greater Phoenix Convention and Visitors Bureau

8:00–9:00 AM Presentations

SESSION 1

Biotechnology as an Avenue for STEM: Lessons from the Northern Arizona University GK–12 Project

(Bio)

(Middle Level)

121A, Convention Center

Kenric Kesler (kenric.kesler@nau.edu) and **Catherine Ueckert**, Northern Arizona University, Flagstaff

This presentation will highlight the integration of graduate students' STEM research into the middle school classroom curriculum from a GK–12 program.

SESSION 2

STEM Where? Integrating STEM into the Science Classroom in Anticipation of the Next Generation Science Standards

(Gen)

(General)

122A, Convention Center

Brian P. Short (bshort@nsta.org), Director, Science Education Competitions, NSTA, Arlington, Va.

What is STEM? What role does it play in a science classroom? How can you incorporate engineering and math into your already full curriculum? What do the NRC *Framework* and the draft of the upcoming Next Generation Science Standards have to do with STEM? These questions and many more will be answered as we discuss how to bring STEM into grades 6–9 classrooms. Information will also be provided on how the new NSTA competition, eCYBERMISSION, can help bring STEM into your classroom.

SESSION 3

Urban Heat Island: Linking Science, Society, and Engineering

(Env)

(Middle Level–High School)

126A, Convention Center

Monica M. Elser (mmelser@asu.edu) and **Gina M. Hupton** (gina.hupton@asu.edu), Arizona State University, Tempe

This interdisciplinary Urban Heat Island unit challenges students to live sustainably in cities by linking concepts in natural science, social science, language arts, and engineering.

SESSION 4

So My Classroom Has Computers...NOW WHAT?

(Gen)

(General)

126C, Convention Center

Christopher Sheehan (csheehan1@msd38.org), Madison Park School, Phoenix, Ariz.

Come learn how to incorporate educational technology and learning resources into your science classroom to impact student achievement.

SESSION 5

Publishing Isn't Just for PhDs: Introducing Students to the World of Science Writing and Publishing!

(Bio)

(Middle Level–High School)

127A, Convention Center

Sarah Fankhauser, Harvard Medical School, Boston, Mass.

Introducing a reviewed, open-access scientific journal that publishes work by grades 6–12 student scientists!

SESSION 6



NSTA Press® Session: Uncovering Physical Science Core Ideas in the NGSS Using Formative Assessment Probes

(Phys)

(General)

129B, Convention Center

Page Keeley (pagekeeley@gmail.com), 2008–2009 NSTA President, and Author/Consultant, Jefferson, Maine

Joyce B. Tugel (jtugel@mmsa.org), Maine Mathematics and Science Alliance, Augusta

Learn how the *Uncovering Student Ideas in Science* probes can be used as diagnostic and formative assessments of students' thinking related to the physical science core ideas in the highly anticipated Next Generation Science Standards and how use of the probes supports the science practices.

SESSION 7

NASA CERES S'COOL Project: Cloud Observation Is S'COOL!

(Earth)

(Elementary–High School)

130, Convention Center

Tina M. Rogerson (tina.m.rogerson@nasa.gov), SSAI/NASA Langley Research Center, Hampton, Va.

Engage students in making cloud and weather observations for NASA—become a S'COOL cloud observer! Plenty of online lessons, activities, and great handouts!

SESSION 8

Successful K–12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics

(Gen)

(General)

131B, Convention Center

Jerry D. Valadez (jvaladez@cvsamacademy.org), SAM Academy, Fresno, Calif.

Providing all students with access to high-quality education in STEM is important to their individual futures and the nation's economic and political health.

SESSION 9



Building a STEM Program: Successes and Challenges (Gen)

(General)

229B, Convention Center

Jack B. Clark (jaclark@pvschools.net), **Phil Howardell** (phowardell@pvschools.net), **Marni Landry** (mlandry@pvschools.net), and **Andrew Bernier** (abernier@pvschools.net), Paradise Valley High School, Phoenix, Ariz.

Learn about the necessities and pitfalls of planning, operating, and maintaining a sustainable STEM program based on our research and experiences.

SESSION 10



Growing Sustainability in the High School from the Grass Roots (Gen)

(High School)

230, Convention Center

Nigel Forrest (nforrest@asu.edu), Arizona State University, Tempe

Jessica Hauer (jhauer@tuhsd.k12.az.us), Tempe (Ariz.) Union High School District

Hear about the approach, successes, failures, barriers, and enablers of Tempe High School's grassroots initiative to develop sustainability as a core value of the school.

SESSION 11

NASA and NOAA Professional Development: How It Fits into the STEM Puzzle (Gen)

(Elementary–High School)

231A, Convention Center

Kaci A. Heins (kheins@northlandprep.org), Northland Preparatory Academy, Flagstaff, Ariz.

Joanne Michael (jmichael@mbusd.org), Meadows Elementary School, Manhattan Beach, Calif.

Based on our experiences participating in NASA and NOAA professional development, we'll share how to increase STEM engagement effectively with students through these opportunities.

8:00–9:00 AM Workshops

Cosmetics, OTC Drugs, Environmental Issues, and the BP Oil Spill—Let's Go Green! (Env)

(Elementary)

121B, Convention Center

Ava F. Pugh (apugh@ulm.edu) and **Dona C. Delgado** (delgaddc@warhawks.ulm.edu), The University of Louisiana at Monroe

Presider: Ava F. Pugh

Conduct hands-on activities testing cosmetics and over-the-counter drugs for pH values, as well as a simulation of the BP oil spill. Let's go green! Handouts and door prizes!

A Buyer's Guide...and Gourmet Menu! Selecting and Using Outstanding Trade Books (Gen)

(Preschool–Middle Level)

121C, Convention Center

Juliana Texley (jtexley@att.net), Palm Beach State College, Boca Raton, Fla.

NSTA has cooperated with the Children's Book Council for 40 years to select the best in children's trade books. Explore the criteria, hear the surprising results, and learn how to use these exemplars in your classroom.

"Astro"nishing Astronomy: The Electromagnetic Spectrum (Earth)

(Middle Level–High School)

124B, Convention Center

Pamela Whiffen (pwpwr@aol.com), NASA/Facing the Future, Phoenix, Ariz.

Facilitated by a NASA Educator Ambassador and teacher, explore the hidden universe with a new set of eyes. Take home NASA CD-ROM and posters.

Is This Your First NSTA Conference? (Gen)

(General)

125 A/B, Convention Center

NSTA Board and Council

Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive walk through the conference program book. By the end of the session, we guarantee you'll know just how to get the most from your conference participation. Refreshments courtesy of Carolina Biological Supply. Door prizes!

Promoting Inquiry in Our Classrooms: Using Hands-On Performance Assessment with K–12 Students (Gen)

(Supervision/Administration) 127B, Convention Center

Deborah L. Tucker (deborahlt@aol.com), Science Education Consultant, Napa, Calif.

Grant M. Gardner (grantmgardner@msn.com), Assessment Services, Inc., Pepperell, Mass.

Assessing inquiry is essential to instruction. Engage in a hands-on performance task and explore the uses and advantages of this form of assessment.

Game On! Gaming as Science Assessment (Gen)

(General) 128A, Convention Center

Kirstin A. Bittel (kbittel@gmail.com) and **David Niecikowski**, Tucson (Ariz.) Unified School District

See how games and game design can be used to evaluate understanding of major science concepts. Leave with a unit plan to use right away.



Building Academic Vocabulary Through Science (Gen)

(Elementary–Middle Level)

229A, Convention Center

Joan Gilbert (joan.gilbert@tusd1.org), Tucson (Ariz.) Unified School District

Proficient use of language is powerful! Understand the research behind the importance of developing academic vocabulary and learn a six-step approach to teaching it effectively.

Is This Your First NSTA Conference?

First-Time Attendee Session

Thursday, December 6
8:00–9:00 AM
125A/B
Convention Center

If your answer is "YES," then please join us at our conveniently offered session for first-time conference attendees where we'll walk through the program, and you'll learn how to get the most from your conference experience. Door prizes!

CAROLINA
World-Class Support for Science & Math

This session is generously supported by Carolina Biological Supply.

NSTA National Science Teachers Association

8:00–9:00 AM Exhibitor Workshop

PBIS™—Moving Beyond “What Is Science?” to Being Scientists Through Science and Engineering Practices (Gen)

(Grades 6–8)

228 A/B, Convention Center

Sponsor: It's About Time

Mary Starr, Starr and Associates, Education Consultants, Plymouth, Mich.

Project-Based Inquiry Science aligns to the NRC *Framework* and the highly anticipated NGSS by blending practices, core ideas, and crosscutting themes. Come experience Project Science as you work with others to complete a science investigation that requires modeling, asking questions, and other science and engineering practices while developing core ideas.

Meet the Presidents and Board/Council

Come “meet and greet” with your elected NSTA officers on your way to the exhibits. Share some face-to-face time with the President, President-Elect, and Retiring President along with your Board and Council members. This Thursday special session runs from 11:15 AM to 12 Noon at the entrance to the Exhibit Hall (page 53).

8:00–9:15 AM Exhibitor Workshops

A Simple Connection Between STEM and Data Logging (Bio)

(Grades 9–12)

221A, Convention Center

Sponsor: Frey Scientific/School Specialty Science

Lou Loftin, Consultant, Reno, Nev.

Conduct a STEM-focused activity that links science concepts with the technology of data logging using the new USB uLog™. Integrate technology and hands-on inquiry activities effortlessly in the classroom with a cost-effective, easy-to-use data collection and analysis system.

Inquiring Minds Provide Spark for Science Lessons (Gen)

(Grades K–6)

221B, Convention Center

Sponsor: Delta Education/School Specialty Science

Tom Graika, Consultant, Lemont, Ill.

Johanna Strange, Consultant, Richmond, Ky.

Inquiry is at the heart of science teaching. Using topics from the Delta Science Modules program, learn how inquiry strategies can provide a variety of learning opportunities for students. Engage in guided, challenge, and open inquiries and take home a resource packet.

Investigating a Cliff Model (Earth)

(Grades 6–8)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Bill Cline and **Lisa Kelp**, LAB-AIDS, Inc., Ronkonkoma, N.Y.

When is the last time you engineered a coastal breakwater? Here's your chance! Engineer a coastal breakwater (from the *Issues & Earth Science* “Erosion and Deposition” unit from LAB-AIDS) and analyze the trade-offs of the design. Explore how the natural world is modified by engineering design, which in turn creates more questions and issues for research. Activities support the NRC *Framework* and show how SEPUP embeds the engineering practices and uses real issues to deliver content learning.

AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (Bio)

(Grades 6–12)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

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 protocols of a forensic pathologist. Free dissection supplies and door prizes!

8:00–9:30 AM Exhibitor Workshop

Chemistry and the Atom: Fun with Atom-building Games! (Chem)

(Grades 5–12) 222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

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

Understanding abstract concepts about atoms can be difficult. Use our model to experience innovative games and activities that present students with opportunities to grasp atomic structure and its connection to the periodic table. Take away STEM activities and an understanding of how to incorporate science and engineering practices into your lessons.

8:00–10:00 AM Exhibitor Workshop

Science-centered Language Development with FOSS (Gen)

(Grades K–8) 221C, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

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

Active learning requires active thinking—and thinking involves language. Discover the ways language is used to help students make sense of their active learning FOSS experiences. We will model a FOSS investigation using listening and speaking, reading and writing, and language-development strategies to further content knowledge, scientific practices, and academic literacy.



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9:15–10:30 AM General Session

Leadership Lessons from *Apollo to Discovery*

(General)

Ballroom 120D, Convention Center



Col. Eileen Collins, First Woman to Pilot and Command an American Spacecraft

Presider: Karen L. Ostlund, NSTA President, and Advisory Council, Texas Natural Sciences Center, The University of Texas at Austin

Introduction of Speaker: Janey Kaufmann, Chairperson, NSTA Phoenix Area Conference; NSELA Past President and PD Coordinator; and Coronado PDC at Coronado High School, Scottsdale, Ariz.

Presentation of The Distinguished Partnership Award to Kelli Wells of GE Foundation in recognition of General Electric's steadfast commitment to the improvement and enhancement of science education.

Platform Guests: Col. Eileen Collins; Karen L. Ostlund; Janey Kaufmann; Patricia Simmons, NSTA Retiring President, and North Carolina State University, Raleigh; Bill Badders, NSTA President-Elect, and Retired Director, Cleveland Math and Science Partnership, Cleveland, Ohio; Vicki M. Massey, NSTA Director, District XIV, ASTA President, and Mesa (Ariz.) Public Schools; Gerry Wheeler, NSTA Interim Executive Director, Arlington, Va.; John A. Giacobbe, Program Coordinator, NSTA Phoenix Area Conference, and South Pointe High School, Phoenix, Ariz.; Cheryl Dunham, Local Arrangements Coordinator, NSTA Phoenix Area Conference, ASTA Past President, and Arizona Dept. of Education, Phoenix

As a highly sought-after diversity speaker, astronaut Eileen Collins discusses the leadership and personal qualities necessary for success. She shares how her career as an astronaut took shape, from her early years in the Air Force to becoming the first woman to command a shuttle mission. She includes projections on the future of NASA and its ability to focus on exciting new space ventures.

The first woman to pilot and command an American spacecraft, astronaut Eileen Collins is recognized as one of America's most admired women. In July 2005, Eileen commanded space shuttle Discovery's historic "Return to Flight" mission, NASA's first manned flight following the February 2003 loss of the space shuttle Columbia.

Eileen entered the Air Force Undergraduate Pilot Training Program in 1978, the same year that NASA opened the shuttle program to women.

9:30–10:30 AM Exhibitor Workshop

How Do Scientists Work Together to Answer Big Questions and Solve Big Problems in *PBIS*™? (Gen)

(Grades 6–8)

228 A/B, Convention Center

Sponsor: It's About Time

Mary Starr, Starr and Associates, Education Consultants, Plymouth, Mich.

Project-Based Inquiry Science Launcher units help students learn science and engineering practices while developing a culture of “doing” science. Investigate our Launcher units, discover the research that supports their use, and hear teachers testify to how these units have changed their students' ideas of science.

10:00–11:15 AM Exhibitor Workshops

Getting the Most Out of Molecular-Level Visualization and Simulation Tools (Chem)

(Grades 7–College)

123, Convention Center

Sponsor: Wavefunction

Jeff Bolognese (sales@wavefun.com), Wavefunction, Irvine, Calif.

Making connections between macroscopic and molecular phenomena is at the core of learning chemistry. Bring your laptop (Windows or Mac OS X) to this hands-on workshop and learn how to investigate at the molecular level with the powerful 2012 releases of *Odyssey High School Chemistry* and *Odyssey AP Chemistry*.

Earthquakes and Tornadoes (Earth)

(Grades 4–12)

129A, Convention Center

Sponsor: Simulation Curriculum Corp.

Herb Koller (hkoller@simcur.com), Simulation Curriculum Corp., Minnetonka, Minn.

What are tornadoes and how are they formed? Why are earthquakes common in certain parts of the world? With *The Layered Earth*, students can visualize, measure, and manipulate these forces of nature as well as basic concepts of geology and meteorology using a virtual model of Earth.

Solving the Mystery of STEM Using Forensic Science (Gen)

(Grades 9–12)

221A, Convention Center

Sponsor: Frey Scientific/School Specialty Science

Lou Loftin, Consultant, Reno, Nev.

Conduct a number of STEM-focused forensic activities that link the scientific method 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 the integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

DSM and STEM: Challenges for the Elementary Student (Gen)

(Grades K–6)

221B, Convention Center

Sponsor: Delta Education/School Specialty Science

Tom Graika, Consultant, Lemont, Ill.

Johanna Strange, Consultant, Richmond, Ky.

Activities from the Delta Science Modules (DSM) program provide ample opportunity for younger students to engage in STEM-based challenges. Discover a process that fosters the STEM initiative and receive a workshop packet and related Delta materials.

Experience the Future of Digital Science from National Geographic and Achieve3000® (Gen)

(Grades 6–8)

222C, Convention Center

Sponsor: Achieve3000

Kathy Warnert (kathy.warnert@achieve3000.com), Achieve3000, Lakewood, N.J.

Experience how a digital middle school science program can extend the day, improve reading and science scores, and engage all students through interactive National Geographic content. This dynamic program is delivered at four Lexile® reading levels and poised to meet the highly anticipated Next Generation Science Standards.

NGSS and Scientific Practices—More Than Photo-shopping Models’ Flaws (Gen)

(Grades 5–8)

223, Convention Center

Sponsor: Sangari Active Science

LeeAnn Sutherland, The University of Michigan, Ann Arbor

What comes to mind when you hear the word “model”? Solar system mobiles? Cells in pie plates? New standards require going beyond the models used in science for years! Come engage in modeling activities for middle schoolers and unpack how to think about models you use now in ways consistent with the highly anticipated NGSS.

Fantastic Physical Science Demonstrations from Flinn (Phys)

(Grades 7–College)

226 A–C, Convention Center

Sponsor: Flinn Scientific, Inc.

Joan Tirado (jtirado@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.

Amaze your students with quick demonstrations that teach common physical science topics, including sound, color dynamics, energy, pressure, density, rotation, and scientific inquiry. More than a dozen effective demonstrations will be performed.

Lemons and Light Bulbs: Exploring the Chemistry of Electricity (Chem)

(Grades 9–12)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Brandon Watters, Lakes Community High School, Lake Villa, Ill.

The person who comes up with better batteries for electric cars will make oodles. The chemistry of electricity is cutting-edge chemical engineering and technology as well as the chemistry of our nervous system. Learn how to make a lemon light a bulb, electroplate copper, and make a battery from simple chemicals. As teachers, we tell students that electrons make chemistry. This workshop will show you how those same electrons make electricity, too.

What Quality Science Instruction Has to Do with Raising Achievement Scores K–8 (Gen)

(Grades K–8)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Learn how inquiry-based science instruction increases student achievement on assessments in reading, writing, and mathematics. Leave with practical strategies that can help you advocate for quality science instruction in your district.

Student Collaboration in the Science Classroom (Gen)

(Grades 6–9) 231B, Convention Center

Sponsor: eCYBERMISSION

Brian P. Short, Director, Science Education Competitions, NSTA, Arlington, Va.

Students in grades 6–9 will either jump (literally) at the idea of working in a group or loathe the idea. Many teachers want their students to work in groups but how can this be done efficiently and successfully? How can problems with group work be resolved? How can group work enhance the learning for ALL students and be a benefit to the teacher? This workshop will work to answer these questions and share how a new NSTA competition, eCYBERMISSION, sets up and uses groups to solve a scientific or engineering problem.

Wait! The Chips I Ate Were a Genetically Modified Organism (GMO)? (Bio)

(Grades 8–College) 231C, Convention Center

Sponsor: Edvotek Inc.

Jack Chirikjian (info@edvotek.com), **Khuyen Mai** (info@edvotek.com), and **Danielle Snowflack** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Because the U.S. Food and Drug Administration does not require foods to be labeled as GMO, it is difficult to discern GMO products in your grocery store. By extracting DNA from soybean and FRITOS® chips from GMOs and performing a polymerase chain reaction (PCR), you will determine if any genetically modified indicator genes are present. Amplified DNA is separated and sized by gel electrophoresis. Take home a free T-shirt and flash drive.

10:00–11:30 AM Exhibitor Workshop

Genetics: Crazy Traits and Adaptation Survivor (Bio)

(Grades 5–12) 222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman, CPO Science/School Specialty Science, Nashua, N.H.

Students learn new vocabulary when they experience genetics. Concepts like traits, alleles, phenotypes, genotypes, and heredity will come alive as you create crazy creatures with a unique kit and study the resulting population. Take away STEM activities and an understanding of how to incorporate science and engineering practices into lessons.

10:30–11:30 AM Exhibitor Workshop

Asteroid! Will Earth Be Hit Again? Planetary Science for Middle School (Earth)

(Grades 5–8) 221C, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

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

Earth has been hit in the past, but what lies ahead? Using data from the Moon, we will calculate frequency of impacts and consider implications for Earth. We'll discuss how these questions guide students' scientific exploration, and review new features, strategies, content, and materials in the revised FOSS Planetary Science Course.

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

Entrance to Exhibit Hall 5, Convention Center

President: Karen L. Ostlund, NSTA President, and Advisory Council, Texas Natural Sciences Center, The University of Texas at Austin

Welcoming Remarks: Janey Kaufmann, Chairperson, NSTA Phoenix Area Conference, and Coronado PDC at Coronado High School, Scottsdale, Ariz.

Special Guests: Karen L. Ostlund; Janey Kaufmann; Patricia Simmons, NSTA Retiring President, and North Carolina State University, Raleigh; Bill Badders, NSTA President-Elect, and Retired Director, Cleveland Math and Science Partnership, Cleveland, Ohio; Vicki M. Massey, NSTA Director, District XIV, ASTA President, and Mesa (Ariz.) Public Schools; Gerry Wheeler, NSTA Interim Executive Director, Arlington, Va.; John A. Giacobbe, Program Coordinator, NSTA Phoenix Area Conference, and South Pointe High School, Phoenix, Ariz.; Cheryl Dunham, Local Arrangements Coordinator, NSTA Phoenix Area Conference, ASTA Past President, and Arizona Dept. of Education, Phoenix; Rick Smith, Managing Director, NSTA Advertising, Exhibits, and Workshops, Arlington, Va.

Musical Entertainment provided by Advanced Vocal Ensemble of Saguaro High School, Scottsdale, Ariz.

11:00 AM–12 Noon Exhibitor Workshop

Your Technology Solution for STEM and the Highly Anticipated Next Generation Science Standards

(Gen)

(Grades 6–12)

228 A/B, Convention Center

Sponsor: It's About Time

Brian DeSoto, Fourier Systems, Orland Park, Ill.

David Birchler, It's About Time, Mount Kisco, N.Y.

Meeting the demands of 21st century education requires technology. It's About Time helps you implement that goal with today's budgets. First, **Fourier Education**: the technology that gives you more for your money in data logging. Second, **WebCam Laboratory**: one the most effective software solutions making experiments feasible with inexpensive equipment.

11:05 AM–5:00 PM Exhibits

Exhibit Hall 5, Convention Center

Come see the most up-to-date science textbooks, software, equipment, and other teaching materials. Some exhibitors will offer materials for sale.

11:15 AM–12 Noon Special Session

Meet the Presidents and Board/Council (Gen)

(General)

Entrance to Exhibit Hall, Convention Center

Be sure to stop by for this special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

12 Noon–1:00 PM Exhibitor Workshop

NASA's Kepler Mission and the Hunt for Exoplanets: Planetary Science for Middle School (Earth)

(Grades 5–8)

221C, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

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

Recent headlines have excitedly announced findings of exoplanets. Learn about the NASA Kepler Mission and how to use classroom models to help your students understand this rapidly developing field of planetary science. Find out about the new features, strategies, content, and materials of the revised FOSS Planetary Science Course.

12 Noon–1:15 PM Exhibitor Workshop

STEM: The Game Changer in Science Lab Design

(Gen)

(Grades 9–12)

221A, Convention Center

Sponsor: Frey Scientific/School Specialty Science

Gordon Strohminger, Frey Scientific/School Specialty Science, Nashua, N.H.

Explore how STEM impacts the environments in which we teach. Participants will explore how STEM influences lab environment design to strengthen the 21st-century skills of collaboration and communication. See how technology integration can push traditional boundaries to facilitate access to essential concepts. Discussions include lab design creation and future trends.

12 Noon–1:30 PM Exhibitor Workshop

STEM Approach to Teaching Electricity and Magnetism (Phys)

(Grades 5–12)

222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman, CPO Science/School Specialty Science, Nashua, N.H.

Explore how electricity and magnetism are related through hands-on experiences. Apply your knowledge to engineering a wind turbine...and build, test, and revise your model so that it generates as much power as possible. Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

12:30–1:00 PM Exhibitor Workshop

Welcome to the Neighborhood: Overview of the Solar System (Earth)

(Grades 5–8)

Booth #331, Exhibit Hall, Convention Center

Sponsor: Science First®/STARLAB®

Helmut Albrecht (halbrecht@starlab.com) and **Nathaniel Bell** (info@sciencefirst.com), Science First®/STARLAB®, Yulee, Fla.

In this “in dome” workshop, we demonstrate how you can introduce your students to our neighborhood—the solar system.

12:30–1:30 PM Presentations

SESSION 1

STEM in an Elementary School: A Schoolwide Model (Gen)

(Elementary) 121A, Convention Center

Robert Aguilar, Diana Campbell, and Chris Loots (*cloots@susd.org*), Navajo Elementary School, A STEM Focus School, Scottsdale, Ariz.

Presider: Diana Campbell

This presentation will review Navajo's journey as a STEM focus school, and provide a road map for other schools to implement a schoolwide STEM focus.

SESSION 2

The American Modeling Teachers Association: Modeling Instruction, the Next Generation (Chem)

(High School) 122A, Convention Center

Colleen Megowan-Romanowicz (*amtaexec@realstem.com*), American Modeling Teachers Association, Tempe, Ariz.

Modeling instruction is a highly effective pedagogy and curriculum. Formerly confined to physics, it is now available for chemistry, biology, and physical science as well.

SESSION 3

Creating Integrated Projects Collaboratively (Gen) (Middle Level–High School) 126A, Convention Center

Deborah S.D. Burke (*deborah.burke@thedeltahighschool.com*), Delta High School, Richland, Wash.

Step-by-step description of the process used to design integrated, project-based, student learning experiences that occur across multiple disciplines, including STEM and the humanities.

SESSION 4 (two presentations)

(High School/Informal Ed) 127A, Convention Center

Engaging Students in Chemistry Outside the Classroom: A Look at ChemClub (Chem)

Karen Kaleuati (*hschemclubs@acs.org*) and **Marta U. Gmurczyk** (*m_gmurczyk@acs.org*), American Chemical Society, Washington, D.C.

Chemistry students are provided enrichment through various activities in the ChemClub. Join us to learn about this free and exciting program. Hear from club leaders and find out how you can easily start your own chemistry club with support and free resources from American Chemical Society. This free program is open to all teachers.

Teaching and Learning in the Digital Age: Chemistry Resources Teachers and Students Can Rely On (Chem)

Marta U. Gmurczyk (*m_gmurczyk@acs.org*), American Chemical Society, Washington, D.C.

Learn about the American Chemical Society innovative (and free of charge) collection of reliable and free digital resources for high school teachers, including ChemEd Digital Library with Models 360, ChemTeacher, and the award-winning Periodic Table Live as well as *ChemMatters* videopodcasts and ChemClub collection of activities.

SESSION 5

NASA's Know Your Earth (Earth)

(General) 130, Convention Center

Brian A. Campbell (*brian.a.campbell@nasa.gov*), Sigma Space/NASA Wallops Flight Facility, Wallops Island, Va.

Let us help you understand NASA's research in climate change through a fun and interactive tool.

Don't miss these standards-related sessions

Implication of the NRC *Framework* and the Highly Anticipated NGSS for Teaching and Learning (page 62)

The Policy of Science Standards in Action: How Will We Respond to the New Science Standards and What Are the Pitfalls to Avoid? (page 82)

Featured Presentation: The Current State of the Next Generation Science Standards (page 86)

How to Engage Science Educators in the Public Review of NGSS (page 93)

Preparing for NGSS—Exploring the Scientific and Engineering Practices (page 97)



SESSION 6

Science and Technology Festivals (Gen)

(General) 131B, Convention Center

Jeremy R. Babendure (jbabendure@aztechcouncil.org), Arizona SciTech Festival, Phoenix

Learn how science and technology festivals can bridge informal and formal education communities, workforce, and community groups.

SESSION 7



STEM Immersion Matrix: A Guide to STEM Program Development and Implementation (Gen)

(General) 229B, Convention Center

Linda M. Coyle (lcoyle@pvschools.net), Paradise Valley Unified School District, Phoenix, Ariz.

Beth F. Broome (bbroome@sfaz.org) and **Darcy Renfro** (drenfro@sfaz.org), Science Foundation Arizona, Phoenix
Designing and implementing a STEM program can be a daunting task. This session will provide step-by-step infor-

mation on complete program development and implementation.

SESSION 8



Discussion and Writing: Making Meaning of Science Learning Activities (Gen)

(Elementary/Supervision) 230, Convention Center

Ken Wareham (klwareham@lcsc.edu), Lewis-Clark State College, Lewiston, Idaho

Aron Jackson (ajackson@lewistonschools.net) and **Shannon Kenyon** (skenyon@lewistonschools.net), Lewiston (Idaho) Independent School District #1

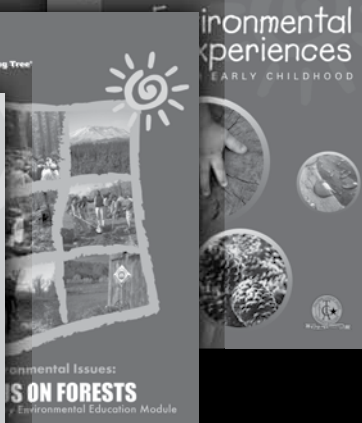
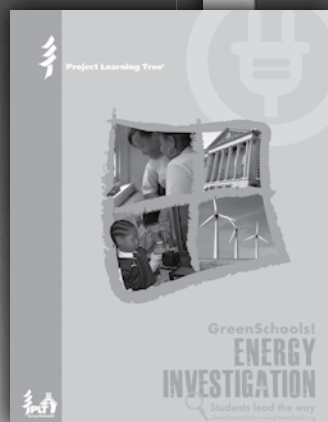
Andrea Kinzer, Centennial Elementary School, Lewiston, Idaho

Kim Schumacher, Cottonwood (Idaho) School District
Join us as we present methods of using discussion and questioning techniques for preparing students to write in science notebooks with precision, accuracy, fluency, and efficiency.

Project Learning Tree

Environmental education curriculum aligned to state and national science standards.

Grants for service-learning projects.



Get free PLT materials at NSTA

Visit Exhibit Booth 402

Participate in PLT sessions

- Forests, Carbon, and Climate Change – Fri, Dec 7, 8-9am (Convention Center, 229B)
- Focus on Forests: PLT's new secondary curriculum – Fri, Dec 7, 3:30-4:30pm (Convention Center, 121C)

Or, get PLT materials by attending a PLT workshop in your state. Contact your state's PLT Coordinator for details.

www.plt.org

12:30–1:30 PM Workshops

Helping Students Write Their Own Scientific Experiments for Environmental Science (Env)

(High School) 121B, Convention Center

Kristen R. Dotti (kristen_dotti@yahoo.com), Christ School, Arden, N.C.

Project Based Learning (PBL) begins with an inquiry approach to science. Learn how to lead your students through explorations using a peer review process that results in excellent scientific thinking.

Going to the Dogs (Gen)

(Elementary–Middle Level) 121C, Convention Center

Michelle Daml (michelle.daml@k12northstar.org) and **Allyson Nicholson** (allyson.nicholson@k12northstar.org), Fairbanks North Star Borough School District, Fairbanks, Alaska

Learn how to integrate the unique sport of dog mushing into your math and science lessons.

Instructional Planning, Resources, and Technology to Enhance Instruction in the AP Classroom (Bio)

(High School) 126B, Convention Center

Mark D. Little (mark.little@bvdsd.org), Broomfield High School, Broomfield, Colo.

Students are provided opportunities to move from lower to higher levels of inquiry during the year. Come learn different methods of scaffolding inquiry.

CSSS Session: Implementing the Common Core State Standards in the Secondary Science Classroom

(Gen)

(High School) 127B, Convention Center

Lacey Wieser (lacey.wieser@azed.gov), Arizona Dept. of Education, Phoenix

Learn how to embed and implement the Common Core State Standards for Literacy in Science and Technical Subjects in the secondary science classroom.

Maximizing Quality Instructional Time: Make Every Minute Count (Gen)

(General) 128A, Convention Center

Nancy L. Foote (nancyfootehigley@gmail.com), San Tan Elementary School, Gilbert, Ariz.

Join me for this fast-paced workshop providing you with myriad activities to do with your students when time is short.

Naturopathic Botanical Medicine: Making a Healing Salve (Bio)

(High School–College) 128B, Convention Center

Amanda Cherry (mrs.gomes.biology@gmail.com), Mesa High School, Mesa, Ariz.

Stephanie King (scking@mpsaz.org), Mesa (Ariz.) Public Schools

Xan Simonson (xsimonson@gmail.com), Southwest College of Naturopathic Medicine, Tempe, Ariz.

Ever wonder about naturopathic medicine? Come learn the principles of naturopathic medicine by applying biochemistry concepts to develop a formula for a skin-healing balm/salve. Learn the process of preparing the components of a balm/salve and make your own lip balm using prepared components. Supplies are limited to the first 50 participants!



NSTA Press® Session: Using Science Mystery Stories—The Details (Gen)

(Elementary–Middle Level) 129B, Convention Center

Richard D. Konicek-Moran (konmor@comcast.net), Professor Emeritus, University of Massachusetts, Amherst

How will the new frameworks affect the use of mystery stories for classroom inquiry? How can classroom teachers use stories to improve reading and other cross-curricular areas? I will focus on these questions and offer suggestions on the details of using mystery stories to enhance science practices.

CESI Session: Experimental Design Just for PreK–5 (Phys)

(Preschool–Elementary) 132 A–C, Convention Center

Barbara Z. Tharp (btharp@bcm.edu), CESI President, and Baylor College of Medicine, Houston, Tex.

Start where? Join me for a variety of activities that merge experimental design with force and motion using paper to investigate flying, spinning, rolling, and floating.

Teaching Science with the 5E Model (Gen)

(General) 229A, Convention Center

Vicki M. Massey (vmmassey@mpsaz.org), NSTA Director, District XIV, and Mesa (Ariz.) Public Schools

Make your classroom more inquiry based by implementing a model of instruction where emphasis is placed on prior knowledge, conceptual learning, and teacher facilitation using the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate).

12:30–1:30 PM Exhibitor Workshop***Engineering the Future: A Practical Approach to STEM for High School* (Gen)**

(Grades 9–12)

228 A/B, Convention Center

Sponsor: It's About Time

Lee Pulis, Museum of Science, Boston, Mass.

STEM—it's a real need. *Engineering the Future* is a real answer. See how the Museum of Science, Boston has packaged a solution that makes implementing STEM easy. Learn how *Engineering the Future's* four real-world projects give students an opportunity to see how engineering is part of their everyday world.

**12:30–1:45 PM Exhibitor Workshops****LEGO Education WeDo™ Robotics Workshop**

(Phys)

(Grades 1–4)

123, Convention Center

Sponsor: LEGO Education

Brian Boufard (brian@edurobotech.com), EduRoboTech, San Tan Valley, Ariz.

Learn how to build and program robots using LEGO® bricks and a simple icon-based drag-and-drop software. This workshop is designed to make you feel comfortable introducing a hands-on approach to science, technology, engineering, math, and literacy to young learners in grades 1–4.

Modeling Protein Structure/Function and Photosynthesis/Respiration (Bio)

(Grades 6–12)

129A, Convention Center

Sponsor: Science Take-Out

Susan Holt (contact@sciencetakeout.com), Science Take-Out, Pittsford, N.Y.

Join us for two simple hands-on modeling activities. In “From DNA to Protein,” we’ll model how the coded information in genes results in proteins with specific shapes that perform specific functions. In “Photosynthesis and Respiration,” we’ll use simple snap bead models to illustrate the reactants, products, and flow of energy for photosynthesis and respiration.

Create a Digital Classroom—Using 21st-Century STEM Initiatives! (Gen)

(Grades 7–College)

222C, Convention Center

Sponsor: Swift Optical Instruments, Inc.

David Doty (david@swiftoptical.com) and **Cynthia Syverson-Mercer** (cynthia@swiftoptical.com), Swift Optical Instruments, Inc., Schertz, Tex.

Go digital...using STEM technology! Transform your labs, lesson plans, and activities into digital formats. Engage your

students by incorporating Motic software, digital cameras, and Swift microscopes into your lessons. Learn how to integrate digital technology, student assessment, and motivation into your current curriculum.

Web Tools to Support STEM and Common Core State Standards (Gen)

(Grades 3–8)

223, Convention Center

Sponsor: Arizona K12 Center

Cherie Stafford, Phoenix, Ariz.

Join us for this fast-paced session and journey into the vast constellation of websites and tools that support and promote STEM content and the Common Core State Standards. You’ll learn about some of the brightest “stars” in this ever-growing list of free applications. Walk away with a list of the websites and tech tools introduced.

Stand Back! We’re Using Discovery Education Science Techbook for Grades K–12 (Gen)

(Grades K–12)

226 A–C, Convention Center

Sponsor: Discovery Education

Michael Bryant (michael_bryant@discovery.com), Discovery Education, Silver Spring, Md.

Learn how to ENGAGE your students as they EXPLORE science through digital media in conjunction with hands-on resources. In this workshop, we will EXPLAIN how digital media can help develop process skills, ELABORATE on strategies for the science literacy connection and ways to meet the needs of every student, and EVALUATE student progress through science concepts.

I Think There's a Genetically Engineered Fly in My Genetically Modified Pea Soup! (Bio)

(Grades 9–12)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Barbara Nagle, The Lawrence Hall of Science, University of California, Berkeley

Students often have trouble conceptualizing how selective gene expression works. In this workshop, participants will use manipulatives to teach this concept and see how it is connected to genetic engineering. Innovative activities are selected from the new *Science & Global Issues* biology program by SEPUP and LAB-AIDS. Activities focus on ways to integrate this topic as a relevant and engaging sustainability issue into teaching about selective gene expression.

Hands-On Science with Classroom Critters (Bio)

(Grades 3–8)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Animals broaden inquiry-based explorations and student interest in science. Through fun, simple hands-on activities, participants learn about termites and insect pheromones; how isopods are great for teaching evolution, adaptation, and behavior; and about experiments that incorporate measuring with beetle activities. Session includes care and handling information, free samples, and literature.

See More, Do More, Learn More—Benefits of Using Digital Technology Tools (Gen)

(General)

231B, Convention Center

Sponsor: Ken-A-Vision

Alyse Howell (ahowell@ken-a-vision.com), Ken-A-Vision, Kansas City, Mo.

In this hands-on workshop, teaching science topics just got a lot easier with Ken-A-Vision digital technology tools. Develop your digital microscopy skills by learning new techniques as you perform activities using the digital microscope, Applied Vision 4 software, and our new app to capture images, take videos, and measure objects.

Water Contaminants! Biotechnology Can Help Save the Marine Environment (Bio)

(Grades 8–College)

231C, Convention Center

Sponsor: Edvotek Inc.

Jack Chirikjian (info@edvotek.com), **Khuyen Mai** (info@edvotek.com), and **Danielle Snowflack** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Drinking water is routinely tested for contamination and, if a screening tests positive, more sophisticated tests are required. One such test uses a polymerase chain reaction (PCR) in multiplex format. Join us as we test for the presence of classroom-safe organisms in a water sample using a single PCR reaction. Take home a free T-shirt and flash drive.

12:30–2:00 PM Exhibitor Workshop

Laurel and Hardy and the Laws of Science (Gen)

(Grades K–8)

221B, Convention Center

Sponsor: Delta Education/School Specialty Science

John Cafarella, Consultant, Canadensis, Pa.

Let's take a look at the NRC *Framework's* Scientific and Engineering Practices as well as the highly anticipated Next Generation Science Standards through a lens using excerpts from the Laurel and Hardy movie *The Music Box**. Participants will also engage in activities based on the NRC *Framework*. Some Science Gnu humor, too.

**Permission has been granted by copyright holder to use excerpts from the movie for this session.*

12:30–3:00 PM Short Course



SANITY, BLAST, and Research Methods: Programs That Engage Students in Science! (SC-1)

(High School–College)

Laveen A, Sheraton

Tickets Required: \$25

Margaret Wilch (margaret.wilch@tusd1.org), Tucson High Magnet School, Tucson, Ariz.

For description, see page 36.

1:30–3:00 PM Exhibitor Workshop

Engage Students with Active Learning Through FOSS, 3rd Edition (Gen)

(Grades K–6)

221C, Convention Center

Sponsor: Delta Education/School Specialty Science—FOSS

Linda De Lucchi, Kathy Long, and Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS developers to learn about the conceptual framework behind the new FOSS elementary program. We'll introduce the instructional design and illustrate how the system incorporates science-centered language development, notebooks, digital resources, formative assessments, and outdoor excursions into a coherent learning experience.

2:00–2:30 PM Presentations

SESSION 1

“Emergency Lesson Plans” for Teaching Chemistry Across Curricula (Chem)

(High School)

127A, Convention Center

Keith Lindblom (k_lindblom@acs.org) and **Marta U. Gmurczyk** (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.

“Emergency lesson plans” have been designed to supplement high school chemistry and history courses. These lesson plans explore relationships between chemical and historical subjects. The classroom-ready lesson plans teach scientific concepts in a historical context using reading material, videos, and a variety of activities (available online) that can be used in combination or separately, and are easily implemented by a substitute teacher.

SESSION 2

Education for Sustainable Development and Science Education in Japan (Env)

(General)

231A, Convention Center

Masakazu Goto (masakazu@nier.go.jp) and **Yoichi Kiyohara** (kiyohara@nier.go.jp), National Institute for Educational Policy Research, Tokyo, Japan

The National Institute for Educational Policy Research developed the innovative Framework for Education for Sustainable Development (ESD) and clarified the relationship among science and other subjects for ESD. Come learn more.

2:00–3:00 PM Featured Presentation



STEM Curriculum—Moving Beyond the Acronym and into Classroom Practice (Gen)

(General)

Ballroom 120D, Convention Center



Jo Anne Vasquez (jvasquez@helios.org), 1996–1997 NSTA President, and Vice President and Program Director, Arizona Transition Years, Teacher and Curriculum STEM Initiatives, Helios Education Foundation, Phoenix

Presiders: Vicki M. Massey, Program Representative, NSTA Phoenix Area Conference, NSTA Director, District XIV, ASTA President, and Mesa (Ariz.) Public Schools; and Sara Torres, Program Representative, NSTA Phoenix Area Conference, and ASTA Executive Director, Phoenix, Ariz.

STEM education is an interdisciplinary approach to learning, which removes the traditional barriers separating the disciplines and integrates them into meaningful, relevant learning experiences for students. STEM teaching requires a different approach to curriculum organization. Moving beyond the “STEM” acronym and into classroom practice requires a fundamentally different approach to organizing the school curriculum. This approach requires coordination and still applies equal attention to the standards and skills in the content areas.

Jo Anne Vasquez has been a classroom teacher, district science specialist for Mesa Public Schools, adjunct professor of science education at Arizona State University, and director of professional development and outreach for ASU's Center for Research on Education in Science, Mathematics, Engineering, and Technology. She is currently Vice President and Program Director, Arizona Transition Years, Teacher and Curriculum STEM Initiatives, for Helios Education Foundation.

A recognized leader in science education, Jo Anne is past president of the National Science Teachers Association. She was a Presidential Appointee to the National Science Board, the governing board of the National Science Foundation, becoming the first and only K–12 educator to hold a seat on this prestigious board. Her distinguished service and extraordinary contributions to the advancement of science education at the local, state, and national levels have won her numerous awards, including NSTA's highest award, the 2006 Robert H. Carleton Award for Leadership in Science Education.

A graduate of Northern Arizona University, Jo Anne holds a BS in biology, an MA in early childhood education, and a PhD in curriculum and instruction.

2:00–3:00 PM Presentations

SESSION 1

AMSE Session: Science Education Equity Discoveries (SEEDs): Transforming Teaching by Enacting Research on Classroom Equity (Bio)

(General) 122A, Convention Center

Deb Morrison (2debmorrison@gmail.com) and **SEEDs Teachers**, University of Colorado, Boulder

The SEEDs collaborative will share successes and challenges of their work in implementing social justice curricula through a critical pedagogical framework.

SESSION 2

Teach Ourselves: Exploring an Online STEM Learning Community (Gen)

(Middle Level–High School/Informal) 126A, Convention Center

Carole Beal (crbeal@email.arizona.edu) and **Jane Strohm** (jstrohm@email.arizona.edu), University of Arizona, Tucson

Students in grades 6–12 solve and create math and science problems online for points. Teachers reflect and researchers present evidence on improving STEM literacy.

SESSION 3

Assessing the AAAS Document Through Action: Vision and Change in Undergraduate Biology Education (Bio)

(College) 126C, Convention Center

Thomas Lord (trlord@iup.edu), NSTA Director, College Science Teaching, and Indiana University of Pennsylvania, Indiana, Pa.

Join members of the NSTA College Science Teachers Committee in an action-packed hour of assessing and implementing the suggestions for change in the way institutions of higher education are teaching science.

SESSION 4



NSTA Press® Session: Uncovering Earth and Space Science Core Ideas in the NGSS Using Formative Assessment Probes (Earth)

(General) 129B, Convention Center

Page Keeley (pagekeeley@gmail.com), 2008–2009 NSTA President, and Author/Consultant, Jefferson, Maine

Learn how the *Uncovering Student Ideas in Science* probes can be used as diagnostic and formative assessments of students' thinking related to Earth and space science core ideas in the highly anticipated Next Generation Science Standards and how use of the probes supports the science practices.

SESSION 5

NASA's High-Energy Vision: Chandra and the X-Ray Universe (Earth)

(General) 130, Convention Center

Donna L. Young (donna@aavso.org), NASA/Chandra EPO Office, Cambridge, Mass.

Listen to the latest discoveries from NASA's Chandra X-Ray Observatory, including black holes, neutron stars, supernovas, star formation, colliding galaxies, X-ray binaries, and dark matter.

SESSION 6

Galileo's Square-Cube Law: Explaining How Size Matters (Gen)

(Middle Level–College) 131B, Convention Center

David L. Esker (david_esker@ymail.com), Pikes Peak Community College, Colorado Springs, Colo.

The ratio between area and volume changes with size, and, as a result, different size objects have different properties. This presentation addresses difficulties in explaining this scientific concept.

SESSION 7



Engineers Serving Education (Gen)

(Elementary/College) 229B, Convention Center

Jan D. Snyder (jan.snyder@asu.edu), Arizona State University, Tempe

Engineering concepts are infused with math and science for Arizona State University elementary teacher candidates through a collaborative effort of the engineering and education schools.

SESSION 8



Plants—From Seed to Seed (Bio)

(Elementary–Middle Level) 230, Convention Center

Jerry Bowen (jb Bowen@nsd131.org) and **Gary Tonn** (gtonn@nsd131.org), South Middle School, Nampa, Idaho

Using small raised garden plots, middle school science teachers show students how plants produce seeds that are used to make flour and popcorn.

SESSION 9

How I Turned a Great Science Lesson into a Presidential Award and \$10,000 (Gen)

(General) 231A, Convention Center

Marilyn J. Suiter (msuiter@nsf.gov), National Science Foundation, Arlington, Va.

Presidential Awardees (PAEMST) share how they each took a quality science lesson and turned it into a meeting with the President, \$10,000, and leadership opportunities.

2:00–3:00 PM Workshops

Inquiry in Action: Investigating Matter Through Inquiry (Chem)

(Elementary) 121B, Convention Center

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

Conduct hands-on guided inquiry activities with common substances from the free website inquiryinaction.org. View and discuss molecular animations and receive a handout of all activities.

Science and Literacy for the ELL Student (Gen)

(Elementary) 121C, Convention Center

Korin Forbes (klforbes@mpsaz.org) and **Cheryl McCaw** (cdmccaw@mpsaz.org), Mesa (Ariz.) Public Schools

Working with K–6 English language learners? Join us to learn fun, practical classroom strategies for integrating science and literacy, meeting all standards—Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects.

Neuroscience for Your Biology Classroom (Bio)

(Middle Level–High School) 124B, Convention Center

Dina Markowitz (dina_markowitz@urmc.rochester.edu) and **Susan Holt**, University of Rochester, N.Y.

Would you like to use simple, hands-on, active learning lessons to introduce neuroscience concepts into your biology curriculum? Join us and experience two sample neuroscience activities from the University of Rochester's Life Sciences Learning Center. Take home handouts and information on support for field testing in your classroom.

Preparing for the Redesign: Using Student-designed Experiments in AP Biology (Bio)

(High School) 126B, Convention Center

Kristen R. Dotti (kristen_dotti@yahoo.com), Christ School, Arden, N.C.

A simple technique can take students through the laboratory door and into real scientific exploration. Learn a step-by-step process to transition your students from scientific thinkers to scientific “do-ers.”

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NASA: Inquiry Activities for Learning About Light and the Electromagnetic Spectrum and Multiwavelength Astronomy (Earth)

(Middle Level–High School) 127B, Convention Center

Pamela K. Harman (pharman@seti.org), SETI Institute, Mountain View, Calif.

Experience inquiry activities for learning about visible and invisible light using simple classroom technologies. Take home standards-based lessons, colorful posters, and spectroscopes.

Teaching and Assessing Scientific Habits of Mind (Gen)

(General) 128A, Convention Center

Keith Roscoe (keith.roscoe@uleth.ca), University of Lethbridge, Alta., Canada

Learn effective strategies for teaching and assessing scientific habits of mind, based on four sets of Key Habits of Mind questions.

CESI Session: Council for Elementary Science International Share-a-Thon (Gen)

(Preschool–Middle Level) 132 A–C, Convention Center

Barbara Z. Tharp (btharp@bcm.edu), CESI President, and Baylor College of Medicine, Houston, Tex.

Betty Crocker (betty.crocker@unt.edu), Retired Educator, Denton, Tex.

Michelle L. Higgins (mhiggins@girlscoutsoaz.org) and **Larry A. Lebofsky** (llebofsky@girlscoutsoaz.org), Girl Scouts of Southern Arizona, Tucson

Join CESI as we share a wealth of ready-to-use, classroom-tested hands-on activities created just for the K–8 teacher. Handouts and website links provided.



Why'd You Change Your Thinking? Science Notebooks: Analysis, Feedback, and Discourse (Gen)

(Elementary–Middle Level) 229A, Convention Center

Deena Gould (dlgould@mpsaz.org), Kino Junior High School, Mesa, Ariz.

R. Bruce Jones (rbjones@mpsaz.org), Mesa Academy for Advanced Studies, Mesa, Ariz.

What does conceptual change look like? Peek into student thinking by analyzing actual notebooks and translate analysis into feedback and discourse for deeper scientific understanding.

2:00–3:00 PM Exhibitor Workshop

Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (Gen)

(Grades 9–12)

228 A/B, Convention Center

Sponsor: It's About Time

Arthur Eisenkraft, 2000–2001 NSTA President, and University of Massachusetts, Boston

Dr. Arthur Eisenkraft will show how these proven programs implement STEM and the essence of the highly anticipated Next Generation Science Standards. Learn the benefits of the Engineering Design Cycle for teaching and learning. See how Dr. Eisenkraft designed a project-driven course that makes a positive impact for students of all levels.

2:00–3:30 PM Exhibitor Workshop

Light and Optics: A Series of EnLIGHTening Experiments! (Phys)

(Grades 5–12)

222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

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

Experience CPO's Optics with Light and Color kit with LED flashlights, a laser, lenses, a mirror, and more. Try color mixing, relate it to human vision, and examine different spectra. We make studying light exciting! Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

2:00–5:00 PM Workshop

Implication of the NRC Framework and the Highly Anticipated NGSS for Teaching and Learning (Gen)

(General)

128B, Convention Center

Joe Krajcik (krajcik@msu.edu), Michigan State University, East Lansing

Mary Starr (mstarrconsultants@gmail.com), Starr and Associates, Education Consultants, Plymouth, Mich.

Science teachers/leaders will be introduced to *A Framework for K–12 Science Education* and provided materials and guidance for replicating the workshop with others.

2:15–3:30 PM Exhibitor Workshops

Marine Ecology, Human Impacts, and Conservation: A High School Ecology Unit from NatGeo (Bio)

(Grades 9–12) 123, Convention Center

Sponsor: National Geographic Education

Mike Trimble, Corona del Sol High School, Tempe, Ariz.
Samantha Zuhlke, National Geographic Society, Washington, D.C.

Experience National Geographic's FREE multimedia high school ecology unit *Marine Ecology, Human Impacts, and Conservation*, which was developed with classroom testing and input from 60 biology teachers from across the country. The activities feature National Geographic videos, photos, and maps.

The Sky Through the Ages (Earth)

(Grades 4–12) 129A, Convention Center

Sponsor: Simulation Curriculum Corp.

Herb Koller (hkoller@simcur.com), Simulation Curriculum Corp., Minnetonka, Minn.

What did our ancestors see in the night sky? How can astronomy help us determine the date of a battle fought thousands of years ago? Find out the answers to these and other historical questions and learn how Starry Night can make astronomy come alive for your students.

Forensic Digital Microscopy and Inquiry Learning (Gen)

(Grades 7–College) 222C, Convention Center

Sponsor: Swift Optical Instruments, Inc.

David Doty (david@swiftoptical.com) and **Cynthia Syverson-Mercer** (cynthia@swiftoptical.com), Swift Optical Instruments, Inc., Schertz, Tex.

Learn how to leverage the use of exciting microscopy principles to engage your students in forensic and other case studies using inquiry-based learning tools. Forensic digital microscopy combines a comparison microscope, digital camera, and a computer with software that allows students to become forensic scientists. Learn how to view and manipulate specimens, then capture and qualify the microscopic images.

Sangari Active Science (Gen)

(Grades K–5) 223, Convention Center

Sponsor: Sangari Active Science

John E. Penick, 2003–2004 NSTA President, and Sangari Active Science, Miami, Fla.

Come experience a standards-based, exciting, experiential, inquiry-centered 21st-century elementary science program.

Participate in innovative grade-level activities and leave with classroom-ready materials. Designed by leading scientists and educators, Sangari Active Science will remind you of all the reasons you love teaching students and science.

Science Projects and Notebooking (Gen)

(Grades K–12) 226 A–C, Convention Center

Sponsor: Dinah-Might Adventures, LP

Dinah Zike (dma@dinah.com), Dinah-Might Adventures, LP, San Antonio, Tex.

High energy, hands on, and research based describe this workshop! Hear from the creator of Foldables® on how to transform manila envelopes into Notebook Foldable projects sure to engage even the most reluctant student. Leave with your own model ready for immediate application.

Mastering the Chemical Formula: An Exceptionally Effective Way to Teach Subscripts and Coefficients (Chem)

(Grades 9–12) 227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Brandon Watters, Lakes Community High School, Lake Villa, Ill.

What is the difference between subscripts and coefficients? What does “balancing” a chemical equation mean? Many students have trouble with these fundamental chemistry concepts. Moles, reactions, and stoichiometry are hopelessly confusing if a student does not fully understand the chemical formula. Join us for some elegant, intuitive, and well-differentiated lessons that can help students of all ability levels master the chemical formula and, therefore, move confidently into a deeper understanding of chemistry.

The Solution Is Simple! Understanding Colligative Properties with Inquiries in Science® (Chem)

(Grades 9–12) 227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Make teaching colligative properties engaging and exciting. Use the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle and engage your students with a simple demo, then explore with a hands-on activity. Plotting data helps to explain the concepts before extending them to a real-world application—making ice cream. Free teacher materials and giveaways!

33 Strategies for Integrating Science (Gen)

(Grades 1–6) 231B, Convention Center

Sponsor: Wireless Generation

Traci Wierman and **Carrie Strohl**, The Lawrence Hall of Science, University of California, Berkeley

Discover how to increase reading comprehension, disciplinary literacy skills, and science knowledge simultaneously for ALL students. Take away 33 ready-to-use strategies for incorporating science trade books into your classroom. Learn integration strategies that provide a better way to teach both science and literacy. Free classroom materials!

How Is HIV Detected in Humans? Welcome to the Exciting World of Immunobiotechnology! (Bio)

(Grades 8–College) 231C, Convention Center

Sponsor: Edvotek Inc.

Jack Chirikjian (info@edvotek.com), **Khuyen Mai** (info@edvotek.com), and **Danielle Snowflack** (info@edvotek.com), Edvotek Inc., Washington, D.C.

ELISA stands for Enzyme-linked Immunosorbent Assay. Discover endless applications offered by the ELISA in research and allied health care and its use as a medical diagnostics tool. This workshop features our new single antibody ELISA that can be completed in under 40 minutes and analyzed by visual inspection. This simple foolproof procedure is much more rapid than the traditional ELISA. Take home a free T-shirt and flash drive.

3:00–4:30 PM Exhibitor Workshop

What's Going on in There? NGSS Inquiry Science for Supervisors, Trainers, and Teachers (Gen)

(Grades K–8) 221B, Convention Center

Sponsor: Delta Education/School Specialty Science

John Cafarella, Consultant, Canadensis, Pa.

Learn how to observe an inquiry science lesson as we support and evaluate it. We'll define types of inquiry and look at the use of inquiry skills through the lens of a draft of the Next Generation Science Standards. We will also engage in activities based on the new science and engineering frameworks.



3:30–4:30 PM Presentations

SESSION 1

Tired of Your Science Fair? How About an Engineering Fair? (Gen)

(Elementary–Middle Level) 121A, Convention Center

Julie Sutherland (julie.sutherland@highlineschools.org), Marvita Elementary School, Normandy Park, Wash.

How is an engineering fair different from a science fair? Find out with an example from a grade 6 classroom. Sample activities and handouts!

SESSION 2

Scientific Literacy and Communication in the New AP Chemistry Course (Chem)

(High School–College) 126A, Convention Center

Trinna S. McKay, Dunwoody High School, Dunwoody, Ga.

The AP Chemistry Development Committee will present how to address the scientific literacy and communication skills of practicing chemists in the revised AP chemistry course.

SESSION 3

How Much Is Too Much Paper? (Env)

(Supervision/Administration) 126C, Convention Center

Stephanie S. Sassetti (ssassetti@oda.edu), The Out-of-Door Academy, Bradenton, Fla.

We did a class study in response to administration's call to cut back on paper use in our classrooms. Come learn more.

SESSION 4

Keep Engaging Youth in Science: Resources for Building Relationships Among Teachers, Students, and Scientists (Bio)

(High School) 127A, Convention Center

Marti Lindsey (lindsey@pharmacy.arizona.edu) and **Heather Ingram** (hci@email.arizona.edu), The University of Arizona, Tucson

Learn about summer high school student research internships at The University of Arizona and get resources about university/high school partnerships.

SESSION 5



NSTA Press® Session: Rise and Shine: A Practical Guide for the Beginning Science Teacher (Gen)

(General) 129B, Convention Center

Linda Froschauer (fro2@mac.com), 2006–2007 NSTA President, and Field Editor, *Science & Children*, Westport, Conn.

Mary L. Bigelow (tramaire@gmail.com), Retired Educator, Middletown, Pa.

Are you new to science teaching? Do you mentor new teachers? We'll share strategies to help new teachers be successful from the very first day.

SESSION 6

STEM Projects for the Middle School Science Classroom (Gen)

(Elementary–High School) 131B, Convention Center

DJ West (djwest78@gmail.com), Schoolcraft College, Livonia, Mich.

Let's examine a variety of projects that can be used in middle school science to integrate STEM concepts into the classroom. Walk away with instructions for each of the projects discussed.

SESSION 7

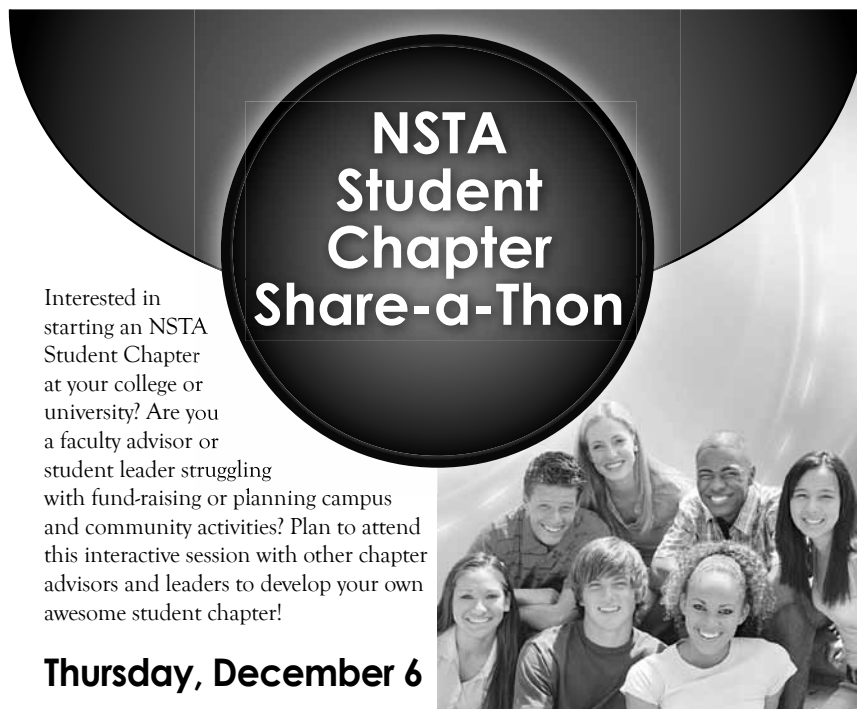
NSTA Student Chapter Share-a-Thon (Gen)

(General) 132 A–C, Convention Center

Howard Wahlberg (hwahlberg@nsta.org), Assistant Executive Director, Membership, NSTA, Arlington, Va.


Teshia Birts (tbirts@nsta.org), Senior Manager, Chapter Relations, NSTA, Arlington, Va.

Howard Wahlberg and Teshia Birts will moderate this interactive session for student chapter leaders, faculty advisors, and members. If you are planning to start a student chapter, this is the session for you.



Interested in starting an NSTA Student Chapter at your college or university? Are you a faculty advisor or student leader struggling with fund-raising or planning campus and community activities? Plan to attend this interactive session with other chapter advisors and leaders to develop your own awesome student chapter!

Thursday, December 6
3:30–4:30 PM
Phoenix Convention Center
Room 132 A–C



SESSION 8



Developing Simple Sustainability Lessons (Env)
(Elementary–Middle Level) 229B, Convention Center

Leanna Archambault (leanna.archambault@asu.edu), **Annie Warren** (aeahalel@asu.edu), and **Kristen Kortman** (kkortman@asu.edu), Arizona State University, Tempe

Presider: Peter Rillero (rillero@asu.edu), Arizona State University, Tempe

As part of the course Sustainability Science for Teachers at ASU, we developed a suite of lessons and activities that can be adapted and used by K–8 teachers (the audience for our new course).

SESSION 9



Kindergarten Science and Literacy (Gen)
(Preschool–Middle Level/Informal) 230, Convention Center

Andrea Zdinak Andretta, Norwalk (Conn.) Public Schools

Zackery Zdinak (wildlife@lifedraw.com), Life Drawing & Education, Flagstaff, Ariz.

Kindergarten science is accessible through literacy. Find ways to access students' learning through literacy, illustrations, poems, and writing.

SESSION 10



Toward a Framework for Integrated Science Collaboration: High School/University Partnerships (Gen)

(High School–College/Supervision) 231A, Convention Center

Kathryn Scheckel (kathryn.scheckel@asu.edu), Arizona State University, Tempe

Linda Coyle (lcoyle@pvschools.net; seabiscuit_64@msn.com), Paradise Valley High School, Phoenix, Ariz.

Co-author **Christos Makridis**, Stanford University, Stanford, Calif.

The Quanta Foundation is a student initiative that creates an interactive community of high school students and college mentors by developing and presenting collaborative projects that encourage science communication.

3:30–4:30 PM Workshops

Engage Your Students with NOAA's Coral Reef Resources (Bio)

(Informal Education)

121B, Convention Center

Britta Culbertson (culbertsonb@einsteinfellows.org), Einstein Fellow, NOAA Office of Education, Washington, D.C.

Grab your students' attention by incorporating coral reefs into your existing curriculum. Several NOAA resources will be highlighted, including demos, labs, activities, and multimedia.

Creating Connections to Foster Action: A Hook for Effective STEM Integration (Gen)

(Middle Level–High School)

121C, Convention Center

Kerry L. Schwartz (kschwartz@cals.arizona.edu), The University of Arizona, Tucson

Relevancy, innovation, solutions, and connections to community and life—all essential to effective STEM integration—are the hallmarks of Arizona Project Wet's School Water Audit Program.

Minds On, Bodies On! Teaching Biology Is a Whole-Body Experience (Bio)

(High School)

124B, Convention Center

Patsy L. Jones (patsy.jones@husd.org), Higley High School, Gilbert, Ariz.

Teaching complex biological concepts is easy with these interactive lessons that involve both mind and body. Get your students out of their desks and learning biology!

Dancing with the Periodic Table (Chem)

(Middle Level–High School)

126B, Convention Center

Deborah A. Garrett (deborah.garrett@svps.k12.az.us), Joyce Clark Middle School, Sierra Vista, Ariz.

Student engagement is the key to this interactive dance that helps students understand the periodic table.

STEM CSI (Gen)

(Middle Level–High School)

127B, Convention Center

Terri Lake (tlake@stcs.us) and **Kathryn Murray** (kmurray@stcs.us), Saint Theresa Catholic School, Phoenix, Ariz.

Renee Ashlock (photorenee@yahoo.com), Bourgade Catholic High School, Phoenix, Ariz.

Learn how STEM and Project Based Learning (PBL) apply to mock crime scenes.

Sorting Out the Galaxy Zoo (Earth)

(Middle Level–College)

128A, Convention Center

Robert T. Sparks (rsparks@noao.edu), National Optical Astronomy Observatory, Tucson, Ariz.

Learn how scientists classify galaxies and how your students can contribute to scientific research through the Galaxy Zoo. Free NASA teacher's guide!

Who Supports Science at Your K–5 School? Recharge with Resources and Collaboration!

(Gen)

(General)

229A, Convention Center

Joan Gilbert (joan.gilbert@tusd1.org), Tucson (Ariz.) Unified School District

With renewed interest in STEM education and the highly anticipated Next Generation Science Standards, successful models for school-based leadership in science education are more important than ever.

3:30–4:30 PM Exhibitor Workshops

Materials in Our World: STEM for Early Childhood (Gen)

(Kindergarten)

221C, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

Linda De Lucchi and **Larry Malone**, The Lawrence Hall of Science, University of California, Berkeley

For thousands of years, humans have used natural fibers to produce useful materials. Join FOSS developers to see how early childhood students use FOSS to explore the properties of paper and to investigate how paper can be designed and engineered into diverse products.

Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (Gen)

(Grades 9–12)

228 A/B, Convention Center

Sponsor: It's About Time

Arthur Eisenkraft, 2000–2001 NSTA President, and University of Massachusetts, Boston

Dr. Arthur Eisenkraft will show how these proven programs implement STEM and the essence of the highly anticipated Next Generation Science Standards. Learn the benefits of the Engineering Design Cycle for teaching and learning. See how Dr. Eisenkraft designed a project-driven course that makes a positive impact for students of all levels.

4:00–5:15 PM Exhibitor Workshops

The Archaeology of Cactus Ruin: A Paper Excavation (Gen)

(Grades 6–12)

123, Convention Center

Sponsor: Crow Canyon Archaeological Center

Marjorie Connolly (mconnolly@crowcanyon.org), Crow Canyon Archaeological Center, Cortez, Colo.

Looking for an easy way to explain sampling strategies to your students? Come take on the role of an archaeologist by excavating a paper site.

Toxin and Energy Flow in an Ecosystem (Bio)

(Grades 6–12)

129A, Convention Center

Sponsor: Science Take-Out

Susan Holt (contact@sciencetakeout.com), Science Take-Out, Pittsford, N.Y.

During this simple hands-on activity, we'll model the flow of toxins and energy through an ecosystem's food chains and food webs. We'll also develop the concept of biological magnification for environmental toxins.

Creating a Digital Strategy for STEM (Bio)

(Grades 7–College)

222C, Convention Center

Sponsor: Swift Optical Instruments, Inc.

David Doty (david@swiftoptical.com) and **Cynthia Syverson-Mercer** (cynthia@swiftoptical.com), Swift Optical Instruments, Inc., Schertz, Tex.

Discover the strategies needed to create a digital STEM program for your school. Lab development, lesson plans, assessment, and teaching techniques will be demonstrated and modeled using Swift digital microscopes and Motic software. Leave with all you need to create a three- to five-year implementation plan and keys to sustaining your STEM program, including professional development.

FDA Food Science Workshop (Middle School) (Bio)

(Grades 5–8)

223, Convention Center

Sponsor: FDA Center for Food Safety and Applied Nutrition

Mimi Cooper (mimicooper@verizon.net), FDA Education Consultant, Green Cove Springs, Fla.

Susan E. Hartley (semumford-hartley@aps.k12.co.us), Hinkley High School, Aurora, Colo.

Come learn about FDA's free food safety curriculum and related materials that you can use in your classroom. Participate in hands-on activities about food science and nutrition that you can take back to your students. Learn from experienced teachers who have worked extensively with FDA's Center for Food Safety and Applied Nutrition.

An Absorbing Misconception About Waves and the “Power” of Colors (Chem)

(Grades 6–8)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

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

Most of us—middle school students included—have no idea how electromagnetic waves actually work despite their relevance to our lives. Join us for a “Next Generation Waves” unit from *Issues & Physical Science* by LAB-AIDS and SEPUP. Explore properties of light by investigating colors of the visible spectrum and energy levels of white light colors through the use of a phosphorescent material. Activities exemplify *A Framework for K–12 Science Education* and show how SEPUP embeds research-based practices and real issues to powerfully deliver content learning.

Carolina Beyond the Tape: Forensic Science for Every Discipline (Bio)

(Grades 9–12)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Learn how to bring the science from headline news into your classroom. Be the first to experience Carolina’s new forensic science laboratory activities with this fast-paced hands-on workshop. Linked to standards, activities are suitable for use in physical science, biology, and chemistry classes. Handouts and door prizes!

Exploring STEM Careers: Water and Our Environment (Env)

(Grades 6–12)

231B, Convention Center

Sponsor: Fisher Science Education

Robert Marshall (marshallr@carnegiesciencecenter.org), Carnegie Science Center, Pittsburgh, Pa.

With global population growth creating a rise in demand, access to clean water is becoming increasingly important. Learn how you can bring this real-world issue to life for your middle school and high school students. Gain hands-on experience in this technology-focused environmental workshop, led by Robert Marshall, a STEM educator from Carnegie Science Center, one of the nation’s leading hands-on science museums. Handouts and door prizes!

The Case of the Missing Archive: Crime Scene and DNA Fingerprinting Investigation (Bio)

(Grades 8–12)

231C, Convention Center

Sponsor: Edvotek Inc.

Jack Chirikjian (info@edvotek.com), **Khuyen Mai** (info@edvotek.com), and **Danielle Snowflack** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Are you ready for a cutting-edge forensic activity? Examine crime scene evidence to determine who stole priceless historical documents from the Maryland Historical Society, including copies of speeches by President Franklin D. Roosevelt. By analyzing “crime scene” and “suspect” DNA samples, you’ll model the process of electrophoresis and DNA fingerprinting to determine whose DNA was left at the crime scene. Take home a free T-shirt and flash drive.



4:00–5:30 PM Exhibitor Workshop

Sound, Waves, and Music (Phys)

(Grades 5–12)

222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

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

Create standing wave patterns on a vibrating string with CPO’s wave machine. Use a synthesizer to explore the wave properties of sound and play some music and learn how to make your own instruments. Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

5:00–6:00 PM Presentations

SESSION 1

Champions for Change: Boost Student Learning and Scores Through Project Based Learning (Gen)

(Elementary–Middle Level)

121A, Convention Center

Joan Gilbert (joan.gilbert@tusd1.org), Tucson (Ariz.) Unified School District

Corrine Blum (cblum@amphi.com), La Cima Middle School, Tucson, Ariz.

Ignite your students' engagement in content material through Project Based Learning! Increase student learning and achievement through extraordinary projects you can bring to your classroom.

SESSION 2

Using GIS in Earth and Environmental Science

(Env)

(Middle Level–High School)

126A, Convention Center

Don Adams (adamds@vail.k12.az.us), Vail Academy and High School, Vail, Ariz.

Geographic Information Systems (GIS) software has been used in industry to solve complex spatial problems. Discover how to use this power in your classroom.

SESSION 3

SEINet: A No-Cost Plant Study Tool (Bio)

(Middle Level–High School)

127A, Convention Center

Benjamin Brandt (bbrandt@email.arizona.edu), University of Arizona Herbarium, Tucson

Learn uses for a powerful no-cost botany web tool called SEINet. This tool provides uniform, simple access to multiple plant study references.

SESSION 4

Vocabulary That Connects and Test Strategies That Work! (Gen)

(General)

130, Convention Center

Vivian Rogers (vrogers@magnoliaisd.org), J.L. Lyon Elementary School, Magnolia, Tex.

Presider: Mark A. Rogers, Magnolia (Tex.) ISD

Discover a systematic approach to vocabulary that is designed for building long-term memory retention. Learn how to teach test-taking strategies that connect elements of the vocabulary method, which in turn help improve test scores.

SESSION 5

Data: It's Not a Four-Letter Word (Gen)

(General)

131B, Convention Center

Britta Culbertson (culbertsonb@einsteinfellows.org), Einstein Fellow, NOAA Office of Education, Washington, D.C.

NOAA's data are not your grandfather's data. Learn about NOAA data resources that are readily available and easy to use in the classroom.

SESSION 6



Camp Colley Goes Green: An Energy Lesson Plan (Env)

(Middle Level–College)

229B, Convention Center

Auriane M. Koster (auriane.koster@asu.edu), Arizona State University, Tempe

Get an introduction to a weeklong energy lesson with the end product being a student-created energy portfolio for a camp.

SESSION 7



Kindergarten Science Illustrations and Recordings (Gen)

(Preschool–Elementary)

230, Convention Center

Andrea Zdinak Andretta, Norwalk (Conn.) Public Schools

Zackery Zdinak (wildlife@lifedraw.com), Life Drawing & Education, Flagstaff, Ariz.

Kindergartners enjoy exploring science topics. Learn how to help them record their findings in journals through illustrations and other recording methods.

SESSION 8

Computational Thinking (CT)—See the World in a New Way (Gen)

(Elementary–High School)

231A, Convention Center

Helen Padgett (helen.padgett@asu.edu), Arizona State University SkySong, Scottsdale

Take STEM strategies to a new level with CT, which combines critical-thinking skills with the power of computing to find solutions or make decisions. ISTE and CSTA free resources!

5:00–6:00 PM Workshops

Hands-On Meteorite Investigations to Learn About the Solar System (Earth)

(Middle Level–High School) 124B, Convention Center

Steven Croft (skcroft@pima.edu), Planetary Science Institute, Tucson, Ariz.

Larry A. Lebofsky (lebofsky@lpl.arizona.edu), Girl Scouts of Southern Arizona, Tucson

Join us as we share the story of meteorites as tools for understanding our solar system. Receive hands-on experience with a variety of samples.

Be Prepared! Move Now from Cookbook to Inquiry! (Chem)

(Middle Level–High School) 126B, Convention Center

Greg Dodd (gbdodd@gmail.com), George Washington High School, Charleston, W.Va.

Join me for a hands-on activity modeling the inquiry approach to science instruction.

Iteration in Engineering (Gen)

(Middle Level–High School) 127B, Convention Center

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

Engineering is the new buzzword, but engineering without testing prototypes that students create and then iterating those designs to make better products, lacks rigor and reality.

Demystifying the STEM Riddle: What You Need to Know (Earth)

(General) 128A, Convention Center

Barry Fried (bfried@schools.nyc.gov) and **Honora Dash** (hdash@schools.nyc.gov), John Dewey High School, Brooklyn, N.Y.

Learn how STEM projects and partnerships create a multi-disciplinary approach and real-world applications by providing authentic science experiences through design projects, competitions, and live-data analysis to make science relevant by blending creativity, innovation, and inquiry to foster a deeper science understanding.



NSTA Press® Session: Authors Share Favorite Lessons from *Teaching Science Through Trade Books*

(Gen)

(Elementary)

129B, Convention Center

Christine A. Royce (caroyce@aol.com), Shippensburg University, Shippensburg, Pa.

Emily Morgan (emily@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio

Karen Ansberry, Mason (Ohio) City Schools

Join the authors of *Science & Children's* "Teaching Through Trade Books" column as they share some of their favorite trade book-inspired lessons featured in their new book.



What You Can Gain from Genetic Testing in Your Classroom (Bio)

(Middle Level)

229A, Convention Center

Nadja Anderson, The University of Arizona, Tucson

Kenric Kesler (kenric.kesler@nau.edu), Northern Arizona University, Flagstaff

This hands-on workshop integrates math (probability and linear functions), science (genetics), technology (biotechnology), and engineering (electrophoresis) and can be used in the classroom.

5:30–8:30 PM Social

Arizona Science Teachers Association Annual Meeting and Social

Off-site, Audubon Center

Come network with ASTA and enjoy complimentary appetizers and a no-host bar at the Nina Mason Pulliam Rio Salado Audubon Center. This event is sponsored by Salt River Project and Helios Education Foundation.

The Nina Mason Pulliam Rio Salado Audubon Center is located at 3131 South Central Avenue, less than three miles from the Convention Center. A shuttle will run every half hour to and from the social. Shuttles will depart from the pull-in area in front of the Convention Center North Building on Third Street.

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—Photo courtesy of Greater Phoenix Convention and Visitors Bureau

Children learn about texture at the Children's Museum of Phoenix as they wander through this hands-on exhibit that uses more than 3,000 pool noodles to create a fun sensory experience.

8:00–9:00 AM Presentations

SESSION 1

Playing Games in the Classroom: Using Student Creations to Teach Anything Better! (Gen)

(Elementary–Middle Level/Informal) 121A, Convention Center

Steve Canipe (steve.canipe@waldenu.edu), Walden University, Tucson, Ariz.

As participants create a learning game, they will learn to use the power of gaming to teach any aspect of science.

SESSION 2

Fuel Cells: How to Put Them into Your Classroom (Chem)

(High School) 126A, Convention Center

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

Learn about the fascinating topic of fuel cells with demos and activities that you can use in class. Take home a CD of information.

SESSION 3 (two presentations)

(Elementary–Middle Level) 126C, Convention Center

NARST Session: The Effect of Instructional Framing on Learning and Transfer of Experimental Design Skills (Gen)

Stephanie A. Siler (siler@cmu.edu), Carnegie Mellon University, Pittsburgh, Pa.

We compared students' learning of experimental design when the instruction was framed traditionally (learning to design experiments) vs. solving brain teasers vs. making fair comparisons.

NARST Session: Microcosmos: A Culturally Relevant Science Learning Environment for Second-Generation Latino Elementary Students (Bio)

Ingrid Sanchez-Tapia and **Consuelo J. Morales** (cjmorale@umich.edu), University of Michigan, Ann Arbor

Join us as we share results of designing and implementing a culturally relevant science learning environment for children of Latin American immigrants in the context of a Saturday Spanish School.

SESSION 4

How Building Solar Cars Promotes Student Interest in STEM (Gen)

(High School) 127A, Convention Center

Louis C. Glover (chemman9@gmail.com), The University of Tennessee at Martin

Come learn how building solar cars promotes student interest in math, science, engineering, computer applications, vocation, and industrial technology. Students apply principles of physics, aerodynamics, and geometric applications in real-world situations as they participate in solar energy learning opportunities.

SESSION 5

Before and After Retirement: Practicalities and Possibilities (Gen)

(General) 130, Convention Center

Howard Wahlberg (hwahlberg@nsta.org), Assistant Executive Director, Membership, NSTA, Arlington, Va.

The NSTA Retired Advisory Board invites you to a vibrant and useful information-sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

SESSION 6

Give Science a Voice! Digital Storytelling in the Science Classroom (Gen)

(Elementary–High School) 131B, Convention Center

Roger D. Pence (rogpence@yahoo.com), Benicia Middle School, Benicia, Calif.

Engage students in science by having them write, compile, produce, and share digital stories. Digital storytelling encourages research, creativity, visual literacy, and concise writing.

SESSION 7

Get SIMulated! (Gen)

(Elementary–High School) 131C, Convention Center

Diane L. Kasparie (dkasparie@quincynotredame.org), Quincy Notre Dame High School, Quincy, Ill.

Online science simulations are research-proven, student-centered, relevant tools that empower great teaching and active learning! They are engaging and effective, and aligned to state/national standards.

SESSION 8



It Can Be Done

(Gen)

(Elementary–High School)

231A, Convention Center

Jeannette M. Andree (andreescience@gmail.com) and **Tamara D. Santilli** (tamara.santilli@cgelem.k12.az.us), Villago Middle School, Casa Grande, Ariz.

Let us introduce you to developing partnerships with higher education and private and corporate businesses to help fund and influence success in the STEM classrooms of today. The focus will be on providing tried-and-true ideas and strategies to accomplish the goals of STEM education in our economically unfriendly world of scientific public education.



8:00–9:00 AM Workshops

Even Before STEM, Science and Math Loved Each Other!

(Bio)

(Middle Level–High School)

121C, Convention Center

Jeff Lukens (jeffrey.lukens@k12.sd.us), Roosevelt High School, Sioux Falls, S.Dak.

Integrating science and math should be seamless, natural, and painless. Come see how the philosophy of STEM has been alive for a long time.

AAPT Session: Using Physics “Challenge Days” to Help Motivate Freshman Students

(Phys)

(Middle Level–High School)

122B, Convention Center

Kate Roman (krroman@tuhsd.k12.az.us), Marcos de Niza High School, Tempe, Ariz.

Engineering competition-type challenges helps motivate students. Find out how this fun experience engages students at all levels.

NABT Session: Free Classroom Resources for Teaching Evolution

(Bio)

(High School–College/Informal)

124B, Convention Center

Jennifer D. Bricken (brickenj@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, Md.

Discover Howard Hughes Medical Institute’s classroom-ready lessons, hands-on activities, animations, video clips, and short films that can help you teach central and difficult biological concepts such as molecular genetics and the evolution topics of selection, phylogenetic trees, drug resistance, and biodiversity. These engaging multimedia resources include inquiry-based investigations and data collection, analysis, and computation.

ACS Session One: Equilibrium and Concentration

(Chem)

(High School)

125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Visualizing the dynamic nature of equilibria is sometimes difficult for students. Putting the concepts in textbooks to work explaining observations from activities makes Le Chatelier’s principle more tangible by comparisons between simulations and experiments. Bring your USB flash drive and take away the presentation and activities to use in your classroom.

Modeling Black Holes

(Earth)

(Middle Level–College)

126B, Convention Center

Robert Sparks (rsparks@noao.edu), National Optical Astronomy Observatory, Tucson, Ariz.

Learn to illustrate the exciting science behind black holes using simple, everyday materials. Free NASA teacher’s guide!

STEM—Now or Never!

(Chem)

(Middle Level–High School)

127B, Convention Center

Greg Dodd (gbdodd@gmail.com), George Washington High School, Charleston, W.Va.

The use of appropriate technology in the classroom makes STEM instruction the best means to integrate science, math, and engineering instruction.

Using Case Studies to Teach AP Biology Content

(Bio)

(High School)

127C, Convention Center

Kristen R. Dotti (kristen_dotti@yahoo.com), Christ School, Arden, N.C.

Take part in a hands-on exploration of AIDS as a vehicle to learn cell communication, signal transduction, immunology, public health, drug resistance, and much more.

ASEE Session: ASEE's K–12 Outreach Program eGFI: Engineering, Go For It and the Marshmallow Challenge (Gen)

(General)

128A, Convention Center

Dennis Cummings (d.cummings@asee.org), ASEE, Washington, D.C.

Presider: Jeffrey B. Goldberg, The University of Arizona, Tucson

The American Society for Engineering Education (ASEE) will share innovative ways to introduce engineering into the K–12 classroom.

ACS Middle Level Session: Solids, Liquids, and Gases: The Kinetic-molecular Theory of Matter (Chem)

(Middle Level)

128B, Convention Center

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

Explore solids, liquids, and gases on the molecular level to discover how heating and cooling affect matter.



NSTA Press® Session: Teaching and Learning Biology Through Scientific Argumentation (Bio)

(Middle Level–High School)

129B, Convention Center

Sharon Schleigh (sharon.schleigh@purduecal.edu), Purdue University Calumet, Hammond, Ind.

Gain an introduction to some innovative ways to help middle school and high school students learn more about scientific argumentation in biology.

“Life begins at retirement.”

—Author Unknown

Join the NSTA Retired Advisory Board for an insightful information-sharing session. Fellow colleagues will share ideas about staying active both in and out of the profession.

Before and After Retirement: Practicalities and Possibilities

**Friday, December 7
8:00–9:00 AM**

Phoenix Convention Center
Room 130

For more information on the Retired Members Advisory Board, contact Rebecca Bell, chair, at rbell153@gmail.com.

NSTA National Science Teachers Association

Climate Change Classroom Tool Kit (Earth)
(Elementary–High School) 132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

Explore the scientific foundations of what we know about climate change, greenhouse gases, and energy consumption through hands-on and data-rich classroom activities from NESTA.

Ice Core Records—From Volcanoes to Supernovas (Earth)
(General) 229A, Convention Center

Donna L. Young (donna@aavso.org), NASA/Chandra EPO Office, Cambridge, Mass.

Use absolute and relative dating techniques with high-resolution ice core data and historic volcanic eruptions to correlate and date supernova events with nitrate anomalies.



Forests, Carbon, and Climate Change (Env)
(Elementary–High School) 229B, Convention Center

Al Stenstrup, Project Learning Tree, Washington, D.C.
Courtney White (cwhite@ra.org), Rainforest Alliance, New York, N.Y.

Rainforest Alliance and Project Learning Tree have created hands-on lessons to help students understand the carbon cycle and the role forests play in climate change.

STEM Curriculum Strategies—Putting Practice into Action (Gen)
(Elementary–Middle Level) 231B, Convention Center

Jo Anne Vasquez (jvasquez@helios.org), 1996–1997 NSTA President, and Helios Education Foundation, Phoenix, Ariz. STEM teaching requires a different approach to curriculum organization. It requires integration of the STEM practices. Experience true integration of the STEM practices and learn how to use these practices in curriculum design.

8:00–9:15 AM Exhibitor Workshops

Using Molecular-Level Visualization to Engage Middle School and High School Science Students (Chem)
(Grades 7–College) 123, Convention Center

Sponsor: Wavefunction

Jeff Bolognese (sales@wavefun.com), Wavefunction, Irvine, Calif.

Would you like to teach chemistry more effectively with the help of molecular models and simulations that are scientifically sound? Bring your laptop (Windows or Mac OS X) to this hands-on workshop and learn how to truly engage your students with the powerful 2012 release of *Odyssey High School Chemistry*.

Improve STEM Literacy for All Students (Gen)
(Grades 6–12) 129A, Convention Center

Sponsor: The STEM Academy®

Russell Mickelson (russell.mickelson@stem101.org), The STEM Academy, Peoria, Ariz.

The STEM Academy is a national nonprofit organization dedicated to improving STEM literacy for all students. We represent a recognized national next generation high-impact academic model. The practices, strategies, and programming are built on a foundation of identified national best practices that are designed to improve underrepresented minority and low-income student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and improve teacher and principal effectiveness.

Science: The Literacy Connection and the Core Curriculum (Gen)
(Grades K–6) 221B, Convention Center

Sponsor: Delta Education/School Specialty Science

Tom Graika, Consultant, Lemont, Ill.

Johanna Strange, Consultant, Richmond, Ky.

We'll show you various strategies and Delta products that you can use to integrate reading and language arts into your science programs. Learn how your students can make the literacy connection as they experience the enjoyment of learning science with Delta Science Modules. Receive a workshop packet and related Delta materials.

Equip Your iPad for Science with SPARKvue® HD, a Full-featured Science Application for the iPad (Gen)
(Grades K–12) 222C, Convention Center

Sponsor: PASCO scientific

Presenter to be announced

Explore SPARKvue HD, PASCO's new science application for the iPad. This new app offers a full suite of display and analytical tools, including reflection prompts, journaling, and more...all within an integrated learning environment. SPARKvue HD also supports the growing collection of SPARKlabs®, which integrate rich content with live data collection and analysis.

Best Practices for Teaching Chemistry from Flinn (Chem)

(Grades 9–12) 226 A–C, Convention Center

Sponsor: Flinn Scientific, Inc.

Scott Stahler (ssstahler@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.

Join us as we present exciting and interactive demonstrations, show video clips, and demonstrate the features and benefits of our new comprehensive *Teaching Chemistry* professional development program. Imagine the opportunity to learn best practices from 20 award-winning master teachers as they carry out their favorite experiments, demonstrations, and chemistry lab activities.

Distillation: Simple and Fascinating Experiments in the Chemistry of Aromas and Smells (Chem)

(Grades 9–12) 227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Brandon Watters, Lakes Community High School, Lake Villa, Ill.

We distill water to purify it, or so we think. So why does the clear distillate from apple cider smell like apples? Join us and find out! Using a clever test tube distillation apparatus, distill the essence of vanilla and the scent of mint... and we'll even show you how to make brandy from wine! Distillation is a crucial process in chemical engineering and technology, yet few students ever get to explore the process. This hands-on distillation workshop is not illegal, but it is excellent chemistry and extremely relevant to those of you who want to put a little STEM in your test tube!

Comparative Vertebrate Anatomy Featuring Carolina's Perfect Solution® Specimens (Bio)

(Grades 9–12) 227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Explore animal diversity by comparing and contrasting the anatomical adaptations of the pig, rat, perch, and frog. We'll use hands-on dissection to identify the characteristics of these popular vertebrates. This is an excellent comparative dissection activity featuring Carolina's Perfect Solution specimens. Free dissection supplies and great door prizes!

Inquiry and Scientific Practices: Keys to Getting Students to Think (Gen)

(Grades K–12) 228 A/B, Convention Center

Sponsor: Pearson

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

Inquiry and scientific practices continue to be a central element of science teaching. With the emergence of the highly anticipated Next Generation Science Standards, it is even more critical that teachers develop an understanding of inquiry, evidence, and scientific practices. This session details how the new standards will focus on inquiry and practices and will outline teaching strategies you can use to develop these important ideas.

8:00–9:30 AM Exhibitor Workshops

Bio-Rad: Explore Inquiry and Ecology with Biofuel Enzymes (AP Big Idea 4) (Bio)

(Grades 9–College) 221A, Convention Center

Sponsor: Bio-Rad Laboratories

Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Need energy? Reveal the power of enzyme kinetics by illustrating the theory through a real-world application of biofuels—using cellobiase, a key enzyme in the production of cellulosic ethanol (a biofuel). The reaction serves as a jumping-off point for introducing variables such as temperature, pH, substrate, and enzyme concentration. The capstone activity is for student-directed experiments using naturally occurring enzymes found in mushrooms. Expand the lab to studies with mushrooms in different ecological niches.

Genetics: Crazy Traits and Adaptation Survivor (Bio)

(Grades 5–12) 222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman, CPO Science/School Specialty Science, Nashua, N.H.

Students learn new vocabulary when they experience genetics. Concepts like traits, alleles, phenotypes, genotypes, and heredity will come alive as you create crazy creatures with a unique kit and study the resulting population. Take away STEM activities and an understanding of how to incorporate science and engineering practices into lessons.

Integrating Your iPad or Mobile Device with Vernier Technology (Gen)

(Grades 3–College) 223, Convention Center

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will use the built-in wireless capabilities of our new LabQuest 2. You will be able to view and analyze data collected on LabQuest 2 using Graphical Analysis for iPad or on any device with a supported browser using Vernier Data Share.

8:00–10:00 AM Exhibitor Workshop

Using Science Notebooks to Impact Student Learning with FOSS (Gen)

(Grades K–8) 221C, Convention Center

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

Ellen Mintz, Charleston County Schools, Charleston, S.C.
Learn how we implement science notebooks in the new FOSS editions. Through active investigations from the new editions, you'll discover how science notebooks impact student achievement by providing a tool for developing conceptual understanding, exposing evidence of learning, and guiding instruction. Take home sample materials.

8:00 AM–1:00 PM NSTA Symposium

Flight of the Monarch Butterflies (SYM-1)

(Grades K–12) Off-site (Arizona Science Center)

Tickets Required: \$54

Jim O'Leary (oleary@mdsci.org), Maryland Science Center, Baltimore

Dolores Cansler (decansler@gmail.com) and **Ann Hobbie**, University of Minnesota Dept. of Fisheries, Wildlife, and Conservation Biology, St. Paul

For description, see page 35.

Note: The Arizona Science Center is located in the Heritage and Science Park on the northwest corner of Seventh and Washington streets. Participants should plan to meet at 7:50 AM in the lobby of the Arizona Science Center.

Tickets, if still available, must be purchased at the Ticket Sales Counter in the NSTA Registration Area before 5:00 PM on Thursday.

8:30–10:30 AM Meeting

Informal Science Meeting

Laveen A, Sheraton

Science education happens in many places. It happens in museums, zoos, and aquariums; in magazines and on TV; in community-based programs; and on the web. Those of us who design, deliver, and research out-of-school science teaching/learning want to connect with schools and classroom teachers to present high-quality science education throughout our lives. Please join us as we discuss ways to make a connection between all types of science education.

8:30 AM–3:30 PM Short Course



Integrating Mathematics and Science Through a Problem-solving Approach with LEGO® Robotics (SC-2)

(Grades K–12)

Camelback A, Sheraton

Tickets Required: \$34

Erik Von Burg (elvonbur@mpsaz.org), MacArthur Elementary School, Mesa, Ariz.

Michael Little Crow and **William A. Johnson**, Scottsdale Community College, Scottsdale, Ariz.

For description, see page 37.



9:00–11:00 AM NSTA ESP Symposium**ESP: Unique Features of Programs That Meet “More Emphasis” Features in the NSES (Gen)***(General)**124A, Convention Center*

The National Science Education Standards offered Four Goals/Justifications for Science in K–6 Settings, namely that all students would: 1) Experience the richness and excitement of knowing about and understanding the natural world; 2) Use appropriate scientific processes and principles in making personal decisions; 3) Engage intelligently in public discourse and debate about matters of scientific and technological concern; and 4) Increase their economic productivity through the use of the knowledge, understandings, and skills of the scientifically literate person in their careers.

The ESP series identifies people and places where the reforms recommended have emerged. The exemplars include: 1) Exemplary Science in Grades PreK–4; 2) Exemplary Science in Grades 5–8; 3) Exemplary Science in Grades 9–12; 4) Exemplary Science: Best Practices in Professional Development; 5) Inquiry: The Key to Exemplary Science; 6) Exemplary Science in Informal Education Settings; and 7) Exemplary Science for Resolving Societal Challenges.

The series was conceived by Robert E. Yager (1982–1983 NSTA President), who continues ESP searches and ways of recognizing classroom successes while also encouraging more to try!

Coordinator: Thomas R. Lord, NSTA Director, College Science Teaching, and Indiana University of Pennsylvania, Indiana

Developing Students’ Authentic Inquiry Skills

Judith A. Scheppler (*quella@imsa.edu*), Illinois Mathematics and Science Academy, Aurora

Success with Science Outdoors

Beth Ann Krueger (*beth.krueger@centralaz.edu*), Central Arizona College–Aravaipa Campus, Winkelman

Why STEM? Why Now?

Brenda Wojnowski (*bwojnowski@gmail.com*), WAI Education Solutions, Dallas, Tex.

Graduate Distance Education Programs: An Evolving Concept with Practical Applications

Oliver Grundmann (*grundman@ufl.edu*), University of Florida, Gainesville

9:00–11:00 AM Workshop**AAPT Session: An Introduction to Modeling Instruction in Physics (Phys)***(Middle Level–High School)**122B, Convention Center*

Suzi Shoemaker, Central Arizona College, Coolidge

Gain an introduction to Modeling Physics Instruction, a powerful instructional practice in wide use across the U.S. that teaches physics, physical science, and chemistry concepts.

9:00 AM–5:00 PM Exhibits*Exhibit Hall 5, Convention Center*

Come see the most up-to-date science textbooks, software, equipment, and other teaching materials. Some exhibitors will offer materials for sale.

9:30–10:30 AM Featured Presentation



Phosphorus, Food, and Our Future (Env) (General) Ballroom 120D, Convention Center



James J. Elser (j.elser@asu.edu), Regents Professor and Distinguished Sustainability Scientist, School of Life Sciences, Arizona State University, Tempe

Presider: Bev DeVore-Wedding, NSTA Director, District XIV; Program Representative, NSTA Phoenix Area Conference; and Meeker

High School, Meeker, Colo.

The 15th element in the periodic table, phosphorus is essential for formation of our genes and our bones. It also limits productivity in ecosystems and for crops. However, runoff of phosphorus from farms and cities pollutes lakes and oceans while concerns have recently been raised about how much longer humanity can continue to mine cheap phosphorus for fertilizer production. This talk will deal with both sides of the sustainability conundrum for phosphorus and discuss ways to a sustainable food system based on nutrient-efficient crops and “alternative fertilizers” from recycling nutrients in our food chain.

James Elser’s research involves the integrative field of biological stoichiometry, the study of balance of energy and multiple chemical elements in living systems. While this work is primarily ecological in focus and includes studies of both aquatic and terrestrial ecosystems and biota, the approach uses an evolutionary perspective to integrate levels of organization from the molecule and cell to the ecosystem. Specific studies involve observational and experimental studies at various scales, including laboratory cultures, short-term field experiments, and sustained whole-ecosystem manipulations. Over the years, field sites have included the Experimental Lakes Area in Ontario, Canada; lakes of the Arctic; lakes, forests, and grasslands of the upper Midwest; desert springs in Mexico’s Chihuahuan Desert; and the surrounding Sonoran Desert.

Recently, James received the G. Evelyn Hutchinson Award from the Association for the Sciences of Limnology and Oceanography (ASLO) and will serve as its next president. He is also an active member of ASU’s NASA-funded Astrobiology project “Follow the Elements” and a co-organizer of ASU’s Sustainable Phosphorus Initiative. He holds a BS in biology from University of Notre Dame; an MS in ecology from The University of Tennessee, Knoxville; and a PhD in ecology from University of California, Davis.

9:30–10:30 AM Presentations

SESSION 1

Sing a Song of Science! (Gen) (Elementary–Middle Level) 121A, Convention Center

Timothy M. Griffin (timteach@pacbell.net), Kingsley Elementary School, Los Angeles, Calif.

Join award-winning teacher/musician Tim Griffin for fun standards-based music about science for grades K–8.

SESSION 2

City of Materials: Connecting Science to the “Stuff” in Kids’ Everyday Lives (Chem) (Middle Level) 122A, Convention Center

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

Andrew G. Nydam (andrewnydam@hotmail.com), Olympia High School, Olympia, Wash.

Discover an interactive STEM website for middle school students that connects science and engineering to their everyday world. See correlating demonstrations and labs for teachers. Handouts!

SESSION 3

Chemistry of Food (Chem) (Middle Level–High School) 126A, Convention Center

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

Polymers are found all around us. Gain a better understanding of why some polymers are used in cooking and what polymers are found in food as well as in cooking tools. Take home a CD of the activities and information.

SESSION 4 (two presentations)

(General)

126C, Convention Center

NARST Session: Analyzing Curriculum Materials with Preservice and Mentor Elementary Teachers: Bridging Science Methods and Field Placement Settings (Gen)**Kristin L. Gunckel** (kgunckel@email.arizona.edu), The University of Arizona, Tucson

I'll present a curriculum analysis activity designed to support preservice and mentor elementary teachers in bridging the science methods/field placement gap.

NARST Session: How Can We Prepare Students to Recognize Errors of Inquiry During Work with Virtual Environments? (Gen)**Eva Erdosne Toth** (eva.toth@mail.wvu.edu), West Virginia University, Morgantown

This presentation will compare and contrast inquiry learning in hands-on and virtual environments with a focus on the sources of error that students experience with these tools.

SESSION 5**Teaching Biological Processes Using Modules Based on 3-D Computer Animations** (Bio)

(High School–College)

127A, Convention Center

Georgia Wood Hodges (georgia.hodges@gmail.com), The University of Georgia, Athens

Demonstrations of case study modules combining dynamic 3-D animations and inquiry-based learning of biology will be highlighted in this session.

SESSION 6**Virtual Field Trips: Creative Ways to Engage Diverse K–12 Student Populations Using Software You Already Have** (Earth)

(Middle Level–College)

131B, Convention Center

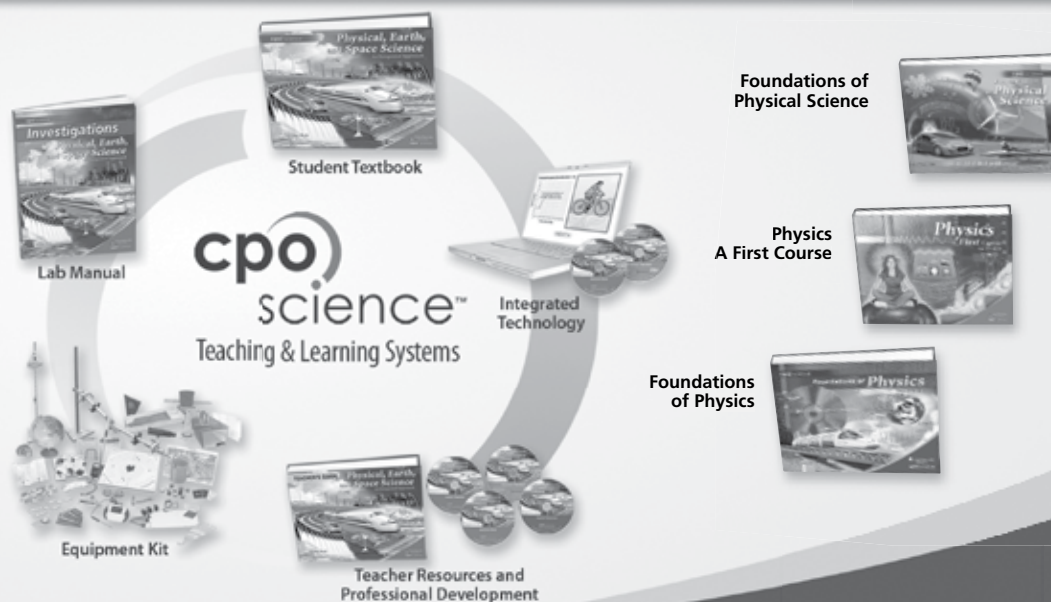
Laura Lukes (lalukes@ncsu.edu), North Carolina State University, Raleigh

Field trips can be an effective way to engage students, but schools have limited resources. Learn to create and use your own virtual field trips.

cposcience**Engage Students with Hands-On Science Programs**

CPO Science's complete, coordinated Teaching and Learning Systems, hands-on equipment, and supplemental curriculum provide all the essential components for a STEM-based science program.

Be sure to visit our booth to learn more about CPO Science's innovative curriculum and equipment.


www.cpoScience.com 800-932-5227

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OUR BOOTH

SESSION 7

The Policy of Science Standards in Action: How Will We Respond to the New Science Standards and What Are the Pitfalls to Avoid? (Gen)

(General) 131C, Convention Center

Eugene Judson (eugene.judson@asu.edu), Arizona State University, Mesa

As Next Generation Science Standards are adopted, various stakeholders will apply their interpretations. Come learn strategies for deciphering new standards and how to avoid snares.

SESSION 8



Authentic Writing in Science: Get Kids to Write Children's Books (Gen)

(Middle Level) 230, Convention Center

Michael Rockow (rockow42@q.com), Leslie Middle School, Salem, Ore.

In order to provide authentic writing opportunities for my middle school students, I have them write children's books and read them to elementary school students.

SESSION 9



Developing Critical Thinkers Through the Water Investigations Program: Connecting Classroom Practice to Real-World Application (Env)

(Middle Level–High School) 231A, Convention Center

Kerry L. Schwartz (kschwartz@cals.arizona.edu) and **Holly Thomas-Hillburn** (hhillburn@cals.arizona.edu), The University of Arizona, Tucson

Learn from veteran Water Investigation Program teachers how students in this program grapple with real-world problem solving and apply STEM concepts in their lives.

Evaluate Your Sessions Online or on Your Smartphone!

This year, we're giving away a Kindle Fire HD 8.9" to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (See page 14 for details.)

9:30–10:30 AM Workshops

Using Inquiry to Teach Igneous and Sedimentary Rocks (Earth)

(Elementary–High School) 121C, Convention Center

David Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.

This workshop will deepen content knowledge and provide inquiry lessons to help your students identify igneous and sedimentary rocks.

Communicate, Collaborate, and Create—Changing Your Classroom and the World (Env)

(General) 122C, Convention Center

Kyle Schutt (kyle_schutt@discovery.com), Discovery Education, Silver Spring, Md.

Transform your teaching with Project Based Learning (PBL) using programs like the Siemens We Can Change the World Challenge (wecanchange.com), a national K–12 student sustainability competition.

NABT Session: Using HHMI's *The Making of the Fittest: Natural Selection and Adaptation* in Your Classroom (Bio)

(Middle Level–College) 124B, Convention Center

Mary Page Colvard (mcolvard@tds.net), Deposit, N.Y.

View Howard Hughes Medical Institute's short film *Natural Selection and Adaptation* and learn about the research of Dr. Nachman, who has documented physical and genetic changes in the evolution of rock pocket mice. Take home classroom-ready resources.

ACS Session Two: Equilibrium and Energy (Chem)

(High School) 125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Quantitative studies deepen understanding of equilibria. Some chemical reactions produce energy and others require energy to proceed. Are energy and equilibrium related? How do we find out? Under what conditions can the energetics of a chemical system be changed and what are the consequences? Bring your USB flash drive and take away the presentation and activities to use in your classroom.

Graphing on the Move**(Phys)***(Middle Level)*

126B, Convention Center

Holly Steele (holly_steele@fsd.k12.ca.us), Beechwood School, Fullerton, Calif.

Help students master interpreting motion graphs by getting them out of their seats. We'll try both high-tech and low-tech ways to keep students engaged!

Candy Analysis**(Chem)***(Middle Level–High School)*

127B, Convention Center

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

Using candy in the classroom is often a good motivator for students. We will explore the typical M&M's® labs and beyond using some newer technology.

What's So Important About Deep-Sea Coral Ecology?**(Bio)***(High School)*

127C, Convention Center

Liz Goehring (lgoehring@neoninc.org), National Ecological Observatory Network (NEON), Boulder, Colo.**Kathryn Kelsey** (kkelsey@seattleschools.org), Seattle (Wash.) Public Schools

Learn how real-life deep-sea ecological research informs important decisions regarding offshore oil exploration, and use Problem-Based Learning to teach this to your students.

ASEE Session: Engineering the Future with TeachEngineering.org**(Gen)***(General)*

128A, Convention Center

Malinda Zarske (malinda.zarske@colorado.edu), University of Colorado, Boulder

Presider: Jeffrey B. Goldberg, The University of Arizona, Tucson

Join us and become acquainted with *TeachEngineering.org*, a free online collection of standards-based engineering lessons and hands-on activities that can help integrate innovative engineering trends into your K–12 classes.

ACS Middle Level Session: Changes of State: Evaporation and Condensation**(Chem)***(Middle Level)*

128B, Convention Center

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

Explore evaporation and condensation on the molecular level to discover how heating and cooling affect the rate of these processes.

**NSTA Press® Session: Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, 3–6****(Gen)***(Elementary)*

129B, Convention Center

Emily Morgan (emily@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio**Karen Ansberry**, Mason (Ohio) City Schools

NSTA Press authors will teach you how to integrate science and reading through the use of engaging picture books.

Activities from Across the Earth System**(Earth)***(Elementary–High School)*

132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

In this NESTA workshop, participants will engage in multiple effective hands-on, inquiry-based activities that illustrate key concepts of Earth system science. Handouts provided!

NASA's Space Forensics: Solving Cosmic Mysteries with Crime Scene Narratives**(Phys)***(General)*

229A, Convention Center

Sara E. Mitchell (sara.mitchell@nasa.gov) and **Sarah Eyer-mann** (sarah.e.eyermann@nasa.gov), NASA Goddard Space Flight Center, Greenbelt, Md.

Solve the universe's greatest mysteries! Combine storytelling and science as you explore exploding stars, hidden black holes, and more with real NASA data.

**Teaching Younger Students About Energy Outside the Science Classroom****(Gen)***(Preschool–Elementary)*

229B, Convention Center

Rebecca Lamb (rlamb@need.org), The NEED Project, Manassas, Va.

Use language arts, math, and presentation skills to teach K–3 students about the energy resources we use. Activities can be implemented today with no special materials.

Bringing Astronomy Activities and Science Content to Girls Locally and Nationally: A Girl Scout and NIRCcam Collaboration**(Earth)***(Elementary–Middle Level)*

231B, Convention Center

Michelle Higgins (mhiggins@girlscoutsoaz.org) and **Larry A. Lebofsky** (lebofsky@lpl.arizona.edu), Girl Scouts of Southern Arizona, Tucson

Nancy R. Lebofsky (nlebofsky@gmail.com), Retired Educator, Tucson, Ariz.**Don W. McCarthy** (dwmccarthy@gmail.com), The University of Arizona, Tucson

Take part in solar system and constellation hands-on activities for grades 4–8 students developed through a Girl Scout/NASA Near Infrared Camera (NIRCcam) collaboration that aligns with national standards.

10:00–11:15 AM Exhibitor Workshops

“Hard” Doesn’t Mean “Bad”—Helping Students Understand That Facing Challenges Is a Good Thing (Gen)

(Grades 6–9)

121B, Convention Center

Sponsor: eCYBERMISSION

Brian P. Short, Director, Science Education Competitions, NSTA, Arlington, Va.

How many times have you heard your grades 6–9 students say, “This is too hard” or “My data does not support my hypothesis so I failed” or “I’m no good at science”? Many students are ready to give up if they feel that something is too difficult or if they don’t succeed immediately. Since many scientific discoveries come from challenges, it’s important that students learn how to embrace these challenges and become more comfortable with science. Participants will “do” science and walk away with lesson plans and resources along with information on eCYBERMISSION, a new NSTA competition that can provide both rigor and relevance in your classroom.

Nailing Molecular Concepts with Scientifically Accurate Visualization and Simulation Tools (Chem)

(Grades 7–College)

123, Convention Center

Sponsor: Wavefunction

Jeff Bolognese (sales@wavefun.com), Wavefunction, Irvine, Calif.

Indispensable in college chemistry classes, molecular modeling is also an effective teaching tool for high schools. Bring your laptop (Windows or Mac OS X) to this hands-on workshop and learn how to get the most out of the powerful 2012 releases of *Odyssey High School Chemistry* and *Odyssey AP Chemistry*.

Pollution and Acid Rain Activities (Env)

(Grades 6–12)

129A, Convention Center

Sponsor: Science Take-Out

Susan Holt (contact@sciencetakeout.com), Science Take-Out, Pittsford, N.Y.

Join us for two simple hands-on activities. In “Pollution Investigation: What Is Causing the Pollution in Big Lake?” we’ll conduct and analyze simulated water tests for nitrates, PCBs, *E. coli*, and lead. In “Acid Rain and Buffers,” we’ll explore why some lakes are more susceptible to the effects of acid rain than others.

Identifying, Clarifying, and Designing Experiments (Gen)

(Grades K–6)

221B, Convention Center

Sponsor: Delta Education/School Specialty Science

Tom Graika, Consultant, Lemont, Ill.

Johanna Strange, Consultant, Richmond, Ky.

Having trouble getting students ready for science fairs and STEM performances? Learn an effective method for teaching students to design experiments from simple investigations. The same process can help students crystallize engineering ideas. Join us as we feature Delta products and resources.

Achievable Inquiry in AP* Biology and Chemistry (Gen)

(Grades 9–12)

222C, Convention Center

Sponsor: PASCO scientific

Presenter to be announced

Experience a true guided inquiry approach with PASCO probeware. Use probeware technology to develop students’ inquiry and reasoning skills while teaching learning objectives and science practices addressed in the new College Board® frameworks for Biology and Chemistry.

**AP is a registered trademark of the College Board, which was not involved in the production of, and does not endorse, this product.*

3-2-1 Blast Off! (Gen)

(Grades 2–10)

226 A–C, Convention Center

Sponsor: Educational Innovations, Inc.

Tami O’Connor, Educational Innovations, Inc., Bethel, Conn.

Get a burst of energy! Join us for things that go bump in the day! Perfect for elementary or middle school teachers teaching energy or Newton’s laws. Door prizes and freebies!

I Think There’s a Genetically Engineered Fly in My Genetically Modified Pea Soup! (Bio)

(Grades 9–12)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Barbara Nagle, The Lawrence Hall of Science, University of California, Berkeley

Students often have trouble conceptualizing how selective gene expression works. In this workshop, participants will use manipulatives to teach this concept and see how it is connected to genetic engineering. Innovative activities are selected from the new *Science & Global Issues* biology program by SEPUP and LAB-AIDS. Activities focus on ways to integrate this topic as a relevant and engaging sustainability issue into teaching about selective gene expression.

Bonding with Carolina Chemistry (Chem)*(Grades 9–12) 227 B/C, Convention Center*

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Is there a law of conservation of volume? Is rusting an endothermic or exothermic process? Answer these questions in this engaging hands-on workshop featuring our new Chem-Kit™ series, great inquiry-based activities, and exciting new classroom apps! Concepts include atomic structure, gas laws, thermochemistry, and chemical bonding. Free door prizes!

Why Teaching About Climate Change Matters—Data, Context, and Implications (Bio)*(Grades 9–12) 228 A/B, Convention Center*

Sponsor: Pearson

Joseph Levine, Author, Concord, Mass.

Overwhelming scientific consensus asserts that climate is changing, and affecting sea level, rainfall, seasonality, and ecosystem function. Yet most Americans don't understand this vital field because it is complex, interdisciplinary, and misrepresented by mass media. This workshop presents strategies and resources to teach students the real science behind the headlines.

10:00–11:30 AM Exhibitor Workshops**Chemistry and the Atom: Fun with Atom-building Games! (Chem)***(Grades 5–12)**222 A/B, Convention Center*

Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman, CPO Science/School Specialty Science, Nashua, N.H.

Understanding abstract concepts about atoms can be difficult. Use our model to experience innovative games and activities that present students with opportunities to grasp atomic structure and its connection to the periodic table. Take away STEM activities and an understanding of how to incorporate science and engineering practices into your lessons.

Introducing the Vernier LabQuest 2! (Gen)*(Grades 3–College)**223, Convention Center*

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will conduct experiments using various sensors as we explore the features of our new LabQuest 2. The LabQuest 2 is our most versatile interface ever and it supports data collection as a stand-alone device, with a computer, and now with iPad and other mobile technology.

10:30 AM–12 Noon Exhibitor Workshop**Bio-Rad: Engineer the Tools for Inquiry of Candy Food Dyes (Bio)***(Grades 6–College)**221A, Convention Center*

Sponsor: Bio-Rad Laboratories

Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

What's in your candy? Extract the colorful food dyes from candy and separate them on a do-it-yourself agarose electrophoresis box to identify what dyes were used. This inquiry-based activity teaches pipetting, gel electrophoresis, and making solutions with stunning results. Turn this into a STEM activity by building your own horizontal electrophoresis box, allowing your students to investigate the science and engineering behind a workhorse in the biotech lab.

10:30 AM–12:30 PM Exhibitor Workshop**FOSS Formative Assessment: Making Student Thinking Visible (Gen)***(Grades K–6)**221C, Convention Center*

Sponsor: Delta Education/School Specialty Science—FOSS

Kathy Long and **Brian Campbell**, The Lawrence Hall of Science, University of California, Berkeley

Formative assessment shows great promise for improving student achievement. FOSS easily makes students' thinking visible, interprets the evidence of learning, and takes action to improve learning. Join FOSS developers for an introduction to the new assessment system created for the 3rd edition, including new computer software—FOSSmap.

11:00–11:30 AM Exhibitor Workshop

Location, Location—Finding Your Way Around the Sky (Earth)

(Grades K–4) Booth #331, Exhibit Hall, Convention Center

Sponsor: Science First®/STARLAB®

Helmut Albrecht (halbrecht@starlab.com) and **Nathaniel Bell** (info@sciencefirst.com), Science First®/STARLAB®, Yulee, Fla.

In this “in dome” workshop, come learn how to use Starry Night™ Small Dome to help your students discover how to use the stars to find their location on Earth and how to find their way around the night sky.



11:00 AM–12 Noon Featured Presentation

The Current State of the Next Generation Science Standards (Gen)

(General)

Ballroom 120D, Convention Center



Stephen L. Pruitt, Vice President for Content, Research, and Development, Achieve, Inc., Washington, D.C.

President: Gerry Wheeler, NSTA Interim Executive Director, Arlington, Va.

The first public draft and review period for the Next Generation Science Standards (NGSS) is complete and revisions are under way. This informational session will provide an update on the development of these standards, including process and timeline for release of drafts and final documents, how science educators can be involved, and implications for science teaching.

With private funding from the Carnegie Corporation, the National Research Council (NRC) and Achieve, Inc., with support from NSTA and the American Association for the Advancement of Science, have embarked on a two-step cooperative process to develop the Next Generation Science Standards. The first step, the NRC *Framework*, was released in July 2011. The next step is the development of the actual standards, a process led by Achieve involving science experts, science teachers, states, and other science education partners. The NGSS are due for completion in early 2013.

Stephen L. Pruitt was named vice president for Content, Research, and Development at Achieve in November 2010. He is leading the development of the Next Generation Science Standards. Stephen began his career as a high school chemistry teacher in Georgia, where he taught for 12 years. In 2003, he joined the Georgia Department of Education (GaDOE) as the program manager for Science. In 2008, he became the associate superintendent of Assessment and Accountability, responsible for directing all state assessments and overseeing the No Child Left Behind accountability process. In April 2009, Stephen became chief of staff to state School Superintendent Kathy Cox, coordinating the work of the agency, and a variety of projects such as Georgia's third-ranked Race to the Top application.

In addition to his state-level work, Stephen also served as a member of the writing team for the College Board Standards for College Success™ (CBSCS) Science Standards. Most recently, he served on the National Academies of Science's Committee on Conceptual Framework for New Science Education Standards, which has developed A Framework for K–12 Science Education. This document is the basis for the development of NGSS.

11:00 AM–12 Noon Presentations**SESSION 1****Mapping Migration Through Movement (Bio)***(Elementary–Middle Level) 121A, Convention Center***Eric M. Proctor** (*eproctor@azgfd.gov*), Arizona Game and Fish Department, Phoenix**Liesl Pimentel** (*nggiantmaps@gmail.com*), National Geographic, Phoenix, Ariz.

Learn how large-scale, room-sized maps can be used to make science concepts, such as migration, come alive for elementary students through a one-of-a-kind engaging program.

SESSION 2**Promoting Science Literacy Using a Hybrid Class (Bio)***(Middle Level–High School/Supv.) 122A, Convention Center***Nancy S. Alcombright** (*nancyalcombright@ihhschool.org*), Immaculate Heart High School, Tucson, Ariz.

Learn how to design a hybrid class using a Wiki. Students engage in real-world science issues discussions in an online segment of a class.

SESSION 3**Creative Problem Solving with Toshiba/NSTA ExploraVision (Gen)***(General) 122C, Convention Center***Barbara R. Pietrucha**, Earth/Environmental Science Educator, Point Pleasant, N.J.

Motivate students and challenge them to think creatively! Learn how the ExploraVision competition encourages developmental skills necessary for success in STEM and uses students' natural curiosity to enhance their science achievement. ExploraVision activities illustrate standards-based connections between science and technology. Session participants have an increased chance to win a Toshiba product!

SESSION 4**Introducing Nanotechnology into the Chemistry Classroom (Chem)***(High School) 126A, Convention Center***Sherri Conn Rukes** (*sherri.rukes@d128.org*), Libertyville High School, Libertyville, Ill.

Nanotechnology is a topic that is taking off in many different areas of science. Learn about what nanotechnology is as well as applications from ancient time to present day. Take home a CD of the activities and concepts.

SESSION 5**NSELA Session: Tools for Leaders, Part I (Gen)***(General) 126C, Convention Center***Elizabeth Allan** (*eallan@uco.edu*), NSELA President, and University of Central Oklahoma, Edmond**Jon Pedersen** (*jep@unl.edu*), University of Nebraska–Lincoln

Walk away with various tools and strategies that support science leaders in their work to enhance teaching and learning in their context.

SESSION 6**You Want Me to Actually Read My Textbook? (Gen)***(High School–College) 127A, Convention Center***Kristi A. Schertz**, Augustus High School, Saugus, Calif.

Bored of PowerPoints? So are your students. Why lecture the material they can read in their textbook? Learn effective alternatives to in-class lecture and ways to ensure students read their books. Ideas include online quizzes, “sticky noting” textbooks, peer discussion, and podcasting lectures. AP students and other students with good reading skills can benefit from these approaches.

SESSION 7**Nonfiction Science Books Add Value to Your Classroom (Gen)***(General) 131B, Convention Center***Donna L. Knoell** (*dknoell@sbcglobal.net*), Educational Consultant, Shawnee Mission, Kans.

Let's discuss the advantages of using nonfiction science trade books to teach science literacy skills, while helping students build essential science knowledge and conceptual understanding. I'll present strategies to help students read informational text, and showcase outstanding science books. Handouts!

SESSION 8**Podcasting and YouTubing Your Way to Student Mastery (Gen)***(General) 131C, Convention Center***Nancy L. Foote** (*nancyfootehigley@gmail.com*), San Tan Elementary School, Gilbert, Ariz.

Don't reinvent the wheel! Use YouTube and podcasts to engage students in learning science. Electronic resources will be given!

SESSION 9



Teaching Sustainability Competencies Through Community Projects (Gen)

(General)

230, Convention Center

Nigel Forrest (nforrest@asu.edu) and **Tamara Lawless** (tlawless@asu.edu), Arizona State University, Tempe

Jessica Hauer (jhauer@tuhsd.k12.az.us), Tempe (Ariz.) Union High School District

Julie Stephan (jstephan@susd.org), Coronado High School, Scottsdale, Ariz.

Let us introduce you to two case studies of teaching sustainability competencies through participation in real-world community projects using a common sustainability problem-solving and transformation framework.

SESSION 10



GIS: Is It the Last Piece of the STEM Puzzle? (Gen)

(General)

231A, Convention Center

Kristi M. Fredrickson (kristi.fredrickson@nau.edu), **Jackie Menasco** (jackie.menasco@nau.edu), and **Lori A. Rubino-Hare** (lori.hare@nau.edu), Northern Arizona University, Flagstaff

Is Geographic Information Systems (GIS) the tool that integrates STEM through all disciplines? Case studies of secondary interdisciplinary teacher pairs will be examined to determine the answer.

11:00 AM–12 Noon Workshops

AAPT Session: The Physics Bus (Phys)

(Elementary–Middle Level)

122B, Convention Center

John “Kip” Perkins (kip.perkins@gmail.co), The Physics Factory, Tucson, Ariz.

Join me for make-and-take physical science projects that motivate children’s interest in science and demonstrate the value of community science workshops.

NABT Session: Using HHMI’s *Bones, Stones, and Genes: The Origin of Modern Humans* (Bio)

(High School–College/Informal)

124B, Convention Center

Mary Page Colvard (mcolvard@tds.net), Deposit, N.Y.

Evidence for human evolution is growing. Join me on a global exploration spanning millions of years to illuminate the rise of modern humans using molecular genetics, the fossil record, and stone tools. Take home the latest Howard Hughes Medical Institute Holiday Lecture DVD and other materials.

ACS Session Three: Rate (Chem)

(High School)

125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Chemistry is about change. Some chemical changes are very slow and others are very fast. How are the rates (speeds) of chemical reactions measured? What are the factors that affect the rates? Are these factors the same as those that are responsible for changes in equilibria? Bring your USB flash drive and take away the presentation and activities to use in your classroom.

NASA’s HIAD Program: Engineering Design in Action (Gen)

(Middle Level–High School)

126B, Convention Center

Rebecca L. Jaramillo (rebecca.jaramillo@nianet.org), National Institute of Aerospace, Hampton, Va.

Use NASA technologies, such as Hypersonic Inflatable Aerodynamic Decelerator (HIAD), to help your students understand engineering and visualize mass properties related to entry, descent, and landing on another world.

Forensic Science: STEM Adventures into the Dark Side (Bio)

(Middle Level–High School)

127B, Convention Center

John A. Giacobbe (jgiacobbe.southpointe@cox.net), Program Coordinator, NSTA Phoenix Area Conference, and South Pointe High School, Phoenix, Ariz.

STEM applications via forensic science as a meta-discipline of scientific inquiry. Lesson examples include analysis of blood and blood spatter to reconstruct a crime scene.

Human Skin Pigmentation and UV Intensity (Bio)

(High School)

127C, Convention Center

Pamela K. Harman (pharman@seti.org), SETI Institute, Mountain View, Calif.

This human evolution activity studies the distribution of patterns of human pigmentation and discovers causal relationship with the environment and natural selection. Take home lesson plan and background resources.

ASEE Session: Putting It Together with Solar Robots (Gen)

(Middle Level–High School) 128A, Convention Center

Jane Hunter (jhunter2@email.arizona.edu), **J. Jill Rogers** (jjillrogers@email.arizona.edu), and **Jim Baygents**, The University of Arizona, Tucson

Jim Colgan, Canyon Del Oro High School, Oro Valley, Ariz.

Presider: Jeffrey B. Goldberg, The University of Arizona, Tucson

This workshop demonstrates formal/informal curricula through which middle school and/or high school students learn about renewable energy, solar technology, and robotics while building solar-powered robots.

ACS Middle Level Session: Density: A Molecular View (Chem)

(Middle Level) 128B, Convention Center

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

Explore the density of different materials to understand how atoms and molecules affect the density of different substances.



NSTA Press® Session: Classroom Activities for Stop Faking It! Energy (Phys)

(Elementary–High School) 129B, Convention Center

Bill Robertson (wrobert9@ix.netcom.com), Bill Robertson Science, Inc., Woodland Park, Colo.

In response to teacher demand, I'm developing a set of classroom activities on energy to accompany the *Stop Faking It! Energy* book. We incorporate the learning cycle in an easy-to-use, teacher-friendly, research-based curriculum for upper elementary and conceptually based high school curricula that can help your students truly understand energy concepts. Join the author for activities from the upcoming book.

Let's Get Well Grounded! (Earth)

(Elementary–High School) 132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

This NESTA workshop presents multiple exemplary activities for the geology classroom that bring fundamental concepts in Earth science to life for your students. Handouts!



The Role of “Drawing” in Supporting Critical Thinking and Science Processes (Gen)

(Elementary) 229A, Convention Center

Marleen L. Lyon (marleenlyon@gmail.com), Tucson (Ariz.) Unified School District

Elizabeth Bouwens (elizabeth.bouwens@tusd1.org), Hollinger Elementary School, Tucson, Ariz.

Illustrating in science notebooks is a key component to aid students in making sense of learning. Engage in drawing and a discussion to better understand this process!

You Are a Paleontologist (Earth)

(Middle Level) 229B, Convention Center

Alexis Marsden and **Kathleen Riley**, All Saints' Episcopal Day School, Phoenix, Ariz.

Presider: Kathleen Riley

Discover this hands-on inquiry-based project for grades 5–8. Students are actual paleontologists uncovering their own fossil, researching its past environment, and then reporting their findings. *Note:* Activities are limited to the first 30 participants.

Saving Energy, Saving Our Night Sky (Earth)

(Elementary–High School) 231B, Convention Center

Constance E. Walker (cwalker@noao.edu) and **Robert Sparks** (rsparks@noao.edu), National Optical Astronomy Observatory, Tucson, Ariz.

Students discover how to conserve energy while preserving dark skies through standards-based, immersive learning experiences illustrating responsible lighting, effects on wildlife, night sky brightness measurements, and more. Teacher's kit available with project sign-up.

11:00 AM–12:30 PM Meeting

NSTA Committee on Multicultural/Equity in Science Education Area Meeting

Laveen A. Sheraton

12 Noon–1:00 PM Workshop

AAPT Session: Ranking Tasks in Physics (Phys)

(High School–College) 122B, Convention Center

Ann Hammersly (ahammersly@susd.org), Chaparral High School, Scottsdale, Ariz.

Ranking tasks are problems that require students to apply and articulate their understanding. I will share samples and you will create your own.



12 Noon–1:15 PM Exhibitor Workshops

Master of Science Degree in Geosciences Available Online Through the Teachers in Geosciences Program (Earth)

(Grades K–12) 123, Convention Center

Sponsor: Mississippi State University

Doug Gillham and **Kathleen M. Sherman-Morris**, Mississippi State University, Mississippi State, Miss.

Discover how you can earn an MS degree via distance learning from Mississippi State University. The 12-course graduate program includes courses in meteorology, geology, astronomy, oceanography, hydrology, environmental geoscience, and a 10-day capstone field course. We have alumni in all 50 states, and all students qualify for in-state tuition rates.

Homeostasis and Diabetes (Bio)

(Grades 6–12) 129A, Convention Center

Sponsor: Science Take-Out

Susan Holt (contact@sciencetakeout.com), Science Take-Out, Pittsford, N.Y.

Experience two simple hands-on activities on homeostasis and diabetes. First, we'll use lab simulations, graphic organizers, and analogies to understand how negative feedback mechanisms are used to maintain homeostasis. Next, we'll analyze simulated blood plasma samples collected during a glucose tolerance test to determine if your patient has Type 1 or Type 2 diabetes.

STEM: Meeting the Standards in Your Classroom

(Gen)

(Grades 6–12)

222C, Convention Center

Sponsor: PASCO scientific

Presenter to be announced

Experience hands-on problem-solving STEM modules that engage students in scientific and engineering practices included in the NRC *Framework*. Not only do these modules incorporate specific Disciplinary Core Ideas and Crosscutting Concepts, they also support the Common Core State Standards for Literacy, Reading, and Math.

Building and Assessing Academic Vocabulary Using Notebook Foldables® (Gen)

(Grades K–12)

226 A–C, Convention Center

Sponsor: Dinah-Might Adventures, LP

Nancy F. Wisker (nancy@dinah.com), Dinah Zike Academy, Comfort, Tex.

Learn by doing in this fast-paced Notebook Foldables session aimed at immersing students in academic vocabulary essential for success. Delve into words in a new way and leave with your own mini comp book constructed on-site filled with immediately usable ideas for teaching and assessing academic vocabulary.

O₂ Understand Photosynthesis and Cellular Respiration! (Bio)

(Grades 9–12)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Barbara Nagle, The Lawrence Hall of Science, University of California, Berkeley

Students have major misconceptions about photosynthesis and cellular respiration, but this content is essential for understanding how matter and energy flows, both at the micro (cellular) and macro (ecosystem) levels. Using a computer simulation, participants will learn to use notebooking and discussion strategies to expose student thinking...all from SEPUP's new *Science & Global Issues* biology program by LAB-AIDS.

Introduction to Wisconsin Fast Plants® (Bio)

(Grades 3–12)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Small, fast-growing Wisconsin Fast Plants (35- to 40-day generation cycle) are ideal classroom tools for exploring

variation and life cycle. Learn how to plant and germinate seeds and about plant growth/development, flower dissection, and hand pollination. These interdisciplinary science materials offer opportunities for student inquiry and learning. Samples included.

The Next Generation of Science Virtual Labs for the Entire Science Curriculum—No Cleanup! (Gen)

(Grades 9–12)

228 A/B, Convention Center

Sponsor: Pearson

Brian Woodfield, Brigham Young University, Provo, Utah
Brian Woodfield, author and creator of Pearson's innovative *Virtual Lab* series, will demo some of his latest eye-popping science virtual labs that are so visually realistic you have to see them to believe them. Whether you are short on time or short on lab materials in the classroom, virtual labs give you the flexibility to experiment. Virtual labs meet your students where they are in the digital world and give them the opportunity to experiment numerous times with various materials and, of course, with no cleanup required.

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12 Noon–1:30 PM Exhibitor Workshops

Light and Optics: A Series of EnLIGHTening Experiments! (Phys)

(Grades 5–12)

222 A/B, Convention Center

Sponsor: CPO Science/School Specialty Science

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

Experience CPO's Optics with Light and Color kit with LED flashlights, a laser, lenses, a mirror, and more. Try color mixing, relate it to human vision, and examine different spectra. We make studying light exciting! Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

Chemistry and Biology with Vernier (Gen)

(Grades 9–College)

223, Convention Center

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will use our new LabQuest 2 with various sensors to conduct experiments from our popular chemistry and biology lab books. LabQuest 2 is our most versatile interface, supporting data collection as a stand-alone device, with a computer, and now with iPad and other mobile technology.

12:30–1:30 PM Presentations

SESSION 1

Raising Chickens in the Grade 1 Classroom and Literature (Bio)

(Preschool–Elementary)

121A, Convention Center

Rita G. MacWilliam (rmacwilliam@gmail.com), Bagdad School, Bagdad, Ariz.

Learn about a step-by-step instruction of a six-week unit on how to incubate and care for chicks in the elementary classroom. Literature and assessment included.

SESSION 2

The Language of Leopold (Bio)

(Middle Level–High School)

122A, Convention Center

Eric M. Proctor (eproctor@azgfd.gov), Arizona Game and Fish Department, Phoenix

Scientist. Author. Innovator. Few have impacted conservation like Aldo Leopold. Yet his work is largely untouched in schools. Learn to bring his writings to life.

SESSION 3

The Scale of the Universe (Earth)

(General)

122C, Convention Center

Jeffrey Bennett (jeff@bigkidsscience.com), Big Kid Science, Boulder, Colo.

How big is the Sun? How far are the stars? The amazing scale of the universe can help you integrate science across your curriculum.

SESSION 4

NABT Session: The Revised AP Biology Course: Understanding the Changes in the Course Audit and New Exam (Bio)

(High School)

124B, Convention Center

Tanya Sharpe (lsharpe@collegeboard.org), The College Board, Duluth, Ga.

Brenda Alston-Mills (alstonmi@anr.msu.edu), Michigan State University, East Lansing

Jennifer Pfannerstill (jennifer.pfannerstill@gmail.com), Tomahawk High School, Tomahawk, Wis.

Join us as we focus on the changes to the course audit and exam for the revised AP Biology course. New course audit requirements will be discussed as well as features of the new exam.

SESSION 5

Bring the Science of Cars into the Classroom (Chem)

(High School)

126A, Convention Center

Andrew G. Nydam (andrewnydam@hotmail.com), Olympia High School, Olympia, Wash.

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

Students love cars but dislike science? Here are some lessons using the car to teach major science concepts. Yes, even if you are mechanically challenged!

SESSION 6

NSELA Session: Tools for Leaders, Part II (Gen)
(General) 126C, Convention Center

Elizabeth Allan (eallan@uco.edu), NSELA President, and University of Central Oklahoma, Edmond

Jon Pedersen (jep@unl.edu), University of Nebraska–Lincoln

The various tools and strategies shared with science leaders in this session support them in their work to enhance teaching and learning in their context.

SESSION 7

NASA's SOFIA Is Flying! Infrared Astronomy Images and Lessons (Earth)

(Middle Level–High School) 127A, Convention Center

Dana E. Backman, NASA Ames Research Center, Moffett Field, Calif.

Join me for the latest astronomical images, lesson plans, and application process information on NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) Airborne Astronomy Ambassador program.

SESSION 8

Authors Needed! Write for an NSTA Journal (Gen)
(General) 130, Convention Center

Ken Roberts, Assistant Executive Director, Journals, NSTA, Arlington, Va.

Meet with journal editors to discuss your article ideas and learn how to prepare and submit an article to an NSTA journal.

SESSION 9

From Standards to Formative Assessment—Maximizing Our Instructional Time (Gen)

(Elementary–High School) 131B, Convention Center

Jennifer Chase (jenniferc@spokaneschools.org) and **Tina Christianson** (tinac@spokaneschools.org), Spokane (Wash.) Public Schools

Learn how to “unpack” state and district standards in order to understand how student learning develops over several grade levels. This evidence of student learning will be transferred into one of several formative assessment templates. Walk away with formative assessment items that can be used in the classroom, as well as a clearer understanding of how standards can help guide instructional decisions.

SESSION 10

Inquiry-based Sustainability Activities (Gen)

(Middle Level–College) 230, Convention Center

Kimberly S. Farah (kfarah@lasell.edu), Lasell College, Newton, Mass.

Join us as we present strategies and successes in implementing inquiry-based sustainability research projects across the curriculum. Share your stories and experiences.

SESSION 11

Yes! You Can Teach Reading and Writing in Science (Gen)

(General) 231A, Convention Center

Larissa Beckstead (lbeckstead@susd.org), Ingleside Middle School, Phoenix, Ariz.

Walk away with practical research-based reading and writing strategies that can be integrated into your science curriculum.

SESSION 12

How to Engage Science Educators in the Public Review of NGSS (Gen)

(General) 231C, Convention Center

Gerry Wheeler (gwheeler@nsta.org), NSTA Interim Executive Director, Arlington, Va.

Ted Willard (twillard@nsta.org), Program Director, COMPASS, NSTA, Arlington, Va.

Zipporah Miller (zmiller@nsta.org), Associate Executive Director, Professional Programs and Conferences, NSTA, Arlington, Va.

Development of the Next Generation Science Standards (NGSS) is well under way. The NGSS are undergoing multiple reviews, including two public drafts, with a final document expected in 2013. NSTA is providing guidance on the project and engaging the science education community in the feedback process. This session will help science educators to become active participants in the review process.

12:30–1:30 PM Workshops

Telling the Science Story: Finding a Common Ground Between the Common Core and Frameworks (Gen)

(Elementary)

121B, Convention Center

Christine A. Royce (caroyce@aol.com), Shippensburg University, Shippensburg, Pa.

Lessons that integrate literacy strategies and science concepts will be modeled with participants and an overview of research and connection to Common Core State Standards provided.

Investigating the Mercalli Intensity Scale (Earth)

(Middle Level–College)

121C, Convention Center

Richard M. Jones (richard.jones@hawaii.edu), University of Hawaii–West Oahu, Kapolei

Earthquakes are typically reported in Richter magnitude scale, which doesn't necessarily relate to the destruction shown in the media. The Mercalli Scale offers another alternative.

ACS Session Four: Catalysis

(Chem)

(High School)

125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Your body is loaded with catalysts that speed up the chemical reactions necessary for life without themselves being used up in the reactions. As we explore the nature of catalysis, keep in mind that one goal of chemistry is creating catalysts to increase the efficiency of the processes involved in producing the goods that help make our lives longer and more pleasant. Bring your USB flash drive and take away the presentation and activities to use in your classroom.

NASA: Dynamic Solar System Models for the Classroom (Earth)

(Middle Level–High School)

127B, Convention Center

Edna K. DeVore (edevore@seti.org), SETI Institute, Mountain View, Calif.

The Human Orrery demonstrates planetary motion with a timescale. Use that understanding to build a model of extra-solar planet detection from classroom materials.

Reach the Higher Levels of Inquiry in Cell Respiration and Photosynthesis Laboratory Investigations in AP Science (Bio)

(High School)

127C, Convention Center

Mark D. Little (mark.little@bvsd.org), Broomfield High School, Broomfield, Colo.

Improve student understanding of photosynthesis and cellular respiration by incorporating more inquiry into Cell Respiration and Photosynthesis labs.

ASCE Session: Introducing Engineering to Elementary School Students (Gen)

(Elementary)

128A, Convention Center

Malinda Zarske (malinda.zarske@colorado.edu), University of Colorado, Boulder

Presider: Jeffrey B. Goldberg, The University of Arizona, Tucson

Become acquainted with the *Engineering is Elementary*® (EiE) program and learn a hands-on way to introduce the engineering design process to any grade level.

ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (Chem)

(Middle Level)

128B, Convention Center

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

Do an activity to explore the first 20 elements of the periodic table and take a fresh look at covalent and ionic bonding.



NSTA Press® Session: Stop Faking It! Finally Understand Chemistry Basics So You Can Teach Them

(Chem)

(Elementary–High School)

129B, Convention Center

Bill Robertson (wrobert9@ix.netcom.com), Bill Robertson Science, Inc., Woodland Park, Colo.

Tired of trying to teach concepts you don't fully understand yourself? Join the author of the *Stop Faking It!* books for hands-on activities from the two chemistry books in the series. Wouldn't it be nice if your students knew why we think atoms look the way we say they do? Sure would!

Our Changing Planet

(Earth)

(Middle Level–High School)

132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

This NESTA workshop introduces 18 free online activities and videos about changes in the Earth system, including three activities we will do together! Handouts!

**Using NASA Press Releases to Develop Literacy in Integrated Science Lessons (Gen)***(Elementary–Middle Level)*

229A, Convention Center

Rebecca L. Jaramillo (rebecca.jaramillo@nianet.org), National Institute of Aerospace, Hampton, Va.**Sharon Bowers** (sharon.bowers@nianet.org), National Institute of Aerospace/Virginia City Beach Public Schools, Hampton, Va.

Use NASA press releases, integrated Space Math problems, and NASA eClips videos to bring current events to life.

**Teaching Engineering Design to Middle School and High School Students Using Chain Reaction STEAM Machines™ (Phys)***(Informal Education)*

229B, Convention Center

Shawn S. Jordan (shawn.s.jordan@asu.edu) and **Odesma Dalrymple** (odesma.dalrymple@asu.edu), Arizona State University, Mesa

Let's explore how to teach the Engineering Design Process to middle school and high school students by designing and building chain reaction STEAM Machines.

Bring Literacy and Science Together: B.L.A.S.T.© for Success at School and Home (Gen)*(Elementary)*

231B, Convention Center

Renee G. O'Leary (vavallme@comcast.net), Holy Angels School, Newark, Del.**Peggy Vavalla** (vavallme@comcast.net), DuPont, 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.

12:30–2:30 PM Workshop**SCST Session: Science Through Application: How Forensic Science Can Get Kids Interested (Gen)***(Middle Level–College)*

124A, Convention Center

Oliver Grundmann (grundman@ufl.edu), University of Florida, Gainesville

Join me for this hands-on workshop that presents forensic science as an interdisciplinary science for teachers to introduce a variety of scientific concepts to students.

1:00–2:15 PM Exhibitor Workshop**Technological Design Standards Meet the STEM Initiative (Gen)***(Grades K–6)*

221B, Convention Center

Sponsor: Delta Education/School Specialty Science

Tom Graika, Consultant, Lemont, Ill.**Johanna Strange**, Consultant, Richmond, Ky.

Learn how a problem-based approach to science lessons can provide opportunity for students to be engaged in activities that incorporate Science, Technology, Engineering, and Math and meet technological design standards. Problem activities from Delta Science Modules will be emphasized. Make and take a variety of prototypes.

1:00–2:30 PM Exhibitor Workshop**Taking Science Outdoors with FOSS K–6 (Gen)***(Grades K–6)*

221C, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

Erica Beck Spencer and **Joanna Snyder**, The Lawrence Hall of Science, University of California, BerkeleyFOSS now reaches beyond the classroom and into your school yard and local environment. Discover how FOSS, 3rd Edition engages children in meaningful outdoor science learning experiences. Participate in outdoor investigations that can apply, extend, and expand classroom content and concepts to the real world. Take home a copy of *Taking FOSS Outdoors*.**1:00–3:00 PM Workshop****AAPT Session: Modeling Energy and Systems in Physics (Phys)***(Middle Level–High School)*

122B, Convention Center

Beverly Trina Cannon (cannonb@hpsid.org), Highland Park High School, Dallas, Tex.

This workshop will walk participants through a modeling instruction approach to thinking and learning about energy.

2:00–3:00 PM Featured Presentation



Building SPEED: Science in the Real World (at 200 mph) (Phys)

(General)

Ballroom 120D, Convention Center



Diandra L. Leslie-Pelecky (*diandra@drdiandra.com*), Professor of Physics, West Virginia University, Morgantown

Presider: Lacey Wieser, Program Representative, NSTA Phoenix Area Conference, and Arizona Dept. of Education, Phoenix

One of the problems science teachers face is a perception (by our students and sometimes ourselves) that science only happens in science classrooms. In reality, virtually everything is profoundly affected by science, including a lot of things we don't normally think of as "science." Motorsports (NASCAR in particular) depend on science for safety and speed—and it often discuss the concepts we teach on television and radio using everyday language. You simply cannot win a race without getting the science right. I'll talk about my experiences with motorsports scientists and engineers, translating complex scientific ideas to make it understandable. Science is more fun at 200 mph!

A group of racecars piloted by the best drivers in NASCAR are turning a corner. Without warning, one of the cars suddenly hits the outside wall. None of the cars touched and there were no engine failures or flat tires...so what happened? This is the question that sparked Diandra Leslie-Pelecky's interest in the science of motorsports. Finding the answers to this and other questions took the physics professor from behind the scenes at top race shops to the asphalt at Texas Motor Speedway.

Diandra Leslie-Pelecky is currently a professor of physics at West Virginia University. Her research focuses on magnetic nanomaterials, structures that are a few thousandths the width of a human hair. The materials she and her research group develop are fundamentally interesting, but also have potential applications in improving magnetic resonance imaging and cancer treatment.

Diandra has extensive experience with science education in K–12 schools, at the college level, and for the general public, including working with inservice and preservice teachers. She blogs about science and cars (at www.buildingspeed.org/blog) and is a weekly guest on Sirius Speedway on SiriusXM NASCAR radio, where she debunks common myths about NASCAR using science and scientific reasoning. Diandra holds a PhD in physics from Michigan State University.

2:00–3:00 PM Presentations

SESSION 1

Using Problem-Based Learning (PBL) to Engage Students in Environmental Science (Gen)

(Elementary–Middle Level)

121A, Convention Center

Barney Peterson (*bpeterson@everettsd.org*), James Monroe Elementary School, Everett, Wash.

Gary Popiolkowski (*garypoprr33@gmail.com*), Chartiers-Houston Junior/Senior High School, Houston, Pa.

Learn to plan and develop problem-based units that tap students' natural fascination with nature and develop an understanding of how our lifestyles affect the environment.

SESSION 2

Forensic Anthropology: Teaching with Bones (Bio)

(Middle Level–High School)

122A, Convention Center

Alison B. Seymour (*seymoura@pvpusd.k12.ca.us*), Ridgecrest Intermediate School, Rancho Palos Verdes, Calif.

Discover a series of lessons that incorporate science, math, and history with hands-on activities and a graveyard crime scene. Lesson handouts provided.

SESSION 3

Linking Science Writing and Research Through the DuPont Challenge (Gen)

(General)

122C, Convention Center

Barbara R. Pietrucha, Earth/Environmental Science Educator, Point Pleasant, N.J.

Come learn a natural way of integrating research and writing into your curriculum that encourages developmental skills necessary for success in STEM and meets local, state, and national standards.

SESSION 4

NABT Session: AP Open Forum (Bio)

(High School)

124B, Convention Center

Tanya Sharpe (*lsharpe@collegeboard.org*), The College Board, Duluth, Ga.

Brenda Alston-Mills (*alstonmi@anr.msu.edu*), Michigan State University, East Lansing

Jennifer Pfannerstill (*jennifer.pfannerstill@gmail.com*), Tomahawk High School, Tomahawk, Wis.

Bring your questions and get them answered! This session will focus on the changes to the AP Biology Curriculum. An overview of the audit, exam, and labs will be presented. College Board instructional materials and professional development opportunities will be highlighted as well.

SESSION 5

Basic Polymer Chemistry for the High School Classroom (Chem)*(High School)* 126A, Convention Center**Debbie Goodwin** (nywin@hotmail.com), Chillicothe High School, Chillicothe, Mo.**Andrew G. Nydam** (andrewnydam@hotmail.com), Olympia High School, Olympia, Wash.

Simple demonstrations, labs, and activities bring polymers into the curriculum and make it relevant. Concepts include formation, classification, structure, and properties. Hand-outs!

SESSION 6

Understanding Earth: A Planetary Science Perspective (Earth)*(Middle Level—College)* 126C, Convention Center**David L. Esker** (david_esker@ymail.com), Pikes Peak Community College, Colorado Springs, Colo.

We gain a better understanding of Earth by first exploring how the planets of our solar system evolved.

SESSION 7

**NSTA Press® Session: Bringing Outdoor Science In (Gen)***(Elementary—Middle Level)* 129B, Convention Center

Steve Rich (bflywriter@comcast.net), NSTA Director, Professional Development, and West GYSTC, Carrollton, Ga. Use natural materials from the school yard to bring science lessons to life as you integrate reading, writing, and mathematics. Explore funding resources and get free seeds.

SESSION 8

Dazzling Deceptions: Discrepant Events That Delight and Mystify! (Gen)*(General)* 131B, Convention Center**Alan J. 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 for kids! Discrepant events build scientific understanding and stimulate creativity.

SESSION 9

Contextualizing STEM Education (Gen)*(General)* 131C, Convention Center

Timothy R. Boyd (tboyd@phxhs.k12.az.us), **Lynn Palacios** (lpalacios@phxhs.k12.az.us), and **Deedee Falls** (falls@phxhs.k12.az.us), Bioscience High School, Phoenix, Ariz.

Join us as we share staff and student reflections on Con-

nection Endeavors, a model for strategic problem solving and service learning through community-based projects at a STEM school.

SESSION 10

**Big Cat Controversy: Issues Provide Context for Rich Learning and Community Building (Gen)***(General)* 230, Convention Center**Lisa K. Herrmann** (lisa.herrmann@gmail.com), Arizona Association for Environmental Education, Phoenix**Eric M. Proctor** (eproctor@azqfd.gov), Arizona Game and Fish Department, Phoenix

Join us as we share effective strategies to support English language arts (ELA) standards and NextGen practices through environmental issue analysis, including evaluating data, analyzing bias, argumentation, relevant investigation, persuasive communication, and consensus building.

SESSION 11

**Developing a Steady Diet of STEM Education Is E.A.S.I. (Gen)***(General)* 231A, Convention Center**Erik W. Hanchett** (erikh@show-low.k12.az.us), Show Low High School, Show Low, Ariz.**Paul R. Anger** (paul.anger@eac.edu), Eastern Arizona College, Safford

Learn how a group of educators called EASI (Eastern Arizona Science Initiative) has successfully developed STEM programs in a rural area covering nine districts.

SESSION 12

Preparing for NGSS—Exploring the Scientific and Engineering Practices (Gen)*(General)* 231C, Convention Center**Ted Willard** (twillard@nsta.org), Program Director, COMPASS, NSTA, Arlington, Va.

The highly anticipated Next Generation Science Standards (NGSS) will include an important new element—scientific and engineering practices—as established in the NRC report, *A Framework for K–12 Science Education*. What are these practices? How are they different or similar to inquiry? How do they work together to form performance expectations in the upcoming NGSS? Come join me and explore these important practices and what it means for science educators. Session participants will have a chance to win a FREE copy of the NRC Framework!

2:00–3:00 PM Workshops

The Carbon Cycle and Bioenergy: Quantitative Modeling with Poker Chips and Student Monitoring of CO₂ (Earth)

(Informal Education)

121B, Convention Center

John M. Greenler (jgreenler@glbrc.wisc.edu), University of Wisconsin–Madison

Understanding the carbon cycle is key to addressing climate change and developing sustainable energy systems, including biofuels. This workshop will involve dynamic active learning activities.

The Multilevel Classroom: Differentiation Strategies for Science (Gen)

(Elementary–High School)

121C, Convention Center

DJ West, Schoolcraft College, Livonia, Mich.

Let's look at a variety of strategies that you can effectively use to impact students that are below level, on level, and above level.

ACS Session Five: Light as a Reactant and/or Product (Chem)

(High School)

125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Some chemical reactions produce energy and others require energy to proceed. Light is a form of energy, so it is natural to wonder whether and under what conditions reactions might produce light or whether light (perhaps from the Sun) could be harnessed to drive reactions that otherwise would not proceed. Bring your USB flash drive and take away the presentation and activities to use in your classroom.

Teaching About Our Human-made World (Env)

(Middle Level–High School)

126B, Convention Center

Sara Jenkins (jenkins37@aol.com), Retired Educator, Litchfield Park, Ariz.

Take part in hands-on activities that explore how our species' population has expanded to dominate Earth and remake the natural world in unprecedented ways.

Seeing the Invisible: Making the Electromagnetic Spectrum (EMS) Concrete (Phys)

(Middle Level–High School)

127B, Convention Center

Christine A. Royce (caroyce@aol.com), Shippensburg University, Shippensburg, Pa.

How do we “see” something that exists but is not visible? This workshop will allow participants to engage in activities that make the EMS a bit more concrete.

Integrating Food Science and Nutrition into Your Science Curriculum (Bio)

(Middle Level–High School/Informal)

127C, Convention Center

Laurie A. Hayes (lhayes@cart.org), Center for Advanced Research and Technology, Clovis, Calif.

Join us in this hands-on workshop as we explore the FDA's free food safety and nutrition curriculum that you can take back to your classroom.

ASEE Session: NASA's BEST Students (Beginning Engineering, Science, and Technology) Build a Buggy to Explore Mars! (Gen)

(General)

128A, Convention Center

Michelle Graf (shellygraf@gmail.com), University of Maryland, Baltimore County, and NASA Goddard Space Flight Center, Baltimore

Presider: Jeffrey B. Goldberg, The University of Arizona, Tucson

Participants design and build a buggy to NASA's specifications. Activity includes the Engineering Design Process, measurement skills, and data representation.

ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (Chem)

(Middle Level)

128B, Convention Center

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

Investigate what makes water a polar molecule and explore how water's polarity affects evaporation and dissolving.

National Earth Science Teachers Association Earth Science Share-a-Thon (Earth)

(Elementary–High School) 132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

Michelle Higgins (mhiggins@girlscoutsoaz.org), Girl Scouts of Southern Arizona, Tucson

Teresa Kennedy, UCAR, Boulder, Colo., and The University of Texas at Tyler

H. Michael Mogil (learning@weatherworks.com), How The Weatherworks, Naples, Fla.

William L. Romine (romine.william@gmail.com), Missouri Valley College, Marshall

Robert Sparks (rsparks@noao.edu), National Optical Astronomy Observatory, Tucson, Ariz.

Mari Westerhausen (mari@azlearns.com), Monterey Park School, Phoenix, Ariz.

Join NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!

Planning and Designing Safe, Sustainable, and Flexible Facilities for STEM-based Science (Science Facilities 101) (Gen)

(General) 229A, Convention Center

LaMoine L. Motz (llmotz@comcast.net), 1986–1987 NSTA President, and Science Education and Facilities Specialist, White Lake, Mich.

Juliana Texley (jtexley@att.net), Palm Beach State College, Boca Raton, Fla.

Sandra West Moody (sw04@txstate.edu), Texas State University, San Marcos

Presider: LaMoine L. Motz

So you want new science facilities? Does your curriculum define your science facility? Hear from experts on planning and designing safe, sustainable, and flexible facilities for STEM-based science. Join the authors of *NSTA Guide to Planning School Science Facilities*, 2nd edition, and learn the “basics” of science facility planning, designing, and budgeting.

Siemens STEM Academy: Top Free STEM Resources for Your Classroom (Gen)

(General) 229B, Convention Center

Kyle Schutt (kyle_schutt@discovery.com), Discovery Education, Silver Spring, Md.

We’ll explore 10 websites that can help you integrate STEM in your teaching—including the Siemens STEM Academy (siemensstemacademy.com)—featuring free resources and professional development opportunities.

Linking Home and School with P.A.S.S. (Portable Affordable Simple Science) (Gen)

(Preschool–Elementary) 231B, Convention Center

Renee G. O’Leary (vavallme@comcast.net), Holy Angels School, Newark, Del.

Peggy Vavalla (vavallme@comcast.net), DuPont, Wilmington, Del.

Discover simple, multisensory, and hands-on early childhood/elementary explorations (preK–2) in zippered plastic bags with take-home and multidisciplinary follow-up. Walk away with sample lesson plans, bags, and follow-up.

SYM-1 Follow-Up Session: Monarch Life Cycles and Raising Monarchs in Captivity (Env)

(Elementary–High School) South Mountain, Sheraton

Dolores Cansler (decansler@gmail.com) and **Ann Hobbie**, University of Minnesota Dept. of Fisheries, Wildlife, and Conservation Biology, St. Paul

Presider: Jim O’Leary (oleary@mdsci.org), Maryland Science Center, Baltimore

Observe live monarchs throughout their life cycle to learn about their biology and how you can raise these fascinating organisms in your classroom!

2:00–3:15 PM Exhibitor Workshops

Detecting Radiation in Our Radioactive World

(Gen)

(Grades 4–12)

123, Convention Center

Sponsor: American Nuclear Society

Toni Bishop (outreach@ans.org), American Nuclear Society, La Grange Park, Ill.

Discover how to use Geiger counters to detect radioactivity and teach the principles of nuclear science. Expand your knowledge of ways nuclear technology is applied in the everyday life of our society.

Hurricanes and Volcanoes

(Earth)

(Grades 4–12)

129A, Convention Center

Sponsor: Simulation Curriculum Corp.

Herb Koller (hkoller@simcur.com), Simulation Curriculum Corp., Minnetonka, Minn.

What are hurricanes and how are they formed? Why are volcanoes common in certain parts of the world? With *The Layered Earth*, students can visualize, measure, and manipulate these forces of nature as well as basic concepts of geology and meteorology using a virtual model of Earth.

Investigating Motion: Understanding and Interpreting Graphs

(Phys)

(Grades 6–12)

222C, Convention Center

Sponsor: PASCO scientific

Presenter to be announced

Gain a deeper understanding of motion by graphing and interpreting real-time data. Explore the differences between speed and velocity in this hands-on, probeware-based workshop featuring PASCO carts and the new PASTrack Dynamics Systems. Your experience will include the use of one of PASCO's standards-based SPARKlabs to improve student understanding of motion, a foundation topic in the study of physics and physical science. Extensions to other activities will also be demonstrated.

Chemistry in the Community, 6th Edition—Changing with the Times

(Chem)

(Grades 9–College)

226 A–C, Convention Center

Sponsor: American Chemical Society

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

Think you know ChemCom? Think again. Want your students thinking scientifically and learning how chemistry

has an important role in their everyday lives? Learn about the exciting new features in the 6th edition of this engaging and groundbreaking chemistry text. We will perform text activities, share supplemental resources, and give prizes!

Color, Spectrophotometry, and Teaching the Structure of the Atom

(Chem)

(Grades 9–12)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Brandon Watters, Lakes Community High School, Lake Villa, Ill.

How do we teach topics such as electron configurations—that were graduate school material a generation ago—so that high school students can learn and understand them? Walk away with some effective ways to teach the structure of the atom. Using a user-friendly spectrophotometer, explore how light interacts with dyes. Then use unique spectrum cards to show how atoms, color, and spectra are related, making a conceptual bridge between a core chemical technology—making dyes—and the fundamental structure of the atom.

Hands-On Activities to Explore Environmental Change

(Env)

(Grades 9–12)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Simulate how human influence effects habitat degradation in a terrestrial ecosystem. Model how global warming and ocean acidification affect marine habitats. Investigate the advantages and disadvantages of four different population sampling methods. These real-world scenarios will challenge and engage your students. Door prizes!

Going Green: Economical and Environmentally Friendly Inquiry in Chemistry

(Chem)

(Grades 9–12)

228 A/B, Convention Center

Sponsor: Pearson

Ed Waterman, Retired Educator, Fort Collins, Colo.

Learn how to implement safe, simple, easy-to-set-up, material-conserving, time-efficient, and effective inquiry activities in chemistry with safety and differentiation built in. Each activity teaches core content and fosters problem solving, creativity, and invention. Encourage students to design and carry out original experiments not possible with traditional methods.

2:00–3:30 PM Exhibitor Workshops**Sound, Waves, and Music (Phys)***(Grades 5–12) 222 A/B, Convention Center*

Sponsor: CPO Science/School Specialty Science

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

Create standing wave patterns on a vibrating string with CPO's wave machine. Use a synthesizer to explore the wave properties of sound and play some music and learn how to make your own instruments. Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

Physics and Physical Science with Vernier (Phys)*(Grades 9–College) 223, Convention Center*

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will use our new LabQuest 2 with various sensors to conduct experiments from our popular physics and physical science lab books. LabQuest 2 is our most versatile interface, supporting data collection as a stand-alone device, with a computer, and now with iPad and other mobile technology.

2:00–4:30 PM Exhibitor Workshop**Bio-Rad: Crime Scene Investigator PCR Basics Kit (Bio)***(Grades 10–College) 221A, Convention Center*

Sponsor: Bio-Rad Laboratories

Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.

Which human DNA sequences are used in crime scene investigations, and why? In this hands-on workshop, you will learn to use the polymerase chain reaction (PCR) and gel electrophoresis to identify which suspects can be exonerated—based on DNA evidence. Learn how the statistics of chance are integral to modern DNA fingerprinting.

2:00–5:00 PM Short Courses**Literacy Tools for Science Learning (SC-3)***(Grades K–8)**Camelback B, Sheraton***Tickets Required: \$21**

Joan Gilbert (joan.gilbert@tusd1.org) and **Marleen L. Lyon** (marleen.lyon@tusd1.org), Tucson (Ariz.) Unified School District

For description, see page 37.

**Developing a “Naturalist” Approach in the Teaching of Science Concepts and Inquiry (SC-4)***(General)**Estrella, Sheraton***Tickets Required: \$76**

William J. Klein (wjmsklein@aol.com), Western Iowa Tech Community College, Sioux City

For description, see page 37.

3:00–4:00 PM Presentation**SESSION 1****AAPT Session: Engineering Wind Turbines: A STEM Application for Physics and Engineering Students (Phys)***(High School)**122B, Convention Center*

Ann Hammersly (ahammersly@susd.org), Chaparral High School, Scottsdale, Ariz.

Physics and engineering students work in tandem to build and optimize model wind turbines, examining ways to improve efficiency for this green energy resource.

3:00–4:00 PM Exhibitor Workshop**Fossil Evidence: A Preview of FOSS Earth History, 2nd Edition for Middle School (Earth)***(Grades 5–8)**221C, Convention Center*

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

Explore the concept of index fossils through a brief hands-on activity and multimedia, and identify connections to the NRC Framework. Be among the first to preview the newly revised FOSS Earth History course, including new features, strategies, content, and materials.

3:30–4:30 PM Presentations

SESSION 1

In the Wake of the Wallow Fire (Env)

(Elementary) 121A, Convention Center

Jennifer DeBenedetti (jdebenedetti@cfsd16.org), Manzanita Elementary School, Tucson, Ariz.

Eric M. Proctor (eproctor@azgfd.gov), Arizona Game and Fish Department, Phoenix

A multidisciplinary elementary school unit was developed following the largest wildfire in Arizona's history. Learn how we integrated language, science, social studies, math, and more.

SESSION 2

A Sense of STEM: A Quality Approach to Teacher Professional Development (Gen)

(Elementary–Middle Level/Supv.) 122A, Convention Center

Matthew J. Adamson, The University of Arizona Biosphere 2, Tucson

Gregory D. Stafford, Desert Ridge High School, Mesa, Ariz.

This overview of professional development allows participants to work alongside field scientists, mathematicians, and engineers to better understand real-world applications, thus translating to real learning for their 21st-century students.

SESSION 3

2012 Preservice Science Standards for Preservice Teachers by NSTA and the National Council for Accreditation of Teacher Education (Gen)

(College) 122C, Convention Center

William R. Veal (vealw@cofc.edu), College of Charleston, S.C.

Join me as I present the new 2012 NSTA/NCATE Preservice Science Standards for science teacher preparation and the assessments for data collection.

SESSION 4

Flipping Your Classes (Chem)

(General) 126C, Convention Center

Brenda A. Wolpa (bwolpa@salpointe.org), Salpointe Catholic High School, Tucson, Ariz.

Jill R. Christman (jchristm@amphi.com), Canyon Del Oro High School, Oro Valley, Ariz.

Find out what flipping is and is not, how we do it, why we do it, the advantages, and what students think.

SESSION 5

Integrating Technology into the Classroom (Gen)

(General) 127A, Convention Center

Sabrina M. Helm (sabrina.helm@dcs.edu), Cedar Ridge Middle School, Decatur, Ala.

Come find out how to successfully integrate technology into the classroom in an easy, uncomplicated way using what you have and exploring innovative technologies. Learn some ways to get technology into the classroom on a budget.

SESSION 6

Siemens We Can Change the World Challenge: Top Free STEM Resources for Your Classroom (Env)

(General) 130, Convention Center

Kyle Schutt, Discovery Education, Silver Spring, Md.

Are you looking for new ideas to integrate STEM learning into your classroom? Join us as we explore numerous free STEM resources that will excite your students, including the Siemens We Can Change the World Challenge (wecanchange.com), a project-based learning environmental challenge with corresponding curriculum.

SESSION 7

Magical Illusions for Science Teachers (Gen)

(General) 131B, Convention Center

Alan J. 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 children's interest and imagination, and build creative and logical thinking skills.

SESSION 8

Teaching with Screen-Capture Podcasts (Gen)

(General) 131C, Convention Center

Wendy Van Norden (wvannorden@hw.com), Harvard-Westlake School, Studio City, Calif.

Learn how to turn science lessons into short screen-capture podcasts that your students can watch and take notes at their own pace.

SESSION 9

Engaging K–6 Science Students with Scientific Inquiry—Supported by Science Literacy Skills and Extraordinary Print Resources (Gen)*(Elementary)* 230, Convention Center**Donna L. Knoell** (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.

Learn about strategies to engage K–6 science students while teaching science literacy skills, science process skills, and hands-on explorations in tandem, stimulating inquiry and developing student competence.


SESSION 10

**Inspiring Students of All Ages Through FIRST® Robotics (Gen)***(Elementary–High School)*

231A, Convention Center

Christine M. Sapio (csapio@fusedl.org), Coconino High School, Flagstaff, Ariz.**David Thompson** (david.thompson@nau.edu), Northern Arizona University, Flagstaff

FIRST Robotics has inspired thousands of students in grades 2–12 in 50 countries during the last 20 years. This session will feature current FIRST students and robots from all levels.



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3:30–4:30 PM Workshops

Engaging Students in PBLs (Problem-Based Learning) (Gen)

(Elementary–Middle Level) 121B, Convention Center

Eileen Patrick, STEM Magnet Lab School, Northglenn, Colo.

Learn to engage your students in authentic PBLs by actively participating in one. We will also discuss how to select panel participants and rubrics.

Focus on Forests: Project Learning Tree's New Secondary Curriculum (Env)

(High School–College/Informal) 121C, Convention Center

Jaclyn Stallard (jstallard@plt.org) and **Al Stenstrup** (astenstrup@plt.org), Project Learning Tree, Washington, D.C.

Learn how secondary students can explore the major issues facing forests today—climate change, invasive species, fire, land ownership, management, and more. Participants receive Project Learning Tree's new *Exploring Environmental Issues: Focus on Forests* activity guide and resource materials.

NABT Session: Creating Student Excitement for the Nature of Science (Bio)

(Middle Level–High School) 124B, Convention Center

Sandie Grinnell (sgrinnell@fusdl.org), Mount Elden Middle School, Flagstaff, Ariz.

Brenda L. Harrop (brenda.harrop@nau.edu), **Alexandra Keller** (apk23@nau.edu), and **Catherine Ueckert** (ueckert@nau.edu), Northern Arizona University, Flagstaff
Robert Woodruff, Flagstaff Arts and Leadership Academy, Flagstaff, Ariz.

In this workshop, engage in various activities that demonstrate how authentic research and the processes of science can be incorporated into middle school and secondary classrooms. Handouts!

ACS Session Six: Half-Life (Chem)

(High School) 125 A/B, Convention Center

Jerry Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Half-life is familiar as a way of characterizing the decay of radioactive nuclei and using radioactive isotopes as “clocks” to date past events. The concept of half-life is broader than this and applicable to many changes that are easy to explore safely in the classroom. Bring your USB flash drive and take away the presentation and activities to use in your classroom.

Using Challenges to Frame Learning in the Science Classroom (Env)

(High School) 126B, Convention Center

Shoshanna Kroeger (shokroeger@gmail.com) and **Quintin Boyce** (quintin.boyce.bhs@gmail.com), Bioscience High School, Phoenix, Ariz.

Learn to develop engaging unit challenges based on real community issues that can guide student learning and create a meaningful storyline for your course.

Effective Professional Development with NSTA Resources (Gen)

(General) 127B, Convention Center

Steve Rich (bflywriter@comcast.net), NSTA Director, Professional Development, and West GYSTC, Carrollton, Ga. Professional development providers will get tips from the PD committee on effective use of NSTA Press® books and other resources that boost teachers' content knowledge and pedagogy.

Squeezing GLUE-GOO into the National Science Education Standards (Chem)

(Informal Education) 127C, Convention Center

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

Make your own “slime” from grocery store supplies. Learn the science behind this popular activity as strategies for extended inquiry into a cooperative physical science project are modeled.

ASEE Session: Developing and Publishing Standards for Professional Development for K–12 Teachers of Engineering (Gen)

(Elementary–High School) 128A, Convention Center

Louis Nadelson, Boise State University, Boise, Idaho
President: **Jeffrey B. Goldberg**, The University of Arizona, Tucson

Participate in a focus group and provide feedback on the developing standards to prepare and enhance the capacity for K–12 teachers to teach engineering.

ACS Middle Level Session: Chemical Change: Breaking and Making Bonds (Chem)

(Middle Level) 128B, Convention Center

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

Explore the production of a gas, a precipitate, and changes in temperature as a result of chemical reactions.



NSTA Press® Session: Writing Stories for Teaching Science Practices (Gen)

(Elementary–High School) 129B, Convention Center

Richard D. Konicek-Moran (konmor@comcast.net), Professor Emeritus, University of Massachusetts, Amherst
Try writing your own mystery story to teach a favorite or difficult science concept. Get coaching from the author of *Everyday Science Mysteries*.

National Earth Science Teachers Association Rock and Mineral Raffle (Earth)

(General) 132 A–C, Convention Center

Roberta M. Johnson (rmjohnsn@netanet.org), National Earth Science Teachers Association, Boulder, Colo.

NESTA offers more than 50 specimens to choose from for a chance to win display-quality specimens of rocks, minerals, fossils, and other Earth science–related materials.

The Architects Have Started Without Me—What Do I Do Now? (Science Facilities 102) (Gen)

(General) 229A, Convention Center

LaMoine L. Motz (llmotz@comcast.net), 1986–1987 NSTA President, and Science Education and Facilities Specialist, White Lake, Mich.

Juliana Texley (jtexley@att.net), Palm Beach State College, Boca Raton, Fla.

Sandra West Moody (sw04@txstate.edu), Texas State University, San Marcos

Presider: LaMoine L. Motz

Is your district planning new science facilities? Learn about budgeting, working with the architect, space requirements, technology, flexibility, safety, new types of spaces, and special adjacencies. In an advanced course (an extension of Science Facilities 101, page 99), the NSTA author team of *NSTA Guide to Planning School Science Facilities*, 2nd edition, will present more detailed information and examples of functional and flexible science spaces for STEM-based science. Resource packet available.

Facing the Future: Fueling the Future (Env)

(Middle Level–High School) 229B, Convention Center

Pamela Whiffen (pwppwr@aol.com), NASA Educator Ambassador/Carl Hayden High School, Phoenix, Ariz.

Experience a selection of hands-on, inquiry-based activities designed to explore the topic of sustainability. Free CD-ROM with complete lesson plans.

Amazing Aircraft (Phys)

(Elementary) 231B, Convention Center



Jon Welte, Hiller Aviation Museum, San Carlos, Calif.

Amy Welte, Fairmont Private School, Santa Ana, Calif.

Take your students on an aerial adventure in science! Experiment with forces using inexpensive gliders, airplanes, and helicopters in this exciting make-and-take workshop.

SYM-1 Follow-Up Session: Classroom Lessons with Monarchs (Env)

(Elementary–High School) South Mountain, Sheraton

Dolores Cansler (decansler@gmail.com) and **Ann Hobbie**, University of Minnesota Dept. of Fisheries, Wildlife, and Conservation Biology, St. Paul

Presider: Jim O'Leary (oleary@mdsci.org), Maryland Science Center, Baltimore

After a brief overview of the monarch's life cycle, we will demonstrate different activities and lessons involving monarchs. Take-home instructions will be available!

4:00–5:00 PM Workshop

AAPT Session: The Box Game: Modeling Simple Nonlinear Systems Using Cellular Automata

(Phys)

(Middle Level–High School) 122B, Convention Center

Steven Weiner (sweiner@chandlerprep.org), Chandler Preparatory Academy, Chandler, Ariz.

This workshop will present a method for introducing students to the fundamental concepts of nonlinear dynamics in a manner that is fun, interactive, and not resource-intensive... and that allows students to visually explore the world of complex systems.

4:00–5:15 PM Exhibitor Workshops

LEGO® MINDSTORMS® NXT Basic Training Workshop (Phys)

(Grades 4–12)

123, Convention Center

Sponsor: LEGO Education

Brian Boufard (brian@edurobotech.com), EduRoboTech, San Tan Valley, Ariz.

Investigate the power of LEGO MINDSTORMS Education NXT-G software as you learn how to combine a graphics-based programming language with LEGO Technic elements. This workshop is designed to help you feel comfortable introducing a hands-on approach to science, technology, engineering, and math in grades 4–12.

The Archaeology of Cactus Ruin: A Paper Excavation (Gen)

(Grades 6–12)

124A, Convention Center

Sponsor: Crow Canyon Archaeological Center

Marjorie Connolly (mconnolly@crowcanyon.org), Crow Canyon Archaeological Center, Cortez, Colo.

Looking for an easy way to explain sampling strategies to your students? Come take on the role of an archaeologist by excavating a paper site.

Integrate! A Better Way to Teach and Learn (Gen)

(Grades 2–6)

129A, Convention Center

Sponsor: Wireless Generation

Traci Wierman and **Carrie Strohl**, The Lawrence Hall of Science, University of California, Berkeley

Explore pedagogical approaches to integration focusing on the synergies between science and literacy from the Seeds of Science/Roots of Reading® program. Developed at The Lawrence Hall of Science, this program is designed to reflect the practices of real scientists and meet the needs of all students.

Exploring Renewable Energy: A Hands-On STEM Investigation (Env)

(Grades 9–12)

222C, Convention Center

Sponsor: PASCO scientific

Presenter to be announced

Experience a hands-on, relevant problem-solving STEM lesson that engages students in scientific and engineering practices included in the NRC *Framework*. In this hands-on workshop featuring the Horizon Renewable Energy SPARKlab® collection, measure energy output from your designed wind turbine under varying environmental conditions. The potential of renewable energy resources is also explored.

High School Biology in a Digital World: Critical Thinking Trumps Information Overload (Bio)

(Grades 9–12)

226 A–C, Convention Center

Sponsor: Discovery Education

Wendy Raymond, Williams College, Williamstown, Mass.

Join Wendy Raymond, Discovery Education senior biology consultant, in exploring the excitement of biology education in a digital world. Learn why some students with the best high school science grades often struggle in college courses and what may be done to provide a stronger high school science foundation.

Power Up! Investigating Electric Motors (Phys)

(Grades 6–8)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Lisa Kelp and **Vicki Jackson**, LAB-AIDS, Inc., Ronkonkoma, N.Y.

How do electric motors work? What is the relationship between electricity and magnetism? Although modern life as we know it would be inconceivable without them, most students do not have a good idea of how electric motors—and generators—work. In this activity, from the Energy unit of the SEPUP middle level program *Issues & Physical Science*, students make and operate a small battery-powered electric motor, then disconnect the battery and reverse the leads to use the motor to light a small LED. Participants will receive a sample kit and print materials.

Engineering, Technology, and the Application of K–8 Science (Gen)

(Grades K–8)

227 B/C, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Ready to prepare your district's students for STEM careers? Using practical applications of science skills from inquiry-based lessons, learn how to collaborate your science resources and translate them into best practice engineering processes.

4:00–5:30 PM Exhibitor Workshop**Chemistry and the Atom: Fun with Atom-building Games! (Chem)***(Grades 5–12) 222 A/B, Convention Center*

Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman, CPO Science/School Specialty Science, Nashua, N.H.

Understanding abstract concepts about atoms can be difficult. Use our model to experience innovative games and activities that present students with opportunities to grasp atomic structure and its connection to the periodic table. Take away STEM activities and an understanding of how to incorporate science and engineering practices into your lessons.

5:00–5:30 PM Presentations**SESSION 1****Critical Thinking Through Science via Technology (Gen)***(Middle Level) 126A, Convention Center***Peter Rillero** (*rillero@asu.edu*), Arizona State University, Phoenix

Enhance critical thinking for better science, living, and exam performance through science experiences with technology. See a demonstration of several virtual resources for content, process skills, and critical thinking.

SESSION 2**Using Stories to Teach Chemistry (Chem)***(High School) 127A, Convention Center*

Marta U. Gmurczyk (*m_gmurczyk@acs.org*) and **Patrice Pages** (*p_pages@acs.org*), American Chemical Society, Washington, D.C.

Students learn core chemistry concepts in their classrooms but often may wonder how and why those concepts are relevant to their lives. Science stories may be a powerful tool to illustrate chemistry concepts, convey their relevance, educate students on real-world problems, and enhance their reading abilities. Examine how magazine articles about science can be used to help students understand basic chemistry concepts and enrich their ability to apply what they have learned to everyday life.

5:00–6:00 PM Presentations**SESSION 1****Expanding STEM Literacy at the K–3 Level Through Children’s Literature (Gen)***(Elementary) 126C, Convention Center***Chris Ciuca** (*chris.ciuca@gmail.com*), SAE International, Warrendale, Pa.

Explore common language arts teaching techniques as a basis for standards-based implementation of interdisciplinary STEM literacy-based educational experiences for K–3 students.

SESSION 2**Oceans of Professional Development Opportunities Through NOAA (Gen)***(General) 131B, Convention Center***Britta Culbertson** (*culbertsonb@einsteinfellows.org*), Einstein Fellow, NOAA Office of Education, Washington, D.C.

Are you looking for professional development opportunities for STEM, oceans, climate, or weather? NOAA has several opportunities varying from a weekend to an entire year.

SESSION 3**MY NASA DATA: Earth Systems Data Visualization Tool for Students (Earth)***(Elementary–High School) 131C, Convention Center***Tina M. Rogerson** (*tina.m.rogerson@nasa.gov*), SSAI/NASA Langley Research Center, Hampton, Va.

Engage your students in using MY NASA DATA as a visualization tool for NASA Earth systems satellite data. Plenty of online lessons and great handouts!

SESSION 4**Teaching with Google Earth (Earth)***(General) 230, Convention Center***Wendy Van Norden** (*wvannorden@hw.com*), Harvard-Westlake School, Studio City, Calif.

Join me for an introduction of basic uses of Google Earth. I’ll demonstrate techniques such as adding placemarks, pictures, overlays, and polygons and embedding videos. Examples of Earth science Google Earth exercises will be highlighted.

5:00–6:00 PM Workshops

AAPT Session: Solving Kinematics Problems Using Graphical Methods (Phys)

(High School)

122B, Convention Center

Seth Guinals-Kupperman (sguinals@schools.nyc.gov), High School for Mathematics, Science and Engineering, New York, N.Y.

Practice solving kinematics problems exclusively through graphical methods.

Molecules, Energy Transfer, and Microbes Promote Inquiry (Bio)

(Middle Level–High School)

126B, Convention Center

John W. Fedors (jfedors@wavecable.com), Science Activities, Lincoln, Calif.

Readily available stuff to stimulate inquiry. Your participation encourages sharing with your students and developing your unique comfortable presentations.

Polydensity Tube Make–Learn–Take: Serious Fun with a Dense Subject (Chem)

(Informal Education)

127C, Convention Center

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

Come make a bottle with solids floating or sinking in two immiscible liquids using grocery store materials. No oil used, so layers separate cleanly and quickly. Free supplies.



Facing the Future: Global Connections and Sustainability (Env)

(Middle Level–High School)

229B, Convention Center

Pamela Whiffen (pwpwr@aol.com), NASA Educator Ambassador/Carl Hayden High School, Phoenix, Ariz.

Experience a selection of hands-on, inquiry-based activities that are easily adjusted for a variety of grade levels. Free CD-ROM with entire book provided.



Understanding Nuclear Energy (Chem)

(High School)

231A, Convention Center

Caryn Turrel (cturrel@need.org), The NEED Project, Manassas, Va.

Discover hands-on activities focusing on nuclear energy and technology in the nuclear industry. Lessons include understanding atomic weight and chain reactions.

Conjure a Class That Bonds Discipline with Academics (Gen)

(General)

231B, Convention Center

Betsy Pozzanghera (betsy@anotherwayteaching.com), Another Way Teaching, Tumwater, Wash.

Learn strategies for managing minor classroom misbehaviors, including techniques that eliminate gimmicks, reduce teacher stress, and work for students. Regain 5–9 hours of your instruction time!



Introducing our self-contained, portable saltwater touch tank!

- Seeing and touching exotic marine animals is a great way to engage your class
- The tank is fully self-contained. All the equipment needed to support marine life is hidden inside the base. Simply plug it in!
- Detailed instruction manual helps you maintain good water quality and healthy animals
- The tank is on casters and fits through typical doorways. Roll it wherever you need it!



Observing marine life is a fascinating learning experience, but field trips to the local aquarium may be a thing of the past. Introducing a portable touch tank that's the perfect solution!

Specifically designed by our aquarist to recreate a saltwater environment, it's a tiny block of ocean on wheels. Fill it with water, stock it with creatures and wheel it through the door and down the hall, from classroom to classroom.

The reinforced 1/2" thick acrylic corners and sides hold everything in place, while the open top allows students to observe and examine the wonders inside. An extra-wide rim around the edge prevents creatures from escaping. Tank measures 60 x 30 x 14", holds over 100 gallons and stands 44" high from top to wheels. Black ABS plastic base conceals included pumps, UV sterilizer, bioreactors and skimmers that keep the water fresh and pure. Heavy-duty locking casters. Complete instructions with detailed list of recommended animals. *Ships motor freight.*

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—Photo courtesy of Greater Phoenix Convention and Visitors Bureau

8:00–9:00 AM Presentation

SESSION 1

STEMulate—Engage and Inspire! (Gen)

(Middle Level) 121A, Convention Center

Helen Padgett (helen.padgett@asu.edu), Arizona State University SkySong, Scottsdale

Are you looking for ways to integrate STEM education into your classroom or school? Learn easy-to-implement strategies to “STEM up” your class or school!

SESSION 2

STEM Stars: Community Collaboration (Gen)

(General) 122A, Convention Center

Freda Vine (fvine10@gmail.com), Clark County School District, Las Vegas, Nev.

How can we build 21st-century STEM leadership through creative collaboration with community? Learn about successful initiatives connecting schools, local community, businesses, and government.

SESSION 3

Understanding the Revised AP Biology Course: Curriculum, Science Practices, and Instructional Design (Bio)

(High School–College) 126A, Convention Center

Tanya Sharpe (tsharpe@collegeboard.org), The College Board, Duluth, Ga.

Brenda Alston-Mills (alstonmi@anr.msu.edu), Michigan State University, East Lansing

Jennifer Pfannerstill (jennifer.pfannerstill@gmail.com), Tomahawk High School, Tomahawk, Wis.

Presider: Tanya Sharpe

AP Biology Development Committee members will provide an overview of the changes to the revised course, which include changes to the curriculum, labs, and exam.

SESSION 4

Cyberlearning: Bringing the Science Classroom Closer to STEM (Bio)

(High School) 126C, Convention Center

Gwendolyn J. Jefferson (gjeffers@rialto.k12.ca.us), Wilmer Amina Carter High School, Rialto, Calif.

Discover ways to effectively use technology with the Vocabulary, Assignments, Projects, and Labs (VAPL) scaffolding method that uses the concepts of STEM. See a paperless classroom use technology to motivate and engage all students.

SESSION 5

Exploring the 2012 ACS Guidelines and Recommendations for Teaching High School Chemistry (Chem)

(High School/Supervision) 230, Convention Center

Terri M. Taylor (t_taylor@acs.org) and **Michael T. Mury** (m_mury@acs.org), American Chemical Society, Washington, D.C.

Ami LeFevre (amilef@d219.org), Niles West High School, Skokie, Ill.

Doug Sawyer, Scottsdale Community College, Scottsdale, Ariz.

Featuring strategies for teaching high school chemistry, the 2012 ACS Guidelines and Recommendations for Teaching High School Chemistry is a useful resource for strengthening high school chemistry programs.

SESSION 6



Teaching Problem-solving Strategies in the Elementary Classroom: Helping Students See the Interconnectedness of Science, Technology, Engineering, and Mathematics (Gen)

(Elementary) 231A, Convention Center

Donna L. Knoell (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.

I’ll identify and discuss essential problem-solving strategies and process skills, and demonstrate how to develop these process skills across the curriculum. Handouts!

The Downtown Phoenix Visitor Information Center located at the Convention Center West Building (across from Hyatt Regency) is open Monday–Friday, 9:00 AM–5:00 PM to assist with making restaurant reservations as well as providing maps, travel guides, tickets to local attractions, and information on what there is to do in the city.

8:00–9:00 AM Workshops

A Portable/Traveling Human Orrery (Earth)

(Informal Education) 121B, Convention Center

Larry A. Lebofsky (lebofsky@lpl.arizona.edu) and **Michelle Higgins** (mhiggins@girlscoutsoaz.org), Girl Scouts of Southern Arizona, Tucson

Don W. McCarthy (dwmccarthy@gmail.com), The University of Arizona, Tucson

Model the daily and yearly motions of the planets and constellations using a student-driven orrey (moving model of the solar system).

Stellar Evolution—From Formation to Destruction (Earth)

(General) 121C, Convention Center

Donna L. Young (donna@aavso.org), NASA/Chandra EPO Office, Cambridge, Mass.

Use beautiful multiwavelength images of stellar nurseries, protostars, supernova remnants, planetary nebulae, neutron stars, pulsars, and black holes to investigate the stages of stellar evolution.

Playing Games to Learn Complex Environmental Science Concepts (Env)

(High School) 126B, Convention Center

Kristen R. Dotti (kristen_dotti@yahoo.com), Christ School, Arden, N.C.

Playing the role of a coal-fired power plant owner, students learn cap-and-trade principles, sulfur-reduction techniques, cost-cutting measures, and the terminology of the industry.

Using Inquiry to Teach Plate Tectonics (Earth)

(Middle Level–High School) 127B, Convention Center

Davida Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.

Join The Geological Society of America as we share inquiry-based lessons to improve student understanding of plate tectonic boundaries characteristics and the resulting features.

Polymers: New Twists on Old Favorites (Chem)

(Middle Level–High School) 127C, Convention Center

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

Andrew G. Nydam (andrewnydam@hotmail.com), Olympia High School, Olympia, Wash.

Enhance and deepen science and math concepts taught in traditionally “fun” polymer labs—add more scientific processes to make them inquiry based. Come participate and pick up complete handouts.



NSTA Press® Session: Classroom Activities for *Stop Faking It! Force & Motion* (Phys)

(Elementary–High School) 129B, Convention Center

Bill Robertson (wrobert9@ix.netcom.com), Bill Robertson Science, Inc., Woodland Park, Colo.

In response to teacher demand, there is now a set of classroom activities on force and motion to accompany the *Stop Faking It! Force & Motion* book. We incorporate the learning cycle in an easy-to-use, teacher-friendly, research-based curriculum for upper elementary and conceptually based high school curricula that can help your students truly understand force and motion concepts. Join the author for activities from the book. Lamé jokes quite possible.



Science + Literacy = Student Achievement (Gen)

(General) 229A, Convention Center

Eileen Patrick, STEM Magnet Lab School, Northglenn, Colo.

Learn some literacy and vocabulary strategies to strengthen your students’ literacy skills while doing science or any content area.



How Does Your Garden Grow? (Env)

(Preschool–Middle Level) 229B, Convention Center

Juliana Texley (jtexley@att.net), Palm Beach State College, Boca Raton, Fla.

Steve Rich (bflywriter@comcast.net), NSTA Director, Professional Development, and West GYSTC, Carrollton, Ga. A school or community garden represents an ideal way to integrate across the elementary curriculum. We’ll share lessons, plans, and trade books for any space or any school.

8:00–9:15 AM Exhibitor Workshops**FDA Food Science Workshop (High School) (Bio)***(Grades 9–College)* 223, Convention Center

Sponsor: FDA Center for Food Safety and Applied Nutrition

Laurie A. Hayes (*lhayes@cart.org*), Center for Advanced Research and Technology, Clovis, Calif.**Susan E. Hartley** (*semumford-hartley@aps.k12.co.us*), Hinkley High School, Aurora, Colo.

Come learn about FDA's free food safety curriculum and related materials that you can use in your classroom. Participate in hands-on activities about food science and nutrition that you can take back to your students. Learn from experienced teachers who have worked extensively with FDA's Center for Food Safety and Applied Nutrition.

O₂ Understand Photosynthesis and Cellular Respiration! (Bio)*(Grades 9–12)* 227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Barbara Nagle, The Lawrence Hall of Science, Berkeley, Calif.

Students have major misconceptions about photosynthesis and cellular respiration, but this content is essential for understanding how matter and energy flows, both at the micro (cellular) and macro (ecosystem) levels. Using a computer simulation, participants will learn to use notebooking and discussion strategies to expose student thinking...all from SEPUP's new *Science & Global Issues* biology program by LAB-AIDS.

Teaching Earth and Space Science in Middle School and High School (Earth)*(Grades K–12)* 228 A/B, Convention Center

Sponsor: Pearson

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

The highly anticipated Next Generation Science Standards represent a bold new direction for K–12 science in America, but also pose many challenges and questions. Michael Wyession, a leader for the Earth and space science standards of NGSS, will talk about the implications of these new standards for teaching, assessment, and professional development in American Earth science education.

8:00–9:30 AM Exhibitor Workshop**Bio-Rad: Implementing a Skills-based Biotech Program with Author Kirk Brown (Bio)***(Grades 9–College)* 221A, Convention Center

Sponsor: Bio-Rad Laboratories

Kirk Brown, Tracy High School, Tracy, Calif.

Empower your students to become tomorrow's leaders by giving them the skills they need to become independent thinkers. Learn how to set the foundation of your program with equipment, supplies, Bio-Rad's new biotechnology lab textbook *Biotechnology—A Laboratory Skills Course*, and supplemental materials such as videos and presentations. Hear the words of wisdom from Tracy High School's model biotech program and inspire your students with real-world lab experiences.

8:30–10:30 AM CESI Breakfast**The “Take Away” in Elementary Science: Kids Say the Darndest Things! (M-1)***(Tickets Required; \$41)* Cambelback A, Sheraton

Julie Thomas, CESI President Elect, 2011–2013, and Frank and Carol Morsani Endowed Chair of Science Education, Oklahoma State University, Stillwater

Drawing on her years of experience in teaching elementary science and PD with elementary science teachers, Julie Thomas conceived of a longitudinal study of third- and fifth-graders. Data from these students' surveys, focus group discussions, achievement, and scientist-drawings document the ways in which children make sense of their science learning. Just as Art Linkletter (in the 1970s) and Bill Cosby (in the 1990s) showed us, gathering the child's perspective can be very revealing when it comes to helping us understand what we are actually teaching them.

Julie Thomas is the Frank and Carol Morsani Endowed Chair of Science Education at Oklahoma State University. Thomas earned both her master's and her doctorate from the University of Nebraska. She currently serves as President-Elect of CESI. Her research and teaching focus on developing teachers' knowledge and skills for teaching elementary science.

Tickets, if still available, must be purchased at the Ticket Sales Counter in the NSTA Registration Area before 12 Noon on Friday.

9:00 AM–12 Noon Exhibits

Exhibit Hall 5, Convention Center

Come see the most up-to-date science textbooks, software, equipment, and other teaching materials. Some exhibitors will offer materials for sale.

9:30–10:30 AM Presentations

SESSION 1

Instructing and Learning in the Online World

(Gen)

(Informal Education)

121A, Convention Center

John Graves (graves@montana.edu), NSTA Director, District XV, and Montana State University, Bozeman

Are you taking an online course? Do you teach an online course? Learn MORE about the unique challenges and rewards of online learning.

SESSION 2

PolyWhat? Understanding What a Polymer Is: Polymer 101

(Chem)

(Middle Level–High School)

126A, Convention Center

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

Walk away with lots of different ways of introducing what a polymer is in a manner that you and your students can understand. Take home many examples and handouts.

SESSION 3

America's Wildlife—Yesterday, Today, and Tomorrow

(Bio)

(High School)

126C, Convention Center

Eric M. Proctor (eproctor@azgfd.gov), Arizona Game and Fish Department, Phoenix

View wildlife conservation through the lens of American history and engage in free lessons that explore America's struggle to preserve our unique wildlife heritage.

SESSION 4

From Galileo to Moon Dust—The Consilience of Science and Religion

(Gen)

(General)

127A, Convention Center

Clyde A. Selner (caselner@aol.com), Kensington, Conn.

A presentation of a hypothesis that reconciles scientific and religious thought and may bring greater understanding and meaning to each. Lively discussion can be expected.

SESSION 5

Teaching Climate and Energy with the CLEAN Collection: Peer-reviewed Climate and Energy Resources at Your Fingertips!

(Gen)

(Middle Level–College)

230, Convention Center

Marian Grogan (marian_grogan@terc.edu) and **Candace Dunlap** (candace_dunlap@terc.edu), TERC, Cambridge, Mass.

The CLEAN collection provides activities, visualizations, and videos that can help you engage your students as you teach climate and energy with confidence.

SESSION 6

Engaging Students in Real-World Science Explorations, Innovation, and Problem Solving: Doing Science While Applying Mathematics, Collaborative Thinking, Exploration, and Critical-thinking Skills

(Gen)

(General)

231A, Convention Center

Donna L. Knoell (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.

I'll discuss the importance of teaching students to observe, investigate, read, use peer group discussions and brainstorming, and apply their mathematics and critical-thinking skills as a basis for exploration and real-life problem solving.



9:30–10:30 AM Workshops**Using Inquiry to Teach Metamorphic Rocks and the Rock Cycle (Earth)***(Elementary–High School)**121B, Convention Center***Davida Buehler** (dbuehler@geosociety.org), The Geological Society of America, Boulder, Colo.

Brought to you by The Geological Society of America! Extract knowledge on metamorphic rocks and the rock cycle with an inquiry-based lesson.

Focusing Not on What We Know But What We Don't Know Is the Terrain of Science (Gen)*(Elementary)**121C, Convention Center***Marleen L. Lyon** (marleenlyon@gmail.com) and **Joan Gilbert** (joan.gilbert@tusd1.org), Tucson (Ariz.) Unified School District

Come learn how to use students' questions to support learning.

Naturopathic Botanical Medicine: Making a Healing Salve (Bio)*(High School–College)**124A, Convention Center***Amanda Cherry Grimes** (mrsgrimes.biology@gmail.com), Mesa High Biotech Academy, Mesa, Ariz.**Stephanie C. King**, Mesa Public Schools Career and Technical Education, Mesa, Ariz.**Xan Simonson** (xsimonson@gmail.com), Southwest College of Naturopathic Medicine, Tempe, Ariz.

Ever wonder about naturopathic medicine? Come learn the principles of naturopathic medicine by applying biochemistry concepts to develop a formula for a skin-healing balm/salve. Learn the process of preparing the components of a balm/salve and make your own lip balm using prepared components. Supplies are limited to the first 50 participants!

Understanding the School Building as a System**(Env)***(Middle Level–High School)**126B, Convention Center***Caryn Turrel** (cturrel@need.org), The NEED Project, Manassas, Va.

Find out how you as a teacher can go beyond turning the lights off and really understand how a house works.

Flipping the Lab in AP Biology and AP Environmental Science (Bio)*(High School)**127B, Convention Center***Mark D. Little** (mark.little@bvsvd.org), Broomfield High School, Broomfield, Colo.

Hands-on open inquiry–based experiments are vital skills to be taught in the science curricula. Online screen cast videos help prepare students for hands-on labs.

Infect Your Biology Classroom with Math! (Bio)*(General)**127C, Convention Center***Jeff Lukens** (jeffrey.lukens@k12.sd.us), Roosevelt High School, Sioux Falls, S.Dak.

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

**STEM Activities: Animal Pictures, WebQuest, Boat Constructions, and Pumpkingrams (Gen)***(Elementary)**229B, Convention Center***Ava F. Pugh** (apugh@ulm.edu) and **Dona C. Delgado** (delgaddc@warhawks.ulm.edu), The University of Louisiana at Monroe

Presenter: Ava F. Pugh

Engage in hands-on activities for making science inferences from pictures, creating WebQuests, constructing boats, and recognizing mathematical relations with Pumpkingrams. Take home CDs and handouts.

10:00–11:15 AM Exhibitor Workshops

Using Mobile Devices in Hands-On Science Investigations (Gen)

(Grades K–12)

223, Convention Center

Sponsor: Arizona K12 Center

Carola Montana, Explorer Middle School of Technology, Phoenix, Ariz.

Learn how to incorporate the use of mobile devices while conducting scientific investigations in your classroom. Your students will be able to access laboratory procedures, report data, and communicate their results using their devices. The collaboration, access to real-time data, and use of technology can make learning more engaging and meaningful.

Breeding Critters (Bio)

(Grades 6–8)

227A, Convention Center

Sponsor: LAB-AIDS, Inc.

Lisa Kelp and **Jan Finch**, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Make the study of genetics more meaningful for students. Join us for an activity sequence from *Issues & Life Science* by LAB-AIDS that lays a framework for dominant/recessive as well as other patterns of inheritance. Pedigrees are introduced as another way to study the behavior of certain genes in humans. In the succeeding activities, you will use what you know to advise Joe about whether to be tested for Marfan's syndrome.

10:30–11:30 AM Exhibitor Workshop

Bio-Rad: Genes in a Bottle™ Kit (Bio)

(Grades 5–College)

221A, Convention Center

Sponsor: Bio-Rad Laboratories

Kirk Brown, Tracy High School, Tracy, Calif.

How do you fit a person in a bottle? Your DNA contains all of the information that makes you who you are. Isolate your own DNA and capture your unique essence in a stylish glass necklace!

11:00 AM–12 Noon Presentations

SESSION 1

Challenge-based Learning—Engage and Inspire!

(Gen)

(Middle Level–High School)

121A, Convention Center

Helen Padgett (helen.padgett@asu.edu), Arizona State University SkySong, Scottsdale

Inspire students to develop deeper content knowledge, accept and solve challenges, take action, share their experience, and enter into global discussions about important issues.

SESSION 2

Online Mentoring—Successes and Challenges

(Gen)

(General)

122A, Convention Center

Sara S. Torres (sstorres71@gmail.com), **Meera Chandrasekhar** (meerac@missouri.edu), **Joan Twillman** (joan@twillman.com), and **Ya-Wen Cheng** (yck86@mizzou.edu), University of Missouri, Columbia

Lisa Grotewiel, Keytesville (Mo.) R-III School District

Let's discuss how a statewide program uses online mentoring. Teachers who participate in a summer professional development program have support throughout the year through an online mentor and other online resources.

SESSION 3

Solids: The Neglected “State” of Chemistry (Chem)

(High School)

126A, Convention Center

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

Andrew G. Nydam (andrewnydam@hotmail.com), Olympia High School, Olympia, Wash.

Use the “stuff” of the everyday world to make science relevant. Hands-on activities using solid materials (ceramics, metals, polymers) make concepts easier to teach and learn. Handouts!

SESSION 4

The Power of Perspective in Scientific Inquiry: Laurel Clark Earth Camp for Educators (Earth)

(Middle Level–High School) 126C, Convention Center

Kerry L. Schwartz (kschwartz@cals.arizona.edu), The University of Arizona, Tucson

Debbie Colodner (dcolodner@desertmuseum.org), Arizona Sonora Desert Museum, Tucson

Join Earth Camp teachers to discuss the use of satellite images to broaden your scientific practice toolkit for conducting authentic inquiry about local and global challenges.

SESSION 5

PEEK (Photography Educating and Empowering Kids) into This! (Bio)

(General) 127A, Convention Center

Stephanie Bowman (stephanie@biodiversitygroup.org), The Biodiversity Group, Tucson, Ariz.

Marissa Still (mstill@trinity-mp.org), Trinity School, Menlo Park, Calif.

Brian Ravizza, Hillbrook School, Los Gatos, Calif.

Learn how your kids can act as citizen scientists and wildlife photographers who aid global sustainability.

SESSION 6



Robotics in Middle School: How Do We Make That Work? (Gen)

(Middle Level) 231A, Convention Center

Bert te Velde (bvelde@susd.org), Mohave Middle School, Scottsdale, Ariz.

Jennifer Velez (jvelez@susd.org), Navajo Elementary School, Scottsdale, Ariz.

Holly Traver, Copper Ridge School and Desert Canyon Middle School, Scottsdale, Ariz.

FIRST® LEGO® League offers opportunities for students to explore robotics. Starting a program is a challenging, but rewarding road for teachers and students. Join me for a reflection from the field.

11:00 AM–12 Noon Workshops

Seeing the Invisible Universe (Earth)

(Middle Level–College) 121B, Convention Center

Robert Sparks (rsparks@noao.edu), National Optical Astronomy Observatory, Tucson, Ariz.

Perform hands-on activities to learn how astronomers use light beyond the visible spectrum to study the universe.

Restriction Enzymes Race: Digest and Analyze Plasmid DNA in a Class Period (Bio)

(High School–College) 124A, Convention Center

Amanda Cherry Grimes (mrsgrimes.biology@gmail.com), Mesa High Biotech Academy, Mesa, Ariz.

Stephanie C. King, Mesa Public Schools Career and Technical Education, Mesa, Ariz.

Xan Simonson (xsimonson@gmail.com), Southwest College of Naturopathic Medicine, Tempe, Ariz.

Love running restriction enzyme labs, but ALWAYS run out of time? Perform a laboratory designed to restrict DNA...and run AND analyze gels in 55 minutes! Protocols are designed for biotechnology or AP/College Biology. *Note:* Materials for the first 25 participants.

Best Practices: Modeling Scientific Phenomena in AP and General Biology (Bio)

(High School) 127B, Convention Center

Kristen R. Dotti (kristen_dotti@yahoo.com), Christ School, Arden, N.C.

Make science an active experience with props, narration, and moving simulations. Add modeling to your bag of tricks to gain scientific understanding using AP-level content.



NSTA Press® Session: More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4 (Gen)

(Elementary) 129B, Convention Center

Emily Morgan (emily@pictureperfectscience.com), Picture-Perfect Science, West Chester, Ohio

Karen Ansberry, Mason (Ohio) City Schools

NSTA Press authors will teach you how to integrate science and reading through the use of engaging picture books.



Science Literacy and Those Accountable Lines of Communication (Earth)

(Supervision/Administration)

229A, Convention Center

Barry Fried (bfried@schools.nyc.gov) and **Honora Dash** (hdash@schools.nyc.gov), John Dewey High School, Brooklyn, N.Y.

Learn how to create an enriched, real, rigorous, and all-inclusive classroom environment using space science as a unifying theme to promote problem solving and communication by building literacy tools and research skills, and offering authentic science learning experiences.



Concept Mapping Environmental Sciences (Env)
(High School)

229B, Convention Center

John C. Jung (jcjung@mpsaz.org), Mesa High School, Mesa, Ariz.

Learn how to construct, assess, and use concept maps for a variety of different objectives, including the integration of environmental concepts.

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

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

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Exhibitors

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Phone: 202-872-6269
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Website: www.acs.org

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Tucson, AZ 85718 PreK-6
Phone: 866-889-3729
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Website: www.learninga-z.com

Science A-Z integrates science and literacy instruction, supplements your core science program, enables development of your own elementary science curriculum, prepares students for high-stakes science testing, and meets state science education standards and National Science Education Standards.

LEGO Education #415
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Pittsburg, KS 66762 K-12, College
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Website: www.legoeducation.us

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E-mail: info@manylabs.com
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ManyLabs is a learning platform that incorporates games, simulations, and sensors. We want students of any age to become comfortable with data, scientific processes, and mathematical representations of the world.

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Website: www.coe.arizona.edu/mp

The Math and Science Teacher Education/Retention Industry Partnerships (MASTER-IP) Program is a statewide program for middle and high school STEM teachers. We collaborate with Arizona businesses to foster a unique connection between the workforce and the classroom by providing teachers with internship opportunities in businesses during the summer coupled with either a Master's degree program or professional development credits.

Minerals Education Coalition #112
12999 E. Adam Aircraft Circle EA
Englewood, CO 80112 K-12, College
Phone: 303-948-4200
E-mail: mec@smenet.org
Website: www.mineralseducationcoalition.org

The Minerals Education Coalition reflects the Society for Mining, Metallurgy & Exploration's (SME) commitment to provide accurate and timely K-12 curriculum and activities to teachers. SME volunteers will distribute mineral samples and posters and be available to discuss the importance of mining and minerals to the public's lives and lifestyles.

Mississippi State University #324
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Exhibitors

Natural Science for Teachers Program #508
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 Biological Sciences West 270
 Tucson, AZ 85721-0088
 Phone: 520-621-5903
 E-mail: warder@u.arizona.edu
 Website: <http://biology.arizona.edu/sciconn>

The Natural Science for Teachers Program offers graduate-level online courses for teachers through a Master of Science degree program that includes a biology research component. A non-degree option is available for those teachers who just want to take online courses to increase their biology content knowledge.

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NSTA 2013 Portland Conference #127
on Science Education
 1840 Wilson Blvd.
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The Oregon Science Teachers Association will help host the NSTA 2013 Portland Area Conference on Science Education, October 24–26, 2013. OSTA members will be available to answer questions about the Portland conference.

Nutrients for Life Foundation #507
 425 Third St. SW, Suite 950 B, EN
 Washington, DC 20024 1–12
 Website: www.nutrientsforlife.org

The Nutrients for Life Foundation offers free plant and soil science curricula and other classroom resources for elementary, middle, and high school teachers.

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NSTA Avenue

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Website: <http://thechallenge.dupont.com>

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Website: www.ecybermission.com

John Glenn Center for Science Education
Booth #225 • E-mail: cse@nsta.org
Website: www.nsta.org/involved/cse

NSTA Learning Center
Booth #226 • E-mail: dblondonville@nsta.org
Website: www.nsta.org/pd

NSTA Membership
Booth #222 • E-mails: hwahlberg@nsta.org; tbirts@nsta.org
Website: www.nsta.org/membership

The Shell Science Lab Challenge
Booth #218 • E-mail: ecrossley@nsta.org
Website: www.nsta.org/shellsciencelab/

Siemens We Can Change the World Challenge
Booth #221 • E-mail: wecanchange@discovery.com
Website: www.wecanchange.com

Toshiba/NSTA ExploraVision®
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- **NSTA Press®** publishes 20–25 new titles each year. Browse at the Science Bookstore and connect with authors to have your new book signed. Submit your new book idea to www.nsta.org/publications/press/authors.aspx.

Add Your Voice

- **Science Matters,** our major public awareness campaign about science education and science literacy, is designed to rekindle a national sense of urgency and action among schools and families. Register to receive our monthly e-newsletter.

- The **John Glenn Center for Science Education.** NSTA has embarked on a \$43 million national campaign to make excellence in science teaching and learning a reality for all. The funding will support a series of forward-thinking programs and a state-of-the-art facility designed to promote leadership, learning, and advocacy in science education.

Distinguish Yourself

- Learn about NSTA's 17 awards programs for science teachers, K–College, such as NSTA's **Shell Science Lab Challenge**, which provides science laboratory equipment and professional development support to winning middle schools and high schools with limited resources. Learn how to win a \$20,000 lab makeover support package.

Student Competitions

- **Toshiba/NSTA ExploraVision®** is a team-based K–12 student competition that awards up to \$240,000 in savings bonds annually.
- **THE DUPONT CHALLENGE®** Science Essay Competition is for grades 7–12 students and awards cash prizes and an expenses-paid trip to Disney World and the Kennedy Space Center.
- **eCYBERMISSION** is an online, STEM-related (Science, Technology, Engineering, and Mathematics) competition for students in grades 6–9.

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Project Learning Tree #402
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Washington, DC 20036 PreK-12, College
Phone: 202-463-2475
E-mail: information@plt.org
Website: www.plt.org

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

Sangari Active Science #327
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Norwalk, CT 06854-2710 G, PH, T
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E-mail: jvtilson@sangariglobaled.com
Website: www.sangariglobaled.com

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The Shell Science Lab Challenge #218
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1840 Wilson Blvd. 6-12
Arlington, VA 22201-3000
Phone: 703-312-9258
E-mail: ecrossley@nsta.org
Website: www.nsta.org/shellsciencelab

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Siemens We Can Change the World Challenge

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Website: www.wecanchange.com

#221
EN, G
K-12

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K-12, College

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#106
EA, G, PH, PD, T
2-12

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Simulation Curriculum is a leading developer of interactive Earth and space science software and curricula for K-12 and college.

Society for Science & The Public #105

1719 N St. NW
Washington, DC 20036
Phone: 202-872-5152
E-mail: ssnyder@societyforscience.org
Website: www.societyforscience.org

6-12

Society for Science & the Public is a nonprofit membership organization dedicated to public engagement in scientific research and education to inform, educate, and inspire.

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Website: www.stem101.org

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Suite 204
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E-mail: sales@strscopes.com
Website: www.schooltr.com

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Website: www.exploravision.org

The Toshiba/NSTA ExploraVision science competition encourages K–12 students to imagine what technology might be like in the future. ExploraVision helps teacher sponsors meet many of the National Science Education Standards while letting students experience scientific process and discovery in an engaging, hands-on way.

Triangle Coalition #522
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Phone: 703-516-5960
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Index of Exhibitor Workshops

Achieve3000 (Booth #433)

Thursday, Dec. 6	10:00–11:15 AM	222C, Conv. Center	Experience the Future of Digital Science from National Geographic and Achieve3000® (p. 51)
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American Chemical Society (Booth #425)

Friday, Dec. 7	2:00–3:15 PM	226 A–C, Conv. Center	<i>Chemistry in the Community</i> , 6th Edition—Changing with the Times (p. 100)
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American Nuclear Society (Booth #115)

Friday, Dec. 7	2:00–3:15 PM	123, Conv. Center	Detecting Radiation in Our Radioactive World (p. 100)
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Arizona K12 Center (Booth #120)

Thursday, Dec. 6	12:30–1:45 PM	223, Conv. Center	Web Tools to Support STEM and Common Core State Standards (p. 57)
Saturday, Dec. 8	10:00–11:15 AM	223, Conv. Center	Using Mobile Devices in Hands-On Science Investigations (p. 116)

Bio-Rad Laboratories (Booth #214)

Friday, Dec. 7	8:00–9:30 AM	221A, Conv. Center	Bio-Rad: Explore Inquiry and Ecology with Biofuel Enzymes (AP Big Idea 4) (p. 77)
Friday, Dec. 7	10:30 AM–12 Noon	221A, Conv. Center	Bio-Rad: Engineer the Tools for Inquiry of Candy Food Dyes (p. 85)
Friday, Dec. 7	2:00–4:30 PM	221A, Conv. Center	Bio-Rad: Crime Scene Investigator PCR Basics Kit (p. 101)
Saturday, Dec. 8	8:00–9:30 AM	221A, Conv. Center	Bio-Rad: Implementing a Skills-based Biotech Program with Author Kirk Brown (p. 113)
Saturday, Dec. 8	10:30–11:30 AM	221A, Conv. Center	Bio-Rad: Genes in a Bottle™ Kit (p. 116)

Carolina Biological Supply (Booth #201)

Thursday, Dec. 6	8:00–9:15 AM	227 B/C, Conv. Center	AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 48)
Thursday, Dec. 6	10:00–11:15 AM	227 B/C, Conv. Center	What Quality Science Instruction Has to Do with Raising Achievement Scores K–8 (p. 51)
Thursday, Dec. 6	12:30–1:45 PM	227 B/C, Conv. Center	Hands-On Science with Classroom Critters (p. 58)
Thursday, Dec. 6	2:15–3:30 PM	227 B/C, Conv. Center	The Solution Is Simple! Understanding Colligative Properties with Inquiries in Science® (p. 63)
Thursday, Dec. 6	4:00–5:15 PM	227 B/C, Conv. Center	Carolina Beyond the Tape: Forensic Science for Every Discipline (p. 68)
Friday, Dec. 7	8:00–9:15 AM	227 B/C, Conv. Center	Comparative Vertebrate Anatomy Featuring Carolina's Perfect Solution® Specimens (p. 77)
Friday, Dec. 7	10:00–11:15 AM	227 B/C, Conv. Center	Bonding with Carolina Chemistry (p. 85)
Friday, Dec. 7	12 Noon–1:15 PM	227 B/C, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 91)
Friday, Dec. 7	2:00–3:15 PM	227 B/C, Conv. Center	Hands-On Activities to Explore Environmental Change (p. 100)
Friday, Dec. 7	4:00–5:15 PM	227 B/C, Conv. Center	Engineering, Technology, and the Application of K–8 Science (p. 106)

CPO Science/School Specialty Science (Booth #500)

Thursday, Dec. 6	8:00–9:30 AM	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 49)
Thursday, Dec. 6	10:00–11:30 AM	222 A/B, Conv. Center	Genetics: Crazy Traits and Adaptation Survivor (p. 52)
Thursday, Dec. 6	12 Noon–1:30 PM	222 A/B, Conv. Center	STEM Approach to Teaching Electricity and Magnetism (p. 53)
Thursday, Dec. 6	2:00–3:30 PM	222 A/B, Conv. Center	Light and Optics: A Series of EnLIGHTening Experiments! (p. 62)
Thursday, Dec. 6	4:00–5:30 PM	222 A/B, Conv. Center	Sound, Waves, and Music (p. 68)
Friday, Dec. 7	8:00–9:30 AM	222 A/B, Conv. Center	Genetics: Crazy Traits and Adaptation Survivor (p. 77)
Friday, Dec. 7	10:00–11:30 AM	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 85)
Friday, Dec. 7	12 Noon–1:30 PM	222 A/B, Conv. Center	Light and Optics: A Series of EnLIGHTening Experiments! (p. 92)

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CPO Science/School Specialty Science, cont.

Friday, Dec. 7	2:00–3:30 PM	222 A/B, Conv. Center	Sound, Waves, and Music (p. 101)
Friday, Dec. 7	4:00–5:30 PM	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 107)

Crow Canyon Archaeological Center (Booth #532)

Thursday, Dec. 6	4:00–5:15 PM	123, Conv. Center	The Archaeology of Cactus Ruin: A Paper Excavation (p. 67)
Friday, Dec. 7	4:00–5:15 PM	124A, Conv. Center	The Archaeology of Cactus Ruin: A Paper Excavation (p. 106)

Delta Education/School Specialty Science (Booth #401)

Thursday, Dec. 6	8:00–9:15 AM	221B, Conv. Center	Inquiring Minds Provide Spark for Science Lessons (p. 48)
Thursday, Dec. 6	10:00–11:15 AM	221B, Conv. Center	DSM and STEM: Challenges for the Elementary Student (p. 51)
Thursday, Dec. 6	12:30–2:00 PM	221B, Conv. Center	Laurel and Hardy and the Laws of Science (p. 58)
Thursday, Dec. 6	3:00–4:30 PM	221B, Conv. Center	What's Going on in There? NGSS Inquiry Science for Supervisors, Trainers, and Teachers (p. 64)
Friday, Dec. 7	8:00–9:15 AM	221B, Conv. Center	Science: The Literacy Connection and the Core Curriculum (p. 76)
Friday, Dec. 7	10:00–11:15 AM	221B, Conv. Center	Identifying, Clarifying, and Designing Experiments (p. 84)
Friday, Dec. 7	1:00–2:15 PM	221B, Conv. Center	Technological Design Standards Meet the STEM Initiative (p. 95)

Delta Education/School Specialty Science–FOSS (Booth #401)

Thursday, Dec. 6	8:00–10:00 AM	221C, Conv. Center	Science-centered Language Development with FOSS (p. 49)
Thursday, Dec. 6	10:30–11:30 AM	221C, Conv. Center	Asteroid! Will Earth Be Hit Again? Planetary Science for Middle School (p. 52)
Thursday, Dec. 6	12 Noon–1:00 PM	221C, Conv. Center	NASA's Kepler Mission and the Hunt for Exoplanets: Planetary Science for Middle School (p. 53)
Thursday, Dec. 6	1:30–3:00 PM	221C, Conv. Center	Engage Students with Active Learning Through FOSS, 3rd Edition (p. 59)
Thursday, Dec. 6	3:30–4:30 PM	221C, Conv. Center	Materials in Our World: STEM for Early Childhood (p. 67)
Friday, Dec. 7	8:00–10:00 AM	221C, Conv. Center	Using Science Notebooks to Impact Student Learning with FOSS (p. 78)
Friday, Dec. 7	10:30 AM–12:30 PM	221C, Conv. Center	FOSS Formative Assessment: Making Student Thinking Visible (p. 85)
Friday, Dec. 7	1:00–2:30 PM	221C, Conv. Center	Taking Science Outdoors with FOSS K–6 (p. 95)
Friday, Dec. 7	3:00–4:00 PM	221C, Conv. Center	Fossil Evidence: A Preview of <i>FOSS Earth History</i> , 2nd Edition for Middle School (p. 101)

Dinah-Might Adventures, LP (Booth #524)

Thursday, Dec. 6	2:15–3:30 PM	226 A–C, Conv. Center	Science Projects and Notebooking (p. 63)
Friday, Dec. 7	12 Noon–1:15 PM	226 A–C, Conv. Center	Building and Assessing Academic Vocabulary Using Notebook Foldables® (p. 90)

Discovery Education (Booth #315)

Thursday, Dec. 6	12:30–1:45 PM	226 A–C, Conv. Center	Stand Back! We're Using Discovery Education Science Techbook for Grades K–12 (p. 57)
Friday, Dec. 7	4:00–5:15 PM	226 A–C, Conv. Center	High School Biology in a Digital World: Critical Thinking Trumps Information Overload (p. 106)

eCYBERMISSION (Booth #220)

Thursday, Dec. 6	10:00–11:15 AM	231B, Conv. Center	Student Collaboration in the Science Classroom (p. 51)
Friday, Dec. 7	10:00–11:15 AM	121B, Conv. Center	“Hard” Doesn't Mean “Bad”—Helping Students Understand That Facing Challenges Is a Good Thing (p. 84)

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Educational Innovations, Inc. (Booth #318)

Friday, Dec. 7	10:00–11:15 AM	226 A–C, Conv. Center	3-2-1 Blast Off! (p. 84)
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Edvotek Inc. (Booth #414)

Thursday, Dec. 6	10:00–11:15 AM	231C, Conv. Center	Wait! The Chips I Ate Were a Genetically Modified Organism (GMO)? (p. 52)
Thursday, Dec. 6	12:30–1:45 PM	231C, Conv. Center	Water Contaminants! Biotechnology Can Help Save the Marine Environment (p. 58)
Thursday, Dec. 6	2:15–3:30 PM	231C, Conv. Center	How Is HIV Detected in Humans? Welcome to the Exciting World of Immunobiotechnology! (p. 64)
Thursday, Dec. 6	4:00–5:15 PM	231C, Conv. Center	The Case of the Missing Archive: Crime Scene and DNA Fingerprinting Investigation (p. 68)

FDA Center for Food Safety and Applied Nutrition (Booth #102)

Thursday, Dec. 6	4:00–5:15 PM	223, Conv. Center	FDA Food Science Workshop (Middle School) (p. 67)
Saturday, Dec. 8	8:00–9:15 AM	223, Conv. Center	FDA Food Science Workshop (High School) (p. 113)

Fisher Science Education (Booth #410)

Thursday, Dec. 6	4:00–5:15 PM	231B, Conv. Center	Exploring STEM Careers: Water and Our Environment (p. 68)
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Flinn Scientific, Inc. (Booth #101)

Thursday, Dec. 6	10:00–11:15 AM	226 A–C, Conv. Center	Fantastic Physical Science Demonstrations from Flinn (p. 51)
Friday, Dec. 7	8:00–9:15 AM	226 A–C, Conv. Center	Best Practices for Teaching Chemistry from Flinn (p. 77)

Frey Scientific/School Specialty Science (Booth #501)

Thursday, Dec. 6	8:00–9:15 AM	221A, Conv. Center	A Simple Connection Between STEM and Data Logging (p. 48)
Thursday, Dec. 6	10:00–11:15 AM	221A, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 51)
Thursday, Dec. 6	12 Noon–1:15 PM	221A, Conv. Center	STEM: The Game Changer in Science Lab Design (p. 53)

It's About Time (Booth #409)

Thursday, Dec. 6	8:00–9:00 AM	228 A/B, Conv. Center	<i>PBIS™</i> —Moving Beyond “What Is Science?” to Being Scientists Through Science and Engineering Practices (p. 48)
Thursday, Dec. 6	9:30–10:30 AM	228 A/B, Conv. Center	How Do Scientists Work Together to Answer Big Questions and Solve Big Problems in <i>PBIS™</i> ? (p. 50)
Thursday, Dec. 6	11:00 AM–12 Noon	228 A/B, Conv. Center	Your Technology Solution for STEM and the Highly Anticipated Next Generation Science Standards (p. 53)
Thursday, Dec. 6	12:30–1:30 PM	228 A/B, Conv. Center	<i>Engineering the Future: A Practical Approach to STEM for High School</i> (p. 57)
Thursday, Dec. 6	2:00–3:00 PM	228 A/B, Conv. Center	Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (p. 62)
Thursday, Dec. 6	3:30–4:30 PM	228 A/B, Conv. Center	Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (p. 67)

Ken-A-Vision (Booth #400)

Thursday, Dec. 6	12:30–1:45 PM	231B, Conv. Center	See More, Do More, Learn More—Benefits of Using Digital Technology Tools (p. 58)
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LAB-AIDS, Inc. (Booth #317)

Thursday, Dec. 6	8:00–9:15 AM	227A, Conv. Center	Investigating a Cliff Model (p. 48)
Thursday, Dec. 6	10:00–11:15 AM	227A, Conv. Center	Lemons and Light Bulbs: Exploring the Chemistry of Electricity (p. 51)

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LAB-AIDS, Inc., cont.

Thursday, Dec. 6	12:30–1:45 PM	227A, Conv. Center	I Think There's a Genetically Engineered Fly in My Genetically Modified Pea Soup! (p. 58)
Thursday, Dec. 6	2:15–3:30 PM	227A, Conv. Center	Mastering the Chemical Formula: An Exceptionally Effective Way to Teach Subscripts and Coefficients (p. 63)
Thursday, Dec. 6	4:00–5:15 PM	227A, Conv. Center	An Absorbing Misconception About Waves and the "Power" of Colors (p. 68)
Friday, Dec. 7	8:00–9:15 AM	227A, Conv. Center	Distillation: Simple and Fascinating Experiments in the Chemistry of Aromas and Smells (p. 77)
Friday, Dec. 7	10:00–11:15 AM	227A, Conv. Center	I Think There's a Genetically Engineered Fly in My Genetically Modified Pea Soup! (p. 84)
Friday, Dec. 7	12 Noon–1:15 PM	227A, Conv. Center	O ₂ Understand Photosynthesis and Cellular Respiration! (p. 91)
Friday, Dec. 7	2:00–3:15 PM	227A, Conv. Center	Color, Spectrophotometry, and Teaching the Structure of the Atom (p. 100)
Friday, Dec. 7	4:00–5:15 PM	227A, Conv. Center	Power Up! Investigating Electric Motors (p. 106)
Saturday, Dec. 8	8:00–9:15 AM	227A, Conv. Center	O ₂ Understand Photosynthesis and Cellular Respiration! (p. 113)
Saturday, Dec. 8	10:00–11:15 AM	227A, Conv. Center	Breeding Critters (p. 116)

LEGO Education (Booth #415)

Thursday, Dec. 6	12:30–1:45 PM	123, Conv. Center	LEGO Education WeDo™ Robotics Workshop (p. 57)
Friday, Dec. 7	4:00–5:15 PM	123, Conv. Center	LEGO® MINDSTORMS® NXT Basic Training Workshop (p. 106)

Mississippi State University (Booth #324)

Friday, Dec. 7	12 Noon–1:15 PM	123, Conv. Center	Master of Science Degree in Geosciences Available Online Through the Teachers in Geosciences Program (p. 90)
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National Geographic Education (Booth #426)

Thursday, Dec. 6	2:15–3:30 PM	123, Conv. Center	<i>Marine Ecology, Human Impacts, and Conservation</i> : A High School Ecology Unit from NatGeo (p. 63)
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PASCO scientific (Booth #309)

Friday, Dec. 7	8:00–9:15 AM	222C, Conv. Center	Equip Your iPad for Science with SPARKvue® HD, a Full-featured Science Application for the iPad (p. 76)
Friday, Dec. 7	10:00–11:15 AM	222C, Conv. Center	Achievable Inquiry in AP* Biology and Chemistry (p. 84)
Friday, Dec. 7	12 Noon–1:15 PM	222C, Conv. Center	STEM: Meeting the Standards in Your Classroom (p. 90)
Friday, Dec. 7	2:00–3:15 PM	222C, Conv. Center	Investigating Motion: Understanding and Interpreting Graphs (p. 100)
Friday, Dec. 7	4:00–5:15 PM	222C, Conv. Center	Exploring Renewable Energy: A Hands-On STEM Investigation (p. 106)

Pearson (Booth #200)

Friday, Dec. 7	8:00–9:15 AM	228 A/B, Conv. Center	Inquiry and Scientific Practices: Keys to Getting Students to Think (p. 77)
Friday, Dec. 7	10:00–11:15 AM	228 A/B, Conv. Center	Why Teaching About Climate Change Matters—Data, Context, and Implications (p. 85)
Friday, Dec. 7	12 Noon–1:15 PM	228 A/B, Conv. Center	The Next Generation of Science Virtual Labs for the Entire Science Curriculum—No Cleanup! (p. 91)
Friday, Dec. 7	2:00–3:15 PM	228 A/B, Conv. Center	Going Green: Economical and Environmentally Friendly Inquiry in Chemistry (p. 100)
Saturday, Dec. 8	8:00–9:15 AM	228 A/B, Conv. Center	Teaching Earth and Space Science in Middle School and High School (p. 113)

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Sangari Active Science (Booth #327)

Thursday, Dec. 6	10:00–11:15 AM	223, Conv. Center	NGSS and Scientific Practices—More Than Photoshopping Models’ Flaws (p. 51)
Thursday, Dec. 6	2:15–3:30 PM	223, Conv. Center	Sangari Active Science (p. 63)

Science First®/STARLAB® (Booth #331)

Thursday, Dec. 6	12:30–1:00 PM	Booth #331, Exhibit Hall	Welcome to the Neighborhood: Overview of the Solar System (p. 53)
Friday, Dec. 7	11:00–11:30 AM	Booth #331, Exhibit Hall	Location, Location—Finding Your Way Around the Sky (p. 86)

Science Take-Out (Booth #530)

Thursday, Dec. 6	12:30–1:45 PM	129A, Conv. Center	Modeling Protein Structure/Function and Photosynthesis/Respiration (p. 57)
Thursday, Dec. 6	4:00–5:15 PM	129A, Conv. Center	Toxin and Energy Flow in an Ecosystem (p. 67)
Friday, Dec. 7	10:00–11:15 AM	129A, Conv. Center	Pollution and Acid Rain Activities (p. 84)
Friday, Dec. 7	12 Noon–1:15 PM	129A, Conv. Center	Homeostasis and Diabetes (p. 90)

Simulation Curriculum Corp. (Booth #424)

Thursday, Dec. 6	10:00–11:15 AM	129A, Conv. Center	Earthquakes and Tornadoes (p. 50)
Thursday, Dec. 6	2:15–3:30 PM	129A, Conv. Center	The Sky Through the Ages (p. 63)
Friday, Dec. 7	2:00–3:15 PM	129A, Conv. Center	Hurricanes and Volcanoes (p. 100)

The STEM Academy® (Booth #408)

Friday, Dec. 7	8:00–9:15 AM	129A, Conv. Center	Improve STEM Literacy for All Students (p. 76)
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Swift Optical Instruments, Inc. (Booth #308)

Thursday, Dec. 6	12:30–1:45 PM	222C, Conv. Center	Create a Digital Classroom—Using 21st-Century STEM Initiatives! (p. 57)
Thursday, Dec. 6	2:15–3:30 PM	222C, Conv. Center	Forensic Digital Microscopy and Inquiry Learning (p. 63)
Thursday, Dec. 6	4:00–5:15 PM	222C, Conv. Center	Creating a Digital Strategy for STEM (p. 67)

Vernier Software & Technology (Booth #208)

Friday, Dec. 7	8:00–9:30 AM	223, Conv. Center	Integrating Your iPad or Mobile Device with Vernier Technology (p. 78)
Friday, Dec. 7	10:00–11:30 AM	223, Conv. Center	Introducing the Vernier LabQuest 2! (p. 85)
Friday, Dec. 7	12 Noon–1:30 PM	223, Conv. Center	Chemistry and Biology with Vernier (p. 92)
Friday, Dec. 7	2:00–3:30 PM	223, Conv. Center	Physics and Physical Science with Vernier (p. 101)

Wavefunction (Booth #423)

Thursday, Dec. 6	10:00–11:15 AM	123, Conv. Center	Getting the Most Out of Molecular-Level Visualization and Simulation Tools (p. 50)
Friday, Dec. 7	8:00–9:15 AM	123, Conv. Center	Using Molecular-Level Visualization to Engage Middle School and High School Science Students (p. 76)
Friday, Dec. 7	10:00–11:15 AM	123, Conv. Center	Nailing Molecular Concepts with Scientifically Accurate Visualization and Simulation Tools (p. 84)

Wireless Generation (Booth #325)

Thursday, Dec. 6	2:15–3:30 PM	231B, Conv. Center	33 Strategies for Integrating Science (p. 64)
Friday, Dec. 7	4:00–5:15 PM	129A, Conv. Center	Integrate! A Better Way to Teach and Learn (p. 106)

Schedule at a Glance

P = Preschool
E = Elementary

M = Middle School
H = High School

S = Supervision/Administration
C = College

I = Informal Education
G = General

Biology/Life Science

Thursday

8:00–9:00 AM	M	121A, Conv. Center	Biotechnology as an Avenue for STEM: Lessons from the Northern Arizona University GK–12 Project (p. 45)
8:00–9:15 AM	9–12	221A, Conv. Center	A Simple Connection Between STEM and Data Logging (p. 48)
8:00–9:15 AM	6–12	227 B/C, Conv. Center	AUTOPSY: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 48)
10:00–11:15 AM	8–C	231C, Conv. Center	Wait! The Chips I Ate Were a Genetically Modified Organism (GMO)? (p. 52)
10:00–11:30 AM	5–12	222 A/B, Conv. Center	Genetics: Crazy Traits and Adaptation Survivor (p. 52)
12:30–1:30 PM	H	126B, Conv. Center	Instructional Planning, Resources, and Technology to Enhance Instruction in the AP Classroom (p. 56)
12:30–1:45 PM	6–12	129A, Conv. Center	Modeling Protein Structure/Function and Photosynthesis/Respiration (p. 57)
12:30–1:45 PM	9–12	227A, Conv. Center	I Think There's a Genetically Engineered Fly in My Genetically Modified Pea Soup! (p. 58)
12:30–1:45 PM	3–8	227 B/C, Conv. Center	Hands-On Science with Classroom Critters (p. 58)
12:30–1:45 PM	8–C	231C, Conv. Center	Water Contaminants! Biotechnology Can Help Save the Marine Environment (p. 58)
2:00–3:00 PM	G	122A, Conv. Center	AMSE Session: Science Education Equity Discoveries (SEEDs): Transforming Teaching by Enacting Research on Classroom Equity (p. 60)
2:00–3:00 PM	M–H	124B, Conv. Center	Neuroscience for Your Biology Classroom (p. 61)
2:00–3:00 PM	H	126B, Conv. Center	Preparing for the Redesign: Using Student-designed Experiments in AP Biology (p. 61)
2:00–3:00 PM	C	126C, Conv. Center	Assessing the AAAS Document Through Action: Vision and Change in Undergraduate Biology Education (p. 60)
2:00–3:00 PM	E–M	230, Conv. Center	Plants—From Seed to Seed (p. 60)
2:15–3:30 PM	9–12	123, Conv. Center	<i>Marine Ecology, Human Impacts, and Conservation: A High School Ecology Unit from NatGeo</i> (p. 63)
2:15–3:30 PM	8–C	231C, Conv. Center	How Is HIV Detected in Humans? Welcome to the Exciting World of Immunobiotechnology! (p. 64)
3:30–4:30 PM	I	121B, Conv. Center	Engage Your Students with NOAA's Coral Reef Resources (p. 66)
3:30–4:30 PM	H	124B, Conv. Center	Minds On, Bodies On! Teaching Biology Is a Whole-Body Experience (p. 66)
3:30–4:30 PM	H	127A, Conv. Center	Keep Engaging Youth in Science: Resources for Building Relationships Among Teachers, Students, and Scientists (p. 65)
4:00–5:15 PM	6–12	129A, Conv. Center	Toxin and Energy Flow in an Ecosystem (p. 67)
4:00–5:15 PM	7–C	222C, Conv. Center	Creating a Digital Strategy for STEM (p. 67)
4:00–5:15 PM	5–8	223, Conv. Center	FDA Food Science Workshop (Middle School) (p. 67)
4:00–5:15 PM	9–12	227 B/C, Conv. Center	Carolina Beyond the Tape: Forensic Science for Every Discipline (p. 68)
4:00–5:15 PM	8–12	231C, Conv. Center	The Case of the Missing Archive: Crime Scene and DNA Fingerprinting Investigation (p. 68)
5:00–6:00 PM	M–H	127A, Conv. Center	SEINet: A No-Cost Plant Study Tool (p. 69)
5:00–6:00 PM	M	229A, Conv. Center	What You Can Gain from Genetic Testing in Your Classroom (p. 70)

Friday

8:00–9:00 AM	M–H	121C, Conv. Center	Even Before STEM, Science and Math Loved Each Other! (p. 74)
8:00–9:00 AM	H–C/I	124B, Conv. Center	NABT Session: Free Classroom Resources for Teaching Evolution (p. 74)

Schedule at a Glance Biology/Life Science

8:00–9:00 AM	H	127C, Conv. Center	Using Case Studies to Teach AP Biology Content (p. 74)
8:00–9:00 AM	M–H	129B, Conv. Center	NSTA Press® Session: <i>Teaching and Learning Biology Through Scientific Argumentation</i> (p. 75)
8:00–9:15 AM	9–12	227 B/C, Conv. Center	Comparative Vertebrate Anatomy Featuring Carolina's Perfect Solution® Specimens (p. 77)
8:00–9:30 AM	9–C	221A, Conv. Center	Bio-Rad: Explore Inquiry and Ecology with Biofuel Enzymes (AP Big Idea 4) (p. 77)
8:00–9:30 AM	5–12	222 A/B, Conv. Center	Genetics: Crazy Traits and Adaptation Survivor (p. 77)
8:30–9:00 AM	E	126C, Conv. Center	NARST Session: Microcosmos: A Culturally Relevant Science Learning Environment for Second-Generation Latino Elementary Students (p. 73)
9:30–10:30 AM	M–C	124B, Conv. Center	NABT Session: Using HHMI's <i>The Making of the Fittest: Natural Selection and Adaptation</i> in Your Classroom (p. 82)
9:30–10:30 AM	H–C	127A, Conv. Center	Teaching Biological Processes Using Modules Based on 3-D Computer Animations (p. 81)
9:30–10:30 AM	H	127C, Conv. Center	What's So Important About Deep-Sea Coral Ecology? (p. 83)
10:00–11:15 AM	9–12	227A, Conv. Center	I Think There's a Genetically Engineered Fly in My Genetically Modified Pea Soup! (p. 84)
10:00–11:15 AM	9–12	228 A/B, Conv. Center	Why Teaching About Climate Change Matters—Data, Context, and Implications (p. 85)
10:30 AM–12 Noon	6–C	221A, Conv. Center	Bio-Rad: Engineer the Tools for Inquiry of Candy Food Dyes (p. 85)
11:00 AM–12 Noon	E–M	121A, Conv. Center	Mapping Migration Through Movement (p. 87)
11:00 AM–12 Noon	M–H/S	122A, Conv. Center	Promoting Science Literacy Using a Hybrid Class (p. 87)
11:00 AM–12 Noon	H–C/I	124B, Conv. Center	NABT Session: Using HHMI's <i>Bones, Stones, and Genes: The Origin of Modern Humans</i> (p. 88)
11:00 AM–12 Noon	M–H	127B, Conv. Center	Forensic Science: STEM Adventures into the Dark Side (p. 88)
11:00 AM–12 Noon	H	127C, Conv. Center	Human Skin Pigmentation and UV Intensity (p. 88)
12 Noon–1:15 PM	6–12	129A, Conv. Center	Homeostasis and Diabetes (p. 90)
12 Noon–1:15 PM	9–12	227A, Conv. Center	O ₂ Understand Photosynthesis and Cellular Respiration! (p. 91)
12 Noon–1:15 PM	3–12	227 B/C, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 91)
12:30–1:30 PM	P–E	121A, Conv. Center	Raising Chickens in the Grade 1 Classroom and Literature (p. 92)
12:30–1:30 PM	M–H	122A, Conv. Center	The Language of Leopold (p. 92)
12:30–1:30 PM	H	124B, Conv. Center	NABT Session: The Revised AP Biology Course: Understanding the Changes in the Course Audit and New Exam (p. 92)
12:30–1:30 PM	H	127C, Conv. Center	Reach the Higher Levels of Inquiry in Cell Respiration and Photosynthesis Laboratory Investigations in AP Science (p. 94)
2:00–3:00 PM	M–H	122A, Conv. Center	Forensic Anthropology: Teaching with Bones (p. 96)
2:00–3:00 PM	H	124B, Conv. Center	NABT Session: AP Open Forum (p. 96)
2:00–3:00 PM	M–H/I	127C, Conv. Center	Integrating Food Science and Nutrition into Your Science Curriculum (p. 98)
2:00–4:30 PM	10–C	221A, Conv. Center	Bio-Rad: Crime Scene Investigator PCR Basics Kit (p. 101)
3:30–4:30 PM	M–H	124B, Conv. Center	NABT Session: Creating Student Excitement for the Nature of Science (p. 104)
4:00–5:15 PM	9–12	226 A–C, Conv. Center	High School Biology in a Digital World: Critical Thinking Trumps Information Overload (p. 106)
5:00–6:00 PM	M–H	126B, Conv. Center	Molecules, Energy Transfer, and Microbes Promote Inquiry (p. 108)

Saturday

8:00–9:00 AM	H–C	126A, Conv. Center	Understanding the Revised AP Biology Course: Curriculum, Science Practices, and Instructional Design (p. 111)
8:00–9:00 AM	H	126C, Conv. Center	Cyberlearning: Bringing the Science Classroom Closer to STEM (p. 111)
8:00–9:15 AM	9–C	223, Conv. Center	FDA Food Science Workshop (High School) (p. 113)
8:00–9:15 AM	9–12	227A, Conv. Center	O ₂ Understand Photosynthesis and Cellular Respiration! (p. 113)
8:00–9:30 AM	9–C	221A, Conv. Center	Bio-Rad: Implementing a Skills-based Biotech Program with Author Kirk Brown (p. 113)
9:30–10:30 AM	H–C	124A, Conv. Center	Naturopathic Botanical Medicine: Making a Healing Salve (p. 115)

Schedule at a Glance Biology/Life Science

9:30–10:30 AM	H	127B, Conv. Center	Flipping the Lab in AP Biology and AP Environmental Science (p. 115)
9:30–10:30 AM	H	126C, Conv. Center	America's Wildlife—Yesterday, Today, and Tomorrow (p. 114)
9:30–10:30 AM	G	127C, Conv. Center	Infect Your Biology Classroom with Math! (p. 115)
10:00–11:15 AM	6–8	227A, Conv. Center	Breeding Critters (p. 116)
10:30–11:30 AM	5–C	221A, Conv. Center	Bio-Rad: Genes in a Bottle™ Kit (p. 116)
11:00 AM–12 Noon	H–C	124A, Conv. Center	Restriction Enzymes Race: Digest and Analyze Plasmid DNA in a Class Period (p. 117)
11:00 AM–12 Noon	G	127A, Conv. Center	PEEK (Photography Educating and Empowering Kids) into This! (p. 117)
11:00 AM–12 Noon	H	127B, Conv. Center	Best Practices: Modeling Scientific Phenomena in AP and General Biology (p. 117)

Chemistry/Physical Science

Thursday

8:00–9:30 AM	5–12	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 49)
10:00–11:15 AM	7–C	123, Conv. Center	Getting the Most Out of Molecular-Level Visualization and Simulation Tools (p. 50)
10:00–11:15 AM	9–12	227A, Conv. Center	Lemons and Light Bulbs: Exploring the Chemistry of Electricity (p. 51)
12:30–1:00 PM	H/I	127A, Conv. Center	Engaging Students in Chemistry Outside the Classroom: A Look at ChemClub (p. 54)
12:30–1:30 PM	H	122A, Conv. Center	The American Modeling Teachers Association: Modeling Instruction, the Next Generation (p. 54)
1:00–1:30 PM	H/I	127A, Conv. Center	Teaching and Learning in the Digital Age: Chemistry Resources Teachers and Students Can Rely On (p. 54)
2:00–2:30 PM	H	127A, Conv. Center	“Emergency Lesson Plans” for Teaching Chemistry Across Curricula (p. 59)
2:00–3:00 PM	E	121B, Conv. Center	Inquiry in Action: Investigating Matter Through Inquiry (p. 61)
2:15–3:30 PM	9–12	227A, Conv. Center	Mastering the Chemical Formula: An Exceptionally Effective Way to Teach Subscripts and Coefficients (p. 63)
2:15–3:30 PM	9–12	227 B/C, Conv. Center	The Solution Is Simple! Understanding Colligative Properties with Inquiries in Science® (p. 63)
3:30–4:30 PM	H–C	126A, Conv. Center	Scientific Literacy and Communication in the New AP Chemistry Course (p. 64)
3:30–4:30 PM	M–H	126B, Conv. Center	Dancing with the Periodic Table (p. 66)
4:00–5:15 PM	6–8	227A, Conv. Center	An Absorbing Misconception About Waves and the “Power” of Colors (p. 68)
5:00–6:00 PM	M–H	126B, Conv. Center	Be Prepared! Move Now from Cookbook to Inquiry! (p. 70)

Friday

8:00–9:00 AM	H	125 A/B, Conv. Center	ACS Session One: Equilibrium and Concentration (p. 74)
8:00–9:00 AM	H	126A, Conv. Center	Fuel Cells: How to Put Them into Your Classroom (p. 73)
8:00–9:00 AM	M–H	127B, Conv. Center	STEM—Now or Never! (p. 74)
8:00–9:00 AM	M	128B, Conv. Center	ACS Middle Level Session: Solids, Liquids, and Gases: The Kinetic-molecular Theory of Matter (p. 75)
8:00–9:15 AM	7–C	123, Conv. Center	Using Molecular-Level Visualization to Engage Middle School and High School Science Students (p. 76)
8:00–9:15 AM	9–12	226 A–C, Conv. Center	Best Practices for Teaching Chemistry from Flinn (p. 77)
8:00–9:15 AM	9–12	227A, Conv. Center	Distillation: Simple and Fascinating Experiments in the Chemistry of Aromas and Smells (p. 77)
9:30–10:30 AM	M	122A, Conv. Center	City of Materials: Connecting Science to the “Stuff” in Kids’ Everyday Lives (p. 80)
9:30–10:30 AM	H	125 A/B, Conv. Center	ACS Session Two: Equilibrium and Energy (p. 82)
9:30–10:30 AM	M–H	126A, Conv. Center	Chemistry of Food (p. 80)

Schedule at a Glance Chemistry/Physical Science

9:30–10:30 AM	M–H	127B, Conv. Center	Candy Analysis (p. 83)
9:30–10:30 AM	M	128B, Conv. Center	ACS Middle Level Session: Changes of State: Evaporation and Condensation (p. 83)
10:00–11:15 AM	7–C	123, Conv. Center	Nailing Molecular Concepts with Scientifically Accurate Visualization and Simulation Tools (p. 84)
10:00–11:30 AM	5–12	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 85)
10:00–11:15 AM	9–12	227 B/C, Conv. Center	Bonding with Carolina Chemistry (p. 85)
11:00 AM–12 Noon	H	125 A/B, Conv. Center	ACS Session Three: Rate (p. 88)
11:00 AM–12 Noon	H	126A, Conv. Center	Introducing Nanotechnology into the Chemistry Classroom (p. 87)
11:00 AM–12 Noon	M	128B, Conv. Center	ACS Middle Level Session: Density: A Molecular View (p. 89)
12:30–1:30 PM	M	128B, Conv. Center	ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (p. 94)
12:30–1:30 PM	H	125 A/B, Conv. Center	ACS Session Four: Catalysis (p. 94)
12:30–1:30 PM	H	126A, Conv. Center	Bring the Science of Cars into the Classroom (p. 92)
12:30–1:30 PM	E–H	129B, Conv. Center	NSTA Press® Session: <i>Stop Faking It!</i> Finally Understand Chemistry Basics So You Can Teach Them (p. 94)
2:00–3:00 PM	H	125 A/B, Conv. Center	ACS Session Five: Light as a Reactant and/or Product (p. 98)
2:00–3:00 PM	H	126A, Conv. Center	Basic Polymer Chemistry for the High School Classroom (p. 97)
2:00–3:00 PM	M	128B, Conv. Center	ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (p. 98)
2:00–3:15 PM	9–C	226 A–C, Conv. Center	<i>Chemistry in the Community</i> , 6th Edition—Changing with the Times (p. 100)
2:00–3:15 PM	9–12	227A, Conv. Center	Color, Spectrophotometry, and Teaching the Structure of the Atom (p. 100)
2:00–3:15 PM	9–12	228 A/B, Conv. Center	Going Green: Economical and Environmentally Friendly Inquiry in Chemistry (p. 100)
3:30–4:30 PM	H	125 A/B, Conv. Center	ACS Session Six: Half-Life (p. 104)
3:30–4:30 PM	G	126C, Conv. Center	Flipping Your Classes (p. 102)
3:30–4:30 PM	I	127C, Conv. Center	Squeezing GLUE-GOO into the National Science Education Standards (p. 104)
3:30–4:30 PM	M	128B, Conv. Center	ACS Middle Level Session: Chemical Change: Breaking and Making Bonds (p. 105)
4:00–5:30 PM	5–12	222 A/B, Conv. Center	Chemistry and the Atom: Fun with Atom-building Games! (p. 107)
5:00–5:30 PM	H	127A, Conv. Center	Using Stories to Teach Chemistry (p. 107)
5:00–6:00 PM	I	127C, Conv. Center	Polydensity Tube Make–Learn–Take: Serious Fun with a Dense Subject (p. 108)
5:00–6:00 PM	H	231A, Conv. Center	Understanding Nuclear Energy (p. 108)

Saturday

8:00–9:00 AM	M–H	127C, Conv. Center	Polymers: New Twists on Old Favorites (p. 112)
8:00–9:00 AM	H/S	230, Conv. Center	Exploring the <i>2012 ACS Guidelines and Recommendations for Teaching High School Chemistry</i> (p. 111)
9:30–10:30 AM	M–H	126A, Conv. Center	PolyWhat? Understanding What a Polymer Is: Polymer 101 (p. 114)
11:00 AM–12 Noon	H	126A, Conv. Center	Solids: The Neglected “State” of Chemistry (p. 116)

Earth/Space Science

Thursday

8:00–9:00 AM	M–H	124B, Conv. Center	“Astro”nishing Astronomy: The Electromagnetic Spectrum (p. 46)
8:00–9:00 AM	E–H	130, Conv. Center	NASA CERES S’COOL Project: Cloud Observation Is S’COOL! (p. 45)
8:00–9:15 AM	6–8	227A, Conv. Center	Investigating a Cliff Model (p. 48)
10:00–11:15 AM	4–12	129A, Conv. Center	Earthquakes and Tornadoes (p. 50)

Schedule at a Glance Earth/Space Science

10:30–11:30 AM	5–8	221C, Conv. Center	Asteroid! Will Earth Be Hit Again? Planetary Science for Middle School (p. 52)
12 Noon–1:00 PM	5–8	221C, Conv. Center	NASA's Kepler Mission and the Hunt for Exoplanets: Planetary Science for Middle School (p. 53)
12:30–1:00 PM	5–8	Booth #331, Exhibit Hall	Welcome to the Neighborhood: Overview of the Solar System (p. 53)
12:30–1:30 PM	G	130, Conv. Center	NASA's Know Your Earth (p. 54)
2:00–3:00 PM	M–H	127B, Conv. Center	NASA: Inquiry Activities for Learning About Light and the Electromagnetic Spectrum and Multiwavelength Astronomy (p. 62)
2:00–3:00 PM	G	129B, Conv. Center	NSTA Press® Session: Uncovering Earth and Space Science Core Ideas in the NGSS Using Formative Assessment Probes (p. 60)
2:00–3:00 PM	G	130, Conv. Center	NASA's High-Energy Vision: Chandra and the X-Ray Universe (p. 60)
2:15–3:30 PM	4–12	129A, Conv. Center	The Sky Through the Ages (p. 63)
3:30–4:30 PM	M–C	128A, Conv. Center	Sorting Out the Galaxy Zoo (p. 67)
5:00–6:00 PM	M–H	124B, Conv. Center	Hands-On Meteorite Investigations to Learn About the Solar System (p. 70)
5:00–6:00 PM	G	128A, Conv. Center	Demystifying the STEM Riddle: What You Need to Know (p. 70)

Friday

8:00–9:00 AM	M–C	126B, Conv. Center	Modeling Black Holes (p. 74)
8:00–9:00 AM	E–H	132 A–C, Conv. Center	Climate Change Classroom Tool Kit (p. 76)
8:00–9:00 AM	G	229A, Conv. Center	Ice Core Records—From Volcanoes to Supernovas (p. 76)
9:30–10:30 AM	E–H	121C, Conv. Center	Using Inquiry to Teach Igneous and Sedimentary Rocks (p. 82)
9:30–10:30 AM	M–C	131B, Conv. Center	Virtual Field Trips: Creative Ways to Engage Diverse K–12 Student Populations Using Software You Already Have (p. 81)
9:30–10:30 AM	E–H	132 A–C, Conv. Center	Activities from Across the Earth System (p. 83)
9:30–10:30 AM	E–M	231B, Conv. Center	Bringing Astronomy Activities and Science Content to Girls Locally and Nationally: A Girl Scout and NIRCcam Collaboration (p. 83)
11:00–11:30 AM	K–4	Booth #331, Exhibit Hall	Location, Location—Finding Your Way Around the Sky (p. 86)
11:00 AM–12 Noon	E–H	132 A–C, Conv. Center	Let's Get Well Grounded! (p. 89)
11:00 AM–12 Noon	M	229B, Conv. Center	You Are a Paleontologist (p. 89)
11:00 AM–12 Noon	E–H	231B, Conv. Center	Saving Energy, Saving Our Night Sky (p. 89)
12 Noon–1:15 PM	K–12	123, Conv. Center	Master of Science Degree in Geosciences Available Online Through the Teachers in Geosciences Program (p. 90)
12:30–1:30 PM	M–C	121C, Conv. Center	Investigating the Mercalli Intensity Scale (p. 94)
12:30–1:30 PM	G	122C, Conv. Center	The Scale of the Universe (p. 92)
12:30–1:30 PM	M–H	127A, Conv. Center	NASA's SOFIA Is Flying! Infrared Astronomy Images and Lessons (p. 93)
12:30–1:30 PM	M–H	127B, Conv. Center	NASA: Dynamic Solar System Models for the Classroom (p. 94)
12:30–1:30 PM	M–H	132 A–C, Conv. Center	Our Changing Planet (p. 94)
2:00–3:00 PM	I	121B, Conv. Center	The Carbon Cycle and Bioenergy: Quantitative Modeling with Poker Chips and Student Monitoring of CO ₂ (p. 98)
2:00–3:00 PM	M–C	126C, Conv. Center	Understanding Earth: A Planetary Science Perspective (p. 97)
2:00–3:00 PM	E–H	132 A–C, Conv. Center	National Earth Science Teachers Association Earth Science Share-a-Thon (p. 99)
2:00–3:15 PM	4–12	129A, Conv. Center	Hurricanes and Volcanoes (p. 100)
3:00–4:00 PM	5–8	221C, Conv. Center	Fossil Evidence: A Preview of <i>FOSS Earth History</i> , 2nd Edition for Middle School (p. 101)
3:30–4:30 PM	G	132 A–C, Conv. Center	National Earth Science Teachers Association Rock and Mineral Raffle (p. 105)
5:00–6:00 PM	E–H	131C, Conv. Center	MY NASA DATA: Earth Systems Data Visualization Tool for Students (p. 107)
5:00–6:00 PM	G	230, Conv. Center	Teaching with Google Earth (p. 107)

Schedule at a Glance Earth/Space Science

Saturday

8:00–9:00 AM	I	121B, Conv. Center	A Portable/Traveling Human Orrery (p. 112)
8:00–9:00 AM	G	121C, Conv. Center	Stellar Evolution—From Formation to Destruction (p. 112)
8:00–9:00 AM	M–H	127B, Conv. Center	Using Inquiry to Teach Plate Tectonics (p. 112)
8:00–9:15 AM	K–12	228 A/B, Conv. Center	Teaching Earth and Space Science in Middle School and High School (p. 113)
9:30–10:30 AM	E–H	121B, Conv. Center	Using Inquiry to Teach Metamorphic Rocks and the Rock Cycle (p. 115)
11:00 AM–12 Noon	M–C	121B, Conv. Center	Seeing the Invisible Universe (p. 117)
11:00 AM–12 Noon	M–H	126C, Conv. Center	The Power of Perspective in Scientific Inquiry: Laurel Clark Earth Camp for Educators (p. 117)
11:00 AM–12 Noon	S	229A, Conv. Center	Science Literacy and Those Accountable Lines of Communication (p. 118)

Environmental Science

Thursday

8:00–9:00 AM	E	121B, Conv. Center	Cosmetics, OTC Drugs, Environmental Issues, and the BP Oil Spill—Let's Go Green! (p. 46)
8:00–9:00 AM	M–H	126A, Conv. Center	Urban Heat Island: Linking Science, Society, and Engineering (p. 45)
12:30–1:00 PM	G	231A, Conv. Center	Education for Sustainable Development and Science Education in Japan (p. 59)
12:30–1:30 PM	H	121B, Conv. Center	Helping Students Write Their Own Scientific Experiments for Environmental Science (p. 56)
3:30–4:30 PM	S	126C, Conv. Center	How Much Is Too Much Paper? (p. 64)
3:30–4:30 PM	E–M	229B, Conv. Center	Developing Simple Sustainability Lessons (p. 66)
4:00–5:15 PM	6–12	231B, Conv. Center	Exploring STEM Careers: Water and Our Environment (p. 68)
5:00–6:00 PM	M–H	126A, Conv. Center	Using GIS in Earth and Environmental Science (p. 69)
5:00–6:00 PM	M–C	229B, Conv. Center	Camp Colley Goes Green: An Energy Lesson Plan (p. 69)

Friday

8:00–9:00 AM	E–H	229B, Conv. Center	Forests, Carbon, and Climate Change (p. 76)
9:30–10:30 AM	G	122C, Conv. Center	Communicate, Collaborate, and Create—Changing Your Classroom and the World (p. 82)
9:30–10:30 AM	M–H	231A, Conv. Center	Developing Critical Thinkers Through the Water Investigations Program: Connecting Classroom Practice to Real-World Application (p. 82)
9:30–10:30 AM	G	Ballroom 120D, Conv. Center	Featured Presentation: Phosphorus, Food, and Our Future (Speaker: James J. Elser) (p. 80)
10:00–11:15 AM	6–12	129A, Conv. Center	Pollution and Acid Rain Activities (p. 84)
2:00–3:00 PM	M–H	126B, Conv. Center	Teaching About Our Human-made World (p. 98)
2:00–3:00 PM	E–H	South Mountain, Sheraton	SYM-1 Follow-Up Session: Monarch Life Cycles and Raising Monarchs in Captivity (p. 99)
2:00–3:15 PM	9–12	227 B/C, Conv. Center	Hands-On Activities to Explore Environmental Change (p. 100)
3:30–4:30 PM	E	121A, Conv. Center	In the Wake of the Wallow Fire (p. 102)
3:30–4:30 PM	H–C/I	121C, Conv. Center	Focus on Forests: Project Learning Tree's New Secondary Curriculum (p. 104)
3:30–4:30 PM	H	126B, Conv. Center	Using Challenges to Frame Learning in the Science Classroom (p. 104)
3:30–4:30 PM	M–H	229B, Conv. Center	Facing the Future: Fueling the Future (p. 105)
3:30–4:30 PM	E–H	South Mountain, Sheraton	SYM-1 Follow-Up Session: Classroom Lessons with Monarchs (p. 105)
4:00–5:15 PM	9–12	222C, Conv. Center	Exploring Renewable Energy: A Hands-On STEM Investigation (p. 106)
5:00–6:00 PM	M–H	229B, Conv. Center	Facing the Future: Global Connections and Sustainability (p. 108)

Schedule at a Glance Environmental Science

Saturday

8:00–9:00 AM	P–M	229B, Conv. Center	How Does Your Garden Grow?
8:00–9:00 AM	H	126B, Conv. Center	Playing Games to Learn Complex Environmental Science Concepts
9:30–10:30 AM	M–H	126B, Conv. Center	Understanding the School Building as a System
11:00 AM–12 Noon	H	229B, Conv. Center	Concept Mapping Environmental Sciences

Integrated/General

Thursday

8:00–9:00 AM	P–M	121C, Conv. Center	A Buyer's Guide...and Gourmet Menu! Selecting and Using Outstanding Trade Books (p. 46)
8:00–9:00 AM	G	122A, Conv. Center	STEM Where? Integrating STEM into the Science Classroom in Anticipation of the Next Generation Science Standards (p. 45)
8:00–9:00 AM	G	125 A/B, Conv. Center	Is This Your First NSTA Conference? (p. 46)
8:00–9:00 AM	G	126C, Conv. Center	So My Classroom Has Computers...NOW WHAT? (p. 45)
8:00–9:00 AM	S	127B, Conv. Center	Promoting Inquiry in Our Classrooms: Using Hands-On Performance Assessment with K–12 Students (p. 47)
8:00–9:00 AM	G	128A, Conv. Center	Game On! Gaming as Science Assessment (p. 47)
8:00–9:00 AM	G	131B, Conv. Center	Successful K–12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics (p. 45)
8:00–9:00 AM	6–8	228 A/B, Conv. Center	<i>PBIS</i> TM —Moving Beyond “What Is Science?” to Being Scientists Through Science and Engineering Practices (p. 48)
8:00–9:00 AM	E–M	229A, Conv. Center	Building Academic Vocabulary Through Science (p. 47)
8:00–9:00 AM	G	229B, Conv. Center	Building a STEM Program: Successes and Challenges (p. 46)
8:00–9:00 AM	H	230, Conv. Center	Growing Sustainability in the High School from the Grass Roots (p. 46)
8:00–9:00 AM	E–H	231A, Conv. Center	NASA and NOAA Professional Development: How It Fits into the STEM Puzzle (p. 46)
8:00–9:15 AM	K–6	221B, Conv. Center	Inquiring Minds Provide Spark for Science Lessons (p. 48)
8:00–10:00 AM	K–8	221C, Conv. Center	Science-centered Language Development with FOSS (p. 49)
9:15–10:30 AM	G	Ballroom 120D, Conv. Center	General Session: Leadership Lessons from <i>Apollo</i> to <i>Discovery</i> (Speaker: Col. Eileen Collins) (p. 50)
9:30–10:30 AM	6–8	228 A/B, Conv. Center	How Do Scientists Work Together to Answer Big Questions and Solve Big Problems in <i>PBIS</i> TM ? (p. 50)
10:00–11:15 AM	9–12	221A, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 51)
10:00–11:15 AM	K–6	221B, Conv. Center	DSM and STEM: Challenges for the Elementary Student (p. 51)
10:00–11:15 AM	6–8	222C, Conv. Center	Experience the Future of Digital Science from National Geographic and Achieve3000® (p. 51)
10:00–11:15 AM	5–8	223, Conv. Center	NGSS and Scientific Practices—More Than Photoshopping Models' Flaws (p. 51)
10:00–11:15 AM	K–8	227 B/C, Conv. Center	What Quality Science Instruction Has to Do with Raising Achievement Scores K–8 (p. 51)
10:00–11:15 AM	6–9	231B, Conv. Center	Student Collaboration in the Science Classroom (p. 52)
11:00 AM–12 Noon	6–12	228 A/B, Conv. Center	Your Technology Solution for STEM and the Highly Anticipated Next Generation Science Standards (p. 53)
11:15 AM–12 Noon	G	Entrance to Exhibit Hall	Meet the Presidents and Board/Council (p. 53)
12 Noon–1:15 PM	9–12	221A, Conv. Center	STEM: The Game Changer in Science Lab Design (p. 53)
12:30–1:30 PM	E	121A, Conv. Center	STEM in an Elementary School: A Schoolwide Model (p. 54)
12:30–1:30 PM	E–M	121C, Conv. Center	Going to the Dogs (p. 56)
12:30–1:30 PM	M–H	126A, Conv. Center	Creating Integrated Projects Collaboratively (p. 54)
12:30–1:30 PM	H	127B, Conv. Center	CSSS Session: Implementing the Common Core State Standards in the Secondary Science Classroom (p. 56)

Schedule at a Glance Integrated/General

12:30–1:30 PM	G	128A, Conv. Center	Maximizing Quality Instructional Time: Make Every Minute Count (p. 56)
12:30–1:30 PM	E–M	129B, Conv. Center	NSTA Press® Session: Using Science Mystery Stories—The Details (p. 56)
12:30–1:30 PM	G	131B, Conv. Center	Science and Technology Festivals (p. 55)
12:30–1:30 PM	9–12	228 A/B, Conv. Center	<i>Engineering the Future</i> : A Practical Approach to STEM for High School (p. 57)
12:30–1:30 PM	G	229A, Conv. Center	Teaching Science with the 5E Model (p. 56)
12:30–1:30 PM	G	229B, Conv. Center	STEM Immersion Matrix: A Guide to STEM Program Development and Implementation (p. 55)
12:30–1:30 PM	E/S	230, Conv. Center	Discussion and Writing: Making Meaning of Science Learning Activities (p. 55)
12:30–1:45 PM	7–C	222C, Conv. Center	Create a Digital Classroom—Using 21st-Century STEM Initiatives! (p. 57)
12:30–1:45 PM	3–8	223, Conv. Center	Web Tools to Support STEM and Common Core State Standards (p. 57)
12:30–1:45 PM	K–12	226 A–C, Conv. Center	Stand Back! We’re Using Discovery Education Science Techbook for Grades K–12 (p. 57)
12:30–1:45 PM	G	231B, Conv. Center	See More, Do More, Learn More—Benefits of Using Digital Technology Tools (p. 58)
12:30–2:00 PM	K–8	221B, Conv. Center	Laurel and Hardy and the Laws of Science (p. 58)
1:30–3:00 PM	K–6	221C, Conv. Center	Engage Students with Active Learning Through FOSS, 3rd Edition (p. 59)
2:00–3:00 PM	E	121C, Conv. Center	Science and Literacy for the ELL Student (p. 61)
2:00–3:00 PM	M–H/I	126A, Conv. Center	Teach Ourselves: Exploring an Online STEM Learning Community (p. 60)
2:00–3:00 PM	G	128A, Conv. Center	Teaching and Assessing Scientific Habits of Mind (p. 62)
2:00–3:00 PM	M–C	131B, Conv. Center	Galileo’s Square-Cube Law: Explaining How Size Matters (p. 60)
2:00–3:00 PM	P–M	132 A–C, Conv. Center	CESI Session: Council for Elementary Science International Share-a-Thon (p. 62)
2:00–3:00 PM	9–12	228 A/B, Conv. Center	Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (p. 62)
2:00–3:00 PM	E–M	229A, Conv. Center	Why’d You Change Your Thinking? Science Notebooks: Analysis, Feedback, and Discourse (p. 62)
2:00–3:00 PM	E/C	229B, Conv. Center	Engineers Serving Education (p. 60)
2:00–3:00 PM	G	231A, Conv. Center	How I Turned a Great Science Lesson into a Presidential Award and \$10,000 (p. 60)
2:00–3:00 PM	G	Ballroom 120D, Conv. Center	Featured Presentation: STEM Curriculum—Moving Beyond the Acronym and into Classroom Practice (Speaker: Jo Anne Vasquez) (p. 59)
2:00–5:00 PM	G	128B, Conv. Center	Implication of the NRC <i>Framework</i> and the Highly Anticipated NGSS for Teaching and Learning (p. 62)
2:15–3:30 PM	7–C	222C, Conv. Center	Forensic Digital Microscopy and Inquiry Learning (p. 63)
2:15–3:30 PM	K–5	223, Conv. Center	Sangari Active Science (p. 63)
2:15–3:30 PM	K–12	226 A–C, Conv. Center	Science Projects and Notebooking (p. 63)
2:15–3:30 PM	1–6	231B, Conv. Center	33 Strategies for Integrating Science (p. 64)
3:00–4:30 PM	K–8	221B, Conv. Center	What’s Going on in There? NGSS Inquiry Science for Supervisors, Trainers, and Teachers (p. 64)
3:30–4:30 PM	E–M	121A, Conv. Center	Tired of Your Science Fair? How About an Engineering Fair? (p. 64)
3:30–4:30 PM	M–H	121C, Conv. Center	Creating Connections to Foster Action: A Hook for Effective STEM Integration (p. 66)
3:30–4:30 PM	M–H	127B, Conv. Center	STEM CSI (p. 66)
3:30–4:30 PM	G	129B, Conv. Center	NSTA Press® Session: <i>Rise and Shine: A Practical Guide for the Beginning Science Teacher</i> (p. 65)
3:30–4:30 PM	E–H	131B, Conv. Center	STEM Projects for the Middle School Science Classroom (p. 65)
3:30–4:30 PM	G	132 A–C, Conv. Center	NSTA Student Chapter Share-a-Thon (p. 65)
3:30–4:30 PM	K	221C, Conv. Center	Materials in Our World: STEM for Early Childhood (p. 67)
3:30–4:30 PM	9–12	228 A/B, Conv. Center	Active Chemistry and Active Physics—Ahead of Their Time in Capturing the Highly Anticipated NGSS and STEM (p. 67)
3:30–4:30 PM	G	229A, Conv. Center	Who Supports Science at Your K–5 School? Recharge with Resources and Collaboration! (p. 67)
3:30–4:30 PM	P–M/I	230, Conv. Center	Kindergarten Science and Literacy (p. 66)

Schedule at a Glance Integrated/General

3:30–4:30 PM	H–C/S	231A, Conv. Center	Toward a Framework for Integrated Science Collaboration: High School/University Partnerships (p. 66)
4:00–5:15 PM	6–12	123, Conv. Center	The Archaeology of Cactus Ruin: A Paper Excavation (p. 67)
5:00–6:00 PM	E–M	121A, Conv. Center	Champions for Change: Boost Student Learning and Scores Through Project Based Learning (p. 69)
5:00–6:00 PM	M–H	127B, Conv. Center	Iteration in Engineering (p. 70)
5:00–6:00 PM	E	129B, Conv. Center	NSTA Press® Session: Authors Share Favorite Lessons from <i>Teaching Science Through Trade Books</i> (p.70)
5:00–6:00 PM	G	130, Conv. Center	Vocabulary That Connects and Test Strategies That Work! (p. 69)
5:00–6:00 PM	G	131B, Conv. Center	Data: It's Not a Four-Letter Word (p. 69)
5:00–6:00 PM	P–E	230, Conv. Center	Kindergarten Science Illustrations and Recordings (p. 69)
5:00–6:00 PM	E–H	231A, Conv. Center	Computational Thinking (CT)—See the World in a New Way (p. 69)

Friday

8:00–8:30 AM	M	126C, Conv. Center	NARST Session: The Effect of Instructional Framing on Learning and Transfer of Experimental Design Skills (p. 73)
8:00–9:00 AM	E–M/I	121A, Conv. Center	Playing Games in the Classroom: Using Student Creations to Teach Anything Better! (p. 73)
8:00–9:00 AM	H	127A, Conv. Center	How Building Solar Cars Promotes Student Interest in STEM (p. 73)
8:00–9:00 AM	G	128A, Conv. Center	ASEE Session: ASEE's K–12 Outreach Program eGFI: Engineering, Go For It and the Marshmallow Challenge (p. 75)
8:00–9:00 AM	G	130, Conv. Center	Before and After Retirement: Practicalities and Possibilities (p. 73)
8:00–9:00 AM	E–H	131B, Conv. Center	Give Science a Voice! Digital Storytelling in the Science Classroom (p. 73)
8:00–9:00 AM	E–H	131C, Conv. Center	Get SIMulated! (p. 73)
8:00–9:00 AM	E–H	231A, Conv. Center	It Can Be Done (p. 74)
8:00–9:00 AM	E–M	231B, Conv. Center	STEM Curriculum Strategies—Putting Practice into Action (p. 75)
8:00–9:15 AM	6–12	129A, Conv. Center	Improve STEM Literacy for All Students (p. 75)
8:00–9:15 AM	K–6	221B, Conv. Center	Science: The Literacy Connection and the Core Curriculum (p. 76)
8:00–9:15 AM	K–12	222C, Conv. Center	Equip Your iPad for Science with SPARKvue® HD, a Full-featured Science Application for the iPad (p. 76)
8:00–9:15 AM	K–12	228 A/B, Conv. Center	Inquiry and Scientific Practices: Keys to Getting Students to Think (p. 77)
8:00–9:30 AM	3–C	223, Conv. Center	Integrating Your iPad or Mobile Device with Vernier Technology (p. 78)
8:00–10:00 AM	K–8	221C, Conv. Center	Using Science Notebooks to Impact Student Learning with FOSS (p. 78)
9:00–11:00 AM	G	124A, Conv. Center	ESP: Unique Features of Programs That Meet “More Emphasis” in the NSES (p. 79)
9:30–10:00 AM	E/C	126C, Conv. Center	NARST Session: Analyzing Curriculum Materials with Preservice and Mentor Elementary Teachers: Bridging Science Methods and Field Placement Settings (p. 81)
9:30–10:30 AM	E–M	121A, Conv. Center	Sing a Song of Science! (p. 80)
9:30–10:30 AM	G	128A, Conv. Center	ASEE Session: Engineering the Future with <i>TeachEngineering.org</i> (p. 83)
9:30–10:30 AM	E	129B, Conv. Center	NSTA Press® Session: <i>Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, 3–6</i> (p. 83)
9:30–10:30 AM	G	131C, Conv. Center	The Policy of Science Standards in Action: How Will We Respond to the New Science Standards and What Are the Pitfalls to Avoid? (p. 82)
9:30–10:30 AM	P–E	229B, Conv. Center	Teaching Younger Students About Energy Outside the Science Classroom (p. 83)
9:30–10:30 AM	M–H	230, Conv. Center	Authentic Writing in Science: Get Kids to Write Children's Books (p. 82)
10:00–10:30 AM	H–C	126C, Conv. Center	NARST Session: How Can We Prepare Students to Recognize Errors of Inquiry During Work with Virtual Environments? (p. 81)
10:00–11:15 AM	6–9	121B, Conv. Center	“Hard” Doesn't Mean “Bad”—Helping Students Understand That Facing Challenges Is a Good Thing (p. 84)
10:00–11:15 AM	K–6	221B, Conv. Center	Identifying, Clarifying, and Designing Experiments (p. 84)
10:00–11:15 AM	9–12	222C, Conv. Center	Achievable Inquiry in AP* Biology and Chemistry (p. 84)
10:00–11:15 AM	2–10	226 A–C, Conv. Center	3-2-1 Blast Off! (p. 84)

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10:00–11:30 AM	3–C	223, Conv. Center	Introducing the Vernier LabQuest 2! (p. 85)
10:30 AM–12:30 PM	K–6	221C, Conv. Center	FOSS Formative Assessment: Making Student Thinking Visible (p. 85)
11:00 AM–12 Noon	G	122C, Conv. Center	Creative Problem Solving with Toshiba/NSTA ExploraVision (p. 87)
11:00 AM–12 Noon	M–H	126B, Conv. Center	NASA's HIAD Program: Engineering Design in Action (p. 88)
11:00 AM–12 Noon	G	126C, Conv. Center	NSELA Session: Tools for Leaders, Part I (p. 87)
11:00 AM–12 Noon	M–H	128A, Conv. Center	ASEE Session: Putting It Together with Solar Robots (p. 89)
11:00 AM–12 Noon	G	131B, Conv. Center	Nonfiction Science Books Add Value to Your Classroom (p. 87)
11:00 AM–12 Noon	G	131C, Conv. Center	Podcasting and YouTubing Your Way to Student Mastery (p. 87)
11:00 AM–12 Noon	E	229A, Conv. Center	The Role of “Drawing” in Supporting Critical Thinking and Science Processes (p. 89)
11:00 AM–12 Noon	G	230, Conv. Center	Teaching Sustainability Competencies Through Community Projects (p. 88)
11:00 AM–12 Noon	G	231A, Conv. Center	GIS: Is It the Last Piece of the STEM Puzzle? (p. 88)
11:00 AM–12 Noon	G	Ballroom 120D, Conv. Center	Featured Presentation: The Current State of the Next Generation Science Standards (Stephen L. Pruitt) (p. 86)
12 Noon–1:15 PM	6–12	222C, Conv. Center	STEM: Meeting the Standards in Your Classroom (p.90)
12 Noon–1:15 PM	K–12	226 A–C, Conv. Center	Building and Assessing Academic Vocabulary Using Notebook Foldables® (p. 90)
12 Noon–1:15 PM	9–12	228 A/B, Conv. Center	The Next Generation of Science Virtual Labs for the Entire Science Curriculum—No Cleanup! (p. 91)
12 Noon–1:30 PM	9–C	223, Conv. Center	Chemistry and Biology with Vernier (p. 92)
12:30–1:30 PM	E	121B, Conv. Center	Telling the Science Story: Finding a Common Ground Between the Common Core and Frameworks (p. 94)
12:30–1:30 PM	G	126C, Conv. Center	NSELA Session: Tools for Leaders, Part II (p. 93)
12:30–1:30 PM	E	128A, Conv. Center	ASEE Session: Introducing Engineering to Elementary School Students (p. 94)
12:30–1:30 PM	G	130, Conv. Center	Authors Needed! Write for an NSTA Journal (p. 93)
12:30–1:30 PM	E–H	131B, Conv. Center	From Standards to Formative Assessment—Maximizing Our Instructional Time (p. 93)
12:30–1:30 PM	E–M	229A, Conv. Center	Using NASA Press Releases to Develop Literacy in Integrated Science Lessons (p. 95)
12:30–1:30 PM	M–C	230, Conv. Center	Inquiry-based Sustainability Activities (p. 93)
12:30–1:30 PM	G	231A, Conv. Center	Yes! You Can Teach Reading and Writing in Science (p. 93)
12:30–1:30 PM	E	231B, Conv. Center	Bring Literacy and Science Together: B.L.A.S.T.© for Success at School and Home (p. 95)
12:30–1:30 PM	G	231C, Conv. Center	How to Engage Science Educators in the Public Review of NGSS (p. 93)
12:30–2:30 PM	M–C	124A, Conv. Center	SCST Session: Science Through Application: How Forensic Science Can Get Kids Interested (p. 95)
1:00–2:15 PM	K–6	221B, Conv. Center	Technological Design Standards Meet the STEM Initiative (p. 95)
1:00–2:30 PM	K–6	221C, Conv. Center	Taking Science Outdoors with FOSS K–6 (p. 95)
2:00–3:00 PM	E–M	121A, Conv. Center	Using Problem-Based Learning (PBL) to Engage Students in Environmental Science (p. 96)
2:00–3:00 PM	E–H	121C, Conv. Center	The Multilevel Classroom: Differentiation Strategies for Science (p. 98)
2:00–3:00 PM	G	122C, Conv. Center	Linking Science Writing and Research Through the DuPont Challenge (p. 96)
2:00–3:00 PM	G	128A, Conv. Center	ASEE Session: NASA's BEST Students (Beginning Engineering, Science, and Technology) Build a Buggy to Explore Mars! (p. 98)
2:00–3:00 PM	E–M	129B, Conv. Center	NSTA Press® Session: <i>Bringing Outdoor Science In</i> (p. 97)
2:00–3:00 PM	G	131B, Conv. Center	Dazzling Deceptions: Discrepant Events That Delight and Mystify! (p. 97)
2:00–3:00 PM	G	131C, Conv. Center	Contextualizing STEM Education (p. 97)
2:00–3:00 PM	G	229A, Conv. Center	Planning and Designing Safe, Sustainable, and Flexible Facilities for STEM-based Science (Science Facilities 101) (p. 99)
2:00–3:00 PM	G	229B, Conv. Center	Siemens STEM Academy: Top Free STEM Resources for Your Classroom (p. 99)
2:00–3:00 PM	G	230, Conv. Center	Big Cat Controversy: Issues Provide Context for Rich Learning and Community Building (p. 97)

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2:00–3:00 PM	G	231A, Conv. Center	Developing a Steady Diet of STEM Education Is E.A.S.I. (p. 97)
2:00–3:00 PM	P–E	231B, Conv. Center	Linking Home and School with P.A.S.S. (Portable Affordable Simple Science) (p. 99)
2:00–3:00 PM	G	231C, Conv. Center	Preparing for NGSS—Exploring the Scientific and Engineering Practices (p. 97)
2:00–3:00 PM	G	Ballroom 120D, Conv. Center	Featured Presentation: Building SPEED: Science in the Real World (at 200 mph) (Speaker: Diandra L. Leslie-Pelecky) (p. 96)
2:00–3:15 PM	4–12	123, Conv. Center	Detecting Radiation in Our Radioactive World (p. 100)
3:30–4:30 PM	E–M	121B, Conv. Center	Engaging Students in PBLs (Problem-Based Learning) (p. 104)
3:30–4:30 PM	C	122C, Conv. Center	2012 Preservice Science Standards for Preservice Teachers by NSTA and the National Council for Accreditation of Teacher Education (p. 102)
3:30–4:30 PM	G	127A, Conv. Center	Integrating Technology into the Classroom (p. 102)
3:30–4:30 PM	G	127B, Conv. Center	Effective Professional Development with NSTA Resources (p. 104)
3:30–4:30 PM	E–H	128A, Conv. Center	ASSEE Session: Developing and Publishing Standards for Professional Development for K–12 Teachers of Engineering (p. 104)
3:30–4:30 PM	E–H	129B, Conv. Center	NSTA Press® Session: Writing Stories for Teaching Science Practices (p. 105)
3:30–4:30 PM	G	131B, Conv. Center	Magical Illusions for Science Teachers (p. 102)
3:30–4:30 PM	G	131C, Conv. Center	Teaching with Screen-Capture Podcasts (p. 103)
3:30–4:30 PM	G	229A, Conv. Center	The Architects Have Started Without Me—What Do I Do Now? (Science Facilities 102) (p. 105)
3:30–4:30 PM	E	230, Conv. Center	Engaging K–6 Science Students with Scientific Inquiry—Supported by Science Literacy Skills and Extraordinary Print Resources (p. 103)
3:30–4:30 PM	E–H	231A, Conv. Center	Inspiring Students of All Ages Through FIRST® Robotics (p. 103)
4:00–5:15 PM	6–12	124A, Conv. Center	The Archaeology of Cactus Ruin: A Paper Excavation (p. 106)
4:00–5:15 PM	2–6	129A, Conv. Center	Integrate! A Better Way to Teach and Learn (p. 106)
4:00–5:15 PM	K–8	227 B/C, Conv. Center	Engineering, Technology, and the Application of K–8 Science (p. 106)
5:00–5:30 PM	M	126A, Conv. Center	Critical Thinking Through Science via Technology (p. 107)
5:00–6:00 PM	G	126C, Conv. Center	Expanding STEM Literacy at the K–3 Level Through Children’s Literature (p. 107)
5:00–6:00 PM	G	131B, Conv. Center	Oceans of Professional Development Opportunities Through NOAA (p. 107)
5:00–6:00 PM	G	231B, Conv. Center	Conjure a Class That Bonds Discipline with Academics (p. 108)

Saturday

8:00–9:00 AM	M	121A, Conv. Center	STEMulate—Engage and Inspire! (p. 111)
8:00–9:00 AM	G	122A, Conv. Center	STEM Stars: Community Collaboration (p. 111)
8:00–9:00 AM	G	229A, Conv. Center	Science + Literacy = Student Achievement (p. 112)
8:00–9:00 AM	E	231A, Conv. Center	Teaching Problem-solving Strategies in the Elementary Classroom: Helping Students See the Interconnectedness of Science, Technology, Engineering, and Mathematics (p. 111)
9:30–10:30 AM	I	121A, Conv. Center	Instructing and Learning in the Online World (p. 114)
9:30–10:30 AM	E	121C, Conv. Center	Focusing Not on What We Know But What We Don’t Know Is the Terrain of Science (p. 115)
9:30–10:30 AM	G	127A, Conv. Center	From Galileo to Moon Dust—The Consilience of Science and Religion \ (p. 114)
9:30–10:30 AM	E	229B, Conv. Center	STEM Activities: Animal Pictures, WebQuest, Boat Constructions, and Pumpkingrams (p. 115)
9:30–10:30 AM	M–C	230, Conv. Center	Teaching Climate and Energy with the CLEAN Collection: Peer-reviewed Climate and Energy Resources at Your Fingertips! (p. 114)
9:30–10:30 AM	G	231A, Conv. Center	Engaging Students in Real-World Science Explorations, Innovation, and Problem Solving: Doing Science While Applying Mathematics, Collaborative Thinking, Exploration, and Critical-thinking Skills (p. 114)
10:00–11:15 AM	K–12	223, Conv. Center	Using Mobile Devices in Hands-On Science Investigations (p. 116)
11:00 AM–12 Noon	M–H	121A, Conv. Center	Challenge-based Learning—Engage and Inspire! (p. 116)

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11:00 AM–12 Noon	G	122A, Conv. Center	Online Mentoring—Successes and Challenges (p. 116)
11:00 AM–12 Noon	E	129B, Conv. Center	NSTA Press® Session: <i>More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4</i> (p. 117)
11:00 AM–12 Noon	M	231A, Conv. Center	Robotics in Middle School: How Do We Make That Work? (p. 117)

Physics/Physical Science

Thursday

8:00–9:00 AM	G	129B, Conv. Center	NSTA Press® Session: Uncovering Physical Science Core Ideas in the NGSS Using Formative Assessment Probes (p. 45)
10:00–11:15 AM	7–C	226 A–C, Conv. Center	Fantastic Physical Science Demonstrations from Flinn (p. 51)
12 Noon–1:30 PM	5–12	222 A/B, Conv. Center	STEM Approach to Teaching Electricity and Magnetism (p. 53)
12:30–1:30 PM	P–E	132 A–C, Conv. Center	CESI Session: Experimental Design Just for PreK–5 (p. 56)
12:30–1:45 PM	1–4	123, Conv. Center	LEGO Education WeDo™ Robotics Workshop (p. 57)
2:00–3:30 PM	5–12	222 A/B, Conv. Center	Light and Optics: A Series of EnLIGHTening Experiments! (p. 62)
4:00–5:30 PM	5–12	222 A/B, Conv. Center	Sound, Waves, and Music (p. 68)

Friday

8:00–9:00 AM	M–H	122B, Conv. Center	AAPT Session: Using Physics “Challenge Days” to Help Motivate Freshman Students (p. 74)
9:00–11:00 AM	M–H	122B, Conv. Center	AAPT Session: An Introduction to Modeling Instruction in Physics (p. 79)
9:30–10:30 AM	M	126B, Conv. Center	Graphing on the Move (p. 83)
9:30–10:30 AM	G	229A, Conv. Center	NASA's Space Forensics: Solving Cosmic Mysteries with Crime Scene Narratives (p. 83)
11:00 AM–12 Noon	E–M	122B, Conv. Center	AAPT Session: The Physics Bus (p. 88)
11:00 AM–12 Noon	E–H	129B, Conv. Center	NSTA Press® Session: Classroom Activities for <i>Stop Faking It! Energy</i> (p. 89)
12 Noon–1:00 PM	H–C	122B, Conv. Center	AAPT Session: Ranking Tasks in Physics (p. 90)
12 Noon–1:30 PM	5–12	222 A/B, Conv. Center	Light and Optics: A Series of EnLIGHTening Experiments! (p. 92)
12:30–1:30 PM	I	229B, Conv. Center	Teaching Engineering Design to Middle School and High School Students Using Chain Reaction STEAM Machines™ (p. 95)
1:00–3:00 PM	M–H	122B, Conv. Center	AAPT Session: Modeling Energy and Systems in Physics (p. 95)
2:00–3:00 PM	M–H	127B, Conv. Center	Seeing the Invisible: Making the Electromagnetic Spectrum Concrete (p. 98)
2:00–3:15 PM	6–12	222C, Conv. Center	Investigating Motion: Understanding and Interpreting Graphs (p. 100)
2:00–3:30 PM	5–12	222 A/B, Conv. Center	Sound, Waves, and Music (p. 101)
2:00–3:30 PM	9–C	223, Conv. Center	Physics and Physical Science with Vernier (p. 101)
3:00–4:00 PM	H	122B, Conv. Center	AAPT Session: Engineering Wind Turbines: A STEM Application for Physics and Engineering Students (p. 101)
3:30–4:30 PM	E	231B, Conv. Center	Amazing Aircraft (p. 105)
4:00–5:00 PM	M–H	122B, Conv. Center	AAPT Session: The Box Game: Modeling Simple Nonlinear Systems Using Cellular Automata (p. 105)
4:00–5:15 PM	4–12	123, Conv. Center	LEGO® MINDSTORMS® NXT Basic Training Workshop (p. 106)
4:00–5:15 PM	6–8	227A, Conv. Center	Power Up! Investigating Electric Motors (p. 106)
5:00–6:00 PM	H	122B, Conv. Center	AAPT Session: Solving Kinematics Problems Using Graphical Methods (p. 108)

Saturday

8:00–9:00 AM	E–H	129B, Conv. Center	NSTA Press Session: Classroom Activities for <i>Stop Faking It! Force & Motion</i> (p. 112)
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