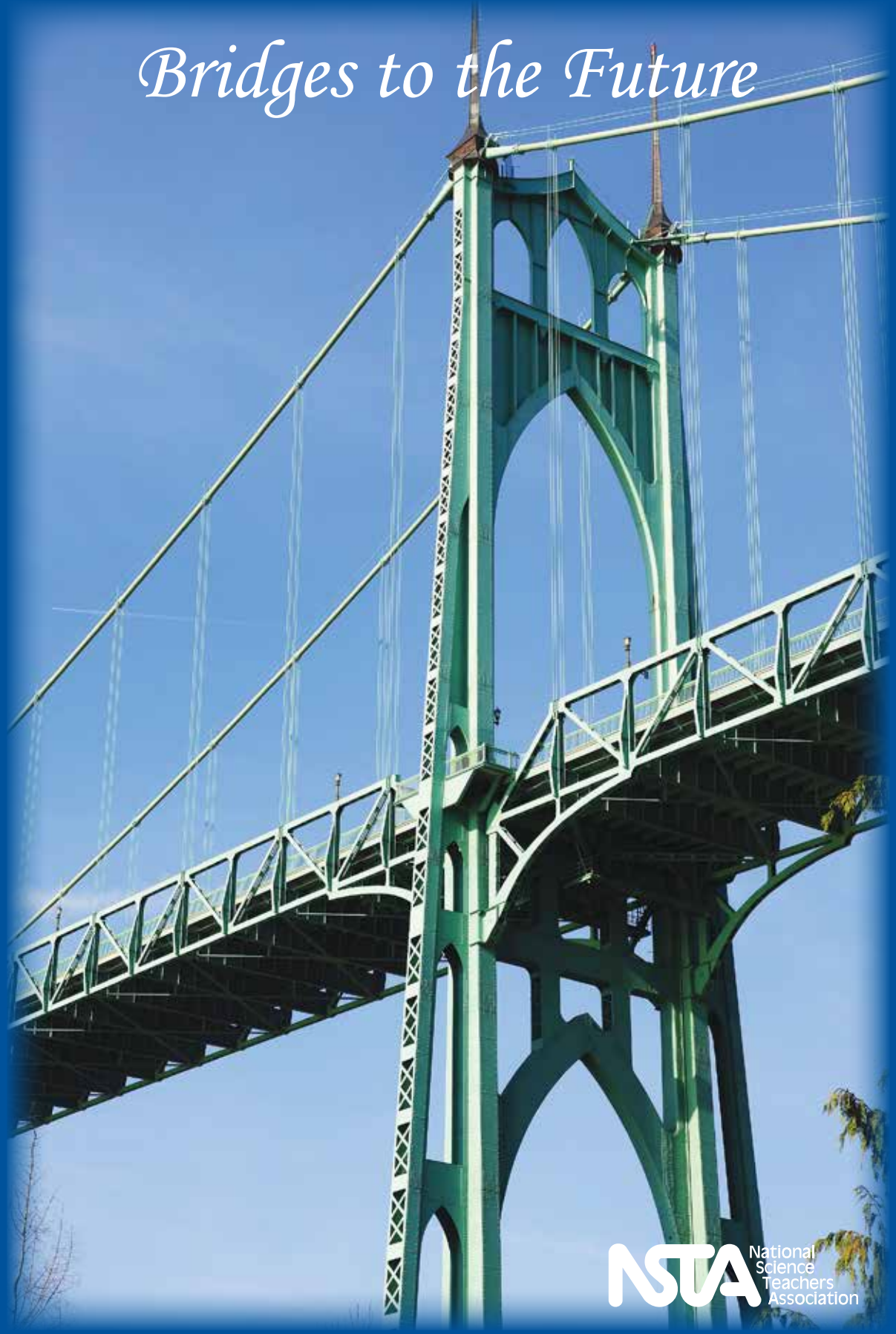


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Bridges to the Future



NSTA National Science Teachers Association

NSTA 2013 Area Conference on Science Education

Wherever your students learn science, they can use TI-Nspire™ technology.

classroom



lab



field



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| | |
|-----------|-----------------|
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| Thursday | 7:00 AM–5:00 PM |
| Friday | 7:00 AM–5:00 PM |
| Saturday | 7:30 AM–12 Noon |

- Fun NSTA-branded gear—unique hats, shirts, mugs, collectible pins, and more
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- Special savings for conference app users
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NSTA National
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BOOTH 910
IN PORTLAND, OR

WHAT

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WHERE

For more information, visit
<http://shellsciencelab.nsta.org>
or write to
ShellScienceLab@nsta.org

HOW



Learn more about this rich professional development opportunity at

<http://shellsciencelab.nsta.org>



NSTA National Science Teachers Association

Shell Science Lab Challenge



NSTA 2013 Area Conference on Science Education

Portland, Oregon • October 24–26, 2013

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National Science Teachers Association

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

NSTA Affiliates

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

Cover Photo

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#2. Access to learning modules and **customized lesson plans** in the NSTA Learning Center.

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#5. Download journal articles—members have **unlimited access**.

#9. Access to **NGSS@NSTA** resources—they'll provide a pathway for incorporating the Standards into classroom instruction.

#10. Year-round, face-to-face, and **online learning opportunities**.

#8. Enjoy up to \$95 off our **National and Area Conferences**—an unparalleled professional development opportunity.

#7. Participate in our **14 vibrant listservs**—collaborate with teachers who ask questions on everything from general pedagogy to “how do I use this piece of equipment?”

#6. **Network** and contribute to the NSTA Blog, an easy-to-use platform.

10

REASONS TO BECOME AN NSTA MEMBER

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

NSTA National
Science
Teachers
Association

Welcome to Portland



Lynda Sanders



Jodie Harnden



Lori Lancaster

We're glad you have joined us in building "Bridges to the Future" at the NSTA Portland Area Conference on Science Education.

During the conference, you'll have the opportunity to explore the Next Generation Science Standards and learn how science links with the Common Core State Standards in ELA and Mathematics. You'll also discover how to connect Science, Technology, Engineering, and Mathematics to benefit all our students and everybody's future.

The conference is organized around the following three strands, which offer content sessions developed for all levels and include a featured presentation by a leading researcher.

- Bridging Elementary and Secondary Science with the Common Core
- Bridging to the Next Generation Science Standards—What's in It for Me?
- Building Bridges Within STEM Education

The Portland Conference Committee has planned an engaging conference filled with hands-on workshops, presentations, and field trips that will provide you with the tools to build your own bridge to the future.

While here, please take time to experience Portland's cultural distinctions.

We look forward to meeting you here in Portland!

2013 Portland Area Conference Committee Leaders
Lynda Sanders, Jodie Harnden, and Lori Lancaster

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

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Portland Conference Committee

Program Committee

Strand Leader: Bridging Elementary and Secondary Science with the Common Core

Lela Thieme
Pilot Rock, OR

Strand Leader: Bridging to the Next Generation Science Standards—What's in It for Me?

Amanda Gossel
Legend High School
Parker, CO

Strand Leader: Building Bridges Within STEM Education

Marjorie (Midge) Ruth Yergen
West Valley Junior High School
Yakima, WA

NSTA Representative, District XVII

Jennifer Thompson
Juneau School District
Juneau, AK

Conference Advisory Board Liaison

Karen L. Ostlund
NSTA Retiring President
Retired Educator
The University of Texas at Austin

Local Arrangements Committee

Field Trips Manager

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Retired Educator
Portland, OR

Guides Manager

Maureen "Moe" Daschel
St Mary's Academy
Portland, OR

Manager of Services for People with Disabilities

Terry Shlaes
Lakeridge High School
Lake Oswego, OR

Volunteers Manager

Paul Zastrow
Retired Educator
Hood River, OR



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▶ HOW TO PLAY

EYE SPY by TOSHIBA is a new hidden treasure hunt. The FASTEST times get entered to win a Toshiba Excite™ 10" tablet!

▶ HOW TO USE WITH YOUR STUDENTS

Whenever students discover a new object, a pop-up dialogue box offers educational tidbits related to the past winning ExploraVision project and the object's significance in the world of technology, history and innovation.

- **Educational opportunities are everywhere!**

Hidden in a big city, students will discover hidden objects and learn amazing facts about the history of innovation, science, technology and the environment.

- **Incorporate this hands-on, inquiry-based program in your classroom!**

Use the game to motivate and energize your students to think about the real-world challenges they can solve through STEM for their ExploraVision projects.

- **For Classroom Game:** http://eyespybytoshiba.com/exploravision_2014

ABOUT TOSHIBA/NSTA EXPLORAVISION:

The Toshiba/NSTA ExploraVision STEM competition inspires K-12 students to envision the technologies of the future. ExploraVision lets your students engage in hands-on learning, problem solving, critical thinking, and collaboration. Learn more at: www.exploravision.org/regionalconference



TOSHIBA | NSTA

ExploraVision

President's Welcome

Building and Sustaining Teacher Leadership in Science, Standards, and Literacy



Welcome to NSTA's 2013 Portland Area Conference on Science Education in beautiful Portland, Oregon. From the Columbia River Gorge to the Pacific coast and from Mt. Hood to the Willamette Valley, this "City of Roses" provides the backdrop for you to engage in professional development to strengthen your understanding of science, standards, and literacy.

With the release of the NRC *Framework*, the Next Generation Science Standards, and the Common Core State Standards in reading and mathematics, the Portland Conference Committee has organized a comprehensive program incorporating these areas around the theme "Bridges to the Future." The conference strands include the following.

- Bridging to the Next Generation Science Standards—What's in It for Me?
- Building Bridges Within STEM Education
- Bridging Elementary and Secondary Science with the Common Core

These strands will allow you to leave the conference with a deeper understanding of the NGSS (including the focus on engineering practice), the principles behind their development, and how they may be implemented. The strands will focus on important issues in STEM education and address the connection between science, literacy, and the Common Core and how to capitalize on that connection. Supporting students' abilities to read, write, and discuss in the context of science is critical to student achievement in both science and literacy.

I encourage you to take full advantage of this opportunity to attend dynamic teacher and exhibitor workshops and presentations, participate in a variety of special programs, see outstanding speakers, explore the exhibit hall, sign up for special ticketed events, and network with colleagues.

I look forward to meeting you here in Portland. I guarantee that you will leave the conference inspired to create new opportunities for your students and colleagues!

Bill Badders

2013–2014 NSTA President

Contributors to the Portland Conference

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

Sponsors

National Geographic Learning
Oregon Science Teachers Association
Southwest Airlines
Texas Instruments, Inc.
Vernier Software & Technology
Washington Science Teachers Association

Contributors

American Chemical Society
American Society for Engineering Education
Oregon Section of the American Association of Physics Teachers



Your Passion. Our Technology. Student Success.™



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

NSTA Conferences Go Green!

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

Conference Previews

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

Online Conference Information and Personal Scheduler

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

Final Conference Programs by E-Mail/Conference App

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

Recycled Paper and Sustainable Print Services

Conference previews and final conference programs are now printed on recycled paper. In addition, Walsworth 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.

Environmentally Friendly Exhibition Practices

Our conference partner, Hargrove, Inc., offers many green product options and services in the production of our conference exhibitions, including 100% recyclable carpet and padding, recycled exhibit structures, a "reclaimer" that recycles 92% of all solvents the company uses in production of graphics, use of LP natural gas in 75–90% of show-site vehicles, and many biodegradable and recycled products such as trash bags and wastebaskets. Their green efforts are extended operationally with reductions in electricity, heating fuel, and water usage, as well as a move to 100% recyclable and biodegradable products.

Oregon Convention Center's Green Efforts

Built with sustainability in mind, the Oregon Convention Center has long held a leadership role in green building and other environmentally responsible business practices. As a LEED-certified Silver building, many green event components are already a part of our building design and sustainability operations.

Under the direction of our in-house sustainability coordinator we are continuously inspired to take our practices to the next level through our key areas of sustainability:

- We have an extensive waste reduction program that includes both front of house and back of house recycling and composting as well as a community partnership program that includes donating food and nonconsumable products to local nonprofits.
- Last year we achieved a 69% landfill diversion rate: we diverted 786,517 pounds of material from the landfill, of which more than 100,000 pounds were items donated to our community partners.
- We incorporate leading-edge environmental design, energy efficiency, and equipment upgrades and operational practices to help reduce our impact on the climate by reducing our greenhouse gas emissions.
- Our storm water management program includes toxics reduction and water conservation. These expansive efforts contributed to our achieving a Salmon Safe Certification; the first Convention Center in the country to receive this certification.
- Prioritize work and contract opportunities with local and regional businesses whenever possible.
- Choose locally grown, seasonal, and organic food and beverages as often as possible.

"Go Green" at the Portland Conference!

- Recycle your conference programs in the clearly marked recycle bins located throughout the Convention Center.
- Recycle or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- In advance of the conference, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- If you prefer to bring handouts to your session, use double-sided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended via the conference app or online.



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| FRIDAY, OCTOBER 25 th – ROOM B117/118 | |
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| 8:00 – 9:30 am | Chemistry and Biology with Vernier |
| 10:00 – 11:30 am | Integrate Your iPad® and BYOD with Vernier Technology |
| 12:00 – 1:30 pm | Integrate Your iPad® and BYOD with Vernier Technology |
| 2:00 – 3:30 pm | Physics and Physical Science with Vernier |

Stop by our **Booth 500**
and enter to **WIN** a



LABQUEST® 2



Registration, Travel, and Hotels

Meeting Location and Times

The headquarters hotel is the DoubleTree by Hilton Hotel Portland. Conference registration, the exhibits, the NSTA Avenue, the NSTA Science Store, exhibitor workshops, and most sessions will be located at the Oregon Convention Center. Other sessions and events will be held at the DoubleTree. The conference will begin on Thursday, October 24, at 8:00 AM, and end on Saturday, October 26, 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 (short courses, field trips, networking events, etc.).

Don’t want to wait in line to register on-site? Please look for the “Self-Serve” signs in the NSTA Registration Area. Here you’ll find two computer stations where you can register on your own.

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

| | |
|---------------|-----------------|
| Wed., Oct. 23 | 5:00–7:00 PM |
| Thu., Oct. 24 | 7:00 AM–5:00 PM |
| Fri., Oct. 25 | 7:00 AM–5:00 PM |
| Sat., Oct. 26 | 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 Portland Planning Committee has scheduled a variety of ticketed events. Each of these events requires a separate fee and ticket. You may purchase tickets for these events, space permitting, in the NSTA Registration Area. See the Conference Program section (starting on page



—Photo courtesy of Jamie Francis and Travel Portland

34) for details. Note that some events may have required advance registration.

Free TriMet Pass!

Every Portland registrant and exhibitor will receive a coupon for one free TriMet conference pass, which will be available at the following locations:

- Preregistrants can redeem their TriMet coupon for the actual pass at the Program Pickup Area.
- Anyone who registers on-site will receive the passes at the “New Registration” counters.
- Exhibitors will receive their passes at the Exhibitor Registration counter.

This pass is good for the duration of the conference on a TriMet bus, the Portland Streetcar, or MAX Light Rail in the Portland metropolitan area. Depending on your selected hotel, you may need this pass to travel to the Convention Center.

You must have this pass with you at all times on TriMet transportation. You do not need it to board, but you may need to show the pass to a fare inspector. If you do not have your pass, the fine is \$175. This pass will not be replaced if lost. If lost, the

fare for an Adult TriMet pass is \$2.50 for a 2-hour ticket or \$5.00/day.

This pass is also good for your TriMet transportation to the airport, provided you are departing before the expiration date on your pass. For information on routes and schedules, check www.trimet.org and www.portlandstreetcar.org.

Ground Transportation to/from Airport

Attendees can choose one of the following options for airport travel:

- The MAX light rail Red Line is the easiest way to travel to the airport. The trip takes about 38 minutes and an adult ticket costs \$2.50. The first train of the day arrives at PDX at 4:45 AM.
- The average taxi fare from the airport to downtown is approximately \$35 plus gratuity. Radio Cab offers a discount with coupons available on their website. The one-way trip takes 20–30 minutes.
- The Downtown Airport Express runs every 30 minutes and costs \$14 one-way.

Getting Around Town

In Portland, the trains, streetcars, and buses are clean, safe, and simple to use,



The ultimate classroom

The forest. What better context for teaching students about plant and wildlife biology, climate science, fire, hydrology and ecosystems?

Go to **LearnForests.org** to browse a variety of free teacher resources – lesson plans, reading materials, posters, field trip ideas and service-learning projects.



making it easy to traverse the city without a car.

- At the heart of Portland's world-class public transportation system is MAX light rail, with 84 stations serving four lines, connecting the city, airport, and region.
- You can easily travel between the cultural attractions of downtown—all on the sleek and modern Portland Streetcar.
- The Portland Transit Mall is where you can catch MAX Green and Yellow line trains, as well as more than 20 bus lines serving the metro area.
- On the TriMet bus system, which covers the city and its suburbs thoroughly, you'll find low fares, friendly drivers, and full wheelchair accessibility.

Parking

In downtown Portland, you can choose on-street parking or parking lots. In Portland's central city, there are 9,700 metered parking spaces and two types of parking meters: the SmartMeter pay station and the single-space meter (coin-operated). The city owns six downtown SmartPark garages with nearly 4,000 public spaces.

More than 700 businesses will validate two hours of free parking with qualifying purchases of \$25 or more. Additional parking lots can be found throughout the central city.

Airlines

NSTA has made arrangements with several major airlines to offer discounted fares to Portland conference attendees. Visit <http://bit.ly/1dOe2e4> for details.

Discounted Rental Cars

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

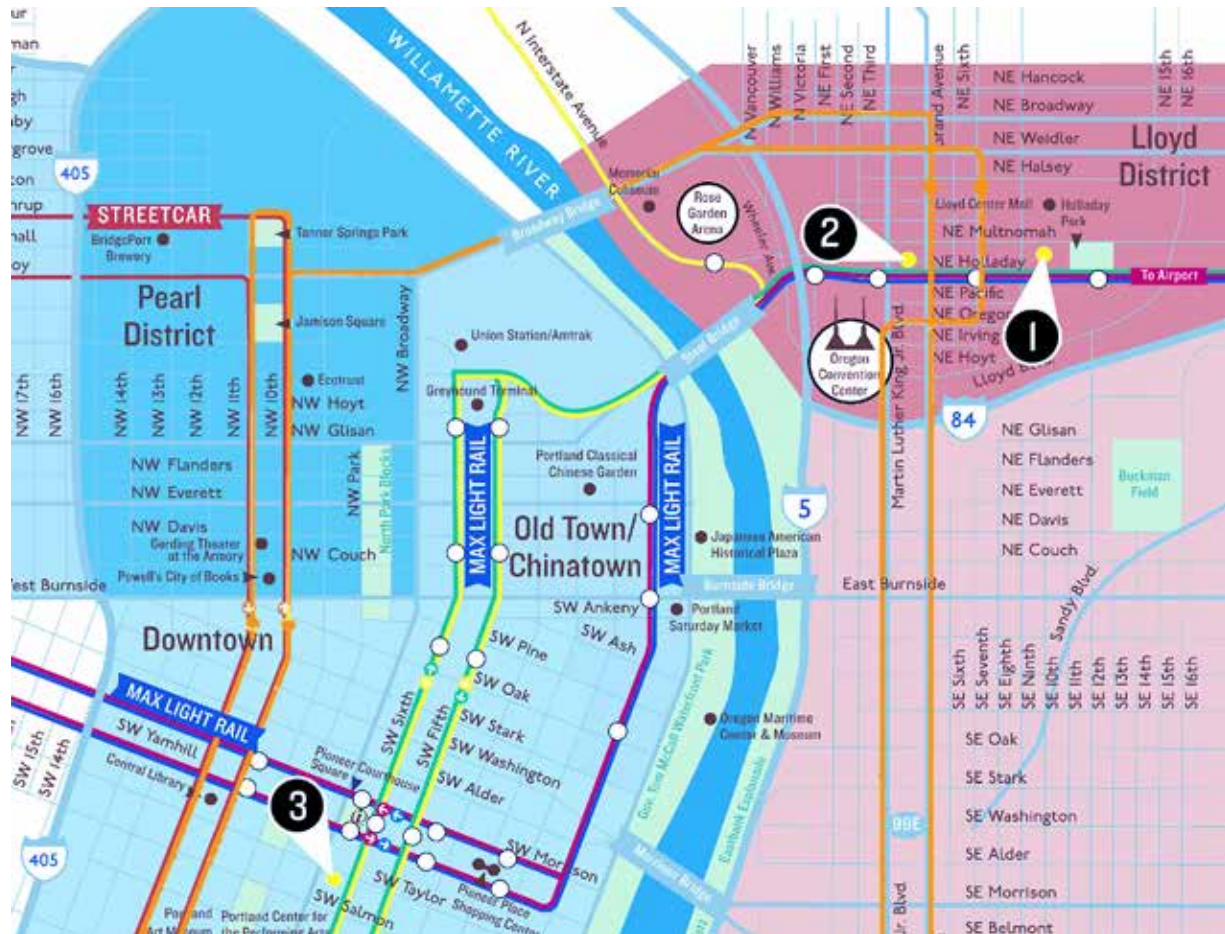
Enterprise 800-593-0505 16AH230

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

Conference Hotels

See page 12 for a list of hotels and a map of the downtown area. If you have questions or concerns regarding your housing, please call Nicole Winschel at Orchid Event Solutions, Monday through Friday, 6:00 AM–5:00 PM PST at 877-352-6710 (toll-free) or 801-505-4123.

Downtown Portland



Hotel Index

1. **DoubleTree by Hilton Hotel Portland (Headquarters Hotel)**
1000 N.E. Multnomah St.
2. **Red Lion Hotel Portland Convention Center**
1021 N.E. Grand Ave.
3. **Hilton Portland & Executive Tower**
921 S.W. Sixth Ave.

Key

MAX Light Rail service

- MAX Blue Line (Hillboro/City Center/Gresham)
- MAX Red Line (Airport/City Center/Beaverton)
- MAX Green Line (Clackamas/City Center/PSU)
- MAX Yellow Line (Expo Center/City Center/PSU)

Portland Streetcar

- Central Loop Line (CL) (OMSI to SW Market)
- North South Line (NS) (NW 23rd to South Waterfront)



**Visit
Booth
701**

FREE
Probeware Starter Kits
 for 60 Lucky Workshop
 Attendees (\$600 Value)!

FREE HANDS-ON WORKSHOPS
Friday, October 25 • Room A103/104

| | |
|-----------------|---|
| 8:00am-9:15am | PASCO's SPARKscience for High School Students - Free starter kits for 20 attendees! |
| 10:00am-11:15am | PASCO's SPARKscience for K-8 Students - Free starter kits for 20 attendees! |
| 12:00am-1:15am | PASCO's SPARKscience for High School Students - Free starter kits for 20 attendees! |



www.pasco.com

PASCO is the proud sponsor of the STEM Educator Award:
Recognizing excellence and innovation in the field of STEM education.

**STEM
 EDUCATOR
 AWARD**



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 113.

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

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

| | |
|---------------|------------------|
| Thu., Oct. 24 | 11:00 AM–5:00 PM |
| Fri., Oct. 25 | 9:00 AM–5:00 PM |
| Sat., Oct. 26 | 9:00 AM–12 Noon |

Did you know that NSTA offers Exclusive Exhibits Hall hours on Thursday from 11:00 AM to 12:30 PM? During these hours there are no sessions or workshops scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer.

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

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional



materials. Attendance is on a first-come, first-served basis. See page 128 for a complete listing of exhibitor workshops.

NSTA Avenue

Stop by NSTA Avenue (Booth #909) and learn about NSTA's benefits, products, services, programs, and partners...and receive free gifts, too! Share with others, expand your knowledge, and earn rewards for you and your students. See pages 120–121 for a complete list of NSTA services and programs.

NSTA Science Store

The NSTA Science Store showcases the best new books of 2013 and a wide range of award-winning professional development titles. Pick up exclusive "I Love Science" T-shirts, mugs, and gifts for friends and colleagues. Located in the attendee registration area, stop by and check out our latest books—*Translating the NGSS for Classroom Instruction*; *The Case for STEM Education: Challenges and Opportunities*; and *Uncovering Student Ideas in Primary Science, Volume 1*—and take a peek at our brand-new line of children's books. We'll also be having special events throughout the conference and opportunities for you to meet our amazing authors. Don't forget—all conference attendees enjoy a 20% dis-

count on NSTA Press® titles along with free shipping for online orders placed during the conference!

NEW for Fall 2013! Come by and enjoy complimentary internet access at our e-mail stations. Make sure to shop with us on Wednesday night and receive a complimentary Welcome Pack with all purchases over \$25. Spend over \$100 and receive a FREE collectible conference mug while supplies last.

OSTA Booth

The Oregon Science Teachers Association (OSTA) booth is located in the NSTA Registration Area. Stop by and find out what is happening in science education in Oregon and what OSTA is doing to support science educators. Plans are underway for the 2014 statewide conference—find out what is being planned and how you can participate!

WSTA Booth

The Washington Science Teachers Association (WSTA) booth is located in the NSTA Registration Area. Stop by for information about the conference or to purchase commemorative items. Membership forms and information on association activities will also be available. Find out what's happening in science education in Washington State!

The NSTA Conference App

Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience. Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, hotels, and Exhibit Hall; Social Media plugins; exhibitor and sponsorship information; complete session evaluations; take notes; and more. Visit www.nsta.org/portlandapp or scan the QR code below to download the app.

Wi-Fi in Convention Center

Complimentary Wi-Fi internet access is available in designated “zones” throughout the Convention Center. Service is intended for casual internet access, e-mail, etc. It is not intended to provide general internet

access needs for all conference attendees. Up to 1 Mbps shared internet is available on limited network infrastructure and technical support is not provided. To access, choose “OCC Comp WiFi Zone”; no code required.

These zones are:

- Portland Roasting 1 coffee shop by the B meeting rooms
- the Stir lounge in the King Lobby
- Portland Roasting 2 coffee shop near the D meeting rooms
- Ginkoberry Concourse adjacent to Portland Roasting 2 coffee shop

Meet the Presidents and Board/Council

Be sure to stop by Thursday from 11:10 AM to 12:10 PM 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 Retir-

Graduate Credit Opportunity

Portland conference attendees can earn one quarter credit in professional development through Portland State University. Visit bit.ly/17Chmrc for complete details and requirements. The fee is \$180 for course #CI810 (2013 NSTA Regional Conference) and the grading method is A–F.

ing President along with your Board and Council members are looking forward to talking with you at the conference!

Lost and Found

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

Help us with your feedback...and get a chance for a free Kindle Fire HDX 7"

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 the recently introduced Kindle Fire HDX 7" courtesy of the NSTA Conference Department.

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

- **WE'RE GIVING AWAY THE NEW KINDLE FIRE HDX 7", 16 GB**



• CONFERENCE APP



- You can also evaluate sessions on your smartphone via the NSTA Conference app.





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.

Audiovisual Needs

NSTA will fulfill AV needs originally requested on the program proposals as long as the request is within the limits of equipment that NSTA provides. For any last-minute AV needs, presenters must arrange and pay for their own equipment. Audio Visual Production Solutions, the designated AV company on-site, will be located in the following rooms:

- A101 and D129, Convention Center
- Grant, DoubleTree

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 October 24–25, 2013, while the session is fresh in your mind! Visit www.nsta.org/portlandapp to download our conference app for your smartphone. Or you can visit www.nsta.org/evaluations at a later time to complete a short online session evaluation for each session you attend. **And this year, we're giving away a NEW Kindle Fire HDX 7" 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, download our conference app and:

- Locate the appropriate session by schedule, format, subject, or keyword search from the home page and click "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 November 12, 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., field trips, short courses, meetings, Exhibit Hall visits, 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.

First Aid Services

First Aid is located next to the Hall A/B junction in the Convention Center. Attendees in need of first aid can use any house phone to dial extension 7849 for the Security Office (this number is also listed on all house phones), or dial “0” for the receptionist.

Information Desk

Travel Portland has an Information Booth located in the lobby of Exhibit Hall A in the Convention Center. It is open Wednesday from 5:00 to 7:00 PM; Thursday and Friday from 8:00 AM to 5:00 PM; and Saturday from 8:00 AM to 12 Noon to provide information about the city and to assist with making restaurant reservations.

Conference Evaluation

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

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

Self Service Business Center is located directly above the main MLK Lobby in the Convention Center. Services include computer access, faxing, copying, and computer printing. Contact information is also

posted for the local UPS store that can provide additional services, including small individual shipping services. The center is open seven days a week from 7:00 AM to 11:00 PM when the facility is in use.

DoubleTree hotel guests can use the business center located on the hotel’s lobby level. It offers complimentary use of computers, with complimentary access to the internet. Documents can also be printed complimentary. The Front Desk can assist with making up to 50 copies at 10 cents a copy for black and white copies. Large copy or print needs can be arranged through FedEx Print Center, which is located at 1605 NE 7th Avenue, within blocks of the hotel. Open 24 hours a day, 7 days a week, this location also delivers completed copy jobs.

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NSTA’s 2014

STEM
SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Forum & Expo

New Orleans

May 14–17

* Evening Exhibits Preview—May 14

Proposal Deadline: December 2, 2013

For more details on the Forum, visit

www.nsta.org/2014stemforum

NSTA National Science Teachers Association

Oregon Convention Center

Level One



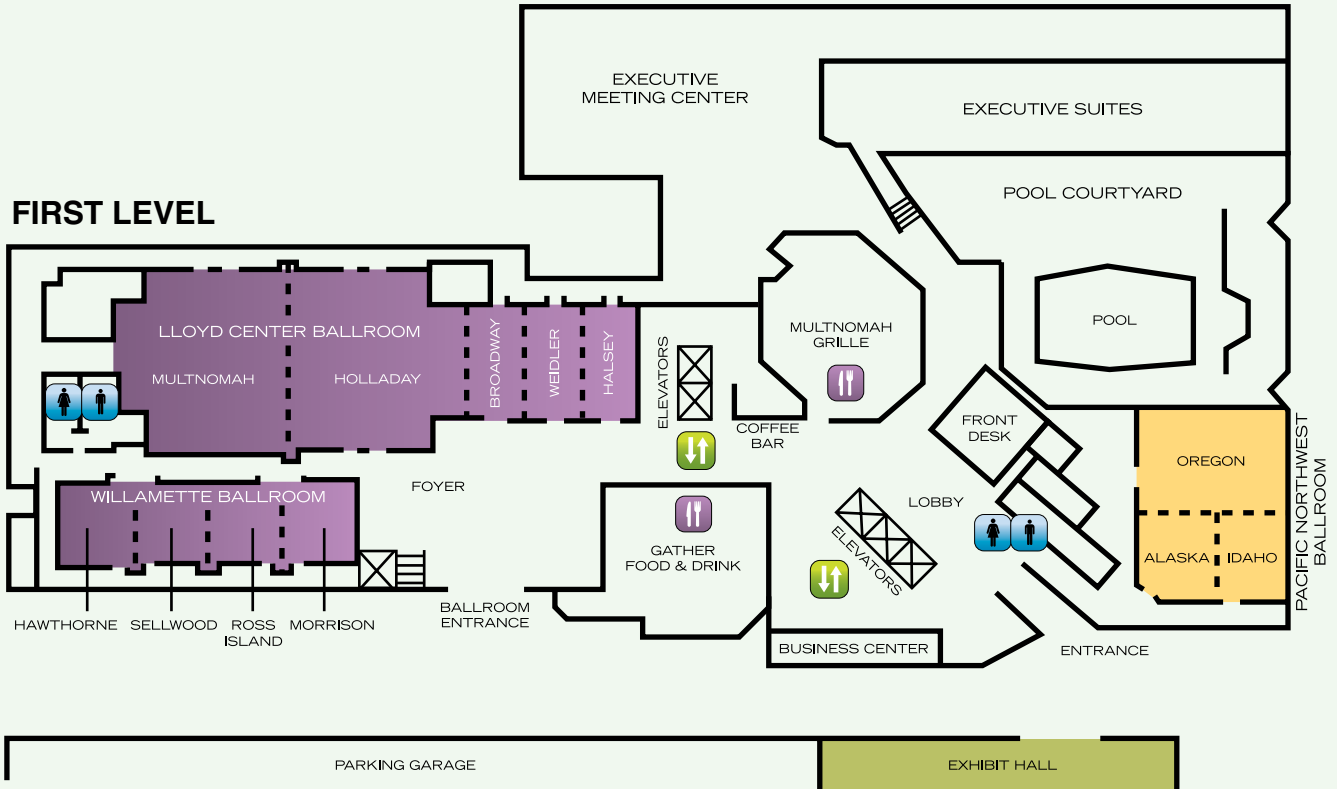
Oregon Convention Center

Level Two

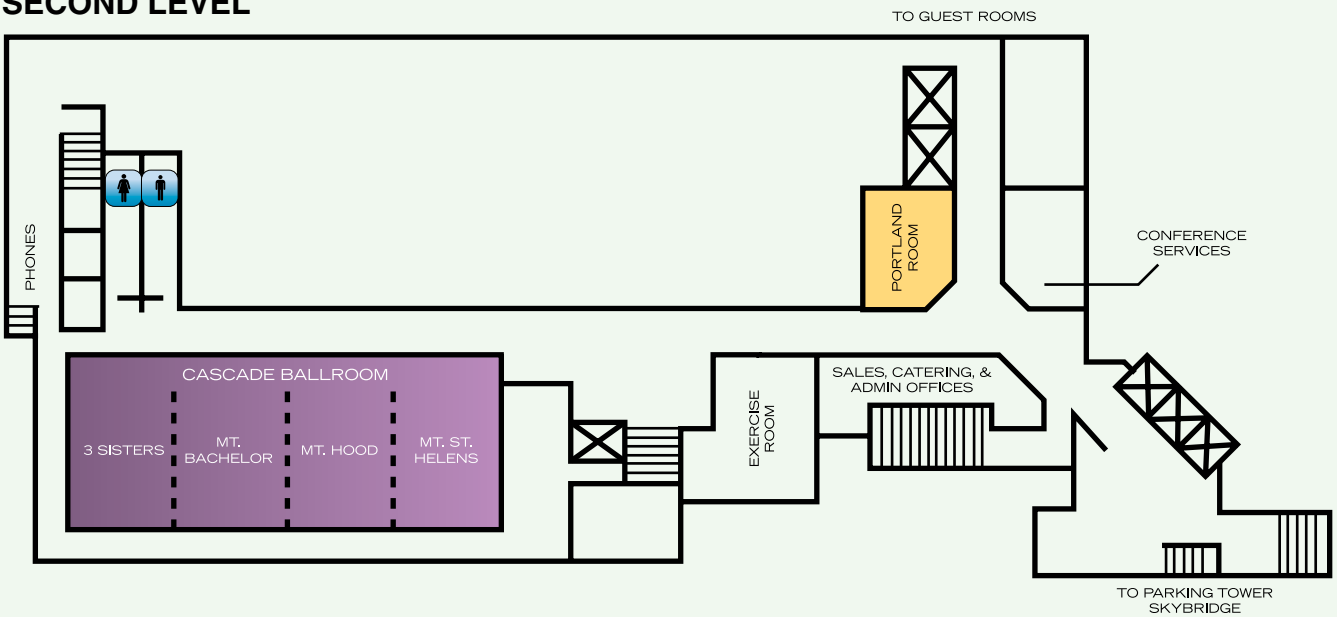


DoubleTree by Hilton

FIRST LEVEL



SECOND LEVEL



DoubleTree by Hilton



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NSTA Mission Statement

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

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All cities are subject to change pending final negotiation.

National Conferences on Science Education

Boston, Massachusetts
April 3–6, 2014

Chicago, Illinois
March 26–29, 2015

Nashville, Tennessee
March 31–April 3, 2016

2014 STEM Forum & Expo

New Orleans, Louisiana
May 14–17

Area Conferences on Science Education

2013 Area Conferences

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
(in collaboration with CSTA)

2015 Area Conferences

Reno, Nevada—October 22–24
Philadelphia, Pennsylvania—November 12–14
Kansas City, Missouri—December 3–5

SHARE YOUR IDEAS!

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

NSTA's 2014+2015 CONFERENCES

to enthuse and stimulate our
community of educators!

2014

Conferences on Science Education

Richmond, Virginia
October 16–18, 2014

Orlando, Florida
November 6–8, 2014

Long Beach, California
—in Collaboration with CSTA
December 4–6, 2014

Proposal Deadline:
1/15/2014

For more information, visit
www.nsta.org/conferences

2015

National Conference on Science Education

Chicago, Illinois
March 26–29, 2015

Proposal Deadline:
4/15/2014

NSTA National
Science
Teachers
Association

literacy principals inspired connected
 education teacher ngss STEM
 professional development math resources
Teach. Lead. Grow.
 science workshops activities engineering presentations
 develop high school common core sessions
 elementary science store
 technology standards **conference**



WHAT AWAITS YOU IN BOSTON

- A wide range of Science, Technology, Engineering, and Mathematics (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 Store with 100s of professional development books; attendees receive a 20% discount
- *And much more!*

PROFESSIONAL DEVELOPMENT STRANDS

- Science and Literacy: A Symbiotic Relationship
- Teaching Elementary Science with Confidence!
- Leading from the Classroom
- Engineering and Science: Technological Partners



NATIONAL CONFERENCE
on **SCIENCE EDUCATION**
BOSTON
APRIL 3-6, 2014

For updates and information, visit
www.nsta.org/boston





—Photo courtesy of Travel Portland

Thursday, October 24

| | | |
|-------------------|--|----|
| 8:00–9:00 AM | First-Timer Conference Attendees Orientation | 44 |
| | (Is This Your First NSTA Conference?) | |
| 8:00 AM–4:30 PM | Engineering Day | 30 |
| 9:15–10:30 AM | General Session: Jimmy Chin | 48 |
| 11:00–11:05 AM | Ribbon Cutting Ceremony/Exhibits Opening | 51 |
| 11:05 AM–5:00 PM | Exhibits | 51 |
| 11:10 AM–12:10 PM | Meet the Presidents and Board/Council | 51 |
| 2:00–3:00 PM | Featured Presentation: Stephen L. Pruitt | 57 |
| 6:30–8:30 PM | OSTA/WSTA Awards Event | 69 |

Friday, October 25

| | | |
|------------------|---|--------|
| 8:00 AM–3:00 PM | Physics Day | 32 |
| 8:00 AM–4:30 PM | Chemistry Day (For Grades 9–12) | 31 |
| 8:00 AM–4:30 PM | Middle School Chemistry Day | 31 |
| 9:00 AM–5:00 PM | Exhibits | 76 |
| 9:30–10:30 AM | Featured Presentation: Jill Castek | 76 |
| 9:30–11:30 AM | NSTA ESP Symposium | 30, 80 |
| 11:00 AM–12 Noon | Featured Presentation: Doug Sanders | 82 |

Saturday, October 26

| | | |
|-----------------|--|-----|
| 8:30–10:30 AM | CESI Breakfast (M-1) (Speaker: Mary Hobbs) | 105 |
| 9:00 AM–12 Noon | Exhibits | 106 |

Don't forget to pick up your FREE TriMet pass! See page 10 for details.



Win a round-trip Southwest travel scholarship to the **BOSTON** conference.

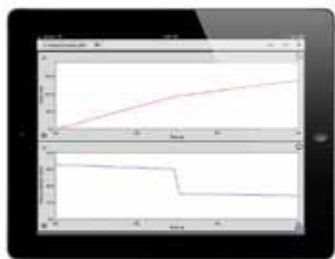
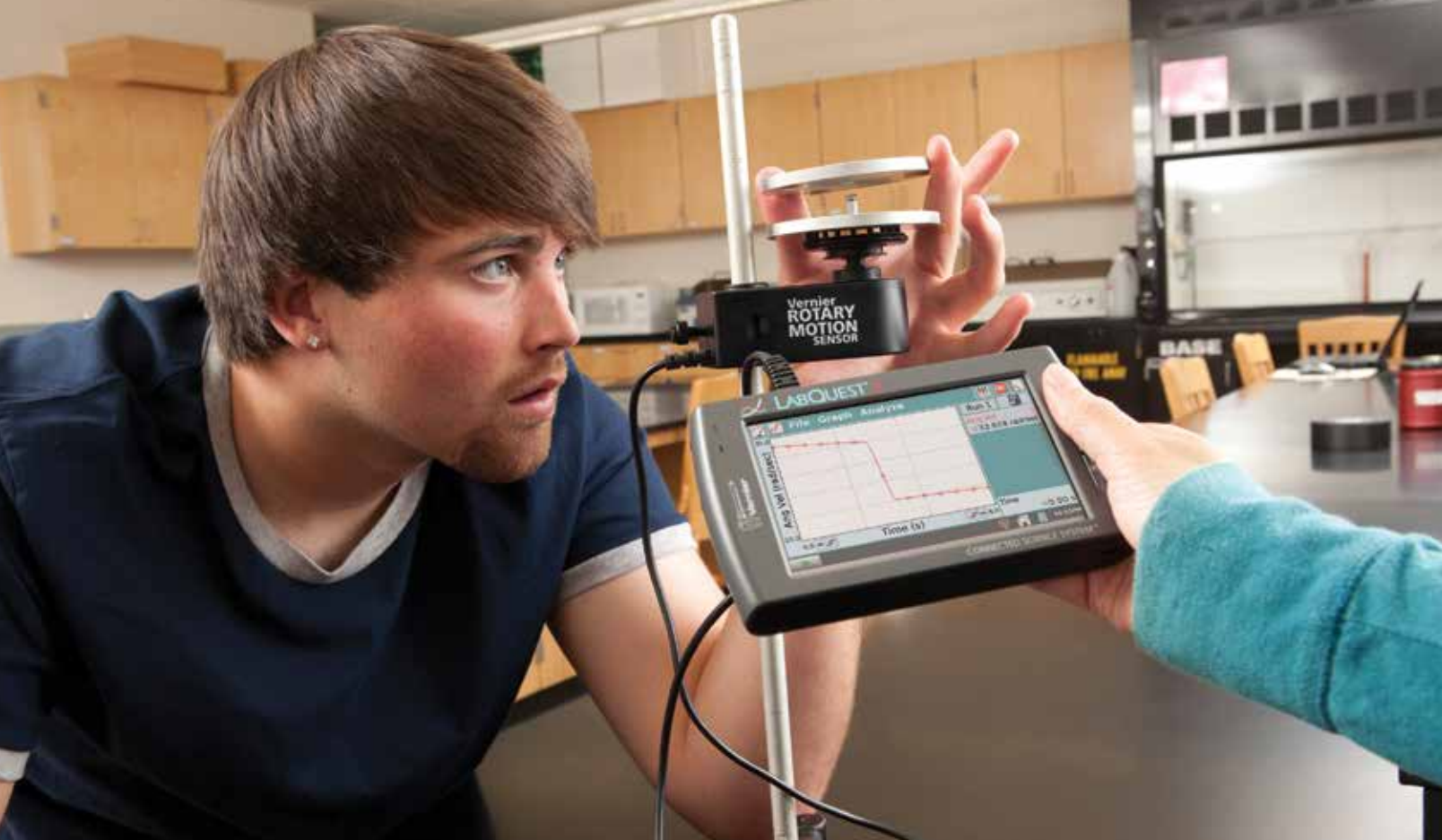
Is This Your First NSTA Conference?

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 44 for details.

Thanks to the generosity of **Southwest Airlines**, we're giving away two Southwest Airline travel scholarships to the **NSTA Boston National Conference on Science Education, April 3–6, 2014!**

The drawings will be held at **4:00 PM** on Oct. 24 and Oct. 25 during the conference. You must be present to win. Stop by The NSTA John Glenn Center for Science Education booth in the Exhibit Hall for all the details!





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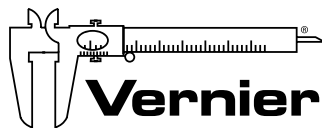
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The Portland Conference Committee has planned the conference around these three strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

CCSS Bridging Elementary and Secondary Science with the Common Core

Adopted by most states, Common Core State Standards must be supported by all content areas. Science is a valuable tool for moving forward with Common Core instruction. Science requires the use of strong communication and mathematical skills and will help students improve within these areas. This strand will increase participants' understanding and ability to link science with the Common Core.

NGSS Bridging to the Next Generation Science Standards—What's in It for Me?

We are at a pivotal point in science education with the release of A Framework for K–12 Science Education and the Next Generation Science Standards (NGSS). This strand will provide guidance for integrating the three dimensions—scientific and engineering practices, crosscutting concepts, and core disciplinary ideas—to prepare students to meet the challenges of the 21st century. The strand is intended to move educators along the continuum from awareness to an understanding of the NRC Framework/NGSS to implement instructional strategies that help students acquire the skills and knowledge to thrive in a global economy.



Building Bridges Within STEM Education

It takes a village to provide comprehensive, well-rounded STEM education experiences for students. This strand is intended to make the connections between science, technology, engineering, and math visible. Sharing resources that are available for teachers, businesses, and students will enhance the STEM-educated workforce of the future. These resources can lead to partnerships among the preK–12 and postsecondary education systems and STEM businesses. The strand will improve awareness of STEM education and connections between its components.

Bridging Elementary and Secondary Science with the Common Core

Thursday, October 24

8:00–9:00 AM

NASA's "Reading, Writing & Rings": Using Saturn to Teach Science and Language Arts

12:30–1:30 PM

Tsunami in a Box

2:00–3:00 PM

College Ready with Mathematics and Physics

3:30–4:30 PM

NASA's "Our Solar System Through the Eyes of Scientists"

5:00–6:00 PM

The Pictures Aren't There Just to Take Up Space—Getting Kids Good at Reading in Science

Friday, October 25

8:00–9:00 AM

Cutting Across the Curriculum: Examining Lessons That Integrate Science, Literacy, and Mathematics

9:30–10:30 AM

Featured Presentation: Implementing Dynamic and Interactive Science Instruction to Meet the Common Core (Speaker: Jill Castek)

What! We Have to Teach English, Too?

12:30–1:30 PM

Bridging Elementary Science for English Learners

2:00–3:00 PM

Energy Debates Can Fuel the Common Core!

5:00–6:00 PM

Bridging the Literacy Gap: Using Explicit Vocabulary Instruction and Reading Strategies to Improve Literacy in the Middle School Science Classroom

Saturday, October 26

8:00–9:00 AM

Authentic Writing with Children's Books: Learning Science from Mr. Fluffy Mittens

9:30–10:30 AM

But I Am Not a Reading Teacher!
Delivering Common Core ELA Standards in Your Science Classroom

Bridging to the Next Generation Science Standards—What’s in It for Me?

Thursday, October 24

8:00–9:00 AM

Integrating Next Generation Science Standards Ahead of District/State Standards Alignment

12:30–1:30 PM

Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom

2:00–3:00 PM

Featured Presentation: Implementing the NGSS: Shifts in Classroom Practice (Speaker: Stephen L. Pruitt)

3:30–4:30 PM

Meeting the Next Generation Science Standards Through Engineering Contexts

5:00–6:00 PM

MY NASA DATA: Incorporating Science Practices in the Classroom

Friday, October 25

8:00–9:00 AM

The NGSS—Make Your Lessons 3-D!

11:00 AM–12 Noon

Engineering Practices: Constructing Ideas for Elementary Teachers

12:30–1:30 PM

Argumentation Skills and Discussion Strategies for Bioethics

3:30–4:30 PM

Using a Patterns Approach to Meet the NGSS in Physics

Saturday, October 26

8:00–9:00 AM

Breaking Down Barriers for Middle School Field Investigations

9:30–10:30 AM

Using Picture Books for Professional Development on the Next Generation Science Standards

11:00–11:30 AM

Elementary Science Teaching: A Path Toward Content Mastery, Confidence, and Competence

Building Bridges Within STEM Education

Thursday, October 24

8:00–9:00 AM

Strategies for Advancing Educational Opportunities for Underrepresented Students in STEM

12:30–1:30 PM

Stellar Science: Integrating STEM and Marine Mammal Research in the Classroom

2:00–3:00 PM

NASA’s Space Forensics: Solving Cosmic Mysteries with Crime Scene Narratives

3:30–4:30 PM

STEM Integration Using Student-built Underwater Robots

5:00–6:00 PM

K–4 Inquiry-based Science Activities Lead to STEM Challenges

Friday, October 25

8:00–9:00 AM

How Does Your Garden Grow?

9:30–10:30 AM

Observing Buoys by Students (OBS): An Authentic STEM Field Investigation

11:00 AM–12 Noon

Featured Presentation: Knowing When You Are Wrong: Real Engineering in the Digital Age (Speaker: Doug Sanders)

Astrobiology: An Interdisciplinary Approach to STEM

12:30–1:30 PM

Connecting Students and Community in a New STEM-focused School

2:00–3:00 PM

Creative Problem Solving with Toshiba/NSTA ExploraVision

3:30–4:30 PM

The Power of STEM Integration

Saturday, October 26

9:30–10:30 AM

NASA/IPAC Teacher Archive Research Program

NSTA Exemplary Science Program (ESP)

ESP: Unique Features of Programs That Meet “More Emphasis” Features in the NSES



Friday, October 25, 9:30–11:30 AM
D135, Convention Center

The Standards offered but 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; 7) Exemplary Science for Resolving Societal Challenges; 8) Exemplary Programs for Building Interest in STEM Careers; and 9) Exemplary College Science Teaching.

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!

See page 80 for complete details.

Engineering Day at NSTA

Sponsored by the American Society
for Engineering Education



Thursday, October 24, 8:00 AM–4:30 PM
D133/134, 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, Engineering is Elementary, *TeachEngineering.org*, and Colleges of Engineering across the nation who actively engage in K–12 engineering in collaboration with partner teachers and schools. All sessions will help teachers understand the new ETS Engineering Design portion of the Next Generation Science Standards (NGSS).

| | |
|------------------|---|
| 8:00–9:00 AM | Introducing Engineering to Elementary School Students (p. 45) |
| 9:30–10:30 AM | ASEE’s K–12 Outreach Program, eGFI: Engineering, Go For It and the Marshmallow Challenge (p. 48) |
| 11:00 AM–12 Noon | Engaging Elementary-aged Children and Parents in Engineering (p. 51) |
| 12:30–1:30 PM | Effective STEM Curricula for Girls! (p. 54) |
| 2:00–3:00 PM | Challenge Your High School Students: Engineer Your World (p. 59) |
| 3:30–4:30 PM | TeachEngineering.org: Free Resources for Engineering in K–12 (p. 64) |



ACS
Chemistry for Life™

Chemistry Day at NSTA

Sponsored by the American Chemical Society

Chemical Concepts in a Changing World

For Grades 9–12

*Friday, October 25, 8:00 AM–4:30 PM
Oregon Ballroom 202, Convention Center*

Engage in activities, discussion, analyses, and assessment that help understand the relationships among basic chemical concepts, human activities that are changing the planet, and their roles in moving toward a more sustainable use of Earth's resources.

Research on teaching and learning indicates a positive correlation between teacher content knowledge and student learning. The goals of Chemistry Day are to enhance and enrich secondary chemistry teachers' knowledge of and interrelationships among chemical concepts and their consequences 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 Chemistry Day draws on several decades of experience the American Chemical Society has in activity-based curricula development, including incorporation of sustainability and Green Chemistry principles. Chemistry Day is a daylong series of sessions that include bonding, entropy, and acid/base rates and equilibria—topics central to understanding the behavior of matter and chemical change in the environment. A complementary theme is incorporating activities as part of the assessment of student learning.

| | |
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| 8:00–9:00 AM | Chemical Bonding—Why Water Is Different (p. 73) |
| 9:30–10:30 AM | Entropy: Mixing and Unmixing (p. 79) |
| 11:00 AM–12 Noon | Entropy: Energy Transfer (p. 85) |
| 12:30–1:30 PM | Electromagnetic Radiation Energy (p. 90) |
| 2:00–3:00 PM | Rates: Concentration and Half-Life (p. 93) |
| 3:30–4:30 PM | Acid/Base Reactions: Carbon Dioxide (p. 97) |

Middle School Chemistry Day

Sponsored by the American Chemical Society

Middle School Chemistry— Big Ideas About the Very Small

*Friday, October 25, 8:00 AM–4:30 PM
D133/134, Convention Center*

Come to one, two, or as many sessions as you like during this full day of activities and information for teaching and learning middle school chemistry. Staff from the American Chemical Society (ACS) 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.

| | |
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| 8:00–9:00 AM | Matter: Solids, Liquids, and Gases (p. 72) |
| 9:30–10:30 AM | Changes of State—Evaporation and Condensation (p. 78) |
| 11:00 AM–12 Noon | Density—A Molecular View (p. 84) |
| 12:30–1:30 PM | The Periodic Table, Energy Levels, and Bonding (p. 89) |
| 2:00–3:00 PM | Polarity of the Water Molecule and Its Consequences (p. 92) |
| 3:30–4:30 PM | Chemical Change—Breaking and Making Bonds (p. 96) |

Physics Day at NSTA

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



Friday, October 25, 8:00 AM–3:00 PM
D131/132, Convention Center

The American Association of Physics Teachers offers a full day of physics content at the Portland area conference. Physics Day consists of interactive hands-on workshops covering important physics topics for today's world. Each of these workshops is organized by

experienced science educators and designed to deal with hard-to-express concepts that can be immediately applied in your classroom. Physics Day is being organized by the Oregon Section of the American Association of Physics Teachers.

| | | | |
|------------------|--|---------------|---|
| 8:00–9:00 AM | Enriching Energy Instruction Through the Use of Novel Representations (p. 71) | 12:30–1:30 PM | Tried-and-True Techniques for Effective Student Learning...Even Graduating Seniors (p. 89) |
| 9:30–10:30 AM | Energy Conservations and Transformations (p. 78) | 2:00–3:00 PM | Taking Science on the Road: Outreach Activities You Can Use (p. 91) |
| 11:00 AM–12 Noon | E.T. Phone Home (p. 84) | | |

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, October 24

| | |
|---------------|--|
| 8:00–9:00 AM | <i>Forensics in Chemistry</i> (p. 43) |
| 12:30–1:30 PM | <i>Exemplary Science: Best Practices in Professional Development</i> (p. 52) |
| 2:00–3:00 PM | <i>Scientific Argumentation in Biology</i> (p. 59) |
| 3:30–4:30 PM | The Authors' Picks! <i>Teaching Science Through Trade Books</i> (p. 64) |

Friday, October 25

| | |
|------------------|--|
| 9:30–10:30 AM | <i>Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry</i> (p. 78) |
| 11:00 AM–12 Noon | Next Time You See a Sunset, a Seashell, a Firefly... (p. 84) |
| 12:30–1:30 PM | Using Astronomy Probes in the Science Classroom (p. 89) |
| 2:00–3:00 PM | Outdoor Science and Bringing It In (p. 92) |

Saturday, October 26

| | |
|------------------|---|
| 8:00–9:00 AM | Stop Faking It! Finally Understand LIGHT AND SOUND So You Can Teach It (p. 104) |
| 9:30–10:30 AM | Stop Faking It! Classroom Activities for Energy Concepts (p. 108) |
| 11:00 AM–12 Noon | Classroom Activities for <i>Stop Faking It: Force and Motion</i> (p. 110) |



This form is for planning purposes only. Do NOT submit to NSTA.
NSTA 2013 Portland Area National 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 Portland conference. Sessions/events such as field trips, short courses, meetings, and exhibit hall visits may not be available for online evaluation. However, these events still qualify for professional development.

Beginning November 12, 2013, Portland transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your Portland Badge ID# and then clicking on “My PD Record and Certificates.” Keep this form and use it to add the following activities to your Portland transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee’s individual profile.

First Name: _____ **Last Name:** _____ **Badge ID#** _____

Evaluate sessions via your smartphone using our conference app (download instructions on page 15), or go to www.nsta.org/evaluations to evaluate sessions (workshops, presentations, and exhibitor workshops) online. See page 16 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 HDX 7”!**

Sample Questions:

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

Sample Responses:

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

Wednesday, October 23 8:30 AM–4:00 PM

| Start Time | End Time | Activity/Event Title |
|------------|----------|----------------------|
| _____ | _____ | _____ |
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Thursday, October 24 8:00 AM–8:30 PM

| Start Time | End Time | Activity/Event Title |
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We’re giving a Kindle Fire 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!

Wednesday, October 23

FOSS Third Edition: Scientific Literacy—FOSStering Connections to the Common Core

By Invitation Only

3 Sisters, DoubleTree 12:30–4:00 PM

Thursday, October 24

NSTA/CAEP Development of Program Report Workshop

By Invitation Only

Washington, DoubleTree 9:00 AM–12 Noon

The Oregon and Washington Science Teachers Associations Present
“A Celebration of Excellence in Science Teaching”

(Tickets required: \$15)

Pacific Northwest Ballroom, DoubleTree 6:30–8:30 PM

Friday, October 25

Council for Elementary Science International Board Meeting

By Invitation Only

Washington, DoubleTree 3:30–6:30 PM

Saturday, October 26

CESI Buffet Breakfast

(Tickets required: M-1; \$37)

Speaker: Mary Hobbs

Weidler/Halsey, DoubleTree 8:30–10:30 AM



Need help navigating?

If this is your first NSTA conference, 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. We'll also have a brief demo of our **NSTA conference app**. Door prizes!

● **First-Timer Attendee Session • Thursday, October 24, 8:00–9:00 AM**
Oregon Ballroom 203/204, Oregon Convention Center



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 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*; *More Picture-Perfect Science Lessons: Using Children's Books to Guide Inquiry, K–4*; and *Even More Picture-Perfect Science Lessons (K–5)*; and co-authors of *Teaching Science Through Trade Books*.



Emily Morgan

Level: Grades K–5

Date: Wednesday, October 23

Time: 8:30 AM–3:30 PM

Location: Oregon, DoubleTree

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



—Photo courtesy of Karen Ansberry and Emily Morgan

once. In this full-day workshop, 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 *Even More Picture-Perfect Science Lessons*, a \$37.95 value containing 15 classroom-ready lessons for grades K–5. Come to this Picture-Perfect Science Workshop and rejuvenate elementary science instruction in your school!

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

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

Level: Grades K–12

Date: Friday, October 25, 1:00–6:00 PM

Location: Adams/Jefferson, DoubleTree

Registration Fee: \$54

NSTA is partnering with the Maryland Science Center, University of Minnesota, and the National Science Foundation to present an exciting symposium for educators, grades K–12, on the topic of monarch butterfly migration. During this half-day symposium, participants will see the film *Flight of the Butterflies* and take part in classroom activities focused on the monarchs' amazing migration across North America, as well as their habitats and life cycle. Attendees will hear from monarch experts about how teachers and students can become involved in citizen science projects to help the monarchs. Educational materials will be provided for classroom use. A drawing for door prizes will take place at the end of the program. Lunch will be served! Participants will be reimbursed \$75 after successful completion of the symposium, courtesy of the presenting groups. Visit bit.ly/15t3leC for more information.



—Photo courtesy of Jim O'Leary/Maryland Science Center

Where big ideas become the next big thing.

Camp Invention provides educators the strategies and environment necessary to nurture a child's curiosity into big ideas through immersive curricula that encourages creativity, innovation, problem solving, communication and collaboration.

Prepare your students for the future. Get them started at campinvention.org

email us at campatmyschool@invent.org

Visit us at booth #1000



How Does Sleep Affect Our Learning? (SC-1)

Jenny L. Williamson (jenlw@uw.edu), University of Washington, Seattle

Shannon Jephson-Hernandez (jephss@u.washington.edu), Mill Creek Middle School, Seattle, Wash.

Level: Middle Level

Date: Thursday, October 24, 9:00 AM–12 Noon

Location: Oregon, DoubleTree

Registration Fee: \$28

Investigate the impact of sleep on learning using the Next Generation Science Standards! Using the nervous system as a model for understanding systems, discover how your students can design and implement sleep study investigations. Join us for a discussion as we answer questions about sleep and current sleep research. Using the Challenge Cycle model, we'll present lessons aligned to national science standards (NRC *Framework* and NGSS). This crosscutting approach allows you to teach multiple standards simultaneously while making the connections between research and decisions regarding health and sleep choices.

Initial lessons include hands-on activities regarding the teen brain, attention, and memory. Using collaborative groups, students plan the methods for conducting the investigation, including how to maintain journals, collect data, and analyze the effects of choices. Extend this course with a free online class! For more information, visit bit.ly/17ORSjV.

Fun with Physics: How Using a Patterns Approach Helps Students Learn (SC-2)

Bradford Hill (bradford_hill@beaverton.k12.or.us), Southridge High School, Beaverton, Ore.

Susan Holveck (susan.holveck@beaverton.k12.or.us), Beaverton (Ore.) School District

Level: High School

Date: Thursday, October 24, 12 Noon–6:00 PM

Location: Adams/Jefferson, DoubleTree

Registration Fee: \$20

This fast-paced hands-on course for the Patterns Approach for Physics is driven by the recurring question: “How do we find and use patterns in nature to predict the future and understand the past?” By utilizing the ideas described in the NGSS, Patterns teaches students to make predictions, plan and conduct experiments, collect data, analyze the results, argue from evidence, and evaluate their conclusions. Participants will experience how scientific practices are used throughout the course, starting with four anchoring experiments that contextualize four common patterns found in physics—linear, quadratic, inverse, and inverse square.

Additional experiences will show how inquiry is used to spiral the anchoring patterns to new physics concepts, helping students develop conceptual, graphical, and symbolic understanding of physics concepts along with inquiry, engineering, modeling, and evidence-based reasoning. We'll discuss the importance of allowing students to explicitly compare low- to high-evidence predictions, and whiteboards will be used to demonstrate how evidence-based reasoning and data-informed decision making can be implemented in the classroom through Board Discussions. Engineering applications for major physics concepts will be shared as well as the importance of creating models and explicitly discussing their limitations. *Note:* Please bring a laptop. Visit bit.ly/15lbrNs for more information.

Learning from Research: Glucose Balance and Type 2 Diabetes (SC-3)

Maureen Munn (mmunn@uw.edu) and **Jeff Shaver** (jshaver@uw.edu), University of Washington, Seattle

Level: High School

Date: Friday, October 25, 9:00 AM–12 Noon

Location: Idaho, DoubleTree

Registration Fee: \$35

Type 2 Diabetes (T2D), a disease of gene-environment interactions, affects more than 8% of the U.S. population. What does this have to do with high school biology? Everything! T2D is a compelling topic that impacts all of us, provides a context for learning concepts like homeostasis and how genes and the environment determine our traits, and presents the challenge of applying scientific understanding to develop solutions to an important public health issue.

This course will include activities from a high school biology unit developed as part of our project, *Genes, the Environment, and Me*. Participants will examine scientific data to elicit their own questions about T2D, measure the glucose content of common foods, explore how genetic and environmental factors can disrupt glucose homeostasis and lead to T2D, and discuss Call-to-Action projects in which students design and implement a solution for combating diabetes.

Genes, the Environment, and Me is funded by a Science Education Partnership Award grant from the Office of the Director, National Institutes of Health.

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

—Photo courtesy of Monterey Bay Aquarium



Did you know that most marine pollution is litter that starts out on land? Many Laysan albatross chicks die each year because their bellies are full of bottle caps, toothbrushes, and other plastic. Learn more at **SC-4: Ocean Plastic Pollution**.

Ocean Plastic Pollution: Issues and Solutions in the Middle School Classroom (SC-4)

Mary Whaley (mwhaley@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.

Level: Middle Level

Date: Friday, October 25, 1:30–4:30 PM

Location: 3 Sisters, DoubleTree

Registration Fee: \$35

Enrich your middle school classroom with inquiry- and standards-based hands-on activities focusing on issues and solutions surrounding plastic pollution. Topics explored will include the chemical composition of plastic, physical properties of plastic (density and buoyancy, strength, flexibility), and effects on marine life. Emphasis will be on exploring solutions to plastic pollution, alternatives to single-use plastics, and empowering students to tackle environmental problems without experiencing ecofatigue. Participants receive curriculum and reusable alternatives to single-use plastics. Help students RETHINK current plastic use and REFUSE single-use plastics through alternatives with data-driven projects. Strong connections with the NGSS and Common Core will be highlighted. Door prizes!

Effective Inquiry-based Collaborative High School Science Learning: Implementing POGIL (SC-5)

Mare Sullivan (msullivan@bcsmail.org) and **Lori Stanton** (lstanton@bcsmail.org), Bellevue Christian School, Clyde Hill, Wash.

Michelle Poletski (poletskim@newberg.k12.or.us), Newberg High School, Newberg, Ore.

Level: High School–College

Date: Saturday, October 26, 8:30 AM–12:30 PM

Location: Oregon, DoubleTree

Registration Fee: \$35

Experience high school chemistry and biology activities that encourage students to question, use models, analyze data, argue from evidence, and improve oral and written communication skills. Process Oriented Guided Inquiry Learning (POGIL) is a research-based instructional technique that seeks to simultaneously teach many of the content and key process skills outlined in the “Scientific and Engineering Practices” and “Disciplinary Core Ideas” dimensions of the NGSS. Specially designed guided inquiry materials are used by collaborative student teams in a learning environment where logical thinking and teamwork are valued as highly as mastery of the core science ideas.

During the half-day course, participants will investigate the underlying structure of POGIL activities, the scientific and vocational process skills incorporated into the POGIL environment, the teacher facilitation skills utilized during a POGIL lesson, and the student roles used in collaborative learning groups. We will also discuss obstacles to implementing inquiry-based learning in a high school science course and present student achievement data to support POGIL. For more information, visit www.pogil.org.

T-1: U.S. Geological Survey Cascades Volcano Observatory



—Photo courtesy of U.S. Geological Survey Cascades Volcano Observatory

F-2: Oregon National Primate Research Center



—Photo courtesy of Diana Gordon, Oregon National Primate Research Center

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 GWCC main entrance on Andrew Young International Drive 15 minutes before departure time.

U.S. Geological Survey Cascades Volcano Observatory \$22

#T-1 Thurs., Oct. 24 8:15 AM–12:45 PM

Dominating the skyline of the Pacific Northwest, active volcanoes are part of a 1,000-mile volcanic chain that extends from northern California to southern British Columbia. Eruptions have occurred at an average rate of about two per century during the past 4,000 years, and future eruptions are certain. The U.S. Geological Survey is responsible for assessing volcano hazards, monitoring volcanic activity, and issuing warnings of impending eruptions.

During this tour, scientists provide an introduction to volcanic hazards and techniques for detection of volcanic unrest, short-range forecasting, and volcano mitigation. Participants will receive a tour of the seismic/operations room and research labs, and view volcano-monitoring equipment. Participants receive volcano posters and literature. For more information, visit on.doi.gov/JfSid3.

An In-depth Tour of Vernier Software & Technology \$10

#T-2 Thurs., Oct. 24 12 Noon–4:30 PM

How do you create, manufacture, and test world-class sensors, interfaces, and software? Find out on this in-depth tour of Vernier. Developing sensor technology for more than 130 countries, Vernier Software & Technology is a world leader in probeware with a reputation for extraordinary customer service. Participants are invited to meet the scientists, engineers, and employees of Vernier. Visit our on-site Technology Museum, discover a bit about the company's history, learn to ride a Segway®, see new products demonstrated, win prizes, and have a relaxing lunch provided courtesy of Vernier. Come check out Vernier's recently expanded LEED-certified building with cool science features such as solar panels, electrochromic windows, a saltwater aquarium, and an indoor slide that is perfect for fun-loving science teachers.

Note: Meet your field trip leader at the Vernier booth (Booth #500) in the Exhibit Hall by 12 Noon. Transportation will be by MAX Light Rail. Please be sure to bring your free conference MAX pass, which can be obtained from the Program Pickup Counter (for those who preregistered) or at the New Registration counter (if registering on-site).

SOLD OUT

Rice Northwest Museum of Rocks & Minerals \$31

#F-1 Fri., Oct. 25 8:15 AM–12:15 PM

Home of the famed Alma Rose, a rare rhodochrosite crystal, the museum is housed in the former home of Richard and Helen Rice. Avid rock hounds, their home is now on the National Historic Registry with its fine display of Oregon Myrtlewood and bird’s eye maple throughout the interior. Situated on 33 wooded acres, there is more to see than just rocks. Walk around the grounds and enjoy the many varieties of hummingbirds and other native animals.

Guests will be guided by our curator through the 9,600-square-foot museum, which includes 11 individual rooms and buildings filled with some of the finest mineral specimens in North America. Bring your cameras. Visit www.ricenorthwestmuseum.org for more information.

Note: No food or beverage provided on this trip.

Oregon National Primate Research Center \$21

#F-2 Fri., Oct. 25 12:30–4:00 PM

Do you ever think about where medicines come from? Before human clinical trials can begin, ideas must be generated and research must be conducted to understand the processes that underlie health and disease. The Oregon National Primate Research Center (ONPRC), one of eight national centers supported by the National Institutes of Health, is home to nearly 50 scientists who direct basic research focused on a variety of health issues, including diabetes, obesity, premature birth, aging, brain injury (stroke, multiple sclerosis, Huntington’s Disease), vaccine development, therapeutic uses of embryonic stem cells, contraception, fertility preservation, and assisted reproductive technologies.

Your visit to ONPRC will include an interactive presentation about current research projects and a discussion about the critical need for animal models in this work, as well as an overview of the animal care program at the Center. Following this presentation, we will visit the outdoor housed breeding colonies of rhesus macaques and Japanese macaques. Visit bit.ly/16dnyG2 for more information.

Note: Guests must be at least 10 years old. Ability to walk a half mile and climb stairs is important. Guests should wear comfortable walking shoes and dress for the weather. Photography is not permitted. No food or beverage provided on this trip.

Special Note: As a secure federal facility, ONPRC collects the names and home addresses of all visitors for the purpose of identification at the front gate. ONPRC does not use this information for any other purpose nor do they provide it to anyone else.

Evergreen Aviation & Space Museum \$40

#S-1 Sat., Oct. 26 7:30 AM–12:30 PM

Evergreen Museum Campus allows for many opportunities to learn about the history of aviation and space flight...and much more. The Evergreen Aviation & Space Museum offers teachers many standards-aligned history and STEM-centered programs, including Ground School (four forces of flight); history tours of both aviation and space museums; robotics, rockets, and Newton’s laws; space exploration; and engineering design challenges.

Tour the one-and-only *Spruce Goose*, Howard Hughes’ famous transport seaplane; experience the Magic Planet; and see one of the fastest spy planes, the SR-71. Visit with our education specialists and discover a wide array of teacher resources and activities that you can take back to the classroom. There is no better way to learn about science, space, and aviation than at Evergreen.

Note: Bring your own snack and beverage, if needed, for the bus ride. No outside food or drink is allowed in the facility.

Conference Program • Affiliate Sessions

Association for Science Teacher Education (ASTE)

President: Kathy Trundle

Friday, October 25

| | | |
|--------------|-----------------------|-------------------------|
| 2:00–3:00 PM | Learn All About ASTE! | B110, Convention Center |
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Council for Elementary Science International (CESI)

President: Julie Thomas

Thursday, October 24

| | | |
|---------------|---|---|
| 12:30–1:30 PM | Get On Board with CESI and NASA's International Space Station | Oregon Blrm. 203/204, Convention Center |
|---------------|---|---|

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|--------------|---|---|
| 2:00–3:00 PM | Council for Elementary Science International Share-a-Thon | Oregon Blrm. 203/204, Convention Center |
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Friday, October 25

| | | |
|--------------|--|------------------------|
| 3:30–6:30 PM | Council for Elementary Science International Board Meeting | Washington, DoubleTree |
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Saturday, October 26

| | | |
|---------------|---|----------------------------|
| 8:30–10:30 AM | CESI Buffet Breakfast (Ticket M-1; \$37) Speaker: Mary Hobbs, The University of Texas at Austin | Weidler/Halsey, DoubleTree |
|---------------|---|----------------------------|

National Association for Research in Science Teaching (NARST)

President: Lynn Bryan

Friday, October 25

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| 12:30–1:30 PM | Impact of an Embedded Assessment System on Elementary Teaching and Learning | Broadway, DoubleTree |
|---------------|---|----------------------|

| | | |
|--------------|--|----------------------|
| 2:00–3:00 PM | Looking at Quality of Instruction and Students' Performance: Where Do the Teachers' Questions Come From? | Broadway, DoubleTree |
|--------------|--|----------------------|

National Middle Level Science Teachers Association (NMLSTA)

President: Patty McGinnis

Thursday, October 24

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|---------------|---|-------------------------|
| 12:30–1:00 PM | LEARN: Long-term Engagement in Authentic Research with NASA | B110, Convention Center |
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|--------------|---|-------------------------|
| 2:00–3:00 PM | National Certification—What's It All About? | B110, Convention Center |
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National Science Education Leadership Association (NSELA)

President: Darlene Ryan

Thursday, October 24

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|---------------|---------------------------|--------------------|
| 12:30–1:30 PM | Tools for Science Leaders | Alaska, DoubleTree |
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8:30 AM–3:30 PM Preconference Workshop

Picture-Perfect Science Preconference Workshop (C-1)

(Grades K–5)

Oregon, DoubleTree

By Preregistration Only

Karen Ansberry (karen@pictureperfectscience.com) and **Emily Morgan** (emily@pictureperfectscience.com), Picture-Perfect Science, LLC, Lebanon, Ohio

For description, see page 34.

12:30–4:00 PM Meeting

FOSS Third Edition: Scientific Literacy—FOSStering Connections to the Common Core

(By Invitation Only)

3 Sisters, DoubleTree



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 133, 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 Portland 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.

CCSS Bridging Elementary and Secondary Science with the Common Core

NGSS Bridging to the Next Generation Science Standards—What's in It for Me?



Building Bridges Within STEM Education

The following icon will be used throughout this program.



NSTA Press Sessions



—Photo courtesy of Travel Portland

8:00–9:00 AM Presentations

SESSION 1

Using Modeling Activities in the High School Chemistry Class (Chem)

(High School/Supervision) B110, Convention Center

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

Visualization is difficult for many students. Join me for a discussion and demonstration of several modeling activities you can use in your chemistry class.

SESSION 2

(Middle Level–High School) B119, Convention Center

Into the Woods: Field-based Science Inquiry (Bio)

Mike Weddle (mkweddle@comcast.net), Jane Goodall Environmental Middle School, Salem, Ore.

Learn how to implement a field-based science inquiry program, from the practical to the theoretical. This session will cover funding, timing, building administrative support, collaboration, and much more.

SESSION 3

Next Generation Science Standards on Wave Behavior: LIGO's Resources for Elementary and Middle School Classrooms (Phys)

(Elementary–Middle Level) C122, Convention Center

Dale Ingram (ingram_d@ligo-wa.caltech.edu), LIGO Hanford Observatory, Richland, Wash.

The NGSS will increase the focus on waves in early grades. Explore LIGO's K–6 activities on waves and vibrations that address the multidimensional nature of the new standards.

SESSION 4

Learning Progressions for Environmental Science Literacy (Env)

(Middle Level–High School) D130, Convention Center

Molly Charnes (mcharnes@gmail.com), Towson University, Towson, Md.

Let's discuss how teachers involved in a five-year project have used learning progressions as a tool for planning instruction.

SESSION 5

NSTA Press® Session: Forensics in Chemistry (Chem)

(High School–College) D136, Convention Center

Sara McCubbins (samccub@ilstu.edu), Illinois State University, Normal

Angie Codron (codrona@ncwhs.org), Normal Community West High School, Normal, Ill.

Forensics is the foundation in this yearlong lab series. As students solve the case, the narrative provides vivid lessons in why chemistry concepts are relevant.

SESSION 6

Simple Activities to Get ELD Learners Reading, Writing, Listening, and Speaking (Gen)

(Elementary–High School) D140, Convention Center

Angela C. Dickey (angela_dickey@centennial.k12.or.us), Centennial Middle School, Portland, Ore.

Join me for this presentation of several short, easy-to-include activities and ideas geared toward increasing the participation of English language development (ELD) learners.

SESSION 7

Strategies for Advancing Educational Opportunities for Underrepresented Students in STEM (Gen)

(Informal Education) E146, Convention Center

Phyllis G. Harvey-Buschel (pgharvey@uw.edu) and **James B. Dorsey** (jbdorsey@uw.edu), University of Washington, Seattle

We'll share some strategies that are useful in successfully engaging and motivating underrepresented students to study and pursue careers in Science, Technology, Engineering, and Mathematics.

SESSION 8

First-Timer Conference Attendees Orientation—Is This Your First NSTA Conference? (Gen)

(General) Oregon Ballroom 203/204, Convention Center

NSTA Board and Council

Feeling overwhelmed by all there is to see and do at an NSTA conference? Join us for an interactive walk through the conference program, and you'll learn how to get the most from your conference experience. We'll also have a brief demo of our NSTA conference app. Door prizes!

SESSION 9

Science Research in High School (Gen)

(High School) 3 Sisters, DoubleTree

Serena McCalla (serena@serenamc.com), Union Free School District

Let's review high school-level practices to promote research in the high school. High school research allows for the hands-on exploration of core curriculum and true insight to systematically complete the scientific method, including conducting experiments and writing journal-worthy papers culminating from years of experimentation.

SESSION 10

Engage Students with Model-based Inquiry (Gen)

(Middle Level–High School) Alaska, DoubleTree

Kevin Carr (kcarr@pacificu.edu), Pacific University, Woodburn, Ore.

Learn about a model-based inquiry unit in which students investigate and evaluate local evidence found in the Willamette Valley that supports the Missoula Flood hypothesis.

SESSION 11

Partners in Science Grant (Gen)

(High School) Idaho, DoubleTree

Leonard “Chuck” Smith, Retired Educator, Hubbard, Ore.

The M.J. Murdock Trust offers a \$15,000 grant for high school science teachers in Alaska, Oregon, Washington, Montana, and Idaho to partner with a researcher for two summers of cutting-edge research. This grant also provides four fantastic conferences for the participants as well as an opportunity to apply for a second grant for a high school project. Come to this session to learn more about this great opportunity!

SESSION 12 (two presentations)

(General) Mt. Bachelor, DoubleTree

What If Glaciers Were Interactive? Transforming Science with Media (Gen)

Alanna Shevak, PBS Education, Arlington, Va.

In just five minutes, PBS LearningMedia can help you to transform your science lessons into interactive learning experiences that engage students and motivate their learning.

Mud, Cows, Bats, and Insects—Getting the Dirt on STEM Careers (Gen)

Tullan Spitz (tspitz@opb.org) and **Catherine Stimac** (cstimac@opb.org), Oregon Public Broadcasting, Portland

More than 100 young STEM professionals on film! Take STEM career inspiration home to your students with free clips from pbslearningmedia.org. PBS prizes!

SESSION 13 (two presentations)

(Informal Education) Roosevelt, DoubleTree

The Global Web Wind Turbine Challenge (Phys)

Anastasia (Asia) Ward (asia@kidwind.org), The KidWind Project, St. Paul, Minn.

Learn how to participate in a global, online wind turbine design competition! Students from all over the world are building turbines and competing in this online forum.

Engaging Girls in Renewable Energy STEM (Gen)

Anastasia (Asia) Ward (asia@kidwind.org), The KidWind Project, St. Paul, Minn.

Address the gender gap in STEM fields through renewable energy science. The larger social purpose of this field engages girls more equally in STEM.

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 11:10 AM to 12:10 PM at the entrance to the Exhibit Hall (page 51).



8:00–9:00 AM Workshops

Science & Children—Year of Inquiry (Gen)
(Preschool–Elementary) D131/132, Convention Center

Linda Froschauer (fro2@mac.com), Field Editor, *Science & Children*, Westport, Conn.

The Next Generation Science Standards support inquiry as a teaching strategy. Learn ways to infuse components of inquiry into your curriculum.

ASEE Session: Introducing Engineering to Elementary School Students (Gen)

(Informal Education) D133/134, Convention Center

Stacy S. Klein-Gardner (stacy.gardner@harpethhall.org), Harpeth Hall School, Nashville, Tenn.

Presider: Sharon A. Jones (jones@up.edu), University of Portland, Ore.

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.

Seeing the Invisible: Making the Electromagnetic Spectrum Concrete (Phys)

(Middle Level) E142, 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 you to engage in activities that make the EMS a bit more concrete.

Gene-Environment Interactions in the Nematode *C. elegans* (Bio)

(High School) E143, Convention Center

Maureen Munn (mmunn@uw.edu), University of Washington, Seattle

Explore ways to engage students in understanding gene-environment interactions using the model organism *C. elegans*.

NGSS Integrating Next Generation Science Standards Ahead of District/State Standards Alignment

(Gen)

(High School)

E144, Convention Center

Lisa A. Collette (lcollette@me.com), Las Vegas High School, Las Vegas, Nev.

Join me for hands-on activities and pick up implementation ideas for life and physical sciences that meet the Next Generation Science Standards without compromising current district/state curriculum requirements.

CCSS NASA’s “Reading, Writing & Rings”: Using Saturn to Teach Science and Language Arts (Earth)

(Elementary)

E145, Convention Center

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

Explore NASA’s science and language arts curriculum that uses the Cassini mission to Saturn as inspiration for enhancing students’ interest in reading, writing, and science.

Integrated STEM

(Gen)

(General)

Mt. St. Helens, DoubleTree

Louis S. Nadelson, Boise State University, Boise, Idaho

Anne Seifert (anne.seifert@inl.gov), Idaho National Laboratory, Idaho Falls

This workshop will involve hands-on/minds-on approaches to integrating STEM using projects and challenges to provide context for STEM content.

8:00–9:15 AM Exhibitor Workshops

STEM Projects, Science Fairs, and Student Performances (Gen)

(Grades K–8)

A103/104, Convention Center

Sponsor: Delta Education/School Specialty Science

Johanna Strange, Consultant, Richmond, Ky.

Having trouble helping students conceptualize science fair projects, STEM performances, and other competitions? Learn an effective method for teaching students to design experiments from simple investigations. The same process can help students crystallize engineering design ideas into products. Delta products will be featured and resources will be provided.

Updating Earth and Space Science for Middle and High School in the New World of the NGSS (Earth)

(Grades 9–12)

A105, Convention Center

Sponsor: Pearson

Michael Wysession (michael@wucore.wustl.edu), Washington University in St. Louis, Mo.

Join Michael Wysession, a lead author of the Next Generation Science Standards, as he talks about the implications of the NGSS for teaching Earth and Space Science (ESS). The emphasis on science and engineering practices, human-relevant content, hands-on work with data and evidence, and a systems-science approach provides many good opportunities for the Earth and space sciences. However, the significant shift in ESS content from middle school to high school poses significant challenges for curriculum and professional development. Wysession will provide curricular ideas for teaching ESS in ways that best align with the NGSS.

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

(Grades 6–9)

A106, Convention Center

Sponsor: CPO Science/School Specialty Science

Scott 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 offer students opportunities to grasp atomic structure and its connection to the periodic table.

DNA Replication and Transcription (Bio)

(Grades 5–12)

A107, Convention Center

Sponsor: K’NEX Education

Presenter to be announced

No more gumdrops and toothpicks! Use K’NEX® to build and explore functional DNA models that actually stay together. Twist DNA ladders to make a helix, replicate it, and transcribe the model to form mRNA. Color-coded nucleotides enable quick changes of the C, G, A, T, and U bases to produce new sequences. Standards-aligned STEM concepts will be emphasized.

“FOSStering” the Common Core: Science-centered Language Development (Gen)

(Grades K–6)

A108/109, Convention Center

Sponsor: Delta Education/School Specialty Science–FOSS

Brian Campbell and **Joanna Totino**, The Lawrence Hall of Science, Berkeley, Calif.

Discover the ways language is used to help elementary 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.

Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (Bio)

(Grades 6–12)

B111/112, 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 the protocols of a forensic pathologist. Free materials and door prizes!

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

(Grades 9–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

What is the difference between subscripts and coefficients? What does “balancing” a chemical equation mean? Many students have trouble with these fundamental chemistry concepts. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some elegant, intuitive, and well-differentiated lessons from the new high school program, *A Natural Approach to Chemistry*, that enables students of all levels to master the chemical formula and thereby move confidently into a deeper understanding of chemistry.

How Data Logging Systems Support Scientific Studies (Phys)

(Grades 8–College) B116, Convention Center

Sponsor: Science First®/STARLAB®

Gilles Gallin-Frandaz, Eurosmart, Montbonnot St. Martin, France

Nathaniel Bell (info@sciencefirst.com), Science First/STARLAB, Yulee, Fla.

Learn about the proper use of connected and wireless data logging equipment to support scientific studies in multiple disciplines. Join us as our European co-presenter shares how educators in France are using data loggers to meet curriculum requirements. In a practical demo, we will conduct a mini study with participants to show if the Achilles tendon myotatic reflex differs between Europeans and North Americans.

33 Strategies for Integrating Disciplinary Literacy (Gen)

(Grades K–6) B117/118, Convention Center

Sponsor: Amplify Education, Inc.

Traci Wierman and **Rebecca Abbott**, 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!



8:30–9:45 AM Exhibitor Workshop

Using Enzyme-linked Immunosorbent Assay (ELISA) to Detect West Nile Virus Outbreak (Bio)

(Grades 9–College) C120/121, Convention Center

Sponsor: Edvotek Inc.

Tom Cynkar (info@edvotek.com) and **Jeff Chirikjian** (info@edvotek.com), Edvotek Inc., Washington, D.C.

The 2012 outbreak of the West Nile virus was the largest ever documented in the U.S.—more than 1,100 cases were reported to the CDC. Join us to discover how ELISA can be used as a diagnostic tool for detecting disease outbreaks. Participants will perform our new simple, foolproof single-antibody ELISA. Much faster than a traditional ELISA, this assay can be completed in 40 minutes or less. Participants receive a free flash drive and enter for a T-shirt drawing at the end of the workshop.

9:00 AM–12 Noon Workshop

NSTA/CAEP Development of Program Report Workshop

(By Invitation Only)

Washington, DoubleTree

9:00 AM–12 Noon Short Course

How Does Sleep Affect Our Learning? (SC-1)

(Middle Level)

Oregon, DoubleTree

Tickets Required: \$28

Jenny L. Williamson (jenlw@uw.edu), University of Washington, Seattle

Shannon Jephson-Hernandez (jephss@u.washington.edu), Mill Creek Middle School, Seattle, Wash.

For description, see page 36.

9:15–10:30 AM General Session

Both Sides of the Lens—Connecting Adventure and Creativity

(General) Oregon Ballroom 201/202, Convention Center

Sponsored by National Geographic Learning



Jimmy Chin (jr@rxrsports.com), National Geographic Photographer and Professional Climber and Skier
@jimkchin

Presider and Introduction of Speaker: Bill Badders, NSTA President, and Retired Director, Cleveland Math and Science Partnership, Cleveland, Ohio

Platform Guests: Jimmy Chin; Bill Badders; Karen L. Ostlund, NSTA Retiring President, and Retired Educator, The University of Texas at Austin; Juliana Texley, NSTA President-Elect, and Palm Beach State College, Boca Raton, Fla.; Steven Ruthford, NSTA Director, District XVII, and Schome High School, Bellingham, Wash.; Lori Lancaster, OSTA President, Local Arrangements Coordinator, Portland Area Conference, and Centennial High School, Gresham, Ore.; John Parker, WSTA President, and Puyallup (Wash.) School District; Lynda Sanders, Chairperson, Portland Area Conference, and Marshfield High School, Coos Bay, Ore.; Jodie Harnden, Program Coordinator, Portland Area Conference, and Sunridge Middle School, Pendleton, Ore.; David L. Evans, NSTA Executive Director, Arlington, Va.

Few photographers will attempt Pakistan's precipitous K7 or ski from the summit of Everest just to frame a shot. So when world-renowned mountaineer Ed Viesturs pushes for the summit of his final 8000m peak, or when alpinist Conrad Anker plans to put up a new route in the Himalayas, they call the same photographer and filmmaker: Jimmy Chin. Arguably one of the most sought-after expedition photographers working today, Chin, a Minnesota native, is himself a professional climber, skier, and 10-year veteran of the North Face Athlete Team.

On top of Jimmy's work as a photographer, he is also a director and cinematographer and he owns his own production company, Camp 4 Collective. Jimmy's films have received awards from numerous film festivals, including Telluride Mountainfilm, Kendal Film Festival, and Boulder Adventure Film Festival.

Chin hopes that images and films from his expeditions and shoots will help him reach a greater goal. "It's about sharing stories that inspire people, highlights the infinite human spirit, and opens people's eyes to a different world," Chin explains. "Creating films and photographs through situations that few others could experience is my life's inspiration."

9:30–10:30 AM Workshop

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

(General) D133/134, Convention Center

Stacy S. Klein-Gardner (stacy.gardner@harpethhall.org), Harpeth Hall School, Nashville, Tenn.

Presider: Sharon A. Jones (jones@up.edu), University of Portland, Ore.

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

9:30–10:30 AM Exhibitor Workshop

Investigating Stem Cell Differentiation (Bio)

(Grades 9–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

The human body is made of more than 200 types of cells, yet they all arise from a single fertilized egg cell. In this hands-on high school biology activity from SEPUP's *Science and Global Issues: Biology* program, you will experience how your students can investigate the development of specialized stem cells and consider bioethical issues in stem cell research.



10:00–11:15 AM Exhibitor Workshops**Science, the Literacy Connection, and Common Core English Language Arts (Gen)***(Grades K–8) A103/104, Convention Center*

Sponsor: Delta Education/School Specialty Science

Johanna Strange, Consultant, Richmond, Ky.

Discover how your students can experience the enjoyment of learning science using Delta Science Modules and make the literacy connection to the Common Core ELA with Delta Science literacy resources. Receive a workshop packet containing Common Core strategy templates and other related Delta literacy materials.

Economical, Efficient, and Effective Inquiry in Chemistry (Chem)*(Grades 9–12) A105, Convention Center*

Sponsor: Pearson

Ed Waterman, Retired Educator, Fort Collins, Colo.

Learn how to implement safe, simple, material-conserving, time-efficient, and educationally effective inquiry activities in chemistry. Each activity teaches core content and fosters problem solving, creativity, and invention. Safety and differentiation are built in as students design and carry out diverse activities that are not possible with traditional materials.

Genetics—Crazy Traits (Bio)*(Grades 6–12) A106, Convention Center*

Sponsor: CPO Science/School Specialty Science

Scott 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 come alive as you use a unique kit to create crazy creatures and study the resulting population.

Exploring Machines (Phys)*(Grades 4–10) A107, Convention Center*

Sponsor: K'NEX Education

Presenter to be announced

Bring the excitement of hands-on learning to your middle school classroom! Build and investigate simple machine models, take measurements, and gather data to determine work input, work output, mechanical advantage, gear ratios, effort forces, resistance forces, and more. The exercises and explorations illustrate engineering and scientifically rich content through the use of models. Applying understandings of these models to real-world examples of machines leads to

a better understanding of design and systems of machines in practical use. Standards-aligned STEM concepts will guide our exploration.

Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (Gen)*(Grades K–6) A108/109, Convention Center*Sponsor: Delta Education/School Specialty Science–FOSS
Brian Campbell and **Joanna Totino**, The Lawrence Hall of Science, University of California, Berkeley

Join FOSS developers to learn about the scientific practices within the context of the FOSS program. You will experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson.

Keep Calm and Chemistry On—Successful Lab Activities for the New Chemistry Teacher (Chem)*(Grades 9–12) B111/112, Convention Center*

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, safe chemistry activities that are sure to produce a reaction from your students. Whether you're new to chemistry or feeling out of your element, these activities can precipitate excitement in your classroom. Free materials and giveaways!

New Advanced Inquiry Labs for AP Chemistry from Flinn Scientific (Chem)*(Grades 9–12) B114/115, Convention Center*

Sponsor: Flinn Scientific, Inc.

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

This hands-on interactive workshop can help you implement the revised laboratory investigations and curriculum framework for AP Chemistry! Join Flinn Scientific as we present two new guided inquiry chemistry experiments that support the integrated learning objectives and applied science practice skills your students will need for success. Pre-lab preparation and preliminary activities for each investigation have been optimized so teachers can effectively guide students and provide maximum opportunities for inquiry. Handouts provided for all activities!

Comets—Beauties or Beasts? (Earth)
(Grades 6–12) B116, Convention Center

Sponsor: Simulation Curriculum

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

Join us as we use Simulation Curriculum’s award-winning Starry Night High School to study the origin, importance, and possible dangers of comets. Watch as Earth passes through the tail of Halley’s Comet, predict the path of Comet ISON, and explore the relationship between comets and meteor showers.

Get Results with Science and Literacy Integration: Seeds of Science/Roots of Reading® (Gen)

(Grades 2–6) B117/118, Convention Center

Sponsor: Amplify Education, Inc.

Traci Wierman and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley

Investigate Models of Matter with the Seeds of Science/Roots of Reading unit! Experience next generation science practices using content-rich science books, scientific discourse, and writing activities. Together these provide rich and varied opportunities to learn core science ideas and vocabulary. Effectiveness data will be shared. Free samples!



Applying Common Core State Standards for English Language Arts Through Active Science Instruction in the K–5 Classroom (Gen)

(Grades K–5) C123, Convention Center

Sponsor: Sangari Active Science

Ellen Mintz, Charleston County Schools, Charleston, S.C.

The Common Core State Standards for English Language Arts require students to read using informational text and write using skills encouraged through science instruction. Using a hands-on/minds-on activity, we will investigate and use the data we collect to write a claims and evidence response. Reading strategies will be used to tie our investigation to informational text.

Molecular-Level Visualization and Simulation: Getting Ready for the Next Generation Science Standards (Chem)

(Grades 7–12) C125/126, Convention Center

Sponsor: Wavefunction, Inc.

Jurgen Schnitker (sales@wavefun.com), Wavefunction Education Labs, 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 start using *ODYSSEY* High School Chemistry to engage your students and address the Next Generation Science Standards.

10:15–11:30 AM Exhibitor Workshop

Solving the Case of the Missing Archive Using DNA Fingerprinting (Bio)

(Grades 9–College) C120/121, Convention Center

Sponsor: Edvotek Inc.

Tom Cynkar (info@edvotek.com) and **Jeff Chirikjian** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Are you ready to perform a cutting-edge classroom forensic experiment? Complete a DNA fingerprinting exercise to determine who stole priceless historical documents from the Historical Society. We will identify the thief by comparing a DNA sample collected by forensic scientists at the crime scene to DNA from different suspects. Your students can solve the crime! Participants receive a free flash drive and enter for a T-shirt drawing at the end of the workshop.

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

Exhibit Hall A, Convention Center

Presider: Bill Badders, NSTA President, and Retired Director, Cleveland Math and Science Partnership, Cleveland, Ohio

Welcoming Remarks: Lynda Sanders, Chairperson, Portland Area Conference, and Marshfield High School, Coos Bay, Ore.

Special Guests: Karen L. Ostlund, NSTA Retiring President, and Retired Educator, The University of Texas at Austin; Juliana Texley, NSTA President-Elect, and Palm Beach State College, Boca Raton, Fla.; Steven Ruthford, NSTA Director, District XVII, and Schome High School, Bellingham, Wash.; Lori Lancaster, OSTA President, Local Arrangements Coordinator, Portland Area Conference, and Centennial High School, Gresham, Ore.; John Parker, WSTA President, and Puyallup (Wash.) School District; Jodie Harnden, Program Coordinator, Portland Area Conference, and Sunridge Middle School, Pendleton, Ore; David L. Evans, NSTA Executive Director, Arlington, Va.; Jason Sheldrake, Assistant Executive Director, Sales, NSTA, Arlington, Va.

11:00 AM–12 Noon Workshop

ASEE Session: Engaging Elementary-aged Children and Parents in Engineering (Gen)

(General) D133/134, Convention Center

David Heil (dheil@davidheil.com) and **Mia Jackson** (mjackson@davidheil.com), David Heil & Associates, Inc., Portland, Ore.

Presider: Sharon A. Jones (jones@up.edu), University of Portland, Ore.

Learn how to host effective family events and discover the excitement of hands-on engineering activities designed to engage the whole family in real-world challenges.

11:00 AM–12 Noon Exhibitor Workshop

Hot Bulbs: Investigating Energy Efficiency (Phys)

(Grades 6–8) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Why use compact fluorescent instead of incandescent bulbs? In this activity from the SEPUP middle level series *Issues and Physical Science*, participants use specially designed equipment to measure the energy lost as heat by small incandescent bulbs. Energy concepts include calories, heat transfer, efficiency, and more.

11:05 AM–5:00 PM Exhibits

Exhibit Hall A, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 11:00 AM to 12:30 PM? During these hours there are no sessions or workshops scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

11:10 AM–12:10 PM 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–6:00 PM Short Course

Fun with Physics: How Using a Patterns Approach Helps Students Learn (SC-2)

(High School) Adams/Jefferson, DoubleTree

Tickets Required: \$20

Bradford Hill (bradford_hill@beaverton.k12.or.us), Southridge High School, Beaverton, Ore.

Susan Holveck (susan.holveck@beaverton.k12.or.us), Beaverton (Ore.) School District

For description, see page 36.

12:30–1:00 PM Presentations

SESSION 1

NMLSTA Session: LEARN: Long-term Engagement in Authentic Research with NASA (Env)

(Middle Level–High School) B110, Convention Center

Jodie Harnden (jodie.harnden@pendleton.k12.or.us), Program Coordinator, Portland Area Conference, and Sunridge Middle School, Pendleton, Ore.

LEARN is a research experience for teachers working on authentic NASA science projects in air quality, aerosols, and climate under the guidance of NASA researchers.

SESSION 2

Reinventing Science Journals in Secondary Classrooms (Bio)

(Middle Level–High School) B119, Convention Center

Shannon M. Kresge (smkresge@hotmail.com), Ferndale High School, Ferndale, Calif.

Learn how to use science notebooks in your classroom as an effective tool for teaching science and organization to students. Come discover this great assessment tool!

SESSION 3

4-H ExCEL in Animal Sciences (Bio)

(High School) Roosevelt, DoubleTree

Maureen E. Hosty (maureen.hosty@oregonstate.edu), OSU Extension, Portland, Ore.

ExCEL stands for EXploring Careers, Education, and Leadership. Find out how 4-H and zoo staff are partnering to provide hands-on learning opportunities for high school youth in animal sciences career exploration and post high school education paths.

12:30–1:00 PM Exhibitor Workshop

A Change of Seasons (Earth)

(Grades 5–8) Booth #408, Exhibit Hall, Convention Center

Sponsor: Science First®/STARLAB®

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

In this in-dome workshop, we will introduce one of the Starry Night Small Dome lessons. Join us as we take a look at why we have seasons here on Earth.

12:30–1:30 PM Presentations

SESSION 1

Successful Partnerships Advance STEM Project Based Learning (Gen)

(Elementary–Middle Level/Informal) C122, Convention Center

Ruth McDonald (wesmcd@charter.net), Lincoln County School District, Newport, Ore.

Tracy Crews (tracy.crews@oregonstate.edu), Oregon State University, Newport

Clair Thomas (thomasc@tillamook.k12.or.us), Tillamook (Ore.) School District

Kerry Carlin-Morgan (kerry.morgan@aquarium.org), Oregon Coast Aquarium, Newport

Oregon Coast school districts are partnering with universities, informal science educators, business, and industry to support grades 3–8 teachers in using STEM Project Based Learning.

SESSION 2

ED²: Earth Day, Every Day (Env)

(Middle Level/College) D130, Convention Center

Terri Hebert (thebert@iusb.edu), Indiana University South Bend
ED² bridges environmental content with community resources to strengthen science instruction of inservice and preservice teachers while engaging middle grade students in urban settings.

SESSION 3



NSTA Press® Session: Exemplary Science: Best Practices in Professional Development (Gen)

(General) D136, Convention Center

Susan B. Koba (skoba@cox.net), Science Education Consultant, Omaha, Neb.

Brenda Wojnowski (bwojnowski@gmail.com), WAI Education Solutions, Dallas, Tex.

Explore professional development programs that work in various settings and serve as case study protocols, professional development implementation templates, strategic planning aids, and university resources.

SESSION 4

Your Students Can Be Radio Astronomers (Earth)

(Middle Level–High School/Informal) D140, Convention Center

Shannon L. McConnell, NASA Jet Propulsion Laboratory, Pasadena, Calif.

Don't miss this information session on a NASA program for radio astronomy in the classroom.

SESSION 5

Magical Illusions for Science—It’s Showtime! (Gen)

(General) *3 Sisters, DoubleTree*

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 6

NSELA Session: Tools for Science Leaders (Gen)

(General) *Alaska, DoubleTree*

Darlene Ryan (*dryan@chccs.k12.nc.us*), NSELA President, and Glenwood Elementary School, Chapel Hill, N.C.

Elizabeth A. Allan (*eallan@uco.edu*), University of Central Oklahoma, Edmond

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

Working with Industry to Build a Computer Science Program That Supports the NGSS (Gen)

(Middle Level–High School/Informal) *Idaho, DoubleTree*

Ann F. Wright-Mockler (*ann.wrightmockler@pnnl.gov*), Pacific Northwest National Laboratory, Richland, Wash.

Emily Blankingship (*emily.blankingship@thedeltahighschool.com*), Delta High School, Richland, Wash.

Understanding basic computer science can help all students be college and career ready, especially when linked to the Next Generation Science Standards. Learn how to engage computer scientists in your community to help build a computer science program in your high school.

Project Learning Tree

Use PLT and the environment to engage students in real world applications of STEM.

- Investigative, student-led learning
- Inquiry-based activities
- GreenSchools! investigations
- Grants for service-learning projects



Get free PLT materials at NSTA

Visit Exhibit Booth 302

Participate in PLT sessions

- Facilitating Early Childhood Education with PLT – Thurs, Oct 24, 5:00-6:00pm (Oregon Convention Center, D131/132)
- Global Connections: Forests of the World – Friday, Oct 25, 12:30-1:30pm (Oregon Convention Center, D135)

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

www.plt.org

SESSION 8

Procrastinator’s Anonymous: A 10-Step Program for the “Time Challenged” Student (Gen)

(General) *Mt. Bachelor, DoubleTree*

Bonnie B. Nelson (*bonnie.nelson@apsva.us*), Wakefield High School, Arlington, Va.

Current research on procrastination and strategies to help all students (including those with special needs) develop self-efficacy and promote academic achievement will be presented.

SESSION 9

Preparation Through Partnership (Gen)

(General) *Mt. Hood, DoubleTree*

Matthew T. Smith and **Larry Madden** (*larry.madden@slschools.org*), Salt Lake Center for Science Education, Salt Lake City, Utah

Discussion centers on the various collaboration efforts between the Salt Lake Center for Science Education and the University of Utah. Join us as we outline methods for creating a secondary/higher education partnership.

12:30–1:30 PM Workshops

MacGuyver Windmills: Wind Power and Energy Transfers (Phys)

(Elementary–Middle Level/Inf.) *D131/132, Convention Center*

Anastasia (Asia) Ward (*asia@kidwind.org*), The KidWind Project, St. Paul, Minn.

Think creatively like “MacGuyver” to build windmills from “junk” materials. We will cover topics on simple machines, energy transformations, ratios, energy, and the engineering/design process.

ASEE Session: Effective STEM Curricula for Girls (Gen)

(Middle Level–High School) *D133/134, Convention Center*

Stacy S. Klein-Gardner (*stacy.gardner@harpethhall.org*), Harpeth Hall School, Nashville, Tenn.

Presider: Sharon A. Jones (*joness@up.edu*), University of Portland, Ore.

Experience integrated STEM curricula specifically targeted for girls that include a focus on service learning and the engineering design process.

Guided Inquiry Labs in the Redesigned AP Chemistry Course (Chem)

(High School–College) *D135, Convention Center*

Serena Magrogan (*smagrogan@collegeboard.org*), The College Board, Duluth, Ga.



Engage in a guided inquiry learning experience and learn how to transform teacher-directed labs into inquiry-based labs for the redesigned AP Chemistry course.

Exploring NASA Engineering Challenges—Something for Everyone! (Phys)

(Elementary–High School) *E142, Convention Center*

Rebecca L. Jaramillo (*rebecca.jaramillo@nianet.org*), Center for Integrative STEM Education, Hampton, Va.

Investigate NASA’s newest engineering challenges for students of all ages. Use engineering design to reinforce strong science content. Inspire your students as only NASA can!

NGSS Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (Env)

(Middle Level) *E144, Convention Center*

Mary Whaley (*mwhaley@mbayaq.org*), Monterey Bay Aquarium, Monterey, Calif.

Enrich your middle school classroom with standards-based hands-on activities focusing on issues and solutions surrounding plastic pollution. Activities will highlight the physical and chemical properties of plastics, including density and buoyancy.

CCSS Tsunami in a Box (Earth)*(Elementary–Middle Level) E145, Convention Center*

Alicia L. Lyman-Holt (*alicia.lyman-holt@oregonstate.edu*) and **Ellen Momsen** (*ellen.momsen@oregonstate.edu*), Oregon State University, Corvallis

Create a tabletop tsunami using everyday materials. Students will connect math, science, and engineering skills as they explore coastal hazards.

**Stellar Science: Integrating STEM and Marine Mammal Research in the Classroom (Gen)***(Middle Level–High School) E146, Convention Center*

William Hanshumaker (*bill.hanshumaker@oregonstate.edu*), Oregon State University, Newport

Lisa Mulcahy (*science.writer@mareposa.com*), MAREPOSA, South Beach, Ore.

Engage students with exciting research on endangered Steller sea lions and the remote-monitoring technology used to study them. We will demonstrate inquiry-based lessons from a STEM curriculum for grades 6–12 based on high-tech research into how Steller sea lions are dying. Perform hands-on activities from the lessons, including learning how your cell phone acts like a transmitter, designing a seal tag, and Animal Crime Scene Investigations to understand marine technology, engineering design, and physical science principles. Take home links to downloadable curricula, links to a teacher's PowerPoint, and web resources.

CESI Session: Get On Board with CESI and NASA's International Space Station (Earth)*(Elementary–Middle Level) Oregon Blrm. 203/204, Conv. Center*

Julie A. Thomas (*julie.thomas@unl.edu*), CESI President and University of Nebraska, Lincoln

Participate in K–8 hands-on activities and learn how NASA's Teaching From Space (TFS) resources provide classroom access to NASA missions, NASA experts, and NASA equipment.

Making the Interdisciplinary Connection Between Literacy and Science (Gen)*(Elementary–High School) Mt. St. Helens, DoubleTree*

Malakia Wright (*malakiaw@gmail.com*) and **Misha Thompson** (*misha.thompson@clayton.k12.ga.us*), Clayton County Public Schools, Jonesboro, Ga.

Join us and gain a common understanding of literacy development and its importance in students' ability to demonstrate proficiency using hands-on activities and technology.

12:30–1:45 PM Exhibitor Workshops**DSM and STEM: Challenges for the Elementary Student (Gen)***(Grades K–6) A103/104, Convention Center*

Sponsor: Delta Education/School Specialty Science

Johanna Strange, Consultant, Richmond, Ky.

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

Problem-Based Learning in the Classroom (Gen)*(Grades K–12) A105, Convention Center*

Sponsor: Pearson

Michael Padilla, 2003–2004 NSTA President, and Clemson University, Clemson, S.C.

One of the biggest shifts involved with the implementation of the NGSS is the movement to incorporate more scenario-based and problem-based learning. To help prepare students for their next steps in school and beyond, students need to be doing science and seeing how it fits into their daily lives. Join Pearson author Mike Padilla as he brings problem-based learning into the science classroom to help prepare students for science and technology careers of the future.

Motion Comes Alive with CPO's Velocity Sensor**(Phys)***(Grades 6–12) A106, Convention Center*

Sponsor: CPO Science/School Specialty Science

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

Our new Velocity Sensor uses sound waves to measure and display position, velocity, and acceleration data of moving objects. We'll investigate how the Energy Car moves on CPO's SmartTrack to explore Newton's laws, kinematics, friction, and the law of conservation of energy in this inquiry-based learning activity.

Forces, Energy, and Motion (Phys)
(Grades 4–10) *A107, Convention Center*

Sponsor: K’NEX Education

Presenter to be announced

It’s off to the races! Join us as we investigate potential and kinetic energy as well as force and motion with K’NEX® cars. Gravity, rubber bands, springs, wind, battery motors, and flywheels will power models as we explore complex STEM concepts. How will your car perform? How would you redesign your model to make it a first-place car? Strategies that empower students to design and complete their own experiments from the teacher’s guide will be emphasized. Standards-aligned STEM concepts will be stressed.

Online Assessment That Informs Instruction (Gen)
(Grades 3–6) *A108/109, Convention Center*

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

Join developers of the new assessment system created for FOSS Third Edition as they introduce you to this new system as well as the accompanying computer software FOSSmap. Experience how formative assessment plays an integral role throughout the FOSS program. Grades 3–6 students can now take benchmark assessments online with most items automatically coded to generate useful reports.

The Next Generation Science Standards Are Here... Now What? Focus and Exploration of Implementation with Integrity K–8 (Gen)

(Grades K–8) *B111/112, Convention Center*

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Focus on getting started and learn to easily read, interpret, and implement the Next Generation Science Standards. Explore the structure of the NGSS, develop your knowledge to communicate, and create a dynamic district interest that can highly engage your staff in implementation integrity. Leave with tools to accelerate your NGSS journey.

Using Climate Proxies to Learn About Earth’s Climate History (Earth)

(Grades 9–12) *B113, Convention Center*

Sponsor: LAB-AIDS®, Inc.

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

How can scientists tell what Earth’s climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. Your students will analyze and graph samples of replicas of these

organisms, and use this information to determine relative warm and cold periods in the past 200,000 years. This activity is from the climate unit of *EDC Earth Science*, a new NSF-supported high school Earth science program that uses an active (more than 60 labs and activities!) approach to the study of Earth science and Earth systems.

Create a Digital Wi-Fi Classroom! (Gen)
(Grades 6–College) *B116, Convention Center*

Sponsor: Swift Optical Instruments, Inc.

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

Go digital...using STEM and Wi-Fi technology. Transform your labs, lesson plans, and activities into digital formats. Engage your students by incorporating Motic software, the new Wi-Fi Moticam X, and Swift microscopes into your lessons. Learn how to integrate digital Wi-Fi technology, student assessment, and motivation into your current curriculum. BYOD (bring your own device) for a true interactive experience.

Detection of Mad Cow Disease Using a Two-Step PCR Process (Bio)

(Grades 10–College) *C120/121, Convention Center*

Sponsor: Edvotek Inc.

Tom Cynkar (info@edvotek.com) and **Jeff Chirikjian** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Bovine spongiform encephalopathy (Mad Cow Disease) is a fatal neurological condition characterized by the sponge-like appearance of degenerated brain tissue. To prevent domestic cattle infection, the FDA inhibits the use of cow parts in cattle bovine-specific DNA present in cattle feed. This quick and easy experiment can be completed in one lab session using Edvotek’s user-friendly Edvocycler™! Participants receive a free flash drive and enter for a T-shirt drawing at the end of the workshop.

Today’s Juggling Act: Keeping the NGSS and CCSS Balls in the Air! (Gen)

(Grades 6–8) *C123, Convention Center*

Sponsor: Sangari Active Science

LeeAnn Sutherland, The University of Michigan, Ann Arbor

Discover how to address the NGSS and Common Core in ways you *and* your students can get excited about! Experience an engaging activity that incorporates reading, writing, speaking, and listening by pushing students to think deeply about science content. Consider how to juggle standards and research-based pedagogies in your own classroom.

**The ANATOMY IN CLAY® Learning System:
The Mind Cannot Forget What the Hands Have
Learned! (Bio)**

(Grades 6–College)

C124, Convention Center

Sponsor: ANATOMY IN CLAY Learning System

Kelly Canino (kelly@anatomyinclay.com), ANATOMY IN CLAY Learning System, Loveland, Colo.

Debbi Warren, South Medford High School, Medford, Ore.

Come explore an innovative and successful method for teaching and learning anatomy. Successfully used in school systems throughout the country for more than 30 years, this hands-on learning system promotes collaboration, motivation, and problem-solving skills resulting in increased knowledge and retention. Join us and experience firsthand how “the mind cannot forget what the hands have learned.”

**From DNA to Genomics to Personalized Medicine—
What Should We Teach? (Bio)**

(Grades 9–College)

C125/126, Convention Center

Sponsor: 3D Molecular Designs & MSOE Center for Bio-Molecular Modeling

Tim Herman (herman@msoe.edu) and **Shannon Colton** (colton@msoe.edu), Milwaukee School of Engineering, Milwaukee, Wis.

Explore manipulative models and hands-on instructional tools to take your students beyond understanding DNA as a double helix to discovering bioinformatics and the importance of genomics in personalized medicine. You’ll also test a new kit to teach the flow of genetic information. Kits and activities bridge to the Next Generation Science Standards.

2:00–2:30 PM Presentation

SESSION 1

Science on a Shoestring (Gen)

(Informal Education)

Roosevelt, DoubleTree

Greg J. Mylet (myletg@loswego.k12.or.us), Lake Oswego Junior High School, Lake Oswego, Ore.

We will share creative ways to use inexpensive, easily available resources in the classroom. Join us as we demonstrate our drill-powered earthquake table, web-trackable GPS-enabled phones, plywood lab benches, and motion-sensing and time-lapse cameras under \$30. Bring your own ideas to share.

2:00–3:00 PM Featured Presentation

NGSS Implementing the NGSS: Shifts in Classroom Practice (Gen)

(General)

Oregon Ballroom 201, Convention Center



Stephen L. Pruitt, Senior Vice President, Achieve, Inc., Washington, D.C.

@DrSPruitt

President: Lori Lancaster, OSTA President; Local Arrangements Coordinator, NSTA Portland Area Conference; and Centennial High School, Gresham, Ore.

Stephen will update the audience on current adoption and implementation efforts around the Next Generation Science Standards as well as discuss the vision for how classroom practice will shift as a result of the NGSS.

Stephen Pruitt is senior vice president at Achieve. For the past three years, he has been 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 as the Program Manager for Science. Until 2010, he held various roles in the agency culminating with him being named Chief of Staff to State School Superintendent, coordinating the work of the agency.

In addition to his state-level work, Stephen also served as president of the Council of State Science Supervisors and a member of the writing team for the College Board’s Standards for College Success Science Standards. He also served on the National Academies of Science’s Committee on Conceptual Framework for New Science Education Standards, which developed the Framework for K–12 Science Education.

**Evaluate Your Sessions Online
or on Your Smartphone!**

This year, we’re giving away a Kindle Fire HDX 7" 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 16 for details.)

2:00–3:00 PM Presentations

SESSION 1

NMLSTA Session: National Certification—What’s It All About? (Gen)

(Elementary–High School) B110, Convention Center

Diana V. Cost (*diana_cost@yahoo.com*), Global Learning Charter Public School, New Bedford, Mass.

Jodie Harnden (*jodie.harnden@pendleton.k12.or.us*), Program Coordinator, Portland Area Conference, and Sunridge Middle School, Pendleton, Ore.

Allan Bruner (*brunerd2002@yahoo.com*), Colton High School, Colton, Ore.

Lynda Sanders (*sandsciosta@charter.net*), Chairperson, Portland Area Conference, and Marshfield High School, Coos Bay, Ore.

Ken M. Loomis (*kloomis@tahomasd.us*), Tahoma High School, Covington, Wash.

Considering seeking National Board certification? Find out what the process is all about and discover the resources and support available.



SESSION 2 (two presentations)

(Middle Level–College) B119, Convention Center

Comparison of Teacher-generated Analogy to Coupled Teacher/Student-generated Analogy in Cell Biology (Bio)

Dana L. Navaroli (*dnavaroli1@pghboe.net*), Pittsburgh Science and Technology Academy, Pittsburgh, Pa.

This study compared the effects of teacher-generated analogies to coupled teacher/student-generated analogies when instructing grade 7 adolescents to learn the functions of cell organelles.

What About the Control? (Bio)

Bryan D. White (*bdwhite@u.washington.edu*), University of Washington, Bothell

Explore how to teach proper use of controls using written scenarios as well as experiments with planarian flatworms and leave with concrete activities.

SESSION 3 (two presentations)

(General) D140, Convention Center

Immersive Earth: Earth Science Stories for Classrooms and Planetariums (Earth)

Tassia B. Owen, NASA Goddard Space Flight Center, Greenbelt, Md.

NASA’s Immersive Earth Program tells Earth science stories in a classroom and planetarium. Immersive Earth is a gateway for students to access visual representations of changes to Earth, using data to draw conclusions about factors that influence a changing world.

Mars Exploration Student Data Teams (MESDT) (Earth)

Dawn Turney (*dawn.turney@jhuapl.edu*), The Johns Hopkins University Applied Physics Laboratory, Laurel, Md.

Students work with scientists, conducting inquiry-based projects and analyzing Martian data through innovative uses of technology. MESDT has influenced participants to pursue STEM fields.

SESSION 4

CCSS College Ready with Mathematics and Physics

(Phys)

(High School) E145, Convention Center

David A. Young (*dayoung7@gmail.com*), Fayetteville High School, Fayetteville, Ark.

Come explore the products from this College Ready workshop integrating mathematics and physics. Teams of teachers developed lessons that exploit common content in these subjects.

SESSION 5

Dazzling Deceptions: Discrepant Events That Delight and Mystify! (Gen)

(General) *3 Sisters, DoubleTree*

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

Come discover how science experiences that seem contrary to “common sense” are great motivators.

SESSION 6

Seeing Math; Supporting Science (Gen)

(Middle Level–High School) *Idaho, DoubleTree*

Mark R. Roddy (*mroddy@seattleu.edu*), Seattle University, Seattle, Wash.

Mathematizing—the quantification of things happening in students’ daily lives, like music, sunlight, and coffee—enables the construction of science understanding that lasts.

SESSION 7 (two presentations)

(General) *Mt. Hood, DoubleTree*

Evaluating Student Success at an Innovative STEM High School (Gen)

Judith Morrison (*jmorrison@tricity.wsu.edu*), Washington State University Tri-Cities, Richland

Deborah S.D. Burke and **Mary Beth Tilson** (*marybeth.tilson@thedeltahighschool.com*), Delta High School, Richland, Wash.

A description of the interdisciplinary teaching and learning occurring at Delta High School will be followed by a report of a research project evaluating students’ successes.

Reaching Common Core—I Did Problem-Based Learning, But Did They Learn Anything? (Gen)

Pam Rickard, Lompoc Valley Middle School, Lompoc, Calif.

Hands-on, inquiry-based lessons are fun and engaging. But are students mastering the concepts or are they simply playing? Learn to use technology to diagnose student thinking.

SESSION 8

Square Pegs (Gen)

(Middle Level–High School) *Oregon, DoubleTree*

Juliana Texley, NSTA President-Elect, and Palm Beach State College, Boca Raton, Fla.

They are in every school community—learners with such divergent learning or behavioral styles that they simply can’t fit in. They may appear sporadically in your class or go to an alternative center, an evening program, or an off-site institutional setting. Science for All must include the “square pegs,” too.

2:00–3:00 PM Workshops

Energize the Common Core in Your Classroom!

(Gen)

(Elementary–Middle Level) *D131/132, Convention Center*

Emily Hawbaker, The NEED Project, Manassas, Va.

Hannah Chandler (*hrchandler@gmail.com*), Consultant and Curriculum Writer, Portland, Ore.

Strengthen the use of Common Core Mathematics in your classroom with these exciting energy activities! The energy-related activities combine nonfiction text and hands-on activities to explore fractions, unit conversions, data analysis, graphing and geometric measurement, engineering and design, and public speaking.

ASEE Session: Challenge Your High School Students:

Engineer Your World

(Gen)

(High School) *D133/134, Convention Center*

Cheryl Farmer (*cheryl.farmer@mail.utexas.edu*), The University of Texas at Austin

President: Sharon A. Jones (*jones@up.edu*), University of Portland, Ore.

Experience how *Engineer Your World* engages students in authentic engineering practice through design. Learn about implementation grants to help bring this innovative course to your school.

Technology Makes STEM Instruction a Snap

(Chem)

(Middle Level–High School) *D135, Convention Center*

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

The Next Generation Science Standards emphasize the need for the integration of STEM instruction in the science classroom. The goal of this hands-on workshop is to make STEM instruction cross-curricular through the use of technology.



NSTA Press® Session: Scientific Argumentation in Biology (Bio)

(Middle Level–High School) *D136, Convention Center*

Victor Sampson (*victor.sampson@gmail.com*), Florida State University, Tallahassee

This workshop will introduce ways to engage students in the practice of arguing from evidence.

Facing the Future: Understanding Sustainability and Global Connections (Env)

(Middle Level–High School) E142, Convention Center

Pamela Whiffen (*pwpwr@aol.com*), NASA Educator Ambassador, Phoenix, Ariz.

Experience a hands-on, inquiry-based curriculum that guides students through examinations of the issues surrounding global climate change. Interdisciplinary small group activities provided.



NASA's Space Forensics: Solving Cosmic Mysteries with Crime Scene Narratives (Phys)

(Middle Level–High School/Informal) E146, Convention Center

Sara E. Mitchell (*sara.mitchell@nasa.gov*) and **Sarah Eyermann** (*sarah.e.eyermann@nasa.gov*), NASA Goddard Space Flight Center, Greenbelt, Md.

Combine storytelling and science...and solve the universe's greatest mysteries! See how STEM disciplines come together to explore exploding stars, hidden black holes, and more.

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

(Elementary–Middle Level) Oregon Blrm. 203/204, Conv. Center

Julie A. Thomas (*julie.thomas@unl.edu*), CESI President, and University of Nebraska, Lincoln

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

Igniting Interest and Engaging Learners with 3-D Graphic Organizers (Gen)

(General) Mt. St. Helens, DoubleTree

Kathie A. Hogen, Arizona State University, Phoenix

See how to turn on the motivation factor with 3-D graphic organizers and discover how to morph student notebooks into dimensional, individualized, and brain-smart tools.

2:00–3:00 PM Exhibitor Workshop

Waves, Energy, and Color (Phys)

(Grades 6–8) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Although we live an EM waves–enabled lifestyle, most of us, including our middle school students, have no idea how they actually work. The Next Generation Science Standards specifically call for students to understand waves and their applications in technologies for information transfer. Join LAB-AIDS for an activity from the waves unit of SEPUP's *Issues and Physical Science* program. Explore properties of light by investigating colors of the visible spectrum and investigate the energy levels of the different colors of white light through the use of a phosphorescent material. Activities show how SEPUP embeds research-based practices and real issues to deliver powerful content learning.

2:15–3:30 PM Exhibitor Workshops

Teaching Argumentation for Our Next Generation (Gen)

(Grades K–8) A103/104, Convention Center

Sponsor: Delta Education/School Specialty Science

Johanna Strange, Consultant, Richmond, Ky.

Argumentation is an important component of the science reform movement. Learn how to help students conduct investigations using claims and defend them with evidence, as well as construct explanations using scientific principles. Join us as we feature Delta products and resources.

Reflecting on Engineering Design (Phys)

(Grades K–8) A105, Convention Center

Sponsor: Pearson

Karen L. Ostlund, NSTA Retiring President, and Retired Professor, The University of Texas at Austin, Tex.

Participants will build a kaleidoscope, analyzing the kaleidoscope system to learn how manipulating light and reflection can create patterns, and use this knowledge to improve the kaleidoscope design.

Wind Turbine and the STEM Approach to Science Concepts (Phys)

(Grades 6–12) *A106, Convention Center*

Sponsor: CPO Science/School Specialty Science

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

Explore energy transformations, electricity, and magnetism through hands-on experiences. Apply your knowledge to engineering a wind turbine. 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.

Renewable Energy (Phys)

(Grades 5–10) *A107, Convention Center*

Sponsor: K’NEX Education

Presenter to be announced

Explore Going Green renewable energy with your students! These activities are designed to address critical STEM concepts and provide instructional models that can enhance students’ understanding of these concepts. Build a model and demonstrate how it can be operated with electricity generated from wind, water, and solar power. Explore other models that complete real-world tasks with these same three renewable power sources.

Asteroid! Will Earth Be Hit Again? (Earth)

(Grades 5–8) *A108/109, Convention Center*

Sponsor: Delta Education/School Specialty Science–FOSS

Jessica Penchos 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’ exploration, and overview strategies, content, materials, and NGSS connections in the revised FOSS Planetary Science Course.

Strawberry DNA and Molecular Models (Bio)

(Grades 9–12) *B111/112, Convention Center*

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Introduce students to the fascinating world of DNA through age-appropriate hands-on activities designed to make biology fun. The activities—from a kit series developed in cooperation with the DNA Learning Center, Cold Spring Harbor Laboratory—use DNA models and real DNA from strawberries to present genetic studies.

Flinn Activities to Integrate STEM Education

(Gen)

(Grades 6–College)

B114/115, Convention Center

Sponsor: Flinn Scientific, Inc.

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

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

Stars—From Cradle to Grave (Earth)

(Grades 6–12)

B116, Convention Center

Sponsor: Simulation Curriculum

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

Where do stars come from? Why do they form? What happens during their lifetime? How do we know a star is dying? Where are the stellar graveyards? Join us as we answer these and other questions using Simulation Curriculum’s award-winning Starry Night lessons and our feature-rich supplementary materials.

The Best of Both Worlds: How to Engage Students in the NGSS Practices Through Science and Literacy

(Gen)

(Grades 2–6)

B117/118, Convention Center

Sponsor: Amplify Education, Inc.

Traci Wierman and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley

Explore an instructional approach that capitalizes on the synergies between science and literacy. The integrated units from Seeds of Science/Roots of Reading are designed to help students learn and express essential science concepts while developing a set of cognitive skills that are generative and transferable across disciplines.



Wait! Were the Chips I Ate Genetically Modified?
(Bio)

(Grades 10–College) C120/121, Convention Center
Sponsor: Edvotek Inc.

Tom Cynkar (info@edvotek.com) and **Jeff Chirikjian** (info@edvotek.com), Edvotek Inc., Washington, D.C.

It is difficult to determine which products in your grocery store contain genetically modified ingredients because the FDA does not require foods to be labeled as such. In this workshop, participants will extract DNA from common snack foods like Fritos™ and soy chips. Using the polymerase chain reaction (PCR) and agarose gel electrophoresis, we will determine which snacks contain genetically modified ingredients. Participants receive a free flash drive and enter for a T-shirt drawing at the end of the workshop.

Meet the Polar Bears and Help Change the World
(Env)

(Grades K–12) C123, Convention Center
Sponsor: Siemens We Can Change the World Challenge

Kyle Schutt, Discovery Education, Silver Spring, Md.

Join us for a unique opportunity as we connect virtually for a live presentation from the Canadian tundra in Churchill, Manitoba. You'll hear from leading scientists and learn about the impact climate change is having on polar bear habitats. In addition, we will provide ongoing opportunities for you and your students to make a positive change in your schools, communities, and around the world through the *Siemens We Can Change the World Challenge* (www.wecanchange.com), the premier national K–12 environmental sustainability competition.

Take a Swipe at Microbes! (Bio)

(Grades 5–12) C124, Convention Center
Sponsor: LaMotte Co.

Ken Rainis, Precision Microslides, Cottonwood, Ariz.

Excite students with fun and safe ways to become scientific explorers of microbes in air, water, food, and on surfaces. As scientists, students use technology to identify the microbes that they find. As engineers, they design methods to collect data using BioPaddles™. As mathematicians, they quantify microbes in CFU/cm² units. Engage students in thinking about the real-world connections of microbes and life—come microbe hunting with us! Takeaways!

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

(Grades 6–9) C125/126, Convention Center
Sponsor: eCYBERMISSION

Sue Whitsett (swhitsett@nsta.org), eCYBERMISSION Outreach Manager, 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 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.

2:30–3:00 PM Presentation

SESSION 1

Engaging the 21st-Century Student (Gen)

(Elementary–Middle Level) C122, Convention Center

Lisa A. Lanza (llanza@glide.k12.or.us), Glide (Ore.) School District

Does your classroom lack 21st-century technology to engage students? Learn how to use online technology to engage your students and provide timely feedback.

3:30–4:00 PM Presentation

SESSION 1

Redesigning Assessments for Standards-based Grading (Gen)

(Middle Level–High School) Alaska, DoubleTree

Angela C. Dickey (angela_dickey@centennial.k12.or.us), Centennial Middle School, Portland, Ore.

When determining if a student has mastered a standard, there are ways to score a test other than 70–80% is a C, etc. Reorganizing a test by question type can provide you and the student with more detailed feedback.

3:30–4:30 PM Presentations

SESSION 1

Linking Science Writing and Research Through the DuPont Challenge (Gen)

(General) B110, Convention Center

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

Barbara R. Pietrucha, Earth/Environmental Science Educator, Point Pleasant, N.J.

Join us to 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 2

Engage Your Students with NOAA’s Coral Reef and Ocean Acidification Resources (Bio)

(Elementary–High School) B119, Convention Center

Britta Culbertson (brittaculbertson@gmail.com), 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.

SESSION 3

Sustainable Development-based Hands-On Activities That Relate to the Next Generation Science Standards (Gen)

(Elementary–Middle Level) C122, Convention Center

Paul Kelter (pkelter@niu.edu), Northern Illinois University, DeKalb

Discover sustainable development-related activities that relate science, math, and social issues to the Next Generation Science Standards.

SESSION 4

Climate Change (Env)

(General) D130, Convention Center

William J. Licopoli (wlicopol@cbsd.org), Central Bucks West High School, Doylestown, Pa.

Join me for this slideshow presentation on the most recent extreme weather patterns and how this relates to climate change. This is a presentation created by Al Gore and provided by an accredited presenter from the Climate Reality Project.

SESSION 5

Stories from Earth: Teaching About Changing Landscapes Using 25 Years of Satellite Observations (Earth)

(General) D140, Convention Center

Peder Nelson, Oregon State University, Corvallis

Joan Swafford (jswafford08@gmail.com), Jefferson Middle School, Jefferson, Ore.

Jeanine Hemel Sullivan (hemelj@gmail.com) and **Kristi Howell** (kristi.howell@molallariv.k12.or.us), Molalla River Middle School, Molalla, Ore.

Angie Ortiz-McNeese (angie_ortiz-mcneese@ddouglas.k12.or.us), Ron Russell Middle School, Portland, Ore.

Prsider: Peder Nelson

Come learn how to teach secondary science students the fundamental components about how satellites collect data to inform an understanding of Earth science.

SESSION 6

**Keeping Watch Over Cascade Range Volcanoes—
From Your Classroom (Earth)**

(Informal Education) Oregon Blrm. 202, Convention Center
Carolyn L. Driedger (*driedger@usgs.gov*) and **Liz Westby**
(*lwestby@usgs.gov*), Cascades Volcano Observatory, USGS,
Vancouver, Wash.

The U.S. Geological Survey keeps close watch over Cascade Range volcanoes. Learn how your class can use real-time data and other products in the classroom.

SESSION 7

**Using Model-based Inquiry in the Classroom: An
Example on Plate Tectonics (Gen)**

(General) Mt. Bachelor, DoubleTree
Ron Gray (*ron.gray@nau.edu*), Northern Arizona University,
Flagstaff

We will describe model-based inquiry and provide an example plate tectonics unit designed and implemented in a middle school Earth science classroom. The unit was based on research in the Pacific Northwest and engaged students in the construction, revision, and testing of a scientific model of the Cascadia subduction zone.

SESSION 8

**Organized Binder: Building Powerful Learning
Communities (Gen)**

(General) Mt. Hood, DoubleTree
Mitch Weathers, Sequoia High School, Redwood City,
Calif.

Empowering elementary students to achieve at the secondary level with Common Core requires classrooms at both levels to share routines and expectations.

3:30–4:30 PM Workshops

Science and Ancient Egypt (Gen)

(Elementary–Middle Level) D131/132, Convention Center
Michael Desautels, Georgetown Day School, Washing-
ton, D.C.

Mummies and engineered water clocks can engage your students in an interdisciplinary study of Ancient Egypt.

**ASEE Session: TeachEngineering.org: Free Resources
for Engineering in K–12 (Gen)**

(General) D133/134, Convention Center
Stacy S. Klein-Gardner (*stacy.gardner@harpethhall.org*),
Harpeth Hall School, Nashville, Tenn.

Presider: Sharon A. Jones (*joness@up.edu*), University of
Portland, Ore.


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.

Science, Engineering, and the Common Core

(Chem)

(High School) D135, Convention Center
Jacklyn Bonneau (*bonneau@wpi.edu*), Massachusetts Acad-
emy of Math & Science at WPI, Worcester

Explore strategies for identifying, implementing, and mutu-ally reinforcing science and engineering practices using tech-nology. Quantitative investigations, analyses, and simulations will define problems and develop solutions.

 **NSTA Press® Session: The Authors' Picks! Teaching
Science Through Trade Books (Gen)**

(Elementary) D136, Convention Center
Christine A. Royce (*caroyce@aol.com*), Shippensburg Uni-
versity, Shippensburg, Pa.

Emily Morgan (*emily@pictureperfectscience.com*) and **Karen
Ansberry** (*karen@pictureperfectscience.com*), Picture-Perfect
Science, LLC, Lebanon, Ohio

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

Galls Alive!

(Bio)

(Middle Level–High School) E143, Convention Center
Marty Greydanus (*marty.greydanus@bethel.k12.or.us*), Shasta
Middle School, Eugene, Ore.

Discover the ecosystem in oak galls. Participants are provided
an interactive investigation on the growth of organisms pres-
ent in galls for students to explore.

NGSS Meeting the Next Generation Science Standards Through Engineering Contexts (Phys)

(Elementary–Middle Level) E144, Convention Center
Miriam Munck (mmunck@eou.edu) and **Donna Rainboth** (drainbot@eou.edu) Eastern Oregon University, La Grande
 Let’s examine connections between engineering practices and the NGSS. Participants will “learn” electrical concepts and design and build several solutions to electrical engineering problems.

CCSS NASA’s “Our Solar System Through the Eyes of Scientists” (Earth)

(Elementary) E145, Convention Center
Rachel Zimmerman Brachman (rachel.zimmerman-brachman@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.
 Explore NASA’s new inquiry-based science and language arts curriculum with biographies, science notebooks, hands-on activities, and demonstrations. Learn about ice, volcanoes, moons, and more.



STEM Integration Using Student-built Underwater Robots (Gen)

(Middle Level–High School/Informal) E146, Convention Center
Tracy Crews (tracy.crews@oregonstate.edu), Oregon State University, Newport
Dana Spink (dana.spink@lincoln.k12.or.us), Toledo Elementary School, Toledo, Ore.
Noah Lambie (noah.lambie@lincoln.k12.or.us), Taft High School, Lincoln City, Ore.
 Presider: Dana Spink
 The Oregon Regional Marine Advanced Technology Education (MATE) ROV program provides opportunities for STEM integration through hands-on, collaborative, challenging activities that engage a variety of learners.



STEM Mosaic—Putting the Pieces Together (Gen)
 (General) Mt. St. Helens, DoubleTree

Emily Mortimer (emortimer@tulsazoo.org), Tulsa Zoo, Tulsa, Okla.

Combining research and unique STEM activities, the Tulsa Zoo would like to share a way to promote relationships with STEM professionals and public school students.

Planning and Designing Safe, Sustainable, and Flexible Facilities for STEM-based Science (Science Facilities 101) (Gen)

(General) Oregon, DoubleTree

LaMoine L. Motz (llmotz@comcast.net), 1988–1989 NSTA President, and Science Education and Facilities Specialist, White Lake, Mich.

James T. Biehle (biehlej@sbcglobal.net), Inside/Out Architecture, Inc., Ballwin, Mo.

Presider: LaMoine L. Motz

So you want new science facilities? Does your curriculum define your science teaching facility? We have more than 20 years of conducting visits and presentations of new and renovated school science facilities. Join the author team of *NSTA Guide to Planning School Science Facilities*, 2nd edition, and learn the “basics” of science facility planning, design, and budgeting for safe and sustainable facilities.

3:30–4:30 PM Exhibitor Workshop

Integrate Math Modeling and Problem Solving Through Racing (Phys)

(Grades 6–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Problem solving and math modeling are learned skills—come learn how to explain them. In this workshop, you’ll maximize the power of electric radio-controlled vehicles through data collection and graphing, and then apply the same process to solve a number of issues professionals face. You’ll maximize torque through gearing, apply Newton’s laws of motion to get the best handling, and use battery chemistry to explain an effective driving strategy...and you’ll take home lessons (learned and in print). This activity is from the new Race Engineering Certifications curriculum module, part of the Ten80 Student Racing Challenge.

4:00–5:15 PM Exhibitor Workshops

Solving the Mystery of STEM Using Forensic Science (Earth)

(Grades 4–12)

A103/104, 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. Our program software allows the integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

Science Under Siege? Teaching Evolution (and Global Warming) in a Climate of Controversy (Bio)

(Grades 9–12)

A105, Convention Center

Sponsor: Pearson

Kenneth R. Miller, Brown University, Providence, R.I.

Even 88 years after the Scopes trial, evolution remains a controversial issue. Today, climate change has been added to the list of scientific topics that are routinely challenged by outside interests. I will discuss these continuing controversies and suggest ways in which educators can respond to such challenges.

Sound and Waves (Phys)

(Grades 6–12)

A106, Convention Center

Sponsor: CPO Science/School Specialty Science

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

Create standing wave patterns on a vibrating string with CPO’s wave machine. Investigate properties of waves, including amplitude, wavelength, and frequency. Take away STEM activities and an understanding of how to apply the engineering cycle in science classes.

Introduction to Simple Machines (Phys)

(Grades 3–6)

A107, Convention Center

Sponsor: K’NEX Education

Presenter to be announced

Explore that common expression “simple machines make work easier” and investigate hands-on strategies to help students understand simple machine technologies. Build and use K’NEX® simple machine models and discover that simple machines make work easier by multiplying force and distance as well as changing the direction of force. Standards-aligned STEM concepts related to simple machines will be stressed.



Evidence for Plate Movement (Earth)

(Grades 5–8)

A108/109, Convention Center

Sponsor: Delta Education/School Specialty Science—FOSS

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

What evidence from rocks informs us about the history of our planet? Explore Earth history concepts with hands-on activities and multimedia, and identify connections to the NGSS scientific and engineering Practices. Be among the first to preview the revised FOSS Earth History Course, including new features, strategies, content, and materials.

Bring Visual Science into K–8 Classrooms—It’s a Game Changer! (Gen)

(Grades 3–8)

B111/112, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Learn techniques to engage students in visual, auditory, and hands-on science learning. Harvey Bagshaw discusses and models how he teaches science with video and activities to support blended learning. Learn to integrate compelling visuals and video, and receive a one-year subscription to Carolina’s Tigtag or Twig online video-based learning program.

33 Strategies for Integrating Disciplinary Literacy (Gen)

(Grades K–6)

B117/118, Convention Center

Sponsor: Amplify Education, Inc.

Traci Wierman and **Rebecca Abbott**, 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!

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

(Grades 10–College) C120/121, Convention Center
Sponsor: Edvotek Inc.

Tom Cynkar (info@edvotek.com) and **Jeff Chirikjian** (info@edvotek.com), Edvotek Inc., Washington, D.C.

Model organisms allow us to study fundamental questions in developmental, neurological, and behavioral biology that may be difficult to study in humans. Join us for an exciting experience exploring alcohol metabolism using the nematode *C. elegans* as a model organism. Learn how to grow and feed *C. elegans* and how to test the effects of alcohol on the locomotion and health of normal and mutant worms. Participants receive a free flash drive and enter for a T-shirt drawing at the end of the workshop.

AP Environmental Water Quality Assessment Curriculum (Env)

(Grades 10–College) C124, Convention Center
Sponsor: LaMotte Co.

Ken Rainis, Precision Microslides, Cottonwood, Ariz.

This complete curriculum explores the Water Quality Index to teach students STEM-based skills that apply to classroom and field activities and satisfy Section VI (water pollution) of the AP environmental topics outline. Students study actual data from the Kansas River in the classroom, then apply those principles learned to their local water source. Curriculum includes PowerPoints and QuickTime iPad/iPod videos for watershed ecology, Water Quality Index, point/nonpoint source pollution, and more. Takeaways and door prize!

5:00–6:00 PM Presentations

SESSION 1

The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (Gen)

(General) B110, Convention Center

Al Byers (abyers@nsta.org), Assistant Executive Director, e-Learning and Government Partnerships, NSTA, Arlington, Va.

Brynn Slate (bslate@nsta.org), Web Seminars/Symposia Manager, NSTA, Arlington, Va.

Lost when it comes to finding online professional development resources to enhance your content knowledge and skills? With more than 10,000 resources (25% of which are free) and quality PD opportunities to assist educators with core subject content, the Learning Center has the answers! Get free resources and ICE CREAM!

SESSION 2

Science Olympiad Coaches Clinic: Astronomy and Reach-for-the-Stars Events (Earth)

(Middle Level–High School/Informal) D140, Convention Center

Donna L. Young (donna@aavso.org), NASA/SAO/CXC, Bullhead City, Ariz.

The National Astronomy Event Supervisor will provide Science Olympiad coaches with information on team-building strategies, extensive resources, and content for the 2014 national competition.

SESSION 3

NGSS MY NASA DATA: Incorporating Science Practices in the Classroom (Earth)

(Middle Level–High School) E144, Convention Center

Preston M. Lewis (preston.lewis@nasa.gov), NASA Langley Research Center, Hampton, Va.

Engage your digital learners by using MY NASA DATA as a visualization tool for NASA Earth Systems satellite data. Plenty of online lessons and activities!

SESSION 4

CCSS The Pictures Aren't There Just to Take Up Space—Getting Kids Good at Reading in Science (Gen)

(Middle Level–High School) E145, Convention Center

Leigh Sturgess-Lace (lsturgesslace@gmail.com), Alderwood Middle School, Lynnwood, Wash.

Learn specific strategies for teaching students how to approach and make sense of readings in science. Strategies will include ways to scaffold reading skills with ideas immediately applicable in participants' classrooms.



SESSION 5

Meaningful Assessment in Science That Impacts Learning (Gen)

(Middle Level–High School)

3 Sisters, DoubleTree

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

The UbD Continuum of Assessment can function throughout the instructional cycle to provide important information about student understanding and mastery of the big ideas of science.

SESSION 6

STEM-ing the Tide of Science Dropouts (Gen)

(General)

Mt. Bachelor, DoubleTree

Carol M. Englander (englanca@etal.uri.edu), University of Rhode Island, Kingston

Presider: Catherine Valentino (thinkalot@aol.com), University of Rhode Island, Kingston

Science and Math Investigative Learning Experiences (SMILE) is a pipeline after-school hands-on program for grades 4–12. It's college/career oriented and it produces 70% college STEM majors.

SESSION 7

Time Will Tell: Using Time-Lapse Photography and Digital Storytelling to Observe Change (Gen)

(Elementary–High School)

Mt. Hood, DoubleTree

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

Observation of slow-moving events in time can be described using time-lapse photography and narrated via techniques used in digital storytelling. This session will explore methods, equipment, and application...and resources and samples will be provided.

5:00–6:00 PM Workshops

Facilitating Early Childhood Education with Project Learning Tree (Env)

(Preschool–Elementary)

D131/132, Convention Center

Al Stenstrup (astenstrup@forestfoundation.org), Project Learning Tree, Washington, D.C.

Experience effective hands-on activities that introduce science concepts (think STEM!) to children ages 3–6 using Project Learning Tree. Each participant will receive PLT's *Environmental Experiences for Early Childhood* activity guide and accompanying music CD.

Chemical Nomenclature Rummy: Naming Compounds and Ion Combination Rules (Chem)

(Middle Level–High School)

D135, Convention Center

Mark D. Greenman (markgreenman@gmail.com), Boston University, Boston, Mass.

Harriet T. Page (page.harriet@marbleheadschoools.org), Marblehead High School, Marblehead, Mass.

Discover a fun student-centered activity using a Rummy-like card game to teach basic rules for ion combinations and naming ionic compounds.

FIRST® Tech Challenge Robotics in Your Classroom (Phys)

(High School)

E142, Convention Center

Jeff M. Blackman, Hood River Valley High School, Hood River, Ore.

How can you teach robotics in your classroom? Offer a K–12 curriculum of computer programming and engineering. Come learn about high-level Career Technical Education (CTE) programs for today's high-wage/high-demand jobs.

Exploring *El Niño/La Niña* Using AMS Maury Project Activities (Earth)

(Middle Level)

E143, Convention Center

Denise A. Thompson (thompsond@einsteinfellows.org), Orting High School, Orting, Wash.

Join me as I use two Maury Project activities—density-driven ocean circulation and coastal upwelling—to explore *El Niño/La Niña* cycles.



K–4 Inquiry-based Science Activities Lead to STEM Challenges (Gen)

(Elementary) E146, Convention Center

Kristi A. Zenchak (*zenchak@oakton.edu*), Oakton Community College, Des Plaines, Ill.

Chris M. Culen (*cculen@district95.org*), Brook Park School, LaGrange Park, Ill.

Elementary teachers—come actively participate in an inquiry-based activity that includes a user-friendly framework for incorporating full inquiry problem-solving experiences along with STEM challenges.

OSTA Regional Raffle (Gen)

(General) Oregon Ballroom 203/204, Convention Center

Bernie Carlsen (*bcarlsen@reed.edu*), Executive Director, Oregon Science Teachers Association, Portland

Michael W. Rockow (*rockow42@q.com*), Leslie Middle School, Salem, Ore.

Holly L. Bense (*hbensel@smschool.us*), St. Mary’s School, Medford, Ore.

President: Bernie Carlsen

The Oregon Science Teachers Association offers more than 50 samples of Oregon specimens representative of the seven regions of OSTA. Your chances are better than door prize drawings to win quality specimens of fossils, shells, wine, and food products representative of the abundant natural resources of Oregon.

A Picture Is Worth a Thousand Words: Teaching Scientific Visual Literacy (Gen)

(General) Mt. St. Helens, DoubleTree

Jami Humphrey, Montana Office of Public Instruction, Butte

Is a picture really worth a thousand words? Find out as you construct 3-D graphic organizers to help your “eye generation” students become visually literate.

6:30–8:30 PM OSTA/WSTA Awards Event

The Oregon and Washington Science Teachers Associations Present “A Celebration of Excellence in Science Teaching”

Pacific Northwest Ballroom, DoubleTree

The Skinny on Obesity



Jonathan Purnell, Professor in the Divisions of Endocrinology and Cardiovascular Medicine, and Associate Director, OHSU Moore Institute, Oregon Health & Science University, Portland

Join your colleagues as we celebrate science educators who have demonstrated professional excellence. Tickets cost \$15 per person and include a dessert reception (6:30–7:30 PM) with a no-host bar available, awards presentation (7:30–8:00 PM), and a keynote presentation by Jonathan Purnell (8:00–8:30 PM).

Far from the simple “energy in, energy out” model, what leads to unwanted weight gain and the expression of obesity is a complex interplay between genetics, epigenetics, and environment. The ultimate result of these forces is a rewiring of the body’s set point in the brain that resists a patient’s best efforts to lose weight. Dr. Purnell will explore some of what is known about how the brain senses body weight and responds to changes in calorie intake and activity, and the underpinnings in our genes and societal structures that have pushed the obesity epidemic forward.

Dr. Purnell is currently a professor in the Divisions of Endocrinology and Cardiovascular Medicine at Oregon Health & Science University. He has a long-standing research interest in the causes and consequences of central obesity, mechanisms of improvement in diabetes following bariatric surgery, and how changes in diet composition affect appetite and body weight in humans. Dr. Purnell was recently appointed associate director of the OHSU Moore Institute, whose mission is to improve the nutrition of pregnant women in hopes of reducing the burden of chronic diseases in adults.

Dr. Purnell received a BA from Whitman College and an MD from Oregon Health & Science University, and he completed residency at the University of Vermont. He briefly lived in Washington, D.C., and worked for Kaiser Permanente before returning to do specialty research training in Endocrinology at the University of Washington.

Tickets (\$15) are available through bit.ly/16ZKZ3y. Seating for this event is limited, so don’t delay.

Thank you to Vernier Software & Technology for helping to sponsor this event!



—Photo courtesy of Julia Grieve and Travel Portland

8:00–9:00 AM Presentations

SESSION 1

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

(General) *C122, Convention Center*

Donna L. Young (*donna@aavso.org*), NASA/SAO/CXC, Bullhead City, Ariz.

Discover the latest discoveries about the universe, including massive black holes, neutron stars, supernovas, star formation, colliding galaxies, X-ray binaries, and dark matter.

SESSION 2

Science Plus Literacy—Blended and Seamless (Gen)

(Middle Level) *D130, Convention Center*

Tullan Spitz (*tspitz@opb.org*) and **Catherine Stimac** (*cstimac@opb.org*), Oregon Public Broadcasting, Portland

Inspire middle school literacy! Blended lessons to engage students in science topics while supporting ELA Common Core are FREE at *pbslearningmedia.org*. Raffle!

SESSION 3

AAPT Session: Enriching Energy Instruction Through the Use of Novel Representations (Phys)

(General) *D131/132, Convention Center*

Stamatis Vokos (*vokos@spu.edu*), Seattle Pacific University, Seattle, Wash.

Local tracking of energy fosters deeper engagement with conservation, transfer and conversion mechanisms, and degradation.

SESSION 4

Write Your Way to Success: Grant-writing Strategies for You and Your Chemistry Students (Chem)

(High School) *D140, Convention Center*

Kenetia Thompson (*k_thompson2@acs.org*), American Chemical Society, Washington, D.C.

Learn top strategies for writing a fundable grant that improves your students' chemistry experience.

SESSION 5

Award-winning Inquiry Lab Activities for High School Biology (Bio)

(High School) *Oregon Ballroom 201, Convention Center*

Ron Thompson (*thompsonron@me.com*), Seattle Pacific University, Seattle, Wash.

Learn how to conduct high-interest lab activities that give students experience in hypothesis formation, experimental design, and the use of computers for data collection and interpretation.

SESSION 6

Great Science Lesson = Presidential Award + \$10,000 (Gen)

(General) *Mt. Bachelor, DoubleTree*

Marilyn Suiter, National Science Foundation, Arlington, Va.

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

SESSION 7

Implementing Change: How Six Washington School Districts Are Using Sustainability and Systems Learning to Leverage STEM Education (Gen)

(General) *Mt. Hood, DoubleTree*

Chuck F. Lennox and **Abby Ruskey**, E3 Washington, Olympia

Learn how E3 Washington and six school districts are linking with the community to leverage STEM education through sustainability and systems learning.

SESSION 8

The Portland Metro STEM Partnership (Gen)

(General) *Oregon, DoubleTree*

Bill Becker (*beckerw@pdx.edu*) and **Melissa Dubois** (*medubois@pdx.edu*), Portland Metro STEM Partnership, Beaverton, Ore.

The Portland Metro STEM Partnership's goal is to fundamentally change the STEM learning cultures in local K–12 schools. Join an interactive discussion on how districts and partners can engage in this effort.

8:00–9:00 AM Workshops

ACS Middle Level Session: Matter: Solids, Liquids, and Gases (Chem)

(Middle Level)

D133/134, Convention Center

James H. Kessler, American Chemical Society, Washington, D.C.

Explore solids, liquids, and gases through hands-on activities and molecular animations from the free, completely developed 5E lesson plans in *middleschoolchemistry.com*.

Science and Mathematics Connections for the Middle School Classroom (Gen)

(Middle Level)

D135, Convention Center

Mika Munakata (*munakatam@mail.montclair.edu*) and **Eliza Leszczynski**, Montclair State University, Montclair, N.J.

This workshop will engage participants in inquiry-based hands-on activities that explore content from ecology and physical sciences through the use of mathematical reasoning.

Common Core Success Using Science Content and Literacy (Bio)

(Elementary–Middle Level)

D136, Convention Center

Linda S. Linnen (*lslinnen@aol.com*), Retired Educator, Aurora, Colo.

Literacy Common Core State Standards will be identified and demonstrated using science lessons.

Children’s Literature for Climate Change Education (Gen)

(Elementary)

D137, Convention Center

Adele Schepige (*schepia@wou.edu*), Western Oregon University, Monmouth

Susan R. McWilliams (*smcw@bendcable.com*), Oregon Science Teachers Association, Bend

Read children’s Global Climate Change (GCC) books, discuss ways to use them aligned with CCSS, and see the new GCC books website for book recommendations.

Writing Scientific Claims About Systems (Gen)

(Elementary/College)

D138, Convention Center

Amy E. Ryken (*aryken@pugetsound.edu*), University of Puget Sound, Tacoma, Wash.

William W. Keith, University Place Primary, University Place, Wash.

A grade 5 teacher and teacher educator will share their experiences teaching preservice teachers how to intentionally support students in writing scientific claims about systems.

Life Cycle of the Monarch Butterfly (Bio)

(Informal Education)

E141, Convention Center

Ann Hobbie (*ann.s.hobbie@gmail.com*) and **De Cansler** (*decansler@gmail.com*), University of Minnesota, St. Paul

Observe live monarchs throughout their life cycle to learn about their biology and how you can raise these fascinating organisms in your classroom.

The Nature of Scientific Research (Bio)

(Middle Level–High School)

E142, Convention Center

Joan Griswold (*jgriswold@nwabr.org*) and **Jeanne T. Chowning** (*jchowning@nwabr.org*), Northwest Association for Biomedical Research, Seattle, Wash.

Jodie Spitze (*jodie.spitze@kent.k12.wa.us*), Kent-Meridian High School, Kent, Wash.

Learn about a new interactive curriculum that teaches how collaboration, skepticism, social issues, funding concerns, and other factors influence how and why science is conducted.

NGSS The NGSS—Make Your Lessons 3-D! (Phys)

(Elementary–Middle Level)

E144, Convention Center

Karen L. Ostlund (*klostlund@utexas.edu*), NSTA Retiring President, and Retired Professor, The University of Texas at Austin

Experience a model lesson integrating the three dimensions (scientific and engineering practices, disciplinary ideas, and crosscutting concepts) in the Next Generation Science Standards.

CCSS Cutting Across the Curriculum: Examining Lessons That Integrate Science, Literacy, and Mathematics (Gen)

(Elementary)

E145, Convention Center

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

Lessons that integrate literacy strategies and mathematical and science concepts will be modeled with participants. Overview of research and connection to Common Core State Standards provided.



How Does Your Garden Grow? (Env)

(Preschool–Elementary)

E146, Convention Center

Steve Rich (bflywriter@comcast.net), NSTA Director, Professional Development, and University of West Georgia, Carrollton
A school garden is simple, creative, scientific, and integrated. Discover elementary applications that link social studies, mathematics, and science inside the classroom and outside in a school garden. I'll also share information for grants and volunteer help as well.

ACS Session One: Chemical Bonding—Why Water Is Different (Chem)

(High School)

Oregon Ballroom 202, Convention Center

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

The properties of water that are essential for life on Earth are very different from the properties of similar molecules. Simple bonding models help us understand why water is so different. Bring your USB flash drive and take away the presentation and activities to use in your class.

Using Natural Hazards as a Hook in the Earth and Space Science Classroom (Earth)

(Elementary–High School)

Oregon Blrm. 203/204, Conv. Center

Roberta M. Johnson (rmjohnsn@gmail.com), NESTA, Boulder, Colo.

Richard M. Jones (rmjones7@hawaii.edu), University of Hawaii–West Oahu, Kapolei

Wendy E. Van Norden (wvannorden@hw.com), Harvard-Westlake School, Studio City, Calif.

Pamela Whiffen (pwpwr@aol.com), NASA Educator Ambassador, Phoenix, Ariz.

This NESTA workshop highlights effective approaches for leveraging dramatic natural events to engage your students and bring your classroom to life with high-impact hands-on activities!

Implementing Interdisciplinary STEM Projects: Year 1 (Gen)

(Middle Level–High School)

Mt. St. Helens, DoubleTree

Tamara H. Nelson (tnelson1@vancouver.wsu.edu), Washington State University, Vancouver

Darby Meade (darby.meade@vansd.org) and **Jennifer Holm** (jennifer.holm@vansd.org), iTech Preparatory, Vancouver, Wash.

Presenter: Tamara H. Nelson

Join us and learn about and analyze two to three standards-based, interdisciplinary projects we designed and implemented at the new STEM middle and high school, Vancouver iTech Preparatory.

8:00–9:00 AM Exhibitor Workshop

Merging the Three Dimensions of the Next Generation Science Standards (Gen)

(Grades 6–8)

A105, Convention Center

Sponsor: It's About Time

Cary I. Sneider, Portland State University, Portland, Ore.
One way the Next Generation Science Standards differ from previous documents is by merging core ideas in science with practices and crosscutting concepts. This workshop will illustrate how *Project-Based Inquiry Science* (PBIS) combines all three dimensions as students design, build, and test “whirligigs” and other aerodynamic structures.

8:00–9:15 AM Exhibitor Workshops

PASCO's SPARKscience for High School Students—Free Starter Kits for Attendees! (Gen)

(Grades 9–12)

A103/104, Convention Center

Sponsor: PASCO scientific

Jason Lovell, PASCO scientific, Roseville, Calif.

Learn how SPARKscience engages students in scientific and engineering practices, affording a deeper understanding of scientific concepts. Participate in investigations to experience real-time data collection with probeware and SPARKvue® software. Free probeware starter kits, including five sensors and a USB interface (a \$600 value), will be given to 20 lucky attendees!

Forces, Energy, and Motion (Phys)

(Grades 4–10)

A107, Convention Center

Sponsor: K'NEX Education

Presenter to be announced

It's off to the races! Join us as we investigate potential and kinetic energy as well as force and motion with K'NEX® cars. Gravity, rubber bands, springs, wind, battery motors, and flywheels will power models as we explore complex STEM concepts. How will your car perform? How would you redesign your model to make it a first-place car? Strategies that empower students to design and complete their own experiments from the teacher's guide will be emphasized. Standards-aligned STEM concepts will be stressed.

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

(Grades 6–12) B111/112, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

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

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

(Grades 9–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

We distill water to purify it, or so we think. So why does the clear distillate from apple cider smell like apples? Join us for this signature activity from the new high school program *A Natural Approach to Chemistry*. Using a clever test tube distillation apparatus, distill the essence of vanilla and the scent of mint. Distillation is a crucial process in chemical engineering and technology, yet few students ever get to explore the process.

Integrating Online Learning into the Science Classroom (Gen)

(Grades 1–10) B114/115, Convention Center

Sponsor: NewPath Learning

Melissa Hughes, NewPath Learning, Victor, N.Y.

Experience NewPath's Online Learning Program, which allows teachers to assign and present ready-to-use, standards-based multimedia lessons, interactive activities, lab simulations, and assessments, as well as track and report student progress. Additionally, the program provides easy-to-use authoring tools and templates to develop customized, interactive lessons. Each participant will receive a free trial subscription.

Chemistry in the Community, 6th Edition—Reinventing Itself (Chem)

(Grades 8–College) B116, 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!

Experience the Power of a Digital Middle School Program (Gen)

(Grades 6–8) C120/121, Convention Center

Sponsor: Achieve3000®

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

Experience the power of digital with differentiated levels of rich content from National Geographic. eScience3000 is tightly aligned to Common Core, NGSS, and STEM initiatives. See how science, literacy, and real-life experiences come together in this engaging middle school resource.

IQWST Tablet Edition: Blending the Effectiveness of Learning-by-Doing with the Power of Connected Mobile Technology (Gen)

(Grades 6–8) C123, Convention Center

Sponsor: Sangari Active Science

Brad Felix, Sangari Active Science, Norwalk, Conn.

IQWST stands for Investigating and Questioning our World through Science and Technology (pronounced I-quest). Tablet computers are beginning to fulfill the long-held belief that technology can radically improve educational outcomes for students. The IQWST Tablet Edition merges a Learning-by-Doing middle school science curriculum with tablet technology to create an interactive student science notebook built on top of our NGSS Standards Engine. Come join us to learn about the future of middle school science.

Stream Ecology: Slimy Leaves for Clean Streams

(Env)

(Grades 5–College/Informal)

C124, Convention Center

Sponsor: LaMotte Co.

Charlie Graham, Consultant, Hillsboro, Ore.

Join us for this hands-on introduction to stream ecology. Observe aquatic macroinvertebrate specimens, engage in hands-on activities, learn classification skills, and calculate a biotic index. Learn how this project turned into a long-term study for one Oregon teacher and his students—and the new direction it took them. Door prize!

Student Collaboration in the Science Classroom

(Gen)

(Grades 6–9)

C125/126, Convention Center

Sponsor: eCYBERMISSION

Sue Whitsett (swhitsett@nsta.org), eCYBERMISSION Outreach Manager, NSTA, Arlington, Va.

Grades 6–9 students 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 session 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.

“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, October 25
11:00 AM–12 Noon**

Oregon Convention Center
B110

For more information on the Retired Members Advisory Board, contact Virginia Baltay, chair, at vbaltay@aol.com.



8:00–9:30 AM Exhibitor Workshop

Chemistry and Biology with Vernier (Chem)

(Grades 7–College) B117/118, Convention Center

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will use various digital tools such as probeware to conduct experiments from our popular chemistry and biology lab books. Use LabQuest Mini with a computer or LabQuest 2 as a stand-alone device, with a computer, or wirelessly to iPad and BYOD environments.

8:30–11:00 AM Exhibitor Workshop

Generate a DNA Barcode and Identify Species (Bio)

(Grades 10–College) A108/109, Convention Center

Sponsor: Bio-Rad Laboratories

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

Extract genomic DNA, amplify it with PCR, and classify species using sequencing and bioinformatics to determine if that fish you just bought is really what the label says it is. Learn about the International Barcode of Life, which uses barcoding, and find out how you can be a part of this initiative!

9:00 AM–12 Noon Short Course

Learning from Research: Glucose Balance and Type 2 Diabetes (SC-3)

(High School) Idaho, DoubleTree

Ticketed Required; \$35

Maureen Munn (mmunn@uw.edu) and **Jeff Shaver** (jshaver@uw.edu), University of Washington, Seattle

For description, see page 36.

9:00 AM–5:00 PM Exhibits

Exhibit Hall A, 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

CCSS Implementing Dynamic and Interactive Science Instruction to Meet the Common Core (Gen)

(General) Oregon Ballroom 201, Convention Center



Jill Castek (jcastek@pdx.edu), Research Assistant Professor, Literacy, Language, & Technology Research Group, Portland State University, Portland, Ore.

@jillcastek

President: Lela Thieme, Common Core Strand Leader, Portland Area Conference, Pilot Rock, Ore.

Science is a valuable tool for addressing the Common Core. This session will provide educators with concrete classroom examples of how these standards can be facilitated through dynamic and interactive science instruction. Teachers will walk away with multiple ways to use reading, writing, and discussion as vehicles for fostering science learning.

Jill Castek is a research assistant professor at Portland State University where she works with projects supporting digital literacy acquisition. Her work lies at the intersection between science and literacy learning. Her recent publications examine the affordances of digital technologies to enhance visualization, critical thinking, collaboration, and content learning. Within this work, she examines how digital tools and instructional techniques mediate the relationship between students and their learning goals. Jill also examines the new literacies of the internet and ways we can support their development in K–12 classrooms to enhance science understanding through reading, writing, and content creation.

Formerly, Jill was a post-doctoral scholar with the Seeds of Science/Roots of Reading project at The Lawrence Hall of Science, University of California, Berkeley. She earned a doctorate degree from the University of Connecticut where she was a Neag fellow in the New Literacies Research Lab.

9:30–10:30 AM Presentations**SESSION 1****The NSTA Learning Center: A Tool to Develop Preservice Teachers (Gen)***(General)**B110, Convention Center*

Flavio Mendez (*fmendez@nsta.org*), Senior Director, Learning Center, NSTA, Arlington, Va.

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

SESSION 2**Win a Shell Science Lab Makeover for Your School (Chem)***(Middle Level–High School)**C122, Convention Center*

Ruth Ruud (*ruth.ruud@yahoo.com*), Fairview, Pa.

Presider: Eric V. Crossley (*ecrossley@nsta.org*), Director, Science Education Competitions, NSTA, Arlington, Va.

Are you a middle school or high school science teacher in need of a science lab makeover? Attend this session and learn how you can apply to win the Shell Science Lab Makeover! You will have an opportunity to actually begin to complete the application and have your questions answered.

SESSION 3**Transitioning to Student-driven Inquiry (Env)***(Informal Education)**D130, Convention Center*

Rebecca L. Martin (*rmartin@clark.edu*), Clark College, Vancouver, Wash.

Norie Dimeo-Ediger (*dimeo-ediger@ofri.org*), Oregon Forest Resources Institute, Portland

Learn how to start with a data collection activity, progress to teacher-led inquiry, and advance to a student-driven investigation with examples from ecology.

SESSION 4 (two presentations)*(High School)**D140, Convention Center***Introducing the ChemMatters Compilation Project (Chem)**

Susan J. Cooper (*sjcooper@fgcu.edu*), Florida Gulf Coast University, Fort Myers

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

Steven Long (*slong@rogers.k12.ar.us*), Rogers High School, Rogers, Ark.

Are you looking for free, high-quality, engaging reading materials and activities to integrate reading and chemistry? Come learn about this new resource from American Chemical Society! Join as we present the new *ChemMatters* compilation project, including past articles from *ChemMatters* with inquiry-based lesson plans correlated with the Common Core State Standards for English Language Arts & Literacy as well as the Next Generation Science Standards.

Digital Chemistry Resources That Teachers and Students Can Rely On (Chem)

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

Learn about the American Chemical Society's innovative collection of reliable and free digital resources for high school teachers. Find out about the many uses of the Chemical Education Digital Library (ChemEd DL), including Models 360, ChemTeacher, and the award-winning Periodic Table Live! Also, watch *ChemMatters* video podcasts and discover the ChemClub collection of activities.

SESSION 5**CCSS What! We Have to Teach English, Too? (Gen)***(High School)**E145, Convention Center*

Laurie A. Hayes (*lhayes@cart.org*), **Erin Andrade** (*eandrade@cart.org*), and **Jill Rossetti** (*jrossetti@cart.org*), Center for Advanced Research and Technology, Clovis, Calif.

Join us as we share ideas on how a high school is integrating the Common Core English standards into their science classroom. Free CD available.

SESSION 6



Observing Buoys by Students (OBS): An Authentic STEM Field Investigation (Env)

(General) *E146, Convention Center*

Amy G. Sprenger (*asprenger@apl.washington.edu*) and **Maile Sullivan** (*mailesul@uw.edu*), University of Washington, Seattle

Deepen students' understanding of STEM concepts with this project. Students investigated a lake by building and deploying observational buoys and then analyzed data and presented their findings. We will share resources for replicating this project.

SESSION 7

Let the iPad Tell a Science (Digital) Story! (Gen)

(General) *Mt. Bachelor, DoubleTree*

Roger D. Pence (*rogpence@yahoo.com*), Benicia (Calif.) Unified School District

Learn to use iPads for science digital stories with popular video-editing apps, and promote science literacy for classroom use. Samples and resources provided.

SESSION 8

Building STEM Education with Multinationals (Gen)

(General) *Mt. Hood, DoubleTree*

Lauren B. Birney (*lbirney@pace.edu*), Pace University, New York, N.Y.

The development of modalities to enhance and motivate students through the support of STEM partnerships and affiliations is a critical component of STEM education. Explore the creation of partnerships opportunities, mobile app building in the classroom through partnership support, and innovative teaching constituents formed through lucrative STEM multinationals.

SESSION 9

Structural Support for Transforming STEM Education (Gen)

(General) *Oregon, DoubleTree*

Kristen Harrison (*collabatory@pdxstem.org*), Portland Metro STEM Partnership, Beaverton, Ore.

The Intel STEM Center supports the aligned activities of school districts and organizations by establishing shared measurements, mobilizing funding, and advancing policy to support change.

9:30–10:30 AM Workshops

AAPT Session: Energy Conservations and Transformations (Phys)

(General) *D131/132, Convention Center*

Jan Mader (*jan_mader@gfps.k12.mt.us*), Great Falls High School, Great Falls, Mont.

Spark learning in your science classroom—experience various activities designed to help students learn about energy conservation and transformations. There will be plenty of “energy” in the room for all grade levels.

ACS Middle Level Session: Changes of State—Evaporation and Condensation (Chem)

(Middle Level) *D133/134, Convention Center*

James H. Kessler, American Chemical Society, Washington, D.C.

Explore evaporation and condensation through hands-on activities and molecular animations from the free completely developed 5E lesson plans in *middleschoolchemistry.com*.



NSTA Press® Session: Picture-Perfect Science Lessons: Using Picture Books to Guide Inquiry (Gen)

(Elementary) *D136, Convention Center*

Emily Morgan (*emily@pictureperfectscience.com*) and **Karen Ansberry** (*karen@pictureperfectscience.com*), Picture-Perfect Science, LLC, Lebanon, Ohio

Join the authors of NSTA's award-winning *Picture-Perfect Science* series to learn how to use picture books to teach science and reading together.

Engineering in the Elementary Classroom—You Can Do It! (Gen)

(Elementary) *D137, Convention Center*

Julie Sutherland (*juliemsutherland@comcast.net*), Marvista Elementary School, Normandy Park, Wash.

President: Marcia Edson (*mtedson@bu.edu*), Boston University, Boston, Mass.

As an elementary science teacher, you CAN teach engineering! Change some simple inquiry science activities into simple engineering activities.

Interactive Inquiry—Effective, Fun, and Relevant (Gen)

(Elementary–Middle Level) D138, Convention Center
Tony Heiting (heitingtony@yahoo.com), Retired Educator, Panora, Iowa

Steve Weinberg, Retired Educator, Boca Raton, Fla.

This workshop will involve participants in activities and discussions that exemplify specific inquiry practices that are effective, fun, and relevant.

Life Cycle of the Monarch Butterfly (Bio)

(Informal Education) E141, Convention Center
Ann Hobbie (ann.s.hobbie@gmail.com) and **De Cansler**

(decansler@gmail.com), University of Minnesota, St. Paul
 Observe live monarchs throughout their life cycle to learn about their biology and how you can raise these fascinating organisms in your classroom.

Science in the Time of Cholera (Bio)

(High School) E142, Convention Center

Marissa Vignali (marissa.vignali@seattlebiomed.org) and **Theresa B. Britschgi** (theresa.britschgi@seattlebiomed.org), Seattle Biomedical Research Institute, Seattle, Wash.

Join us as we demonstrate two hands-on activities well suited for classroom implementation that bridge biological and social sciences in the context of cholera treatment and prevention.

Using Crash Debates to Teach Logic, Bioethics, and Communication in AP and IB Sciences (Bio)

(High School–College) E143, Convention Center

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

Bring controversy into your classroom using debates that are well researched, articulately presented, and taught using a quick, clean teaching structure.

ACS Session Two: Entropy: Mixing and Unmixing (Chem)

(High School) Oregon Ballroom 202, Convention Center

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

Approaching the concept of entropy from a molecular viewpoint gives it a more easily visualized and intuitive meaning. Using this molecular view helps us understand how both mixing and unmixing are spontaneous processes under the appropriate conditions. Bring your USB flash drive and take away the presentation and activities to use in your class.

Effective Approaches for Addressing the Next Generation Science Standards in the Earth and Space Science Classroom (Earth)

(Elementary–High School) Oregon Blrm. 203/204, Conv. Center
Roberta M. Johnson (rmjohnsn@gmail.com), NESTA, Boulder, Colo.

This NESTA hands-on workshop highlights lessons and strategies using the NGSS crosscutting concepts to unite core ideas and science and engineering practices for the geoscience classroom.

The Architects Have Started Without Me—What Do I Do Now? (Science Facilities 102) (Gen)

(General) Mt. St. Helens, DoubleTree

LaMoine L. Motz (llmotz@comcast.net), 1988–1989 NSTA President, and Science Education and Facilities Specialist, White Lake, Mich.

James T. Biehle (biehlej@sbcglobal.net), Inside/Out Architecture, Inc., Ballwin, Mo.

Prsider: LaMoine L. Motz

Is your district designing new science facilities but you're not involved? You need to get involved before it is TOO LATE! In this advanced course on science facility planning and design (an extension of the Science Facilities 101 session, page 65), the NSTA author team for *NSTA Guide to Planning School Science Facilities*, 2nd edition, will present more detailed information and examples of functional and flexible science facilities for STEM-based science. We'll look at budgeting, working with the architect, space requirements, technology, flexibility, safety, new types of spaces, and special adjacencies. Take home a packet of materials.



9:30–10:30 AM Exhibitor Workshops

Engineering in the Next Generation Science Standards (Gen)

(Grades 9–12)

A105, Convention Center

Sponsor: It's About Time

Cary I. Sneider, Portland State University, Portland, Ore. The NGSS will break from previous documents by merging science and engineering. This workshop will illustrate how a new high school curriculum—Engineering the Future: Science, Engineering, and the Design Process—can help students learn core ideas about energy by designing, building, and testing various structures.

Biomes and Invasive Species

(Bio)

(Grades 9–12)

B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

How do the characteristics of a biome determine the plant and animal life found there? How do nonnative species survive to become invasive species? In this activity from the SEPUP high school biology program *Science and Global Issues: Biology*, students match a set of organism cards to proper climate/biome cards, and then use literacy strategies to consider the impact of invasive species.

9:30–11:30 AM NSTA ESP Symposium

ESP: Unique Features of Programs That Meet “More Emphasis” Features in the NSES (Gen)

(General)

D135, Convention Center

The Standards offered but 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; 7) Exemplary Science for Resolving Societal Challenges; 8) Exemplary Programs for Building Interest in STEM Careers; and 9) Exemplary College Science Teaching.

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!

Coordinators:

Robert E. Yager (robert-yager@uiowa.edu), 1982–1983 NSTA President, and **University of Iowa, Iowa City**; and **Brenda Wojnowski** (bwojnowski@gmail.com), WAI Education Solutions, Dallas, Tex.

Symposium Participants:

Community of Excellence in Mathematics and Science

Susan Koba (skoba@cox.net), Retired Educator, Omaha, Neb.

The 4-H Wildlife Stewards Program

Maureen Hosty (maureen.hosty@oregonstate.edu) and **Virginia Bourdeau** (virginia.bourdeau@oregonstate.edu), Oregon State University, Portland

Developing Students’ Authentic Inquiry Skills

Judith A. Scheppler (quella@msa.edu), Illinois Mathematics and Science Academy®, Aurora

Less and More

Brenda Wojnowski (bwojnowski@gmail.com), WAI Education Solutions, Dallas, Tex.

10:00–11:15 AM Exhibitor Workshops**PASCO's SPARKscience for K–8 Students—Free Starter Kits for Attendees! (Gen)***(Grades 6–8) A103/104, Convention Center*

Sponsor: PASCO scientific

Jason Lovell, PASCO scientific, Roseville, Calif.

Learn how SPARKscience engages students in scientific and engineering practices, affording a deeper understanding of scientific concepts. Participate in investigations to experience real-time data collection with probeware and SPARKvue® software. Free probeware starter kits, including five sensors and a USB interface (a \$600 value), will be given to 20 lucky attendees!

Renewable Energy (Phys)*(Grades 5–10) A107, Convention Center*

Sponsor: K'NEX Education

Presenter to be announced

Explore Going Green renewable energy with your students! These activities are designed to address critical STEM concepts and provide instructional models that can enhance students' understanding of these concepts. Build a model and demonstrate how it can be operated with electricity generated from wind, water, and solar power. Explore other models that complete real-world tasks with these same three renewable power sources.

The Next Generation Science Standards...and the Common Core? Reflection and Application of Common Core English Language Arts and Math Integration K–8 (Gen)*(Grades K–8) B111/112, Convention Center*

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Reflect on the makeup of the Next Generation Science Standards—disciplinary core ideas, scientific and engineering practices, crosscutting concepts, and performance expectations. Apply this knowledge and understanding to integrate the Common Core English language arts and math connections. Leave with tools that can make resource selection simpler for your district.

Fantastic Physical Science Demonstrations from Flinn Scientific (Phys)*(Grades 6–12) B114/115, Convention Center*

Sponsor: Flinn Scientific, Inc.

Janet Hoekenga (jhoekenga@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.

Plate Tectonics: Continents on the Move (Earth)*(Grades 6–12) B116, Convention Center*

Sponsor: Simulation Curriculum

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

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

There's a New Robot in Class! LEGO® MINDSTORMS® Education EV3 in Your Classroom (Phys)*(Grades 5–9) C120/121, Convention Center*

Sponsor: LEGO Education

Ian Chow-Miller (tcoon@legoeducation.us), Bethel School District, Tacoma, Wash.

Are you already using LEGO® MINDSTORMS® Education NXT? If so, this hands-on session is for you. Experience the new LEGO MINDSTORMS Education EV3 platform through a sample lesson from the new Design Engineering Projects curriculum. See the robust capabilities and the cross-curricular applications the third generation has to offer.

The Private Eye® Way to Magnify Minds! Hands-On Science, Writing, and Art to Fire Up STEM and the NGSS (Gen)*(General) C123, Convention Center*

Sponsor: Educational Innovations, Inc.

Kerry Ruef and **David Melody**, The Private Eye Project, Lyle, Wash.

Dandelions! Crickets! Eyeballs! Use a jeweler's loupe, everyday objects, simple questions, and thinking by analogy to go REALLY close up—and develop the essential skills of scientist, writer, and artist in all your students. Ignite creative and critical thinking as students write, draw, and theorize with this acclaimed inquiry program. Plus, experience a peek at The Private Eye STEM course, a collaboration with the Portland Metro STEM Partnership.

HHMI's *The Making of the Fittest: Got Lactase? The Co-evolution of Genes and Culture* (Bio)

(Grades 9–College) C124, Convention Center

Sponsor: Howard Hughes Medical Institute

Ann Brokaw, Rocky River High School, Rocky River, Ohio View HHMI's latest short film, *Got Lactase? The Co-evolution of Genes and Culture*. Today, about a third of human adults worldwide can digest lactose, the main sugar in milk. This film tells the story of how this trait evolved in the last 10,000 years of human history. Learn about brand-new resources to help you bring this memorable example of the evolutionary process into your classroom. Participants will receive free classroom-ready materials appropriate for all levels of biology, including middle school, high school, and undergraduate.

Molecular Modeling and the Revised AP Chemistry Curriculum Framework: Challenges and Opportunities (Chem)

(Grades 9–College) C125/126, Convention Center

Sponsor: Wavefunction, Inc.

Jurgen Schnitker (sales@wavefun.com), Wavefunction Education Labs, Irvine, Calif.

The new 2013–2014 Curriculum Framework introduces a slew of issues to the teaching of AP Chemistry. Bring your laptop (Windows or Mac OS X) to this hands-on workshop, install *ODYSSEY* AP Chemistry, and learn how to teach with molecular modeling software that is routinely encountered in college chemistry classes.

10:00–11:30 AM Exhibitor Workshop

Integrate iPad and BYOD with Vernier Technology (Gen)

(Grades 3–College) B117/118, Convention Center

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, you will use Vernier's digital tools such as probeware to conduct an investigation with either Graphical Analysis for iPad or Vernier Data Share for tablets, Chromebooks, and BYOD environments. These tools can help you address NGSS practices and performance expectations, as well as many states' standards.

11:00 AM–12 Noon Featured Presentation



Knowing When You Are Wrong: Real Engineering in the Digital Age (Gen)

(General) Oregon Ballroom 201, Convention Center



Doug Sanders (doug_sanders@k2sports.com), Global Product Director for Snowboards, Poles, and Backcountry Tools, K2 Sports, Seattle, Wash.

President: Marjorie (Midge) Ruth Yergen, STEM Strand Leader, Portland Area Conference, and West Valley Junior High School, Yakima, Wash.

A great engineer in the past was able to calculate the right answer. They would analyze a section to figure out the stresses, or design an efficient truss structure that was safe for the design loads. Today, computational tools have reached the point that you no longer need to know how to calculate the right answer. The computer is going to do that for you. Today, a great engineer's key skill is knowing when the answer you get back is wrong. They are always answering the fundamental question: "Do I believe the result?" The challenge for educators in the future is fostering the skills of having that intuition and understanding of how materials and load paths work without relying on pencil on paper, old school number crunching to find "the right answer." Let's work together to get kids excited about figuring out how the world works without losing the ones that "don't like math."

Doug Sanders has more than 20 years of real-world engineering experience from designing airplanes to snowboards for Olympic athletes. After graduating from Oregon State University with a Mechanical Engineering degree, he worked at Boeing designing aircraft wing structures before joining K2 Sports in 1997. This allowed him the remarkable opportunity of merging engineering and a passion for the outdoors into a real job designing toys. The products he has designed are used throughout the mountains of the world by everyone from the highest level athletes to people experiencing a new sport for the first time.

11:00 AM–12 Noon Presentations**SESSION 1****Before and After Retirement—Practicalities and Possibilities (Gen)***(General) B110, Convention Center***Teshia Birts** (*tbirts@nsta.org*), Senior Manager, Chapter Relations, 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 2**Scientific Practices—Getting to Know the Next Generation Science Standards (Gen)***(General) C122, Convention Center***Sue Whitsett** (*swhitsett@nsta.org*), eCYBERMISSION Outreach Manager, NSTA, Arlington, Va.

The Next Generation Science Standards are here and with them the idea of “scientific practices.” Many teachers are already using these scientific practices without knowing it. During this session, we will help demystify the practices and discuss where they already fit into your existing curriculum and what the differences are between engineering and scientific practices. We will also discuss the eCYBERMISSION STEM competition and how it can be used to solidify scientific practices for your students.

SESSION 3**Bridging School Garden Programs to the Classroom (Env)***(Informal Education) D130, Convention Center***Maureen E. Hosty** (*maureen.hosty@oregonstate.edu*), OSU Extension, Portland, Ore.

Learn how 4-H faculty are training and supporting master volunteers to bring science alive by bridging classroom learning with hands-on science school garden projects.

SESSION 4**Students’ Cloud Observations Online—Building Connections (Earth)***(Elementary–High School) D140, Convention Center***Preston M. Lewis** (*preston.lewis@nasa.gov*), NASA Langley Research Center, Hampton, Va.

Engage students in cloud observations for NASA. Through the process of cloud observations and satellite comparisons, students develop connections between Science, Technology, Engineering, and Math.

SESSION 5**Who Moved My Inquiry? What Are These Practices Doing Here? (Gen)***(Elementary–High School) Mt. Bachelor, DoubleTree***Sherry L. Schaaf** (*scitchrs@centurytel.net*), Forks, Wash.**Craig T. Gabler** (*cgabler@esd113.org*), Educational Service District 113, Tumwater, Wash.

The Next Generation Science Standards has science and engineering practices incorporated into the performance expectations. What are these practices? Two experienced Northwest science educators on the writing team for the NGSS will present an in-depth look at the practices.

SESSION 6**STEM Expo: Innovative Alternatives to the Typical Science Fair (Gen)***(General) Mt. Hood, DoubleTree***Eric K. Bull** (*ebull@jessup.edu*), William Jessup University, Rocklin, Calif.

How do you motivate everyone to eagerly anticipate a science fair? Give them choices to allow for their passion and genius to shine through. Visit *STEMexpo.org* for more information.

SESSION 7**Common Outcomes for Student Success in STEM (Gen)***(Elementary–High School) Oregon, DoubleTree***Emily A. Saxton** (*easaxton@pdx.edu*), Portland Metro STEM Partnership, Beaverton, Ore.

Join me as I introduce and lead a discussion of three key student success outcome spaces in STEM, including affective, conceptual knowledge, and cognitive skill outcomes.

Travel Portland has an Information Booth located in the lobby of Exhibit Hall A in the Convention Center. It is open the following hours to provide information about the city and to assist with making restaurant reservations.

| | |
|------------------------|------------------------|
| Wednesday | 5:00–7:00 PM |
| Thursday–Friday | 8:00 AM–5:00 PM |
| Saturday | 8:00 AM–12 Noon |

11:00 AM–12 Noon Workshops

AAAPT Session: E.T. Phone Home (Phys)
(General) D131/132, Convention Center

Jan Mader (jan_mader@gfps.k12.mt.us), Great Falls High School, Great Falls, Mont.


Experience a lesson developed by the Perimeter Institute designed to help students understand abstract concepts relating GPS and relativity. You can't "phone home" without it!

ACS Middle Level Session: Density—A Molecular View (Chem)

(Middle Level) D133/134, Convention Center

James H. Kessler, American Chemical Society, Washington, D.C.

Explore the density of different materials through hands-on activities and animations from the free completely developed 5E lesson plans in middleschoolchemistry.com.

 **NSTA Press® Session: Next Time You See a Sunset, a Seashell, a Firefly...** (Gen)

(Elementary) D136, Convention Center

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

The author of NSTA's new *Next Time You See* picture book series will demonstrate some before and after reading activities that can inspire a sense of wonder in your students!

Let's Get Physical! (Phys)

(Preschool–Elementary) D137, Convention Center

Juliana Texley, NSTA President-Elect, and Palm Beach State College, Boca Raton, Fla.

Ruth Ruud (ruth.ruud@yahoo.com), Fairview, Pa.

Don't look now—but the Common Core asks that you teach physical science as early as kindergarten, and the NGSS have very specific goals for the early primary. No more procrastinating. The good news is that you already have your equipment. Come get easy activities, links, and basic teacher background so that you can start right away.

Energy Is Chemistry (Chem)

(Middle Level–High School) E141, Convention Center

Don Pruett, Jr. (don_pruett@sumnersd.org), Sumner High School, Sumner, Wash.

Nearly 88% of energy used in the United States comes from chemical sources. Lessons in energy sources are enriching for students and relevant in today's economy. See activities that can enhance your lessons in physical properties, thermochemistry, electrochemistry, and organic chemistry.

NASA's Pi in the Sky: Using Mathematics to Investigate Astronomical Phenomena (Earth)

(Middle Level–High School) E142, Convention Center

Janet L. Moore (janetmoore@gmail.com), NASA/Sonoma State University, Rohnert Park, Calif.

Use simple materials to investigate ratios, proportions, and angles. Then use those mathematics concepts to draw conclusions about eclipses and distant galaxies. Free NASA materials!

Epigenetics—Beyond the Central Dogma (Bio)

(High School) E143, Convention Center

Molly Malone (molly.malone@utah.edu), The University of Utah, Salt Lake City

The environment interacts with the epigenome to control gene expression. Interactive activities explore epigenetics and how it confounds conventional notions of inheritance. Free at learn.genetics.utah.edu.

 **NGSS Engineering Practices: Constructing Ideas for Elementary Teachers** (Gen)

(Elementary) E144, Convention Center

Adele Schepige (schepia@wou.edu) and **Philip D. Wade** (wadep@wou.edu), Western Oregon University, Monmouth

Engineering is everywhere! Explore a variety of engineering activities for elementary classrooms and examine their alignment with the NGSS engineering practices. Activity and resources handouts provided.

 **Astrobiology: An Interdisciplinary Approach to STEM** (Earth)

(Middle Level–High School/Informal) E146, Convention Center

Denise A. Thompson (thompsond@einsteinfellows.org), Orting High School, Orting, Wash.

This workshop will include hands-on activities and resources that demonstrate the interdisciplinary nature of astrobiology, including biology, Earth science, math, technology, chemistry, and physics.

ACS Session Three: Entropy: Energy Transfer**(Chem)**

(High School) Oregon Ballroom 202, Convention Center
Jerry A. Bell (j_bell@acs.org), American Chemical Society, Washington, D.C.

Net energy transfer is always one way—from warmer objects to cooler objects. Combining molecular views of entropy and energy helps us understand why. The combination can also lead to an understanding of the conditions for equilibrium. Bring your USB flash drive and take away the presentation and activities to use in your class.

Effective Strategies for Sharing Climate Change Science and Energy Consumption Implications in the Classroom**(Earth)**

(Elementary–High School) Oregon Blrm. 203/204, Conv. Center
Roberta M. Johnson (rmjohnsn@gmail.com), NESTA, Boulder, Colo.

Richard M. Jones (rmjones7@hawaii.edu), University of Hawaii–West Oahu, Kapolei

Wendy E. Van Norden (wvannorden@hw.com), Harvard-Westlake School, Studio City, Calif.

Pamela Whiffen (pwpwr@aol.com), NASA Educator Ambassador, Phoenix, Ariz.

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

**Close Reading in Science: Applying the Common Core Literacy Standards****(Gen)**

(Elementary–High School) Mt. St. Helens, DoubleTree

David Vernot (dvernot@gmail.com), Butler County Educational Service Center, Hamilton, Ohio

Experience “Close Reading” strategies that can help your students dissect passages from a variety of “complex texts,” “read like a detective,” identify tiered vocabulary, and use text-dependent questions.

11:00 AM–12 Noon Exhibitor Workshops**Bringing Technology into Your STEM Classroom****(Gen)**

(Grades 6–College) A105, Convention Center
 Sponsor: It’s About Time

Kevin Schroeder, It’s About Time, Mount Kisco, N.Y.

Struggling to incorporate meaningful technology into your science classroom? Experience an innovative, fully functioning Android tablet that incorporates probes, apps, activities, and the full Android experience. Discover how to blend meaningful technology into your classroom with *Project-Based Inquiry Science* (PBIS) and create your own project-based STEM classroom.

Comparing Earth to Other Worlds**(Earth)**

(Grades 9–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

What is it about conditions on Earth that make it especially hospitable for life as we know it? In this activity, your students will read an excerpt from a science fiction story about Mars colonists and then use a card-sort procedure to analyze the resources necessary to sustain human population on the “Red Planet.” This activity is from the introductory unit of *EDC Earth Science*, a new NSF-supported high school Earth science program that uses an active (more than 60 labs and activities!) approach to the study of Earth science and Earth systems.

12 Noon–1:15 PM Exhibitor Workshops

PASCO's SPARKscience for High School Students— Free Starter Kits for Attendees! (Gen)

(Grades 9–12) A103/104, Convention Center

Sponsor: PASCO scientific

Jason Lovell, PASCO scientific, Roseville, Calif.

Learn how SPARKscience engages students in scientific and engineering practices, affording a deeper understanding of scientific concepts. Participate in investigations to experience real-time data collection with probeware and SPARKvue® software. Free probeware starter kits, including five sensors and a USB interface (a \$600 value), will be given to 20 lucky attendees!

Introduction to Simple Machines (Phys)

(Grades 3–6) A107, Convention Center

Sponsor: K'NEX Education

Presenter to be announced

Explore that common expression “simple machines make work easier” and investigate hands-on strategies to help students understand simple machine technologies. Build and use K'NEX® simple machine models and discover that simple machines make work easier by multiplying force and distance as well as changing the direction of force. Standards-aligned STEM concepts related to simple machines will be stressed.

Introduction to Wisconsin Fast Plants® (Bio)

(Grades K–12) B111/112, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Students can actively take part in science with new hands-on activities using Wisconsin Fast Plants. These minuscule and quick-growing plants are ideal classroom tools for exploring environmental effects, variation, life cycle, and nutrient cycling. Participants work with hands-on activities such as planting seeds. Free materials!

How Data Logging Systems Support Scientific Studies (Phys)

(Grades 8–College)

B116, Convention Center

Sponsor: Science First®/STARLAB®

Gilles Gallin-Frandaz, Eurosmart, Montbonnot St. Martin, France

Nathaniel Bell (info@sciencefirst.com), Science First/STARLAB, Yulee, Fla.

Learn about the proper use of connected and wireless data logging equipment to support scientific studies in multiple disciplines. Join us as our European co-presenter shares how educators in France are using data loggers to meet curriculum requirements. In a practical demo, we will conduct a mini study with participants to show if the Achilles tendon myotatic reflex differs between Europeans and North Americans.

HHMI's *The Making of the Fittest: Evolving Switches, Evolving Bodies* (Bio)

(Grades 9–College)

C124, Convention Center

Sponsor: Howard Hughes Medical Institute

Ann Brokaw, Rocky River High School, Rocky River, Ohio
Screen HHMI's short film and learn how researchers have studied living stickleback fish populations, identified key genes and genetic switches in the evolution of their body transformation, and even documented the evolutionary change over thousands of years by studying the remarkable fossil record. Participants will receive free classroom-ready resources to enhance their teaching of the genetic evidence of evolution, including an exciting new virtual laboratory in which students measure, graph, and analyze data to compare living populations to their fossil ancestors.

Drugs, Drug Targets, and You—A Molecular Perspective (Bio)

(Grades 9–College)

C125/126, Convention Center

Sponsor: 3D Molecular Designs & MSOE Center for Bio-Molecular Modeling

Tim Herman (herman@msoe.edu) and **Shannon Colton** (colton@msoe.edu), Milwaukee School of Engineering, Milwaukee, Wis.

Using student-centered physical models of drugs and the proteins they bind to, an interactive synapse kit, and a David Goodsell cellular landscape, we'll explore the molecular consequences of using both prescription drugs and drugs of abuse. Kits and activities bridge to the Next Generation Science Standards.

12 Noon–1:30 PM Exhibitor Workshop

Integrate iPad and BYOD with Vernier Technology (Gen)

(Grades 3–College) B117/118, Convention Center

Sponsor: Vernier Software & Technology

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

In this hands-on workshop, you will use Vernier’s digital tools such as probeware to conduct an investigation with either Graphical Analysis for iPad or Vernier Data Share for tablets, Chromebooks, and BYOD environments. These tools can help you address the NGSS practices and performance expectations, as well as many states’ standards.

12:30–1:30 PM Presentations

SESSION 1

Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success (Gen)

(General)

B119, Convention Center

Donna L. Knoell (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.

Join me as I share an overview of the components of differentiation in the K–6 science classroom. I’ll suggest ways to differentiate effectively to maximize student participation and learning. Handouts!

I Want to Be a Science Teacher— Now What?

Are you a preservice or new teacher interested in learning more about the science education profession? Join us for an interactive session with experienced teachers and NSTA Staff.

Friday, October 25

2:00–3:00 PM

**Oregon Convention Center
C122**



SESSION 2 (two presentations)

(General)

D130, Convention Center

The Brock Mentorship Program: Real Scientific Research for Senior High School Students (Gen)

Joe Engemann (engemann@brocku.ca), Brock University, St. Catharines, Ont., Canada

The purpose of this presentation is to outline an innovative full-semester university science research-based mentorship program for senior high school students.

Tying It All Together: Using Field Science Experiences to Support STEM Learning (Env)

Jennifer Kidder (jkidder@naturebridge.org), NatureBridge at Olympic National Park, Port Angeles, Wash.

Learn how a high school teacher used Washington STEM grant funding to give students field science experiences on the Elwha River in Olympic National Park.

SESSION 3

CCSS Bridging Elementary Science for English Learners (Gen)

(Preschool–Elem/Supervision)

E145, Convention Center

Virginia R. Nelson (vnelson@ttsd.k12.or.us), Tigard-Tualatin School District, Tigard, Ore.

Join me as I review recent research and approaches for engaging all learners via the Common Core State Standards mathematical practices, leading to specific science activities you can use on Monday.

SESSION 4



Connecting Students and Community in a New STEM-focused School (Gen)

(Middle Level–High School)

E146, Convention Center

Christina Iremonger (christina.iremonger@vansd.org),

Leslie Simpson, Darby Meade (darby.meade@vansd.org),

and **Jennifer Holm** (jennifer.holm@vansd.org), Vancouver iTech Preparatory, Vancouver, Wash.

Tamara H. Nelson (tnelson1@vancouver.wsu.edu), Washington State University, Vancouver

Presider: Tamara H. Nelson

We will describe specific strategies, challenges, and outcomes related to creating partnerships between a new STEM-focused school and the larger community.

SESSION 5

NARST Session: Impact of an Embedded Assessment System on Elementary Teaching and Learning (Gen)

(General)

Broadway, DoubleTree

Ellen Osmundson (eosmundson21@comcast.net), University of California, Los Angeles

Formative assessment is a powerful classroom practice that can significantly increase learning, particularly for low-achieving students. This session presents results from a large study that examined how use of an embedded assessment system impacted teacher and student science understandings.

SESSION 6

Reading and Writing Like a Scientist (Gen)

(Middle Level–College)

Mt. Bachelor, DoubleTree

Andrew M. Ising (drewising@gmail.com), Junction City High School, Junction City, Kans.

Explore strategies used in a high school classroom that challenge students to communicate science with a variety of audiences to increase science literacy.

SESSION 7

Using Crowdsourcing to Advance STEM Education (Gen)

(Middle Level–College)

Mt. Hood, DoubleTree

Bob Scarfo (bscarfo@landandlife.net), Land and Life, LLC, Spokane, Wash.

Come learn how crowdsourcing can be used as an engaging and effective method to enhance STEM education through its application to authentic community-based service learning projects.

SESSION 8

STEM and Environmental Literacy: Engaging Students Beyond the Classroom Walls (Gen)

(Informal Education)

Oregon, DoubleTree

Traci Price (tp@traciprice.net), Gray Family Foundation, Portland, Ore.

Melissa Dubois (medubois@pdx.edu), Portland Metro STEM Partnership, Beaverton, Ore.

This session will help you identify the networks of community partners and resources available to engage students in applied community learning.

12:30–1:30 PM Workshops**AAPT Session: Tried-and-True Techniques for Effective Student Learning...Even Graduating Seniors**
(Phys)*(General)* D131/132, Convention Center**Thomas F. Haff** (hafft@issaquah.wednet.edu), Issaquah High School, Issaquah, Wash.

Find out how to create an environment in your science classroom that lets learning occur.

ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding
(Chem)*(Middle Level)* D133/134, Convention Center**James H. Kessler**, American Chemical Society, Washington, D.C.Explore the periodic table and bonding through a card game, molecular animations, and video from the completely developed 5E lesson plans in middleschoolchemistry.com.**Global Connections: Forests of the World**
(Env)*(Middle Level–College)* D135, Convention Center**Al Stenstrup** (astenstrup@forestfoundation.org), Project Learning Tree, Washington, D.C.**Rick Zenn** (rzenn@worldforestry.org), World Forestry Center, Portland, Ore.The forests of the world are changing. Project Learning Tree's high school module, *Global Connections: Forest of the World*, explores this vital Earth system using STEM connections. Take home an activity module and poster sets.**NSTA Press® Session: Using Astronomy Probes in the Science Classroom**
(Earth)*(Elementary–High School)* D136, Convention Center**Cary I. Sneider** (csneider@pdx.edu), Portland State University, Portland, Ore.

Use astronomy probes from the Page Keeley series to engage your students in minds-on and eyes-on activities to meet performance expectations in the NGSS.

Animal Pictures, WebQuest, Boat Constructions, and Pumpkingrams
(Gen)*(Elementary–Middle Level)* D137, Convention Center**Ava F. Pugh, Dorothy C. Schween and Rhonda M. Mann**, The University of Louisiana at Monroe

President: Ava F. Pugh

This workshop provides hands-on activities for making science inferences from pictures, creating WebQuests, constructing boats, and recognizing mathematical relations with Pumpkingrams. CDs and handouts provided.

STEM in State and Local Community Events
(Gen)*(Elementary–Middle Level)* D138, Convention Center**Michelle Daml** (michelle.daml@k12northstar.org), Fairbanks North Star Borough School District, Fairbanks, Alaska**Allyson Nicholson** (allyson.nicholson@k12northstar.org), Badger Road Elementary School, Fairbanks, Alaska

This workshop will explain how you can use local community events to expand science inquiry skills and STEM applications. Explore the many options for scientific connections to real life in a student's daily community happenings.

Ice Core Records: Earth Systems, Volcanoes, Solar Proton Events, and Supernovas
(Earth)*(High School–College)* E142, Convention Center**Donna L. Young**, NASA/SAO/CXC, Bullhead City, Ariz.

Apply absolute and relative dating techniques with high-resolution ice core data, volcanic eruptions, and solar photon events to correlate and date historic supernova events.

The Human Microbiome
(Bio)*(High School)* E143, Convention Center**Molly Malone** (molly.malone@utah.edu), The University of Utah, Salt Lake CityPresident: Mary Zelinski (zelinski@ohsu.edu), Oregon National Primate Research Center, BeavertonExplore the ecosystem of the human body. Learn what we're discovering about the body's microbes and how they influence our health. Free materials at learn.genetics.utah.edu.

NGSS Argumentation Skills and Discussion Strategies for Bioethics (Bio)

(Informal Education) E144, Convention Center

Joan Griswold (jgriswold@nwabr.org) and **Jeanne T. Chowning** (jchowning@nwabr.org), Northwest Association for Biomedical Research, Seattle, Wash.

Jodie Spitze (jodie.spitze@kent.k12.wa.us), Kent-Meridian High School, Kent, Wash.

Support students in justifying their position on challenging socio-scientific issues while employing classroom strategies and discussion techniques that encourage student engagement and respectful dialogue.

ACS Session Four: Electromagnetic Radiation Energy (Chem)

(High School) Oregon Ballroom 202, Convention Center

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

The energy of electromagnetic radiation (light) is evident to anyone standing in the sunlight on a bright summer day. Less obvious is the radiation emitted by the warmed planetary surface. The characteristics of these electromagnetic radiations and their consequences are important for maintaining life as we know it on Earth. Bring your USB flash drive and take away the presentation and activities to use in your class.

High-Impact Classroom Earth Science in a STEM World (Earth)

(Elementary–High School) Oregon Blrm. 203/204, Conv. Center

Roberta M. Johnson (rmjohnsn@gmail.com), NESTA, Boulder, Colo.

Richard M. Jones (rmjones7@hawaii.edu), University of Hawaii–West Oahu, Kapolei

Wendy E. Van Norden (wvannorden@hw.com), Harvard-Westlake School, Studio City, Calif.

Pamela Whiffen (pwppwr@aol.com), NASA Educator Ambassador, Phoenix, Ariz.

This NESTA workshop presents exemplary activities addressing fundamental concepts in Earth system science with an emphasis on the solid Earth, STEM practices, and the NGSS.

Science Observation Forms: Unique to Fit the Needs of Your Department (Gen)

(Middle Level–College) Mt. St. Helens, DoubleTree

Robb G. Gorr (rgorr@loyolahs.edu), Loyola High School of Los Angeles, Calif.

Have you ever wondered why all teacher observation forms are the same? Common observation forms make NO sense; science is a unique subject that must be taught in unique ways. Learn how to personalize an observation form to fit the needs and beliefs of your science department.

12:30–1:30 PM Exhibitor Workshops

Active Physics—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (Phys)

(Grades 9–College) A105, Convention Center

Sponsor: It's About Time

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

Learn from author Arthur Eisenkraft on how this proven program implements STEM and the essence of the Next Generation Science Standards. Understand the benefits of the Engineering Design Cycle. Discover how physicists, teachers, and science educators designed this project-driven course, recognized for the positive impact it has on students of all levels.

Genetics—From Counselor to Genetic Engineer (Bio)

(Grades 6–12) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Let's make genetics more meaningful for students. Beginning with a framework for dominant/recessive and other patterns of inheritance, pedigrees will be introduced to study the behavior of certain genes in humans. We will also conceptualize how selective gene expression works with ways to make it a relevant and sustainability issue. These activities are from SEPUP's *Issues and Life Science* and *Science & Global Issues: Biology* programs.

1:00–1:30 PM Exhibitor Workshop

Shaping Earth (Earth)

(Grades 5–12) Booth #408, Exhibit Hall, Convention Center

Sponsor: Science First®/STARLAB®

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

This in-dome workshop introduces the internal and external processes that modified Earth's surface. By using an in-dome version of The Layered Earth, this lesson creates an immersive teaching experience.

1:00–2:30 PM Exhibitor Workshop**Ecology to Enzymes to Industry (AP Big Idea 4)
(Bio)***(Grades 10–College) A108/109, Convention Center*

Sponsor: Bio-Rad Laboratories

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

In this inquiry-based hands-on workshop, learn to use ecological knowledge of the kingdom fungi to find and characterize novel cellobiase enzymes for application in cellulosic biofuel production. The enzyme cellobiase is easy to extract from mushrooms and a colorimetric system for assaying activity can be used to determine how pH, temperature, and concentrations affect the rate of reaction.

1:00–6:00 PM NSTA Symposium**Flight of the Monarch Butterflies (SYM-1)***(Grades K–12) Adams/Jefferson, DoubleTree***Tickets Required; \$54**

Ann Hobbie (*ann.s.hobbie@gmail.com*) and **De Cansler** (*decansler@gmail.com*), University of Minnesota, St. Paul
For description, see page 34.

1:30–4:30 PM Short Course**Ocean Plastic Pollution: Issues and Solutions in the Middle School (SC-4)***(Middle Level) 3 Sisters, DoubleTree***Tickets Required; \$35**

Mary Whaley (*mwhaley@mbayaq.org*), Monterey Bay Aquarium, Monterey, Calif.
For description, see page 37.

2:00–3:00 PM Presentations**SESSION 1****ASTE Session: Learn All About ASTE! (Gen)***(College) B110, Convention Center***Judith Morrison** (*jmorrison@tricity.wsu.edu*), Washington State University Tri-Cities, Richland

Don't belong to ASTE yet? Join us for an introduction to all the benefits of membership. Already an ASTE member? Attend and build collaborations among other new or current members.

SESSION 2**I Want to Be a Science Teacher—Now What? (Gen)***(General) C122, Convention Center***Teshia Birts** (*tbirts@nsta.org*), Senior Manager, Chapter Relations, NSTA, Arlington, Va.

Preservice teachers will join with experienced teachers and NSTA staff to guide this interactive hands-on session for students and new professionals.

SESSION 3**AAPT Session: Taking Science on the Road: Outreach Activities You Can Use (Phys)***(Middle Level–High School) D131/132, Convention Center*

Kathy Dawes (*outreachpdsc@gmail.com*) and **Dana Dawes** (*exhibitshop@gmail.com*), Palouse Discovery Science Center, Pullman, Wash.

Christine Berven (*berven@uidaho.edu*), University of Idaho, Moscow

The Palouse Discovery Science Center will share its most successful outreach activities that can be used in science classes for grades 5–12.

SESSION 4**Creative Problem Solving with Toshiba/NSTA ExploraVision (Gen)***(General) E146, Convention Center*

Barbara R. Pietrucha, Earth/Environmental Science Educator, Point Pleasant, N.J.

Presider: **Eric V. Crossley** (*ecrossley@nsta.org*), Director, Science Education Competitions, NSTA, Arlington, Va.

Motivate students and challenge them to think creatively! Learn how the ExploraVision competition encourages developmental skills necessary for success in STEM and utilizes the natural curiosity of students 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 5

NARST Session: Looking at Quality of Instruction and Students' Performance: Where Do the Teachers' Questions Come From? (Gen)

(Elementary) *Broadway, DoubleTree*

Maria Araceli Ruiz-Primo (*maria.ruiz-primo@ucdenver.edu*), University of Colorado, Denver

Min Li (*minli@u.washington.edu*), University of Washington, Seattle

This study focuses on one aspect of curriculum materials and their implementation—questions. We looked closely at the questions 19 teachers asked and linked these questions to students' performance.

SESSION 6

The Best in Books—How to Find and Use Them (Gen)

(General) *Mt. Bachelor, DoubleTree*

Juliana Texley (*jtexley@att.net*), NSTA President-Elect, and Palm Beach State College, Boca Raton, Fla.

NSTA's database of 8,000 teacher-generated book reviews includes the best of the best—42 years of Children's Book Council award winners. Find out why they won and how they can be used in the classroom. This session will include active participation in the process of reviewing books, learning to search and select books, and take-home ideas for integration with science, mathematics, and social studies.

SESSION 7 (two presentations)

(General) *Mt. Hood, DoubleTree*

Robotic Rewards: Recruiting Middle School Students for an Award-winning Robotics Team (Gen)

Tevfik Eski, Kenilworth Science and Technology School, Baton Rouge, La.

Hear winning strategies on creating an award-winning Title I school robotics team and leveraging success into an opportunity for community engagement and positive public relations.

Partners in Progress: Best Practices for Building Partnerships with STEM-based Groups (Gen)

Tevfik Eski, Kenilworth Science and Technology School, Baton Rouge, La.

Learn how a Title I middle school developed effective partnerships with academic, business, and industry association groups to become a STEM pioneer in South Louisiana.

2:00–3:00 PM Workshops

ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (Chem)

(Middle Level) *D133/134, Convention Center*

James H. Kessler, American Chemical Society, Washington, D.C.


Explore water's characteristics and what makes water a polar molecule through hands-on activities and molecular animations from the free completely developed 5E lesson plans in *middleschoolchemistry.com*.

Science Education for Global Citizenship: People, Food, Energy, and Sustainability (Env)

(Middle Level–High School) *D135, Convention Center*

Jo Cooper (*joc@neahkahnie.k12.or.us*), Neah-Kah-Nie Middle School, Rockaway Beach, Ore.

Discover interdisciplinary hands-on activities to prepare all students to think critically and creatively about global challenges to the planet and human well-being.

 **NSTA Press® Session: Outdoor Science and Bringing It In (Gen)**

(Elementary–Middle Level) *D136, Convention Center*

Steve Rich (*bflywriter@comcast.net*), NSTA Director, Professional Development, and University of West Georgia, Carrollton

Whether taking it outside or bringing outdoor science in, explore school yard resources for teaching crosscutting concepts and how sticks and stems bring in STEM. Free seeds!

Shipping from STEM to Stern (Gen)

(Elementary–Middle Level) *D138, Convention Center*

Chris Geerer (*christine.geerer@gpschools.org*), **Laura M. Mikesell** (*laura.mikesell@gpschools.org*), and **Alex Gulyas**, Parcels Middle School, Grosse Pointe Woods, Mich.

Prsident: Chris Geerer

Load math and engineering into your science classroom via the shipping industry with this blueprint for adapting STEM activities to fit your local port.

Claims and Evidence: Writing for the Common Core (Earth)

(Middle Level) *E142, Convention Center*

Wendy E. Pierce (*wendy.pierce@bsd7.org*), Chief Joseph Middle School, Bozeman, Mont.

Using hands-on materials, participants will create a poster (pre-write) and an expository essay showing claims, evidence, reasons, and strengths and limitations of an astronomy model.

CCSS Energy Debates Can Fuel the Common Core! (Gen)
(Elementary–High School) E145, Convention Center

Don Pruett, Jr. (don_pruett@sumnersd.org), Sumner High School, Sumner, Wash.

Use energy activities and discussions to support the Common Core State Standards. Participants will engage in one of many activities available that engage students in a variety of presentations, discussions, and debates. Take home materials and lesson plans.

ACS Session Five: Rates: Concentration and Half-Life (Chem)

(High School) Oregon Ballroom 202, Convention Center

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

The rates of chemical reactions cover an enormous range, from almost instantaneous explosions to geological changes that may take millions of years. Half-life is a familiar way to characterize many reactions, including the decay of radioactive nuclei often used as “clocks” to date past events. Bring your USB flash drive and take away the presentation and activities to use in your class.



National Earth Science Teachers Association Earth Science Share-a-Thon (Earth)

(Elementary–High School) Oregon Blrm. 203/204, Conv. Center
Roberta M. Johnson (rmjohnsn@gmail.com), NESTA, Boulder, Colo.

Emily Mortimer (emc1101@tulsazoo.org), Tulsa Zoo, Tulsa, Okla.

Join NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!

HELP! I Need to Get Organized! (Gen)

(Elementary–High School) Holladay, DoubleTree

Sarah B. Andres (sbandres@interact.ccsd.net), Forbuss Elementary School, Las Vegas, Nev.

This workshop covers the history and application of concept mapping in a science classroom. It also provides for assessment options using concept maps.

The Power of Learning Journals to Bridge Science and the Common Core (Gen)

(General) Mt. St. Helens, DoubleTree

Andrea M. Guillaume (aguillaume@fullerton.edu) and **Ruth H. Yopp** (ryopp@fullerton.edu), California State University, Fullerton

Experience learning journals to inquire and develop habits of mind central to the Common Core. Learn strategies to invigorate learning in science through mixed media.

Elevating Expertise: Connecting STEM Experts to the Classroom (Gen)

(High School) Multnomah, DoubleTree

Kim Herzog, Sammamish High School, Bellevue, Wash.
Suzanne Reeve (reeves@bsd405.org), Bellevue (Wash.) School District

We will share tools for engaging STEM professionals in curriculum design and classroom mentoring. The workshop will include both presentation and small group discussion.

Using Social Media to Extend STEM Inquiry (Gen)

(Informal Education) Weidler/Halsey, DoubleTree

Joanie F. Gillispie, Berkeley City College, Berkeley, Calif. Participants will engage with a key social justice issue and use STEM inquiry to share identified trends and problem-solving strategies through social media platforms.

2:00–3:00 PM Exhibitor Workshops

Active Chemistry—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (Chem)

(Grades 9–College)

A105, Convention Center

Sponsor: It's About Time

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

Before the NGSS or STEM, Dr. Arthur Eisenkraft recognized the need and developed this proven program, which can help you implement STEM and the essence of the Next Generation Science Standards. See the Engineering Design Cycle and discover how chemists, teachers, and science educators designed a true project-driven course for Next Generation students of all levels.

2:00–3:15 PM Exhibitor Workshops

DNA Replication and Transcription (Bio)

(Grades 5–12)

A107, Convention Center

Sponsor: K'NEX Education

Presenter to be announced

No more gumdrops and toothpicks! Use K'NEX® to build and explore functional DNA models that actually stay together. Twist DNA ladders to make a helix, replicate it, and transcribe the model to form mRNA. Color-coded nucleotides enable quick changes of the C, G, A, T, and U bases to produce new sequences. Standards-aligned STEM concepts will be emphasized.

Engineer Excitement in Your Classroom with a Carolina STEM Challenge™ (Phys)

(Grades 6–12)

B111/112, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Catapult, float, and race your way into hands-on activities that will engage your middle and high school students. Foster both critical thinking and creative problem-solving skills! Come experience how Carolina makes it easy to incorporate STEM into your classroom. Free handouts and door prizes!

Foldables® + Science Standards + Envelopes = A Winning Combination (Gen)

(General)

B114/115, Convention Center

Sponsor: Dinah-Might Adventures, LP

Jami Humphrey, Dinah Zike Academy, Comfort, Tex.

In this fast-paced, interactive workshop you will cut, fold, and more as you transform basic classroom materials and manila envelopes into Foldables specifically designed to address science curriculum standards. See the possibilities

Using the Engineering Design Process to Understand Heat (Chem)

(Grades 9–12)

B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

A central theme of chemistry is heat transfer. We will explore thermal equilibrium and then design experiments to compare the thermal equilibrium point of mixtures of water. The activity will be followed up by using the engineering design process to construct and test a simple calorimeter that can be used to predict the equilibrium temperatures of water samples. This activity is from LAB-AIDS' *A Natural Approach to Chemistry* program.

unFOLD before you and leave with ideas ready to use on Monday that are evidence based, kinesthetic, and integrative.

Volcanoes—The Good, the Bad, and the Ugly (Earth)

(Grades 6–12)

B116, Convention Center

Sponsor: Simulation Curriculum

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

The destructive potential of volcanoes is well known. Using Simulation Curriculum's *The Layered Earth*, we will investigate these hazards and discover any benefits. The virtual model allows students to simulate volcanic eruptions, examine historic volcanic activities, and learn about the "Ugly" that may be hiding in our own backyard.

Free Resources to Teach Deep Earth History, Paleoclimate, and Climate Change (Bio)

(Grades 7–12)

C124, Convention Center

Sponsor: Howard Hughes Medical Institute

Chris Hedeem, Oregon City High School, Oregon City, Ore.

The story of Earth's past climate is written in the rocks. Take a trip with us into the past to understand how and why climate has changed throughout Earth history. We will present classroom-ready resources—including HHMI's free EarthViewer app—that illustrate Earth's natural mechanism for modulating climate and the chemical signals that tell us about past climate. Understanding what has happened in the past gives us an important perspective for understanding current climate change and what the future may hold. Participants will receive HHMI's latest *Holiday Lectures on Science* DVD and a free Earth Evolution poster.

Models and Modeling: An Essential Practice of Science (Bio)

(Grades 9–College) C125/126, Convention Center
Sponsor: 3D Molecular Designs & MSOE Center for Bio-Molecular Modeling

Tim Herman (herman@msoe.edu) and **Shannon Colton** (colton@msoe.edu), Milwaukee School of Engineering, Milwaukee, Wis.

Using engaging, interactive models, explore how models and modeling—an authentic practice of science—can help your students understand the basic principles of chemistry that drive proteins to fold into compact shapes, each capable of performing a specific function. Kits and activities bridge to the Next Generation Science Standards.

2:00–3:30 PM Exhibitor Workshop

Physics and Physical Science with Vernier (Phys)

(Grades 7–College) B117/118, Convention Center
Sponsor: Vernier Software & Technology

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

In this hands-on workshop, we will use various digital tools—such as probeware—to conduct experiments from our popular physics and physical science lab books. Use LabQuest Mini with a computer, or LabQuest 2 as a stand-alone device with a computer or wirelessly to iPad and BYOD environments.

3:00–4:30 PM Exhibitor Workshop

Engineer the Tools for Inquiry of Candy Food Dyes (Gen)

(Grades 7–College) A108/109, Convention Center
Sponsor: Bio-Rad Laboratories

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

What's in your candy? In this hands-on workshop, extract colorful food dyes from candy and separate and identify them using a STEM-integrated do-it-yourself electrophoresis box. This inquiry-based activity is a great way to introduce pipetting, electrophoresis, and solution-making skills in addition to chemistry, physics, and engineering concepts.

3:30–4:00 PM Presentation

SESSION 1

Write for an NSTA Journal (Gen)

(General) C122, Convention Center

Ken Roberts, Assistant Executive Director, Journals, NSTA, Arlington, Va.

Learn how to prepare and submit your manuscript for submission to an NSTA journal. Editors will be on hand to critique your article ideas.

3:30–4:30 PM Presentations

SESSION 1

Teaching Essential Science Concepts and Skills: Doing Science, Reading Science, Writing Science, and Talking Science (Gen)

(General) B119, Convention Center

Donna L. Knoell (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.

Emphasis will be placed on the importance of teaching science that mirrors real-world science—accessing information, observing, investigating, drawing conclusions, solving problems, and communicating results. Handouts!

SESSION 2

Researcher Teacher Partnerships: Making Global Climate Change Relevant in the Classroom (Env)

(Middle Level–High School/Supv.) D130, Convention Center

Kari B. O'Connell (kari.oconnell@oregonstate.edu) and **Peder Nelson** (peder.nelson@oregonstate.edu), Oregon State University, Corvallis

Joan Swafford (jswafford08@gmail.com), Jefferson Middle School, Jefferson, Ore.

Presenter: Kari B. O'Connell

Fourteen secondary science teachers participated in a multi-year climate change research project. We will present project results and some of the teaching units they developed.

SESSION 3

Ten Activities to Invigorate Elective Physics Classes (Phys)

(Middle Level–High School) D140, Convention Center

Kim E. Gerber (*kgerber@leyden212.org*), East Leyden High School, Franklin Park, Ill.

These 10 activities can create student interest in your elective physics classes and challenge the minds and creativity of your students.

SESSION 4

NGSS Using a Patterns Approach to Meet the NGSS in Physics (Phys)

(High School) E144, Convention Center

Bradford Hill (*bradford_hill@beaverton.k12.or.us*), Southridge High School, Beaverton, Ore.

Susan Holveck (*susan_holveck@beaverton.k12.or.us*), Beaverton (Ore.) School District

Four patterns are used to help freshmen develop a conceptual, graphical, and symbolic understanding of physics. Join us as we share hands-on inquiry and engineering that engage students.

SESSION 5

Fulbright Teacher Exchange Program (Gen)

(Middle Level–High School) Broadway, DoubleTree

Amy J. Zitzelberger (*amyzitzelberger@gmail.com*), Hazel Park High School, Hazel Park, Mich.

The Fulbright Classroom Teacher Exchange provides opportunities for primary and secondary teachers to exchange positions with colleagues in other countries.

SESSION 6

Teaching Engineering Design to “All” Students Using Robotics (Gen)

(Informal Education) Oregon, DoubleTree

Andy Byerley (*byerleya@newberg.k12.or.us*), Newberg (Ore.) School District

Engage, innovate, and explore the nature of the engineering design process using LEGO MINDSTORMS®.

3:30–4:30 PM Workshops

ACS Middle Level Session: Chemical Change—Breaking and Making Bonds (Chem)

(Middle Level) D133/134, Convention Center

James H. Kessler, American Chemical Society, Washington, D.C.

Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular animations from the free completely developed 5E lessons plans in *middleschoolchemistry.com*.

Let’s Talk Science: Seeding Argumentation (Bio)

(Elementary–Middle Level) D138, Convention Center

Deena Lee Gould (*DNAMartin@cox.net*), Arizona State University, Tempe

How do you begin scientific argumentation in a classroom? A framework for seeding collaborative discourse will be shared around concepts of living and growing.

Spectroscopy: Stairway to the Stars (Earth)

(High School–College) E142, Convention Center

Donna L. Young, NASA/SAO/CXC, Bullhead City, Ariz.

Identify emission lines and calculate temperatures in actual stellar spectra to construct the stellar classification system and correlate with stellar masses and probable evolutionary histories.

What Makes Kids Want to Learn? FOOD! (Bio)

(Middle Level–High School) E143, Convention Center

Laurie A. Hayes (*lhayes@cart.org*), Center for Advanced Research and Technology, Clovis, Calif.

Join me for this hands-on workshop and explore integrating food science and nutrition into your curriculum. Free materials and door prizes!

The Power of STEM Integration (Gen)

(Elementary) E146, Convention Center

Cary I. Sneider (*csneider@pdx.edu*), Portland State University, Portland, Ore.

Engage in a hands-on activity that illustrates how each of the STEM fields complements the others and builds bridges to art, language, and social studies.



ACS Session Six: Acid/Base Reactions: Carbon Dioxide (Chem)*(High School)* Oregon Ballroom 202, Convention Center**Jerry A. Bell** (j_bell@acs.org), American Chemical Society, Washington, D.C.

Aqueous solutions of carbon dioxide, including your blood and the oceans, are essential to life on Earth. Upsetting the acid/base balance of these important solutions can be a matter of life and death. Bring your USB flash drive and take away the presentation and activities to use in your class.

National Earth Science Teachers Association Rock and Mineral Raffle (Earth)*(General)* Oregon Ballroom 203/204, Convention Center**Roberta M. Johnson** (rmjohnsn@gmail.com), NESTA, Boulder, Colo.**Richard M. Jones** (rmjones7@hawaii.edu), University of Hawaii–West Oahu, Kapolei**Wendy E. Van Norden** (wvannorden@hw.com), Harvard-Westlake School, Studio City, Calif.**Pamela Whiffen** (pwpwr@aol.com), NASA Educator Ambassador, Phoenix, Ariz.

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.

Data: It's Not a Four-Letter Word (Gen)*(Middle Level–High School)* Holladay, DoubleTree**Britta Culbertson** (brittaculbertson@gmail.com), 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 your classroom.

Even Before STEM, Science and Math Loved Each Other! (Gen)*(General)* Mt. St. Helens, DoubleTree**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.

Scaffolding Student Success: Collecting Data, Collegiality, and Common Core (Gen)*(High School)* Multnomah, DoubleTree**MaryMargaret Welch** (mmwelch@seattleschools.org) and **Jen B. Fox** (jbfox@seattleschools.org), Seattle (Wash.) Public Schools

Learn how to synthesize guidance from Common Core, the NGSS, high-stakes assessments, and formative assessments to build a cohesive and comprehensive science program for student success.

Ways to STEM-ify Activities from NASA Project Endeavor Fellows (Gen)*(Middle Level–High School)* Weidler/Halsey, DoubleTree**Michael A. Holst** (michaelarthur4@comcast.net), Chehalis (Wash.) School District**Christy L. Wood** (wood.christy@evsd90.wednet.edu), East Valley Central Middle School, Yakima, Wash.**Kim Abegglen** (kim.abegglen@hock.k12.wa.us), Hodgkinson Middle School, Brush Prairie, Wash.

Fellows will share highlights of their training by presenting what and how they STEM-ified specific activities with audience members participating. Future fellowships will be presented.

3:30–4:30 PM Exhibitor Workshop**Integrate Math Modeling and Problem Solving Through Racing** (Phys)*(Grades 6–12)* B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Problem solving and math modeling are learned skills—come learn how to explain them. In this workshop, you'll maximize the power of electric radio-controlled vehicles

through data collection and graphing, and then apply the same process to solve a number of issues professionals face. You'll maximize torque through gearing, apply Newton's laws of motion to get the best handling, and use battery chemistry to explain an effective driving strategy...and you'll take home lessons (learned and in print). This activity is from the new Race Engineering Certifications curriculum module, part of the Ten80 Student Racing Challenge.

3:30–5:30 PM Workshop

Next Generation Science Exemplar PD System (Chem)

(Elementary–High School) D136, Convention Center

Jean Moon, Tidenmark Institute, Damariscotta, Maine

Brian Reiser, Northwestern University, Evanston, Ill.

Sarah Michaels, Clark University, Worcester, Mass.

Presider: Ted Willard (twillard@nsta.org), Program Director, COMPASS, NSTA, Arlington, Va.

The Next Generation Science Exemplar System for Professional Development or NGSX is a web-based, image-rich learning system designed to meet this challenge.

3:30–6:30 PM Meeting

Council for Elementary Science International (CESI) Board Meeting

(By Invitation Only)

Washington, DoubleTree

4:00–5:15 PM Exhibitor Workshops

Exploring Machines (Phys)

(Grades 4–10) A107, Convention Center

Sponsor: K'NEX Education

Presenter to be announced

Bring the excitement of hands-on learning to your middle school classroom! Build and investigate simple machine models, take measurements, and gather data to determine work input, work output, mechanical advantage, gear ratios, effort forces, resistance forces, and more. The exercises and explorations illustrate engineering and scientifically rich content through the use of models. Applying understandings of these models to real-world examples of machines leads to a better understanding of design and systems of machines in practical use. Standards-aligned STEM concepts will guide our exploration.

Hands-On Science with Classroom Critters (Bio)

(Grades K–12) B111/112, Convention Center

Sponsor: Carolina Biological Supply

Carolina Teaching Partner

Here's a surefire boost to your class—live organisms. Whether you use a hands-on curriculum or develop your own lessons, animals broaden students' inquiry-based explorations and increase their interest in science. Participate in fun, simple hands-on activities with bessbugs, pill bugs, termites, and more. Free materials provided.

The Cellular Landscapes of David Goodsell: A Bridge from the Cell to the Molecular World (Bio)

(Grades 9–College) C125/126, Convention Center

Sponsor: 3D Molecular Designs & MSOE Center for Bio-Molecular Modeling

Tim Herman (herman@msoe.edu) and **Shannon Colton** (colton@msoe.edu), Milwaukee School of Engineering, Milwaukee, Wis.

Bridge the microscopic and molecular views of the cell with cellular landscapes that illustrate the size, shape, and distribution of proteins in their natural environment. Science and art coalesce in the vibrant, accurate illustrations. These unique instructional tools will also help you bridge to the Next Generation Science Standards.

5:00–5:30 PM Presentation**SESSION 1****Stoichiometry Made Easy (Chem)***(High School) D140, Convention Center***Maria G. Thurmond**, Peachtree Ridge High School, Suwanee, Ga.

Stoichiometry through dimensional analysis is made easy for all students to learn with the use of a new graphic organizer. Come learn more!

**5:00–6:00 PM Presentations****SESSION 1** (two presentations)*(Elementary/College/Supervision) D137, Convention Center***Bringing Engineering into Elementary Science Methods (Gen)**

Derek Brower, Northwestern College, Orange City, Iowa
Bringing engineering opportunities to an elementary science methods course, this presentation shares the design process with preservice teachers and local students.

Transforming Elementary Schools to a STEM Focus (Gen)

Sharon Angal, Quatama Elementary School, Hillsboro, Ore.

Sandie Grinnell (*grinnels@hsd.k12.or.us*), Hillsboro (Ore.) School District

Leslie Smith Mayfield, Tobias Elementary School, Aloha, Ore.

Janet Rabe (*rabej@hsd.k12.or.us*), Farmington View and Groner Elementary Schools, Hillsboro, Ore.

A network of school districts, local businesses, and higher education partners collaborate to create a STEM/STEAM focus in four Hillsboro elementary schools.

SESSION 2

CCSS Bridging the Literacy Gap: Using Explicit Vocabulary Instruction and Reading Strategies to Improve Literacy in the Middle School Science Classroom (Gen)

(General) E145, Convention Center

Janel M. Reed (*reedj@eaglepnt.k12.or.us*) and **MaryBeth Munroe**, White Mountain Middle School, White City, Ore.

Learn how to seamlessly incorporate vocabulary instruction and reading strategies to improve science literacy and increase meaningful learning in a dynamic science classroom.

SESSION 3**Teaching with Screen-Capture Podcasts (Gen)***(Middle Level–High School) Broadway, DoubleTree*

Wendy E. 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 4**STEM Projects for the Middle School Classroom (Gen)***(Middle Level–High School) Oregon, DoubleTree*

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

Two of the problems with integrating STEM into the science or math classroom are the lack of intentionality and finding great ideas. Examine 8–10 middle school projects incorporating all areas of STEM—in the areas of life, Earth, and physical science. These projects truly incorporate Engineering Design, Application of Technology, Mathematical Skills for Analysis, and the related Science Application. Leave with projects you can use in your classroom.

5:00–6:00 PM Workshops

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

(High School–College) D135, Convention Center

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

Project-based learning 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.

Inquiry in Action: Investigating Matter Through Inquiry (Chem)

(Elementary–Middle Level) D138, Convention Center

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

Conduct simple tests on four identical-looking household liquids to tell them apart. Molecular model animations show why each liquid behaves as it does. Everything is at *www.inquiryinaction.org*.

Inquiry + Technology = Mastery (Chem)

(Middle Level–High School) E141, Convention Center

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

The goal of this workshop is the appropriate use of technology to promote student science inquiry. Learn strategies for teaching a model inquiry-based activity called “Endothermic or Exothermic?”

Engaging Your Students in Scientific Argumentation (Earth)

(General) E142, Convention Center

Sarah Pedemonte (*spedemonte.berkeley.edu*), The Lawrence Hall of Science, University of California, Berkeley
Engaging in argument from evidence is a scientific practice also emphasized in the Common Core. Explore ways to incorporate effective scientific argumentation in your science classroom.

No Engineer Left Inside: Biomimicry in Action (Bio)

(Elementary–High School) E143, Convention Center

Susan R. McWilliams (*smcw@bendcable.com*), Oregon Science Teachers Association, Bend

Mary Hansel (*mary.hansel@pro.biomimicry.net*), Biomimicry Oregon, Portland

Ginny Stern (*ginnyems@yahoo.com*), Sunnyside Environmental School, Portland, Ore.

Explore ways to engage students in inquiry and engineering design through BIOMIMICRY, a new science that studies nature’s designs and processes to solve human problems.

Help! They Need More Skills! (Gen)

(General) Holladay, DoubleTree

Deborah M. Batzer, Mount View Middle School, Marriottsville, Md.

Let me introduce you to a variety of strategies that construct scientific literacy using systematic approaches in reading, writing, and process skills.

Putting It All Together: Developing Connections Between CCSS and the NGSS (Gen)

(General) Mt. St. Helens, DoubleTree

David W. Brothers (*davidbrothers@wentzville.k12.mo.us*) and **Keri Skeeters** (*keriskeeters@wentzville.k12.mo.us*), Wentzville (Mo.) R-IV School District

Join us for engaging activities that reveal the close relationship among the NGSS science and engineering practices, CCSS mathematical practices, and CCSS literacy standards.

NEW!

Introducing NSTA Kids

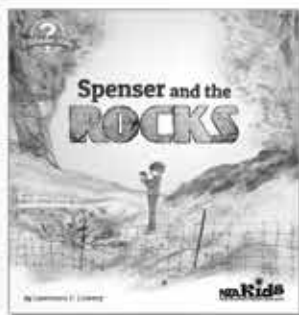


Trade books dedicated to nurturing the wonder and curiosity inherent in young minds

NSTA Kids fills the needs of both teachers and parents by providing lively children's picture books that also impart sound science. Engaging narratives and bold, bright graphics help make science fun and encourage children to curl up with a good book and ask, "Why?"



Prices start at
\$7.96 for members,
\$9.95 for
non-members



To learn more about NSTA Kids and to purchase your copies today, visit www.nsta.org/nstakids

NSTA National Science Teachers Association



—Photo courtesy of Travel Portland

8:00–9:00 AM Presentations

SESSION 1

Closing the Achievement Gap for Middle School STEM Students Through the Lesson Study Process (Gen)

(Middle Level)

B119, Convention Center

Sue Teele (steele@ucx.ucr.edu), University of California, Riverside

Don Krasniak and **Lori Lee** (llee@mvusd.net), Mountain View Middle School, Moreno Valley, Calif.

Presider: Lori Lee

Explore ways to build collaborations with middle school STEM teachers through lesson study. Learn how planning and assessing lessons together facilitates student learning and closes the achievement gap.

SESSION 2

A Districtwide Approach to Science Literacy

(Gen)

(General)

C120/121, Convention Center

Rachael M. Bashor (rachael.bashor@aquarium.org), Oregon Coast Aquarium, Newport

Discover how identifying a local context and resources can drive a districtwide science literacy initiative while supporting student achievement in math and language arts.

SESSION 3

Developing Space Probes for Suborbital Rockets in High School (Earth)

(General)

C122, Convention Center

Jeff Adkins (astronomyteacher@mac.com), Deer Valley High School, Antioch, Calif.

Learn how high school students can build and launch small space probes on suborbital and model rockets.

SESSION 4

PHYSICS FIRST: A Story of Adoption, Implementation, and Evaluation (Phys)

(High School)

D130, Convention Center

Craig E. Bouma (cbouma@loyolahs.edu), Loyola High School of Los Angeles, Calif.

Join us as we tell the story of implementing an inquiry-based Physics First curriculum, evaluating it along the way, and the need for more teachers to do curricular research and share their results.

SESSION 5

CCSS Authentic Writing with Children's Books: Learning Science from Mr. Fluffy Mittens (Gen)

(Middle Level)

D135, Convention Center

Michael W. 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 6

Energy from the Sun: Cycles of Matter and Energy in Ecosystems (Gen)

(Elementary)

D140, Convention Center

Patti O'Malley (patti_omalley@sumnersd.org), Emerald Hills Elementary School, Bonney Lake, Wash.

Don Pruett, Jr. (don_pruett@sumnersd.org), Sumner High School, Sumner, Wash.

This K–4 spiraling unit focuses on the energy from the Sun and connects to various systems such as ecosystems and the water cycle.

8:00–9:00 AM Workshops

Fueling the Future: Energy Interconnections and Sustainable Choices (Gen)

(General)

B116, Convention Center

Dave Wilton (dave@facingthefuture.org), Facing the Future, Seattle, Wash.

Think critically about the science behind the headlines. Experience hands-on lessons that demonstrate the interconnections between energy sources, human choices, economic challenges, and environmental impacts. Free curriculum!

Use Molecules, Energy Transfer, and Microbes to Promote Inquiry and Bridges (Chem)

(Middle Level–High School)

C123, Convention Center

John W. Fedors (jfedors@wavecable.com), Science Activities, Lincoln, Calif.

Discover readily available materials to stimulate inquiry and bridges in science disciplines. Attendees' participation encourages sharing with students and developing your comfort level.

Fruits and Flowers—Exploring Native Plants (Bio)

(Middle Level–High School)

C125/126, Convention Center

Stefni A. Stephens (stefni.stephens@corvallis.k12.or.us), Cheldelin Middle School, Corvallis, Ore.

Help students recognize different parts of native plants by practicing with these hands-on classroom lessons using readily available fruits and flowers.

Student Field Science Investigations Using GIS

(Env)

(General)

D131/132, Convention Center

Tom Butler (tbutler@naturebridge.org), NatureBridge in Olympic National Park, Port Angeles, Wash.

President: Kristen Finck, NatureBridge, Seattle, Wash.

Participants will explore an online Geographic Information Systems to engage students in data collection, analysis, and visualization to communicate authentic science learning experiences.



NSTA Press® Session: Stop Faking It! Finally Understand LIGHT AND SOUND So You Can Teach It

(Phys)

(Elementary–Middle Level)

D136, Convention Center

Bill Robertson (wrobert9@ix.netcom.com), Bill Robertson Science, Inc., Woodland Park, Colo.

Join the author of the *Stop Faking It!* books for activities from the *Light* and *Sound* books. We'll cover color addition and subtraction, interference of light, and sound waves...and you'll learn how to write secret messages. Whoopee!

NGSS Breaking Down Barriers for Middle School Field Investigations (Gen)

(Middle Level)

D137, Convention Center

Charlene Shea and **Meagan Graves** (meagan.graves@vansd.org), Gaiser Middle School, Vancouver, Wash.

Come find out how to identify barriers to field investigation implementation in an urban setting. We'll practice macroinvertebrate identification and water quality testing...and share strategies to overcome issues such as time, money, location, and student motivation.

Dancing Dixie® Cups (Phys)

(Elementary)

D138, Convention Center

Bill Bailey (john_bailey@beaverton.k12.or.us), Beaverton (Ore.) School District

Learn how your students can use circuitry to engineer a simple tool that is capable of drawing patterns. Everyday materials will be used.



8:00–9:00 AM Exhibitor Workshop**Shuffle It Up! Understanding Photosynthesis and Respiration (Bio)***(Grades 9–12)**B113, Convention Center*

Sponsor: LAB-AIDS®, Inc.

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

Students have major misconceptions about photosynthesis and cellular respiration. Explore these topics at the micro (cellular) and macro (ecosystem) levels using a computer simulation and a hands-on activity.

8:00–9:30 AM Exhibitor Workshop**Worm and Squirm Your Way into Behavior Labs (Bio)***(Grades 10–College)**A108/109, Convention Center*

Sponsor: Bio-Rad Laboratories

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

How do genes influence behavior? Use the model organism *C. elegans* (a nematode) to answer this question in an engaging activity that compares normal and mutant worm behavior. We will explore worm taste preferences in a simple and fast chemotaxis assay, and examine the connection of our worm mutant to human diseases. Come see this great alternative to AP fruit fly behavior lab!

8:30–10:30 AM CESI Breakfast**It Makes a Good Story! (M-1)***(Tickets Required; \$37)**Weidler/Halsey, DoubleTree*

Mary Hobbs (*maryhobbs@mail.utexas.edu*), The University of Texas at Austin

Join the Council for Elementary Science International for a buffet breakfast with Mary Hobbs, who has spent the last four years working with university colleagues and a group of 24 teachers-as-researchers

to gather data on what four-year-olds know and can do in science. The teachers often embedded their observations of children in stories and then used those stories as a context for reflection. In the process, they experienced shifts in identities that changed the way they saw themselves as teachers and the way they saw children as learners. Mary weaves a series of stories about children, teachers, and university mentors to illustrate how we became more fully known to ourselves and others and about new possibilities for educational change.

Mary Hobbs is Coordinator for Science Initiatives for the Texas Regional Collaboratives, housed in the Center for STEM Education at The University of Texas at Austin. She earned her doctorate from Texas Tech University in 2004. Mary has taught grades PK–8 and worked as a science specialist and as a school district administrator. Her research focus is on increasing teachers' sense of empowerment via differentiated professional development support.

Tickets, if still available, must be purchased at the Registration Area before 12 Noon on Friday.

8:30 AM–12:30 PM Short Course**Effective Inquiry-based Collaborative High School Science Learning: Implementing POGIL (SC-5)***(High School–College)**Oregon, DoubleTree*

Mare Sullivan (*msullivan@bcsmail.org*) and **Lori Stanton** (*lstanton@bcsmail.org*), Bellevue Christian School, Clyde Hill, Wash.

Michelle Poletski (*poletskim@mewberg.k12.or.us*), Newberg High School, Newberg, Ore.

For description, see page 37.



9:00 AM–12 Noon Exhibits

Exhibit Hall A, 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

Building Community Partnerships for STEM Learning: Class Visits to Student Internships (Gen)

(General) B117/118, Convention Center

Ann F. Wright-Mockler (ann.wrightmockler@pnnl.gov), Pacific Northwest National Laboratory, Richland, Wash.

Emily Blankingship (emily.blankingship@thedeltahighschool.com), Delta High School, Richland, Wash.

Community partnerships are a cornerstone of the student experience at Delta High School. Come learn how we have built community partnerships for classroom visits, field trips, after-school clubs and activities, student internships, and more.

SESSION 2

How Do I Learn? The Adolescent Brain and Learning (Gen)

(Middle Level) B119, Convention Center

Kieran O'Mahony (tko2@u.washington.edu), University of Washington, Seattle

How do I teach students how they learn? Come explore the Challenge Cycle, a learning model based on the “How People Learn” research.

SESSION 3

Engaging Students in Authentic Learning Through Problem-Based Learning Units (Earth)

(General) C122, Convention Center

Barney Peterson (bpeterson@everettsd.org), James Monroe Elementary School, Everett, Wash.

Presider: Gary Popiolkowski (garypoprr33@gmail.com), Chartiers-Houston Junior/Senior High School, Houston, Pa. Develop problem-based learning units that challenge students using basic science understandings and research skills to solve real-world problems. These units are correlated with the NRC *Framework*.

SESSION 4

Increasing Student Mastery Using Small Group Instruction (Gen)

(Middle Level–High School) D130, Convention Center

Mark Dieter (mdieter@newarkunified.org) and **Tom Collett** (tcollett@newarkunified.org), Newark Junior High School, Newark, Calif.

Many students act like they are engaged and learning. Assessment results show that some aren't. Small group instruction is the answer to this common problem.

SESSION 5

NASA/IPAC Teacher Archive Research Program (Earth)

(Middle Level–High School) D133/134, Convention Center

Laura A. Orr, Ukiah High School, Ukiah, Ore.

John C. Gibbs (gibbsj@hds.k12.or.us), Glenoe High School, Hillsboro, Ore.

Holly L. Bensel (hbensel@smschool.us), St. Mary's School, Medford, Ore.

NITARP partners small groups of educators with mentor professional astronomers on original research. Educators incorporate experiences into their classrooms and share experience with other teachers.



SESSION 6

NGSS Using Picture Books for Professional Development on the Next Generation Science Standards (Gen)*(Preschool–Elementary)*

D137, Convention Center

Kirk G. Robbins (*robbinsk2@comcast.net*), Consultant, Bonney Lake, Wash.

Join me as I share specific lessons for using picture books to teach literacy standards, systems concepts, and engineering (design process).

SESSION 7

How to Utilize Informal Science Education Resources in Your Community (Gen)*(Preschool–Middle Level/Informal)*

D140, Convention Center

Brian Berry (*bberry@omsi.edu*), Oregon Museum of Science and Industry, Portland

President: Steve Trita, Oregon Museum of Science and Industry, Portland

Join us as we explore ways that schools can utilize resources from local science museums, both at the museums and in schools and communities.

9:30–10:30 AM Workshops**Engaging in the Crosscutting Concepts (Gen)***(General)*

B116, Convention Center

Mechelle L. LaLanne (*mechellel@ncesd.org*), North Central Educational Service District, Wenatchee, Wash.

This workshop highlights the seven crosscutting concepts through a hands-on experience. Participants will then identify how they can apply these concepts to their own classroom.

Field Investigations: Taking Inquiry Outdoors**(Env)***(Elementary–High School)*

D131/132, Convention Center

Patricia Otto (*tootieotto@comcast.net*), Pacific Education Institute, Olympia, Wash.

This workshop will explore field investigations from types of questions asked about our environment to planning and conducting an investigation and then writing conclusions.

What Is Your Cosmic Connection to the Elements?**(Chem)***(Middle Level–High School)*

C123, Convention Center

Cheryl Niemela, Universities Space Research Association, Puyallup, Wash.

Discover activities and curricula from NASA on the origin of the periodic elements. A workbook, poster, and *Imagine the Universe* DVD are highlighted and given to participants.

CCSS But I Am Not a Reading Teacher! Delivering Common Core ELA Standards in Your Science Classroom**(Gen)***(General)*

D135, Convention Center

Georgia A. Boatman (*gboatman@esd123.org*), Educational Service District 123, Pasco, Wash.**Wendy Whitmer** (*wwhitmer@esd101.net*), Educational Service District 101, Spokane, Wash.

Experience the Common Core State Standards for English Language Arts & Literacy through a science lesson. Learn practical strategies supporting students' ability to meet the rigorous demands of CCSS–ELA while increasing science content understanding.

Maury Project: Great Global Gyres (Earth)*(High School)*

C124, Convention Center

Ken M. Loomis (*kloomis@tahomasd.us*), Tahoma High School, Covington, Wash.

Join me and receive a ready-to-go activity (constructivist approach to learning about global ocean currents) as well as information about the Maury Project.

Questions Are the Key: Taking Inquiry into the Field (Bio)*(Informal Education)*

C125/126, Convention Center

Susan R. McWilliams (*smcw@bendcable.com*), Oregon Science Teachers Association, Bend

K–12 teachers will be introduced to methodologies for conducting field studies using the web-based Encyclopedia of Life, linking science with the Common Core.



NSTA Press® Session: Stop Faking It! Classroom Activities for Energy Concepts (Phys)

(Elementary–High School) D136, 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.

Connect2Science Through Nature (Gen)

(Elementary–Middle Level) D138, Convention Center

Stephanie H. Wagner (stwagner@pdx.edu), Portland State University, Portland, Ore.

Observations of the natural world bridge into incorporation of the science practices, crosscutting concepts, and core ideas into student-centered science lessons.

9:30–10:30 AM Exhibitor Workshop

Breeding Critters (Bio)

(Grades 6–8) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

Here is your opportunity to make the study of genetics more meaningful for students. Join LAB-AIDS for an activity sequence from *Issues and Life Science*, a SEPUP middle school program 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 a person about whether to be tested for Marfan's Syndrome.

10:00–11:30 AM Exhibitor Workshop

Discovering DNA (A Middle School Lab Activity) (Bio)

(Grades 6–8)

A108/109, Convention Center

Sponsor: Bio-Rad Laboratories

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

Introduce your students to the exciting world of DNA science with their own DNA! In this hands-on activity, students use real-world laboratory techniques to extract DNA from their own cheek cells and watch it magically come to life as floating white strands. The DNA is then collected and transferred to a very cool crystal clear plastic helix-shaped necklace that can be kept as a lasting science memory for years to come.

11:00–11:30 AM Presentations

SESSION 1

“Sugar Has A Lot of Fat in It”—Understanding the Logic of Undergraduate Student Conceptions About Biological Molecules (Bio)

(High School–College)

D135, Convention Center

Karen E. Bledsoe (bledsoek@wou.edu), Western Oregon University, Monmouth

This research study uncovered logical structures underlying undergraduate student conceptions of biomolecules, which may explain the persistence of alternative conceptions. Educational implications will be discussed.

SESSION 2

NGSS Elementary Science Teaching: A Path Toward Content Mastery, Confidence, and Competence (Gen)

(Preschool–Middle Level)

D137, Convention Center

Grinell Smith (grinell.smith@sjsu.edu) and **Colette Rabin** (colette.rabin@sjsu.edu), San Jose State University, San Jose, Calif.

Presenter: Grinell Smith

This grassroots, multipronged, entertaining approach to content mastery is designed to help teachers deepen their science understanding, teach using inquiry approaches, and address new standards.

11:00 AM–12 Noon Presentations**SESSION 1****Energy Education—Easy and Effective (Gen)***(General) B117/118, Convention Center***Ken Crawford** (*powerwheel@comcast.net*) and **Roy Bentley**, R.B. MFG US INC., Bellingham, Wash.

Presider: Roy Bentley

Teaching about energy is not only important, it is easy to do with the right information and tools.

SESSION 2**High-Stakes Assessment Practice Made Easy Using Google Forms (Gen)***(General) C120/121, Convention Center***Susan Stansberry** (*stansberrys@edmonds.wednet.edu*), Meadowdale Middle School, Lynnwood, Wash.**Dana Marsden** (*marsdend@edmonds.wednet.edu*), Edmonds School District, Lynnwood, Wash.

Create multiple practice assessment opportunities using Google forms to improve student achievement on high-stakes state assessments. Student performance data are quick, timely, and easily obtained.

SESSION 3 (two presentations)*(Middle Level–College) C122, Convention Center***Elevating Climate Change Across Science Education (Earth)****Paul Ruscher** (*ruscherp@lanec.edu*), Lane Community College, Eugene, Ore.

This session hopes to illustrate how climate change can be an appropriate means to effectively instilling deep thinking in life, physical, and Earth sciences classes.

Using Google Earth in the Classroom (Earth)**Wendy E. Van Norden** (*wvannorden@hw.com*), Harvard-Westlake School, Studio City, Calif.

Join me for an introduction to basic uses of Google Earth. I'll demonstrate techniques such as adding placemarks, pictures, overlays, and polygons...and creating lessons. Examples of Earth Science Google Earth exercises will be highlighted.

SESSION 4**Diagnoser.com: A Collection of Diagnostic Assessments and Next-Day Activities (Phys)***(Middle Level–College) D130, Convention Center***Eric Magi**, Spokane (Wash.) Public Schools**Jim Minstrell** (*jimminstrell@facetinnovations.com*), FACET Innovations, Seattle, Wash.**Adam Schmierer** (*adam.schmierer@evergreenps.org*), Union High School, Vancouver, Wash.

Presider: Jim Minstrell

We will demonstrate Facets of Thinking and *Diagnoser.com* as they apply to student learning associated with NGSS MS-PS2 Motion and Stability: Forces and Interactions.**SESSION 5****Your Students Stuck Inside? No Problem; Bring the Outside In! (Env)***(Elementary) D140, Convention Center***José M. Rios** (*jrios@u.washington.edu*), University of Washington, Tacoma

Bad weather outside? No problem! Come learn how to make and use Environmental Education (EE) Centers that address important NGSS content and inquiry skills.



11:00 AM–12 Noon Workshops

Elements of Science Instruction and Common Instructional Frameworks (Gen)

(General)

B116, Convention Center

Jeff Ryan, Olympic Educational Service District, Bremerton, Wash.

Cheryl Lydon (claydon@psesd.org), Puget Sound Educational Service District, Renton, Wash.

Explore how quality science instruction plays out in commonly used instructional frameworks, including Marzano, Danielson, and CEL-5D supporting understanding of the NGSS in quality instruction.

The Hidden Lives of Galaxies (Earth)

(Middle Level–High School)

C123, Convention Center

Cheryl Niemela, Universities Space Research Association, Puyallup, Wash.

Come discover activities and curricula from NASA that uncover new information about galaxies. A workbook, poster, and *Imagine the Universe* DVD are highlighted and given to participants.

Rolling on the River: Real Data in Real Time (Chem)

(Middle Level–High School)

C124, Convention Center

Sheree J. Watson and **Nieviata Bueno Watts** (buenowat@ohsu.edu), Oregon Health & Science University, Beaverton

Presenter: Nieviata Bueno Watts

Bridge biology, geology, chemistry, technology, engineering, and math through the use of real data collected continuously in the Columbia River by scientific sensors. Bring a laptop.

Integrating Bioinformatics into Introductory Biology Courses (Bio)

(High School–College)

C125/126, Convention Center

Jeanne T. Chowning (jchowning@nwabr.org), Northwest Association for Biomedical Research, Seattle, Wash.

Learn how to integrate basic bioinformatics concepts and tools into introductory biology classrooms using a case study about genetic testing for breast cancer.

Freshwater Bugs—ID to Inquiry (Env)

(Informal Education)

D131/132, Convention Center

Michael Clapp (clapp.michael@battlegroundps.org), CAM Academy, Battle Ground, Wash.

Keith Johnson (keith.johnson@evergreenps.org), Shahala Middle School, Vancouver, Wash.

Judy Bufford (aquabuff@comcast.net), City of Vancouver, Wash.

Presenter: Peter Ritson, The Southwest Washington Amphibian Monitoring Project, Portland, Ore.

Engage students in learning about invertebrate biology and stream ecology by collecting, identifying, and analyzing the diversity of bugs found in freshwater streams and ponds.

Still Yet Another Better Way to Scale the Universe (Earth)

(Informal Education)

D133/134, Convention Center

Jeff Adkins (astronomyteacher@mac.com), Deer Valley High School, Antioch, Calif.

Come see two new methods of translating the scale of the universe using powers of 1,000 and by translating distance into time. Free NASA materials!



NSTA Press® Session: Classroom Activities for *Stop Faking It: Force and Motion* (Phys)

(Elementary–High School)

D136, 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 and 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. Lame jokes quite possible.

What Can We Learn at the Pond? A Model for Engaging Students in Scientific Inquiry (Bio)

(Elementary)

D138, Convention Center

Virginia D. Bourdeau (virginia.bourdeau@oregonstate.edu), Oregon State University, Salem

Harness students' curiosity about nature with a learner-friendly Inquiry Flowchart that guides them to apply their current knowledge to ask questions and design inquiry experiences.

11:00 AM–12 Noon Exhibitor Workshop

Fast and Furious—Measuring Speed (Phys)

(Grades 6–8) B113, Convention Center

Sponsor: LAB-AIDS®, Inc.

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

In this activity from the SEPUP middle level series *Issues and Physical Science*, which explores Newton's laws in a context of motor vehicle safety, participants are challenged to design an investigation to measure the speed of a moving cart as a function of its release point from a curved ramp. Participants will carry out the experiment, discuss the role of speed in automobile collisions, and conclude by examining distance versus motion graphs.

1:00–4:00 PM Special Session

Professional Development for Oregon Educators

(By Invitation Only) Multnomah/Holladay Room, DoubleTree

Cheryl Kleckner, Education Specialist, Oregon Dept. of Education, Portland

Page Keeley, 2008–2009 NSTA President, Jefferson, Maine

Cary Sneider, Portland State University, Portland, Ore.

Join Oregon science educators and administrators for a customized professional development experience designed to support the teaching and learning of the Next Generation Science Standards in support of the Common Core State Standards and the Oregon Science Standards.





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

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

Look for a map display of the exhibit hall.

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Washington, DC 20036 K-12, College
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Website: www.acs.org

The American Chemical Society (ACS) is the world's largest scientific society. ACS will exhibit textbooks, reference materials, videos, and other materials to supplement the K-12 and college curriculum. ACS will also provide information on programs for students and teachers.

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E-mail: mikelee@americanlabdesign.com

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CASE develops curricula utilizing science inquiry for lesson foundation, and concepts are taught using activity-, project-, and problem-based instructional strategies. In addition to the curriculum aspect of CASE, the project ensures quality teaching by providing extensive professional development for teachers that leads to certification.

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The Cornell Lab of Ornithology, BirdSleuth #519
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 E-mail: customerservice.cpo@schoolspecialty.com
 Website: www.cposcience.com

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

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 80 Northwest Blvd. PreK–8
 Nashua, NH 03063
 Phone: 800-258-1302
 E-mail: customerservice.delta@schoolspecialty.com
 Website: www.deltaeducation.com

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

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 PO Box 690328 PreK–12, College
 San Antonio, TX 78269
 Phone: 800-993-4624
 E-mail: sara@dinah.com
 Website: www.dinah.com

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

Exhibitors

The DuPont Challenge #921
200 Powder Mill Rd. B, C, EA, G, PH, T
Wilmington, DE 19880
Phone: 302-695-2554
E-mail: thechallenge@dupont.com
Website: thechallenge.dupont.com

The DuPont Challenge Science Essay Competition is the premier science competition in North America. Science teachers who are closely involved and who guide their classes through the process produce the most successful entries. So get your students thinking, researching, and writing about our world's most pressing challenges, or exploring improvements in any area of STEM. More than \$100,000 in cash awards, trips, and exclusive tours...and teachers win, too!

Ecology in Classrooms and Outdoors (ECO) #205
4245 SE Milwaukie Ave.
Portland, OR 97202
Phone: 503-367-8920; 503-680-2389
E-mail: info@ecologyoutdoors.org
Website: www.ecologyoutdoors.org

ECO is a Portland-based nonprofit that aims to connect students to nature through exploration of local ecology. We do this by visiting individual elementary school classrooms and presenting a series of hands-on ecology activities. Our scientists lead outside activities and often facilitate student-led service-learning projects on school grounds.

eCYBERMISSION #918
1840 Wilson Blvd. B, C, EN, G, PH, T
Arlington, VA 22201 6-9
Phone: 703-312-9360
E-mail: swhitsett@nsta.org
Website: www.ecybermission.com

eCYBERMISSION is a free, online STEM competition for students in grades 6-9. Students choose a problem that affects their community and solve it using scientific practices or engineering design. eCYBERMISSION is sponsored by the U.S. Army and managed by NSTA.

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1536 N.E. Saratoga St.
Portland, OR 97211
Phone: 503-380-4140
E-mail: rick@engagingeverystudent.com
Website: www.engagingeverystudent.com

Informed by years of classroom experience, we foster active, visual, technology-rich, and environmentally aware learning. For example, *The EverGreen Twins Activity Book* and *Marco the Molecule* integrate key standards in enjoyable ways. Led by Rick Reynolds, we also offer training/consulting and create custom e-learning resources, curriculum guides, and websites.

Environmental Education Association of Oregon (EEO) #203
PO Box 66014
Portland, OR 97290
Phone: 503-380-4140 (Rick Reynolds)
E-mail: admin@eeao.org
Website: www.eeao.org

EEO leads and supports initiatives such as the Oregon Environmental Literacy Plan and No Oregon Child Left Inside that advance the role of environmental education in achieving student success and improving our environment. By fostering partnerships with key stakeholders, we promote a vision for engaged students and a healthy, sustainable environment.

Equal Exchange #1002
50 United Dr.
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Phone: 774-776-7335
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500 NE Captain Michael King Smith Way
K-8
McMinnville, OR 97128
Phone: 503-434-4185
E-mail: scott.mcguyer@sprucegoose.com
Website: www.evergreenmuseum.org

Evergreen Aviation & Space Museum will have information on our education programs, including STEM Activities, Footlocker History, Homeschool, Scouting, and more. We have original space and Cold War artifacts as well as 130 airplanes! We also have Oregon's only educational waterpark!

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Charlottesville, VA 22902
Phone: 866-882-4141
E-mail: sales@explorelearning.com
Website: www.explorelearning.com

ExploreLearning develops online solutions to improve student learning in math and science. ExploreLearning Gizmos are the world's largest library of interactive, online simulations for math and science in grades 3-12. ExploreLearning Reflex (www.reflexmath.com) is the most powerful solution available for math fact fluency.

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200 Bedford St.
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Phone: 503-481-5982
E-mail: debbie.kerr@oregonfirst.org
Website: www.usfirst.org

Our mission is to inspire young people to be science and technology leaders by engaging them in exciting mentor-based programs that build science, engineering, and technology skills; inspire innovation; and foster well-rounded life capabilities, including self-confidence, communication, and leadership.

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Phone: 800-225-3739
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Frey Scientific offers a complete line of supplies, equipment, technology, and lab design services for grades K-12. Among its secondary-level supplemental science curriculum offerings, Inquiry Investigations® and iNeo/SCI® are proven to support student achievement through hands-on and virtual lab experiences.

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Portland, OR 97282
Phone: 503-257-1774
E-mail: kim@friendsofoutdoorschool.org
Website: www.FriendsofOutdoorSchool.org

Friends of Outdoor School is dedicated to preserving the Outdoor School (ODS) experience for all Oregon students regardless of a student's ability, experience, income, or family background.



Exhibitors

Friends of Tryon Creek #203
 11321 SW Terwilliger Blvd.
 Portland, OR 97219
 Phone: 503-636-4398
 E-mail: matthew@tryonfriends.org
 Website: www.tryonfriends.org

The Friends of Tryon Creek's (FOTC) mission is to connect people to this important natural area, share our passion for the wonders of nature, and inspire environmental stewardship in all. FOTC strives to fulfill this mission by offering innovative and inspiring educational and stewardship programs.

The Fulbright Program #1005
 1400 K St. NW, Suite 700 PD
 Washington, DC 20005 1-12
 Phone: 202-326-7689
 E-mail: mhug@iie.org
 Website: eca.state.gov/fulbright/information/teachers

The Fulbright Program is pleased to inform teachers about available overseas opportunities.

Grand Classroom #503
 1455 E. Rio Rd. B, EA, EN
 Charlottesville, VA 22901 5-12
 Phone: 434-466-5821
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Grand Classroom provides educational student travel to the Grand Canyon; Washington, D.C.; and many national parks. These worry-free tours emphasize safety and fun. Grand Classroom provides superior customer service and numerous benefits for educators, including free travel.

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 Website: www.exploringrobotics.com

We offer a comprehensive curriculum for rigorous STEM learning through robotics in an easy-to-teach format with minimal expertise required. We cover the principles of electronics, electricity, physics, motion and logic programming, and other STEM and core curriculum topics. Robots include Parallax Boe-Bot and Scribbler, Fritz, and other educational kits.

It's About Time #609
 333 N. Bedford Rd. B, C, EA, EN,
 Mount Kisco, NY 10549 G, PH, PD, T
 Phone: 914-273-2233 6-12, College
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 Website: www.iat.com

It's About Time is a leading educational publisher of middle and high school inquiry-based science and math programs supported by the National Science Foundation. Our challenge-driven programs increase student achievement because they motivate and engage and develop critical thinking. Students gain the skills to work collaboratively and the ability to apply what they have learned.

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 Website: www.kidwind.org

The KidWind Project is a team of teachers, engineers, and scientists committed to innovative energy education. Our goal is to promote the elegance of wind power through affordable tools and training programs that challenge, engage, and inspire students of all ages.

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Mountain Home Biological is a family-owned science supply business located in the beautiful Columbia River Gorge of Washington State. We serve schools, students, science professionals, and home enthusiasts with a broad array of competitively priced products. Our focus is on customer care and quality products at a fair price.

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 Milwaukee, WI 53202-3109
 Phone: 414-277-7529
 Website: <http://cbm.msoe.edu>

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The Museum of Flight #1007
 9404 E. Marginal Way South EA, G, PH,
 Seattle, WA 98108 PD, T
 Phone: 206-764-5700 PreK–12, College
 Website: www.museumofflight.org

The Museum of Flight in Seattle offers aerospace education programs to preK–12 children, as well as professional development for teachers. Various programs are offered every day of the week, both at the museum and as outreach programs that can be brought to your location.

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 4825 Stoddard Rd. B, C, EA, EN, G, PH
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National Geographic Learning provides quality preK–12, academic, and adult education instructional solutions for reading, writing, science, social studies, ESL/ELD, and Spanish/Dual language.

Exhibitors

National Nanotechnology Infrastructure Network #316
B, C, EN, G, PH, PD
Georgia Institute of Technology
791 Atlantic Dr. NW K-12, College
Atlanta, GA 30332
Phone: 404-385-4307
E-mail: nancy.healy@mirc.gatech.edu
Website: www.nnin.org

The National Nanotechnology Infrastructure Network is an integrated partnership of 14 user facilities, supported by NSF, providing opportunities for nanotechnology research. In addition, we offer a large and varied education program that includes teacher resources (online and in print) and workshops—all standards based. We also have a children's magazine, *Nanooze*.

NatureBridge #719
111 Barnes Point Rd. B, EA, EN, G, PD
Port Angeles, WA 98363 K-12
Phone: 360-928-3720
E-mail: efoster@naturebridge.org
Website: www.naturebridge.org/olympic-national-park

NatureBridge is a nonprofit organization providing experiential and inquiry-based science education that immerses youth in the natural environment while enhancing school-based curriculum. Stop by our booth and get hands-on experience with an Elwha River model highlighting issues of dam removal, instructions to build inexpensive field science tools, and lesson plans for schoolyard investigations.

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E-mail: seangarrick@nics.org
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NewPath Learning #710
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E-mail: kgelke@newpathlearning.com
Website: www.newpathlearning.com

NewPath's Curriculum Mastery Games, Flip Charts, IWB Software, and Visual Learning Guides provide comprehensive coverage of the NGSS and current state standards for Early Childhood–Grade 12 science. We also offer a unique Online Learning Program at www.newpathlearning.com with ready-to-use lessons and tools/templates to develop and deliver custom lessons.

NGSS@NSTA #912
1840 Wilson Blvd. G, PD
Arlington, VA 22201 K-12, College
E-mail: ngss@nsta.org
Website: ngss.nsta.org

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

NOAA Office of Education #901
1401 Constitution Ave. NW B, EA, EN, G
Washington, DC 20230 3-12, College
Phone: 301-713-1208
E-mail: education@noaa.gov
Website: www.education.noaa.gov

NOAA is a federal science agency providing free information to educators about weather, climate, oceans, coasts, satellite data, solar weather, and fisheries. Everyday, NOAA's science touches the lives of all Americans. In partnership with NSTA, NOAA supports and develop a suite of products for the science classroom.

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Website: www.ecybermission.com

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Website: www.nsta.org/cse

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

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 16 awards programs for science teachers, K–College, such as the **Shell Science Lab Challenge**, which provides science laboratory equipment and professional development support to winning teachers from middle schools and high schools with limited resources. Learn how to win a \$20,000 lab makeover support package.

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- **Toshiba/NSTA ExploraVision**® is a team-based K–12 student competition that awards up to \$240,000 in savings bonds; trips to Washington, D.C.; Toshiba Tablets for teachers; and other great prizes every year.
- **THE DUPONT CHALLENGE**® Science Essay Competition for grades 7–12 students awards cash prizes and an all-expenses-paid trip to Disney World® and the Kennedy Space Center.
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NSTA National Science Teachers Association

Exhibitors

Northwest Aquatic and Marine Educators #1012
B, C, EA, EN, G, PD
9510 2nd Ave. NW K-12, College
Seattle, WA 98117
E-mail: nw.aquatic.marine@gmail.com
Website: www.pacname.org

The Northwest Aquatic and Marine Educators (NAME) is a “family” of educators passionate about oceans and watersheds. We believe in the magic of the world of water and its ability to facilitate learning. NAME holds an annual summer conference and local professional development opportunities for formal and nonformal educators.

The NSTA John Glenn Center for Science Education #908
1840 Wilson Blvd.
Arlington, VA 22201
Phone: 703-312-9203
E-mail: cse@nsta.org
Website: www.nsta.org/cse

NSTA's has embarked on a \$43 million national campaign to make excellence in science teaching and learning a reality for all U.S. students. 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.

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NSTA Professional Programs #917
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Arlington, VA 22201
Phone: 703-312-9206
E-mail: dblondonville@nsta.org
Website: www.nsta.org/conferences

The NSTA Professional Development (PD) Department supports science educators through a variety of professional opportunities tailored to their specific needs. The Learning Center is NSTA's professional learning portal designed to address your classroom needs and busy schedule. Visit our booth to learn more about the professional learning tools that are available to personalize, manage, and document your learning growth.

Nutrients for Life Foundation #813
425 Third St. SW, Suite 950 B, EA, EN, G
Washington, DC 20024 1-12
Phone: 202-731-4365
E-mail: jburatowski@nutrientsforlife.org
Website: www.nutrientsforlife.org

Nutrients for Life Foundation is an nonprofit education association that provides information and resources to educators and the public about the vital role fertilizers play in feeding our world. The Foundation offers free soil science education materials for elementary, middle school, and high school educators.

OHAUS Corp. #509
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Phone: 971-673-2944
E-mail: info@ofri.org
Website: www.LearnForests.org

The Oregon Forest Resources Institute was created in 1991 by the Oregon Legislature to improve public understanding of the state's forest resources and encourage environmentally sound forest management through landowner education. It is governed by a 13-member board of directors and is funded by a dedicated tax on timber harvest.

Oregon Health & Science University #213
3181 SW Sam Jackson Park Rd.
Portland, OR 97239
Phone: 503-494-9000
E-mail: scied@ohsu.edu
Website: www.ohsu.edu

Oregon Health & Science University is a nationally prominent research university and Oregon's only public academic health center. It educates health professionals and scientists and provides leading-edge patient care, biomedical research, and community and education services to make an impact locally and around the globe.

Oregon Museum of Science and Industry #209
1945 SE Water Ave.
Portland OR 97214
Phone: 503-797-4000
E-mail: info@omsi.edu (general) or register@omsi.edu (teachers can register for programs)
Web: www.oms.edu

The Oregon Museum of Science and Industry (OMSI) is a scientific, educational, and cultural resource center dedicated to improving the public's understanding of science and technology. OMSI makes science exciting and relevant through exhibits, programs, and experiences that are presented in an entertaining and participatory fashion.

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 505 NW 185th Ave. 5–12, College
 Beaverton, OR 97006
 Phone: 503-690-5201
 E-mail: gordoni@ohsu.edu
 Website: www.ohsu.edu/onprc

We will feature programs and opportunities that teachers and students will find at the Oregon National Primate Research Center. Information about tours, the speakers' bureau, and apprenticeships will be available, as well as curricular materials supporting an exciting new organization approach for a high school-level biology course.

Oregon State University #315
 College of Engineering G, PD, T
 151 Batcheller Hall 1–12
 Corvallis, OR 97333
 Phone: 541-737-9699
 E-mail: ellen.momsen@oregonstate.edu
 Website: oregonstate.edu/precollege

Stop by for information on K–12 outreach programs at Oregon State University.

Oregon State University Ecampus #317
 4943 The Valley Library B, C, G, PH
 Corvallis, OR 97331 9–12, College
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 OSUP 121 The Valley Library B, EN
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 E-mail: micki.reaman@oregonstate.edu
 Website: osupress.oregonstate.edu

The Taylor Trade Publishing Long Term Ecological Research series seeks to engage children and their families in learning about Earth's ecosystems. Oregon State University Press presents *Ellie's Log* and companion teacher's guide and website, which combines science and storytelling to engage young readers in observing and recording the natural world.

Oregon Zoo #201
 4001 SW Canyon Rd.
 Portland, Oregon 97221
 Phone: 503-220-5774
 E-mail: alison.heimowitz@oregonzoo.org
 Website: www.oregonzoo.org

The Oregon Zoo is a service of Metro and is dedicated to its mission of inspiring the community to create a better future for wildlife. Committed to conservation, the zoo is currently working to save local endangered and threatened species, and its award-winning education programs serve more than 500,000 people a year throughout the region.

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 Portland, OR 97212 K–12, College
 Phone: 503-475-1507
 E-mail: tina@obdk.com
 Website: www.obdk.com

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 Website: www.peytonstafford.com

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 Phone: 620-231-0000
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 Website: www.pitsco.com

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Portland Metro STEM Partnership #211
 18624 NW Walker Rd. (Entrance B)
 Beaverton, OR 97006
 E-mail: collaboratory@pdxstem.org
 Website: www.pdxstem.org

The Portland Metro STEM Partnership (PMSP) is a regional collaboration of public and private organizations with a shared goal of transforming Science, Technology, Engineering, and Mathematics (STEM) education for K–12 students. The PMSP Teacher's Academy provides high-quality, research-based, STEM-focused professional development opportunities to Portland area teachers.

Project Learning Tree #302
 1111 19th St. NW, Suite 708 EN, PD
 Washington, DC 20036 PreK–12
 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.

Qwizdom USA HQ #304
 12617 Meridian East G, T
 Puyallup, WA 98373 1–12, College
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 E-mail: info@qwizdom.com
 Website: www.qwizdom.com

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 50 Washington St. G, PD, T
 Norwalk, CT 06854 K–8
 Phone: 917-517-0944
 E-mail: astrizich@sangariglobaled.com
 Website: www.sangariglobaled.com

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 Phone: 904-225-5558 K-12, College
 E-mail: info@sciencefirst.com; halbrecht@starlab.com
 Website: www.sciencefirst.com; www.starlab.com

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 Website: www.shapeoflife.org

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The Seattle Times Newspapers #810
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Shell Science Lab Challenge #910
 1840 Wilson Blvd. B, C
 Arlington, VA 22201 6-8
 Phone: 305-748-1608
 E-mail: mwarsame@nsta.org
 Website: www.nsta.org/shellsciencelab

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Challenge EN, G
 One Discovery Place K-12
 Silver Spring, MD 20910
 E-mail: wecanchange@discovery.com
 Website: www.wecanchange.com

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 Minnetonka, MN 55305 PH, T
 Phone: 877-290-8256 1-12, College
 E-mail: mgoodman@simcur.com
 Website: www.simulationcurriculum.com

Simulation Curriculum is a leading developer of interactive Earth, space, geography, and climate curricula for K-12 and college.

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 Englewood, CO 80112 K-12
 Phone: 303-948-4247
 E-mail: grimes@smenet.org
 Website: www.mineralseducationcoalition.org

The Minerals Education Coalition reflects the Society for Mining, Metallurgy, and Exploration's 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.

SOLVE #201
 2000 SW 1st Ave., Suite 400
 Portland, OR 97201
 Phone: 503-844-9571
 E-mail: info@solveoregon.org
 Website: www.solveoregon.org

SOLVE is a nonprofit organization that brings together individuals, business groups, and service and conservation groups through volunteering and education to restore our natural spaces and take good care of Oregon. Our mission is to bring Oregonians together to improve our environment and build a legacy of stewardship.

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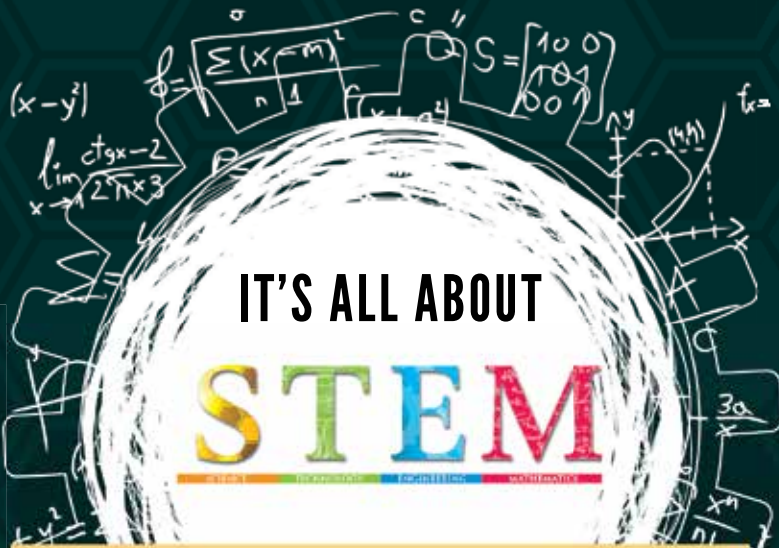
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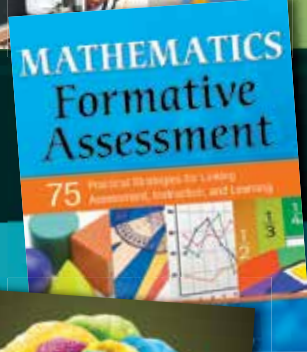
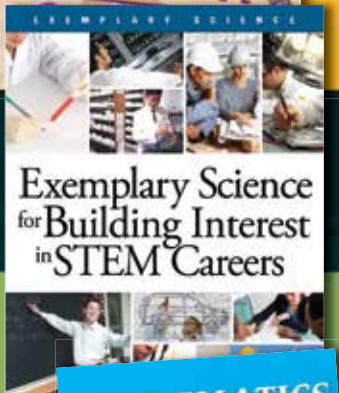
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3D Molecular Designs, LLC & MSOE Center for BioMolecular Modeling (Booth #414)

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| Friday, October 25 | 2:00–3:15 PM | C125/126, Conv. Center | Models and Modeling: An Essential Practice of Science (p. 95) |
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| Friday, October 25 | 10:00–11:15 AM | C124, Conv. Center | HHMI's <i>The Making of the Fittest: Got Lactase? The Co-evolution of Genes and Culture</i> (p. 82) |
| Friday, October 25 | 12 Noon–1:15 PM | C124, Conv. Center | HHMI's <i>The Making of the Fittest: Evolving Switches, Evolving Bodies</i> (p. 86) |
| Friday, October 25 | 2:00–3:15 PM | C124, Conv. Center | Free Resources to Teach Deep Earth History, Paleoclimate, and Climate Change (p. 94) |

It's About Time (Booth #609)

| | | | |
|--------------------|------------------|--------------------|--|
| Friday, October 25 | 8:00–9:00 AM | A105, Conv. Center | Merging the Three Dimensions of the Next Generation Science Standards (p. 73) |
| Friday, October 25 | 9:30–10:30 AM | A105, Conv. Center | Engineering in the Next Generation Science Standards (p. 80) |
| Friday, October 25 | 11:00 AM–12 Noon | A105, Conv. Center | Bringing Technology into Your STEM Classroom (p. 85) |
| Friday, October 25 | 12:30–1:30 PM | A105, Conv. Center | Active Physics—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (p. 90) |
| Friday, October 25 | 2:00–3:00 PM | A105, Conv. Center | Active Chemistry—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (p. 94) |

K'NEX Education (Booth #411)

| | | | |
|----------------------|-----------------|--------------------|---|
| Thursday, October 24 | 8:00–9:15 AM | A107, Conv. Center | DNA Replication and Transcription (p. 46) |
| Thursday, October 24 | 10:00–11:15 AM | A107, Conv. Center | Exploring Machines (p. 49) |
| Thursday, October 24 | 12:30–1:45 PM | A107, Conv. Center | Forces, Energy, and Motion (p. 56) |
| Thursday, October 24 | 2:15–3:30 PM | A107, Conv. Center | Renewable Energy (p. 61) |
| Thursday, October 24 | 4:00–5:15 PM | A107, Conv. Center | Introduction to Simple Machines (p. 66) |
| Friday, October 25 | 8:00–9:15 AM | A107, Conv. Center | Forces, Energy, and Motion (p. 73) |
| Friday, October 25 | 10:00–11:15 AM | A107, Conv. Center | Renewable Energy (p. 81) |
| Friday, October 25 | 12 Noon–1:15 PM | A107, Conv. Center | Introduction to Simple Machines (p. 86) |
| Friday, October 25 | 2:00–3:15 PM | A107, Conv. Center | DNA Replication and Transcription (p. 94) |
| Friday, October 25 | 4:00–5:15 PM | A107, Conv. Center | Exploring Machines (p. 98) |

LAB-AIDS®, Inc. (Booth #713)

| | | | |
|----------------------|------------------|--------------------|---|
| Thursday, October 24 | 8:00–9:15 AM | B113, Conv. Center | Mastering the Chemical Formula: An Effective Way to Teach Subscripts and Coefficients (p. 47) |
| Thursday, October 24 | 9:30–10:30 AM | B113, Conv. Center | Investigating Stem Cell Differentiation (p. 48) |
| Thursday, October 24 | 11:00 AM–12 Noon | B113, Conv. Center | Hot Bulbs: Investigating Energy Efficiency (p. 51) |

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LAB-AIDS®, Inc., cont.

| | | | |
|----------------------|------------------|--------------------|--|
| Thursday, October 24 | 12:30–1:45 PM | B113, Conv. Center | Using Climate Proxies to Learn About Earth’s Climate History (p. 56) |
| Thursday, October 24 | 2:00–3:00 PM | B113, Conv. Center | Waves, Energy, and Color (p. 60) |
| Thursday, October 24 | 3:30–4:30 PM | B113, Conv. Center | Integrate Math Modeling and Problem Solving Through Racing (p. 65) |
| Friday, October 25 | 8:00–9:15 AM | B113, Conv. Center | Distillation: Simple and Fascinating Experiments in the Chemistry of Aromas and Smells (p. 74) |
| Friday, October 25 | 9:30–10:30 AM | B113, Conv. Center | Biomes and Invasive Species (p. 80) |
| Friday, October 25 | 11:00 AM–12 Noon | B113, Conv. Center | Comparing Earth to Other Worlds (p. 85) |
| Friday, October 25 | 12:30–1:30 PM | B113, Conv. Center | Genetics—From Counselor to Genetic Engineer (p. 90) |
| Friday, October 25 | 2:00–3:00 PM | B113, Conv. Center | Using the Engineering Design Process to Understand Heat (p. 94) |
| Friday, October 25 | 3:30–4:30 PM | B113, Conv. Center | Integrate Math Modeling and Problem Solving Through Racing (p. 97) |
| Saturday, October 26 | 8:00–9:00 AM | B113, Conv. Center | Shuffle It Up! Understanding Photosynthesis and Respiration (p. 105) |
| Saturday, October 26 | 9:30–10:30 AM | B113, Conv. Center | Breeding Critters (p. 108) |
| Saturday, October 26 | 11:00 AM–12 Noon | B113, Conv. Center | Fast and Furious—Measuring Speed (p. 111) |

LaMotte Co. (Booth #904)

| | | | |
|----------------------|--------------|--------------------|--|
| Thursday, October 24 | 2:15–3:30 PM | C124, Conv. Center | Take a Swipe at Microbes! (p. 62) |
| Thursday, October 24 | 4:00–5:15 PM | C124, Conv. Center | AP Environmental Water Quality Assessment Curriculum (p. 67) |
| Friday, October 25 | 8:00–9:15 AM | C124, Conv. Center | Stream Ecology: Slimy Leaves for Clean Streams (p. 75) |

LEGO Education (Booth #504)

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|--------------------|----------------|------------------------|---|
| Friday, October 25 | 10:00–11:15 AM | C120/121, Conv. Center | There’s a New Robot in Class! LEGO® MINDSTORMS® Education EV3 in Your Classroom (p. 81) |
|--------------------|----------------|------------------------|---|

NewPath Learning (Booth #710)

| | | | |
|--------------------|--------------|------------------------|--|
| Friday, October 25 | 8:00–9:15 AM | B114/115, Conv. Center | Integrating Online Learning into the Science Classroom (p. 74) |
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PASCO scientific (Booth #701)

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|--------------------|-----------------|------------------------|--|
| Friday, October 25 | 8:00–9:15 AM | A103/104, Conv. Center | PASCO’s SPARKscience for High School Students—Free Starter Kits for Attendees! (p. 73) |
| Friday, October 25 | 10:00–11:15 AM | A103/104, Conv. Center | PASCO’s SPARKscience for K–8 Students—Free Starter Kits for Attendees! (p. 81) |
| Friday, October 25 | 12 Noon–1:15 PM | A103/104, Conv. Center | PASCO’s SPARKscience for High School Students—Free Starter Kits for Attendees! (p. 86) |

Pearson (Booth #709)

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|----------------------|----------------|--------------------|--|
| Thursday, October 24 | 8:00–9:15 AM | A105, Conv. Center | Updating Earth and Space Science for Middle and High School in the New World of the NGSS (p. 46) |
| Thursday, October 24 | 10:00–11:15 AM | A105, Conv. Center | Economical, Efficient, and Effective Inquiry in Chemistry (p. 49) |
| Thursday, October 24 | 12:30–1:45 PM | A105, Conv. Center | Problem-Based Learning in the Classroom (p. 55) |
| Thursday, October 24 | 2:15–3:30 PM | A105, Conv. Center | Reflecting on Engineering Design (p. 60) |
| Thursday, October 24 | 4:00–5:15 PM | A105, Conv. Center | Science Under Siege? Teaching Evolution (and Global Warming) in a Climate of Controversy (p. 66) |

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Sangari Active Science (Booth #301)

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|----------------------|----------------|--------------------|--|
| Thursday, October 24 | 10:00–11:15 AM | C123, Conv. Center | Applying Common Core State Standards for English Language Arts Through Active Science Instruction in the K–8 Classroom (p. 50) |
| Thursday, October 24 | 12:30–1:45 PM | C123, Conv. Center | Today’s Juggling Act: Keeping the NGSS and CCSS Balls in the Air! (p. 56) |
| Friday, October 25 | 8:00–9:15 AM | C123, Conv. Center | IQWST Tablet Edition: Blending the Effectiveness of Learning-by-Doing with the Power of Connected Mobile Technology (p. 74) |

Science First®/STARLAB® (Booth #408)

| | | | |
|----------------------|-----------------|--------------------------|---|
| Thursday, October 24 | 8:00–9:15 AM | B116, Conv. Center | How Data Logging Systems Support Scientific Studies (p. 47) |
| Thursday, October 24 | 12:30–1:00 PM | Booth #408, Exhibit Hall | A Change of Seasons (p. 52) |
| Friday, October 25 | 12 Noon–1:15 PM | B116, Conv. Center | How Data Logging Systems Support Scientific Studies (p. 86) |
| Friday, October 25 | 1:00–1:30 PM | Booth #408, Exhibit Hall | Shaping Earth (p. 90) |

Siemens We Can Change the World Challenge (Booth #717)

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|----------------------|--------------|--------------------|--|
| Thursday, October 24 | 2:15–3:30 PM | C123, Conv. Center | Meet the Polar Bears and Help Change the World (p. 62) |
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Simulation Curriculum (Booth #404)

| | | | |
|----------------------|----------------|--------------------|---|
| Thursday, October 24 | 10:00–11:15 AM | B116, Conv. Center | Comets—Beauties or Beasts? (p. 50) |
| Thursday, October 24 | 2:15–3:30 PM | B116, Conv. Center | Stars—From Cradle to Grave (p. 61) |
| Friday, October 25 | 10:00–11:15 AM | B116, Conv. Center | Plate Tectonics: Continents on the Move (p. 81) |
| Friday, October 25 | 2:00–3:15 PM | B116, Conv. Center | Volcanoes—The Good, the Bad, and the Ugly (p. 94) |

Swift Optical Instruments, Inc. (Booth #705)

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|----------------------|---------------|--------------------|---|
| Thursday, October 24 | 12:30–1:45 PM | B116, Conv. Center | Create a Digital Wi-Fi Classroom! (p. 56) |
|----------------------|---------------|--------------------|---|

Vernier Software & Technology (Booth #500)

| | | | |
|--------------------|-----------------|------------------------|--|
| Friday, October 25 | 8:00–9:30 AM | B117/118, Conv. Center | Chemistry and Biology with Vernier (p. 76) |
| Friday, October 25 | 10:00–11:30 AM | B117/118, Conv. Center | Integrate iPad® and BYOD with Vernier Technology (p. 82) |
| Friday, October 25 | 12 Noon–1:30 PM | B117/118, Conv. Center | Integrate iPad® and BYOD with Vernier Technology (p. 87) |
| Friday, October 25 | 2:00–3:30 PM | B117/118, Conv. Center | Physics and Physical Science with Vernier (p. 95) |

Wavefunction, Inc. (Booth #708)

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|----------------------|----------------|------------------------|---|
| Thursday, October 24 | 10:00–11:15 AM | C125/126, Conv. Center | Molecular-Level Visualization and Simulation: Getting Ready for the Next Generation Science Standards (p. 50) |
| Friday, October 25 | 10:00–11:15 AM | C125/126, Conv. Center | Molecular Modeling and the Revised AP Chemistry Curriculum Framework: Challenges and Opportunities (p. 82) |

Schedule at a Glance

G = General
P = Preschool
C = College

M = Middle School
H = High School
R = Research

S = Supervision/Administration
I = Informal Education

T = Teacher Preparation
E = Elementary

Biology/Life Science

Thursday

| | | | |
|----------------|------|------------------------|--|
| 8:00–9:00 AM | H | E143, Conv. Center | Gene-Environment Interactions in the Nematode <i>Caenorhabditis elegans</i> (p. 45) |
| 8:00–9:00 AM | M–H | B119, Conv. Center | Into the Woods: Field-based Science Inquiry (p. 43) |
| 8:00–9:15 AM | 6–12 | B111/112, Conv. Center | Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 46) |
| 8:00–9:15 AM | 5–12 | A107, Conv. Center | DNA Replication and Transcription (p. 46) |
| 8:30–9:45 AM | 9–C | C120/121, Conv. Center | Using Enzyme-linked Immunosorbent Assay (ELISA) to Detect West Nile Virus Outbreak (p. 47) |
| 9:30–10:30 AM | 9–12 | B113, Conv. Center | Investigating Stem Cell Differentiation (p. 48) |
| 10:00–11:15 AM | 6–12 | A106, Conv. Center | Genetics—Crazy Traits (p. 49) |
| 10:15–11:30 AM | 9–C | C120/121, Conv. Center | Solving the Case of the Missing Archive Using DNA Fingerprinting (p. 50) |
| 12:30–1:00 PM | M–H | B119, Conv. Center | Reinventing Science Journals in Secondary Classrooms (p. 52) |
| 12:30–1:00 PM | H | Roosevelt, DoubleTree | 4-H ExCEL in Animal Sciences (p. 52) |
| 12:30–1:45 PM | 10–C | C120/121, Conv. Center | Detection of Mad Cow Disease Using a Two-Step PCR Process (p. 56) |
| 12:30–1:45 PM | 9–C | C125/126, Conv. Center | From DNA to Genomics to Personalized Medicine—What Should We Teach? (p. 57) |
| 12:30–1:45 PM | 6–C | C124, Conv. Center | The ANATOMY IN CLAY® Learning System: The Mind Cannot Forget What the Hands Have Learned! (p. 57) |
| 2:00–3:00 PM | M–H | D136, Conv. Center | NSTA Press® Session: <i>Scientific Argumentation in Biology</i> (p. 59) |
| 2:00–3:00 PM | M–H | B119, Conv. Center | Comparison of Teacher-generated Analogy to Coupled Teacher/Student—generated Analogy in Cell Biology (p. 58) |
| 2:00–3:00 PM | H–C | B119, Conv. Center | What About the Control? (p. 58) |
| 2:15–3:30 PM | 10–C | C120/121, Conv. Center | Wait! Were the Chips I Ate Genetically Modified? (p. 62) |
| 2:15–3:30 PM | 9–12 | B111/112, Conv. Center | Strawberry DNA and Molecular Models (p. 61) |
| 2:15–3:30 PM | 5–12 | C124, Conv. Center | Take a Swipe at Microbes! (p. 62) |
| 3:30–4:30 PM | E–H | B119, Conv. Center | Engage Your Students with NOAA's Coral Reef and Ocean Acidification Resources (p. 63) |
| 3:30–4:30 PM | M–H | E143, Conv. Center | Galls Alive! (p. 64) |
| 4:00–5:15 PM | 10–C | C120/121, Conv. Center | The Drunken Worms: Exploring Gene Function with <i>C. elegans</i> (p. 67) |
| 4:00–5:15 PM | 9–12 | A105, Conv. Center | Science Under Siege? Teaching Evolution (and Global Warming) in a Climate of Controversy (p. 66) |

Friday

| | | | |
|----------------|------|--------------------------|---|
| 8:00–9:00 AM | E–M | D136, Conv. Center | Common Core Success Using Science Content and Literacy (p. 72) |
| 8:00–9:00 AM | I | E141, Conv. Center | Life Cycle of the Monarch Butterfly (p. 72) |
| 8:00–9:00 AM | M–H | E142, Conv. Center | The Nature of Scientific Research (p. 72) |
| 8:00–9:00 AM | H | Oregon 201, Conv. Center | Award-winning Inquiry Lab Activities for High School Biology (p. 71) |
| 8:00–9:15 AM | 6–12 | B111/112, Conv. Center | Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 74) |
| 8:30–11:00 AM | 10–C | A108/109, Conv. Center | Generate a DNA Barcode and Identify Species (p. 76) |
| 9:30–10:30 AM | H–C | E143, Conv. Center | Using Crash Debates to Teach Logic, Bioethics, and Communication in AP and IB Sciences (p. 79) |
| 9:30–10:30 AM | 9–12 | B113, Conv. Center | Biomes and Invasive Species (p. 80) |
| 9:30–10:30 AM | I | E141, Conv. Center | Life Cycle of the Monarch Butterfly (p. 79) |
| 9:30–10:30 AM | H | E142, Conv. Center | Science in the Time of Cholera (p. 79) |
| 10:00–11:15 AM | 9–C | C124, Conv. Center | HHMI's <i>The Making of the Fittest: Got Lactase? The Co-evolution of Genes and Culture</i> (p. 82) |

Schedule at a Glance Biology/Life Science

| | | | |
|------------------|------|------------------------|--|
| 11:00 AM–12 Noon | H | E143, Conv. Center | Epigenetics—Beyond the Central Dogma (p. 84) |
| 12 Noon–1:15 PM | 9–C | C124, Conv. Center | HHMI's <i>The Making of the Fittest: Evolving Switches, Evolving Bodies</i> (p. 86) |
| 12 Noon–1:15 PM | 9–C | C125/126, Conv. Center | Drugs, Drug Targets, and You—A Molecular Perspective (p. 86) |
| 12 Noon–1:15 PM | K–12 | B111/112, Conv. Center | Introduction to Wisconsin Fast Plants® (p. 86) |
| 12:30–1:30 PM | 6–12 | B113, Conv. Center | Genetics—From Counselor to Genetic Engineer (p. 90) |
| 12:30–1:30 PM | I | E144, Conv. Center | Argumentation Skills and Discussion Strategies for Bioethics (p. 90) |
| 12:30–1:30 PM | H | E143, Conv. Center | The Human Microbiome (p. 89) |
| 1:00–2:30 PM | 10–C | A108/109, Conv. Center | Ecology to Enzymes to Industry (AP Big Idea 4) (p. 91) |
| 2:00–3:15 PM | 5–12 | A107, Conv. Center | DNA Replication and Transcription (p. 94) |
| 2:00–3:15 PM | 9–C | C125/126, Conv. Center | Models and Modeling: An Essential Practice of Science (p. 95) |
| 2:00–3:15 PM | 7–12 | C124, Conv. Center | Free Resources to Teach Deep Earth History, Paleoclimate, and Climate Change (p. 94) |
| 3:30–4:30 PM | E–M | D138, Conv. Center | Let's Talk Science: Seeding Argumentation (p. 96) |
| 3:30–4:30 PM | M–H | E143, Conv. Center | What Makes Kids Want to Learn? FOOD! (p. 96) |
| 4:00–5:15 PM | 9–C | C125/126, Conv. Center | The Cellular Landscapes of David Goodsell: A Bridge from the Cell to the Molecular World (p. 98) |
| 4:00–5:15 PM | K–12 | B111/112, Conv. Center | Hands-On Science with Classroom Critters (p. 98) |
| 5:00–6:00 PM | E–H | E143, Conv. Center | No Engineer Left Inside: Biomimicry in Action (p. 100) |

Saturday

| | | | |
|------------------|------|------------------------|---|
| 8:00–9:00 AM | 9–12 | B113, Conv. Center | Shuffle It Up! Understanding Photosynthesis and Respiration (p. 105) |
| 8:00–9:00 AM | M–H | C125/126, Conv. Center | Fruits and Flowers—Exploring Native Plants (p. 104) |
| 8:00–9:30 AM | 10–C | A108/109, Conv. Center | Worm and Squirm Your Way into Behavior Labs (p. 105) |
| 9:30–10:30 AM | 6–8 | B113, Conv. Center | Breeding Critters (p. 108) |
| 9:30–10:30 AM | I | C125/126, Conv. Center | Questions Are the Key: Taking Inquiry into the Field (p. 107) |
| 10:00–11:30 AM | 6–8 | A108/109, Conv. Center | Discovering DNA (A Middle School Lab Activity) (p. 108) |
| 11:00–11:30 AM | H–C | D135, Conv. Center | “Sugar Has A Lot of Fat in It”—Understanding the Logic of Undergraduate Student Conceptions About Biological Molecules (p. 108) |
| 11:00 AM–12 Noon | E | D138, Conv. Center | What Can We Learn at the Pond? A Model for Engaging Students in Scientific Inquiry (p. 110) |
| 11:00 AM–12 Noon | H–C | C125/126, Conv. Center | Integrating Bioinformatics into Introductory Biology Courses (p. 110) |

Chemistry/Physical Science

Thursday

| | | | |
|----------------|------|------------------------|---|
| 8:00–9:00 AM | H–C | D136, Conv. Center | NSTA Press® Session: <i>Forensics in Chemistry</i> (p. 43) |
| 8:00–9:00 AM | H/S | B110, Conv. Center | Using Modeling Activities in the High School Chemistry Class (p. 43) |
| 8:00–9:15 AM | 9–12 | B113, Conv. Center | Mastering the Chemical Formula: An Effective Way to Teach Subscripts and Coefficients (p. 47) |
| 8:00–9:15 AM | 6–9 | A106, Conv. Center | Chemistry and the Atom: Fun with Atom Building Games! (p. 46) |
| 10:00–11:15 AM | 9–12 | A105, Conv. Center | Economical, Efficient, and Effective Inquiry in Chemistry (p. 49) |
| 10:00–11:15 AM | 9–12 | B111/112, Conv. Center | Keep Calm and Chemistry On—Successful Lab Activities for the New Chemistry (p. 49) |
| 10:00–11:15 AM | 7–12 | C125/126, Conv. Center | Molecular-Level Visualization and Simulation: Getting Ready for the Next Generation Science Standards (p. 50) |
| 10:00–11:15 AM | 9–12 | B114/115, Conv. Center | New Advanced Inquiry Labs for AP Chemistry from Flinn Scientific (p. 49) |
| 12:30–1:30 PM | H–C | D135, Conv. Center | Guided Inquiry Labs in the Redesigned AP Chemistry Course (p. 54) |
| 2:00–3:00 PM | M–H | D135, Conv. Center | Technology Makes STEM Instruction a Snap (p. 59) |
| 3:30–4:30 PM | H | D135, Conv. Center | Science, Engineering, and the Common Core (p. 64) |

Schedule at a Glance Chemistry/Physical Science

Friday

| | | | |
|------------------|------|--------------------------|--|
| 8:00–9:00 AM | H | D140, Conv. Center | Write Your Way to Success: Grant-writing Strategies for You and Your Chemistry Students (p. 71) |
| 8:00–9:00 AM | M | D133/134, Conv. Center | ACS Middle Level Session: Matter: Solids, Liquids, and Gases (p. 72) |
| 8:00–9:00 AM | H | Oregon 202, Conv. Center | ACS Session One: Chemical Bonding—Why Water Is Different (p. 73) |
| 8:00–9:15 AM | 9–12 | B113, Conv. Center | Distillation: Simple and Fascinating Experiments in the Chemistry of Aromas and Smells (p. 74) |
| 8:00–9:15 AM | 8–C | B116, Conv. Center | <i>Chemistry in the Community</i> , 6th Edition—Reinventing Itself (p. 74) |
| 8:00–9:30 AM | 7–C | B117/118, Conv. Center | Chemistry and Biology with Vernier (p. 76) |
| 9:30–10:30 AM | M | D133/134, Conv. Center | ACS Middle Level Session: Changes of State—Evaporation and Condensation (p. 78) |
| 9:30–10:30 AM | M–H | C122, Conv. Center | Win a Shell Science Lab Makeover for Your School (p. 77) |
| 9:30–10:30 AM | H | D140, Conv. Center | Introducing the <i>ChemMatters</i> Compilation Project (p. 77) |
| 9:30–10:30 AM | H | D140, Conv. Center | Digital Chemistry Resources That Teachers and Students Can Rely On (p. 79) |
| 9:30–10:30 AM | H | Oregon 202, Conv. Center | ACS Session Two: Entropy: Mixing and Unmixing (p. 79) |
| 10:00–11:15 AM | 9–C | C125/126, Conv. Center | Molecular Modeling and the Revised AP Chemistry Curriculum Framework: Challenges and Opportunities (p. 82) |
| 11:00 AM–12 Noon | M | D133/134, Conv. Center | ACS Middle Level Session: Density—A Molecular View (p. 84) |
| 11:00 AM–12 Noon | M–H | E141, Conv. Center | Energy Is Chemistry (p. 84) |
| 11:00 AM–12 Noon | H | Oregon 202, Conv. Center | ACS Session Three: Entropy: Energy Transfer (p. 85) |
| 12:30–1:30 PM | H | Oregon 202, Conv. Center | ACS Session Four: Electromagnetic Radiation Energy (p. 90) |
| 12:30–1:30 PM | M | D133/134, Conv. Center | ACS Middle Level Session: The Periodic Table, Energy Levels, and Bonding (p. 89) |
| 2:00–3:00 PM | M | D133/134, Conv. Center | ACS Middle Level Session: Polarity of the Water Molecule and Its Consequences (p. 92) |
| 2:00–3:00 PM | 9–12 | B113, Conv. Center | Using the Engineering Design Process to Understand Heat (p. 94) |
| 2:00–3:00 PM | 9–C | A105, Conv. Center | Active Chemistry—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (p. 94) |
| 2:00–3:00 PM | H | Oregon 202, Conv. Center | ACS Session Five: Rates: Concentration and Half-Life (p. 93) |
| 3:30–4:30 PM | H | Oregon 202, Conv. Center | ACS Session Six: Acid/Base Reactions: Carbon Dioxide (p. 97) |
| 3:30–4:30 PM | M | D133/134, Conv. Center | ACS Middle Level Session: Chemical Change—Breaking and Making Bonds (p. 96) |
| 5:00–5:30 PM | H | D140, Conv. Center | Stoichiometry Made Easy (p. 99) |
| 5:00–6:00 PM | M–H | E141, Conv. Center | Inquiry + Technology = Mastery (p. 100) |
| 5:00–6:00 PM | E–M | D138, Conv. Center | Inquiry in Action: Investigating Matter Through Inquiry (p. 100) |

Saturday

| | | | |
|------------------|-----|--------------------|--|
| 8:00–9:00 AM | M–H | C123, Conv. Center | Use Molecules, Energy Transfer, and Microbes to Promote Inquiry and Bridges (p. 104) |
| 9:30–10:30 AM | M–H | C123, Conv. Center | What Is Your Cosmic Connection to the Elements? (p. 107) |
| 11:00 AM–12 Noon | M–H | C124, Conv. Center | Rolling on the River: Real Data in Real Time (p. 110) |

Earth/Space Science

Thursday

| | | | |
|----------------|------|--------------------------|--|
| 8:00–9:00 AM | E | E145, Conv. Center | NASA's "Reading, Writing & Rings": Using Saturn to Teach Science and Language Arts (p. 45) |
| 8:00–9:15 AM | 9–12 | A105, Conv. Center | Updating Earth and Space Science for Middle and High School in the New World of the NGSS (p. 46) |
| 10:00–11:15 AM | 6–12 | B116, Conv. Center | Comets—Beauties or Beasts? (p. 50) |
| 12:30–1:00 PM | 5–8 | Booth #408, Exhibit Hall | A Change of Seasons (p. 52) |

Schedule at a Glance Earth/Space Science

| | | | |
|---------------|-------|------------------------------|---|
| 12:30–1:30 PM | E–M | Oregon 203/204, Conv. Center | CESI Session: Get On Board with CESI and NASA’s International Space Station (p. 55) |
| 12:30–1:30 PM | E–M | E145, Conv. Center | Tsunami in a Box (p. 55) |
| 12:30–1:45 PM | 9–12 | B113, Conv. Center | Using Climate Proxies to Learn About Earth’s Climate History (p. 56) |
| 2:00–3:00 PM | G | D140, Conv. Center | Mars Exploration Student Data Teams (MESDT) (p. 58) |
| 2:15–3:30 PM | 6–12 | B116, Conv. Center | Stars—From Cradle to Grave (p. 61) |
| 2:15–3:30 PM | 5–8 | A108/109, Conv. Center | Asteroid! Will Earth Be Hit Again? (p. 61) |
| 3:30–4:30 PM | G | D140, Conv. Center | Stories from Earth: Teaching About Changing Landscapes Using 25 Years of Satellite Observations (p. 63) |
| 3:30–4:30 PM | E | E145, Conv. Center | NASA’s “Our Solar System Through the Eyes of Scientists” (p. 65) |
| 3:30–4:30 PM | I | Oregon 201, Conv. Center | Keeping Watch Over Cascade Range Volcanoes—From Your Classroom (p. 64) |
| 4:00–5:15 PM | 5–8 | A108/109, Conv. Center | Evidence for Plate Movement (p. 66) |
| 4:00–5:15 PM | 4–12 | A103/104, Conv. Center | Solving the Mystery of STEM Using Forensic Science (p. 66) |
| 5:00–6:00 PM | M–H/I | D140, Conv. Center | Science Olympiad Coaches Clinic: Astronomy and Reach-for-the-Stars Events (p. 67) |
| 5:00–6:00 PM | M | E143, Conv. Center | Exploring <i>El Niño/La Niña</i> Using AMS Maury Project Activities (p. 68) |
| 5:00–6:00 PM | M–H | E144, Conv. Center | MY NASA DATA: Incorporating Science Practices in the Classroom (p. 67) |

Friday

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| 8:00–9:00 AM | E–H | Oregon 203/204, Conv. Center | Using Natural Hazards as a Hook in the Earth and Space Science Classroom (p. 73) |
| 8:00–9:00 AM | G | C122, Conv. Center | NASA’s High-Energy Vision: Chandra and the X-ray Universe (p. 71) |
| 9:30–10:30 AM | E–H | Oregon 203/204, Conv. Center | Effective Approaches for Addressing the Next Generation Science Standards in the Earth and Space Science Classroom (p. 79) |
| 10:00–11:15 AM | 6–12 | B116, Conv. Center | Plate Tectonics: Continents on the Move (p. 81) |
| 11:00 AM–12 Noon | 9–12 | B113, Conv. Center | Comparing Earth to Other Worlds (p. 85) |
| 11:00 AM–12 Noon | E–H | D140, Conv. Center | Students’ Cloud Observations Online—Building Connections (p. 83) |
| 11:00 AM–12 Noon | M–H | E142, Conv. Center | NASA’s Pi in the Sky: Using Mathematics to Investigate Astronomical Phenomena (p. 84) |
| 11:00 AM–12 Noon | E–H | Oregon 203/204, Conv. Center | Effective Strategies for Sharing Climate Change Science and Energy Consumption Implications in the Classroom (p. 85) |
| 11:00 AM–12 Noon | M–H/I | E146, Conv. Center | Astrobiology: An Interdisciplinary Approach to STEM (p. 84) |
| 12:30–1:30 PM | E–H | Oregon 203/204, Conv. Center | High-Impact Classroom Earth Science in a STEM World (p. 90) |
| 12:30–1:30 PM | H–C | E142, Conv. Center | Ice Core Records: Earth Systems, Volcanoes, Solar Proton Events, and Supernovas (p. 89) |
| 12:30–1:30 PM | E–H | D136, Conv. Center | NSTA Press® Session: Using Astronomy Probes in the Science Classroom (p. 89) |
| 1:00–1:30 PM | 5–12 | Booth #408, Exhibit Hall | Shaping Earth (p. 90) |
| 2:00–3:00 PM | M | E142, Conv. Center | Claims and Evidence: Writing for the Common Core (p. 92) |
| 2:00–3:15 PM | 6–12 | B116, Conv. Center | Volcanoes—The Good, the Bad, and the Ugly (p. 94) |
| 3:30–4:30 PM | H–C | E142, Conv. Center | Spectroscopy: Stairway to the Stars (p. 96) |
| 3:30–4:30 PM | G | Oregon 203/204, Conv. Center | National Earth Science Teachers Association Rock and Mineral Raffle (p. 97) |
| 5:00–6:00 PM | G | E142, Conv. Center | Engaging Your Students in Scientific Argumentation (p. 100) |

Saturday

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|---------------|---|--------------------|---|
| 8:00–9:00 AM | G | C122, Conv. Center | Developing Space Probes for Suborbital Rockets in High School (p. 103) |
| 9:30–10:30 AM | G | C122, Conv. Center | Engaging Students in Authentic Learning Through Problem-Based Learning Units (p. 106) |
| 9:30–10:30 AM | H | C124, Conv. Center | Maury Project: Great Global Gyres (p. 107) |

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| 9:30–10:30 AM | M–H | D133/134, Conv. Center | NASA/IPAC Teacher Archive Research Program (p. 106) |
| 11:00–11:30 AM | M–C | C122, Conv. Center | Elevating Climate Change Across Science Education (p. 109) |
| 11:00 AM–12 Noon | I | D133/134, Conv. Center | Still Yet Another Better Way to Scale the Universe (p. 110) |
| 11:00 AM–12 Noon | M–H | C123, Conv. Center | The Hidden Lives of Galaxies (p. 110) |
| 11:30 AM–12 Noon | M–H | C122, Conv. Center | Using Google Earth in the Classroom (p. 109) |

Environmental Science

Thursday

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|---------------|------|------------------------|--|
| 8:00–9:00 AM | M–H | D130, Conv. Center | Learning Progressions for Environmental Science Literacy (p. 43) |
| 12:30–1:00 PM | M–H | B110, Conv. Center | NMLSTA Session: LEARN: Long-term Engagement in Authentic Research with NASA (p. 52) |
| 12:30–1:30 PM | G | D130, Conv. Center | ED ² : Earth Day, Every Day (p. 52) |
| 12:30–1:30 PM | M | E144, Conv. Center | Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 54) |
| 2:00–3:00 PM | M–H | E142, Conv. Center | Facing the Future: Understanding Sustainability and Global Connections (p. 60) |
| 2:15–3:30 PM | K–12 | C123, Conv. Center | Meet the Polar Bears and Help Change the World (p. 62) |
| 3:30–4:30 PM | G | D130, Conv. Center | Climate Change (p. 63) |
| 4:00–5:15 PM | 10–C | C124, Conv. Center | AP Environmental Water Quality Assessment Curriculum (p. 67) |
| 5:00–6:00 PM | P–E | D131/132, Conv. Center | Facilitating Early Childhood Education with Project Learning Tree (p. 68) |

Friday

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| 8:00–9:00 AM | P–E | E146, Conv. Center | How Does Your Garden Grow? (p. 73) |
| 8:00–9:15 AM | 5–C | C124, Conv. Center | Stream Ecology: Slimy Leaves for Clean Streams (p. 75) |
| 9:30–10:30 AM | I | D130, Conv. Center | Transitioning to Student-driven Inquiry (p. 77) |
| 9:30–10:30 AM | G | E146, Conv. Center | Observing Buoys by Students (OBS): An Authentic STEM Field Investigation (p. 78) |
| 11:00 AM–12 Noon | I | D130, Conv. Center | Bridging School Garden Programs to the Classroom (p. 83) |
| 12:30–1:30 PM | G | D130, Conv. Center | Tying It All Together: Using Field Science Experiences to Support STEM Learning (p. 88) |
| 12:30–1:30 PM | M–C | D135, Conv. Center | <i>Global Connections: Forests of the World</i> (p. 89) |
| 2:00–3:00 PM | M–H | D135, Conv. Center | Science Education for Global Citizenship: People, Food, Energy, and Sustainability (p. 92) |
| 3:30–4:30 PM | M–H/S | D130, Conv. Center | Researcher Teacher Partnerships: Making Global Climate Change Relevant in the Classroom (p. 95) |
| 5:00–6:00 PM | H–C | D135, Conv. Center | Helping Students Write Their Own Scientific Experiments for Environmental Science (p. 100) |

Saturday

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|------------------|-----|------------------------|--|
| 9:30–10:30 AM | E–H | D131/132, Conv. Center | Field Investigations: Taking Inquiry Outdoors (p. 107) |
| 11:00 AM–12 Noon | I | D131/132, Conv. Center | Freshwater Bugs—ID to Inquiry (p. 110) |
| 11:00 AM–12 Noon | E | D140, Conv. Center | Your Students Stuck Inside? No Problem; Bring the Outside In! (p. 109) |

Schedule at a Glance General Science

Integrated/General

Thursday

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|-------------------|-------|------------------------------|--|
| 8:00–9:00 AM | M–H | Alaska, DoubleTree | Engage Students with Model-based Inquiry (p. 44) |
| 8:00–9:00 AM | H | Idaho, DoubleTree | Partners in Science Grant (p. 44) |
| 8:00–9:00 AM | G | Mt. Bachelor, DoubleTree | Mud, Cows, Bats, and Insects—Getting the Dirt on STEM Careers (p. 44) |
| 8:00–9:00 AM | G | Mt. Bachelor, DoubleTree | What If Glaciers Were Interactive? Transforming Science with Media (p. 44) |
| 8:00–9:00 AM | H | E144, Conv. Center | Integrating Next Generation Science Standards Ahead of District/State Standards Alignment (p. 45) |
| 8:00–9:00 AM | I | E146, Conv. Center | Strategies for Advancing Educational Opportunities for Underrepresented Students in STEM (p. 43) |
| 8:00–9:00 AM | G | Oregon 203/204, Conv. Center | First-Timer Conference Attendees Orientation—Is This Your First NSTA Conference? (p. 44) |
| 8:00–9:00 AM | E–H | D140, Conv. Center | Simple Activities to Get ELD Learners Reading, Writing, Listening, and Speaking (p. 43) |
| 8:00–9:00 AM | I | D133/134, Conv. Center | ASEE Session: Introducing Engineering to Elementary School Students (p. 45) |
| 8:00–9:00 AM | P–E | D131/132, Conv. Center | <i>Science & Children</i> —Year of Inquiry (p. 45) |
| 8:00–9:00 AM | I | Roosevelt, DoubleTree | Engaging Girls in Renewable Energy STEM (p. 44) |
| 8:00–9:00 AM | G | Mt. St. Helens, DoubleTree | Integrated STEM (p. 45) |
| 8:00–9:15 AM | K–8 | A103/104, Conv. Center | STEM Projects, Science Fair, and Student Performances (p. 46) |
| 8:00–9:15 AM | K–6 | A108/109, Conv. Center | “FOSStering” the Common Core: Science-centered Language Development (p. 46) |
| 8:00–9:15 AM | K–6 | B117/118, Conv. Center | 33 Strategies for Integrating Disciplinary Literacy (p. 47) |
| 9:00 AM–12 Noon | C | Washington, DoubleTree | NSTA/CAEP Development of Program Report Workshop (p. 47) |
| 9:15–10:30 AM | G | Oregon 201/202, Conv. Center | Both Sides of the Lens—Connecting Adventure and Creativity (p. 48) |
| 9:30–10:30 AM | G | D133/134, Conv. Center | ASEE Session: ASEE’s K–12 Outreach Program, eGFI: Engineering, Go For It and the Marshmallow Challenge (p. 48) |
| 10:00–11:15 AM | K–5 | C123, Conv. Center | Applying Common Core State Standards for English Language Arts Through Active Science Instruction in the K–5 Classroom (p. 50) |
| 10:00–11:15 AM | K–6 | A108/109, Conv. Center | Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 49) |
| 10:00–11:15 AM | K–8 | A103/104, Conv. Center | Science, the Literacy Connection, and Common Core English Language Arts (p. 49) |
| 10:00–11:15 AM | 2–6 | B117/118, Conv. Center | Get Results with Science and Literacy Integration: Seeds of Science/Roots of Reading® (p. 50) |
| 11:00 AM–12 Noon | G | D133/134, Conv. Center | ASEE Session: Engaging Elementary-aged Children and Parents in Engineering (p. 51) |
| 11:10 AM–12:10 PM | G | Entrance to Exhibit Hall | Meet the Presidents and Board/Council (p. 51) |
| 12:30–1:30 PM | M–H | E146, Conv. Center | Stellar Science: Integrating STEM and Marine Mammal Research in the Classroom (p. 55) |
| 12:30–1:30 PM | G | Mt. Hood, DoubleTree | Preparation Through Partnership (p. 54) |
| 12:30–1:30 PM | G | Alaska, DoubleTree | NSELA Session: Tools for Science Leaders (p. 53) |
| 12:30–1:30 PM | M–H/I | Idaho, DoubleTree | Working with Industry to Build a Computer Science Program That Supports the NGSS (p. 53) |
| 12:30–1:30 PM | G | 3 Sisters, DoubleTree | Magical Illusions for Science—It’s Showtime! (p. 53) |
| 12:30–1:30 PM | G | Mt. Bachelor, DoubleTree | Procrastinator’s Anonymous: A 10-Step Program for the “Time Challenged” Student (p. 54) |
| 12:30–1:30 PM | G | D136, Conv. Center | NSTA Press® Session: <i>Exemplary Science: Best Practices in Professional Development</i> (p. 52) |
| 12:30–1:30 PM | E–M/I | C122, Conv. Center | Successful Partnerships Advance STEM Project Based Learning (p. 52) |
| 12:30–1:30 PM | M–H | D133/134, Conv. Center | ASEE Session: Effective STEM Curricula for Girls (p. 54) |
| 12:30–1:30 PM | E–H | Mt. St. Helens, DoubleTree | Making the Interdisciplinary Connection Between Literacy and Science (p. 55) |
| 12:30–1:45 PM | K–6 | A103/104, Conv. Center | DSM and STEM: Challenges for the Elementary Student (p. 55) |
| 12:30–1:45 PM | K–12 | A105, Conv. Center | Problem-Based Learning in the Classroom (p. 55) |

Schedule at a Glance General Science

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| 12:30–1:45 PM | 3–6 | A108/109, Conv. Center | Online Assessment That Informs Instruction (p. 56) |
| 12:30–1:45 PM | 6–C | B116, Conv. Center | Create a Digital Wi-Fi Classroom! (p. 56) |
| 12:30–1:45 PM | K–8 | B111/112, Conv. Center | The Next Generation Science Standards Are Here...Now What? Focus and Exploration of Implementation with Integrity K–8 (p. 56) |
| 12:30–1:45 PM | 6–8 | C123, Conv. Center | Today's Juggling Act: Keeping the NGSS and CCSS Balls in the Air! (p. 56) |
| 2:00–2:30 PM | I | Roosevelt, DoubleTree | Science on a Shoestring (p. 57) |
| 2:00–2:30 PM | G | Mt. Hood, DoubleTree | Evaluating Student Success at an Innovative STEM High School (p. 59) |
| 2:00–3:00 PM | G | Oregon 201, Conv. Center | Implementing the NGSS: Shifts in Classroom Practice (p. 57) |
| 2:00–3:00 PM | G | Mt. St. Helens, DoubleTree | Igniting Interest and Engaging Learners with 3-D Graphic Organizers (p. 60) |
| 2:00–3:00 PM | E–H | B110, Conv. Center | NMLSTA Session: National Certification—What's It All About? (p. 58) |
| 2:00–3:00 PM | H | D133/134, Conv. Center | ASEE Session: Challenge Your High School Students: <i>Engineer Your World</i> (p. 59) |
| 2:00–3:00 PM | E–M | D131/132, Conv. Center | Energize the Common Core in Your Classroom! (p. 59) |
| 2:00–3:00 PM | G | 3 Sisters, DoubleTree | Dazzling Deceptions: Discrepant Events That Delight and Mystify! (p. 59) |
| 2:00–3:00 PM | M–H | Idaho, DoubleTree | Seeing Math—Supporting Science (p. 59) |
| 2:00–3:00 PM | M–H | Oregon, DoubleTree | Square Pegs (p. 59) |
| 2:00–3:00 PM | E–M | Oregon 203/204, Conv. Center | CESI Session: Council for Elementary Science International Share-a-Thon (p. 60) |
| 2:15–3:30 PM | 6–C | B114/115, Conv. Center | Flinn Activities to Integrate STEM Education (p. 61) |
| 2:15–3:30 PM | 6–9 | C125/126, Conv. Center | STEM Where? Integrating STEM into the Science Classroom in Anticipation of the Next Generation Science Standards (p. 62) |
| 2:15–3:30 PM | 2–6 | B117/118, Conv. Center | The Best of Both Worlds: How to Engage Students in the NGSS Practices Through Science and Literacy (p. 61) |
| 2:15–3:30 PM | K–8 | A103/104, Conv. Center | Teaching Argumentation for Our Next Generation (p. 60) |
| 2:30–3:00 PM | E–M | C122, Conv. Center | Engaging the 21st-Century Student (p. 63) |
| 3:30–4:00 PM | M–H | Alaska, DoubleTree | Redesigning Assessments for Standards-based Grading (p. 63) |
| 3:30–4:30 PM | G | Mt. Bachelor, DoubleTree | Using Model-based Inquiry in the Classroom: An Example on Plate Tectonics (p. 64) |
| 3:30–4:30 PM | G | Oregon, DoubleTree | Planning and Designing Safe, Sustainable, and Flexible Facilities for STEM-based Science (Science Facilities 101) (p. 65) |
| 3:30–4:30 PM | M–H/I | E146, Conv. Center | STEM Integration Using Student-built Underwater Robots (p. 65) |
| 3:30–4:30 PM | E–M | C122, Conv. Center | Sustainable Development-based Hands-On Activities That Relate to the Next Generation Science Standards (p. 63) |
| 3:30–4:30 PM | G | D133/134, Conv. Center | ASEE Session: <i>TeachEngineering.org</i> : Free Resources for Engineering in K–12 (p. 64) |
| 3:30–4:30 PM | E | D136, Conv. Center | NSTA Press® Session: The Authors' Picks! <i>Teaching Science Through Trade Books</i> (p. 64) |
| 3:30–4:30 PM | G | Mt. St. Helens, DoubleTree | STEM Mosaic—Putting the Pieces Together (p. 65) |
| 3:30–4:30 PM | G | Mt. Hood, DoubleTree | Organized Binder: Building Powerful Learning Communities (p. 64) |
| 3:30–4:30 PM | G | B110, Conv. Center | Linking Science Writing and Research Through the DuPont Challenge (p. 63) |
| 4:00–5:15 PM | 3–8 | B111/112, Conv. Center | Bring Visual Science into K–8 Classrooms—It's a Game Changer! (p. 66) |
| 4:00–5:15 PM | K–6 | B117/118, Conv. Center | 33 Strategies for Integrating Disciplinary Literacy (p. 66) |
| 5:00–6:00 PM | G | B110, Conv. Center | The NSTA Learning Center: Free Professional Development Resources and Opportunities for Educators (p. 67) |
| 5:00–6:00 PM | E–H | Mt. Hood, DoubleTree | Time Will Tell: Using Time-Lapse Photography and Digital Storytelling to Observe Change (p. 68) |
| 5:00–6:00 PM | G | Mt. St. Helens, DoubleTree | A Picture Is Worth a Thousand Words: Teaching Scientific Visual Literacy (p. 69) |
| 5:00–6:00 PM | E | E146, Conv. Center | K–4 Inquiry-based Science Activities Lead to STEM Challenges (p. 69) |
| 5:00–6:00 PM | G | Oregon 203/204, Conv. Center | OSTA Regional Raffle (p. 69) |
| 5:00–6:00 PM | M–H | E145, Conv. Center | The Pictures Aren't There Just to Take Up Space—Getting Kids Good at Reading in Science (p. 67) |
| 5:00–6:00 PM | M–H | 3 Sisters, DoubleTree | Meaningful Assessment in Science That Impacts Learning (p. 68) |
| 5:00–6:00 PM | G | Mt. Bachelor, DoubleTree | STEM-ing the Tide of Science Dropouts (p. 68) |

Schedule at a Glance General Science

Friday

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| 8:00–9:00 AM | G | Mt. Hood, DoubleTree | Implementing Change: How Six Washington School Districts Are Using Sustainability and Systems Learning to Leverage STEM Education (p. 71) |
| 8:00–9:00 AM | G | Mt. Bachelor, DoubleTree | Great Science Lesson = Presidential Award + \$10,000 (p. 71) |
| 8:00–9:00 AM | G | Oregon, DoubleTree | The Portland Metro STEM Partnership (p. 71) |
| 8:00–9:00 AM | E | E145, Conv. Center | Cutting Across the Curriculum: Examining Lessons That Integrate Science, Literacy, and Mathematics (p. 72) |
| 8:00–9:00 AM | M–H | Mt. St. Helens, DoubleTree | Implementing Interdisciplinary STEM Projects: Year 1 (p. 73) |
| 8:00–9:00 AM | 6–8 | A105, Conv. Center | Merging the Three Dimensions of the Next Generation Science Standards (p. 73) |
| 8:00–9:00 AM | E | D137, Conv. Center | Children’s Literature for Climate Change Education (p. 72) |
| 8:00–9:00 AM | M | D135, Conv. Center | Science and Mathematics Connections for the Middle School Classroom (p. 72) |
| 8:00–9:00 AM | E/C | D138, Conv. Center | Writing Scientific Claims About Systems (p. 72) |
| 8:00–9:00 AM | M | D130, Conv. Center | Science Plus Literacy—Blended and Seamless (p. 71) |
| 8:00–9:15 AM | 6–8 | C123, Conv. Center | IQWST Tablet Edition: Blending the Effectiveness of Learning-by-Doing with the Power of Connected Mobile Technology (p. 74) |
| 8:00–9:15 AM | 6–8 | C120/121, Conv. Center | Experience the Power of a Digital Middle School Program (p. 74) |
| 8:00–9:15 AM | 6–9 | C125/126, Conv. Center | Student Collaboration in the Science Classroom (p. 75) |
| 8:00–9:15 AM | 9–12 | A103/104, Conv. Center | PASCO’s SPARKscience for High School Students—Free Starter Kits for Attendees! (p. 73) |
| 8:00–9:15 AM | 1–10 | B114/115, Conv. Center | Integrating Online Learning into the Science Classroom (p. 74) |
| 9:30–10:30 AM | G | Oregon 201, Conv. Center | Implementing Dynamic and Interactive Science Instruction to Meet the Common Core (p. 76) |
| 9:30–10:30 AM | G | Oregon, DoubleTree | Structural Support for Transforming STEM Education (p. 78) |
| 9:30–10:30 AM | G | Mt. Bachelor, DoubleTree | Let the iPad Tell a Science (Digital) Story! (p. 78) |
| 9:30–10:30 AM | H | E145, Conv. Center | What! We Have to Teach English, Too? (p. 77) |
| 9:30–10:30 AM | G | Mt. St. Helens, DoubleTree | The Architects Have Started Without Me—What Do I Do Now? (Science Facilities 102) (p. 79) |
| 9:30–10:30 AM | G | Mt. Hood, DoubleTree | Building STEM Education with Multinationals (p. 78) |
| 9:30–10:30 AM | 9–12 | A105, Conv. Center | Engineering in the Next Generation Science Standards (p. 80) |
| 9:30–10:30 AM | G | B110, Conv. Center | The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 77) |
| 9:30–10:30 AM | E–M | D138, Conv. Center | Interactive Inquiry—Effective, Fun, and Relevant (p. 79) |
| 9:30–10:30 AM | E | D136, Conv. Center | NSTA Press® Session: <i>Picture-Perfect Science Lessons</i> : Using Picture Books to Guide Inquiry (p. 78) |
| 9:30–10:30 AM | E | D137, Conv. Center | Engineering in the Elementary Classroom—You Can Do It! (p. 78) |
| 9:30–11:30 AM | G | D135, Conv. Center | ESP: Unique Features of Programs That Meet “More Emphasis” Features in the NSES (p. 80) |
| 10:00–11:15 AM | G | C123, Conv. Center | The Private Eye® Way to Magnify Minds! Hands-On Science, Writing, and Art to Fire Up STEM and the NGSS (p. 81) |
| 10:00–11:15 AM | K–8 | B111/112, Conv. Center | The Next Generation Science Standards...and the Common Core? Reflection and Application Common Core English Language Arts and Math Integration K–8 (p. 81) |
| 10:00–11:15 AM | 6–8 | A103/104, Conv. Center | PASCO’s SPARKscience for K–8 Students—Free Starter Kits for Attendees! (p. 81) |
| 10:00–11:30 AM | 3–C | B117/118, Conv. Center | Integrate iPad® and BYOD with Vernier Technology (p. 82) |
| 11:00 AM–12 Noon | G | Oregon 201, Conv. Center | Knowing When You Are Wrong: Real Engineering in the Digital Age (p. 82) |
| 11:00 AM–12 Noon | G | B110, Conv. Center | Before and After Retirement—Practicalities and Possibilities (p. 83) |
| 11:00 AM–12 Noon | 6–C | A105, Conv. Center | Bringing Technology into Your STEM Classroom (p. 85) |
| 11:00 AM–12 Noon | G | Mt. Hood, DoubleTree | STEM Expo: Innovative Alternatives to the Typical Science Fair (p. 83) |
| 11:00 AM–12 Noon | E–H | Mt. St. Helens, DoubleTree | Close Reading in Science: Applying the Common Core Literacy Standards (p. 85) |

Schedule at a Glance General Science

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| 11:00 AM–12 Noon | G | C122, Conv. Center | Scientific Practices—Getting to Know the Next Generation Science Standards (p. 83) |
| 11:00 AM–12 Noon | E | D136, Conv. Center | NSTA Press® Session: Next Time You See a Sunset, a Seashell, a Firefly... (p. 84) |
| 11:00 AM–12 Noon | E | E144, Conv. Center | Engineering Practices: Constructing Ideas for Elementary Teachers (p. 84) |
| 11:00 AM–12 Noon | E–H | Mt. Bachelor, DoubleTree | Who Moved My Inquiry? What Are These Practices Doing Here? (p. 83) |
| 11:00 AM–12 Noon | E–H | Oregon, DoubleTree | Common Outcomes for Student Success in STEM (p. 83) |
| 12 Noon–1:15 PM | 9–12 | A103/104, Conv. Center | PASCO's SPARKscience for High School Students—Free Starter Kits for Attendees! (p. 86) |
| 12 Noon–1:30 PM | 3–C | B117/118, Conv. Center | Integrate iPad® and BYOD with Vernier Technology (p. 87) |
| 12:30–1:30 PM | E–M | D137, Conv. Center | Animal Pictures, WebQuest, Boat Constructions, and Pumpkingrams (p. 89) |
| 12:30–1:30 PM | G | B119, Conv. Center | Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success (p. 87) |
| 12:30–1:30 PM | M–C | Mt. St. Helens, DoubleTree | Science Observation Forms: Unique to Fit the Needs of Your Department (p. 90) |
| 12:30–1:30 PM | M–C | Mt. Hood, DoubleTree | Using Crowdsourcing to Advance STEM Education (p. 88) |
| 12:30–1:30 PM | E–M | D138, Conv. Center | STEM in State and Local Community Events (p. 89) |
| 12:30–1:30 PM | H–C | D130, Conv. Center | The Brock Mentorship Program: Real Scientific Research for Senior High School Students (p. 88) |
| 12:30–1:30 PM | I | Oregon, DoubleTree | STEM and Environmental Literacy: Engaging Students Beyond the Classroom Walls (p. 88) |
| 12:30–1:30 PM | G | Broadway, DoubleTree | NARST Session: Impact of an Embedded Assessment System on Elementary Teaching and Learning (p. 88) |
| 12:30–1:30 PM | M–C | Mt. Bachelor, DoubleTree | Reading and Writing Like a Scientist (p. 88) |
| 12:30–1:30 PM | P–E/S | E145, Conv. Center | Bridging Elementary Science for English Learners (p. 88) |
| 12:30–1:30 PM | M–H | E146, Conv. Center | Connecting Students and Community in a New STEM-focused School (p. 88) |
| 2:00–2:30 PM | G | Mt. Hood, DoubleTree | Robotic Rewards: Recruiting Middle School Students for an Award-winning Robotics Team (p. 92) |
| 2:00–3:00 PM | G | Mt. St. Helens, DoubleTree | The Power of Learning Journals to Bridge Science and the Common Core (p. 93) |
| 2:00–3:00 PM | H | Multnomah, DoubleTree | Elevating Expertise: Connecting STEM Experts to the Classroom (p. 93) |
| 2:00–3:00 PM | C | B110, Conv. Center | ASTE Session: Learn All About ASTE! (p. 91) |
| 2:00–3:00 PM | G | C122, Conv. Center | I Want to Be a Science Teacher—Now What? (p. 91) |
| 2:00–3:00 PM | E–M | D138, Conv. Center | Shipping from STEM to Stern (p. 92) |
| 2:00–3:00 PM | E–M | D136, Conv. Center | NSTA Press® Session: Outdoor Science and Bringing It In (p. 92) |
| 2:00–3:00 PM | E–H | Holladay, DoubleTree | HELP! I Need to Get Organized! (p. 93) |
| 2:00–3:00 PM | G | E146, Conv. Center | Creative Problem Solving with Toshiba/NSTA ExploraVision (p. 91) |
| 2:00–3:00 PM | E–H | E145, Conv. Center | Energy Debates Can Fuel the Common Core! (p. 93) |
| 2:00–3:00 PM | G | Mt. Bachelor, DoubleTree | The Best in Books—How to Find and Use Them (p. 92) |
| 2:00–3:00 PM | I | Weidler/Halsey, DoubleTree | Using Social Media to Extend STEM Inquiry (p. 93) |
| 2:00–3:00 PM | E | Broadway, DoubleTree | NARST Session: Looking at Quality of Instruction and Students' Performance: Where Do the Teachers' Questions Come From? (p. 92) |
| 2:00–3:15 PM | G | B114/115, Conv. Center | Foldables® + Science Standards + Envelopes = A Winning Combination (p. 94) |
| 2:30–3:00 PM | G | Mt. Hood, DoubleTree | Partners in Progress: Best Practices for Building Partnerships with STEM-based Groups (p. 92) |
| 3:00–4:30 PM | 7–C | A108/109, Conv. Center | Engineer the Tools for Inquiry of Candy Food Dyes (p. 95) |
| 3:30–4:00 PM | G | C122, Conv. Center | Write for an NSTA Journal (p. 95) |
| 3:30–4:30 PM | G | B119, Conv. Center | Teaching Essential Science Concepts and Skills: Doing Science, Reading Science, Writing Science, and Talking Science (p. 95) |
| 3:30–4:30 PM | H | Multnomah, DoubleTree | Scaffolding Student Success: Collecting Data, Collegiality, and Common Core (p. 97) |

Schedule at a Glance General Science

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| 3:30–4:30 PM | G | Mt. St. Helens, DoubleTree | Even Before STEM, Science and Math Loved Each Other! (p. 97) |
| 3:30–4:30 PM | M–H | Holladay, DoubleTree | Data: It's Not a Four-Letter Word (p. 97) |
| 3:30–4:30 PM | E | E146, Conv. Center | The Power of STEM Integration (p. 96) |
| 3:30–4:30 PM | M–H | Broadway, DoubleTree | Fulbright Teacher Exchange Program (p. 96) |
| 3:30–4:30 PM | M–H | Weidler/Halsey, DoubleTree | Ways to STEM-ify Activities from NASA Project Endeavor Fellows (p. 97) |
| 3:30–4:30 PM | I | Oregon, DoubleTree | Teaching Engineering Design to "All" Students Using Robotics (p. 96) |
| 5:00–5:30 PM | E/C | D137, Conv. Center | Bringing Engineering into Elementary Science Methods (p. 99) |
| 5:00–6:00 PM | M–H | Broadway, DoubleTree | Teaching with Screen-Capture Podcasts (p. 99) |
| 5:00–6:00 PM | M–H | Oregon, DoubleTree | STEM Projects for the Middle School Classroom (p. 99) |
| 5:00–6:00 PM | G | E145, Conv. Center | Bridging the Literacy Gap: Using Explicit Vocabulary Instruction and Reading Strategies to Improve Literacy in the Middle School Science Classroom (p. 99) |
| 5:00–6:00 PM | G | Holladay, DoubleTree | Help! They Need More Skills! (p. 100) |
| 5:00–6:00 PM | G | Mt. St. Helens, DoubleTree | Putting It All Together: Developing Connections Between CCSS and the NGSS (p. 100) |
| 5:30–6:00 PM | E/C/S | D137, Conv. Center | Transforming Elementary Schools to a STEM Focus (p. 99) |

Saturday

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| 8:00–9:00 AM | M | D137, Conv. Center | Breaking Down Barriers for Middle School Field Investigations (p. 104) |
| 8:00–9:00 AM | M | D135, Conv. Center | Authentic Writing with Children's Books: Learning Science from Mr. Fluffy Mittens (p. 103) |
| 8:00–9:00 AM | E | D140, Conv. Center | Energy from the Sun: Cycles of Matter and Energy in Ecosystems (p. 103) |
| 8:00–9:00 AM | G | C120/121, Conv. Center | A Districtwide Approach to Science Literacy (p. 103) |
| 8:00–9:00 AM | M | B119, Conv. Center | Closing the Achievement Gap for Middle School STEM Students Through the Lesson Study Process (p. 103) |
| 8:00–9:00 AM | G | B116, Conv. Center | Fueling the Future: Energy Interconnections and Sustainable Choices (p. 104) |
| 9:30–10:30 AM | G | B116, Conv. Center | Engaging in the Crosscutting Concepts (p. 107) |
| 9:30–10:30 AM | G | B117/118, Conv. Center | Building Community Partnerships for STEM Learning—Class Visits to Student Internships (p. 106) |
| 9:30–10:30 AM | M | B119, Conv. Center | How Do I Learn? The Adolescent Brain and Learning (p. 106) |
| 9:30–10:30 AM | M–H | D130, Conv. Center | Increasing Student Mastery Using Small Group Instruction (p. 106) |
| 9:30–10:30 AM | P–M/I | D140, Conv. Center | How to Utilize Informal Science Education Resources in Your Community (p. 107) |
| 9:30–10:30 AM | E–M | D138, Conv. Center | Connect2Science Through Nature (p. 108) |
| 9:30–10:30 AM | G | D135, Conv. Center | But I Am Not a Reading Teacher! Delivering Common Core ELA Standards in Your Science Classroom (p. 107) |
| 9:30–10:30 AM | P–E | D137, Conv. Center | Using Picture Books for Professional Development on the Next Generation Science Standards (p. 107) |
| 11:00–11:30 AM | P–M | D137, Conv. Center | Elementary Science Teaching: A Path Toward Content Mastery, Confidence, and Competence (p. 108) |
| 11:00 AM–12 Noon | G | C120/121, Conv. Center | High-Stakes Assessment Practice Made Easy Using Google Forms (p. 109) |
| 11:00 AM–12 Noon | G | B117/118, Conv. Center | Energy Education—Easy and Effective (p. 109) |

Physics/Physical Science

Thursday

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| 8:00–9:00 AM | I | Roosevelt, DoubleTree | The Global Web Wind Turbine Challenge (p. 44) |
| 8:00–9:00 AM | E–M | C122, Conv. Center | Next Generation Science Standards on Wave Behavior: LIGO’s Resources for Elementary and Middle School Classrooms (p. 43) |
| 8:00–9:00 AM | M | E142, Conv. Center | Seeing the Invisible: Making the Electromagnetic Spectrum Concrete (p. 45) |
| 8:00–9:15 AM | 8–C | B116, Conv. Center | How Data Logging Systems Support Scientific Studies (p. 47) |
| 10:00–11:15 AM | 4–10 | A107, Conv. Center | Exploring Machines (p. 49) |
| 11:00 AM–12 Noon | 6–8 | B113, Conv. Center | Hot Bulbs: Investigating Energy Efficiency (p. 51) |
| 12:30–1:30 PM | E–M/I | D131/132, Conv. Center | MacGuyver Windmills: Wind Power and Energy Transfers (p. 54) |
| 12:30–1:30 PM | E–H | E142, Conv. Center | Exploring NASA Engineering Challenges—Something for Everyone! (p. 54) |
| 12:30–1:45 PM | 4–10 | A107, Conv. Center | Forces, Energy, and Motion (p. 56) |
| 12:30–1:45 PM | 6–12 | A106, Conv. Center | Motion Comes Alive with CPO’s Velocity Sensor (p. 55) |
| 2:00–3:00 PM | 6–8 | B113, Conv. Center | Waves, Energy, and Color (p. 60) |
| 2:00–3:00 PM | H | E145, Conv. Center | College Ready with Mathematics and Physics (p. 58) |
| 2:00–3:00 PM | M–H/I | E146, Conv. Center | NASA’s Space Forensics: Solving Cosmic Mysteries with Crime Scene Narratives (p. 60) |
| 2:15–3:30 PM | 6–12 | A106, Conv. Center | Wind Turbine and the STEM Approach to Science Concepts (p. 61) |
| 2:15–3:30 PM | K–8 | A105, Conv. Center | Reflecting on Engineering Design (p. 60) |
| 2:15–3:30 PM | 5–10 | A107, Conv. Center | Renewable Energy (p. 61) |
| 3:30–4:30 PM | 6–12 | B113, Conv. Center | Integrate Math Modeling and Problem Solving Through Racing (p. 65) |
| 3:30–4:30 PM | E–M | E144, Conv. Center | Meeting the Next Generation Science Standards Through Engineering Contexts (p. 65) |
| 4:00–5:15 PM | 3–6 | A107, Conv. Center | Introduction to Simple Machines (p. 66) |
| 4:00–5:15 PM | 6–12 | A106, Conv. Center | Sound and Waves (p. 66) |
| 5:00–6:00 PM | H | E142, Conv. Center | FIRST® Tech Challenge Robotics in Your Classroom (p. 68) |

Friday

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| 8:00–9:00 AM | G | D131/132, Conv. Center | AAPT Session: Enriching Energy Instruction Through the Use of Novel Representations (p. 71) |
| 8:00–9:00 AM | E–M | E144, Conv. Center | The NGSS—Make Your Lessons 3-D! (p. 72) |
| 8:00–9:15 AM | 4–10 | A107, Conv. Center | Forces, Energy, and Motion (p. 73) |
| 9:30–10:30 AM | G | D131/132, Conv. Center | AAPT Session: Energy Conservations and Transformations (p. 78) |
| 10:00–11:15 AM | 5–10 | A107, Conv. Center | Renewable Energy (p. 81) |
| 10:00–11:15 AM | 5–9 | C120/121, Conv. Center | There’s a New Robot in Class! LEGO® MINDSTORMS® Education EV3 in Your Classroom (p. 81) |
| 10:00–11:15 AM | 6–12 | B114/115, Conv. Center | Fantastic Physical Science Demonstrations from Flinn Scientific (p. 81) |
| 11:00 AM–12 Noon | G | D131/132, Conv. Center | AAPT Session: E.T. Phone Home (p. 84) |
| 11:00 AM–12 Noon | P–E | D137, Conv. Center | Let’s Get Physical! (p. 84) |
| 12 Noon–1:15 PM | 8–C | B116, Conv. Center | How Data Logging Systems Support Scientific Studies (p. 86) |
| 12 Noon–1:15 PM | 3–6 | A107, Conv. Center | Introduction to Simple Machines (p. 86) |
| 12:30–1:30 PM | 9–C | A105, Conv. Center | Active Physics—Ahead of Its Time in Capturing the Essence of the NGSS and STEM (p. 90) |
| 12:30–1:30 PM | G | D131/132, Conv. Center | AAPT Session: Tried-and-True Techniques for Effective Student Learning... Even Graduating Seniors (p. 89) |
| 2:00–3:00 PM | M–H | D131/132, Conv. Center | AAPT Session: Taking Science on the Road: Outreach Activities You Can Use (p. 91) |
| 2:00–3:15 PM | 6–12 | B111/112, Conv. Center | Engineer Excitement in Your Classroom with a Carolina STEM Challenge™ (p. 94) |

Schedule at a Glance Physics/Physical Science

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| 2:00–3:30 PM | 7–C | B117/118, Conv. Center | Physics and Physical Science with Vernier (p. 95) |
| 3:30–4:30 PM | 6–12 | B113, Conv. Center | Integrate Math Modeling and Problem Solving Through Racing (p. 97) |
| 3:30–4:30 PM | M–H | D140, Conv. Center | Ten Activities to Invigorate Elective Physics Classes (p. 96) |
| 3:30–4:30 PM | H | E144, Conv. Center | Using a Patterns Approach to Meet the NGSS in Physics (p. 96) |
| 4:00–5:15 PM | 4–10 | A107, Conv. Center | Exploring Machines (p. 98) |

Saturday

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| 8:00–9:00 AM | E | D138, Conv. Center | Dancing Dixie® Cups (p. 104) |
| 8:00–9:00 AM | E–M | D136, Conv. Center | NSTA Press® Session: Stop Faking It! Finally Understand LIGHT AND SOUND So You Can Teach It (p. 104) |
| 8:00–9:00 AM | H | D130, Conv. Center | PHYSICS FIRST: A Story of Adoption, Implementation, and Evaluation (p. 103) |
| 9:30–10:30 AM | E–H | D136, Conv. Center | NSTA Press® Session: Stop Faking It! Classroom Activities for Energy Concepts (p. 108) |
| 11:00 AM–12 Noon | E–H | D136, Conv. Center | NSTA Press® Session: Classroom Activities for <i>Stop Faking It: Force and Motion</i> (p. 110) |
| 11:00 AM–12 Noon | M–C | D130, Conv. Center | <i>Diagnoser.com</i> : A Collection of Diagnostic Assessments and Next-Day Activities (p. 109) |
| 11:00 AM–12 Noon | 6–8 | B113, Conv. Center | Fast and Furious—Measuring Speed (p. 111) |

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