NSTA AREA CONFERENCE ON SCIENCE EDUCATION

EXPLORING MOUNTAINS:

GUIDING SCIENCE TEACHING AND LEARNING

P O R T L A N D

NOVEMBER 10-12, 2016





What happens to tires when it's cold?

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

Come see us in booth #500 FREE Inquiry-based workshops Friday 11/11 Room B113

\$69

Wireless Pressure

Modeling Climate Change: Dissolving Carbon Dioxide. 8:00 - 9:00 am

Rising temperatures are not the only impact of increased CO_2 emissions. The Earth's oceans act as a buffer by dissolving excess CO_2 into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO_2 using the wireless pH sensor and experience how easy inquiry can be.

Exploring Misconceptions: Speed & Velocity. 9:30 - 10:30 am

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

Exploring Misconceptions: Is there a Difference Between Heat and Temperature?

11:00 am - 12:00 pm

Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKvue and wireless temperature sensors will provide you effective new ways to teach the concepts of heat and temperature, central to physical science.



www.pasco.com/wireless A-0392_NSTA_OR_11/16

PASCO Wireless Solutions ***** Save time and money in your

science lab with





How would you like a powerful electron microscope for each of your students?

MyScope[™] Outreach is a free, online tool designed to make microscopy education and outreach accessible to a global user community.

Explore the fundamentals of microscopy:

Magnification and optics

- Visualize magnification levels.
- Focus and lenses.

Scanning electron microscope

- Learn how an SEM works and use the SEM simulator.
- Examine virtual samples and save or print your images to share.

Scope it out at booth 408!

MyScopeOutreach.org





Visit NSTA's SCERECE STORE Exhibit Hall A

An Travel Light with FREE Shipping for Online Orders!

Offering the latest resources for science teachers, including new releases and best sellers!

- Fun NSTA-branded gear—unique hats, shirts, mugs, collectible pins, and more
- Everyone enjoys member pricing:
 20% off bestseller NSTA Press[®] titles
- Traveling light? Ask about our NSTA gift cards great gift ideas!

Download the conference app or follow #NSTA16 for special giveaways, contests, and more throughout the conference!

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

STORE HOURS

Wednesday, Nov. 9 Thursday, Nov. 10 Friday, Nov. 11 Saturday, Nov. 12

FL.

4:00 PM-7:00 PM 7:30 AM-5:30 PM 7:30 AM-4:00 PM 8:00 AM-12 Noon





NSTA 2016 Area Conference on Science Education Exploring Mountains: Guiding Science Teaching and Learning

Portland, Oregon • November 10–12, 2016

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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

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NSTA Affiliates

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



Left to right, Susan Holveck, Bradford Hill, and Lori Lancaster

Welcome to the NSTA Portland Area Conference. On behalf of the science education community in Oregon, we welcome you to Portland, a city filled with friendly people who love the environment, bicycling, and the outdoors; great food and drink; bridges; roses; and creative thinking.

The Conference Committee wants you to engage in exciting learning experiences focused on the NGSS and "Exploring Mountains: Guiding Science Teaching and Learning." We have organized a wide variety of experiences across all grade levels and disciplines that will challenge you and help you grow your practice as a science educator and leader. The conference is organized around these three strands:

- Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA
- The View from the Summit: Celebrating Science for All
- The View from All Angles: Connecting Three-Dimensional Science Instruction

From the exciting expert invited speakers to hands-on workshops, presentations, educational trips, an award ceremony at OMSI, short courses, and more, you are sure to find innovative ideas and practices that will assist you in preparing students for the Next Generation. We know that you will have a terrific learning experience. We hope that you meet other like-minded educators who will become friends and colleagues. We are all in this together!

We look forward to meeting you as you engage in the wonderful adventure of learning and growing! We are so excited that you are here.

> 2016 Portland Area Conference Committee Leaders Bradford Hill, Susan Holveck, and Lori Lancaster

Portland Conference Committee

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.

Conference Chairperson

Bradford Hill Teacher Southridge High School 9625 SW 125th Ave. Beaverton, OR 97008 bradford_hill@beaverton.k12.or.us

Program Coordinator

Susan Holveck OSTA President and Science Teacher On Special Assignment (TOSA) for Secondary Schools Beaverton School District 16550 SW Merlo Rd. Beaverton, OR 97003 susan_holveck@beaverton.k12.or.us

Local Arrangements Coordinator

Lori Lancaster Communications Coordinator Oregon Science Teachers Association 4110 SE Hawthorne Blvd., #1025 Portland, OR 97214-5246 communications@oregonscience.org

Local Arrangements Committee

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

Manager of Services for People with Special Needs Terry Shlaes Lakeridge High School Lake Oswego, OR

Volunteers Manager Stephen Scannell Gresham High School Gresham, OR

Program Committee

Strand Leader: Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA Jodi Harnden Sunridge Middle School Pendleton, OR

Strand Leader: The View from All Angles: Connecting Three-Dimensional Science Instruction Lynda Sanders Marshfield High School Coos Bay, OR

Strand Leader: The View from the Summit: Celebrating Science for All

Marjorie "Midge" Yergen NSTA Director, District XVII West Valley Junior High School Yakima, WA

Program Representatives

Alfonso Garcia Arriola ACCESS Academy Portland, OR

Steven Ruthford Geneva Elementary School Bellingham, WA

Conference Advisory Board Liaison

Carolyn Hayes NSTA Retiring President Retired Educator Greenwood, IN

President's Welcome

Connect, Collaborate, Celebrate—Teachers are the Key



Welcome to NSTA's 2016 Portland Area Conference on Science Education. The area theme of *Exploring Mountains: Guiding Science Teaching and Learn*ing serves to describe the opportunities to explore science professional development aligned to the most current science curriculum and enhanced with the most current technology. This conference will provide

opportunities to explore and reach the highest pinnacles based on three themes that explore topics of current significance. These three strands are based on my theme for the year—Connect, Collaborate, Celebrate—Teachers are the Key.

In the strand: *Base Camp COLLABORATING to Integrate Elementary Science Instruction with Mathematics and ELA*, teachers will be able to provide students with tools they need to reach the summit to become scientifically literate students. Science education fosters creativity and natural curiosity especially with elementary students. Teachers will learn how to integrate content by bundling ELA standards, mathematics, and science to reach the whole child and improve the teaching and learning for all their students.

Ensuring that we have scientifically literate students is vital for ALL

students. The strand: *The View from the Summit: CELEBRATING Science for All* will stress that all students (e.g. special education, English language learners, gifted and talented, poverty based, etc.) must have access to science and engineering learning opportunities that engage them in constructing meaning about the world around them. Successful applications of science and engineering practices and the understanding of how crosscutting concepts will be accomplished across a range of core ideas will demand a greater support for scientific literacy.

The third strand: *The View from All Angles: CONNECTING Three-Dimensional Science Instruction* emphasizes quality instruction based on research-based best practices for today's learners. This strand connects the three dimensions of NGSS—crosscutting concepts, disciplinary core ideas, and science and engineering practices—to exemplify the intertwining nature of these dimensions necessary for high-quality instruction for all students.

I encourage you to take advantage of this dynamic opportunity to attend the many sessions that meet your needs. Climb those mountains of knowledge and reach the summit of exemplary teaching and learning. NSTA has provided the CONNECT, now you must provide the COLLABORATE and CELEBRATE. Enjoy—Learn— Share—Network with others. Teachers are the Key!

> Mary Gromko 2016–2017 NSTA President

Sponsors and Contributors to the Portland Conference

NSTA, OSTA, 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

HHMI BioInteractive Oregon Science Teachers Association Southwest Airlines Texas Instruments Vernier Software & Technology

Contributors

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













NSTA Portland Area Conference on Science Education

NSTA Conferences Go Green!

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

Conference Previews

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

Online Conference Information and Personal Scheduler

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

Final Conference Programs by E-Mail/Conference App

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

Recycled Paper and Sustainable Print Services

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

Environmentally Friendly Exhibition Practices

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

Oregon Convention Center's Green Practices

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

Under the direction of its in-house sustainability coordinator, OCC is continuously inspired to take its practices to the next level through these key areas of sustainability:

- OCC has 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. Each year OCC recycles, composts, and donates over 500,000 pounds of material instead of putting it in the landfill.
- OCC incorporates leading-edge environmental design, energy efficiency, and equipment upgrades and operational practices to help reduce OCC's impact on the climate by reducing its greenhouse gas emissions.
- Their storm water management program includes toxic 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.
- Work and contract opportunities with local and regional businesses are prioritized whenever possible.
- We 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 doublesided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended online.

Registration, Travel, and Hotels

Meeting Location and Times

The conference hotels are DoubleTree by Hilton Hotel Portland (*headquarters*), Courtyard by Marriott Portland, Crowne Plaza Portland–Downtown, Hilton Portland & Executive Tower, and Hotel Eastlund. Conference registration, exhibits, the Membership Booth, the NSTA Science Store, exhibitor workshops, and many sessions will be located at the Oregon Convention Center. Other sessions and events will be held at DoubleTree. The conference will begin on Thursday, November 10, at 8:00 AM, and end on Saturday, November 12, at 12 Noon.

Registration

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

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

5:00-7:00 PM
7:00 AM-5:00 PM
7:00 AM-5:00 PM
7:30 AM–12 Noon

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

Purchasing Ticketed Events

The 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 Registration Area. See the Conference Program section (starting on page 31) for details. Note that some events may have required advance registration.



Ground Transportation to/from Airport

MAX Red Line light rail service connects Portland International Airport (PDX) and Portland City Center. Portland's TriMet MAX Light Rail stops 300 times a day at the front door of the Convention Center, connecting riders to downtown, surrounding neighborhoods, attractions such as the Oregon Zoo, and the Portland International Airport. For directions on how to ride MAX Light Rail, visit *bit.ly/2dVuMK2*.

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 Pick-Up Area. Anyone who registers on-site will receive a pass 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

-Photo courtesy of Jamie Francis / Travel Portland

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 twohour ticket or \$5/day.

For information on routes and schedules, check *www.trimet.org* and *www.portlandstreet car.org*.

Getting Around Town

A small, personable downtown with halfsize city blocks (200 feet vs. the standard 400-foot monsters) and plentiful public spaces make Portland an ideal city to explore on foot. And thanks to the MAX (trimet.org/max)—Portland's award-winning light rail system with 84 stations and 52 miles of track—you can go from airport to hotel to Convention Center easily. MAX has five lines, all of which run through downtown. MAX trains run about every 15 minutes most of the day, every day. Or you may leisurely explore the city via the sleek Portland Streetcar (www.portlandstreetcar.org), which travels to the city's hottest shopping districts-and includes an eastside line connecting the Convention Center to the popular Oregon Museum of Science and Industry (OMSI), great restaurants, and nightlife.

Registration, Travel, and Hotels

Lyft Offer

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

Parking

The Convention Center (*www.oregoncc.org/ visitors/parking-and-directions*) garage opens daily at 6:00 AM. The maximum daily rate to park is \$10. Overnight parking is prohibited. The parking garage offers four electric vehicle charging stations, two on each level. To access a map of nearby parking options, visit *bit.ly/2dz9Ur4*.

Airlines

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

Discounted Rental Cars

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

Enterprise 800-593-0505 16AH230

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



— Courtesy of Jamie Francis / Travel Portland



Registration, Travel, and Hotels



- DoubleTree by Hilton Hotel Portland (Headquarters Hotel) 1000 NE Multnomah St.
- Courtyard by Marriott Portland Downtown/Convention Center 435 NE Wasco St.
- 3. Crowne Plaza Portland– Downtown Convention Center 1441 NE 2nd Ave.

- **4. Hilton Portland & Executive Tower** 921 SW 6th Ave.
- 5. Hotel Eastlund

1021 NE Grand Ave.

Complimentary TriMet passes will be provided. See page 7 for details. There will not be any shuttle service.

If you have questions or concerns regarding your housing, please contact Orchid Event Solutions (during business hours), Monday through Friday, 7:00 AM–7:00 PM PST at 877-352-6710 (toll-free) or 801-505-4611, or e-mail *help@orchideventsolutions.com*. After hours and on Saturday, call 801-505-4104.

Conference Resources



NSTA Exhibits

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

The lapel badge e-mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities except those for which a separate fee is stated. Maps of the Exhibit Hall and other meeting rooms will be accessible via our Conference app (see page 13). See page 114 for a complete list of exhibitors and contact information.

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

Thu., Nov. 10	11:00 AM-5:00 PM
Fri., Nov. 11	9:00 AM-3:00 PM
Sat., Nov. 12	9:00 AM-12 Noon

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

Thu., Nov. 1011:00 AM-12:30 PMFri., Nov. 111:30-3:00 PM

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

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 126 for a complete listing of exhibitor workshops.

Exhibit Hall Beverage Break

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

NSTA Science Store

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

- Exclusive author signings and meetand-greet opportunities
- Our latest books—Argument-Driven Inquiry in Physical Science; Inquiring Scientists, Inquiring Readers in Middle School; Disciplinary Core Ideas: Reshaping Teaching and Learning; and Uncovering Student Ideas in Earth and Environmental Science—and our new children's books from NSTA Kids, including Next Time You See a Cloud; From Flower to Fruit; and Notable Notebooks: Scientists and Their Writings
- "I Love Science" and NSTA gear product lines to show your love of science and pride in teaching
- Member discounts of 20% on NSTA Press® items and 10% on books from other publishers for all attendees
- Daily book and gear specials, product giveaways, and more.

Meet the Presidents and Board/Council

Be sure to stop by Friday from 1:15 to 2:00 PM at the entrance to Hall A for a special session. Come "meet and greet" with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

Wi-Fi in Convention Center

Complimentary Wi-Fi internet access is available in designated "zones" throughout the Convention Center. Service is intended for casual internet access, e-mail, etc. 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
- Holladay Lobby

OSTA Booth

The Oregon Science Teachers Association (OSTA) booth is located in Hall A near the NSTA Registration Area. Stop by and find out what is happening in science education in Oregon and what OSTA is doing beyond the conference to support science educators. We would love to meet you, and share with you what your professional organization is doing to support you, including the 2017 OSTA Fall conference that will be held at the PCC Sylvania Campus on October 13–14, 2017. Oregon teachers can also sign up for PDU certificates toward licensure renewal.

WSTA Booth

The Washington Science Teachers Association (WSTA) booth is located in Hall A near the NSTA Registration Area. The booth will have membership forms and information about science activities in Washington. Clock hours will be available to our Washington Teachers. Please pick up a session verification form before you start your conference sessions. Then return to the booth at the end of

Conference Resources

Graduate Credit Opportunity

Portland conference attendees can earn one graduate-level credit in professional development through Portland State University. Visit *bit.ly/2aoAWjw* for complete details or visit the OSTA Booth. The fee is \$180. For any questions, contact Terry Shlaes at *shlaest@loswego.k12.or.us*.

your conference journey to pay and pick up your clock hour form! Stop by to say hello, learn how we can keep you up to date on the latest happenings in our area, and pick up some great commemorative items!

Presenters and Presiders Check-In

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

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

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

When you log on to *www.nsta.org/portlandbrowser* and fill out an evaluation by clicking on the "evaluate session" button below the session you attended, you get entered

into a drawing for a chance to win an Apple iPad mini 2 Wi-Fi tablet *courtesy of the NSTA Conference Department*.

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

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



CONFERENCE APP



 Scan QR code below to access our NSTA Conference App.





Conference Resources



Lost and Found

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

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.

Visitor Information Desk

The Visitor Information Desk is located in the MLK lobby of the Convention Center. The desk is open 8:00 AM to 5:00 PM every day of the conference to provide information about the city and assist with restaurant recommendations and reservations.

Online Session Evaluations and Tracking Professional Development

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

Help NSTA's **GREEN** efforts by visiting the conference session browser to complete session evaluations online, November 9–29, 2016. During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Registration Area. And this year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!

To evaluate a session, attendees should follow these steps:

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

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

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

Beginning December 6, 2016, an attendee can view his or her transcript at the NSTA Learning Center *(learningcenter.nsta. org)* by first logging on and then clicking "My Profile" under the Welcome. Here you'll find a "Certificates" tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional development experiences (online and face to face) for your longterm growth and professionalism.

Each attendee is responsible for tracking his or her own attendance at such events. The transcript can be printed here and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

Conference Resources

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, DoubleTree, and Exhibit Hall; social media plugins; and a note-taking tool. Scan the QR code or visit *www.nsta.org/conferenceapp* to download the app. Please make sure to create a CrowdCompass account when logging in to be able to export any notes taken within the app. *Note:* The NSTA Conference app does not sync to our online Personal Scheduler.

Membership Booth and the (UN)conference

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

Also in Portland, we're holding an NSTA (UN)conference, hosted by expert STEM educator, Dedric McGhee. Follow us on Twitter @NSTA or #NSTA16 to see updates!

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 lastminute 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, Conv. Center
- Portland Room, DoubleTree

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 will be open during registration hours of the conference.

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. 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.



Oregon Conv



ention Center



DoubleTree by Hilton Hotel Portland

First Level



Second Level





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

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NS74 Mission Statement

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

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National Conferences on Science Education

Los Angeles, California March 30–April 2, 2017

Atlanta, Georgia March 15–18, 2018

St. Louis, Missouri April 11–14, 2019

Boston, Massachusetts March 26–29, 2020

Chicago, Illinois April 8–11, 2021

6th Annual STEM Forum & Expo, hosted by NSTA

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

Area Conferences on Science Education

2016 Area Conferences

Columbus, Ohio—December 1-3

2017 Area Conferences

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

Share Your Ideas! NSTA's CONFERENCES Have an idea for an inspiring presentation or workshop on science education? Submit a session proposal today for... **ON SCIENCE EDUCATION** 6th Annual STEM Forum & Expo, hosted by NSTA **Proposal Deadline:** 12/5/2016 Gaylord Palms Resort/Kissimmee, Orlando, FL....July 12–14 2017 Area Conferences **Proposal Deadline:** 1/17/2017 Baltimore, MD.....October 5-7 Milwaukee, WI.....November 9–11 New Orleans, LANovember 30–December 2 2018 National Conference **Proposal Deadline:** 4/17/2017 Atlanta, GA March 15–18

To submit a proposal, visit *www.nsta.org/conferenceproposals*



NSTA NATIONAL CONFERENCE ON Science Education

LOS ANGELES

March 30–April 2 2017

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

 Sharon Ruggieri, past conference attendee Over **1,200** sessions Network with more than **10,000** educators

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And much more!

NGSS The Next Generation of Science Teaching **2017** A STEM Odyssey Science & Literacy Reloaded

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Conference Program • Highlights



-Courtesy of the Oregon Museum of Science and Industry



Is This Your First NSTA Conference?

Yes, you say? Then you are invited to attend a special session on Thursday, 8:00–9:00 AM. Learn how you can gain the most from your conference experience and have fun doing it! See page 40 for details.

Thursday, November 10

8.00-9.00 AM	First-Timer Conference Attendees' Orientation 40
	(Is This Your First NSTA Conference?)
9:15-10:30 AM	General Session: Sean Carroll, sponsored by HHMI BioInteractive 44
10:30-11:30 AM	Sean Carroll book signing in the NSTA Science Store
11:00 AM-5:00 PM	Exhibits (<i>Exclusive hours: 11:00 AM-12:30 PM</i>) 50
2:00-3:00 PM	Featured Presentation: Philip Bell
4:30-6:00 PM	OSTA/WSTA Awards Program @ OMSI 65
6:00-9:00 PM	Teacher Evening at OMSI (M-1, \$35) 69
	Friday, November 11
8:00 AM-1:30 PM	Middle School Chemistry Day 28
8:00 AM-4:30 PM	Physics Day
8:00 AM-5:00 PM	Chemistry Day (For Grades 9–12) 28
8:00 AM-5:00 PM	Elementary Day @ NSTA 29
8:00 AM-6:00 PM	Engineering Day 29
9:00 AM-3:00 PM	Exhibits (<i>Exclusive hours: 1:30–3:00 PM</i>) 77
9:30-10:30 AM	Featured Presentation: Deena Pierott
11:00 AM-12 Noon	Featured Presentation: Carla Zembal-Saul
1:15-2:00 PM	Meet the Presidents and Board/Council
1:15-3:00 PM	Exhibit Hall Beverage Break
3:30-4:30 PM	Featured Presentation: Dennis Schatz
	Saturday, November 12

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



Thanks to the generosity of

Southwest Airlines

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



The drawings will be held at:

- 4:00 PM, Thursday, Nov. 10
- 2:00 PM, Friday, Nov. 11
- 10:00 AM, Saturday, Nov. 12

Stop by the NSTA Membership booth for all the details! You need not be present to win.





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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.



Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA

^NScience education fosters the natural curiosity and creativity in students. By teaching science and laying the foundation, elementary teachers provide students with the tools they need to reach the summit to become scientifically literate adults. When teachers integrate content during instruction, they are modeling how the real world operates, allowing students to make meaning of the world they live in. Teachers choosing this strand will learn how to bundle science, mathematics, and ELA standards in a way that reaches the whole child and improves efficiency in the elementary classroom.

The View from the Summit: Celebrating Science for All

In a science- and technology-driven society, equity means that all students should have access to knowledge that will allow them to participate as productive citizens. Successful application of science and engineering practices and the understanding of how crosscutting concepts play out across a range of disciplinary core ideas will demand increased cognitive abilities of ALL students (e.g., special education, English language learners, gifted and talented). This strand will demonstrate how teachers can provide equitable science and engineering learning opportunities that engage students in constructing meaning about the world around them.

3D The View from All Angles: Connecting Three-Dimensional Science Instruction

The NRC *Framework* and the *Next Generation Science Standards* identified research-based best practices for today's learners. Quality instruction incorporates the three dimensions of *NGSS* (crosscutting concepts, disciplinary core ideas, and science and engineering practices). Three-dimensional science learning produces scientifically literate and competent students. This strand will exemplify the intertwining nature of the three dimensions necessary for high-quality science instruction at all levels.

Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA

Thursday, November 10

8:00-9:00 AM

Differentiating K–6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success

12:30–1:30 PM

Patterns of Survival

2:00-3:00 PM

Developing and Implementing NGSS-Focused Curricula in Gillette, Wyoming: Focus on Earth and Space Science as a Vehicle for Mathematics and Literacy Integration

3:30-4:30 PM

NGSS Storyline Coherence for Kindergarten: Phenomena and Context-Based Units of Study for Kindergarten

Friday, November 11

8:00–9:00 AM Coyote vs. Road Runner: Why Acme Anvils Aren't Needed

9:30–10:30 AM Solving the Mystery of the Megaflood with

Fourth-Graders!

11:00 AM-12 Noon

Featured Presentation: Beyond the Blender Metaphor of Integration: *NGSS* as a Lever for Transforming Educational Opportunities for Elementary Learners (Speaker: Carla Zembal-Saul)

12:30–1:30 PM FieldSTEM Plus: An Integrated Learning Model

1:00-4:00 PM

SC-3: Writing in Science: A Research-Based Approach That Enhances Learning in Both Domains (Ticket Required: \$25)

3:30-4:30 PM

Cross-Curricular Learning with a Science Focus: Optimizing Student Learning and Maximizing Efficiency of Instruction While Embracing All Aspects of STEM

5:00-6:00 PM

Base Camp—Where Science and Literacy Standards Meet

Saturday, November 12

9:30–10:30 AM Goldilocks, an Engineer?

The View from All Angles: Connecting Three-Dimensional Science Instruction

Thursday, November 10

8:00–9:00 AM The Re-Wilding Project!

12:30–1:30 PM Inquiring Minds Want to Know

2:00-3:00 PM

Featured Presentation: How Should Districts and Schools Focus Professional Development When Starting to Implement *NGSS*? (Speaker: Philip Bell)

3:30–4:30 PM Problems and Phenomena: Engaging Your Students in Three-Dimensional *NGSS* Learning!

5:00–6:00 PM Constructing Explanations in Biology— Getting from There to Here

Friday, November 11

8:00–9:00 AM Three-Dimensional Formative Assessment

9:30-10:30 AM

Integrating Green Chemistry and Engineering Design into Every Classroom: Interactive Workshop for High School Educators

11:00 AM–12 Noon Biology for the Next Generation: 3-D

Teaching, Learning, and Assessment in the Biology Classroom

12:30–1:30 PM Making Yogurt as an Engineering Design Project in Biology

3:30–4:30 PM Teaching Engineering

5:00–6:00 PM Reach Higher with Projectiles and the *NGSS*

Saturday, November 12

8:00–9:00 AM Three Dimensional Assessments: The Changes Ahead

8:00 AM-12 Noon

SC-4: From Roots to STEM—Using Roots Instruments to Teach STEM (Ticket Required: \$41)

9:30-10:30 AM

Regurgitation and Argumentation: Teaching Science Practices Using Owl Pellets

11:00 AM–12 Noon Student-Designed Research on Sleep,

Memory, and Emotional Regulation

The View from the Summit: Celebrating Science for All

Thursday, November 10

2:00-2:30 PM

A Transformational Model for Science Instruction in a 21st-Century Classroom

2:30-3:00 PM

Teaching, Integrating, Exploring Science (TIES): A Science Mentoring Program for Grade 5 Girls

3:30-4:30 PM

Inclusion: Strategies for Helping Students with Disabilities in the Science Classroom

5:00-6:00 PM

The nPower Girls: Cultivating Interest and Achievement in STEM

Friday, November 11

8:00–9:00 AM Infect Your Science Classroom with Math

9:30–10:30 AM Featured Presentation: Implicit Bias and Its Effect on Diverse Youth (Featured Speaker: Deena Pierott)

11:00 AM-5:30 PM

SC-2: Supporting the *NGSS* with Process-Oriented Guided Inquiry Learning (POGIL) (Ticket Required: \$60)

12:30–1:30 PM Recipe for Research and Application: The Science of Food and Eating

3:30–4:30 PM Beyond Differential Instruction

5:00-6:00 PM

Perspectives on Time as a Means of Optimizing Science Instruction in a Diverse Classroom

Saturday, November 12

8:00–9:00 AM Constructing Equitable STEM Activities for All

9:30-10:30 AM

Equity and Engagement of Economically Disadvantaged Students in STEM Project-Based Learning

11:00 AM-12 Noon

Engaging Girls in STEAM

TEACHER EVENING AT OMSI



at the Oregon Museum of Science and Industry

Thursday, November 10, 6:00–9:00 PM (Ticket Required) M-I ticket: \$35 on-site (per person)

Ranked as one of the top science centers in the U.S., OMSI (*www.omsi.edu*) has an international reputation for its innovative exhibits and educational programs. Join us to explore OMSI exhibit halls, experience STEM programming as well as demonstrations and hands-on activities with museum educators. This evening experience will give teachers opportunities to engage in classroom-ready, hands-on activities, and take-away resources encouraging implementation of STEM activities in the classroom.

Ticket cost includes museum admission and light appetizers. Tickets may be purchased at registration. Cash bar.

Note: Transportation to and from the museum is not provided. OMSI is on the streetcar line about 15 minutes from the Convention Center. The cost is \$2 to ride or use your TriMet pass and ride for free (given out at program pickup). For directions and parking, visit www.omsi.edu/visitor-info.



NSTA Press Sessions

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



Thursday, November 10

8:00-9:00 AM	Argumentation in the Biology Science	Friday, November	11
	Classroom	8:00–9:00 AM	Argument-Driven Inquiry in Chemistry:
12:30-1:30 PM	Solar Science = <i>NGSS</i> -Focused Solar		Lab Investigations for Grades 9–12
	Astronomy Experiences + Preparation for the All-American Total Solar Eclipse	9:30–10:30 AM	Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12
2:00-3:00 PM	Outdoor Science with Birds, Books, and Butterflies	11:00 AM-12 Noon	Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6–8
3:30-4:30 PM	Teaching for Conceptual Understanding in Science	12:30-1:30 PM	Argumentation in the Physical Science/ Physics Science Classroom
5:00-6:00 PM	Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Tradebooks		,

Meetings and Social Functions

Thursday, November 10

OSTA/WSTA Awards Program	@ OMSI
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- To purchase tickets, visit *www.oregonscience.org/event-2288540*. Ticket Required, Off-site at OMSI4:30–6:00 PM
- M-1: Teacher Evening at Oregon Museum of Science and Industry Ticket Required, Off-site at OMSI6:00–9:00 PM

Friday, November 11

North-West and Far West Regions Association of Science Teacher Educators Joint Business Meeting Weidler/Halsey, DoubleTree 12 Noon–1:00 PM

Friday, cont.

Discover the NGSS Train-the-Trainer Workshop
Saturday, November 12
Multnomah, DoubleTree
The State of Science/STEM/STEAM Education in Oregon
Weidler/Halsey, DoubleTree 2:00-4:00 PM
Educators Joint Meeting
North-West and Far West Regions Association of Science Teacher
Mt. St. Helens, DoubleTree2:00–3:00 PM
STEM Lighthouse Schools: The View from the Summit

Holladay, DoubleTree 8:00 AM-5:00 PM



Chemistry Day at NSTA

Sponsored by the American Chemical Society

Energy as a Framework to Teach Chemistry at Multiple Levels For Grades 9–12

Friday, November 11, 8:00 AM–5:00 PM E145, Oregon Convention Center

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

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

8:00-10:00 AM	Energy in Chemistry–A Macroscopic View
10:30 AM-12:30 PM	Energy in Chemistry—A Particulate View
3:00-5:00 PM	Energy in Chemistry—An Atomic View

Middle School Chemistry Day

Sponsored by the American Chemical Society

Middle School Chemistry— Big Ideas About the Very Small

Friday, November 11, 8:00 AM–1:30 PM E146, Oregon Convention Center

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

8:00–9:00 AM	Solids, Liquids, Gases, and Changes of State
9:30-10:30 AM	Density: A Molecular View
11:00 AM-12 Noon	The Water Molecule and Dissolving
12:30-1:30 PM	Chemical Reactions: Breaking and Making Bonds



Engineering Day at NSTA

Sponsored by the American Society for Engineering Education Friday, November 11, 8:00 AM–6:00 PM D139, Convention Center

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

8:00-9:00 AM	ASEE's K–12 Outreach: Engineering,	11:00 AM-12 Noon	Cognitive and Noncognitive Experiences
	Go For It (eGFI), Teach Engineering,		with Engineering Practices
	Link Engineering, and the National	12:30-1:30 PM	Creatively Applying the "E" in STEM
9:30-10:30 AM	Engineering a Pathway to STEM: Advancing Elementary Level Engineering	3:30-4:30 PM	Computer Science as a Bridge Between Concepts, Ideas, and Practice in Grades 6–12 Science Classrooms
	and Partnerships	5:00-6:00 PM	Coupling Engineering Design Practices with CCSS ELA Writing

Elementary Day @ NSTA

Sponsored by the Oregon Science Teachers Association

Friday, November 11, 8:00 AM–5:00 PM Multnomah, DoubleTree

Join Susan Holveck, Science TOSA for Secondary Science at the Beaverton School District, and distinguished guests as they present sessions that demonstrate the impact that teaching science at the elementary level has on equity, English language proficiency, academic achievement, and college and career readiness.

- 8:00–10:00 AM Panel Discussion: Articulating the "Why": Science in the Elementary Years
- 10:30 AM-12:30 PM Taking Stock and Planning for Three-Dimensional Science Teaching and Learning in Elementary Schools

Elementary Day @ NSTA begins with a panel discussion, followed by a workshop and networking event covering both successes and impediments in teaching science in elementary school. Elementary Day @ NSTA is being organized by the Oregon Science Teachers Association (*www.oregonscience.org/event-2349506*).

3:00-5:00 PM The State

The State of Science/STEM/ STEAM Education in Oregon



Physics Day at NSTA

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

Friday, November 11, 8:00 AM-4:30 PM E143, Oregon Convention Center

The American Association of Physics Teachers offers a full day of physics content. Physics Day consists of interactive hands-on workshops and sessions covering important physics topics for today's world. Each of these workshops or sessions is organized by experienced science educators and designed to deal with hard-toexpress concepts that can be immediately applied in your classroom. Physics Day in Portland is being organized by the Oregon Section of the American Association of Physics Teachers.

8:00–9:00 AM	Physics and Engineering in the Classroom and After-School Clubs I: Using Microcontrollers to Collect and Display Results in Fun and Exciting Ways	11:00 AM–12 Noon	Physics and Engineering in the Classroom and After-School Clubs III: Student miniROVs in the Classroom, the Field, and in Student Competitions
9:30–10:30 AM	Physics and Engineering in the Classroom and After-School	12:30-1:30 PM	Developing an Energy Policy for the U.S.
	Clubs II: Using an Arduino to Collect Data and Control Motors	3:30-4:30 PM	How to Make Holograms Using the Litiholo Home Holography Kit



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.

NASA's Exploration of the Solar System: Activities for Out-of-School Time (SC-1)

Christine Shupla *(shupla@lpi.usra.edu),* Lunar and Planetary Institute, Houston, Tex.

Brandy Laney (*brandyb@springisd.org*) Northgate Crossing Elementary School, Houston, Tex.

Meredith Harris (meredithaharris@me.com), Spring ISD, Houston, Tex.

Science Focus: ESS1.B, ESS2.D, INF, CCC1, CCC2, CCC4, SEP2, SEP3, SEP4

Level: Grades 2–6

Date: Thursday, November 10, 1:00–4:00 PM Location: 3 Sisters/Mt. Bachelor, DoubleTree Ticket Price: \$18

Discover Jupiter's unique personality traits, including its dynamic weather, mysterious interior, and amazing magnetic field. Join in as we compare the characteristics of planets through hands-on activities, compare their densities, weigh ourselves on other worlds, and use models to infer their structure and composition. This short course uses Explore Jupiter's Family Secrets developed for the Juno mission now at Jupiter. This series of activities was written for informal educators, but addresses many of the questions and standards that teachers explore in the classroom.

Supporting the *NGSS* with Process-Oriented Guided Inquiry Learning (POGIL) (SC-2)

Mare Sullivan (*joe.mare.sullivan@gmail.com*), Seattle Pacific University, Seattle, Wash.

Julia Dudley (jjones@psd1.org), Pasco (Wash.) School District

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

Science Focus: GEN, NGSS

Level: Grades 6–12

Date: Friday, November 11, 11:00 AM-5:30 PM

Location: Mt. Hood, DoubleTree

Ticket Price: \$60

In this short course, immerse yourself in collaborative learning to explore connections among POGIL strategies and the *NGSS* crosscutting concepts, disciplinary core ideas, and science and engineering practices. The small group collaborative learning strategies support all students, from English language learners and SPED through gifted, as they work through guided inquiry activities. We will develop the confidence to adapt existing curriculum activities so that they better align with a guided-inquiry learning cycle. A break for lunch on own will be built in.

es 🕇

Writing in Science: A Research-Based Approach That Enhances Learning in Both Domains (SC-3)

Betsy Rupp Fulwiler (*bruppfulwiler@comcast.net*), Betsy Rupp Fulwiler Consulting, Seattle, Wash. Science Focus: GEN Level: K–6 Date: Friday, November 11, 1:00–4:00 PM Location: 3 Sisters/Mt. Bachelor, DoubleTree Ticket Price: \$25

Explore research-based strategies for using scaffolding to increase diverse elementary students' achievement in science and writing, as described in *NGSS* and *CCSS ELA*. Learn how to use word banks, graphic organizers, and writing frames so that students learn how to think, talk, and write (e.g., scientific observations, comparisons, data interpretation, explanations) as scientists do. This approach has been found to be highly effective with all students, including those who are learning English or have special needs. We will engage in discussions, modeling, shared mini lessons, and view a video of an actual classroom. Handout with blackline masters and annotated student notebook entries for grades K–6 students included.

3D From Roots to STEM—Using Roots Instruments to Teach STEM (SC-4)

Nicholas Krissie (@krissie_nick: nicholas.krissie@ oakland.k12.or.us), Lincoln Middle School, Oakland, Ore. Science Focus: ETS2, CCC3, SEP1, SEP5 Level: Grades 4–8 Date: Saturday, November 12, 8:00 AM–12 Noon Location: Mt. Bachelor, DoubleTree Ticket Price: \$41

Build a STEM program that rocks! From Bo Diddley to Muddy Waters, the artists who influenced the Blues did so on homemade roots instruments. These instruments are simple enough for a fourth-grader to build but complex enough to teach something from each of the STEM disciplines at any grade level. In this short course, participants will build one of the most influential roots instruments—the diddley bow—and explore how to use high-quality, student-built roots instruments as part of an integrated STEM program. Tickets for educational trips may be purchased (space permitting) at the Ticket Sales Counter in the NSTA Registration Area. Meet your educational trip leader at the Holladay Street entrance of the Oregon Convention Center 15 minutes prior to departure time.



-Photo courtesy of Cascades Volcano Observatory

Oregon National Primate Research Center Tour

		\$17, by preregistration only
#T-1	Thurs., Nov. 10	8:30 AM-12:30 PM

The Oregon National Primate Research Center (ONPRC), one of seven 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.

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.

Cascades Volcano Observatory Tour

\$33

#T-2 Thurs., Nov. 10 12:15–5:00 PM The U.S. Geological Survey is responsible for assessing volcano hazards, monitoring becanic activity, and issuing warnings of impending erificans. 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. Note: No food or beverage provided on this trip.

Columbia	River Gorge Geology Tour	\$59
#F-1	Fri., Nov. 11	7:30 AM-5:00 PM

Come study the geology of the Columbia Gorge. Explore the evolution of this area through examination of the rocks and features. Examine Glacial Flood evidence and visit Rocky Butte, Multnomah Falls, Hood River Delta, the Cascade Locks, and various other scenic stops as time allows. Moderate hiking is required. Bring field clothing, water bottle, and any medication you might require. *Note:* This trip is not weather dependent. If it rains, we travel east, starting our stops at Hood River with one at Multnomah Falls on the west side. Nice weather, we start our outside stops right in Portland. Lunch included.

Evergreen A	viation & Space Museu	ım \$57
#F-2	Fri., Nov. 11	8:00 AM-2:00 PM

Evergreen Museum Sampus allows for many opportunities to learn about the instory of aviation and space flight...and much more the Evergreen Aviation & Space Museum offers teachers many standards-focused 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. Box lunch included. For more information, visit *www. evergreenmuseum.org.* Travel time is roughly 1.5 hours each way.

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

Portland Area Conference, November 10–12, 2016 Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the 2016 Portland Area Conference. Sessions/events such as exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

Beginning December 6, 2016, Portland conference transcripts can be accessed at the NSTA Learning Center *(learningcenter.nsta.org)* by logging on with your conference badge ID# and first clicking on "My Profile" under the "Welcome." Here you'll find a "Certificates" tab to access your transcript. Keep this form and use it to add the following activities to your Portland conference transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

	First Name:	Last Name:	Badge ID#
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Evaluate sessions by accessing the Portland session browser: www.nsta.org/portlandbrowser. You will need your badge number to evaluate sessions. See page 12 of the program for instructions. Note: Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them.

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

Wednesday, November 9 12 Noon-4:00 PM

Start Time	End Time	Activity/Event Title

We're giving an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who evaluates sessions that he or she attends. The more sessions you attend and evaluate, the more chances you have to win!

Thursday, November 10 8:00 AM-6:00 PM

Start Time	End Time	Activity/Event Title
Friday, Novembe	er II 7:30 AM	1–6:00 PM
Friday, Novembe Start Time	er II 7:30 AM End Time	1–6:00 PM Activity/Event Title
Friday, Novembe Start Time	er II 7:30 AN End Time	1–6:00 PM Activity/Event Title
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Friday, Novembe	er II 7:30 AM End Time	1–6:00 PM Activity/Event Title
Friday, Novembe Start Time	er II 7:30 AM	1–6:00 PM Activity/Event Title
Friday, Novembe	er II 7:30 AM	1–6:00 PM Activity/Event Title
Friday, Novembe	er II 7:30 AM	1–6:00 PM Activity/Event Title
Friday, Novembe	er II 7:30 AM	1-6:00 PM Activity/Event Title

Saturday, November 12 8:00 AM-5:00 PM

Start Time	End Time	Activity/Event Title
Rice Northwest Museum of Rocks & Minerals Tour \$28

#F-3 Fri., Nov. 11 8:30 AM-1:00 PM

The Rice Northwest Museum showcases not only fine rocks and minerals, but also investigates, meteorites, lapidary art, and gemstones from the Pacific Northwest and all around the world.

> Home of the famed Alma Rose, a rare

> rhodochrosite crys-

tal, the museum is

housed in the former

home of Richard and

Helen Rice. Avid

rock hounds, their

home is now on the

Registry with its

fine display of Or-

egon Myrtlewood

and bird's eye maple

throughout the in-

terior. Participants

will be guided by

our curator through

Historic

National



-Photo of the "Alma Rose" rhodochrosite, courtesy of the Rice Northwest Museum of Rocks & Minerals

the 9,600-square-foot museum, which includes some of the finest mineral specimens in North America. Bring your cameras. Come see how our on-site school tours and Portable Programs can meet your classroom's needs. Visit *www.ricenorthwestmuseum. org* for more information.

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

#F-4 Fri., Nov. 11 9:	:30 AM-3:15 PM
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How do you create and produce 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 tour the company with David Vernier, former physics teacher and founder of the company. Visit the on-site Technology Museum, discover a bit about the company's history, see new products demonstrated, receive a bag of science goodies, and have a relaxing lunch provided courtesy of Vernier. Come check out Vernier's LEED-certified building with cool science features such as solar panels, electrochromic windows, a saltwater aquarium, an augmented reality sandbox, and an indoor slide that is perfect for fun-loving science teachers.

15 minutes prior, participants will meet Angie, the Vernier rep, at the OCC entrance located on Holladay Street. Angie will distribute MAX passes for the trip via MAX Light Rail and accompany the participants and trip leaders to Vernier.



—Photo courtesy of Julia Grieve / Travel Portland

Association for Multicultural Science Education (AMSE)

President: Sharon Delesbore

Thursday, November 10		
2:00-3:00 PM	Moving to Teacher as Facilitator: NGSS and Critical Pedagogy	D136, OCC
Friday, November 11		
8:00–9:00 AM	Building an Equitable Science Classroom Community: Strategies by and for Teachers	D137, OCC

Association for Science Teacher Education (ASTE)

President: Malcolm Butler

Thursday, November 10		
3:30-4:30 PM	Sharing Innovative Program Designs for Professional Development and Research in Science Education	Oregon Blrm. 203, OCC
Saturday, November 12		
11:00 AM-12 Noon	Integrating ELA and Math with <i>NGSS</i> -Based Activities for Elementary Teachers	D133/134, OCC

Association of Science-Technology Centers (ASTC)

Director: Margaret Glass

Friday, November 11

11:00 AM-12 Noon	Informal Science Educators Networking Brown Bag Lunch	D132, OCC

Council for Elementary Science International (CESI)

President: James T. McDonald

Friday, November 11

9:30–10:30 AM	Integrating Science for Young Children with an Outdoor Focus	Oregon Blrm. 203, OCC
11:00 AM–12 Noon	Elementary Science Share-a-Thon	Oregon Blrm. 203, OCC

Thursday, November 10		
12:30–1:00 PM	Presidential Awards for Excellence in Mathematics and Science Teaching	D137, OCC
Friday, November 11		
3:30-4:30 PM	Science Starts with a Story, <i>NGSS</i> in Support of Language Acquisition for All Students	D138, OCC
National Association for	Research in Science Teaching (NARST)	
President: Mei-Hung Chiu		
Friday, November 11		
8:00–9:00 AM	The Efficacy of Multi-Level Professional Development for Elementary, Middle School, and High School Teachers	D138, OCC
Saturday, November 12		
9:30–10:30 AM	Resisting Racist, Classist, Neoliberalism in Science Education	B119, OCC
National Middle Level Sc	ience Teachers Association (NMLSTA)	
President: Mary Lou Lipscomb		
Thursday, November 10		
8:00–9:00 AM	Calling All Middle Level Teachers!	E145, OCC
National Science Educati	on Leadership Association (NSELA)	
President: Keri Randolph		
Thursday, November 10		
12:30–1:30 PM	Tools for Science Leaders, Part 1	D138, OCC
Friday, November 11		
11:00 AM–12 Noon	Tools for Science Leaders, Part 2	D138, OCC

Council of State Science Supervisors (CSSS)

President: Ellen Ebert

Three Dimensions of the Next Generation Science Standards (NGSS)

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

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

Disciplinary Core Ideas

12 Noon–4:00 PM Preconference Seminars

OSTA Preconference Seminar: Using Science to Promote Language and Literacy for All Elementary Students

(Grades K—6)

Broadway, DoubleTree

\$75; By Preregistration Through OSTA

Science Focus: GEN

Carol Biskupic Knight, Beaverton (Ore.) School District Jennifer Whitten, Beaver Acres Elementary School, Beaverton, Ore.

This seminar builds off the Math Science Partnership Grant: Expansion of K–6 *NGSS* Science Instructional Specialists. Experience active engagement of phenomenon-based activities along with modeling by classroom teachers.

OSTA Preconference Seminar: Physics for the Next Generation

(Grades 9–12) Morrison, DoubleTree \$75; By Preregistration Through OSTA

Science Focus: PS

Bradford Hill, Chairperson, NSTA Portland Area Conference, and Southridge High School, Beaverton, Ore.

Matt McCollum, Southridge High School, Beaverton, Ore.

Stephen Scannell, Gresham High School, Gresham, Ore. This hands-on seminar is driven by the recurring question: "How do we find and use patterns in nature to predict the future and understand the past?"

OSTA Preconference Seminar: Chemistry for the Next Generation

(Grades 9–12) Ross Island, DoubleTree \$75; By Preregistration Through OSTA

Science Focus: PS

Jomae Sica, Forest Grove High School, Forest Grove, Ore. **Lori Lancaster**, Local Arrangements Coordinator, NSTA Portland Area Conference, and Oregon Science Teachers Association, Portland

Using knowledge of thermodynamics, engage in the practice of inquiry to collect data that will then inform a design of a hot or cold pack.

OSTA Preconference Seminar: Biology for the Next Generation (Grades 9–12)

(Grades 9–12) Sellwood, DoubleTree **\$75; By Preregistration Through OSTA** Science Focus: LS

Caitlin Everett, Beaverton (Ore.) School District Experience the patterns approach of using inquiry experiments as a mode to learn content as well as how to integrate engineering and student-centered learning experiences, such as case studies and simulations, into instructional design.

OSTA Preconference Seminar: NGSS for Middle School Science Teachers

(Grades 6–8) Weidler, DoubleTree \$75; By Preregistration Through OSTA

Science Focus: GEN, NGSS

Susan Holveck, Program Coordinator, NSTA Portland Area Conference, and Beaverton (Ore.) School District **Berkeley Gadbaw,** Raleigh Hills K–8, Portland, Ore. This active, hands-on seminar is designed especially for middle school science teachers who want to experience what *NGSS* instruction and assessment look like in the classroom.



—Photo courtesy of © 2007 Bruce Forster Photography/Travel Portland

One of only two commuter aerial tramways in the U.S., the Portland Aerial Tram or OHSU Tram carries commuters between the city's South Waterfront district and the main Oregon Health & Science University (OHSU) campus. A tram ride lasts three minutes and travels a horizontal distance of 3,300 feet.



—Photo courtesy of Wayne Williams/Travel Portland

The Portland Japanese Garden offers a scenic view of Mt. Hood while the Sun sets.

8:00–8:30 AM Presentation

Survival Science

(Grades 7-12)

B110, Convention Center

Science Focus: ETS, CCC, SEP

Alicia Ryan (aryan@cascade.k12.or.us), Cascade School District, Turner, Ore.

Cannibalize existing technology to engineer survival in a simulated disaster. Create novel uses for "trash" and scavenged items while reinforcing fundamental NGSS practices.

8:00–9:00 AM Presentations

Bioplastic—Going from Synthetic to Natural Polymers (Grades 6-12) Morrison, DoubleTree

Science Focus: PS, CCC, SEP

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

Many of the items that we use today are becoming more Earth friendly. Learn how a bioplastic is made and what plant materials are used. Take home a CD with information and activities.

Teachers Bridging School and Workplace: Summer in Industry

(Grades 6-College)

Oregon, DoubleTree

Science Focus: GEN, SEP

Paul Gibbins (@NC_Iowa_STEM; pgibbins@iastate.edu), North Central STEM Hub, Iowa State University, Ames Business and education benefit from cross-pollinating educators on the job site through summer, extracting meaningful lessons for the classroom while adding value to worksite operations.

Engaging Students in Science Through Virtual Field Trips

(Grades K-11) Science Focus: GEN, SEP Ross Island, DoubleTree

Dacia Jones, Educational Consultant, Durham, N.C. Use social media and internet resources to design a "virtual field trip" for your students that can integrate STEM, science, ELA, and social studies.

Science Area

A science area category is associated with each session. These categories are abbreviated on the Science Focus line for each session listing. On page 132, you will find the conference sessions grouped according to their assigned science area category.

The science areas and their abbreviations are:

- LS Life Science =
- PS **Physical Science** =
- ESS **Earth and Space Science** =
- ETS = Engineering, Technology, and the Application of Science
- **General Science Education** GEN =
- INF **Informal Science Education** =

NGSS

See page 36 for a complete list of the *NGSS* codes used in this program.

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 24.



Base Camp: Collaborating to Integrate **Elementary Science Instruction with Math** and ELA



The View from the Summit: Celebrating Science for All

The View from All Angles: Connecting **Three-Dimensional Science Instruction**

The following icons will be used throughout this program.





NSTA NGSS@NSTA Forum Sessions

Sessions highlighting STEM learning INF experiences that occur in out-of-school environments.

Where Art and Science Meet

(Grades 6–12) Science Focus: GEN, CCC

Anne Artz (@anneartz; *aartz@ucsd.edu),* The Preuss School UCSD, La Jolla, Calif.

Draw your students into learning by incorporating creative and artistic activities into your science classroom to promote student engagement across curricular subjects. Help your students see careers that incorporate scientific principles with artistic expression.

Incorporating CCSS for Literacy in Science and Technical Subjects into Introductory Chemistry Investigations

(Grades 9–12) C122, Convention Center Science Focus: PS1.C, SEP

Angela Powers, Colorado State University-Pueblo

Carolyn Schwennsen (cschwenn@yahoo.com), Cate School, Carpinteria, Calif.

We will model key science-related components of the *CCSS* and an approach for incorporating literacy skills into existing investigations within chemistry curricula.





B119, Convention Center

Differentiating K-6 Science Instruction to Enable All Students to Inquire, Explore, Participate, and Achieve Success

D137, Convention Center

Science Focus: GEN, NGSS

(Grades K-6)

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

Discover ways to differentiate effectively to maximize student participation and learning, as well as to accommodate the needs of English language learners and the diverse range of student abilities in K–6 science classrooms.

Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions

(Grades K–8) D140, Convention Center Science Focus: GEN, NGSS

Lauren Brodsky (brodsky@berkeley.edu), Eric Greenwald, and Andrew Falk, The Lawrence Hall of Science, University of California, Berkeley

Examine how short-term learning progressions (e.g., for an instructional unit) can help teachers monitor and support student progress toward three-dimensional performance expectations.

NMLSTA-Sponsored Session: Calling All Middle Level Teachers!

(Grades 5–9) E145, Convention Center Science Focus: GEN

Terri Hebert (thebert@iusb.edu), Indiana University South Bend

The National Middle Level Science Teachers Association (NMLSTA) is an organization devoted to middle level science education. Join us to learn about NMLSTA membership opportunities.

Is This Your First NSTA Conference? First-Timer Conference Attendees' Orientation

(General) Oregon Ballroom 203, Convention Center Science Focus: GEN

NSTA Board and Council

Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive exploration through the program, the conference app, and NSTA's social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

8:00–9:00 AM Hands-On Workshops

Advising Our High School Students Toward STEM Degrees and Careers

(Grades 9–College) Hawthorne/Sellwood, DoubleTree Science Focus: GEN

Kathryn Lenahan (lenahank@ohsu.edu), Oregon Health & Science University, Portland

Kristen Harrison (@pdxstem; collaboratory@pdxstem.org), Portland Metro STEM Partnership, Beaverton, Ore.

Find out how teachers, counselors, and community college advisers can empower high school students to successfully plan for degrees in STEM.

NASA Is with You When You Fly: Principles of Flight and Four Forces

(*Grades K–12*) D131, Convention Center Science Focus: ETS1, PS2, PS3.A, PS3.B, PS3.C, CCC1, CCC2, CCC4, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7

Barbara Buckner (@bbuckner; *barbie.buckner@nasa.gov*), NASA Armstrong Flight Research Center, Palmdale, Calif. Come explore aeronautics, parts of an airplane, and four forces as you engage in hands-on, standards-focused STEM activities. Make real-world connections with NASA research.

3D The Re-Wilding Project!

(Grades 6–12) D133/134, Convention Center Science Focus: LS2.A, CCC, SEP

Susan Boudreau (*sboudreau*@*orinda.k12.ca.us*) and **Marshall Sachs** (*msachs*@*orinda.k12.ca.us*), Orinda Intermediate School, Orinda, Calif.

Middle school students bring back biodiversity to the school grounds with this inspiring and effective real-world environmental engineering project exploring the resilience of nature.



Need help navigating?

Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join other first-time attendees for an interactive exploration through the conference program, the conference app, and NSTA's social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

First-Timer Attendee Session • Thursday, November 10, 8:00–9:00 AM Oregon Ballroom 203, Oregon Convention Center





Cancer Medicine Focus Enhances Biology Curriculum: Biomaterials

(Grades 9–College) D139, Convention Center Science Focus: LS, CCC, SEP

Lynda Jones (jonesly@ohsu.edu), Mary Zelinski (zelinski@ ohsu.edu), and Diana Gordon (gordondi@ohsu.edu), Oregon National Primate Research Center, Beaverton

Explore a free *NGSS*-focused biology activity that integrates concepts in cancer biology with preserving fertility in cancer patients through real-life medical examples and cutting-edge biomaterials technology.

Analyzing Supernova Remnants Using Spectroscopy, NASA Data, and STEM

(*Grades 10–College*) E141, *Convention Center* Science Focus: ESS1.A, PS1, PS3.C, PS4.B, PS4.C, CCC2, CCC3, CCC4, CCC6, CCC7, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

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

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

NSTA Press® Session: Argumentation in the Biology Science Classroom

E142, Convention Center

Science Focus: LS **Sharon Schleigh** (sharonpschleigh@gmail.com), East Carolina University, Greenville, N.C.

In this hands-on workshop, learn how to engage in scientific argumentation to support teaching in your classroom. Sample activities from the NSTA Press books provided.

Teach Students to Read Like Scientists!

E143, Convention Center

Science Focus: GEN

(Grades 5-College)

(Grades 4-8)

Ann Berg (aberg@c-ischools.org), Cambridge Middle School, Cambridge, Minn.

Explore strategies through interactive activities and discussion that support success in reading science nonfiction and, most importantly, scientific inquiry.

Cycles, Sinks, and Solutions: An *NGSS*-Focused Climate Change Unit

(Grades 5–9) E144, Convention Center Science Focus: ESS3, CCC2, CCC5, CCC7, SEP4, SEP5, SEP7

Christine Geerer (@geererc; jcgeerer@comcast.net) and **Alex Gulyas** (alexandra.gulyas@gpschools.org), Parcells Middle School, Grosse Pointe Farms, Mich.

Laura Mikesell (*lmikesell3@gmail.com*), Grosse Pointe Education Association, Grosse Pointe, Mich.

Measure school yard trees to calculate carbon sinks, create Excel graphs to analyze ice data, and engineer wind turbines in this STEM-enhanced climate change unit.

NESTA Shares: A Hands-On Approach to Creating an NGSS-Focused High School Earth and Space Science Course

(Grades 6–12) Oregon Ballroom 204, Convention Center Science Focus: ESS, CCC, SEP

Cheryl Manning (@clbmanning; *clbmanning*@*mac.com*), Evergreen High School, Evergreen, Colo.

Experience how teachers are trained to use a set of flash cards with *NGSS* performance expectations, disciplinary core ideas, science and engineering practices, and crosscutting concepts to redesign curricula.

B113, Convention Center

8:00–9:00 AM Exhibitor Workshops

 Martian Genetics: An Electrophoresis Exploration

 (Grades 6–College)
 A105, Convention Center

 Science Focus: LS

 Sponsor: Edvotek Inc.

Maria Dayton and Danielle Snowflack, Edvotek Inc., Washington, D.C.

Explore genetics with our "out of this world" workshop! Imagine being the first scientist to explore Mars and discovering extraterrestrials. How would you use biotechnology to learn about the Martians? Discover how DNA technology can be used to explore the relationship between genotype and phenotype. Fluorescent dyes simulate DNA fragments, eliminating post-electrophoresis staining and saving classroom time! Take home a free gift and entry in a LabStationTM giveaway.

Engineer Physical Science Excitement with a Carolina STEM Challenge ${\ensuremath{\mathbb R}}$

(Grades 6–12) A108/109, Convention Center Science Focus: ETS, PS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Bounce and race into hands-on activities that engage middle school and high school students. Apply creative problemsolving skills and engineering practices to chemistry and physical science challenges. Experience how Carolina makes it easy to bring STEM to your classroom.

Teach Next Gen Like Your Hair Is on Fire!

(Grades K–2) B111/112, Convention Center Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Become legendary in your own time when you teach science in your classroom. Experience lessons from Delta Science Modules that incorporate the *NGSS*. Receive corresponding content readers, strategies, and resources that you can take back and use with your students tomorrow.

CPO's LinkTM with Car and Ramp: Force, Motion, and Variables

Grades 6–12)	
Science Focus:	PS2

Sponsor: CPO Science/School Specialty Science

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

Kat Mills, School Specialty Science, Rosharon, Tex.

Learn to distinguish between dependent, manipulated, resultant, controlled, and independent variables. In this hands-on workshop, students discover variables while designing their own experiment. We will feature the Link learning module for car and ramp as we present a new "angle" on how to master confusing terminology using scientific investigations.

Gas Exchange

(Grades 6–8) B116, Convention Center Science Focus: LS1.C, PS3, CCC1, CCC4, SEP3, SEP5 Sponsor: LAB-AIDS®, Inc.

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

Teachers know their students have many misconceptions about respiration. In this activity from the SEPUP middle level life science program, participants use an acid-base indicator to determine the relative amount of carbon dioxide gas in a sample of their exhaled breath. They consider differences in individual response, explore qualitative vs. quantitative measures, and examine the structure of the lungs and their role in the process of respiration.

Wave Properties and Information Transfer

(Grades 6–8) B117/118, Convention Center Science Focus: PS4

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

Engage in activities using lasers and optical fibers in the new FOSS Next Generation Edition Waves Course for Middle School. Explore properties of refraction and reflection that allow information transfer by fiber optic technology, and identify connections to the three dimensions of *NGSS*.

Experience Amplify Science: Grades K-1

C124, Convention Center

(Grades P–2) Science Focus: GEN, NGSS Sponsor: Amplify

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

Immerse yourself in Amplify Science, a new curriculum developed by University of Califrnia Berkeley's Lawrence Hall of Science. Experience the program's rich, multi-modal, and problem-based approach. See how your K–1 students can engage with deep dives into understanding the natural and designed worlds.

8:30–9:00 AM Presentations

"Keep on Rolling" with STEM

(Grades 8–10) Science Focus: ETS1, PS3 B110, Convention Center

Robert Hill (bob.hill@lacenterschools.org) and Teridee Newman (teri.newman@lacenterschools.org), La Center High School, La Center, Wash.

Learn how to use student-constructed rolling cars to develop multiple engineering lessons showing how one project can be modified and used for many concepts.

STEM in a Blender

Science Focus: ETS

(Grades 3–6)

D130, Convention Center

Matt Pederson (matthew_pederson@eatonville.wednet.edu), Tricia Whitted (trishw2010@gmail.com), and Amy Sturdivant (amy_sturdivant@eatonville.wednet.edu), Weyerhaeuser Elementary School, Eatonville, Wash.

Learn how four dynamic elementary teachers design and implement an innovative program that integrates STEM, English language arts, and thematic units in a mixed-age environment.

Planning for Three-Dimensional Learning

(Grades K–12) D138, Convention Center Science Focus: GEN, NGSS

Cindy Fabbri (cfabbri@alaska.edu), University of Alaska Fairbanks

A template for three-dimensional lesson planning will be shared. Participants will discuss examples and use the template to brainstorm lesson ideas for their classrooms.

9:15–10:30 AM General Session

The Serengeti Rules: The Quest to Discover How Life Works, and Why It Matters

(General) Oregon Ballroom 201/202, Convention Center Science Focus: LS

Speaker sponsored by HHMI BioInteractive



Sean Carroll (@SeanBiolCarroll; carrolls@hhmi.org), Vice President for Science Education, Howard Hughes Medical Institute, Chevy Chase, Md.

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

Platform Guests: Sean Carroll; Mary

Gromko; Carolyn Hayes, NSTA Retiring President, and Retired Educator, Greenwood, Ind.; David Crowther, NSTA President-Elect, and University of Nevada, Reno; Midge Yergen, NSTA Director, District XVII, and West Valley Junior High School, Yakima, Wash.; Bradford Hill, Chairperson, NSTA Portland Area Conference, Past President, Oregon Science Teachers Association (OSTA), and Southridge High School, Beaverton, Ore.; Roy Beven, President, Washington Science Teachers Association (WSTA), and Northwest Evaluation Association (NWEA), Bellingham; Susan Holveck, Program Coordinator, NSTA Portland Area Conference, President, Oregon Science Teachers Association (OSTA), and Beaverton (Ore.) School District; Lori Lancaster, Local Arrangements Coordinator, NSTA Portland Area Conference, and Communications Coordinator, Oregon Science Teachers Association (OSTA), Portland; David Evans, NSTA Executive Director, Arlington, Va.

Everything in nature is regulated—from the numbers of vital molecules in our bloodstream to the number of lions on an African savanna. Over the past 50 years, two revolutions have unfolded in biology in understanding the regulation of life at these two scales. Join Sean Carroll as he discusses the discovery of the "The Serengeti Rules," the ecological rules that regulate the numbers and kinds of animals and plants in any given place, and how they are being applied to restore some of the greatest wildernesses on the planet.

Hailed for his pioneering work in evolutionary developmental biology, Sean Carroll is an award-winning scientist, writer, educator, and executive producer. Dr. Carroll leads the Department of Science Education at the Howard Hughes Medical Institute and is the Allan Wilson Professor of Molecular Biology and Genetics at the University of Wisconsin—Madison.

Join Sean for a book signing in the NSTA Science Store 10:30–11:30 AM, immediately following this session.

Assessments for the next generation

Gather evidence of 3-dimensional learning

STEM Gauge[®] is a formative assessment tool that supports instruction as you adjust your curriculum to the NGSS*. Each middle or elementary school **STEM Gauge** provides:

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9:30–10:30 AM Exhibitor Workshops

Dive In with Magnetic Water Molecules

(Grades 5–College) A103/104, Convention Center Science Focus: PS, SEP

Sponsor: 3D Molecular Designs

Tim Herman (*herman@msoe.edu*), MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

Engaging water molecules enable you to use an inquiry approach to explore why water is essential for life. Discover the physical and chemical properties of water, states of matter, evaporation, condensation, transpiration, erosion, and more, using interactive water molecules with embedded magnets that mimic the polar interactions in real water.

Left at the Scene of the Crime: Introduction to Forensic Science

(Grades 6–College) A105, Convention Center Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack and **Maria Dayton**, Edvotek Inc., Washington, D.C.

Explore genetic diversity using forensic science! Your students become crime scene investigators as they analyze biological evidence using DNA fingerprinting, a technique that identifies people via genetic differences. Gel electrophoresis is used to create DNA fingerprints from crime scene and suspect samples. A match between samples suggests which suspect committed the crime. Receive a free gift for attending.

Science Storylines: Developing Three-Dimensional Lessons That Build on Student Curiosity

(Grades 6–8) A107, Convention Center Science Focus: PS1, CCC2, CCC5, SEP1, SEP2, SEP6, SEP7 Sponsor: Activate Learning

Heather Milo, Activate Learning, Greenwich, Conn.

With *NGSS* being taken up by educators across the country, it can be easy to lose sight of student interest and identity in the search for *NGSS*-focused curricula. Join us for an engaging workshop on storyline coherence as a means to not only have pedagogy meet the standards, but also build on students' ideas and questions about the natural world. This workshop targets both middle school teachers and science education leaders.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher

(Grades 9–12) A108/109, Convention Center Science Focus: PS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that are sure to produce a reaction from your students. Whether you're new to chemistry or feeling out of your element, you'll learn ways to create excitement with hands-on labs and demonstrations.

SEPs Made Easy

(Grades 2–5) Science Focus: GEN, SEP

Sponsor: Delta Education/School Specialty Science

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

B111/112, Convention Center

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Experience lessons from Delta Science Modules that incorporate science and engineering practices. Receive a corresponding content reader, strategies, and resources that you can take back and use with your students next week.

Solving the Mystery of STEM Using Forensic Science

(Grades 6–12) B113, Convention Center Science Focus: GEN, NGSS

Sponsor: Frey Scientific/School Specialty Science

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

Kat Mills, School Specialty Science, Rosharon, Tex.

Conduct STEM-focused, beginning forensic activities that connect scientific investigations to analysis and investigative skills. Solve "cases" involving fingerprinting, blood spatter, and document or fabric analysis. We'll use a digital learning environment with simple supplies to apply basic mathematic principles, plus integrate reading and writing strategies.

Infusing Inquiry and Demonstrations into AP Biology

(Grades 9–12) B114/115, Convention Center Science Focus: LS1.B, LS1.C, LS2.B

Sponsor: Flinn Scientific, Inc.

Meg Griffith (*mgriffith@flinnsci.com*), Flinn Scientific, Inc., Batavia, Ill.

Join biologists from Flinn Scientific as we share inquiry strategies and techniques for AP, IB, and advanced-level biology courses. Get tips for managing the inquiry process and see demonstrations to help engage your students. Discover the benefits of FlinnPREPTM, an online supplemental curriculum and assessment resource with engaging video content, animations, and text. Get more out of your prep time with automatic tracking of student progress. Handouts!

Modeling Convection Currents and Plate Motion

(Grades 6–8) B116, Convention Center Science Focus: ESS2.A, ESS2.B, CCC3, CCC4, CCC5, SEP2, SEP3, SEP4, SEP6

Sponsor: LAB-AIDS®, Inc.

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

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

Engage Students in FOSS Next Generation

(Grades K–5) B117/118, Convention Center Science Focus: GEN, NGSS

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

Join FOSS developers to learn about the FOSS Next Generation Elementary Program. We'll introduce the instructional design, and illustrate how the system incorporates science-centered language development, notebooks, digital resources, formative assessments, and outdoor excursions into a coherent learning experience for students and teachers.

Using Maggots, Flies, and Flesh to Solve a Mystery!

C120/121, Convention Center

C124, Convention Center

Science Focus: GEN

(Grades 6-12)

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

Experience Amplify Science: Grades 2-5

(Grades 2–5) Science Focus: GEN

Sponsor: Amplify

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

Immerse yourself in Amplify Science, a new curriculum developed by University of California Berkeley's Lawrence Hall of Science. Experience the program's rich, multimodal, and problem-based approach. See how your grades 2–5 students can engage with deep dives into understanding the natural and designed worlds.



11:00 AM–12 Noon Exhibitor Workshops Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR

A105, Convention Center

A107, Convention Center

(Grades 9–College) Science Focus: LS Sponsor: Edvotek Inc.

Danielle Snowflack and **Maria Dayton**, Edvotek Inc., Washington, D.C.

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

An NGSS Approach to Engineering in the Upper Grade Bands

(Grades 6–12) A106, Convention Center Science Focus: ETS, SEP2, SEP3, SEP7

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, Author and STEM Specialist, North Falmouth, Mass.

Join educator, broadcast host, and Houghton Mifflin Harcourt author Michael DiSpezio for an engaging and informative workshop that addresses the *NGSS* approach to engineering and the engineering design process in the upper grade bands. In this hands-on session, you will work in multidisciplinary teams as you participate in several activities that profile and address a standards-based approach to engineering.

Riding the Wave with TCI

(Grades K–5) Science Focus: PS4

Sponsor: TCI

Christy Sanders (*info@teachtci.com*), TCI, Mountain View, Calif.

With TCI's Bring Science Alive! programs, participants will be fully immersed in a lesson learning the ideas of science by actually "doing" science rather than just memorizing facts. Using a powerful online learning system to develop a model of waves to describe patterns in terms of amplitude and wavelength, participants will experience learning from a student's perspective. Leave with tools to implement hands-on, in-class investigations that work seamlessly with interactive technology.

Waves, Waves, Waves: Building Models to Explain Phenomena

(Grades K–5) Science Focus: PS4 A108/109, Convention Center

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

The phenomena of waves can be explained by children through model building. Explore examples of how elementary students can share their learnings of how waves work through modeling. Discover how the new Carolina Building Blocks of Science leads to student success in only 30 minutes a day.

Build Skills to Boost the Makerspace Experience for Young Scientists!

(Grades K–3) B111/112, Convention Center Science Focus: ETS

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for students in grades K–3, tackling STEM-related challenges requires a foundation in science investigation. Help young scientists build the skills needed for independent exploration in their makerspaces with programs like Science in a Nutshell.

CPO's Link[™] Genetics Learning Modules: Crazy Chromosomes and Crazy Traits

(Grades 6–12) B113, Convention Center Science Focus: LS

Sponsor: CPO Science/School Specialty Science

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

Kat Mills, School Specialty Science, Rosharon, Tex.

CPO Science's Link learning modules for genetics use *NGSS* strategies in a real-time digital learning environment. Students can study the relationship between DNA, genes, mitosis, meiosis, traits, alleles, phenotypes, and genotypes. Heredity will come alive as you use hands-on models to create crazy creatures in a unique collaborative program.

"The Martian should be required reading for all middle and high school students, and it should serve as a call to action for improving science education."

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



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THE MARTIAN: A Novel by ANDY WEIR

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

This new edition has:

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

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

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Engaging Students in Authentic Science Experiences Using Digital Tools

(Grades K–12) B114/115, Convention Center Science Focus: GEN, NGSS

Sponsor: Discovery Education

Patti Duncan, Discovery Education, Silver Spring, Md. In a student-centered learning environment, we want students to ask deep, meaningful questions; collaborate with their peers; arrive at meaningful conclusions; and solve real-world problems. Join us to learn about a variety of digital resources and instructional strategies for engaging all students in authentic science experiences.

Calling All Carbons

(Grades 9–12) B116, Convention Center Science Focus: ESS2.A, SEP2, SEP3, SEP4 Sponsor: LAB-AIDS®, Inc.

Jennifer Boldt, Solon High School, Solon, Iowa

The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. Join us to learn about and model different carbon transfer processes.

The Reflective Assessment Practice: Improving Science Achievement in 10 Minutes

(Grades K–5) B117/118, Convention Center Science Focus: GEN

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

Join FOSS developers to learn how assessment can become an integrated teaching tool that both teachers and students can embrace. Create a classroom culture of self motivation and growth mind-set by just adding a 10-minute reflective practice to your day.

Experience Amplify Science: Middle School

(Grades 6–8) Science Focus: GEN, NGSS

Sponsor: Amplify

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

C124, Convention Center

Immerse yourself in Amplify Science, developed by University of California Berkeley's Lawrence Hall of Science. Experience the program's technology-enhanced and problem-based approach. See how your grades 6–8 students can engage with deep dives into understanding the natural and designed worlds.

11:00 AM-5:00 PM Exhibits

Hall A, Convention Center

As you enter the exhibit hall, enjoy musical entertainment courtesy of Southridge High School Brass Quintet, under the direction of Jeremy Zander. Did you know that NSTA offers Exclusive Exhibits Hall hours today from 11:00 AM to 12:30 PM? During these hours there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

12:30–1:00 PM Presentations It's All Matter with Matter Tag

(Grades 4—9) Alaska/Idaho, DoubleTree Science Focus: PS1

Amy Manhart (amanhart@tcsd.org), Jackson Hole Middle School, Jackson, Wyo.

Matter tag is an interactive tag game developed to help students understand a model of the kinetic theory teaching the states of matter and the phase changes of matter. This is great for all learners but especially for English language learners. Kids love it!

Biotechnology Education with a Focus on Careers

(Grades 9–College) B110, Convention Center Science Focus: GEN, SEP

Sandra Porter (@digitalbio; *sandra@digitalworldbiology. com)*, Digital World Biology LLC, Seattle, Wash.

Let's discuss the benefits of participating in Bio-Link, a national community of industry partners and biotech educators at two-year colleges and high schools.

CSSS Session: Presidential Award for Excellence in Mathematics and Science Teaching

(Grades K–6) D137, Convention Center Science Focus: GEN

Linda Jordan (jordan.linda1212@gmail.com), Council of State Science Supervisors, Nashville, Tenn.

The Presidential Awards for Mathematics and Science Teaching program has been in existence since 1983. This is the highest honor a science or math teacher can receive for exemplary instruction.

12:30–1:30 PM Presentations

Time Will Tell: Use of Time-Lapse Photography and Digital Storytelling to Observe Change

(Grades 3–12) Morrison, DoubleTree Science Focus: GEN, CCC

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

Observation of slow-moving events in time can be described using time-lapse photography and narrated via techniques used in digital storytelling. Explore methods, equipment, and applications. Resources and samples provided.

INF ISE Science in the Community Forum: Highlighting Programs and Practices That Bridge In-School and Out-of-School STEM Learning

(General) Ross Island, DoubleTree Science Focus: INF

Kelly Riedinger, David Heil & Associates, Inc., Portland, Ore.

Join us for a panel discussion with leading education professionals in the field who will share their unique viewpoints regarding programs and practices that bridge in-school and out-of-school STEM learning.

NGSS@NSTA Forum Session: Developing Coherent Storylines of NGSS Lessons

(Grades K–12) B119, Convention Center Science Focus: GEN, NGSS

Michael Novak, Northwestern University, Evanston, Ill. This session will explore how to develop a coherent storyline for a unit where instead of students *learning about* science ideas, they are motivated by questions arising from phenomena to *figure out these ideas* and, in the process, incrementally build explanatory models.

Meet the Standards and Enhance Your Chemistry Classroom with Other People's Money

(Grades 9–12) C122, Convention Center Science Focus: PS

Kenetia Thompson and **Karen Kaleuati** (*k_kaleuati@ acs.org*), American Chemical Society, Washington, D.C. Learn about grant opportunities available to high school chemistry teachers (including those from the American Chemical Society) and the process for writing a fundable

Embedded Assessment: Making Instructional Activities Opportunities for Formative Assessment

(Grades K–8) D130, Convention Center Science Focus: GEN, NGSS

Lauren Brodsky (*brodsky@berkeley.edu*), Eric Greenwald, and Andrew Falk, The Lawrence Hall of Science, University of California, Berkeley

We will share techniques for and worked examples of how to build formative assessment opportunities into students' learning experiences, without stopping the flow of instruction.

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

(General) D138, Convention Center Science Focus: GEN

Bob Sotak (@nselascience; *bobsotak*(@gmail.com), Science/ STEM Education Consultant, Edmonds, Wash.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

Engaging Students in Place-Based Learning Through a Field STEM Experience

(Grades 5–8) D140, Convention Center Science Focus: ESS3, LS1, LS2, CCC1, CCC4, CCC5, CCC7, SEP1, SEP3, SEP4, SEP6, SEP7

Pamela Farr (pfarr@sheltonschools.org), Shelton (Wash.) School District

Wendy Boles (wboles@sheltonschools.org), Olympic Middle School, Shelton, Wash.

Daron Williams (*daron@capitollandtrust.org*), Capital Land Trust, Olympia, Wash.

Learn how a small/rural district is tackling three-dimensional instruction. We will share the program structure, discuss how it addresses the *NGSS*, and immerse you in the work.

proposal.

12:30–1:30 PM Hands-On Workshops

Designing Elementary Preservice Teacher Preparation Courses with a Focus on STEM-Rich Making Practices

(Grades K–9) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, NGSS

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

Fred Nelson (@fredn56; fnelson@csufresno.edu) and Emily Walter (emwalter@gmail.com), California State University, Fresno

Engage with integrated STEM activities and learn how teacher preparation courses based on these successful STEM-rich practices foster equity and access for underserved students.

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

(Grades 6–8) D131, Convention Center Science Focus: ESS3.C, LS2, PS1.A, CCC2, CCC6, SEP1 Mary Whaley (mwhaley@mbayaq.org), Monterey Bay Aquarium, Monterey, Calif.

Enrich your classroom with *NGSS*-focused activities on plastic pollution issues and solutions. Activities highlight physical and chemical properties of plastics, including density and buoyancy.

Inquiring Minds Want to Know

(Grades 6–12) D133/134, Convention Center Science Focus: LS, PS, SEP

Anne Artz (@anneartz; *aartz@ucsd.edu*), Jason Flesock (*jmflesock@ucsd.edu*), and Carla Petraglia (@CVPetraglia; *carlavaldez1@gmail.com*), The Preuss School UCSD, La Jolla, Calif.

We will demonstrate how to incorporate engineering principles into all areas of science. Join us to engage in sample lessons in physics, chemistry, and biology and gain a better understanding of what quality inquiry-based activities look like.

-12

Patterns of Survival

(Grades K–2) D136, Convention Center Science Focus: LS1.A, CCC1, SEP6, SEP8

Joey Scott (@joeyelle; *jlehnhard@mbayaq.org*), Monterey Bay Aquarium, Monterey, Calif.

What patterns do we see in animals that live in the rocky shore? Use free iPad applications to help primary students communicate explanations and patterns.

Making Science Accessible Through Technology: Using QR Codes and Video to Construct and Assess Student Comprehension

(Grades 6–12)	D139, Convention Center
Science Focus: GEN, NGSS	

Rebecca Krueger (rebecca.krueger@bellinghamschools.org), Squalicum High School, Bellingham, Wash.

Anne Mortimer (anneemortimer@gmail.com), Mount Vernon High School, Mount Vernon, Wash.

Heather Farren (heatherfarren 89@gmail.com), Mount Vernon (Wash.) School District No. 320

Use QR codes and video to build student comprehension with students of all levels. We'll share English language learner strategies and you'll leave with rubrics you can use immediately. Please bring your smartphone, iPhone, or laptop to this hands-on workshop.

Planning and Designing Safe and Sustainable Science Facilities That Meet the NGSS (Science Facilities 101) (General) E141, Convention Center Science Facilities

Science Focus: GEN, NGSS

(Grades 5-9)

Science Focus: ESS

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

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

NSTA Press® Solar Science = NGSS-Focused Solar Astronomy Experiences + Preparation for the All-American Total Solar Eclipse

E142, Convention Center

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

Andrew Fraknoi, Foothill College, Los Altos Hills, Calif. NSTA recently published *Solar Science*, a solar astronomy curriculum resource that is *NGSS* focused and prepares you for the 2017 solar eclipse. Come explore some of these effective learning experiences.

iPadography: Using Devices in the Classroom for More Than Just Photos

(Grades 1–8) E143, Convention Center Science Focus: GEN, SEP8

Stacey Holder (*sholder*@*pleasantonusd.net*), Fairlands Elementary School, Pleasanton, Calif.

Jenifer Perazzo (@overlandersafari; *jperazzo*@*lbl.gov*), Pleasanton (Calif.) Unified School District

Gain experience and ideas for incorporating photo-taking and editing apps into science lessons using time-lapse, photo collages, flip books, and more. Beginners welcome!

Taking STEM Outside

(Grades P-8)

Science Focus: LS

E144, Convention Center

Norie Dimeo-Ediger (*dimeo-ediger@ofri.org*), Oregon Forest Resources Institute, Portland

In addition to hitting STEM benchmarks, learn how outdoor and placed-based science lessons can enhance students' knowledge of trees, forests, and the environment around them.

Epidemiology as the Next "Forensic Science" Capstone Course

(Grades 6–12) E146, Convention Center Science Focus: LS

Terrence Grant, The Catholic High School of Baltimore, Md.

Come learn how epidemiology can be an exciting capstone science course in the same way that forensic science captured student imaginations.

NESTA Shares: Earth and Space Science Share-a-Thon

(Grades K–12) Oregon Ballroom 204, Convention Center Science Focus: ESS

Cheryl Manning (@clbmanning; *clbmanning*@*mac.com*), Evergreen High School, Evergreen, Colo.

Join more than 20 NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!

12:30–1:30 PM Exhibitor Workshops

Constructing and Crossing Cell Membranes

(Grades 8–12) A103/104, Convention Center Science Focus: LS, PS, CCC, SEP

Sponsor: 3D Molecular Designs

Tim Herman (herman@msoe.edu) and Diane Munzenmaier (munzenmaier@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

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

Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA)

(Grades 9–College) A105, Convention Center Science Focus: LS

Sponsor: Edvotek Inc.

Maria Dayton and Danielle Snowflack, Edvotek Inc., Washington, D.C.

The spread of the Zika virus has led to a public health crisis in the Americas. While most infections are mild, the virus can contribute to birth defects and neurological problems. In this workshop, you will perform a quick, easy ELISA that simulates Zika testing. Free gift/raffle entry for attending!

Gains in the Education of Mathematics and Science: What Can GEMS Do for You?

(Grades 5–12) A106, Convention Center Science Focus: GEN

Sponsor: AEOP eCYBERMISSION

Jarod Phillips (aeopgems@nsta.org), Project Manager, GEMS, NSTA, Arlington, Va.

Receive an overview of the AEOP GEMS programs and find out how you can incorporate similar ideas and practices into your science classroom.

Hands-On Activities to Model Habitat Preference and Population Sampling

(Grades K–12) A108/109, Convention Center Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Watch and learn! First you'll create a terrestrial model to observe how pill bugs respond to habitat change. Then you'll use inquiry to develop experiments to observe the habitat preference of bess beetles, millipedes, and other insects. This engaging workshop gives you new inquiry-based tools to nurture students' curiosity.

STEM-gineering

Science Focus: ETS

(Grades 2–6)

B111/112, Convention Center

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Experience science lessons from Delta Science Modules that provide opportunities for students to be engaged in activities that incorporate Science, Technology, Engineering, and Math (STEM) and meet Technological Design Standards. You'll receive make-and-take prototypes, strategies, and other workshop materials.

CPO's Wind Turbine: A STEM Approach to Engineering and Design

(Grades 6–12)

B113, Convention Center

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

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

Kat Mills, School Specialty Science, Rosharon, Tex.

CPO's LinkTM Wind Turbine learning module lets students learn in a real-time digital platform and engineer a wind turbine. Students build, test, and revise their designs. Link uses STEM activities and an *NGSS* approach, giving students an understanding of how to apply the engineering cycle in science class.

Climate Proxies

(Grades 9–12) B116 Science Focus: ESS2.A, ESS2.C, ESS2.D

B116, Convention Center

Sponsor: LAB-AIDS®, Inc.

Jennifer Boldt, Solon High School, Solon, Iowa How can scientists tell what Earth's climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. We will analyze and graph samples of replicas of these organisms, and then determine relative warm and cold periods in the past 200,000 years. This activity is from *EDC Earth Science*, a new NSF-supported program from LAB-AIDS.

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

(Grades K–5) B117/118, Convention Center Science Focus: GEN

Sponsor: Delta Education/School Specialty Science–FOSS Diana Velez and Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley

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

Zombie Apocalypse!

(Grades 6–12)

C120/121, Convention Center

Science Focus: GEN Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (Tex.) School District

Be part of a zombie apocalypse! Learn about disease spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students learning science!

What Is Amplify Science?

(Grades K–8) Science Focus: GEN, NGSS Sponsor: Amplify C124, Convention Center

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

Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley's Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for *NGSS*, engages students as scientists and engineers to solve real-world problems.

1:00–1:30 PM Presentations

Crafting a Cosmos

(Grades 5–9) Science Focus: GEN, NGSS Alaska/Idaho, DoubleTree

Judy Sweeney (@judytsweeney1; *judytsweeney@gmail.com*), Universal American School, Dubai, United Arab Emirates Join a middle school journey as students take the role of Earth engineers and share projects that connect practices, concepts, and performance tasks.

Students Reading Real Science: Primary Literature in the Classroom

(Grades 9–College) B110, Convention Center Science Focus: GEN, SEP1, SEP2, SEP4, SEP6, SEP7, SEP8 **Melissa McCartney** (@SciClassroom; mmccartn@aaas. org), Science/AAAS, Washington, D.C.

View a demonstration of a web-based resource designed to make primary scientific articles (from the journal *Science*) accessible to students and teachers.

1:00–4:00 PM Short Course

INF NASA's Exploration of the Solar System: Activities for Out-of-School Time (SC-1)

Tickets Required; \$18

(Grades 2–6) 3 Sisters/Mt. Bachelor, DoubleTree Science Focus: ESS1.B, ESS2.D, INF, CCC1, CCC2, CCC4, SEP2, SEP3, SEP4

Christine Shupla *(shupla@lpi.usra.edu),* Lunar and Planetary Institute, Houston, Tex.

Brandy Laney (*brandyb@springisd.org*), Northgate Crossing Elementary School, Spring, Tex.

Meredith Harris (meredithaharris@me.com), Spring (Tex.) ISD

For description, see page 31.

2:00–2:30 PM Presentations

Skynet Junior Scholars: See the Skies as Never Before (Grades 4–12) Science Focus: ESS, NANCEL Idaho, DoubleTree

Laura Orr, Ukiah High School, Ukiah, Ore.

The Skynet Junior Scholars Program connects youth to the world's telescopes. Participants become scholars of the sky through use of a web-based portal, community forums, activities, resources, and guidance.

A Transformational Model for Science Instruction in a 21st-Century Classroom

(Grades 9–College) D137, Convention Center Science Focus: GEN, NGSS

Paul Hampton (@DrPaul74; *paul_hampton*@beaverton.k12. or.us), Sunset High School, Portland, Ore.

A case study is presented where high school science teachers transform their instructional practices to meet the needs of marginalized students.



2:00–3:00 PM Featured Presentation How Should Districts and Schools Focus Professional Development When Starting to Implement NGSS?

(General) Oregon Ballroom 201, Convention Center Science Focus: GEN, NGSS



Philip Bell (@philiplbell; pbell@ uw.edu), University of Washington, Seattle

Presider: Lynda Sanders, The View from All Angles: Connecting Three-Dimensional Science Instruction Strand Leaders, and Marshfield High School, Coos Bay, Ore.

Philip Bell will share his work designing a collection of open education resources called STEM Teaching Tools. This curriculum adaptation toolkit helps teachers develop equityfocused instructional materials that meet the *NGSS*. Hear how you can engage all students, especially emerging bilingual students, through curriculum adaptation, the development of formative assessments, and the use of discourse strategies. He will highlight how research-practice partnerships between school districts, education researchers, and scientists/engineers can support this kind of implementation work.

Philip Bell is a professor of the Learning Sciences and Human Development and holds the Shauna C. Larson Chair in Learning Sciences. He is executive director of the UW Institute for Science and Math Education focused on equity-focused innovation in K–12 STEM education, and is co-director of the Learning in Informal and Formal Environments (LIFE) Science of Learning Center.

Dr. Philip Bell's research interests focus on how and why people learn across settings from cognitive and cultural perspectives, as well as scaffolding disciplinary STEM investigations in the classroom, culturally expansive curriculum and instruction, research-guided innovative learning technologies, digital technologies in youth culture, and design-based research in education and ethnography of learning. Currently, he is editing a series of research- and practicebased tools for science education called STEM Teaching Tools. The effort is providing resources for equity-focused improvements in science education.

He served on the committee of the NRC Framework for K-12 Science Education that was used to guide development of Next Generation Science Standards and was a member of the Board of Science Education with the National Academy of Sciences.

2:00–3:00 PM Presentations

Increasing Science Engagement and Achievement Through Content Literacy

(Grades 3–8) Morrison, DoubleTree Science Focus: GEN

Linda Linnen, Retired Teacher, Aurora, Colo.

In this interactive presentation, participants will experience how to integrate reading, writing, speaking, listening, and Common Core strategies into daily science lessons.

How Does Your Garden Grow? Creating and Maintaining Kid- and Bird-Friendly Gardens

(Grades K–11) Oregon, DoubleTree Science Focus: LS

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

Through school gardens, students can explore the characteristics that create good habitats for birds and other wildlife. Discover grants and resources to support your work.

Using Digital Tools to Check For Understanding

(Grades 6–12) B110, Convention Center Science Focus: GEN, NGSS

Marlene Gutierrez, Terra Nova High School, Pacifica, Calif.

Explore how Web 2.0 tools such as Padlet, TodaysMeet, and AnswerGarden can be used to check for understanding and support *CCSS ELA* and *NGSS*. Bring your own device.

NGSS@NGSS@NSTA Forum Session: Selecting Phenomena NSTA to Motivate Student Sensemaking

(Grades K–12) Science Focus: GEN, NGEDULED9, Convention Center

Ted Willard Fishard@nse. Sg), Program Director, NGSS@NSTA, NSTA, Prington, Va,

The right phenomena are a key ingredient in successful threedimensional teaching and learning. This session will focus on what makes some phenomena better than others and how to use them successfully in the classroom.

Using Pop Culture and Polymers to Create Inquisitive Minds

C122, Convention Center

(Grades 9–12) Science Focus: PS, CCC, SEP

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

Ever wonder how to get more students interested in what you teach? Add some pop culture and a pop culture project to make the connection with the students. CD provided.

Data Is Not a "Four-Letter Word": Use NOAA Resources to Build Student Proficiency in Data Analysis

(Grades 5–12) D138, Convention Center Science Focus: ESS, CCC

June Teisan (*june.teisan@noaa.gov*), NOAA Office of Education, Washington, D.C.

Scientists at the National Oceanic and Atmospheric Administration collect a stunning array of data in their work. Learn how to access this treasure trove of archived and real-time data, and explore NOAA's data-rich resources, lesson plans, and visualization tools to help you build student proficiency in scientific data analysis.

2:00–3:00 PM Hands-On Workshops

Argumentation in the Science Classroom

(Grades K–12) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, SEP

Rebecca Burns (*rebecca.burns@dpsnc.net*), Sherwood Githens Middle School, Durham, N.C.

Come to this hands-on workshop to learn how to incorporate this crosscutting concept into your curriculum.

Use NASA Design Challenges to Develop Critical Thinking

(Grades 5–College) D131, Convention Center Science Focus: ETS1

Kathleen Fredette, Maker School Network, Castaic, Calif. Explore the engineering design process through NASA design challenges. Experience design challenges through Project-Based Learning, NASA curricula, and metacognitive practices that support authentic learning.

Ocean Acidification as a Way to Teach Multidisciplinary Science and NGSS

(*Grades 8–12*) D133/134, Convention Center Science Focus: ESS3.A, ESS3.C, ESS3.D, ETS, LS1.A, LS1.B, LS2, LS4.B, LS4.C, LS4.D, PS1.A, PS1.B, PS2.C, PS3.D, PS4.C, CCC, SEP

Claudia Ludwig (@SystemsEd; *cludwig@systemsbiology. org*), Institute for Systems Biology, Seattle, Wash.

Mari Knutson Herbert (@mari-herbert; knutsonm@ lynden.wednet.edu), Lynden (Wash.) School District

Explore a set of lessons that engage and guide students through their own research project on ocean acidification. Students build STEM and systems-thinking skills while learning how to make a difference.

Balancing and Addressing Inequalities in the Middle School STEM Classroom

(Grades 6–8) Science Focus: ETS2.B D140, Convention Center

Christine Zarker Primomo (*cprimomo@lwgms.org*), Lake Washington Girls Middle School, Seattle, Wash.

Lewis Maday-Travis (*ltravis@seattleacademy.org*), Seattle Academy of Arts and Sciences, Seattle, Wash.

Learn and share how addressing inequity in STEM begins with classroom teachers incorporating identity development and a social justice framework to STEM education.



(Grades 1–6) D135, Convention Center Science Focus: ESS, CCC, SEP

Ana Houseal (ahouseal@uwyo.edu), University of Wyoming, Laramie

Let's explore specific integrated ELA and mathematics activities embedded in an Earth and space science unit developed and implemented by teachers from Gillette, Wyoming. Exemplars will be provided.

AMSE-Sponsored Session: Moving to Teacher as Facilitator: NGSS and Critical Pedagogy

(Grades 6–12) D136, Convention Center Science Focus: GEN, NGSS

Melissa Campanella (melissa.rae.campanella@gmail.com), Noel Community Arts School, Denver, Colo.

Explore how making the shift to teacher as facilitator can support all students to become cocreators of science knowledge.

Science from the Stratosphere: STEM Activities in the Infrared

(Grades 6–12) D139, Convention Center Science Focus: ESS1, ETS2.B, PS3.A, PS4.B, CCC4, CCC5 **Susan Oltman** (@sueatsea; soltman@mountvernonschool.org), Mount Vernon Presbyterian School, Atlanta, Ga.

Jo Dodds, Idaho Digital Learning Academy, Twin Falls Join two NASA SOFIA Science Ambassadors as they share specifics about flying with NASA and infrared astronomy, and present hands-on infrared activities to use in the classroom.



Science Facilities 102: The Architects Have Started Without Me...What Do I Do Now?

(General) Science Focus: GEN, NGSS E141, Convention Center

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

Is your district planning for new science facilities? Are you involved? If not, you need to get involved before it is too late. In an advanced course (an extension of *Science Facilities 101)*, the NSTA author team for *NSTA Guide to Planning School Science Facilities* (2nd ed.) will present more detailed information and examples of safe, ergonomically correct, and functional science facilities for STEM-based science. Budgeting, working with the architect, technology, and special adjacencies will be presented, and a packet will be distributed.

NSTA Press® Session: Outdoor Science with Birds, Books, and Butterflies

(Grades P–8) Science Focus: GEN E142, Convention Center

Steve Rich, University of West Georgia, Carrollton

Outdoors or in, discover engaging lesson ideas with natural materials, children's books, and citizen science. Join me for outdoor classroom basics, funding ideas, crosscutting concepts, and free seeds.

Engineering: Blow the Roof Off!

Science Focus: ESS3.B, ETS1

(Grades 3-8)

E144, Convention Center

Karen Ostlund, (@karenostlund; *klostlund*@*utexas.edu*), 2012–2013 NSTA President, and The University of Texas at Austin Strong winds generated by hurricanes and tornados can lift the roof off a house. Use a model for the engineering design process that integrates the *NGSS* 3 Ds to design a better roof.

"Phenomenal" Strategies for Teaching NGSS

(Grades 1–6) E145, Convention Center Science Focus: GEN, NGSS Sharon Angal (angals@hsd.k12.or.us), Quatama Elementary School, Hillsboro, Ore.

Janet Rabe (*rabej@hsd.k12.or.us*), Farmington View Elementary School, Hillsboro, Ore.

Sharing strategies behind using phenomena to develop a unit around a phenomenon, this session will support work toward a "phenomenal" *NGSS* unit for your class!

So Your Students Won't Talk (Argue)?

(Grades 5–College) Science Focus: GEN, NGSS E146, Convention Center

Sharon Schleigh, East Carolina University, Greenville, N.C.

Emphasis will be placed on a variety of strategies to get ALL of your students engaged in a scientific argument in your classroom.

NESTA Shares: Using the CLEAN Collection of Resources to Teach Energy and Climate

(Grades 5–College) Oregon Ballroom 204, Convention Center Science Focus: ESS1.B, ESS1.C, ESS2.C, ESS2.D, ESS2.E, ESS3, ETS, LS2.A, LS2.B, LS2.C, LS4.C, LS4.D, PS1.A, PS1.B, PS2.C, PS3.D, PS4.B, CCC, SEP,

Cheryl Manning (@clbmanning; *clbmanning@mac.com*), Evergreen High School, Evergreen, Colo.

Bring your device and use the CLEAN collection of resources to start creating age-appropriate units that teach students about climate and energy.

2:00–3:00 PM Exhibitor Workshops

The Many Jobs of Proteins: Enzymes in the Spotlight

(Grades 8–College) A103/104, Convention Center Science Focus: PS, CCC, SEP

Sponsor: 3D Molecular Designs

Tim Herman (*herman@msoe.edu*), MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

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

Using Biotechnology to Diagnose HIV/AIDS

(Grades 9–College) A105, Convention Center Science Focus: LS

Sponsor: Edvotek Inc.

Danielle Snowflack and **Maria Dayton**, Edvotek Inc., Washington, D.C.

The Human Immunodeficiency Virus (HIV) causes acquired immune deficiency syndrome (AIDS), a serious disease that suppresses a patient's immune system, leaving them susceptible to infections. In this simulation, we'll perform two common tests (western blot, ELISA) used by doctors to diagnose an HIV infection. Attendees receive a free gift!

The HMH Science Dimensions of NGSS

(Grades K–12) A106, Convention Center Science Focus: GEN, CCC2, CCC6, SEP2, SEP3, SEP8 Sponsor: Houghton Mifflin Harcourt

Damon Smerchek, Houghton Mifflin Harcourt, Boston, Mass.

Take a walk through an all new, built from the ground up, *NGSS* K–12 science program produced by the educational solutions company that has been bringing you quality programs for over 180 years, Houghton Mifflin Harcourt. Be one of the first to see how HMH Science Dimensions has the tools to create a true *NGSS* classroom using print resources, innovative student experiences, and advanced technology via Google Classroom and Google Expeditions. Bring device to participate.

Integrating Literacy and Science: The Wow Factor

A107, Convention Center

Science Focus: GEN, SEP7

(Grades P-5)

Sponsor: Activate Learning

Ellen Mintz, Charleston County School District, Charleston, S.C.

Come engage in a hands-on investigation where your students explore, read, write, talk, and think critically about science. Address reading, writing, and math through science investigations. Create data tables and argue from evidence, as you give your students a reason to write beyond just "fill in the blank."

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

(Grades K-5) A108/109, Convention Center Science Focus: GEN Sponsor: Carolina Biological Supply Co. Carolina Teaching Partner

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

Increase Your 3-D Vision of NGSS

(Grades 3–5)

Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

B111/112, Convention Center

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Experience lessons from Delta Science Modules that incorporate the three dimensions of the *NGSS*. Tackle argumentation embedded in the session. Receive a corresponding content reader, strategies, and resources that you can take back and use with your students tomorrow.

Building Electric Circuits with CPO's New LinkTM Learning Module

B113, Convention Center

(Grades 6–12) Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

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

Kat Mills, School Specialty Science, Rosharon, Tex.

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

Teaching Forensics with Real Crime Scene Investigation Techniques from Flinn Scientific

(Grades 9–12) B114/115, Convention Center Science Focus: PS1.A, PS1.B

Sponsor: Flinn Scientific, Inc.

Meg Griffith (mgriffith@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.

Looking for innovative new ways to teach forensics? See demonstrations of products and laboratory activities that can get your students engaged in forensic science! We'll feature professional-grade products used by real CSI teams with write-ups that make them ideal for classroom use. From footwear impression castings to fingerprints, there is always something left behind at a crime scene to be analyzed. Handouts for all activities.

Chemical Batteries

(Grades 6–8) B116, Convention Center Science Focus: ESS3.B, PS, CCC2, CCC5, SEP1, SEP2, SEP3, SEP4

Sponsor: LAB-AIDS®, Inc.

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

Although we live a battery-powered lifestyle, most of us (students included) have no idea how batteries actually work. In this hands-on workshop, we will engage in an activity from *Issues and Physical Science* from LAB-AIDS. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.

What Does Conceptual Modeling Look Like in an Elementary Classroom?

(Grades K–5) B117/118, Convention Center Science Focus: PS

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

Join FOSS Next Generation Program developers to explore how students construct models within the context of physical science. Experience strategies within an active investigation to create and refine models about matter. Find out how student models can be used to guide future instruction within the FOSS program.

The Value of Writing Scientific Explanations in STEM

(Grades K–12) C120/121, Convention Center Science Focus: GEN, NGSS

Sponsor: Accelerate Learning–STEMscopes

Pam Caffery, Accelerate Learning–STEMscopes, Brandon, Fla.

Claim-Evidence-Reasoning (CER) is a way for students to explain, in a scientific way, how their observations and data from an investigation are connected to science knowledge. Using a CER framework provides a scaffold for building the skill of argumentation and writing scientific explanations.

Stop Creating Lesson Plans—Start Creating Learning Experiences

(General) C125/126, Convention Center

Science Focus: GEN, NGSS

Sponsor: Van Andel Education Institute

Marty Coon (*marty.coon@vai.org*), Van Andel Education Institute, Grand Rapids, Mich.

Kimberly Newman (kimberly.newman@camas.wednet.edu), Camas High School, Camas, Wash.

Tim Renz (*renzt@tukwila.wednet.edu*), Foster High School, Tukwila, Wash.

Engage your students to think and act like scientists. Be the teacher that transforms everyday lesson plans into authentic, memorable learning experiences with inquiry-focused instruction. Come with a willingness to inspire learning; leave with strategies and tools to make it happen.

2:30–3:00 PM Presentations

INF Space-Age STEM: Virgin Galactic's Virtual Connection, Mentorship, and Experimentation Hangouts

Alaska/Idaho, DoubleTree

Science Focus: ESS, INF

(Grades 5-12)

Marcia Fiamengo, NASA Jet Propulsion Laboratory, Pasadena, Calif.

Get involved in Virgin Galactic Future Astronauts, an aerospace engineering mentorship and group experimentation delivered free via Google Hangouts. Logistics, programs, and actual experiments will be shared.

3:30–4:30 PM Presentations

Leadership for Three-Dimensional Teaching and Learning: The Washington Science Fellows Program (Grades K–12) Alaska/Idaho, DoubleTree Science Focus: GEN, NGSS

Vickei Hrdina (vickei.hrdina@esd112.org) and Stacy Meyer (stacy.meyer@esd112.org), Educational Service District 112, Vancouver, Wash.

Brian MacNevin (bmacnevin@nwesd.org), Northwest Educational Service District 189, Anacortes, Wash.

Mechelle LaLanne (@mechellencesd; mlalanne@mac.com), North Central ESD, Wentachee, Wash.

Washington State Science Fellows are teacher leaders representing over 110 school districts across the state. Fellows develop and implement action plans to support transitioning to *NGSS* in their home districts. We will share the development of the program and examples of Fellows' work, and give out a tool for helping others to operationalize three-dimensional science instruction and messaging in their home context.

Building NGSS Models in Microsoft Office and Google Drive

(Grades K–12) Morrison, DoubleTree Science Focus: ESS1, ESS2, CCC4, SEP2

Lyle Tavernier (@lyletav; *lyle.tavernier*@jpl.nasa.gov), NASA Jet Propulsion Laboratory, Pasadena, Calif.

Learn how students can use programs in Microsoft Office and Google Drive to build and manipulate models to meet and exceed *NGSS* performance expectations.



(Grades 5–6) D137, Convention Center

Science Focus: ETS

Maureen Daschel (maureen.daschel@smapdx.org), St. Mary's Academy, Portland, Ore.

High school girls serve as mentors to grade 5 girls by offering positive exposure to the excitement and challenge of doing science and engineering.

How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions

(Grades K–12)	Oregon, DoubleTree
Science Focus: GEN, NGSS	

Sue Whitsett (*swhitsett@nsta.org*) AEOP Project Director, and Acacia McKenna (*amckenna@nsta.org*), Director, Competitions, NSTA, Arlington, Va.

Hear about various NSTA competitions and how they can bring STEM and the *NGSS* into the classroom, as well as give students and teachers a chance to earn recognition and prizes.

PolyWhat? Understanding What a Polymer Is (Polymer 101)

(Grades 5–12) Ross Island, DoubleTree

Science Focus: PS, CCC, SEP

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

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

NGSS@NGSS@NSTA Forum Session: Selecting Phenomena NSTA to Motivate Student Sensemaking

(Grades K-12) Science Former CEN NCSS

B119, Convention Center

Science Focus: GEN, NGSS

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

The right phenomena are a key ingredient in successful threedimensional teaching and learning. This session will focus on what makes some phenomena better than others and how to use them successfully in the classroom.

The Air We Breathe: Authentic Student Research on Indoor/Outdoor Air Quality

(Grades 9–12) C122, Convention Center Science Focus: GEN, NGSS

Naomi Delaloye (naomi.delaloye @umontana.edu), University of Montana, Missoula

Learn about a model program that engages students in authentic research, a process that both boosts student interest in science and addresses the *NGSS* three dimensions.

Place-Based Earth Science: Using the Geology of Oregon

(Grades 4–10) D130, Convention Center Science Focus: ESS2.B, ESS2.C

Jodie Harnden (*jodie.harnden@pendleton.k12.or.us*), Sunridge Middle School, Pendleton, Ore.

Kenneth Loomis (kloomis@tahomasd.us), Tahoma High School, Covington, Wash.

Oregon has it all...earthquakes, glaciers, beaches, volcanoes, high plains...why not use what is familiar to students (or not so familiar) to develop their understanding of the formation and features of Oregon and the impact this has on our economy, resources, population, recreation, and the future?



Design for Disaster: Using Three-Dimensional Learning/Literacy in the Service of Science

(Grades 6–8) D140, Convention Center

Science Focus: ESS2, ETS1 Lisa Ernst, Alice Fong Yund Phative School, San Francisco, Calif.

Go in-depth with literacy tools in the study of earthquakes Some of the tools include closed-reading, herringbone, pair share, small group discussion, planning, and writing.

¥	NSTA Press® Session:	Teaching for Conceptual	Under-
	standing in Science		

(General) Science Focus: GEN E142, Convention Center

Richard Konicek-Moran (*tkonicek@gmail.com*), Professor Emeritus, UMass Amherst, Mass.

Using the NSTA Press books *Teaching for Conceptual Understanding in Science* and *Everyday Science Mysteries*, find out what "conceptual understanding" means and how it is used in teaching the *NGSS*.

ASTE-Sponsored Session: Sharing Innovative Program Designs for Professional Development and Research in Science Education

(General) Oregon Ballroom 203, Convention Center Science Focus: GEN, NGSS

Lisa Martin-Hansen (@lmartinhansen; *l.martinhansen*(@ csulb.edu), Stephen Adams (stephen.adams@csulb.edu), and Paul Burns (@burnspn; burnspn@gmail.com), California State University, Long Beach

Kristin Lesseig (kristin.lesseig@vancouver.wsu.edu) and **Tamara Nelson** (tnelson1@wsu.edu), Washington State University Vancouver

Lindsay Lightner (llightner@wsu.edu) and Judith Morrison (jmorriso@tricity.wsu.edu), Washington State University Tri-Cities, Richland

Patricia Morrell (*morrell@up.edu*), University of Portland, Ore.

Kathleen Nitta (*nitta@gonzaga.edu*), Gonzaga University, Spokane, Wash.

Donna Rainboth (*drainbot@eou.edu*), Eastern Oregon University, La Grange

Donna Ross (dlross@mail.sdsu.edu) and Meredith Vaughn (mhoule@mail.sdsu.edu), San Diego State University, San Diego, Calif.

Science education leaders and researchers share information in an interactive poster session. All are welcome to engage in discussion with our presenters.

3:30–4:30 PM Hands-On Workshops

3D Problems and Phenomena: Engaging Your Students in Three-Dimensional NGSS Learning!

(Grades 9–12) D133/134, Convention Center Science Focus: GEN, NGSS

Amanda Rainwater, Bothell High School, Bothell, Wash. Learn how to engage your students in solving real-world problems and investigating puzzling phenomena. Two example units will be shared.

Inclusion: Strategies for Helping Students with Disabilities in the Science Classroom

(Grades 7–12) D135, Convention Center Science Focus: GEN, SEP1, SEP2, SEP3

Terry Shlaes (*shlaest@loswego.k12.or.us*), Lakeridge High School, Lake Oswego, Ore.

With the implementation of *NGSS*, *CCSS*, and other state and federal mandates, students with disabilities need to be in the general education science classroom to learn the concepts that they will be expected to know to graduate. Learn strategies to include these students successfully in your class. Examples of lessons with accommodations will be shared!

Inventing Is Just Plain Fun (for All)!

(Grades 4–12) D136, Convention Center Science Focus: ETS1, SEP6

Anthony Perry (@tonyperry; *aperry*@mit.edu), The Lemelson-MIT Program, Cambridge, Mass.

Michael Lampert (@artofphysics; *mlampert@aol.com*), West Salem High School, Salem, Ore.

Don Domes, Retired CTE Engineering Teacher, Hillsboro, Ore.

Join us and get experience leading a design challenge and incorporating invention into your curriculum to provide authentic and engaging opportunities for all students.

NASA Earth Science: Real-World Connections to Data and Tools for Science Fairs

(Grades 8–12) D139, Convention Center Science Focus: ESS, ETS1

Tassia Owen (*tassia.owen@nasa.gov*), NASA Goddard Space Flight Center, Greenbelt, Md.

Join me as I share how NASA Earth system science resources can be used to support educators and students as they prepare for science fair research projects. NASA develops new ways to observe and study Earth's interconnected natural systems with long-term data records. Bring a laptop/tablet as we explore tools and resources in support of *NGSS* Earth's system, weather and climate, and engineering design.

New POGIL Activities to Integrate Life Science

(Grades 6–College) E141, Convention Center Science Focus: LS, CCC, SEP

Mare Sullivan (*joe.mare.sullivan@gmail.com*), Seattle Pacific University, Seattle, Wash.

Try out free Process-Oriented Guided Inquiry Learning (POGIL) activities that can help your students incorporate the *NGSS* science and engineering practices while mastering foundational concepts of experimental design, evolutionary biology, and developmental biology.

NASA's Journey to Mars: Build a Mars Rover Using NASA's Beginning Engineering Science and Technology (BEST) Curriculum

(Grades K–8) E143, Convention Center Science Focus: ETS, CCC, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

Barbara Buckner (*@bbuckner; barbie.buckner@nasa.gov*), NASA Armstrong Flight Research Center, Palmdale, Calif. Use the engineering design process to build and test a Mars Rover that can carry equipment and astronauts. Come learn about current NASA missions.

Evolution for Educators

(Grades 7–9) E144, Convention Center Science Focus: LS4

Cheryl Ann Hollinger (*cheryl.hollinger*@*richarddawkins.net*), Teacher Institute for Evolutionary Science, Washington, D.C. Middle school science teachers—come learn about innovative ready-to-use classroom resources that address *NGSS* middle school core ideas in evolution and natural selection.



(Kindergarten)

NGSS Storyline Coherence for Kindergarten: Phenomena and Context-Based Units of Study for Kindergarten

E145, Convention Center

Science Focus: GEN, NGSS Carol Biskupic Knight (carol_biskupic_knight@beaverton. k12.or.us), Beaverton (Ore.) School District

Lisa Hazel (*lisa_hazel@beaverton.k12.or.us*), Springville K–8 School, Portland, Ore.

Stephanie Wilkerson (wilkerss@hsd.k12.or.us), Hillsboro (Ore.) School District

NGSS-focused kindergarten units of study engage kindergartners in coherent, cohesive three-dimensional learning investigations centering on phenomena and relevant context with a literacy lens.

Zombies Don't Stand a Chance Against STEM!

(Grades 6–College) E146, Convention Center Science Focus: GEN

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

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

NESTA and CEETEP Shares: Feeling Earth Move: GPS and How It Teaches Us About Future Earthquakes

(Grades 5–12) Oregon Ballroom 204, Convention Center Science Focus: ESS2.B, ESS3.B, ETS2.A, CCC2, CCC4, SEP4, SEP5, SEP6

Robert Butler (*butler@up.edu*), University of Portland, Ore.

Roger Groom (*rgroom@pps.net*), Mt. Tabor Middle School, Portland, Ore.

Douglas Lownsbery (lownsbed@oregonstate.edu), Oregon State University, Corvallis

Join us for classroom activities about GPS-measured crustal motion. Learn how data analysis and quantitative skills are applied to the highly engaging topic of earthquakes. Free digital resources.



3:30–4:30 PM Exhibitor Workshop

Environmental Toxicology Using Edvotek's New EZ-elegans

A105, Convention Center

(Grades 8–College)	
Science Focus: LS	
Sponsor: Edvotek Inc.	

Danielle Snowflack and Maria Dayton, Edvotek Inc., Washington, D.C.

Model organisms allow scientists to investigate biological questions that cannot be studied in humans. Learn how Edvotek's EZ-elegans simplifies culturing *C. elegans* in your classroom. Then, explore effects of environmental factors on *C. elegans* using a simple locomotion assay. Integrate STEM concepts with data collection and statistics. Freebie/raffle entry for attending!

Group Work: Using Student Collaboration in the Middle School Science Classroom

(Grades 6–9) A106, Convention Center Science Focus: GEN, SEP7, SEP8 Sponsor: AEOP eCYBERMISSION

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

Grades 6–9 students either love or loathe the idea of working in a group. The science and engineering practices in the *NGSS* involve students collectively making sense of the world around them by working in groups—plus group work enhances learning for all students. We will cover aspects of quality group work and how it can be beneficial to the middle school science class through hands-on activities. Discussion includes how the online STEM competition eCYBERMIS-SION sets up and uses groups for investigations.

The Best of Engineering for Elementary Students

(Grades 1–5) A108/109, Convention Center Science Focus: ETS, SEP Sponsor: Carolina Biological Supply Co. Carolina Teaching Partner

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

Liven Up Literacy with Science

(Grades K–5) B111/112, Convention Center Science Focus: GEN, NGSS

Sponsor: Delta Education/School Specialty Science

Kathy Armstrong, Northside Elementary School, Midway, Ky.

Darrick Wood, Distance Learning Coordinator, Louisville, Ky.

Use science to put some enthusiasm into your literacy program. Experience engaging lessons from Delta Science Modules that incorporate literacy skills. Receive corresponding a content reader, strategies, and resources that you can take back and use with your students next week.

CPO Science's LinkTM Module: Learning About Chemistry Models

(Grades 6–12)	B113, Convention Center	
Science Focus: PS		
Sponsor: CPO Science/School S	Specialty Science	
Erik Benton, CPO Science/School Specialty Science,		
Nashua, N.H.		
Kat Mills, School Specialty Sci	ience, Rosharon, Tex.	
CPO's new Link Chemistry Mode	ls module is an NGSS approach	
that lets students experience inno	vative activities to learn about	

that lets students experience innovative activities to learn about atomic structure and the periodic table. We'll use a digital learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity.

4:00–4:30 PM Presentation

iPrize: A Transdisciplinary Innovation Competition

(Grades 6–12) B110, Convention Center Science Focus: GEN, SEP8

Ines Kuna (ines.kuna@vansd.org), Ian Hurst (@iTechPrep; @ihurst8; ian.hurst@vansd.org), and Isaiah Wyckoff (isaiah. wyckoff@vansd.org), Vancouver iTech Preparatory, Vancouver, Wash.

Students design, develop, market, and present their own innovations in this *Shark Tank*—style innovation competition.

4:30–6:00 PM Networking Opportunity

OSTA/WSTA Awards Program @OMSI

Oregon Museum of Science and Industry \$25; By Ticket Through OSTA

Join your OSTA and WSTA colleagues at Theory, the Cafe at OMSI, for food and drink to celebrate awardees honored for their professional excellence in science education. Enjoy exploring the museum after the celebration. For more information and to purchase tickets, please visit *www.oregonscience. org/event-2288540*.

Reclaiming the Metal

(Grades 6–8) B116, Convention Center Science Focus: PS1.B, CCC5, SEP3, SEP7 Sponsor: LAB-AIDS®, Inc.

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

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

Evolutionary Evidence in the Fossil Record: Life Science with FOSS

(*Grades 6–8*) B117/118, Convention Center Science Focus: LS, SEP Sponsor: Delta Education/School Specialty Science–FOSS Virginia Reid and Jessica Penchos. The Lawrence Hall

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

What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Edition Heredity and Adaptation Course for Middle School, and identify connections to the three dimensions of *NGSS*.

5:00–5:30 PM Presentation

LEARN with NASA (Long-Term Engagement in Authentic Research with NASA)

(Grades 3–College) B119, Convention Center Science Focus: ESS3, SEP4

Jodie Harnden, Sunridge Middle School, Pendleton, Ore. Find out about LEARN, a research experience for teachers working on authentic science projects in air quality, aerosols, or climate with the guidance of NASA researchers.

Don't forget to pick up your FREE TriMet pass! See page 7 for details.

T R I 🌀 M E T

5:00–6:00 PM Presentations

Modeling to Promote Accountable Talk

(Grades 6–College) Alaska/Idaho, DoubleTree Science Focus: GEN, NGSS

Lynn Kim John, UCLA Center X, Los Angeles, Calif. Review findings from a study of the use of talk moves in secondary science classrooms and learn how teachers need a deeper understanding of the Accountable Talk Framework in order to promote talk that leads to the conceptual understanding called forth by the *NGSS*.

Authors Needed! Publish Your Teaching Idea in an NSTA Journal

(General) Saianga Eagu Morrison, DoubleTree

Science Focus: GEN

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

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

Moving Toward NGSS Through Project-Based Learning

(Grades 4–College)

Oregon, DoubleTree

Science Focus: GEN, NGSS DJ West, Schoolcraft College, Livonia, Mich.

Explore how Problem-Based Learning or Project-Based Learning move toward the intent of *NGSS* by integrating all three areas of the standards. Leave with practical suggestions and resources for immediate implementation.

Unraveling NGSS Implementation: Key Points and Discussion

(Grades K–12)

Ross Island, DoubleTree

Science Focus: GEN, NGSS

Karen Whisler (whisler.karen@measuredprogress.org), Measured Progress, Dover, N.H.

A session for educators working to implement *NGSS!* Participants will learn valuable implementation pointers and have time to ask questions, discuss challenges, and share ideas.



INF Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content

(Grades 6–11) B110, Convention Center Science Focus: ESS1, ESS2.A, ESS2.B, ESS2.C, ESS2.D, ESS3.D, ETS1, ETS2.A, LS1.A, LS1.B, LS3, LS4.D, PS1.B, PS2.A, PS2.B, PS3.D, PS4.B, PS4.C, INF, CCC4, CCC5, SEP1, SEP2, SEP4, SEP5, SEP6, SEP8

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

Find out how National Science Olympiad regional, state, and national competitions include STEM events and supporting resources that are easily incorporated into existing curricula to actively engage students.

Lessons from the Sky (A Teacher's STEM Source)

(Grades 1–12) C122, Convention Center Science Focus: ESS, CCC, SEP

Michael Holst, Satellite Educators Association Student Coordinator, Chehalis, Wash.

From the Library of Satellites and Education Association, learn how to use the Lesson Plans Library, which is tooled to *NGSS* and *NSES* and incorporates environmental satellitebased data. The NOAA and NASA satellites will range across all sciences, STEM, math, and grade levels. This will be a great source to add to your tools.



The nPower Girls: Cultivating Interest and Achievement in STEM

(Grades 4–8) D137, Convention Center Science Focus: ESS, ETS, CCC3, CCC4, CCC5, CCC7, SEP1, SEP2, SEP6, SEP7

Vickei Hrdina (vickei.hrdina@esd112.org), Educational Service District 112, Vancouver, Wash.

Find out about several teacher initiatives from the nPower Girls professional development program, including sample STEM activities and research-based practices for getting and keeping—girls engaged in STEM.

Record and Analyze Seismic Data in the Classroom with Free IRIS Software!

(Grades 6–College) D138, Convention Center Science Focus: ESS2.B, ESS3.B, CCC1, SEP1, SEP4 **Tammy Bravo** (@IRIS_quakes; *tkb@iris.edu)*, IRIS, Washington, D.C.

Monitor Earth from your classroom! Display real-time data from school seismographs or nearby professional seismometers. Students can determine earthquake locations, magnitudes, and more.

5:00–6:00 PM Hands-On Workshops

Inspired by 18th- and 19th-Century Naturalists: Recreating Vintage Wall Charts for Structure and Function Science That Incorporates Cultural Context, Lived Experiences, and Visual Art

(Grades 3–9) Hawthorne/Sellwood, DoubleTree Science Focus: LS1.A, LS3, LS4.C, CCC6, SEP1, SEP2, SEP4, SEP8

Kay Phelps (khphelps@fortlewis.edu), Fort Lewis College, Durango, Colo.

View detailed taxonomy art from Cornell University, examine the science aptitude Harrison Observation Tool, and then engage in a structure and function STEAM lesson.

Looking for a Way to Teach Matter and Energy Through a Model-Based Approach?

(*Grades* 6–10) D131, Convention Center Science Focus: LS1.B, LS1.C, PS1.A, PS1.B, PS3.B, PS3.D, CCC3, CCC5, SEP2, SEP3, SEP4, SEP6, SEP7

MaryMargaret Welch (mmwelch323@gmail.com), Seattle (Wash.) Public Schools

Jenny Newell (jcnewell@seattleschools.org), Nathan Hale High School, Seattle, Wash.

Experience this research-based online curriculum to develop students' thinking around human energy systems. It is designed to engage students in developing and using models, constructing explanation, and engaging in arguments from evidence.

Student Investigations: Get Good Questions!

(Grades 4–8) D140, Convention Center Science Focus: LS2, CCC, SEP1

Katie-Lyn Bunney and Sarah Weaver (*weave048@umn. edu*), University of Minnesota Monarch Lab, Saint Paul Transform student wonderings into authentic research questions. We will use citizen science data to actively engage participants in the process of effectively using a question throughout an investigation process.

3D Constructing Explanations in Biology—Getting from There to Here

Grades 9—12)	D133/134, Convention Center
Science Focus: LS	

Veronica Zonick (zonick.veronica@measuredprogress.org) and Marie-Lise Bouscaren (bouscaren.marie-lise@measuredprogress.org), Measured Progress, Bellingham, Wash.

With coaching, participants will adapt a typical biology class activity to meet the *NGSS* life science performance expectation for constructing explanations, and develop accompanying assessment plans.

INF Connect Chemistry to Your World with ChemClub

(Grades 9–12) D139, Convention Center Science Focus: PS, INF

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

The ACS ChemClub program provides fun and educational resources—all for FREE! Learn about the program, try out some of the activities, and take home a copy of the resources.

Light in the Deep Sea

(Grades 6-8)

E141, Convention Center

Science Focus: PS4, CCC1, SEP4

Joey Scott (@joeyelle; *jlehnhard@mbayaq.org*), Monterey Bay Aquarium, Monterey, Calif.

Why are so many deep-sea creatures red? Explore the phenomenon in this lesson from the Monterey Bay Aquarium. *NGSS* connections and formative assessment probe included.

NSTA Press® Session: Inside or Out: The Perfect Place for Connecting Outdoor Science and Children's Trade Books

(Grades K–6)

E142, Convention Center

Science Focus: GEN

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

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

Communicating Science Through Narrative Writing

(Grades 5–7) E143, Convention Center Science Focus: ESS, LS, PS

Joan Swafford (*jswafford08@gmail.com*) and **Janet Foster**, Jefferson Middle School, Jefferson, Ore.

During this interactive session, participants will become a water molecule, write a narrative, learn a feedback technique, and practice implementing applicable scientific vocabulary.

Curriculum for a Crowded Planet

(Grades 6–8) E144, Convention Center Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2.A, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC7, SEP

Jennifer Wyld (@wyld_peace; wyldmama@gmail.com), Oregon State University, Corvallis

Participate in hands-on activities that apply math and science skills to tackle major global challenges, including human population pressures, finite natural resources, and climate change.

Preparing Educators to Meet the Demands of NGSS Through a Three-Dimensional Professional Development Model

E145, Convention Center

(Grades K-6)

Science Focus: GEN, NGSS

Erika Hansen-Rudishauser and **Carol Biskupic Knight** (*carol_biskupic_knight@beaverton.k12.or.us*), Beaverton (Ore.) School District

We will present a high-leverage professional development model framework to build capacity in educator leaders, moving *NGSS* implementation from the classroom to school/ district levels.

NESTA and CEETEP Shares: Surviving the Shake: Engineering Activities for Earthquake Resilience

(Grades 5–12) Oregon Ballroom 204, Convention Center Science Focus: ESS1.A, ESS1.B, ESS2.A, ESS2.B, ESS3.B, SEP2, SEP4, SEP6, CCC2, CCC4, CCC6

Robert Butler (*butler@up.edu*), University of Portland, Ore.

Roger Groom (*rgroom@pps.net*), Mt. Tabor Middle School, Portland, Ore.

Douglas Lownsbery (lownsbed@oregonstate.edu), Oregon State University, Corvallis

Join us for hands-on activities and visualizations that feature engineering solutions to earthquake hazards. Applicable anywhere, but especially focused on the Pacific Northwest. Free digital resources.
5:30–6:00 PM Presentation

The AMS DataStreme Project: Comprehensive Earth Science Education for Teachers

(General) B119, Convention Center Science Focus: ESS

James Brey, American Meteorological Society, Washington, D.C.

Come learn how AMS DataStreme courses provide a comprehensive look at our Earth system. The information can be easily adapted for use in your classroom!

6:00–9:00 PM Networking Opportunity Teacher Evening at Oregon Museum of Science and Industry (M-1)

(Tickets Required; \$35)

Oregon Museum of Science and Industry

Ranked as one of the top science centers in the U.S., Oregon Museum of Science and Industry (*www.omsi.edu*) has an international reputation for its innovative exhibits and educational programs. This evening experience will provide opportunities to engage in classroom-ready, hands-on activities, and take away resources encouraging implementation of STEM activities in the classroom. Ticket cost includes museum admission and light appetizers. Cash bar. Tickets, if available, may be purchased at registration.

Note: Transportation is not provided. OMSI is on the streetcar line about 15 minutes from the Convention Center. The cost is \$2 to ride or you can use your TriMet pass and ride for free (given out at program pickup). For directions and parking, visit www.omsi.edu/visitor-info.



-Photo courtesy of Oregon Museum of Science and Industry



-Photo courtesy of Travel Portland

Just a 30-minute drive from Portland, Multnomah Falls plummets a cascade of icy water 611 feet. See page 32 for a Columbia River Gorge Geology Tour that includes a stop at the Falls.

8:00–8:30 AM Presentation

Edible Labs

(Grades 6-12) Science Focus: GEN B110, Convention Center

John Vaden, Riverdale High School, Murfreesboro, Tenn. Serve up new learning in your classroom. Edible labs allow teachers an innovative means of presenting science concepts such as DNA and density to diverse students using food.

8:00–9:00 AM Presentations

Let the Tablet Tell a Science (Digital) Story!

(Grades 3-12) Morrison, DoubleTree Science Focus: GEN, CCC

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

Discover how to use digital tablets for crafting science digital stories with popular video-editing apps while promoting science writing and visual literacy skills. Samples, live demonstration, and resources provided.

STEM P3: A Statewide Programs/Policy Partnership to Advance PreK-12 STEM Education

(General) Oregon, DoubleTree Science Focus: GEN, SEP

Paul Gibbins (@NC_Iowa_STEM; pgibbins@iastate.edu), North Central STEM Hub, Iowa State University, Ames Building a STEM culture across the state calls for systemic rather than piecemeal solutions, integrating classroom, community, and Capitol activities. Hear about a case study of Iowa STEM.

INF The Monarch Butterfly: Sophisticated Science

(Grades 4-9)

Ross Island, DoubleTree Science Focus: LS2, INF, CCC1, SEP1, SEP4

Sarah Weaver (weave048@umn.edu) and Katie-Lyn Bunney, University of Minnesota Monarch Lab, Saint Paul Engage students with citizen science data to understand current monarch research and inspire authentic investigations. Go beyond the life cycle!

Evaluate Your Sessions Online!

This year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to one lucky attendee who completes a session evaluation!

Remember, the more sessions you attend and evaluate, the more chances you have to win! (See page 12 for details.)

Using Data Proactively to Guide Differentiated Instruction

(Grades 9-12) Science Focus: GEN, CCC

C122, Convention Center

Brandon Rodriguez (brodriguez209@gmail.com), NASA Jet Propulsion Laboratory, Pasadena, Calif.

See how the science staff used performance and perception data to identify and act upon trends for students before having to play instructional catch-up.

STEM in the Primary Classroom

(Grades K-2) D130, Convention Center Science Focus: GEN, SEP1, SEP3, SEP7

Jen Gutierrez (@jengutierrez18; jengutierrez@cox.net), NSTA Director, District XIV, and Arizona Dept. of Education, Phoenix

Jennifer Thompson (@jenjuneau; *jenjuneauak@gmail.com*), NSTA Director, Preschool/Elementary Science Teaching, and Harborview Elementary School, Juneau, Alaska

Supporting young children's instinctive desire to explore STEM ideas and phenomena has lasting benefits. Come investigate how interdisciplinary STEM teaching and learning support all students.

Using Problem-Based Learning to Promote Authentic **Research and Problem Solving and Excite Interest for** Students of All Levels

Grades 4—College)	D132, Convention Center
Science Focus: GEN	

Barney Peterson (@BarneyPeterson; bpeterson@everettsd. org), James Monroe Elementary School, Everett, Wash.

Gary Popiolkowski (garypoprr33@gmail.com), Chartiers-Houston Junior/Senior High School, Houston, Pa.

Discover how to use Problem-Based Learning to promote authentic research and problem-solving opportunities and excite interest for students of all ages.



-Photo courtesy of Jacob Slaton

AMSE-Sponsored Session: Building an Equitable Science Classroom Community: Strategies by and for Teachers

(Grades 3-College) D137, Convention Center Science Focus: GEN, NGSS

Deb Morrison (@educatordeb; educator.deb@gmail.com), University of Washington, Seattle

Come explore research-based strategies for building justicecentered science classroom communities. Discussion centers on the strategies in reference to participants' own teaching contexts.

NARST-Sponsored Session: The Efficacy of Multi-Level Professional Development for Elementary, Middle School, and High School Teachers

D138, Convention Center (General) Science Focus: GEN, NGSS

Caren Gough (caren.gough@stonybrook.edu), Stony Brook University, Old Bethpage, N.Y.

How might multi-group professional development help to prepare elementary, middle school, and high school teachers to successfully connect the NGSS learning progressions across grade levels?

Sing for the Planet

(Grades 3-8) Science Focus: ESS3, LS2

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

D140, Convention Center

Celebrate science and environmental stewardship with the award-winning music of Pete Seeger and the Rivertown Kids and eight other free films with support materials.

8:00–9:00 AM Hands-On Workshops

Science Practices: Effective, Fun, and Relevant

Hawthorne/Sellwood, DoubleTree (Grades 3-10) Science Focus: GEN, CCC, SEP3, SEP4 **Steve Weinberg** (*weinberg* (*@ntplx.net*), Science Consultant,

Boynton Beach, Fla. W. Tony Heiting, Science Consultant, Portland, Ore. Take part in a number of authentic and engaging investigatory activities that exemplify specific science practices such as planning and carrying out investigations and analyzing

and interpreting data that are effective, fun, and relevant.

Engineering Water Wheels: A Three-Dimensional Approach for Integrating Science and Engineering (Grades 3-10) Weidler/Halsey, DoubleTree Science Focus: ETS

David Crowther (crowther@unr.edu), NSTA President-Elect, and University of Nevada, Reno

I'll introduce the engineering design process in an integrated STEM activity to design a water wheel that will most efficiently lift a load of washers. This lesson uses the three dimensions of the *NGSS* and a learning cycle approach.

INF Promising Practices in STEM Education for English Language Learners

(Grades K-8) D131, Convention Center

Science Focus: GEN, INF, NGSS

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

Ana López (anaglopez4@gmail.com), Central Valley Science Project, Sanger, Calif.

Engage with successful STEM-rich "making" practices and learn how to support English language learners as equityminded teachers and leaders.

3 Three-Dimensional Formative Assessment

(General)

D133/134, Convention Center Science Focus: GEN, NGSS

John Graves (@cjmogan; graves@montana.edu), Montana State University, Bozeman

Learn strategies and techniques to create and use formative assessments that address the three dimensions of the NGSS.

Infect Your Science Classroom with Math

(Grades 6–College) D135, Convention Center Science Focus: GEN

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

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

Coyote vs. Road Runner: Why Acme Anvils Aren't Needed

(*Grades K–8*) D136, Convention Center Science Focus: LS1.A, LS1.C, LS2.B, LS3.B, CCC5, CCC6, SEP1, SEP2, SEP6, SEP7, SEP8

Christina Cid (ccid@highdesertmuseum.org) and Carolyn Nesbitt (cnesbitt@highdesertmuseum.org), High Desert Museum, Bend, Ore.

Wonder how animals thrive on eating toxic prey or why some animals play dead? Investigate adaptations and food webs using a specimen- and inquiry-based approach.

ASEE Session: ASEE's K–12 Outreach: Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, and the National Science Digital Library

(Grades K–12) D139, Convention Center Science Focus: ETS, SEP

David Heil, David Heil & Associates, Inc., Portland, Ore. The American Society for Engineering Education (ASEE) and its K–12 division will introduce teachers to innovative ways to add engineering into the K–12 classroom.

Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects

(*Grades* 6–12) E141, Convention Center Science Focus: ESS2, ESS3, ETS1, ETS2.A, PS2, CCC3, SEP1, SEP3, SEP4, SEP6, SEP7

Shelley Olds (@terraunbound; @UNAVCO; @ESIPfed; *shelley.e.olds@gmail.com*), UNAVCO, Boulder, Colo.

Engage students in STEM using the "it" toy of the year— Unmanned Aerial Vehicles (UAVs or drones)! Try free teacher-developed activities for STEM learning.



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

(Grades 9–12) E142, Convention Center Science Focus: PS, CCC, SEP

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

Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

INF AAPT Session: Physics and Engineering in the Classroom and After-School Clubs I: Using Microcontrollers to Collect and Display Results in Fun and Exciting Ways

(Grades 9-College)

(Grades 6-8)

Science Focus: PS1.A

Science Focus: PS, INF

E143, Convention Center

Greg Mulder, Linn-Benton Community College, Albany, Ore.

In this first of three hands-on workshops, we will explore using Arduino microcontrollers and VPython to collect and present data. No prior programming or electronics experience needed.

Get Ready for the Great American Eclipse!

(General) E144, Convention Center Science Focus: ESS1.B, CCC1, CCC3, SEP2, SEP4 Brian Kruse (bkruse@astrosociety.org) Astronomical Society

Brian Kruse (*bkruse@astrosociety.org*), Astronomical Society of the Pacific, San Francisco, Calif.

David Johnson (*djohnson@jeffnet.org*), Oregon Science Teachers Association, Portland

Discover how to safely view the August 2017 total solar eclipse, and engage in three-dimensional modeling and data analysis to understand the pattern of eclipses.

ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State

E146, Convention Center

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

Explore solids, liquids, gases, and changes of state through hands-on activities and molecular animations from the free completely developed 5E lesson plans available at *www. middleschoolchemistry.com.*

(Grades 9-12)

NGSS? Got It Covered!

E147/148, Convention Center

Science Focus: ETS, LS **Claudia Ludwig** (@SystemsEd; *cludwig@systemsbiology. org*), Institute for Systems Biology, Seattle, Wash.

Mari Knutson Herbert (@mari.herbert; *knutsonm@ lynden.wednet.edu*), Lynden (Wash.) School District

Bring engineering to your biology course. Engage students with a case study involving halophiles as indicators of ecosystem health. Challenge students to design, build, and use a data collection device, and collaborate to address an environmental issue.

8:00–9:00 AM Exhibitor Workshops Let's Get Helical: Exploring DNA Structure and Function with Physical Models

(Grades 9–College) A103/104, Convention Center Science Focus: LS, CCC

Sponsor: 3D Molecular Designs

Tim Herman (*herman@msoe.edu*), MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

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

Integrating Chromebook with Vernier Data-Collection Technology

(Grades 3–12) A105, Convention Center Science Focus: GEN, SEP3, SEP4

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data helps students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classroom. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.



An NGSS Approach to Engineering in the Upper Grade Bands

(Grades 6–12) A106, Convention Center Science Focus: ETS, SEP2, SEP3, SEP7 Sponsor: Houghton Mifflin Harcourt Michael DiSpezio, Author and STEM Specialist, North

Falmouth, Mass.

Join educator, broadcast host, and Houghton Mifflin Harcourt author Michael DiSpezio for an engaging and informative workshop that addresses the *NGSS* approach to engineering and the engineering design process in the upper grade bands. In this hands-on session, you will work in multidisciplinary teams as you participate in several activities that profile and address a standards-based approach to engineering.

Fun with Freewheelers! Teaching Science and Math with Manipulatives

A107, Convention Center

Science Focus: ETS, PS Sponsor: LEGO Education

(Grades 4-8)

Ty Stevenson (*ty.stevenson@lego.com*), LEGO Education, Boston, Mass.

Experience LEGO Education Simple and Powered Machines through hands-on activities with the materials. Students using this solution have the ability to design and build machines using motors to probe issues of force, friction, and measurement. Challenging students to apply math concepts including division and ratios, the curriculum extends beyond physical science. Explore concepts related to design, gearing ratios, and the application of math.

Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens

(Grades 9–12) A108/109, Convention Center Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Explore animal diversity by comparing and contrasting anatomical adaptations of the pig, rat, dogfish, and frog. Participants use hands-on dissection to identify characteristics of these popular vertebrates. This is an excellent comparative dissection activity featuring Carolina's Perfect Solution specimens.

Viruses—From Adenovirus to HIV to Zika

(Grades 9–12) B111/112, Convention Center Science Focus: LS, SEP1, SEP6

Sponsor: HHMI BioInteractive

Mary Colvard, Retired Educator, Deposit, N.Y.

How are viruses the same...and different? How do they infect different hosts? Why do they cause disease in some hosts and not others? Explore free HHMI BioInteractive materials, including click and learns, hands-on activities, and videos that can engage your students in both asking and answering these questions.

Modeling Climate Change Impacts: Dissolving Carbon Dioxide

(Grades 9–12) B113, Convention Center Science Focus: ESS3, PS Sponsor: PASCO scientific

Presenter to be announced

Rising temperatures are not the only impact of increased CO_2 emissions. Earth's oceans have acted a buffer by dissolving excess CO_2 into solution. In this quick hands-on activity, create a model to investigate the effects of dissolved CO_2 using the wireless pH sensor and experience how easy inquiry can be.

Hands-On Integrated Science Activities for Middle School from Flinn Scientific

(Grades 6–8) B114/115, Convention Center Science Focus: ESS2, LS1, PS1, PS4

Sponsor: Flinn Scientific, Inc.

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

Hands-on science leads to minds-on learning! Flinn Scientific presents relevant and age-appropriate activities for middle school—integrating life, Earth, and physical science topics. Workshop participants perform and observe experiments designed to capture the curiosity and engage the energy of adolescent students. Handouts for all activities.

Waves

(Grades 6–8) B116, Convention Center Science Focus: PS4.A, PS4.B, CCC2, CCC5, SEP3, SEP4, SEP7, SEP8

Sponsor: LAB-AIDS®, Inc.

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

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

STEM Literacy: Strategies for Making Complex Text Meaningful

(Grades K-12) C120/121, Convention Center

Science Focus: GEN, NGSS

Sponsor: Accelerate Learning–STEMscopes

Pam Caffery, Accelerate Learning-STEMscopes, Brandon, Fla.

Join us as we learn the power of using close reading strategies to engage students in reading, writing, and discussing the science text in collaborative groups, which can lead to student mastery and high achievement. Build the capacity for scientific literacy success in your STEM classroom!

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

(Grades 9–College) C123, Convention Center Science Focus: LS

Sponsor: Bio-Rad Laboratories

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

Disease can spread like wildfire through populations. In this hands-on workshop, you will assume the role of an epidemiologist and use an ELISA assay to track viruses like HIV, Ebola, Zika, and SARS. See if you can find patient zero.

Implementing Science Seminars and Scientific Argumentation with Amplify Science

(Grades 6–8) C124, Convention Center Science Focus: GEN, SEP7 Sponsor: Amplify

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

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

Stop Creating Lesson Plans—Start Creating Learning Experiences

(General) C125/126, Convention Center Science Focus: GEN, NGSS

Sponsor: Van Andel Education Institute

Marty Coon (*marty.coon@vai.org*), Van Andel Education Institute, Grand Rapids, Mich.

Kimberly Newman, Camas High School, Camas, Wash. Tim Renz (renzt@tukwila.wednet.edu), Foster High School, Tukwila, Wash.

Engage your students to think and act like scientists. Be the teacher that transforms everyday lesson plans into authentic, memorable learning experiences with inquiry-focused instruction. Come with a willingness to inspire learning; leave with strategies and tools to make it happen.

8:00–10:00 AM Elementary Day @NSTA Panel Articulating the "Why": Science in the Elementary

Articulating the "Why": Science in the Elementary Years

Multnomah, DoubleTree

(Grades K–6/College) Science Focus: GEN, NGSS

Susan Holveck (susan_holveck@beaverton.k12.or.us), OSTA President; Program Coordinator, NSTA Portland Area Conference; and and Beaverton (Ore.) School District

Melissa Dubois, South Metro-Salem STEM Partnership, Klamath Falls, Ore.

Teresa Goetter, Metzger Elementary School, Portland, Ore.

Mary Gromko, NSTA President, Colorado Springs, Colo. Mark Lewis, Chief Education Office, Salem, Ore.

Michael Ann McIlvenny, South Shore Elementary School, Albany, Ore.

Peter McLaren, Next Gen Education, LLC, North Kingstown, R.I.

Salam Noor, Oregon Dept. of Education, Salem

Bryan Rebar, University of Oregon, Eugene

Moderator: Cristina Trecha, Portland State University, Portland, Ore.

Principals and elementary teachers will learn why science instruction is important for students and why it is an equity issue if science is not taught.



—Photo courtesy of Jacob Slaton

8:00–10:00 AM Hands-On Workshop

ACS Session One: Energy in Chemistry—A Macroscopic View

(Grades 9–12)

Science Focus: PS3, SEP6

Marta Gmurczyk, American Chemical Society, Washington, D.C.

Shelly Belleau, University of Colorado Boulder

Chad Bridle (@sciencebridle; *cbridle1@gpsbulldogs.org*), Grandville High School, Grandville, Mich.

Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.

Engage in design activities that can help students meaningfully understand energy transfer between systems with different temperatures by designing devices with specific properties and testing their properties. These activities have been developed to deepen students' conceptual understanding about energy, heat, and temperature in macroscopic systems.

8:00 AM-5:00 PM Meeting

Discover the NGSS Train-the-Trainer Workshop

(By Separate Registration Only) Holladay, DoubleTree This workshop gives teacher leaders a solid understanding of the NGSS, tools for conducting teacher training, and the ongoing support they need to be leaders.

8:30–9:00 AM Presentation

Project-Based Instruction Is a Perfect Match for NGSS

(Grades 6–12)

Science Focus: ETS, SEP

B110, Convention Center

E145, Convention Center

Sandra Leiterman (@saleiterman; *sleiterman9796@hotmail. com)*, University of Arkansas at Little Rock

Learn key components for designing and implementing effective project-based units, even if you're the "lone wolf" trying it in your building.

9:00 AM-3:00 PM Exhibits

Hall A, Convention Center

Did you know that NSTA offers Exclusive Exhibits Hall hours today from 1:30 to 3:00 PM? During these hours there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

Take a break and join us today from 1:15 to 3:00 PM for complimentary Iced Tea and Lemonade. Coinciding with our exclusive Exhibit Hall hours, we welcome you to drop by for a refreshing beverage.

9:30–10:30 AM Featured Presentation Implicit Bias and Its Effect on Diverse Youth

(General) Oregon Ballroom 201, Convention Center Science Focus: GEN



Deena Pierott (@DeenaPierott; *deena@iurbanteen.org*), Founder and Chief Innovator, iUrban Teen, Vancouver, Wash.

Presider: Marjorie "Midge" Yergen, The View from the Summit: Celebrating Science for All Strand Leader; NSTA Director, District XVII; and and West Valley Junior High School, Yakima, Wash.

How can we intentionally counteract the negative effects of implicit bias across students' educational experiences? Implicit biases can impact youth's interactions with each other and impede learning opportunities. Join Deena as she discusses both explicit and implicit biases and the role of educators in mitigating their effects both personally and in their classrooms.

Deena Pierott is a tireless advocate and a strong voice in support of diversity, equity, and inclusion. A 2013 White House Champion for Change, Deena founded iUrban Teen in 2011 in an effort to expose nontraditional STEM learners to career opportunities while encouraging high school graduation and extended learning. She has both corporate and public sector experience working for companies such as Exxon, Mattel Toys, Hughes Aircraft, the Urban League, and the City of Portland's Environmental Services Bureau.

Recently, she created the Portland Metro Diversity Employment Network, which consists of over 90 human resources managers and corporate recruiters to create a whole new model for diversity recruiting and onboarding.

9:30–10:30 AM Presentations

Yes! You Can Teach Computer Science with Scalable Game Design!

(Grades 4–8) Alaska/Idaho, DoubleTree Science Focus: GEN, SEP2, SEP5, SEP6

Ryan Rasar (@RLRasar; *rrasar*@*nvvacademy.org*), Nevada Virtual Academy, Las Vegas

In Scalable Game Design, students learn computational thinking patterns and 21st-century skills while coding video games and scientific simulations. NSF grant funded.

The Role of Community Partnerships in FieldSTEM Plus

(Grades K–12) Morrison, DoubleTree Science Focus: GEN, NGSS

Pamela Farr (pfarr@sheltonschools.org), Shelton (Wash.) School District

Pacific Education Institute will showcase a rural school district model of K–12 FieldSTEM that engages all students in grade-level *NGSS*-focused science content.

Chemistry Concepts STEAM-ified

(Grades 5–College) Oregon, DoubleTree Science Focus: PS

Julie Smith (julieltapresident@gmail.com), Lennox Middle School, Lennox, Calif.

Use animations, online resources, and a paper chemistry set to make *NGSS* chemistry disciplinary core ideas accessible for all, including modeling atomic structure, periodic table organization, and chemical bonding.

Baby Carrots Are Killing You!

(Grades 7–College) Ross Island, DoubleTree Science Focus: GEN, SEP7

Doug Fraser (*fraser.biology@gmail.com*), Science Author/ Consultant, Nanaimo, B.C., Canada

Let's examine myths and misconceptions and the role of social media in spreading good, bad, and bogus information, from vaccines and the Food Babe to GMOs.

INF Leveling the Playing Field: After-School STEM Coaching Model

(Grades K–12) B110, Convention Center Science Focus: INF, SEP

Sandie Grinnell (grinnels@hsd.k12.or.us), Hillsboro (Ore.) School District

Paul Hanson (hansonp@hsd.k12.or.us), Liberty High School, Hillsboro, Ore.

Join us as we share strategies for implementing a districtwide STEM coaching model, successes to be celebrated, and lessons learned along the way. Borrowing from the longstanding practice of stipending athletic coaches, Hillsboro School District has created a STEM coaching model with dedicated coaches specifically supporting after-school STEM programs at each of its schools.

Ecology and Biodiversity Labs: The Environment in Three Dimensions

(Grades 10–College) B119, Convention Center Science Focus: LS2.A, LS2.C, LS2.D, LS4.D Ben Smith (ben.smith@alumni.duke.edu), Palos Verdes Pen-

insula High School, Rolling Hills, Calif.

Explore engaging student-designed ecology and biodiversity lab and field investigations to enhance three-dimensional environmental science learning and teaching.

Basic Polymer Science for the Science Classroom

(Grades 6–12) C122, Convention Center Science Focus: PS1.A, PS1.B, CCC6

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

Simple demonstrations, labs, and activities bring STEMrelevant polymers into your curriculum. Concepts include formation, classification, structure, and properties. *NGSS correlations* will be shared as well as a CD of activities/information.

3-D Outdoor Learning Strategies

(Grades K–5) D130, Convention Center Science Focus: GEN

Karen Stanfield, Cowan Road Elementary School, Milner, Ga.

Students remain highly engaged when their interest levels are piqued using a 3-D outdoor learning environment. We will discuss strategies for integrating required standards and a deeper understanding of *NGSS*.

Solving the Mystery of the Megaflood with Fourth-Graders!

(Grades P–6)

D137, Convention Center

Science Focus: GEN, NGSS

Jennifer Whitten (*jennifer.ann.whitten@gmail.com*), Beaver Acres Elementary School, Beaverton, Ore.

Megafloods? A rebel geologist? Students in a grade 4 classroom puzzle over the complex phenomena of the Eastern Washington "scablands" while developing evidence-based explanations through activities, readings, and discussions.

Engage Your Students Through Conservation Connect

(Grades 4–8) D138, Convention Center Science Focus: LS, CCC4, SEP4

Randy Robinson (randy_robinson@fws.gov), U.S. Fish & Wildlife Service, Falls Church, Va.

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

Hear about Conservation Connect, a new web-based video series produced by the U.S. Fish & Wildlife Service for middle school students.

9:30–10:30 AM Hands-On Workshops Do I Really Want Them to Argue?

(Grades 6–12) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, SEP5, SEP7

Leticia Perez, UCLA Center X, Los Angeles, Calif.

Leery of argumentation or how it fits into your classroom? Identify how data science and computational thinking can be used in conjunction with argumentation to support concept development.

Developing Project-Based Learning Units in Partnership with STEM Professionals: Real-World Project Examples

(Grades 3–8) D131, Convention Center Science Focus: GEN, SEP

Bryan Rebar (@RebarBryan; brebar@cas.uoregon.edu), University of Oregon, Eugene

Dara Brennan (@SPS_STEM; *dara.brennan@springfield. k12.or.us*), Springfield (Ore.) Public Schools

Grades 3–8 teachers will share projects they developed with inspiration and guidance from community partners who use STEM skills in their careers.

3D Integrating Green Chemistry and Engineering Design into Every Classroom: Interactive Workshop for High School Educators

(Grades 9–12) D133/134, Convention Center Science Focus: ETS1, PS

Jill Stoddard Tepe, University of Washington, Seattle Join me as I bring together the principles of green chemistry and resources for lab activities that both teach and use green chemistry concepts.

GAUGE: A Novel NGSS-Based Grading System

(Grades 6–12) D140, Convention Center Science Focus: GEN, NGSS

David Midkiff (@midkiffwrites; dave.james.midkiff(@gmail. com), **Christina Iremonger** (christina.iremonger@vansd.org), and **Darby Meade** (darby.meade@vansd.org), Vancouver iTech Preparatory, Vancouver, Wash.

Gil Luna (gilbert.luna@vansd.org), Vancouver (Wash.) Public Schools

How do we convert standards-based scores into a single representative letter grade? Averaging can hide a student's true knowledge and understanding.

Go Probe! Teaching Astronomy with Sensors and Apps

(Grades 6–12) D13 Science Focus: ESS

D136, Convention Center

Jenifer Perazzo (@overlandsafari; jperazzo@pleasantonusd. net), Pleasanton (Calif.) Unified School District

Stacey Holder (@StaceyAHolder; *sholder*@*pleasantonusd*. *net*), Fairlands Elementary School, Pleasanton, Calif.

Explore the built-in sensors on any device to enhance students' observations and data collection skills. Use technology to model, create, collect, and communicate results.

INF ASEE Session: Engineering a Pathway to STEM: Advancing Elementary-Level Engineering Education Through Innovative Programs and Partnerships (Grades K-5) D139, Convention Center Science Engineer ETS, INE

Science Focus: ETS, INF

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

Discover how to provide quality STEM experiences in your school and community through two nationally recognized engineering programs—Engineering is Elementary and Family Engineering.

Do You See What I See?

(Grades 6–12) E141, Convention Center Science Focus: GEN, SEP2, SEP6, SEP7

Samantha Johnson (@SciInnovations; smjohnson@slzusd. org), Arroyo High School, San Lorenzo, Calif.

Come see modeling in action and engage in several modeling activities. Leave with a "goodies grab bag," lesson plans, and strategies that can be implemented in your classroom as soon as you return.

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

(Grades 9–12) E142, Convention Center Science Focus: LS, CCC, SEP

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

Jonathon Grooms (@drjongrooms; *jgrooms@gwu.edu*), The George Washington University, Washington, D.C. Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts,

and science practices to explain natural phenomena.

INF AAPT Session: Physics and Engineering in the Classroom and After-School Clubs II: Using an Arduino to Collect Data and Control Motors

(Grades 9–College) E143, Convention Center Science Focus: PS, INF

Greg Mulder, Linn-Benton Community College, Albany, Ore.

In this second of three hands-on workshops, we will explore using Arduino microcontrollers and VPython to collect and present data. No prior programming or electronics experience needed.

ACS Middle Level Session: Density: A Molecular View

(Grades 6–8) Science Focus: PS1.A E146, Convention Center

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

Explore and identify materials based on density through hands-on activities and molecular models from the free completely developed 5E lesson plans available at *www. middleschoolchemistry.com.*

Learning About Global Climate Change in a Physics Course for Prospective Teachers

(General) E147/148, Convention Center Science Focus: ESS3, PS

Emily Van Zee, Oregon State University, Corvallis Participate in activities that explore the nature of light and thermal phenomena and their influence on local weather and global climate change.

CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus

(Grades P–3) Oregon Ballroom 203, Convention Center Science Focus: GEN, SEP

Jim McDonald (@jimscienceguy; *jim.mcdonald@cmich. edu)*, CESI President, and Central Michigan University, Mount Pleasant

I'll present engaging activities that allow you to take children outside and easily integrate science, art, music, and social studies while using *NGSS* science practices.

9:30–10:30 AM Exhibitor Workshops

3D Printing for the BioScience Classroom

(Grades 9–College) A103/104, Convention Center Science Focus: LS, PS, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman (herman@msoe.edu) and Mark Hoelzer (hoelzer@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Recent advances in 3D printing technology make these amazing machines affordable for schools. Learn how 3D printing can be used to integrate *NGSS* science and engineering practices with crosscutting concepts and disciplinary core ideas by creating physical models of molecular structures in your biology or chemistry classroom!

Chemistry with Vernier

(Grades 9-12)

A105, Convention Center

Science Focus: PS, SEP3, SEP4

Sponsor: Vernier Software & Technology

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

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

FOLD-tastic Science Notebooks via Dinah Zike's **Notebook Foldables**

(General) Science Focus: GEN Sponsor: Dinah.com

A106, Convention Center

A107, Convention Center

B113, Convention Center

Bob Stremme, Dinah.com, Plymouth Meeting, Pa.

Cut, fold, and more in this hands-on workshop as you construct Notebook Foldables that are sure to make your students' science notebooks FOLD-tastic. Use basic classroom materials and depart with examples and ideas ready to use on Monday.

Discourse Tools for Equitable and Rigorous Talk

(Grades 5-8) Science Focus: GEN, SEP8

Sponsor: Activate Learning

Heather Milo, Activate Learning, Greenwich, Conn.

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

Learning By Arguing: Claims, Evidence, and Reasoning

A108/109, Convention Center (Grades 6-8) Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Middle school students naturally love to argue. How can we use scientific argumentation to produce real learning in the science classroom? Explore claims, evidence, and reasoning through practical, real-world applications. Experience phenomena as delivered in the new Smithsonian Science and Technology Concepts (STC) Middle School program.

Exploring Misconceptions: Speed and Velocity

(Grades 9-12) Science Focus: PS2 Sponsor: PASCO scientific

Presenter to be announced

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

3-2-1 Blast Off!

(Grades 2-8) B114/115, Convention Center Science Focus: ETS1.A, ETS1.B, ETS2.A, PS2.A, PS3.A, PS3.B, PS3.C, CCC5, SEP1, SEP3

Sponsor: Educational Innovations, Inc.

Priscilla Robinson, Educational Innovations, Inc., Portland, Ore.

What student doesn't like a burst of energy?! Join us for things that go bump in the day! Perfect for elementary or middle school teachers teaching energy or Newton's laws. Make your own rockets to explore elastic, potential, and kinetic energy, and more. Lesson ideas, giveaways, and door prizes!

pH Scale and Math Modeling

(Grades 9-12) B116, Convention Center Science Focus: PS1.B, CCC3, SEP3, SEP4, SEP5 Sponsor: LAB-AIDS®, Inc.

Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.

What does pH actually measure? In this investigation, you will measure pH indirectly using indicators and absorption using the Lab-Master. Using their data participants generate a graph of absorbance vs. pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from The Natural Approach to Chemistry program.

STEM and NGSS Inquiry in Chemistry-Effective, Efficient, Economical

(General) Science Focus: PS B117/118, Convention Center

Sponsor: Pearson

Ed Waterman, Retired Educator, Fort Collins, Colo.

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

Building the Skills of Argumentation and Collaboration in STEM

(Grades K–12) C120/121, Convention Center Science Focus: GEN, SEP7

Sponsor: Accelerate Learning–STEMscopes

Pam Caffery, Accelerate Learning–STEMscopes, Brandon, Fla.

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

Investigate Photosynthesis and Cellular Respiration with Algae Beads

(Grades 8–College) C123, Convention Center Science Focus: LS

Sponsor: Bio-Rad Laboratories

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

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

Not Your Typical Classroom Experience: Amplify Science's Digital Engineering Internships

(Grades 6–8) C124, Convention Center Science Focus: ETS Sponsor: Amplify

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

Discover Amplify Science's digital Engineering Internships—compelling, immersive classroom experiences. As students become interns at the firm Futura Engineering, teachers are able to facilitate an authentic opportunity for students to iterate and design solutions to real-world problems.

miniPCR PTC Taster Lab—From Genotype to Phenotype

(*Grades* 6–*College*) C125/126, Convention Center Science Focus: LS1, LS3, LS4, CCC2, CCC3, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Sponsor: miniPCR

Ezequiel Alvarez Saavedra (team@minipcr.com) and **Sebastian Kraves** (team@minipcr.com), miniPCR, Cambridge, Mass.

Are you a super taster? Come explore the molecular genetics of taste at the DNA level! Learn how a single letter change in our DNA can transform our taste perception. In this classroom-friendly lab, students start from a cheek swab and use PCR, restriction enzymes, and electrophoresis to study their taste receptor genes.



10:30 AM–12:30 PM Hands-On Workshops Taking Stock and Planning for Three-Dimensional Science Teaching and Learning in Elementary Schools

(Grades K–6/College) Multnomah, DoubleTree Science Focus: GEN, NGSS

Susan Holveck (*susan_holveck@beaverton.k12.or.us*), Program Coordinator, NSTA Portland Area Conference, and Beaverton (Ore.) School District

Carol Biskupic Knight (*carol_biskupic_knight@beaverton*. *k12.or.us*), Beaverton (Ore.) School District

Noelle Gorbett (*ngorbett@ttsd.k12.or.us*), Tigard-Tualatin School District, Portland, Ore.

Andrew Byerley (@andybyerley; *abyerley*@fgsd.k12.or.us), Forest Grove (Ore.) School District

Calling all elementary teacher and administrators who want to learn implementation strategies for transforming their schools' culture to be more inclusive of three-dimensional science teaching and learning.

ACS Session Two: Energy in Chemistry—A Particulate View

(Grades 9–12) E145, Convention Center Science Focus: PS3, SEP2, SEP6, SEP7

Marta Gmurczyk, American Chemical Society, Washington, D.C. Shelly Belleau, University of Colorado Boulder

Jennifer Keil (jenniferkeill1@gmail.com), Thornton High School, Thornton, Colo.

Chad Bridle (@sciencebridle; *cbridle1@gpsbulldogs.org*), Grandville High School, Grandville, Mich.

Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.

Engage in modeling activities focused on energy transfer during physical and chemical processes by building and analyzing particulate models of matter. These activities are designed to deepen students' conceptual understanding of how kinetic and potential energy of particles change during phase changes and in chemical reactions, and how this information can be used to analyze changes in our surroundings.

11:00–11:30 AM Presentation

Using the Case Studies as a Cumulative Review

(Grades 9–College) D140, Convention Center Science Focus: LS

Kristina Braithwaite (kbraithwaite@bentleyschool.net) and Erin Be (ebe@bentleyschool.net), Bentley School, Upper School, Lafayette, Calif.

Discussion centers on a biology case study that students can use to review and apply the year's units. We will be giving an example of a multi-part case study that incorporates cell biology, genetics, evolution, biotechnology, ecology, and macromolecules.



11:00 AM-12 Noon Featured Presentation Beyond the Blender Metaphor of Integration: NGSS as a Lever for Transforming Educational Opportunities for Elementary Learners

(Grades P–5) Oregon Ballroom 201, Convention Center Science Focus: GEN, NGSS



Carla Zembal-Saul (@czem; czem@psu.edu), Penn State, University Park, Pa.

Presider: Jodie Harnden, Base Camp: Collaborating to Integrate Elementary Science Instruction with Math and ELA Strand Leader, and Sunridge Middle School, Pendleton, Ore.

A Framework for K-12 Science Education and the NGSS advance a compelling vision of integration on multiple fronts. In addition to performance expectations that weave together science and engineering practices with disciplinary core ideas and crosscutting concepts, there are clear opportunities to integrate science teaching and learning with literacy and mathematics instruction around reasoning about phenomena and arguing from evidence. Less frequently emphasized, however, are opportunities to involve language learners more centrally in the classroom community through science and engineering, leverage intersections between 3D instruction and authentic formative assessments, and support a more coherent approach to teacher learning across the professional continuum that includes administrators and informal or community educators. Join the conversation about how to make the most of this exciting time in education and intentionally move beyond the "chop it up and mix it together" (i.e., blender) metaphor of integration.

Carla Zembal-Saul is a professor of science education, co-director of elementary teacher education, and Kahn Professor of STEM Education at Penn State University. A former middle school science teacher with a background in biology, she is co-author of the book, What's Your Evidence? Engaging K–5 Students in Constructing Explanations in Science.

Her research investigates instructional practices and tools that support preservice and practicing elementary teachers in engaging children productively in science practices and discourse with an emphasis on sense-making about natural phenomena. Carla is deeply invested in practitioner inquiry and video analysis of practice as mechanisms for advancing teacher learning and development.

11:00 AM–12 Noon Presentations

Identity Crisis? From Science Teacher to District-**Based Science Specialist**

(General)

Morrison, DoubleTree

Science Focus: GEN

Jennifer Mayo (@spacegirljenn; jennifer.kelley66@gmail. com), Einstein Fellow, NASA Headquarters, Washington, D.C.

Attention will be paid to research from district-based science specialists with discussion centered around professional identity, leadership, and the changing role of teachers.

Dazzling Deceptions: Discrepant Events That Delight and Mystify!

(Grades 4-College) Oregon, DoubleTree Science Focus: GEN, NGSS

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

Science experiences that seem contrary to "common sense" are great motivators for kids!

Understanding and Including the Crosscutting **Concepts in NGSS Instruction**

(Grades K-12)

Ross Island, DoubleTree Science Focus: GEN, CCC

Karen Whisler (whisler.karen@measuredprogress.org), Measured Progress, Dover, N.H.

Crosscutting concepts may be the most challenging NGSS dimension to implement. This session will explore the CCCs and evaluate strategies for explicitly incorporating them into instruction.



Making Waves: Seismic Waves Activities and Demonstrations

(Grades 5-12) Science Focus: ESS2 B110, Convention Center

B119, Convention Center

Lawrence Braile (*braile@purdue.edu*), Purdue University, West Lafayette, Ind.

Hands-on activities and effective animations and software are used to demonstrate important seismic wave characteristics and propagation.

The NSTA Learning Center: A Tool to Develop Preservice Teachers

(College) Science Focus: GEN, NGSS

Flavio Mendez (flavio_m@nsta.org), Assistant Executive Director, NSTA Learning Center, NSTA, Arlington, Va. Come learn how to use the NSTA Learning Center as an

online textbook when teaching preservice science teachers.

Do You Need a New Science Lab?

(Grades 6-12)

C122, Convention Center Science Focus: GEN

Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio

Win a Shell Science Lab Makeover (\$20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this Shell Science Lab presentation and learn how you can apply to win the Shell Science Lab Challenge. You will have an opportunity to actually begin to complete the application and have your questions answered.

Eureka! Science Trade Books—Good as Gold!

D130, Convention Center

Science Focus: GEN, SEP8

(General)

Suzanne Flynn, Lesley University and Cambridge College, Carver, Mass.

Juliana Texley @JulianaTexley; *texle1j@cmich.edu*), 2014– 2015 NSTA President, and Central Michigan University, Mount Pleasant

Need great books for student learning? Explore and use NSTA Recommends and the Children's Book Council Outstanding Science Trade Books. Door prizes—books, of course!

INF ASTC-Sponsored Session: Informal Science Educators Networking Brown Bag Lunch

(General) D132, Convention Center Science Focus: INF, SEP

Kelly Riedinger, David Heil & Associates, Inc., Portland, Ore.

Bring your own lunch and join us for a networking session to meet other informal science educators and discuss current issues in STEM education.

11:00 AM–12 Noon Hands-On Workshops Transitioning Instructional Materials for the *NGSS*

(Grades K–12) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, NGSS

Jennifer Childress (jchildress@achieve.org), Achieve, Inc., Washington, D.C.

Explore tools and resources that can help evaluate whether instructional materials are designed for the *NGSS* and help guide their revision if they aren't.

Transforming Elementary Grade–Level Science Demonstrations from Ordinary to Inquiry

(Grades 1–5) D131, Convention Center Science Focus: GEN

Mary Jean Lynch (*mlynch@noctrl.edu*) and **John Zenchak** (*jjzenchak@noctrl.edu*), North Central College, Naperville, Ill. Join us and find out how to transform a typical science demonstration into an engaging inquiry activity.

Teaching Genetics and Evolution Through Context-Based Learning Involving Food Security Issues in Africa

(Grades 8–College) D133/134, Convention Center Science Focus: LS4

Timothy Goodale (tagoodal@ncsu.edu), North Carolina State University, Raleigh

Using methods from an NSF-funded international study, this workshop will demonstrate the first of four units involving the teaching and learning of genetics and evolution through context-based methods surrounding food security issues in Africa.

3D Biology for the Next Generation: 3-D Teaching, Learning, and Assessment in the Biology Classroom (Grades 6–12) D135, Convention Center Science Focus: LS1, CCC1, SEP2, SEP6

Caitlin Everett (*caitlin_everett@beaverton.k12.or.us*), Beaverton (Ore.) School District

Have your students take part in the practices of modeling,

NSELA-Sponsored Session: Tools for Science Leaders, Part 2

(General)

Science Focus: GEN

D138, Convention Center

Bob Sotak (@nselascience; *bobsotak@gmail.com*), Science/ STEM Education Consultant, Edmonds, Wash.

Come learn about the various tools and strategies that science leaders can use to enhance teaching and learning in their outreach.

designing solutions, and arguing from evidence. *NGSS*-focused lessons and assessments for the biology classroom will be shared.

Teaching Science Practices and the Nature of Science

(Grades K–8) D136, Convention Center Science Focus: GEN, SEP

Randy Bell, Oregon State University, Corvallis

Participate in activities that make learning about science practices and the nature of science fun for your elementary students. You'll receive free resources and lessons.

ASEE Session: Cognitive and Noncognitive Experiences with Engineering Practices

(General) D139, Convention Center Science Focus: ETS1, SEP

Ann McMahon (@annpmcmahon; annpmcmahon@gmail. com), University of Washington Bothell

Engineering is a team sport. This workshop highlights the social/emotional learning opportunities within each engineering design challenge. Come to engineer AND build relationship skills.

Science, ELLs, and Three-Dimensional Learning for Grades 3–8 Life Science

(Grades 3–8) E141, Convention Center

Science Focus: LS, CCC, SEP

David Crowther (@dtcrowther; *crowther*@unr.edu), NSTA

President-Elect, and University of Nevada, Reno Engage in a model lesson in life science with adaptations for English language learners and modeled through threedimensional learning as advocated in the *NGSS*.



NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades 6-8

(Grades 6–8) E142, Convention Center Science Focus: LS, PS, CCC, SEP

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

Learn about Argument-Driven Inquiry and how it can help students learn to use core ideas, crosscutting concepts, and science practices to explain natural phenomena.

INF AAPT Session: Physics and Engineering in the Classroom and After-School Clubs III: Student miniROVs in the Classroom, the Field, and in Student Competitions

(Grades 9–College)

E143, Convention Center

Science Focus: PS, INF

Greg Mulder, Linn-Benton Community College, Albany, Ore.

In this third of three hands-on workshops, we will explore using Arduino microcontrollers and VPython to collect and present data. No prior programming or electronics experience needed.

How to Engage Students in Three-Dimensional Learning Around NGSS: Two Examples Units

(Grades 9–12) E144, Convention Center Science Focus: GEN, NGSS

Amanda Rainwater (arainwater@nsd.org) and Rachel Endelman (rendelman@nsd.org), Bothell High School, Bothell, Wash.

Learn how to engage your students in solving real-world problems and investigating puzzling phenomena. Two example units will be shared.

ACS Middle Level Session: The Water Molecule and Dissolving

(Grades 6–8) Science Focus: PS1.A

E146, Convention Center

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

Explore the polarity of the water molecule and identify substances based on their solubility using hands-on activities and molecular animations from the free website *www. middleschoolchemistry.com.*

INF Dark Skies and Energy Education: Globe at Night Citizen Science Program Workshop

(Grades 5–College) E147/148, Convention Center Science Focus: ESS, INF

Holly Bensel (hbensel@smschool.us), St. Mary's School, Medford, Ore.

Laura Orr (laura.orr@ukiah.k12.or.us), Ukiah High School, Ukiah, Ore.

John Gibbs, Glencoe High School, Hillsboro, Ore.

We will spotlight a variety of hands-on, inquiry-based resources for developing the concept of dark skies, energy usage, and conservation across a range of curriculum.

CESI-Sponsored Session: Elementary Science Sharea-Thon

(Grades P–8) Oregon Ballroom 203, Convention Center Science Focus: GEN, NGSS

Jim McDonald (@jimscienceguy; jim.mcdonald@cmich. edu), CESI President, and Central Michigan University, Mount Pleasant

Come see a variety of elementary science ideas that can be integrated with other subjects presented by CESI members. Walk away with handouts to implement in your classroom.

11:00 AM-12 Noon Exhibitor Workshops Telling Stories with David Goodsell's Watercolor Molecular Landscapes

(Grades 9–College) A103/104, Convention Center Science Focus: LS, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman (*herman@msoe.edu*), MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.

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

Biology with Vernier

(Grades 9-12)

A105, Convention Center

Sponsor: Vernier Software & Technology

Science Focus: LS, SEP3, SEP4

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

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

What's the Problem? Integrating Engineering into the Science Classroom Without Bridges and Rockets

(Grades 6–9) A106, Convention Center Science Focus: ETS, SEP

Sponsor: AEOP eCYBERMISSION

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

Problem solving is a skill that all science students must have, and it can be learned through engineering. Come learn some new ways to bring engineering ideas and problem solving into your grades 6–9 science classrooms beyond the old and stale examples of building bridges or rockets. Discussion includes the online STEM competition eCYBERMISSION and how you and your students can participate at no cost.

Hands-On Tools for Teaching the Science of Solar Energy

(Grades P–12) A107, Convention Center Science Focus: ETS1, ETS2.A, PS3.A, PS3.B, CCC2, CCC3, CCC5, CCC6, SEP1, SEP3, SEP5

Sponsor: Solar 4R Schools

Parker Mullins (*pmullins@b-e-f.org*), Bonneville Environmental Foundation, Portland, Ore.

Join in and engage in a hands-on activity involving renewable energy and electricity concepts. This workshop features a teacher from our Educator Lab curriculum design opportunity who will share experience with the program.

Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens

(Grades 9–12)	A108/109, Convention Center
Science Focus: LS	
Sponsor: Carolina Biol	ogical Supply Co.
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Carolina Teaching Partner

Come show us your surgical skills while you experience the superior quality of Carolina's Perfect Solution specimens. Participants dissect a sheep brain, cow eye, pig heart, or pig kidney and observe internal and external structures. Use this excellent comparative dissection to gain a better understanding of these mammalian organs.

Helping Students Understand Deep Time Using HHMI BioInteractive's EarthViewer

(Grades 6–12) B111/112, Convention Center Science Focus: ESS, CCC4

Sponsor: HHMI BioInteractive

Mickey Laney-Jarvis, Grants Pass High School, Grants Pass, Ore.

What did Earth look like 250 million years ago...or 4.5 billion years ago? What was the climate like in the deep past? Explore these questions and more with EarthViewer, HHMI BioInteractive's interactive tool for exploring the science of Earth's deep history.

Exploring Misconceptions: There's a Difference Between Heat and Temperature?!?

(Grades 6–12) B113, Convention Center Science Focus: PS

Sponsor: PASCO scientific

Presenter to be announced

Are heat and temperature the same thing or are they different? This hands-on workshop using SPARKvue and wireless temperature sensors will provide you with effective new ways to teach the concepts of heat and temperature, central to physical science.

Magnify Your Mind! ... with The Private Eye®

(Grades K–12) Science Focus: GEN B114/115, Convention Center

Sponsor: Educational Innovations, Inc.

Kerry Ruef, The Private Eye, Lyle, Wash.

Give your students a wallop of wonder and mystery—using a jeweler's loupe, everyday objects, and a powerful inquiry process. Students investigate science topics with fresh perspective and surprise themselves as they write, draw, and theorize at sophisticated levels. Habits of close observation bloom, critical thinking soars, and *NGSS* and *CCSS* come to life. Take away this easy hands-on method—and magnify minds! Free starter kit.

Chemical Formula and Amino Acids

(Grades 9–12) B116, Convention Center Science Focus: PS1.A, PS2.B, CCC3, SEP3, SEP4 Sponsor: LAB-AIDS®, Inc.

Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.

What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these concepts. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for intuitive lessons for all students to master the formula and gain a deeper understanding of chemistry.

Teaching Geoscience in an NGSS-Focused Curriculum

B117/118, Convention Center

(General)

Science Focus: ESS

Sponsor: Pearson

Michael Wysession, Washington University in St. Louis, Mo.

A member of the *NGSS* writing team, Michael Wysession will talk about challenges and solutions to teaching Earth and space science (ESS) that meets the *NGSS*.

Using Maggots, Flies, and Flesh to Solve a Mystery!

C120/121, Convention Center

Science Focus: GEN

(Grades 6-12)

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist and director of the human ID lab of Colorado, Dr. Diane France helped to develop this free middle school and high school forensic science lesson.

The GMO Debate Rages On!

C123, Convention Center

Science Focus: LS Sponsor: Bio-Rad Laboratories

(Grades 9-College)

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

Are GM crops a good thing? Do all countries have the same GM food labeling requirements? Learn more about GMOs and how to test for the presence of GM content in foods. Join a debate and learn how to bring this experience to your classroom.

What Is Amplify Science?

C124, Convention Center

(Grades K–8) Science Focus: GEN, NGSS Sponsor: Amplify

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

Explore Amplify Science, the newest breakthrough curriculum from University of California Berkeley's Lawrence Hall of Science for grades K–8. Discover how the immersive program, built from the ground up for *NGSS*, engages students as scientists and engineers to solve real-world problems.

CONNECTIONS: Three-Dimensional Learning by National Geographic Explorers

(Grades 1–5) C125/126, Convention Center

Science Focus: GEN, NGSS

Sponsor: National Geographic Learning | Cengage Learning **Tom Hinojosa,** National Geographic Learning | Cengage Learning, Littleton, Colo.

See how National Geographic provides your students with new, relevant, and natural examples of the three dimensions of crosscutting concepts, disciplinary core ideas, and science and engineering practices through the research being done by explorers all around the world. Learn how to incorporate these models to guide your instruction and energize student interest in science.

11:00 AM–5:30 PM Short Course

Supporting the NGSS with Process-Oriented Guided Inquiry Learning (POGIL) (SC-2)

Tickets Required; \$60

(Grades 6–12) Mt. Hood, DoubleTree Science Focus: GEN, NGSS Mare Sullivan (joe.mare.sullivan@gmail.com), Seattle Pacific University, Seattle, Wash. Julia Dudley (jjones@psd1.org), Pasco (Wash.) School District Michelle Poletski (poletskim@newberg.k12.or.us), Newberg High School, Newberg, Ore. For description, see page 31.

12:30–1:30 PM Presentations

Strategies and Tools for Ensuring Each K–12 Student Has a STEM Future

(Grades P–12) Alaska/Idaho, DoubleTree Science Focus: GEN, SEP

Bob Sotak (*bobsotak@gmail.com*), Science/STEM Education Consultant, Edmonds, Wash.

Brian Day (*briangday@gmail.com*), Everett (Wash.) Public Schools

Engage in strategies and tools used to implement a districtor school-wide STEM program, integrating science literacy across the curriculum to ensure each student a STEM future.

The NGSS@NSTA Hub

(Grades K–12)

Oregon, DoubleTree

Science Focus: GEN, NGSS Ted Willard (@Ted_NSTA; twillard@nsta.org), Program

Director, NGSS@NSTA, NSTA, Arlington, Va.

Join me for a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the *NGSS*. Hear about the work of NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

Deliver Your Science Content with iPads in Your 1:1 Classroom

(Grades 3–12)

Ross Island, DoubleTree

Science Focus: GEN, NGSS

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

Deliver your high-quality standards-based science curriculum to your students in your iPad 1:1 classroom to ensure genuine student learning, painlessly! BYOD! 12 Noon–1:00 PM Meeting North-West and Far West Regions Association of Science Teacher Educators Joint Business Meeting Weidler/Halsey, DoubleTree

Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources

(Grades 5–12) B119, Convention Center Science Focus: ESS, LS, PS, CCC

June Teisan (*june.teisan@noaa.gov*), NOAA Office of Education, Washington, D.C.

Coral reefs are a stunning global treasure, but these fragile ecosystems are under increasing threat from pollution, harmful fishing practices, and ocean acidification. Even areas far from coasts can impact marine health. Incorporate coral reefs into your existing curriculum—biology, chemistry, climate studies, and more—using lesson plans, demos, activities, and multimedia from the National Oceanic and Atmospheric Administration (NOAA).

Solids: The Neglected "State" of Chemistry

(Grades 9–12) C122, Convention Center Science Focus: PS1.A, CCC6

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

Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymers/ceramics) make concepts easier to teach/learn. Receive *NGSS* correlations and take home a CD of information.

Science Is a Story: Using Kids' Science Trade Books and the Internet to Explore Current Developments in Science

(Grades K–6) Science Focus: ETS

D130, Convention Center

Pamela Turner (*pstrst@pacbell.net*), Author, Oakland, Calif. **Suzanne Flynn,** Lesley University and Cambridge College, Carver, Mass.

Join award-winning science writers as they show how thinking of science as storytelling can help you integrate science with language arts through science trade books and the internet.

3D Making Yogurt as an Engineering Design Project in Biology

(Grades 9–12) D137, Convention Center Science Focus: ETS1, LS, SEP

Charlotte Denis, Forest Grove High School, Forest Grove, Ore.

Learn how students apply respiration knowledge to design yogurt for the school cafeteria. See how they create prototypes and test for pH, viscosity, and taste.

INF Developing Science Process Skills Through School Yard Investigations

(Grades 3–8) D138, Convention Center Science Focus: LS, INF

Phil Kahler (*philk@tvja.org*), Tualatin Valley Academy, Hillsboro, Ore.

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

Meeting science practice standards goes hand in hand with student investigations and citizen science. We'll inspire you to motivate your students with school yard projects and real data, such as The Cornell Lab of Ornithology's citizen science project.



12:30–1:30 PM Hands-On Workshops Connecting to the Coast and Ocean

(Grades 3–12) Hawthorne/Sellwood, DoubleTree Science Focus: ESS3.C

Cait Goodwin (*cait.goodwin@oregonstate.edu*), Oregon State University, Newport

Sara Roberts (@oceanscicomm; *sara.shawroberts*@aquarium. org), Oregon Coast Aquarium, Newport

Engage in hands-on activities featured in the Oregon Coast Education Program coastal education modules, and make connections to *NGSS* and outdoor experiences for students.

Squeezing In Time for STEM

D131, Convention Center

Science Focus: PS, SEP4, SEP5

(Grades K-5)

Leticia Perez, UCLA Center X, Los Angeles, Calif.

Discover how to use the *NGSS* to drive *CCSS ELA* and math instruction in the elementary classroom. Through hands-on science, investigate the phenomenon of surface tension and discuss how to design lessons that develop science, engineering, and mathematical practices.

Moon Mania: Modeling Lunar Phases

(Grades 6–8) D132, Convention Center Science Focus: ESS1.B, CCC1, CCC2, CCC4, SEP2, SEP4 Christine Shupla (shupla@lpi.usra.edu), Lunar and Planetary Institute, Houston, Tex.

Meredith Harris (meredithaharris@me.com), Spring ISD, Houston, Tex.

Brandy Laney (*laneyscastle73@gmail.com*), Northgate Crossing Elementary School, Spring, Tex.

Conduct innovative hands-on activities to build an understanding of the lunar cycle and explore kinesthetic models to assess student understanding of phases.

FieldSTEM Plus: An Integrated Learning Model

(Grades K-5) D133/134, Convention Center Science Focus: LS1, LS2, CCC4, CCC5, CCC7, SEP1, SEP4, SEP7, SEP8

Pamela Farr (*pfarr@sheltonschools.org*), Shelton (Wash.) School District

Come hear how a small rural school district has developed an integrated approach to K-5 science literacy that connects math, ELA, and science content with field experiences in the rich natural environment.



Recipe for Research and Application: The Science of Food and Eating

(Grades 7–College) D135, Convention Center Science Focus: LS, CCC1, CCC2, CCC3, CCC5, CCC6, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Alishia Huntoon (alishia.huntoon@oit.edu), Oregon Institute of Technology, Klamath Falls

Create an appetite for science in your classroom. Food and eating are integral to life. They offer an opportunity to better understand science with a topic students can readily relate to and apply.

Learning About Molecular Structures with Molecular Models

(Grades 9–College) D136, Convention Center Science Focus: LS1, LS3, LS4, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5

Sandra Porter (@digitalbio; *sandra@digitalworldbiology. com)*, Digital World Biology LLC, Seattle, Wash.

Learn techniques for working with user-friendly iOS-based molecular modeling programs and authentic molecular models to study key features of protein and DNA structure.

ASEE Session: Creatively Applying the "E" in STEM

(Grades 5–9) D139, Convention Center Science Focus: ETS1

Celeste Baine *(celbaine@engineeringedu.com),* Engineering Education Service Center, Springfield, Ore.

Get inspired and use creative engineering concepts to make a model hydraulic crane! This lesson plan can be used to extend students' understanding of STEM concepts.

NSTA Press® Session: Argumentation in the Physical Science/Physics Classroom

(Grades 5–College) E142, Convention Center Science Focus: PS

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

In this hands-on workshop, learn how to engage in scientific argumentation to support teaching in your classroom. Sample activities from the NSTA Press books provided.

AAPT Session: Developing an Energy Policy for the U.S.

(Grades 9–12)	E143, Convention Center
Science Focus: PS	

Pat Keefe (*pkeefe@clatsopcc.edu*), Clatsop Community College, Astoria, Ore.

Let me introduce you to a model that can be used to help students study energy and social issues. Discuss and research energy and social issues more effectively in your classroom.

STEAM Ahead for Climate Change

E144, Convention Center

(Grades K–8) Science Focus: GEN

Brian Ballenger (*brballenger@gmail.com*) and **Blair Johnston** (@ACSJohnston; *blair.johnston@asheville.k12.nc.us*), Vance Elementary School, Asheville, N.C.

We've transformed our school's science culture! Passion is all you need to initiate the same revolution in your school. We'll show you everything else.

ACS Middle Level Session: Chemical Reactions: Breaking and Making Bonds

(Grades 6–8) E146, Convention Center Science Focus: PS1.B

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

Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations from the free completely developed 5E lesson plans available at *www.middleschoolchemistry.com*.

Think It Through: Guiding Students to Authentically Solve Problems

(Grades 6–College) E147/148, Convention Center Science Focus: GEN, CCC1, CCC2, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Katie Busch (kabusch09@gmail.com), The University of Alabama at Birmingham

Join me for a simple yet powerful approach to training students to think and work like scientists and engineers to solve problems and design solutions.

12:30–1:30 PM Exhibitor Workshops

Integrating Chromebook with Vernier Data-Collection Technology

(Grades 3–12) A105, Convention Center Science Focus: GEN, SEP3, SEP4

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

Bake for Good: Kids Learn-Bake-Share

(Grades 4–7)

A106, Convention Center

A107, Convention Center

Science Focus: GEN

Sponsor: King Arthur Flour

Libby Treadway (libby.treadway@kingarthurflour.com), Paula Gray (paula.gray@kingarthurflour.com), and Amy Driscoll (amy.driscoll@kingarthurflour.com), King Arthur Flour Bake for Good: Kids Learn-Bake-Share Program, White River Junction, Vt.

The free Bake for Good: Kids program visits hundreds of schools each year, teaching kids in grades 4–7 to bake yeast bread from scratch. Kids take ingredients home to bake two loaves; one to donate, one to enjoy. They discover that math, science, reading, and baking know-how make something delicious!

NGSS-Focused Interactive Digital Assessment for Middle School

(Grades 6–8) Science Focus: GEN, NGSS Sponsor: Activate Learning

Heather Milo, Activate Learning, Greenwich, Conn.

Patty Kreikemeier, University of Wisconsin–Madison Come experience the most recent developments in standardsbased assessment research from the Wisconsin Center for Education Research at the University of Wisconsin. Participate in three-dimensional science instruction using formative assessment prompts to elicit (and build on) student preconceptions and summative assessment items to collect data on student progress toward the *NGSS*. All participants will qualify to pilot this new digital product in their classroom!

Hands-On Science with Classroom Critters

(Grades K–12) A108/109, Convention Center Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Add action and excitement to your science class with live organisms! Discover fun hands-on activities with pill/sow bugs, termites, bessbugs, and butterflies you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online.

The Biology of Skin Color: An NGSS-Focused Exploration

(Grades 9–12) B111/112, Convention Center Science Focus: LS, SEP1, SEP4, SEP6

Sponsor: HHMI BioInteractive

Sydney Bergman, School Without Walls, Washington, D.C.

Why do people have different skin colors? What's the relationship between skin color, UV radiation, selection, and adaptation? HHMI BioInteractive's free, *NGSS*-focused resources (also available in Spanish) weave together key concepts in biogeography, human evolution, genetics, and anatomy and physiology to explore this phenomenon.

What Is a Species

(Grades 9–12) B116, Convention Center Science Focus: LS4.A, LS4.B, LS4.D, CCC2, SEP6, SEP7, SEP8

Sponsor: LAB-AIDS®, Inc.

Dawn Posekany, Solon High School, Solon, Iowa In this activity from the SEPUP high school biology program, learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. Then apply this knowledge to determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

A Conceptual Framework for Teaching Global Change—NGSS Ready!

(General) B117/118, Convention Center Science Focus: GEN, NGSS Sponsor: Pearson

Joseph Levine, Author, Boston, Mass.

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

Supporting Excellence in STEM Programs and Teaching Through STEM Certification

(General) C120/121, Convention Center Science Focus: GEN, NGSS Sponsor: Accelerate Learning–STEMscopes

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

Do you want to be a STEM-certified teacher? Come learn more about the National Institute for STEM Education

1:00-4:00 PM Short Course

Writing in Science: A Research-Based Approach That Enhances Learning in Both Domains (SC-3)

Tickets Required; \$25 (Grades K–6) 3 Sisters/Mt. Bachelor, DoubleTree Science Focus: GEN

Betsy Rupp Fulwiler (bruppfulwiler@comcast.net), Betsy Rupp Fulwiler Consulting, Seattle, Wash. For description, see page 31.

1:15–2:00 PM Special Session

Meet the Presidents and Board/Council

(General) NSTA Exhibits (Hall A) Entrance, 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! (NISE), which clearly defines the practices of a successful STEM program and those of the STEM classroom teacher. STEM Teacher Certification recognizes excellence at the classroom, campus, and district levels.

How to Use Pop Culture in Your Life Science Class

(Grades 9–College) C123, Convention Center Science Focus: LS Sponsor: Bio-Rad Laboratories

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

Use popular science to engage high school and college students in your classroom. See how popular TV shows and movies connect to real-world discoveries and issues. Learn how to use examples like DNA fingerprinting to make gel electrophoresis the foundation of a fun hands-on lab that increases student involvement and understanding.

1:15–3:00 PM Exhibit Hall Beverage Break

Hall A, Convention Center

Take a break and join us for complimentary iced tea and lemonade. Coinciding with our exclusive Exhibit Hall hours, we welcome you to drop by for a refreshing beverage.

2:00–3:00 PM Presentation

The NSTA Learning Center: Free Professional Devel-opment Resources and Opportunities for Educators(General)C122, Convention Center

Science Focus: GEN, NGSS

Flavio Mendez (*flavio_m@nsta.org*), Assistant Executive Director, NSTA Learning Center, NSTA, Arlington, Va.

Lost when it comes to finding online professional learning resources to enhance your content knowledge and skills? With more than 12,000 resources (25% of which are free) and quality PD opportunities to assist educators with core subject content, the Learning Center has the answers! Get free resources and ICE CREAM!

2:00–3:00 PM Exhibitor Workshops Integrating iPad with Vernier Data-Collection Technology

(Grades 3–12) A105, Convention Center Science Focus: GEN, SEP3, SEP4

Sponsor: Vernier Software & Technology

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

Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use iPads in their classrooms. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

The HMH Science Dimensions of NGSS

(Grades 1–12) A106, Convention Center Science Focus: ETS2, LS1, CCC2, CCC6, SEP2, SEP3, SEP8 Sponsor: Houghton Mifflin Harcourt

Damon Smerchek, Houghton Mifflin Harcourt, Boston, Mass.

Take a walk through an all new, built from the ground up, *NGSS* K–12 science program produced by the educational solutions company that has been bringing you quality programs for over 180 years, Houghton Mifflin Harcourt. Be one of the first to see how HMH Science Dimensions has the tools to create a true *NGSS* classroom using print resources, innovative student experiences, and advanced technology via Google Classroom and Google Expeditions. Bring device to participate.

Analyzing and Interpreting Data Using TCI's Bring Science Alive!

A107, Convention Center

(Grades K–5) Science Focus: GEN, NGSS Sponsor: TCI

Christy Sanders (*info@teachtci.com*), TCI, Mountain View, Calif.

Get your students to do more than just read a graph, chart, or statement. Participants will be immersed in a Bring Science Alive! classroom where students analyze and interpret data and construct an argument based on research.

Introduction to Wisconsin Fast Plants®

(Grades K–12) A108/109, Convention Center Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants engage students, suit all learning

levels, and let you integrate plant development, life cycle, environmental effects, genetics, and evolution into your instruction. Learn the basics for successful planting, flower dissection, and pollination.

Can We Save the World's Coral Reefs Before They Disappear?

(Grades 6–12) B111/112, Convention Center Science Focus: ESS3, LS2, SEP1, SEP3, SEP6 Sponsor: HHMI BioInteractive

Cheryl Ann Hollinger, Teacher Institute for Evolutionary Science, Washington, D.C.

Coral reefs are threatened by human activities, including global ocean warming from climate change. What are researchers doing to try to conserve reef ecosystems? Find out how scientists are trying to find a solution and receive free classroom-ready resources from HHMI BioInteractive, suitable for middle school and high school students.

Bringing NGSS to the Classroom with Discovery Education

B114/115, Convention Center

Science Focus: GEN, SEP

(Grades K-12)

Sponsor: Discovery Education

Patti Duncan, Discovery Education, Silver Spring, Md. One of the most important aspects of a quality *NGSS* curriculum is the opportunity for students to develop science and engineering practices. These types of skills are not explicitly taught, but must be developed by experience. Come learn how the Discovery Education Science Techbook brings these experiences to the forefront.

Cell Differentiation and Gene Expression

(Grades 9–12) B116, Convention Center Science Focus: LS1.A, LS1.B, LS1.D, LS3.A, CCC1, CCC2, SEP6

Sponsor: LAB-AIDS®, Inc.

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

Transforming Science Education Through Inquiry-Based Learning and Narrative-Based Teaching

(Grades 6–12) B117/118, Convention Center Science Focus: GEN Sponsor: Pearson

Joseph Levine, Author, Boston, Mass.

Teaching through inquiry is challenging to implement because "inquiry" is rarely defined clearly, and contentbased standards constrain the classroom time necessary to encourage scientific thinking and open-ended questioning. We will examine levels of inquiry and show how to harness the power of scientific storytelling to motivate and guide active student learning.

Zombie Apocalypse!

(Grades 6–12) Science Focus: GEN C120/121, Convention Center

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (S.Dak.) School District

Be part of a zombie apocalypse! Learn about disease spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students learning science!

How Do You Know What Fish Species You Are Eating? DNA Barcoding!

(Grades 9–College) C123, Convention Center Science Focus: GEN, NGSS

Sponsor: Bio-Rad Laboratories

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

How many aquatic species are there in the world? DNA barcoding has shown that there may be more than were ever thought to exist. Can you be certain the sushi you are eating really is what you think it is? Many instances of fish mislabeling (sometimes even endangered species) have also been brought to light through DNA barcoding activities. Learn more about this fascinating topic and how you can apply it in your classroom.

The *Framework* and *NGSS*: Opportunity for Teacher Growth

(Grades 9–12) C124, Convention Center Science Focus: GEN, NGSS Sponsor: It's About Time

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

Looking at our past successful lessons through the lens of *A Framework for K–12 Science Education* and *NGSS*, we better understand what makes some lessons highly effective. Sharing these vital experiences is the path from being a great teacher some days to becoming a great teacher every day.

INF The STEM Design Challenge

(Grades 3–8) C125/126, Convention Center Science Focus: PS2.A, PS3.B, PS3.C, INF, CCC4, SEP2, SEP3, SEP4, SEP8

Sponsor: Fisher Science Education

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

Join us to experience how you can easily create interactive experiments about force, energy, and motion in the classroom. Help your elementary and middle school students identify variables to test. Along the way, solve an engineering problem using realistic scientific processes. Finally, support your understanding with a creative and fun team competition that can expand after school.



2:00–3:00 PM Meeting

STEM Lighthouse Schools: The View from the Summit Mt. St. Helens, DoubleTree

2:00–4:00 PM Meeting

North-West and Far West Regions Association of Science Teacher Educators Joint Meeting

Weidler/Halsey, DoubleTree This meeting is for members of North-West and Far West Regions of the Association of Science Teacher Educators attending this conference. Members will share research and a joint business meeting will be held.

3:00–5:00 PM Networking Opportunity The State of Science/STEM/STEAM Education in Oregon

(General)

Multnomah, DoubleTree

Science Focus: GEN, NGSS

Susan Holveck (*susan_holveck@beaverton.k12.or.us*), Program Coordinator, NSTA Portland Area Conference, and Beaverton (Ore.) School District

In this networking event, participants will learn about various science, STEM, and STEAM projects that have been made possible by funding granted by the State of Oregon.

3:00–5:00 PM Hands-On Workshop

ACS Session Three: Energy in Chemistry—An Atomic View

(Grades 9–12) E145, Convention Center Science Focus: PS3, SEP7

Marta Gmurczyk, American Chemical Society, Washington, D.C.

Shelly Belleau, University of Colorado Boulder

Jennifer Keil (jenniferkeil11@gmail.com), Thornton High School, Thornton, Colo.

Chad Bridle (@sciencebridle; *cbridle1@gpsbulldogs.org*), Grandville High School, Grandville, Mich.

Rebecca Stober, Mapleton Expeditionary School of the Arts, Denver, Colo.

Engage in argumentation activities focused on energy transfer at the atomic level by building arguments based on evidence and scientific models and ideas. These activities are designed to deepen students' conceptual understanding about atomic models of matter, quantization of energy, and atomic emission spectroscopy.

3:30–4:30 PM Featured Presentation Are You Ready for the Astronomical Event of the Decade: The 2017 All-American Total Eclipse?

(General) Oregon Ballroom 201, Convention Center Science Focus: ESS



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

Presider: Alfonso Garcia Arriola, NSTA Portland Area Conference Program Committee Member, and ACCESS Academy, Portland, Ore.

For the first time in almost 40 years, the U.S. will experience a total solar eclipse—Monday, August 21, 2017. Interest will be high because the total phase of this "All-American" eclipse will only be seen in the U.S., with the partial phase of the eclipse visible to everyone in North America. Come learn more about this astronomical event of the decade, including when and where you need to go to see the total eclipse and the timing of both the total and partial phases for the entire U.S. Hear suggestions for how to make this a community-wide event, find out how to observe the eclipse safely, and get ideas for effective learning activities to use in both in-school and out-of-school settings.

Dennis Schatz is senior advisor at Pacific Science Center, where he has held a broad range of positions from director of the Planetarium in his early years to vice president for Exhibits and vice president for Education to senior vice president in more recent years. In the last five years, Dennis was a visiting scholar at the University of Queensland, Brisbane, Australia, followed by four years as a program director at the National Science Foundation (NSF). He has provided leadership to several of Pacific Science Center's major initiatives, including Washington State LASER and Portal to the Public.

He is currently on the board of the National Science Teachers Association (NSTA) and is field editor for the new journal, Connected Science Learning, which is a joint effort of NSTA and the Association of Science-Technology Centers (ASTC) and features articles that deal with programs at the intersection of in-school and out-of-school learning.

Dennis has authored to date 23 science books for children, including his latest, The Amazing Squishy T.rex. His most recent teacher resource book is the NSTA Press® Solar Science, which has an Eclipse Observing Guide for the upcoming "All-American" total solar eclipse on August 21, 2017.

3:30–4:30 PM Presentations

Climate Change Education and State Science Standards: A National Assessment

(Grades 7–12) Alaska/Idaho, DoubleTree Science Focus: ESS3, SEP4

Madeline Goodwin (@EcoScienceGirl; *madeline.goodwin*(@ *gmail.com*), The Evergreen State College, Olympia, Wash. Discussion centers on an analysis of climate change concepts in state science standards, and a comparison with the concepts scientists and teachers deem most important.

Connecting CCSS and NGSS Through Close Reading

(Grades 4–12) Morrison, DoubleTree Science Focus: GEN, NGSS

Bobbi Hansen (chansen@sandiego.edu), University of San Diego, Calif.

Emphasis will be placed on ways for teachers to link *NGSS* with *CCSS ELA* via "close reading" teaching strategies.

The Multi-Level Classroom: Differentiation to Reach All Students in Science

(Grades 4-12)

Oregon, DoubleTree

Science Focus: GEN

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

Explore a variety of strategies that teachers can effectively use to impact students that are at every level in their multi-level classroom. This is a practical workshop for immediate use.

Tsunami! Understanding the Generation, Propagation, and Hazards of Tsunamis

(Grades 5–12) B110, Convention Center Science Focus: ESS2.B

Lawrence Braile (braile@purdue.edu), Purdue University, West Lafayette, Ind.

Explore recent tsunamis (Indonesia and Japan), and a handson activity using a simple and inexpensive wave tank to understand tsunami generation, propagation, and hazards.

INF Globe at Night Citizen Science Program

(Grades 5–College) B119, Convention Center Science Focus: INF

Holly Bensel (hbensel@smschool.us), St. Mary's School, Medford, Ore.

The Globe at Night campaign raises public awareness of the impact of light pollution. Come learn how to implement this program in your community.

Reaching the Limits: Population Ecology in Biology

(Grades 9–12) C122, Convention Center Science Focus: LS2.A, CCC, SEP

Amber Willis (asb9616@lausd.net), Downtown Magnets High School, Los Angeles, Calif.

Let me guide you through a population math lesson in which students plot, infer, and analyze data while integrating mathematical thinking and crosscutting concepts.

Strengthen Your STEM Lessons with NSTA High School Committee Activities

(Grades 8–12) D130, Convention Center Science Focus: ETS, LS1.C, LS2.B, PS1.A, PS2.B, PS3.B, PS3.D, SEP1, SEP2, SEP3, SEP4, SEP7

Steve Wood (*swood@d125.org*), Adlai E. Stevenson High School, Lincolnshire, Ill.

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

Cross-Curricular Learning with a Science Focus: Optimizing Student Learning and Maximizing Efficiency of Instruction While Embracing All Aspects of STEM

(Grades K–6) Science Focus: GEN, NGSS D137, Convention Center

Donna Knoell, Educational Consultant, Overland Park, Kans.

Attention will be paid to effective ways to integrate crosscurricular learning with science instruction, to optimize student learning and maximize opportunities to deepen understanding, yielding added time for science exploration.

CSSS-Sponsored Session: Science Starts with a Story—*NGSS* in Support of Language Acquisition for All Students

D138, Convention Center

Science Focus: GEN, NGSS

(Grades P-5)

Richard Vineyard, Nevada Dept. of Education, Carson City

More than simply teaching science using children's literature, Science Starts with a Story is about using stories to engage students of all ages in the pursuit of new learning.

Corrosion: Chemistry Made Simple, Relevant, and Fun

(Grades 8–12) D140, Convention Center Science Focus: PS, CCC, SEP

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

Join in for labs, demonstrations, and examples that make reactivity, oxidation/reduction, and corrosion engineering exciting, practical, and easy to teach and learn. STEM connections and a CD of information will be shared.

3:30–4:30 PM Hands-On Workshop

Stretch Your Legs for Science!

(Grades 1–12) Hawthorne/Sellwood, DoubleTree Science Focus: LS

Kelly Schaeffer, The Cornell Lab of Ornithology, Ithaca, N.Y.

Explore citizen science through a mini bird walk. Enjoy bird identification tutorials, and experience how engaging and easy bird watching is!

Science and Literacy: It's Elementary

(Grades 1–5)

D131, Convention Center

Science Focus: GEN, CCC

Kelly Chaney, University of Arkansas at Little Rock Looking for ways to integrate ELA and science? Come learn creative ideas and activities you can use next week with your class.

Teaching Engineering

Science Focus: ETS1, PS1

(Grades 6–12)

D133/134, Convention Center

Michael Rockow (rockow42@q.com) and Mark Madland (madland_mark@salkeiz.k12.or.us), Leslie Middle School, Salem, Ore.

Design, build, and test heat shields while learning how to teach students about engineering design.

Beyond Differential Instruction

(Grades 10–12) D135, Convention Center Science Focus: PS1, SEP1, SEP2, SEP3, SEP4, SEP6, SEP5 Jacklyn Bonneau, Massachusetts Academy of Math & Science at WPI, Worcester

Differential instruction sometimes means less content for less able. This workshop is designed to see the same chemistry concept for everyone with just more scaffolding.

Partners in Science Share-a-Thon

(Grades 9–12) Oregon Ballroom 203, Convention Center Science Focus: GEN

Lori Lancaster (@SciLori; *lancaster.ld@gmail.com*), Local Arrangements Coordinator, NSTA Portland Area Conference, and Oregon Science Teachers Association, Portland Pacific Northwest High School teachers share their research, discuss program benefits, and the new equipment that program funding has brought into the classroom.

ASEE Session: Computer Science as a Bridge Between Concepts, Ideas, and Practice in Grades 6–12 Science Classrooms

(Grades 6–College) D139, Convention Center Science Focus: GEN, NGSS

Mike Borowczak (@MBorowczak; mike@erebuslabs.com), Erebus Labs, Laramie, Wyo.

Andrea Burrows (@SciEdBurrows; *aburrow1@uwyo.edu*), University of Wyoming, Laramie

Experience activities that use computer science concepts to provide real-world context and applications to the three dimensions of the *NGSS*.

No-Hassle Messy Science with a Wow! Chemical Reactions

(Grades K–8) E141, Convention Center Science Focus: ESS3.C, PS1.A, PS1.B, PS3.A, PS3.D, CCC1, CCC2, CCC3, CCC5, SEP1, SEP2, SEP6, SEP7, SEP4

Elizabeth Andanen (eandanen@omsi.edu), OMSI, Portland, Ore.

Prepare to get messy! We will explore chemical reactions with hands-on chemistry experiments that use easy-tofind materials, cross-curricular connections, and in-depth explanations.

AAPT Session: How to Make Holograms Using the Litiholo Home Holography Kit

(Grades 9–College) E143, Convention Center Science Focus: PS

Robert Brown (*rob.brown@rockwellcollins.com*), Rockwell Collins: Portland, Ore.

Learn to build a hologram, make hologram measurements, and derive actual holograph physical parameters.

Cancer Medicine Focus Enhances Biology Curriculum: Cryopreservation

(Grades 9–College) E144, Convention Center Science Focus: LS, CCC, SEP

Lynda Jones (jonesly@ohsu.edu), Oregon National Primate Research Center, Beaverton

Explore a free *NGSS*-focused biology activity that integrates concepts in cancer biology with preserving fertility in cancer patients through real-life medical examples and cutting-edge cryopreservation technology.

3:30–4:30 PM Exhibitor Workshops

Physics and Physical Science with Vernier

(Grades 7–12) A105, Convention Center Science Focus: PS, SEP3, SEP4

Sponsor: Vernier Software & Technology

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

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

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

A108/109, Convention Center

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

(Grades 6-12)

Science Focus: GEN

Are you ready for a forensic dissection activity that is on the cutting edge? Engage students and revitalize your mammalian structure and function lessons with a real classroom autopsy. Participants dissect a Carolina's Perfect Solution pig by modeling the protocols of a professional forensic pathologist. This exciting workshop features our exclusive Carolina's Perfect Solution preserved specimens.

How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks That Elicit NGSS Practices

(Grades K–8) E147/148, Convention Center Science Focus: GEN, NGSS

Philip Bell and Shelley Stromholt, University of Washington, Seattle

We will analyze assessment tasks and discuss strengths of these tasks and how they can be improved to better elicit three-dimensional science learning.

Trophic Cascades: A Force of Nature

(Grades 7–12)	B111/112, Convention Center
Science Focus: LS2	

Sponsor: HHMI BioInteractive

Samantha Johnson, Arroyo High School, San Lorenzo, Calif.

Trophic cascades are a fundamental concept in ecology that describe the relationships between organisms. Discover the new HHMI BioInteractive film and supporting activities that describe the classic experiments that first illustrated trophic cascades.

Energy Flow Through an Ecosystem

(Grades 9–12) B116, Convention Center Science Focus: ETS1.B, LS2.B, LS2.C, LS2.D, PS3.D, CCC4, CCC5, CCC7, SEP2, SEP6, SEP7

Sponsor: LAB-AIDS®, Inc.

Dawn Posekany, Solon High School, Solon, Iowa

Use an interactive card sort of organism cards and ecosystem events to predict the effect of different events on the food web and the ecosystem. Then construct an energy pyramid to examine how much energy is stored at each level of a food web.

Enzymes: Technology Inspired by Nature

(Grades 9–College) Science Focus: PS

Sponsor: Bio-Rad Laboratories

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

With rising greenhouse gases, scientists look to nature for a biofuel solution. The star of this hands-on workshop is the cellobiase enzyme, an engine for cellulosic biofuel production. Use the inquiry-based approach to extract enzyme, test activity, and design experiments to study how pH, temperature, and concentrations affect reaction rates.

C123, Convention Center

3:30–5:00 PM Presentation

Equity in Science Education Roundtable D132, Convention Center

(General) Science Focus: GEN

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

The Equity in Science Education Roundtable includes conference participants in the development of a framework that NSTA will use in developing strategies for equity and inclusion.



5:00–5:30 PM Presentations

INF Science Outside—No Box Needed

(Grades 5-10) Morrison, DoubleTree Science Focus: INF

Christina Porn (chris_porn@hotmail.com), Science Consultant, Erie, Colo.

Learning does not need to happen only in a classroom. Spark interest for science outside the classroom by providing unique experiences. Get the most out of your field trips by focusing on the pre- and post-trip experience.

Students Tell the Story of a Glacier Using Science, Math, and Literacy

(Grades 7–12) Science Focus: ESS, CCC D130, Convention Center

Joan Swafford, Jefferson Middle School, Jefferson, Ore. Hear how middle school students are using math and science to interpret satellite images and tell the story of glaciers. Quantitative and qualitative data of glaciers are obtained by using satellite images within GoogleEarth.

Newton's Laws on Gym Scooters

(Grades 5-9) D138. Convention Center Science Focus: PS2

Amy Manhart (*amanhart*@*tcsd.org*), Jackson Hole Middle School, Jackson, Wyo.

If you are willing to add some chaos in your classroom and the PE department doesn't mind, PE scooters are a fabulous way to teach your student's Newton's laws of motion. Students love the physical activity but it can be crazy! This is a great Sheltered Instruction lesson.

What Does STEM Education Look Like in Grades 6-12 Science Classrooms?

(Grades 6-12) D140, Convention Center Science Focus: GEN, SEP1, SEP3, SEP6

Tamara Nelson (@tbuddhiker; tnelson1@wsu.edu), Washington State University Vancouver

Hear how 34 educators conceptualized and implemented STEM education. Discussion centers on ideas, challenges, and successes with STEM.

5:00–6:00 PM Presentations

Integrating Green Chemistry and Engineering Design into Every Classroom for High School Educators

(Grades 9–12) Oregon, DoubleTree Science Focus: ETS1, PS

Jennifer Dean (jennifer.dean@camas.wednet.edu), Camas High School, Camas, Wash.

Mary Burt (strandmb@hotmail.com), Walla Walla High School, Walla Walla, Wash.

Presider: Nancy Simcox, University of Washington, Seattle We will introduce green chemistry, engineering, and a toxicology curriculum developed by teachers, researchers, and government, featuring an activity demonstrating green chemistry integration into an existing curriculum.

Spark Students' Curiosity with Chemistry!

(Grades K–12) Ross Island, DoubleTree Science Focus: PS

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

Did you know that the American Chemical Society (ACS) has resources for K–12 teachers, and you don't need to be a member? Learn about these free resources, including games, lesson plans, grants, and more.

Teach Engineering Principles on the Cheap with Concrete

(Grades 7–12) B110, Convention Center Science Focus: PS1.A, CCC6, SEP1, SEP3, SEP4

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

Teach engineering using concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. *NGSS* correlations will be shared.

Stories in the Secondary Science Classroom

(Grades 9–12) C122, Convention Center Science Focus: GEN

Cynthia Cykert, Rogers High School, Newport, R.I. Discussion centers on 13 fiction and nonfiction books to use in secondary science classrooms. Daily activities and longterm project ideas will be shared.

Perspectives on Time as a Means of Optimizing Science Instruction in a Diverse Classroom

(Grades 9–College) D137, Convention Center Science Focus: GEN, NGSS

Paul Hampton (@DrPaul74; *paul_hampton*@beaverton.k12. or.us), Sunset High School, Portland, Ore.

Attention will be paid on how the effective use of instructional time can improve acquisition of science content, thereby meeting the needs of diverse students.

5:00–6:00 PM Hands-On Workshops Smart Skies LineUp With Math

(Grades 5–8) Hawthorne/Sellwood, DoubleTree Science Focus: PS, SEP5

Karen Crow Roark, NASA Ames Research Center, Mountain View, Calif.

Want to discover what it's like to be an air traffic controller? Take student learning to new heights with the interactive simulator, LineUp With Math. Engage in proportional reasoning skills to resolve distance-rate time conflicts in realistic air traffic control problems. Bring a laptop/tablet.

Shared Goals in the New Science and Language Arts Standards for Grades 3–6

(Grades 3–6) D131, Convention Center Science Focus: LS2.A, LS4, PS3.A, CCC5, CCC4, SEP7 Laura Tucker (lauratucker98368@gmail.com), Consultant,

Port Townsend, Wash.

Explore how students can effectively achieve these common goals during science instruction. Join in and experience an exemplary ocean science curriculum that involves supporting ideas with evidence.

3 Reach Higher with Projectiles and the NGSS

(Grades 1–7) D133/134, Convention Center Science Focus: PS3.B, PS3.C, CCC1, CCC5, SEP Holly Neill (@homelifescience), Valor Christian School International, Beaverton, Ore.

Boost your students' learning by using projectiles like straw rockets and other simple machines to understand ideas of motion, design, and graphing. Join in to feel more confident on terminology as well as practice the process.

Base Camp—Where Science and Literacy Standards | Meet

(Grades 3–6) D135, Convention Center Science Focus: ESS, SEP1, SEP6

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

Investigate a series of activities that help to integrate science and literacy skills through the use of children's literature. A variety of science topic areas will be explored!

ASEE Session: Coupling Engineering Design Practices with CCSS ELA Writing

(Grades 3–6) D139, Convention Center Science Focus: ETS1

Patricia Morrell, University of Portland, Ore.

In this interactive workshop, elementary teachers engage in engineering design practices tied to children's literature and explore ways to explicitly integrate *CCSS ELA* with the activity.

5:30–6:00 PM Presentations

Using Issues-Based Culminating Projects to Bring STEM to Introductory Chemistry

(Grades 8–12) D130, Convention Center Science Focus: ETS, PS1

Angela Powers, Colorado State University-Pueblo

Discover how culminating projects can integrate knowledge from STEM disciplines, broaden perspectives on global issues, and sharpen 21st-century skills within the chemistry curriculum.

Yes, You Can Teach Circuits and Programming!

E141, Convention Center

Science Focus: ETS, SEP

(Grades 6-12)

Lee Jones (lee.jones@dsd2.org), Dallas High School, Dallas, Ore.

Whatever your background or training, you can teach programming and circuits with Arduino using simple projectbased lessons. Bring a laptop/tablet (or share) with the Arduino IDE programming software installed.

Don't Tell, Let Them Inquire with SOS Explorer: NOAA's Science On a Sphere Data Visualization Tool

(Grades 4–12) Science Focus: ESS

E144, Convention Center

Hilary Peddicord, NOAA Earth System Research Laboratory, Boulder, Colo.

We will demonstrate and interact with NOAA Science On a Sphere data visualizations within SOS Explorer, a new interactive Earth display for personal computer.

Linking the Three Dimensions of Science Education Using the *Framework* and the *NGSS*

(Grades 7–9) D140, Convention Center Science Focus: GEN, NGSS

Christy Mathes (*cmathes*@*ccsd.k12.wy.us*), Campbell County School District, Gillette, Wyo.

Ana Houseal (ahouseal@uwyo.edu), University of Wyoming, Laramie

This session illuminates the power of integrating the dimensions of the *Framework* within a science classroom/ curriculum.



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—Photo courtesy of Travel Portland

A kayaker paddles by the Hawthorne Bridge on the Willamette River.
8:00–9:00 AM Presentations

NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think!

(Grades K–12) Alaska/Idaho, DoubleTree Science Focus: GEN, NGSS

June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.

The National Oceanic and Atmospheric Administration (NOAA) has hundreds of facilities and professional communicators across the nation. Get connected to guest speakers, field trips, and local and national professional development opportunities.

Supporting Elementary Literacy Development Through Science: Three Key Strategies for Shifting Elementary Science Kits to Improve Literacy Skill Development

(Grades K-6) Morrison, DoubleTree

Science Focus: GEN, SEP2, SEP6

Jeff Ryan (*jryan*@*oesd114.org*) and **Patricia Moore** (*pmoore*@*oesd114.org*), Olympic Educational Service District 114, Bremerton, Wash.

Receive an overview of the process for transitioning a science kit to provide better opportunity for students to explain phenomena, engage in argument from evidence, develop and use models, and construct scientific explanations. We will highlight several literacy support strategies, the Ambitious Science Teaching Framework from the University of Washington, and some samples of modified elementary science units.

INF Animal Multimedia Inspires Learning and Engagement

(Grades K–12) Science Focus: LS, INF

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

Each spring and summer, birds, frogs, and insects are real "country" music singers! Come discover online resources, lessons, and apps that support STEM learning through animal sounds and videos.

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

(General)

Ross Island, DoubleTree

Oregon, DoubleTree

Science Focus: GEN, NGSS

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

Flipping, Cinematography, Podcasting, and Authoring: Nontraditional Teaching Strategies to Engage Students in the Science Classroom

(Grades 9–College) B119, Convention Center Science Focus: GEN, SEP

Arlene Courtney, Western Oregon University, Monmouth Discussion centers on the use of flipping, "movie-making," podcasting, and Wiki-textbook generation for teaching science concepts to today's students with emphasis on inexpensive, easy-to-use tools.

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials

(Grades 9–12) C122, Convention Center Science Focus: GEN, NGSS

Marta Gmurczyk, American Chemical Society, Washington, D.C.

Promote critical thinking using standards-based inquiry lesson plans based on high-interest, scientifically accurate articles about topics relevant to high school students' everyday lives.

INF After-School STEM Clubs

(Grades 3-6)

D130, Convention Center

Science Focus: INF, NGSS

Miriam Munck, Eastern Oregon University, La Grande After-school STEM clubs excite students about STEM and broaden their knowledge. Find out how to get started and receive curriculum ideas.

The Art of Communicating Science: A Practical Toolkit

(Grades 6–12) Science Focus: GEN D138, Convention Center

Cristina Veresan, Le Jardin Academy, Kailua, Hawaii Help students effectively communicate their own or professional scientific research with narrative structure through engaging modules. Leave with a classroom-ready toolkit of lessons!

8:00–9:00 AM Hands-On Workshops

Increase Student Engagement Through Educator Collaboration and Community Partnerships

(Grades K–12) Hawthorne/Sellwood, DoubleTree Science Focus: LS, CCC1, CCC4, CCC6, CCC7, SEP6, SEP8

LeeAnn Mikkelson (leeann.mikkelson@oregonstate.edu), Oregon State University, Corvallis

Steven Braun (*stevenmatthewbraun@gmail.com*), Aprovecho Center for Research and Education in Sustainability and Oregon Environmental Literacy Program, Cottage Grove Foster environmental literacy and provide STEM learning opportunities for K–12 students using natural resources as a context for engagement by leveraging community partnerships and educator to educator professional development.

Let's Get Physical—From Force and Friction to Water and Weather

(Grades P–3) D131, Convention Center Science Focus: PS1, PS2

Ruth Ruud (ruudruth61@gmail.com), Cleveland State University, Cleveland, Ohio

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

Don't look now, but the *CCSS* asks that you teach physical sciences as early as kindergarten, and the *NGSS* have specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

Engaging Students Through Integrated Instruction Using Elementary GLOBE Storybooks

(Grades K–6) Science Focus: ESS, GELFECC2, CCC5, SEP1, SEP3, SEP4, SEP6, EEA, SEP8

Tina Harte, NASA Langley Research Center, Hampton, Va. Elementary GLOBE develops integrated instruction through Earth science–based storybooks that engage the natural curiosity of students through a variety of learning activities and journaling experiences.



Constructing Equitable STEM Activities for All

(Grades 7–12) D135, Convention Center Science Focus: PS

Ann Haley Mackenzie (@annmackenzie; mackenah@ miamioh.edu), Miami University, Oxford, Ohio Explore two innovative STEM activities where two structures are built using equitable strategies for all.

Scientific Modeling and the NGSS

(Grades K–8) Science Focus: GEN, NGSS

Randy Bell (randy.bell@oregonstate.edu), Oregon State University, Corvallis

D136, Convention Center

E144, Convention Center

Participate in engaging activities designed to clarify and teach scientific modeling to elementary and middle school students. You'll receive free resources and lessons.

DIG Field School: Paleontologists and Teachers Together in the Field

(Grades 3–12) D139, Convention Center Science Focus: ESS

Mark Watrin (mwatrin@comcast.net), Battle Ground (Wash.) School District No. 119

Brody Hovatter (*bthov13@uw.edu*), Uinversity of Washington, Seattle

DIG Field School puts teachers with University of Washington paleontologists in the field digging dinosaurs and fossil evidence for the Mesozoic extinction. Join in as we "sort microfossils" from the DIG box, provided by the Burke Museum.

What Do You Mean I Have to Teach Engineering?!?

(Grades 7–College)

Science Focus: ETS1, PS

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

We will focus on engineering design by engaging in a handson STEM activity on how a colorimeter works and how to design and use a simple colorimeter.

How to Make Science Instruction Compelling for Students: Designing Formative Assessments to Build on Learners' Interests and Knowledge

(Grades K–12) E145, Convention Center Science Focus: GEN, NGSS

Shelley Stromholt (@sshellery; *stromhos*@uw.edu), University of Washington, Seattle

Learn formative assessment approaches for discovering and building on students' interests and knowledge in support of 3-D science learning.

8:00–9:00 AM Exhibitor Workshops

Genes, Genomes, and Personalized Medicine

(Grades 9–College) A103/104, Convention Center Science Focus: LS, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman (herman@msoe.edu) and Diane Munzenmaier (munzenmaier@msoe.edu), MSOE Center for BioMolecular

Modeling, Milwaukee, Wis.

Introduce students to the science of genomics and personalized medicine with interactive DNA models and gene maps. We will tell a genomic story of how whole genome sequencing has been used to reach a molecular diagnosis of a disease.

Modeling Earth, Sun, and Other Stars with Bring Science Alive!

(Grades K–5) A107, Convention Center Science Focus: ESS Sponsor: TCI

Christy Sanders (*info@teachtci.com*), TCI, Mountain View, Calif.

Experience learning from a student's perspective as you learn about the relationship between Earth, Sun, and other stars using a powerful online learning system. The lesson was entirely built on the *NGSS*.

Inquiry Matters: Identify Unknown Liquids

(Grades 4–8) E146, Convention Center Science Focus: PS1.A, CCC6, SEP3, SEP4, SEP6 **Patricia Galvan** (*p_galvan@acs.org*), American Chemical Society, Washington, D.C.

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

Photosynthesis and Respiration: It's a Plant's Life!

(Grades 9–12) B116, Convention Center Science Focus: LS, CCC3, SEP1, SEP3, SEP4, SEP5 Sponsor: LAB-AIDS®, Inc.

Paul Wesley Crawford, Sutherlin High School, Sutherlin, Ore.

Help your students sprout and grow with a different approach to teaching photosynthesis and cellular respiration. Learn how to captivate students through inquiry activities that can challenge and excite them. Easily implement activities into your current biology or plant science class.

Investigate Photosynthesis and Cellular Respiration with Algae Beads

(Grades 8–College)	C123, Convention Center
Science Focus: LS	
Sponsor: Bio-Rad Laboratories	

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

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

8:00 AM–12 Noon Short Course

From Roots to STEM—Using Roots Instruments to Teach STEM (SC-4)

Tickets Required; \$41

(Grades 4–8) Mt. Bachelor, DoubleTree Science Focus: ETS2, CCC3, SEP1, SEP5 Nicholas Krissie (@krissie_nick; nicholas.krissie@oakland. k12.or.us), Lincoln Middle School, Oakland, Ore.

For description, see page 31.

8:00 AM-5:00 PM Meeting

Discover the NGSS Train-the-Trainer Workshop

(By Separate Registration Only) Holladay, DoubleTree This workshop gives teacher leaders a solid understanding of the NGSS, tools for conducting teacher training, and the ongoing support they need to be leaders.

8:30–9:00 AM Presentation

Bringing Science to Life: Authentic Learning Experiences

(Grades 4–8) Science Focus: ETS1 D140, Convention Center

Courtney Lockridge (@soonerhorns; *courtney.lockridge*(@ *piedmontschools.org*), Piedmont (Okla.) Public Schools

Shawn Blankenship (@Blankenship_S; shawn.blankenship@piedmontschools.org), Piedmont Intermediate School, Piedmont, Okla.

Hear about examples of authentic learning experiences that have transformed STEM in the intermediate classroom using projects applying the engineering design model.

9:00 AM-12 Noon Exhibits

Hall A, Convention Center

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

9:30–10:30 AM Presentations

Developing a Leadership PD Toolkit for the Next Generation of Science Education Leaders

(Grades K–12) Alaska/Idaho, DoubleTree Science Focus: GEN

Gary Nakagiri (gnakagiri@gmail.com), SETI Institute, Hayward, Calif.

What are some relevant "tools" for your leadership toolkit? Experience and discuss their appropriate use with likeminded colleagues. Handouts, including a resource list, will be provided.

Magical Illusions and Scintillating Simulations for STEM

(Grades 3–College) Oregon, DoubleTree Science Focus: LS, PS

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

Storylines, discrepant events, and magic develop concepts in both physical and biological sciences, pique children's interest and imagination, and build creative and logical thinking skills.

INF NARST-Sponsored Session: Resisting Racist, Classist, and Neoliberalism in Science Education

(General) B119, Convention Center Science Focus: ETS2.B, INF

Jean Aguilar-Valdez (*aguil@pdx.edu*), Portland State University, Portland, Ore.

Neoliberalism in science education focuses on justifying the teaching of science to bolster the capitalistic competition and the market economy. Racist and classist repercussions result from this mind-set. Attention will be paid to ways to resist this attitude in science teaching and embrace a more critical, anti-racist approach to teaching science for social justice.

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

(Grades 9–12) C122, Convention Center Science Focus: ETS, CCC1, CCC4, SEP

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

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

A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts

(Grades 8–12) D130, Convention Center Science Focus: CCC, SEP, PS

Andrew Nydam, Polymer Ambassador, Olympia, Wash. Labs and demonstrations will be shared that relate automobiles to the science and engineering practices in the new *Framework*. Content will focus on physical science core ideas as well as applications of science to the everyday world. Correlations to *CCSS* will be shared and handouts provided on a CD.

Equity and Engagement of Economically Disadvantaged Students in STEM Project-Based Learning

(Grades 7–12) D137, Convention Center Science Focus: GEN, SEP

Kama Almasi (kama.almasi@lincoln.k12.or.us) and Melissa Steinman (melissa.steinman@lincoln.k12.or.us), Waldport High School, Waldport, Ore.

We created three career pathways and are using Project-Based Learning in STEAM/CTE fields to improve equity, engagement, and post-graduation success.

9:30–10:30 AM Hands-On Workshops

Engineering a Robot to Do the Job

(Grades 3–5) 3 Sisters, DoubleTree Science Focus: ETS1, PS, SEP1, SEP2, SEP3, SEP4, SEP5 **Karen Crow Roark** (kcroark@gmail.com), NASA Ames Research Center, Mountain View, Calif.

Let's design and build a robot to help with a task, just like Robonaut! Engineer a bristle bot to move payloads from one location to another. Go through the steps of the engineering design process to determine the best method to move the payload.

How to Create Meaningful Student Dialogue

(Grades 6–12) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, SEP4, SEP6, SEP7, SEP8 Samantha Johnson (@SciInnovations; smjohnson@slzusd. org), Arroyo High School, San Lorenzo, Calif.

What does student talk in your classroom look like? The *NGSS* asks us to have our students evaluate and communicate information. Discussion centers on activities and strategies that build academic conversations, promote critical thinking, and deepen content understanding.

Cultural and Ecological Studies on Mount St. Helens

(*Grades* 6–12) D138, Convention Center Science Focus: LS2.A, LS2.C, LS4.C, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Tom Wolverton (@iTechPrep; *twolvie@hotmail.com*) and John Zingale (@iHistorywMrJZ; *john.zingale@vansd.org*), Vancouver iTech Preparatory, Vancouver, Wash.

Abigail Groskopf (agroskopf@mshinstitute.org), Mount St. Helens Institute, Amboy, Wash.

We will take a look into vertically aligned collaborative projects between our school and the Mount St. Helens Institute through cultural, social, and ecological lenses.

Engineering Design, 3D Printing, and Physics— Putting It All Together!

(Grades 9–12) Mt. Hood, DoubleTree Science Focus: ETS, PS, CCC1, CCC2, CCC3, CCC4, CCC6, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8, Jacklyn Bonneau (bonneau@wpi.edu), Massachusetts Academy of Math & Science at WPI, Worcester, Mass. See how 3D printing enhances the design of physics labs and how the engineering cycle enhances the design of your 3D printing, along with enhanced learning in science!

Decode a Fish

(Grades 3–5) D131, Convention Center Science Focus: LS1.A, CCC1, SEP6, SEP7

Joey Scott (@joeyelle; *jlehnhard@mbayaq.org*), Monterey Bay Aquarium, Monterey, Calif.

What patterns do we observe in shapes of fishes from the same habitat? Discover fish traits through the concept of patterns from Monterey Bay Aquarium educators! Door Prizes!



-Photo courtesy of Jacob Slaton

3D Regurgitation and Argumentation: Teaching Science Practices Using Owl Pellets

(Grades 2–5) D133/134, Convention Center Science Focus: LS, CCC5, CCC6, SEP1, SEP3, SEP4, SEP7 **José Rios** (*jrios@u.washington.edu*), University of Washington Tacoma

According to the *NGSS*, claims and evidence are integral parts of the science practices. Come explore how you can use owl pellets to teach scientific argumentation.

Goldilocks, an Engineer?

(Grades P-2)

D135, Convention Center

Science Focus: ETS1, PS2, SEP

Margaret Giunta (giuntam@pcsb.org), Douglas L. Jamerson, Jr. Elementary School, Saint Petersburg, Fla.

Fairy tales provide context for kindergarten-aged children to learn important science, math, and engineering design concepts.

A STEM Activity for Physics and Physical Science

(Grades 7–12) D139, Convention Center Science Focus: PS, SEP1, SEP2, SEP3, SEP4, SEP5, SEP8 John Currie (jcurrie_98406@yahoo.com), Retired Physics Teacher, Mountlake Terrace, Wash.

Engage in hands-on circuit-building activities, involving models of digital logic that your students can use to study electricity and some electronic components.

Seasons in the Sun

(Grades 6–8) E141, Convention Center Science Focus: ESS1.B, CCC1, CCC2, CCC4, SEP2, SEP4 Christine Shupla (shupla@lpi.usra.edu), Lunar and Planetary Institute, Houston, Tex.

Nana Baffour (baffournana@aol.com), David Crockett Middle School, Richmond, Tex.

Participate in data-rich activities, examining patterns in temperatures, modeling the reasons for seasons, and predicting patterns for the number of daylight hours for cities.

No-Hassle Messy Science with a Wow! Atoms, Molecules, and Density

(Grades K–8) E143, Convention Center Science Focus: PS1.A, PS1.B, PS3.A, PS3.D, CCC1, CCC2, CCC3, CCC5, SEP1, SEP3, SEP5, SEP6, SEP7

Elizabeth Andanen (eandanen@omsi.edu), OMSI, Portland, Ore.

Prepare to get messy! We will explore atoms, molecules, and density with hands-on chemistry experiments that use easy-to-find materials, cross-curricular connections, and in-depth explanations.

Beet Armyworm Invasion: Breeding Better Plants with Natural Diversity

(Grades 7–College) E144, Convention Center Science Focus: ESS3.D, ETS2, LS1.B, LS3, LS4

Tiffany Fleming (@btiscience; *tfleming*@*cornell.edu*), Boyce Thompson Institute for Plant Research, Ithaca, N.Y.

With global climate change, the full potential of natural diversity in food crops must be harnessed. Get the latest buzz on plant research and a citizen science project that explores biodiversity, chemistry, plant breeding, agriculture, imaging technology, and insects.

Exploring the Science and Engineering Practices

(Grades K–12) Hawthorne/Sellwood, DoubleTree Science Focus: GEN, SEP

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

Come explore science and engineering practices (such as constructing explanations and developing models) that are central to the vision of education described in the *Framework* and the *NGSS*.

INF Using Local Native Landscapes to Broaden Environmental Education: GLOBE Opportunities

(Grades 3–College) E146, Convention Center Science Focus: ESS2.C, ESS3.D, LS2.C, INF

Paul Ruscher (@paul_ruscher; *ruscherp@lanecc.edu*), Lane Community College, Eugene, Ore.

The GLOBE program has recently developed implementation strategies for *NGSS* across the curriculum. An Oregon partnership is putting this into action in 2016 to support informal and K–12 science education.

9:30–10:30 AM Exhibitor Workshops

Of All the Nerve: Modeling Neurotransmission

A103/104, Convention Center (Grades 9–College) Science Focus: LS, CCC, SEP

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman (herman@msoe.edu) and Diane Munzenmaier (munzenmaier@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Construct models of cholinergic, dopaminergic, and GABAergic synapses. Explore the role of various ions in action potential generation and neurotransmitter release. Visualize neurotransmitter synthesis using 3D printed models. Handouts provided!

Tracking the Spread of Infectious Diseases: Human and Animal

(Grades 9-12) B116, Convention Center Science Focus: LS, CCC3, SEP1, SEP3, SEP4, SEP7, SEP8 Sponsor: LAB-AIDS®, Inc.

Paul Wesley Crawford, Sutherlin High School, Sutherlin, Ore. Help students understand the spread of diseases in a human or animal population by using this engaging hands-on lab. Model how health organizations trace a disease while teaching important concepts of disease transmission and exponential growth.

Build a Box: Engineering Food Dye Electrophoresis for NGSS

C123, Convention Center Science Focus: ETS, PS, SEP

C124, Convention Center

Sponsor: Bio-Rad Laboratories

(Grades 7-College)

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

In this hands-on workshop, see great ways to engage your students in engineering practices to study something they encounter in their everyday lives-food dyes! Have students engineer a protocol to separate and identify dyes using an integrated do-it-yourself electrophoresis box. It's a colorful way to introduce pipetting and electrophoresis skills in addition to chemistry and physics concepts.

Three Dimensions in the Project-Based Classroom

(Grades 6-8)

Science Focus: GEN, NGSS

Sponsor: It's About Time

Mary Starr, Michigan Mathematics and Science Centers Network, Plymouth

Meeting the *NGSS* is a shift in how we teach science. With well-designed, project-focused resources, you can make the shift and get your students, of all levels, engaged as they participate in realistic educational projects like real scientists do. Come experience it for yourself.

11:00 AM–12 Noon Presentations

STEM Teaching Tools: Linking Research and Practice (Grades K-12) Alaska/Idaho, DoubleTree

Science Focus: GEN, NGSS

Shelley Stromholt (@sshellery; stromhos@uw.edu), University of Washington, Seattle

Learn about and use STEM teaching tools, a suite of accessible, bite-sized practice briefs aimed at specific aspects of science education with research- and practice-based ideas and actionable advice.

Helping Children Understand the Impact of STEM and the Essential Integration of All STEM Disciplines: Explorations with Physical Structures, Plants, and Everyday Household Tools

(Grades 3-6) Oregon, DoubleTree Science Focus: GEN, NGSS

Donna Knoell, Educational Consultant, Overland Park, Kans.

Attention will be paid to strategies and activities to engage elementary students actively in STEM applications by constructing physical structures (bridges, ramps, etc.), by growing plants, and by exploring how everyday objects use simple machines for mechanical advantage.

Science Teaching for Social Justice

(Grades 6-College) Ross Island, DoubleTree Science Focus: ETS2, CCC1, CCC2, SEP4, SEP7, SEP8 **Moses Rifkin** (@RiPhysKin; mrifkin@universityprep.org), University Prep, Seattle, Wash.

Teaching for social justice can be part of science education. Hear how a scientific exploration and analysis of who does science leads to questions of equity.

A Unique Ice Core Investigation that Integrates the Three Dimensions of the NGSS and STEM

(Grades 7–College) B110, Convention Center Science Focus: ESS1, ESS2.A, ESS2.B, ESS2.D, ESS3.C, PS1.B, PS3.D, PS4.B, CCC1, CCC2, CCC3, CCC4, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

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

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

Interactive Notebooks in the Secondary Science Classroom

C122, Convention Center

(Grades 9–12) Science Focus: GEN, NGSS

Tiffany Allen, Campus High School, Wichita, Kans.

Heard the hype about interactive notebooks, but unsure how to implement them in a secondary classroom? Gain insight from teachers successfully implementing this teaching structure.

A Picture-Perfect Approach to Connecting Reading Strategies and Science

(Grades K–5) D130, Convention Center Science Focus: GEN, NGSS

Kimberly Stilwell, Picture-Perfect Science, West Chester, Ohio

Need ideas to connect literacy and science? Never before has it been so easy to interest students in reading and science. *Picture-Perfect Science Lessons* combine the appeal of children's picture books with standards-based science content. Leave with ideas on how to begin the integration in your classroom.

3D Student-Designed Research on Sleep, Memory, and Emotional Regulation

(Grades 9–College) D137, Convention Center Science Focus: ETS2, LS1.A, LS1.D, SEP

Nancy Cowdin (*nancy.cowdin@visi.org*), Georgetown Visitation Preparatory School, Washington, D.C.

High school science neurobiology students learn research methods by designing and conducting sleep research using ambulatory sleep monitors and psychometric measures of sleep quality.

11:00 AM–12 Noon Hands-On Workshop The STEAM Behind a NASA Mission, as Seen by a Teacher Who "Flew"

(Grades 5–12)

3 Sisters, DoubleTree

Science Focus: ESS, SEP8 **Kathleen Fredette** (kathleen.fredette@ileadschools.org), Maker School Network, Castaic, Calif.

Examine the collaborative STEAM professions required to make a NASA mission successful, such as NASA's Stratospheric Observatory for Infrared Astronomy and how you can fly!

NITARP: Bringing Real Astronomy Research into Classrooms

(Grades 7–12) D138, Convention Center Science Focus: ESS

Laura Orr (*laura.orr@ukiah.k12.or.us*), Ukiah High School, Ukiah, Ore.

John Gibbs (gibbsj@hsd.k12.or.us), Glencoe High School, Hillsboro, Ore.

Holly Bensel (hbensel@smschool.us), St. Mary's School, Medford, Ore.

NITARP stands for the NASA/IPAC Teacher Archive Research Program. The program partners small groups of educators with a mentor professional astronomer for a yearlong original research project using NASA's vast archives of data from space- and ground-based telescopes.

Making Waves with Marine-Themed Project-Based Learning

(Grades 4–12) D140, Convention Center Science Focus: ESS2.B, ESS2.C

Cait Goodwin (*cait.goodwin@oregonstate.edu*), Oregon State University, Newport

Kama Almasi (kama.almasi@lincoln.k12.or.us), Waldport High School, Waldport, Ore.

From tsunamis to student-built underwater gliders, explore how marine topics can be used to engage diverse learners and make learning relevant while meeting *NGSS* requirements.

Science in the "Shark Tank"

Mt. Hood, DoubleTree

Science Focus: GEN, SEP

(Grades 5-10)

Debi Callies, Paradise Valley Unified School District, Phoenix, Ariz.

Have your students present to the "Shark Tank." Join me as we go through the process of a problem-solving task with a strong emphasis on justifying your decisions based on science concepts.

Intensifying STEM on the Oregon Trail

(Grades K–5) D131, Convention Center Science Focus: ETS1, SEP1, SEP2, SEP3, SEP4, SEP6 **Carolyn Nesbitt**, High Desert Museum, Bend, Ore. **Josh Hayden**, Buckingham Elementary School, Bend, Ore. Tired of one-and-done field trips? High Desert Museum and local schools have created STEM-focused field experiences that expand resources to all students. This workshop focuses on STEM and social studies integration as part of a larger curriculum unit.

ASTE-Sponsored Session: Integrating ELA and Math with NGSS-Based Activities for Elementary Teachers

(Grades 3–5) D133/134, Convention Center Science Focus: PS, CCC4, SEP3

William Veal (*vealw@cofc.edu*), College of Charleston, S.C. Participants will be able to complete three activities that are based upon *NGSS* performance expectations and integrate ELA and math concepts and methods.

Engaging Girls in STEAM

D135, Convention Center

Science Focus: ETS, SEP

(Grades 6-8)

Gillian Thomas, Julia Morgan School for Girls, Oakland, Calif.

Learn how to build a STEAM program that can empower girls to develop a passion for engineering, build self-confidence, and inspire girls to become tomorrow's leaders in STEAM fields. I will share how to create this curriculum and explore resources. We will try out a design challenge to build a prosthetic arm using affordable everyday materials.

The "E" in STEM Is Not to Be Feared

D136, Convention Center

Science Focus: ETS1, CCC, SEP

(Grades 7-12)

Michael Holst, NASA Endeavor STEM Fellow, Chehalis, Wash.

Are you finding "jitters" about incorporating engineering into your science program for "STEM-ification"? This presentation will present various "hows" and "ways" without adding an engineering course for grades 1–12 science programs. This presentation is intended for preservice and "soon-tobe" STEM teachers.

Using the World Issue of Food Security to Teach Multiple NGSS

(*Grades 8–12*) D139, Convention Center Science Focus: ESS3, ETS, LS1.C, LS2, LS4.D, PS1.B, PS2.C, PS3.B, PS3.D, PS4.C, CCC, SEP

Claudia Ludwig (@SystemsEd; *cludwig@systemsbiology.org*) and **Jessica Day** (@projectfeed1010; *jday@systemsbiology. org*), Institute for Systems Biology, Seattle, Wash.

Aquaponics can be used as an engaging and beneficial STEM experience in the classroom. Learn how to set up systems and how to connect meaningful curriculum to the experience for biology and environmental science courses.

Molecular Modeling as a Tool for Understanding Cancer and Other Types of Genetic Disease

(Grades 9–College) E144, Convention Center Science Focus: LS1, LS3, LS4, CCC2, CCC6, SEP **Sandra Porter** (@digitalbio; sandra@digitalworldbiology. com), Digital World Biology LLC, Seattle, Wash. Use molecular modeling software to compare molecule structures and develop hypotheses to explain why some mutations in BRCA1 can lead to cancer.



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

Biology/Life Science	В
Chemistry/Physical Science	C
Earth/Space Science	EA
Environmental Science	EN
Integrated/General Science	G
Physics/Physical Science	PH
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Accelerate Learning is a national leader in STEM curriculum and teacher, campus, and district STEM certification. Available preK-12, STEMscopes is in use by 7,600 schools in 40 states. The company has earned recognition from numerous industry programs, such as District Administration's Top 100 Products and EdTech Digest's Cool Tool Awards.

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

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Phone: 202-752-7208		
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aeopgems@nsta.o	rg	
Website: www.usaeop.com		

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

American Chemical Society	#715
1155 16th St. NW	С
Washington, DC 20036	PreK-12
Phone: 202-776-8141	
E-mail: education@acs.org	
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The ACS Education Division serves learners and educators by building communities and providing effective chemistry education resources, grants, communities, professional development opportunities, standards, and guidelines. Stop by our booth to find information that can support your efforts to provide innovative, relevant, and effective chemistry education from kindergarten through professional education.

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#918

Ardusat is a complete STEM program for schools looking for an interactive and effective STEM solution. Ardusat provides open curriculum resources mapped to local standards, and eHub where students build experiments and share their findings. Activities range from using an Arduino and sensors, to running experiments on satellites in space.

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The goal of the Bright Schools program is to create a learning experience that will help students, parents, and teachers better understand the link between light, sleep, and student health and performance. Through the Bright Schools Competition, students in grades 6-8 will select a topic related to light and sleep and select one of three exploration options (developing a prototype, creating an awareness campaign, or writing a research proposal) to create an original project.

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Creative Discovery Museum (Chattanooga, Tennessee) is working with the BioEnergy Science Center (BESC) in Oak Ridge, Tennessee, on a biofuels/alternative energies project called Farming For Fuels. Free materials, including curriculum, hands-on activities, "Road Trip Challenge" software app, website (*www.learnbiofuels.org*), and distance learning lesson information are available to educators! Come by our booth and see what free STEM materials might work well in your classroom! Delta Education/School#608Specialty Science8080 Northwest Blvd.80Nashua, NH 030639hone: 800-258-1302E-mail: customerservice.delta@schoolspecialty.comWebsite: www.deltaeducation.com

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It's About Time	#412
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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.

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Shell Science Lab Challenge

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The NSTA Professional Learning Team supports science educators in school districts and institutions of higher education through a variety of face-to-face, online, and blended experiences tailored to their specific needs. The Learning Center is NSTA's professional learning portal designed to enhance the content and pedagogical knowledge of teachers of science.

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Website: www.healthoregon.org/antibiotics	

The Oregon Alliance Working for Antibiotic Resistance Education (AWARE) Coalition's mission is to encourage the appropriate use of antibiotics and reduce the problem of antibiotic-resistant bacteria in Oregon. This curriculum, designed for grades 9 and 10 students, includes two 45-60 minute modules discussing viruses, bacteria, antibiotics, and antibiotic resistance.

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EA	Research Center	В
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В

Oregon National Primate Research Center's education outreach program includes opportunities to tour the Center (for anyone age 10 and older), apprenticeships for high school and college-aged students, and many other opportunities to interact with researchers and animal care staff that support research we undertake to further medical progress.

OSU Dept. of Chemistry	#808
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Corvallis, OR 97331	9–12, College
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E-mail: anita.bracha@oregonsta	te.edu
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Thursday, Nov 10	12:30-1:30 PM	A103/104, Conv. Center	Constructing and Crossing Cell Membranes (p. 53)
Thursday, Nov 10	2:00-3:00 PM	A103/104, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 59)
Friday, Nov 11	8:00-9:00 AM	A103/104, Conv. Center	Let's Get Helical: Exploring DNA Structure and Function with
			Physical Models (p. 74)

Accelerate Learning—STEMscopes (Booth #809)

Thursday, Nov 10	2:00-3:00 PM	C120/121, Conv. Center	The Value of Writing Scientific Explanations in STEM (p. 60)
Friday, Nov 11	8:00-9:00 AM	C120/121, Conv. Center	STEM Literacy: Strategies for Making Complex Text
			Meaningful (p. 75)
Friday, Nov 11	9:30-10:30 AM	C120/121, Conv. Center	Building the Skills of Argumentation and Collaboration in
			STEM (p. 82)
Friday, Nov 11	12:30-1:30 PM	C120/121, Conv. Center	Supporting Excellence in STEM Programs and Teaching
			Through STEM Certification (p. 93)

Activate Learning (Booth #901)

Thursday, Nov 10	9:30–10:30 AM	A107, Conv. Center	Science Storylines: Developing Three-Dimensional Lessons That Build on Student Curiosity (p. 46)
Thursday, Nov 10	2:00-3:00 PM	A107, Conv. Center	Integrating Literacy and Science—The Wow Factor (p. 59)
Friday, Nov 11	9:30-10:30 AM	A107, Conv. Center	Discourse Tools for Equitable and Rigorous Talk (p. 81)
Friday, Nov 11	12:30-1:30 PM	A107, Conv. Center	NGSS-Focused Interactive Digital Assessment for Middle
			School (p. 92)

AEOP eCYBERMISSION (Booth #624)

Thursday, Nov 10	12:30-1:30 PM	A106, Conv. Center	Gains in the Education of Mathematics and Science: What Can
			GEMS Do for You? (p. 53)
Thursday, Nov 10	3:30-4:30 PM	A106, Conv. Center	Group Work: Using Student Collaboration in the Middle
			School Science Classroom (p. 64)
Friday, Nov 11	11:00 AM-12 Noon	A106, Conv. Center	What's the Problem? Integrating Engineering into the Science
			Classroom Without Bridges and Rockets (p. 87)
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Amplify (Booth #609)

Thursday, Nov 10	8:00-9:00 AM	C124, Conv. Center	Experience Amplify Science: Grades K–1 (p. 44)
Thursday, Nov 10	9:30-10:30 AM	C124, Conv. Center	Experience Amplify Science: Grades 2-5 (p. 47)
Thursday, Nov 10	11:00 AM-12 Noon	C124, Conv. Center	Experience Amplify Science: Middle School (p. 50)
Thursday, Nov 10	12:30-1:30 PM	C124, Conv. Center	What Is Amplify Science? (p. 54)
Friday, Nov 11	8:00-9:00 AM	C124, Conv. Center	Implementing Science Seminars and Scientific Argumentation
			with Amplify Science (p. 76)
Friday, Nov 11	9:30-10:30 AM	C124, Conv. Center	Not Your Typical Classroom Experience: Amplify Science's
			Digital Engineering Internships (p. 82)
Friday, Nov 11	11:00 AM-12 Noon	C124, Conv. Center	What Is Amplify Science? (p. 88)

Bio-Rad Laboratories (Booth #805)

Friday, Nov 11	8:00–9:00 AM	C123, Conv. Center	Contagion! Track the Progress of Dangerous Viruses That Are Spreading Throughout the Country (p. 75)
Friday, Nov 11	9:30–10:30 AM	C123, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 82)
Friday, Nov 11	11:00 AM-12 Noon	C123, Conv. Center	The GMO Debate Rages On! (p. 88)
Friday, Nov 11	12:30-1:30 PM	C123, Conv. Center	How to Use Pop Culture in Your Life Science Class (p. 93)
Friday, Nov 11	2:00-3:00 PM	C123, Conv. Center	How Do You Know What Fish Species You Are Eating? DNA
			Barcoding! (p. 95)
Friday, Nov 11	3:30-4:30 PM	C123, Conv. Center	Enzymes: Technology Inspired by Nature (p. 99)
Saturday, Nov 12	8:00-9:00 AM	C123, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae
			Beads (p. 107)
Saturday, Nov 12	9:30–10:30 AM	C123, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 111)

Carolina Biological Supply Co. (Booth #601)

Thursday, Nov 10	8:00-9:00 AM	A108/109, Conv. Center	Engineer Physical Science Excitement with a Carolina STEM
			Challenge® (p. 43)
Thursday, Nov 10	9:30–10:30 AM	A108/109, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for
			the New Chemistry Teacher (p. 46)
Thursday, Nov 10	11:00 AM-12 Noon	A108/109, Conv. Center	Waves, Waves, Waves: Building Models to Explain
			Phenomena (p. 48)
Thursday, Nov 10	12:30-1:30 PM	A108/109, Conv. Center	Hands-On Activities to Model Habitat Preference and
			Population Sampling (p. 54)
Thursday, Nov 10	2:00-3:00 PM	A108/109, Conv. Center	Bring Visual Science into K-5 Classrooms—It's a Game
·			Changer! (p. 59)
Thursday, Nov 10	3:30-4:30 PM	A108/109, Conv. Center	The Best of Engineering for Elementary Students (p. 64)
Friday, Nov 11	8:00-9:00 AM	A108/109, Conv. Center	Comparative Vertebrate Anatomy with Carolina's Perfect
·			Solution® Specimens (p. 75)
Friday, Nov 11	9:30-10:30 AM	A108/109, Conv. Center	Learning By Arguing: Claims, Evidence, and Reasoning (p. 81)
Friday, Nov 11	11:00 AM-12 Noon	A108/109, Conv. Center	Comparative Mammalian Organ Dissection with Carolina's
			Perfect Solution® Specimens (p. 87)
Friday, Nov 11	12:30-1:30 PM	A108/109, Conv. Center	Hands-On Science with Classroom Critters (p. 92)
Friday, Nov 11	2:00-3:00 PM	A108/109, Conv. Center	Introduction to Wisconsin Fast Plants® (p. 94)
Friday, Nov 11	3:30-4:30 PM	A108/109, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect
5.4			Solution® Pigs (p. 99)

CPO Science/School Specialty Science (Booth #610)

Thursday, Nov 10	8:00-9:00 AM	B113, Conv. Center	CPO's $\mathrm{Link}^{\mathrm{TM}}$ with Car and Ramp: Force, Motion, and
			Variables (p. 43)
Thursday, Nov 10	11:00 AM-12 Noon	B113, Conv. Center	CPO's Link TM Genetics Learning Modules: Crazy
·			Chromosomes and Crazy Traits (p. 48)
Thursday, Nov 10	12:30-1:30 PM	B113, Conv. Center	CPO's Wind Turbine: A STEM Approach to Engineering and
			Design (p. 54)
Thursday, Nov 10	2:00-3:00 PM	B113, Conv. Center	Building Electric Circuits with CPO's New Link TM Learning
			Module (p. 60)
Thursday, Nov 10	3:30-4:30 PM	B113, Conv. Center	CPO Science's Link TM Module: Learning About Chemistry
			Models (p. 65)
			· · ·

Delta Education/School Specialty Science (Booth #608)

Thursday, Nov 10	8:00-9:00 AM	B111/112, Conv. Center	Teach Next Gen Like Your Hair Is on Fire! (p. 43)
Thursday, Nov 10	9:30-10:30 AM	B111/112, Conv. Center	SEPs Made Easy (p. 46)
Thursday, Nov 10	11:00 AM-12 Noon	B111/112, Conv. Center	Build Skills to Boost the Makerspace Experience for Young
			Scientists! (p. 48)
Thursday, Nov 10	12:30-1:30 PM	B111/112, Conv. Center	STEM-gineering (p. 54)
Thursday, Nov 10	2:00-3:00 PM	B111/112, Conv. Center	Increase Your 3-D Vision of NGSS (p. 59)
Thursday, Nov 10	3:30-4:30 PM	B111/112, Conv. Center	Liven Up Literacy with Science (p. 65)

Delta Education/School Specialty Science–FOSS (Booth #608)

Thursday, Nov 10	8:00-9:00 AM	B117/118, Conv. Center	Wave Properties and Information Transfer (p. 43)
Thursday, Nov 10	9:30-10:30 AM	B117/118, Conv. Center	Engage Students in FOSS Next Generation (p. 47)
Thursday, Nov 10	11:00 AM-12 Noon	B117/118, Conv. Center	The Reflective Assessment Practice: Improving Science
			Achievement in 10 Minutes (p. 50)
Thursday, Nov 10	12:30-1:30 PM	B117/118, Conv. Center	Scientific Practices: What Does Argumentation Look Like in
			an Elementary Classroom? (p. 54)
Thursday, Nov 10	2:00-3:00 PM	B117/118, Conv. Center	What Does Conceptual Modeling Look Like in an Elementary
			Classroom? (p. 60)
Thursday, Nov 10	3:30-4:30 PM	B117/118, Conv. Center	Evolutionary Evidence in the Fossil Record: Life Science with
			FOSS (p. 65)

Dinah.com (Booth #509)

Friday, Nov 11	9:30–10:30 AM	A106, Conv. Center	FOLD-tastic Science Notebooks via Dinah Zike's Notebook Foldables (p. 81)		
Discovery Education (Booth #403)					

Thursday, Nov 10	11:00 AM-12 Noon	B114/115, Conv. Center	Engaging Students in Authentic Science Experiences Using
			Digital Tools (p. 50)
Friday, Nov 11	2:00-3:00 PM	B114/115, Conv. Center	Bringing NGSS to the Classroom with Discovery Education (p. 94)

Educational Innovations, Inc. (Booth #709)

Friday, Nov 11	9:30-10:30 AM	B114/115, Conv. Center	3-2-1 Blast Off! (p. 81)
Friday, Nov 11	11:00 AM-12 Noon	B114/115, Conv. Center	Magnify Your Mind!—With The Private Eye® (p. 88)

Edvotek Inc. (Booth #504)

Thursday, Nov 10	8:00-9:00 AM	A105, Conv. Center	Martian Genetics: An Electrophoresis Exploration (p. 43)
Thursday, Nov 10	9:30-10:30 AM	A105, Conv. Center	Left at the Scene of the Crime: Introduction to Forensic
			Science (p. 46)
Thursday, Nov 10	11:00 AM-12 Noon	A105, Conv. Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene
			Using PCR (p. 48)
Thursday, Nov 10	12:30-1:30 PM	A105, Conv. Center	Outbreak! Zika Testing Using the Enzyme-Linked
			Immunosorbent Assay (ELISA) (p. 53)
Thursday, Nov 10	2:00-3:00 PM	A105, Conv. Center	Using Biotechnology to Diagnose HIV/AIDS (p. 59)
Thursday, Nov 10	3:30-4:30 PM	A105, Conv. Center	Environmental Toxicology Using Edvotek's New
-			EZ-elegans (p. 64)

Fisher Science Ed	lucation (Booth #716)		
Friday, Nov 11	2:00-3:00 PM	C125/126, Conv. Center	The STEM Design Challenge (p. 95)
Flinn Scientific, l	nc. (Booth #501)		
Thursday, Nov 10	9:30-10:30 AM	B114/115, Conv. Center	Infusing Inquiry and Demonstrations into AP Biology (p. 46)
Thursday, Nov 10	2:00-3:00 PM	B114/115, Conv. Center	Teaching Forensics with Real Crime Scene Investigation
Friday, Nov 11	8:00–9:00 AM	B114/115, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 75)
Frey Scientific/Sc	chool Specialty Science	e (Booth #612)	
Thursday, Nov 10	9:30–10:30 AM	B113, Conv. Center	Solving the Mystery of STEM Using Forensic Science (p. 46)
HHMI BioInterac	tive (Booth #615)		
Friday, Nov 11	8:00-9:00 AM	B111/112, Conv. Center	Viruses—From Adenovirus to HIV to Zika (p. 75)
Friday, Nov 11	11:00 AM-12 Noon	B111/112, Conv. Center	Helping Students Understand Deep Time Using HHMI BioInteractive's EarthViewer (p. 87)
Friday, Nov 11	12:30-1:30 PM	B111/112, Conv. Center	The Biology of Skin Color: An NGSS-Focused Exploration (p. 92)
Friday, Nov 11	2:00-3:00 PM	B111/112, Conv. Center	Can We Save the World's Coral Reefs Before They Disappear? (p. 94)
Friday, Nov 11	3:30-4:30 PM	B111/112, Conv. Center	Trophic Cascades: A Force of Nature (p. 99)
Houghton Miffli	n Harcourt (Booth #61	9)	
Thursday, Nov 10	11:00 AM-12 Noon	A106, Conv. Center	An NGSS Approach to Engineering in the Upper Grade Bands (p. 48)
Thursday, Nov 10	2:00-3:00 PM	A106, Conv. Center	The HMH Science Dimensions of NGSS (p. 59)
Friday, Nov 11 Friday, Nov 11	8:00–9:00 AM 2:00–3:00 PM	A106, Conv. Center A106, Conv. Center	An NGSS Approach to Engineering in the Upper Grade Bands (p. 74) The HMH Science Dimensions of NGSS (p. 94)
lt's About Time (Booth #412)		
Friday, Nov 11	2:00-3:00 PM	C124, Conv. Center	The Framework and NGSS: Opportunity for Teacher Growth (p. 95)
Saturday, Nov 12	9:30–10:30 AM	C124, Conv. Center	Three Dimensions in the Project-Based Classroom (p. 111)
King Arthur Flou	ır (Booth #525)		
Friday, Nov 11	12:30-1:30 PM	A106, Conv. Center	Bake for Good: Kids Learn-Bake-Share (p. 92)
LAB-AIDS®, Inc.	(Booth #617)		
Thursday, Nov 10	8:00-9:00 AM	B116, Conv. Center	Gas Exchange (p. 43)
Thursday, Nov 10	9:30-10:30 AM	B116, Conv. Center	Modeling Convection Currents and Plate Motion (p. 47)
Thursday, Nov 10	11:00 AM-12 Noon	B116, Conv. Center	Calling All Carbons (p. 50)
Thursday, Nov 10	12:30-1:30 PM	B116, Conv. Center	Climate Proxies (p. 54)
Thursday, Nov 10	2:00-3:00 PM	B116, Conv. Center	Chemical Batteries (p. 60)
Thursday, Nov 10	3:30-4:30 PM	B116, Conv. Center	Reclaiming the Metal (p. 65)
Friday, Nov 11	8:00–9:00 AM	B116, Conv. Center	Waves (p. 75)
Friday, Nov 11	9:30–10:30 AM	B116, Conv. Center	pH Scale and Math Modeling (p. 81)

LAB-AIDS®, Inc.,	, continued		
Friday, Nov 11	11:00 AM-12 Noon	B116, Conv. Center	Chemical Formula and Amino Acids (p. 88)
Friday, Nov 11	12:30-1:30 PM	B116, Conv. Center	What Is a Species (p. 92)
Friday, Nov 11	2:00-3:00 PM	B116, Conv. Center	Cell Differentiation and Gene Expression (p. 94)
Friday, Nov 11	3:30-4:30 PM	B116, Conv. Center	Energy Flow Through an Ecosystem (p. 99)
Saturday, Nov 12	8:00-9:00 AM	B116, Conv. Center	Photosynthesis and Respiration: It's a Plant's Life! (p. 107)
Saturday, Nov 12	9:30–10:30 AM	B116, Conv. Center	Tracking the Spread of Infectious Diseases: Human and Animal (p. 111)
LEGO Education	(Booth #904)		
Friday, Nov 11	8:00–9:00 AM	A107, Conv. Center	Fun with Freewheelers! Teaching Science and Math with Manipulatives (p. 74)
miniPCR (Booth	#815)		
Friday, Nov 11	9:30–10:30 AM	C125/126, Conv. Center	miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 82)
MSOE Center for	r BioMolecular Modeli	ng (Booth #710)	
Friday, Nov 11	9:30-10:30 AM	A103/104, Conv. Center	3D Printing for the BioScience Classroom (p. 80)
Friday, Nov 11	11:00 AM-12 Noon	A103/104, Conv. Center	Telling Stories with David Goodsell's Watercolor Molecular Landscapes (p. 87)
Saturday, Nov 12	8:00-9:00 AM	A103/104, Conv. Center	Genes, Genomes, and Personalized Medicine (p. 107)
Saturday, Nov 12	9:30–10:30 AM	A103/104, Conv. Center	Of All the Nerve: Modeling Neurotransmission (p. 111)
National Geogra	phic Learning Cenga	ge Learning (Booth #722)	
Friday, Nov 11	11:00 AM–12 Noon	C125/126, Conv. Center	CONNECTIONS: Three-Dimensional Learning by National Geographic Explorers (p. 88)
PASCO scientific	(Booth #500)		
Friday, Nov 11	8:00–9:00 AM	B113, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 75)
Friday, Nov 11	9:30-10:30 AM	B113, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 81)
Friday, Nov 11	11:00 AM–12 Noon	B113, Conv. Center	Exploring Misconceptions: There Is a Difference Between Heat and Temperature? (p. 88)
Pearson (Booth	#508)		
Friday, Nov 11	9:30–10:30 AM	B117/118, Conv. Center	STEM and <i>NGSS</i> Inquiry in Chemistry: Effective, Efficient, Economical (p. 81)
Friday, Nov 11	11:00 AM-12 Noon	B117/118, Conv. Center	Teaching Geoscience in an NGSS-Focused Curriculum (p. 88)
Friday, Nov 11	12:30-1:30 PM	B117/118, Conv. Center	A Conceptual Framework for Teaching Global Change: <i>NGSS</i> Ready! (p. 93)
Friday, Nov 11	2:00-3:00 PM	B117/118, Conv. Center	Transforming Science Education Through Inquiry-Based Learning and Narrative-Based Teaching (p. 95)

Solar 4R Schools (Booth #718)				
Friday, Nov 11	11:00 AM-12 Noon	A107, Conv. Center	Hands-On Tools for Teaching the Science of Solar Energy (p. 87)	
TCI (Booth #818)				
Thursday, Nov 10	11:00 AM-12 Noon	A107, Conv. Center	Riding the Wave with TCI (p. 48)	
Friday, Nov 11	2:00-3:00 PM	A107, Conv. Center	Analyzing and Interpreting Data Using TCI's Bring Science Alive! (p. 94)	
Saturday, Nov 12	8:00–9:00 AM	A107, Conv. Center	Modeling Earth, Sun, and Other Stars with Bring Science Alive! (p. 107)	

Texas Instruments (Booth #701)

Thursday, Nov 10	9:30-10:30 AM	C120/121, Conv. Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 47)
Thursday, Nov 10	12:30-1:30 PM	C120/121, Conv. Center	Zombie Apocalypse! (p. 54)
Friday, Nov 11	11:00 AM-12 Noon	C120/121, Conv. Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 88)
Friday, Nov 11	2:00-3:00 PM	C120/121, Conv. Center	Zombie Apocalypse! (p. 95)

Van Andel Education Institute (Booth #400)

Thursday, Nov 10	2:00-3:00 PM	C125/126, Conv. Center	Stop Creating Lesson Plans—Start Creating Learning
			Experiences (p. 60)
Friday, Nov 11	8:00-9:00 AM	C125/126, Conv. Center	Stop Creating Lesson Plans—Start Creating Learning
			Experiences (p. 76)

Vernier Software & Technology (Booth #801)

Friday, Nov 11	8:00-9:00 AM	A105, Conv. Center	Integrating Chromebook with Vernier Data-Collection
			Technology (p. 74)
Friday, Nov 11	9:30-10:30 AM	A105, Conv. Center	Chemistry with Vernier (p. 80)
Friday, Nov 11	11:00 AM-12 Noon	A105, Conv. Center	Biology with Vernier (p. 87)
Friday, Nov 11	12:30-1:30 PM	A105, Conv. Center	Integrating Chromebook with Vernier Data-Collection
			Technology (p. 92)
Friday, Nov 11	2:00-3:00 PM	A105, Conv. Center	Integrating iPad with Vernier Data-Collection Technology (p. 94)
Friday, Nov 11	3:30-4:30 PM	A105, Conv. Center	Physics and Physical Science with Vernier (p. 99)

Schedule at a Glance Earth and Space Science

Earth and Space Science

Thursday

8:00–9:00 AM	6–12	Oregon Blrm. 204, Conv. Center	NESTA Shares: A Hands-On Approach to Creating an <i>NGSS</i> -Focused High School Earth and Space Science Course (p. 42)
8:00-9:00 AM	5-9	E144, Conv. Center	Cycles, Sinks, and Solutions: An NGSS-Focused Climate Change Unit (p. 42)
8:00-9:00 AM	10-C	E141, Conv. Center	Analyzing Supernova Remnants Using Spectroscopy, NASA Data, and STEM (p. 42)
8:00-9:00 AM	6-8	B114/115, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 75)
9:30-10:30 AM	6-8	B116, Conv. Center	Modeling Convection Currents and Plate Motion (p. 47)
11:00 AM-12 Noon	9-12	B116, Conv. Center	Calling All Carbons (p. 50)
12:30-1:30 PM	9-12	B116, Conv. Center	Climate Proxies (p. 54)
12:30-1:30 PM	K-12	Oregon Blrm. 204, Conv. Center	NESTA Shares: Earth and Space Science Share-a-Thon (p. 53)
12:30-1:30 PM	6-8	D131, Conv. Center	Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 52)
12:30-1:30 PM	5-12	B119, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 89)
12:30-1:30 PM	5–9	E142, Conv. Center	NSTA Press® Solar Science = $NGSS$ -Focused Solar Astronomy Experiences + Preparation for the All-American Total Solar Eclipse (p. 52)
12:30-1:30 PM	5-8	D140, Conv. Center	Engaging Students in Place-Based Learning Through a Field STEM Experience (p. 51)
1:00-4:00 PM	2-6	3 Sisters/Mt. Bachelor, DoubleTree	SC-1: NASA's Exploration of the Solar System: Activities for Out-of-School Time (p. 55)
2:00-3:00 PM	8-12	D133/134, Conv. Center	Ocean Acidification as a Way to Teach Multidisciplinary Science and NGSS (p. 57)
2:00-3:00 PM	6-8	B116, Conv. Center	Chemical Batteries (p. 60)
2:00-3:00 PM	6-12	D139, Conv. Center	Science from the Stratosphere: STEM Activities in the Infrared (p. 57)
2:00-3:00 PM	5-12	D138, Conv. Center	Data Is Not a "Four-Letter Word": Use NOAA Resources to Build Student Proficiency in Data Analysis (p. 57)
2:00-3:00 PM	1–6	D135, Conv. Center	Developing and Implementing <i>NGSS</i> -Focused Curriculum in Gillette, Wyoming: Focus on Earth and Space Science as a Vehicle for Mathematics and Literacy Integration (p. 57)
2:00-3:00 PM	5-C	Oregon Blrm. 204, Conv. Center	NESTA Shares: Using the CLEAN Collection of Resources to Teach Energy and Climate (p. 58)
2:30-3:00 PM	5-12	Alaska/Idaho, DoubleTree	Space-Age STEM: Virgin Galactic's Virtual Connection, Mentorship, and Experimentation Hangouts (p. 61)
3:30-4:30 PM	7-12	Alaska/Idaho, DoubleTree	Climate Change Education and State Science Standards: A National Assessment (p. 97)
3:30-4:30 PM	K-12	Morrison, DoubleTree	Building NGSS Models in Microsoft Office and Google Drive (p. 61)
3:30-4:30 PM	6-8	D140, Conv. Center	Design for Disaster: Using Three-Dimensional Learning/Literacy in the Service of Science (p. 62)
3:30-4:30 PM	8-12	D139, Conv. Center	NASA Earth Science: Real-World Connections to Data and Tools for Science Fairs (p. 63)
3:30-4:30 PM	4-10	D130, Conv. Center	Place-Based Earth Science: Using the Geology of Oregon (p. 62)
3:30-4:30 PM	7–9	E144, Conv. Center	Evolution for Educators
3:30-4:30 PM	5-12	Oregon Blrm. 204, Conv. Center	NESTA and CEETEP Shares: Feeling the Earth Move: GPS and How It
			Teaches Us About Future Earthquakes (p. 64)
5:00-5:30 PM	3-С	B119, Conv. Center	LEARN with NASA (Long-Term Engagement in Authentic Research with NASA) (p. 65)
5:00-6:00 PM	6-11	B110, Conv. Center	Using the National Science Olympiad and STEM to Address NGSS Crosscutting Concepts and Content (p. 66)
5:00-6:00 PM	1-12	C122, Conv. Center	Lessons from the Sky (A Teacher's STEM Source) (p. 66)

Schedule at a Glance Earth and Space Science

5:00-6:00 PM	5-12	Oregon Blrm. 204, Conv. Center	NESTA and CEETEP Shares: Surviving the Shake: Engineering Activities
			for Earthquake Resilience (p. 68)
5:00-6:00 PM	4-8	D137, Conv. Center	The nPower Girls: Cultivating Interest and Achievement in STEM (p. 66)
5:00-6:00 PM	6-C	D138, Conv. Center	Record and Analyze Seismic Data in the Classroom with Free IRIS
			Software! (p. 67)
5:00-6:00 PM	6-8	E144, Conv. Center	Curriculum for a Crowded Planet (p. 68)
5:00-6:00 PM	5-7	E143, Conv. Center	Communicating Science Through Narrative Writing (p. 68)
5:30-6:00 PM	G	B119, Conv. Center	The AMS DataStreme Project: Comprehensive Earth Science Education for
			Teachers (p. 69)
			*

Friday

8:00–9:00 AM	6-12	E141, Conv. Center	Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 73)
8·00-9·00 AM	3-8	D140 Conv Center	Sing for the Planet (p. 72)
8:00-9:00 AM	G	E144 Conv Center	Get Ready for the Great American Eclipse! (p. 73)
8:00-9:00 AM	9-12	B113. Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 75)
9:30-10:30 AM	6-8	D136. Conv. Center	Go Probe! Teaching Astronomy with Sensors and Apps (p. 79)
9:30–10:30 AM	G	E147/148, Conv. Center	Learning About Global Climate Change in a Physics Course for Prospective Teachers (p. 80)
11:00 AM-12 Noon	5-C	E147/148, Conv. Center	Dark Skies and Energy Education: Globe at Night Citizen Science Program Workshop (p. 86)
11:00 AM-12 Noon	6-12	B111/112, Conv. Center	Helping Students Understand Deep Time Using HHMI BioInteractive's EarthViewer (p. 87)
11:00 AM-12 Noon	G	B117/118, Conv. Center	Teaching Geoscience in an NGSS-Focused Curriculum (p. 88)
12:30-1:30 PM	6-8	E141, Conv. Center	Moon Mania: Modeling Lunar Phases (p. 90)
12:30-1:30 PM	3-12	Hawthorne/Sellwood, DoubleTree	Connecting to the Coast and Ocean (p. 90)
12:30-1:30 PM	5-12	B119, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 89)
2:00-3:00 PM	6-12	B111/112, Conv. Center	Can We Save the World's Coral Reefs Before They Disappear? (p. 94)
3:30-4:30 PM	G	Oregon Blrm. 201, Conv. Center	Featured Presentation: Are You Ready for the Astronomical Event of the Decade: The 2017 All-American Total Eclipse? (p. 96)
3:30-4:30 PM	5-12	B110, Conv. Center	Tsunami! Understanding the Generation, Propagation, and Hazards of Tsunamis (p. 97)
3:30-4:30 PM	K-8	E141, Conv. Center	No-Hassle Messy Science with a Wow! Chemical Reactions (p. 98)
5:00-5:30 PM	7-12	D130, Conv. Center	Students Tell the Story of a Glacier, Using Science, Math, and Literacy (p. 100)
5:00-6:00 PM	4-12	E144, Conv. Center	Don't Tell, Let Them Inquire with SOS Explorer: NOAA's Science On a Sphere Data Visualization Tool (p. 102)
5:00-6:00 PM	3-6	D135, Conv. Center	Base Camp: Where Science and Literacy Standards Meet (p. 102)

Saturday

8:00-9:00 AM	3-12	D139, Conv. Center	DIG Field School: Paleontologists and Teachers Together in the Field (p. 106)
8:00-9:00 AM	K-5	A107, Conv. Center	Modeling Earth, Sun, and Other Stars with Bring Science Alive! (p. 107)
9:30-10:30 AM	7–C	E144, Conv. Center	Beet Armyworm Invasion: Breeding Better Plants with Natural
			Diversity (p. 110)
9:30-10:30 AM	6-8	E141, Conv. Center	Seasons in the Sun (p. 110)
9:30-10:30 AM	3-C	E146, Conv. Center	Using Local Native Landscapes to Broaden Environmental Education:
			GLOBE Opportunities (p. 110)
11:00 AM-12 Noon	7–C	B110, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of
			the NGSS and STEM (p. 111)
11:00 AM-12 Noon	8-12	D139, Conv. Center	Using the World Issue of Food Security to Teach Multiple NGSS (p. 113)
11:00 AM-12 Noon	7-12	D138, Conv. Center	NITARP: Bringing Real Astronomy Research into Classrooms (p. 112)

Schedule at a Glance Earth and Space Science

 11:00 AM-12 Noon
 5-12
 3 Sisters, DoubleTree

 11:00 AM-12 Noon
 4-12
 D140, Conv. Center

The STEAM Behind a NASA Mission, as Seen by a Teacher Who "Flew" (p. 112) Making Waves with Marine-Themed Project-Based Learning (p. 112)

Engineering, Technology, and the Application of Science

Thursday

0.00.0.20 AM	7 10	D110 C C /	
8:00-8:30 AM	7-12	B110, Conv. Center	Survival Science (p. 39)
8:00–9:00 AM	K-12	D131, Conv. Center	NASA Is with You When You Fly: Principles of Flight and Four Forces (p. 41)
8:00–9:00 AM	6-12	A108/109, Conv. Center	Engineer Physical Science Excitement with a Carolina STEM Challenge® (p. 43)
8:30-9:00 AM	8-10	B110, Conv. Center	"Keep on Rolling" with STEM (p. 44)
8:30-9:00 AM	3-6	D130, Conv. Center	STEM in a Blender (p. 44)
11:00 AM-12 Noon	K-3	B111/112, Conv. Center	Build Skills to Boost the Makerspace Experience for Young Scientists! (p. 48)
11:00 AM-12 Noon	6-12	A106, Conv. Center	An NGSS Approach to Engineering in the Upper Grade Bands (p. 48)
12:30-1:30 PM	2-6	B111/112, Conv. Center	STEM-gineering (p. 54)
12:30-1:30 PM	6-12	B113, Conv. Center	CPO's Wind Turbine: A STEM Approach to Engineering and Design (p. 54)
2:00-3:00 PM	6-12	B113, Conv. Center	Building Electric Circuits with CPO's New Link TM Learning Module (p. 60)
2:00-3:00 PM	5-11/C	D131, Conv. Center	Use NASA Design Challenges to Develop Critical Thinking (p. 57)
2:00-3:00 PM	6-12	D139, Conv. Center	Science from the Stratosphere: STEM Activities in the Infrared (p. 57)
2:00-3:00 PM	5-C	Oregon Blrm. 204, Conv. Center	NESTA Shares: Using the CLEAN Collection of Resources to Teach Energy
		C	and Climate (p. 58)
2:00-3:00 PM	3-8	E144, Conv. Center	Engineering: Blow the Roof Off! (p. 58)
2:00-3:00 PM	8-12	D133/134, Conv. Center	Ocean Acidification as a Way to Teach Multidisciplinary Science and
			NGSS (p. 57)
2:00-3:00 PM	6-8	D140, Conv. Center	Balancing and Addressing Inequalities in the Middle School STEM
			Classroom (p. 57)
2:30-3:00 PM	5-6	D137, Conv. Center	Teaching, Integrating, Exploring Science (TIES): A Science Mentoring
			Program for Grade 5 Girls (p. 61)
3:30-4:30 PM	5-12	Oregon Blrm. 204, Conv. Center	NESTA and CEETEP Shares: Feeling the Earth Move: GPS and How It
			Teaches Us About Future Earthquakes (p. 64)
3:30-4:30 PM	4-12	D136, Conv. Center	Inventing Is Just Plain Fun (for All)! (p. 63)
3:30-4:30 PM	8-12	D139, Conv. Center	NASA Earth Science: Real-World Connections to Data and Tools for
			Science Fairs (p. 63)
3:30-4:30 PM	6-8	D140, Conv. Center	Design for Disaster: Using Three-Dimensional Learning/Literacy in the
			Service of Science (p. 62)
3:30-4:30 PM	K-8	E143. Conv. Center	NASA's Journey to Mars: Build a Mars Rover Using NASA's Beginning
		-,	Engineering Science and Technology (BEST) Curriculum (p.63)
3:30-4:30 PM	1-5	A108/109, Conv. Center	The Best of Engineering for Elementary Students (p. 64)
5:00-6:00 PM	4-8	D137. Conv. Center	The nPower Girls: Cultivating Interest and Achievement in STEM (n. 66)
5:00-6:00 PM	6-11	B110, Conv. Center	Using the National Science Olympiad and STEM to Address NGSS
		.,	Crosscutting Concepts and Content (p. 66)

Friday

8:00–9:00 AM	3-10	Weidler/Halsey, DoubleTree	Engineering Water Wheels: A Three-Dimensional Approach for Integrating Science and Engineering (p. 72)
8:00-9:00 AM	9-12	E147/148, Conv. Center	NGSS? Got It Covered! (p. 74)
8:00-9:00 AM	4-8	A107, Conv. Center	Fun with Freewheelers! Teaching Science and Math with Manipulatives (p. 74)
8:00-9:00 AM	K-12	D139, Conv. Center	ASEE Session: ASEE's K-12 Outreach: Engineering, Go For It (eGFI),
			Teach Engineering, Link Engineering, and the National Science Digital
			Library (p. 73)
8:00-9:00 AM	6-12	E141, Conv. Center	Using Recreational UAVs (Drones) for STEM Activities and Science Fair
			Projects (p. 73)

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

8:00-9:00 AM	6-12	A106, Conv. Center	An NGSS Approach to Engineering in the Upper Grade Bands (p. 74)
8:30-9:00 AM	6-12	B110, Conv. Center	Project-Based Instruction Is a Perfect Match for NGSS (p. 77)
9:30-10:30 AM	9-12	D133/134, Conv. Center	Integrating Green Chemistry and Engineering Design into Every
			Classroom: Interactive Workshop for High School Educators (p. 79)
9:30-10:30 AM	2-8	B114/115, Conv. Center	3-2-1 Blast Off! (p. 81)
9:30-10:30 AM	6-8	C124, Conv. Center	Not Your Typical Classroom Experience: Amplify Science's Digital
			Engineering Internships (p. 82)
9:30-10:30 AM	K-5	D139, Conv. Center	ASEE Session: Engineering a Pathway to STEM: Advancing Elementary
			Level Engineering Education Through Innovative Programs and
			Partnerships (p. 79)
11:00 AM-12 Noon	5-12	B110, Conv. Center	Making Waves: Seismic Waves Activities and Demonstrations (p. 84)
11:00 AM-12 Noon	G	D139, Conv. Center	ASEE Session: Cognitive and Noncognitive Experiences with Engineering
			Practices (p. 85)
11:00 AM-12 Noon	P-12	A107, Conv. Center	Hands-On Tools for Teaching the Science of Solar Energy (p. 87)
11:00 AM-12 Noon	6–9	A106, Conv. Center	What's the Problem? Integrating Engineering into the Science Classroom
			Without Bridges and Rockets (p. 87)
12:30-1:30 PM	K-6	D130, Conv. Center	Science Is a Story: Using Kids' Science Trade Books and the Internet to
			Explore Current Developments in Science (p. 90)
12:30-1:30 PM	9-12	D137, Conv. Center	Making Yogurt as an Engineering Design Project in Biology (p. 90)
12:30-1:30 PM	5-9	D139, Conv. Center	ASEE Session: Creatively Applying the "E" in STEM (p. 91)
2:00-3:00 PM	1-12	A106, Conv. Center	The HMH Science Dimensions of NGSS (p. 94)
3:30-4:30 PM	8-12	D130, Conv. Center	Strengthen Your STEM Lessons with the NSTA High School Committee
			Activities (p. 97)
3:30-4:30 PM	9-12	B116, Conv. Center	Energy Flow Through an Ecosystem (p. 99)
3:30-4:30 PM	6-12	D133/134, Conv. Center	Teaching Engineering (p. 98)
5:00-6:00 PM	9-12	Oregon, DoubleTree	Integrating Green Chemistry and Engineering Design into Every Classroom
		C	for High School Educators (p. 101)
5:00-6:00 PM	6-12	E141, Conv. Center	Yes, You Can Teach Circuits and Programming! (p. 102)
5:00-6:00 PM	3-6	D139, Conv. Center	ASEE Session: Coupling Engineering Design Practices with CCSS ELA
			Writing (p. 102)
5:30-6:00 PM	8-12	D130, Conv. Center	Using Issues-Based Culminating Projects to Bring STEM to Introductory
			Chemistry (p. 102)

Saturday

8:00_9:00 A M	7–C	E144 Conv Center	What Do You Mean I Have to Teach Engineering? (n. 106)
8.00 AM 12 Noon	1-0	Mt. Bachalar, DoubleTree	SC 4. From Poots to STEM. Using Poots Instruments to Tooch STEM (p. 108)
0:00 AM-12 NOOII	+-0	Mt. Bachelor, DoubleTree	SC-+: From Roots to STEM: Using Roots instruments to reach STEM (p. 108)
8:30–9:00 AM	4-8	D140, Conv. Center	Bringing Science to Life: Authentic Learning Experiences (p. 108)
9:30-10:30 AM	7–C	E144, Conv. Center	Beet Armyworm Invasion: Breeding Better Plants with Natural Diversity (p. 110)
9:30-10:30 AM	G	B119, Conv. Center	NARST-Sponsored Session: Resisting Racist, Classist, Neoliberalism in
			Science Education (p. 108)
9:30-10:30 AM	9-12	C122, Conv. Center	Engineer Your World: Integrating Engineering Design, Computational
			Thinking, and 21st-Century Skills (p. 108)
9:30-10:30 AM	9-12	Mt. Hood, DoubleTree	Engineering Design, 3D Printing, and Physics Putting It All Together! (p. 109)
9:30-10:30 AM	3-5	3 Sisters, DoubleTree	Engineering a Robot to Do the Job (p. 109)
9:30-10:30 AM	P-2	D135, Conv. Center	Goldilocks, an Engineer? (p. 110)
9:30-10:30 AM	7-С	C123, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 111)
11:00 AM-12 Noon	8-12	D139, Conv. Center	Using the World Issue of Food Security to Teach Multiple NGSS (p. 113)
11:00 AM-12 Noon	6-C	Ross Island, DoubleTree	Science Teaching for Social Justice (p. 111)
11:00 AM-12 Noon	7-12	D136, Conv. Center	The "E" in STEM Is Not to Be Feared (p. 113)
11:00 AM-12 Noon	9-С	D137, Conv. Center	Student-Designed Research on Sleep, Memory, and Emotional
			Regulation (p. 112)
11:00 AM-12 Noon	K-5	D131, Conv. Center	Intensifying STEM on the Oregon Trail (p. 113)
11:00 AM-12 Noon	6-8	D135, Conv. Center	Engaging Girls in STEAM (p. 113)

Schedule at a Glance Life Science

Life Science

Thursday

8:00-9:00 AM	6-12	D133/134, Conv. Center	The Re-Wilding Project! (p. 41)
8:00-9:00 AM	5-С	E142, Conv. Center	NSTA Press® Session: Argumentation in the Biology Science
			Classroom (p. 42)
8:00-9:00 AM	9–C	D139, Conv. Center	Cancer Medicine Focus Enhances Biology Curriculum: Biomaterials (p. 42)
8:00-9:00 AM	6-C	A105, Conv. Center	Martian Genetics: An Electrophoresis Exploration (p. 43)
8:00-9:00 AM	6-8	B116, Conv. Center	Gas Exchange (p. 43)
9:15–10:30 AM	G	Oregon Blrm. 201/202, Conv. Ctr.	General Session: The Serengeti Rules: The Quest to Discover How Life Works, and Why It Matters (p. 44)
9:30-10:30 AM	6-C	A105, Conv. Center	Left at the Scene of the Crime: Introduction to Forensic Science (p. 46)
9:30-10:30 AM	9-12	B114/115, Conv. Center	Infusing Inquiry and Demonstrations into AP Biology (p. 46)
11:00 AM-12 Noon	9–C	A105, Conv. Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR (p. 48)
11:00 AM-12 Noon	6-12	B113, Conv. Center	CPO's Link TM Genetics Learning Modules: Crazy Chromosomes and Crazy Traits (p. 48)
12:30-1:30 PM	K-12	A108/109, Conv. Center	Hands-On Activities to Model Habitat Preference and Population Sampling (p. 54)
12:30-1:30 PM	9–C	A105, Conv. Center	Outbreak! Zika Testing Using the Enzyme-Linked Immunosorbent Assay (ELISA) (p. 53)
12:30-1:30 PM	8-12	A103/104, Conv. Center	Constructing and Crossing Cell Membranes (p. 53)
12:30-1:30 PM	K-2	D136, Conv. Center	Patterns of Survival (p. 52)
12:30-1:30 PM	6-12	D133/134, Conv. Center	Inquiring Minds Want to Know (p. 52)
12:30-1:30 PM	5-8	D140, Conv. Center	Engaging Students in Place-Based Learning Through a Field STEM Experience (p. 51)
12:30-1:30 PM	P-8	E144, Conv. Center	Taking STEM Outside (p. 53)
12:30-1:30 PM	6-12	E146, Conv. Center	Epidemiology as the Next "Forensic Science" Capstone Course (p. 53)
12:30-1:30 PM	6-8	D131, Conv. Center	Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School Classroom (p. 52)
2:00-3:00 PM	8-12	D133/134, Conv. Center	Ocean Acidification as a Way to Teach Multidisciplinary Science and NGSS (p. 57)
2:00-3:00 PM	K-11	Oregon, DoubleTree	How Does Your Garden Grow? Creating and Maintaining Kid-Friendly, Bird-Friendly Gardens (p. 56)
2:00-3:00 PM	5-C	Oregon Blrm. 204, Conv. Center	NESTA Shares: Using the CLEAN Collection of Resources to Teach Energy and Climate (p. 58)
2:00-3:00 PM	9–C	A105, Conv. Center	Using Biotechnology to Diagnose HIV/AIDS (p. 59)
3:30-4:30 PM	8-C	A105, Conv. Center	Environmental Toxicology Using Edvotek's New EZ-elegans (p. 64)
3:30-4:30 PM	6-8	B117/118, Conv. Center	Evolutionary Evidence in the Fossil Record: Life Science with FOSS (p. 65)
3:30-4:30 PM	6-C	E141, Conv. Center	New POGIL Activities to Integrate Life Science (p. 63)
3:30-4:30 PM	7–9	E144, Conv. Center	Evolution for Educators (p. 63)
5:00-6:00 PM	4-8	D140, Conv. Center	Student Investigations: Get Good Questions! (p. 67)
5:00-6:00 PM	6-11	B110, Conv. Center	Using the National Science Olympiad and STEM to Address <i>NGSS</i> Crosscutting Concepts and Content (p. 66)
5:00-6:00 PM	9-12	D133/134, Conv. Center	Constructing Explanations in Biology—Getting from There to Here (p. 67)
5:00-6:00 PM	6-8	E144, Conv. Center	Curriculum for a Crowded Planet (p. 68)
5:00-6:00 PM	5-7	E143, Conv. Center	Communicating Science Through Narrative Writing (p. 68)
5:00-6:00 PM	6-10	D131, Conv. Center	Looking for a Way to Teach Matter and Energy Through a Model-Based
		·	Approach? (p. 67)
5:00-6:00 PM	3-9	Hawthorne/Sellwood, DoubleTree	Inspired by 18th- and 19th-Century Naturalists: Recreating Vintage Wall Charts for Structure and Function Science That Incorporates Cultural Context, Lived Experiences, and Visual Art (p. 67)

Friday

8:00–9:00 AM	9–C	C123, Conv. Center	Contagion! Track the Progress of Dangerous Viruses that Are Spreading Throughout the Country (p. 75)
8:00-9:00 AM	K-8	D136, Conv. Center	Coyote vs. Road Runner: Why Acme Anvils Aren't Needed (p. 73)
8:00-9:00 AM	3-8	D140, Conv. Center	Sing for the Planet (p. 72)
8:00-9:00 AM	9-12	B111/112, Conv. Center	Viruses—From Adenovirus to HIV to Zika (p. 75)
8:00–9:00 AM	9–12	A108/109, Conv. Center	Comparative Vertebrate Anatomy with Carolina's Perfect Solution®
8:00–9:00 AM	9–C	A103/104, Conv. Center	Let's Get Helical: Exploring DNA Structure and Function with Physical Models (p. 74)
8:00-9:00 AM	4-9	Ross Island, DoubleTree	The Monarch Butterfly: Sophisticated Science (p. 71)
8:00-9:00 AM	9-12	E147/148, Conv. Center	NGSS? Got It Covered! (p. 74)
8:00-9:00 AM	6-8	B114/115, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 75)
8:30-9:00 AM	9-C	B119, Conv. Center	Using the Case Studies as a Cumulative Review (p. 83)
9:30-10:30 AM	10-C	B119, Conv. Center	Ecology and Biodiversity Labs: The Environment in Three Dimensions (p. 78)
9:30-10:30 AM	4-8	D138, Conv. Center	Engage Your Students Through Conservation Connect (p. 79)
9:30–10:30 AM	9–12	E142, Conv. Center	NSTA Press® Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12 (p. 80)
9:30-10:30 AM	9–C	A103/104, Conv. Center	3D Printing for the BioScience Classroom (p. 80)
9:30–10:30 AM	8-C	C123. Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae Beads (p. 82)
9:30–10:30 AM	6–C	C125/126. Conv. Center	miniPCR PTC Taster Lab—From Genotype to Phenotype (p. 82)
11:00 AM-12 Noon	9–C	C123. Conv. Center	The GMO Debate Rages On! (p. 88)
11:00 AM-12 Noon	9–C	A103/104. Conv. Center	Telling Stories with David Goodsell's Watercolor Molecular Landscapes (p. 87)
11:00 AM-12 Noon	9–12	A108/109, Conv. Center	Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens (p. 87)
11:00 AM-12 Noon	8-C	D133/134, Conv. Center	Teaching Genetics and Evolution Through Context-Based Learning Involving Food Security Issues in Africa (p. 85)
11:00 AM-12 Noon	9-12	A105, Conv. Center	Biology with Vernier (p. 87)
11:00 AM-12 Noon	6-8	E142. Conv. Center	NSTA Press® Session: Araument-Driven Inauiry in Physical and Life Science: Lab
		,	Investigations for Grades $6-8$ (p. 86)
11:00 AM-12 Noon	6-12	D135, Conv. Center	Biology for the Next Generation: 3-D Teaching, Learning, and Assessment in the Biology Classroom (p. 85)
11:00 AM-12 Noon	3-8	E141, Conv. Center	Science, ELLs, and Three-Dimensional Learning for Grades 3–8 Life Science (p. 85)
12:30-1:30 PM	5-12	B119, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOA A Resources (p. 89)
12·30-1·30 PM	K-5	D133/134 Conv Center	FieldSTEM Plus: An Integrated Learning Model (n. 90)
12:30-1:30 PM	9_12	D137 Conv Center	Making Yogurt as an Engineering Design Project in Biology (n. 90)
12:30-1:30 PM	K-12	A108/109 Conv Center	Hands-On Science with Classroom Critters (p. 92)
12:30–1:30 PM	9-12	B111/112 Conv Center	The Biology of Skin Color: An NGSS-Focused Exploration (p. 92)
12:30–1:30 PM	7–C	D135 Conv Center	Recipe for Research and Application: The Science of Food and Fating (p. 91)
12:30-1:30 PM	3-8	D138 Conv. Center	Developing Science Process Skills Through Schoolvard Investigations (p. 90)
12:30-1:30 PM	9-C	C123 Conv. Center	How to Use Pon Culture in Your Life Science Class (p. 93)
12:30-1:30 PM	9-C	D136 Conv. Center	Learning About Molecular Structures with Molecular Models (p. 91)
12:30-1:30 PM	9-12	B116 Conv Center	What Is a Species $(p, 92)$
2:00-3:00 PM	6-12	B111/112. Conv. Center	Can We Save the World's Coral Reefs Before They Disappear? (p. 94)
2:00-3:00 PM	9-12	B116, Conv. Center	Cell Differentiation and Gene Expression (p. 94)
2:00-3:00 PM	1-12	A106, Conv. Center	The HMH Science Dimensions of NGSS (p. 94)
2:00-3:00 PM	K-12	A108/109, Conv. Center	Introduction to Wisconsin East Plants [®] (p , 94)
3:30-4:30 PM	6-12	A108/109, Conv. Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (n. 99)
3:30-4:30 PM	9-12	C122. Conv. Center	Reaching the Limits: Population Ecology in Biology (p. 97)
3:30–4:30 PM	8–12	D130, Conv. Center	Strengthen Your STEM Lessons with the NSTA High School Committee Activities (p. 97)

Schedule at a Glance Life Science

3:30-4:30 PM	7-12	B111/112, Conv. Center	Trophic Cascades: A Force of Nature (p. 99)
3:30-4:30 PM	9-C	E144, Conv. Center	Cancer Medicine Focus Enhances Biology Curriculum: Cryopreservation (p. 99)
3:30-4:30 PM	1-12	Hawthorne/Sellwood, DoubleTree	Stretch Your Legs for Science! (p. 98)
3:30-4:30 PM	9-12	B116, Conv. Center	Energy Flow Through an Ecosystem (p. 99)
5:00-6:00 PM	3-6	D131, Conv. Center	Shared Goals in the New Science and Language Arts Standards for Grades
			3-6 (p. 101)

Saturday

8:00-9:00 AM	8-C	C123, Conv. Center	Investigate Photosynthesis and Cellular Respiration with Algae
			Beads (p. 107)
8:00-9:00 AM	K-12	Oregon, DoubleTree	Animal Multimedia Inspires Learning and Engagement (p. 105)
8:00-9:00 AM	K-12	Hawthorne/Sellwood, DoubleTree	Increase Student Engagement Through Educator Collaboration and
			Community Partnerships (p. 106)
8:00-9:00 AM	9-12	B116, Conv. Center	Photosynthesis and Respiration: It's a Plant's Life! (p. 107)
8:00-9:00 AM	9-С	A103/104, Conv. Center	Genes, Genomes, and Personalized Medicine (p. 107)
9:30-10:30 AM	9-С	A103/104, Conv. Center	Of All the Nerve: Modeling Neurotransmission (p. 111)
9:30-10:30 AM	6-12	D138, Conv. Center	Cultural and Ecological Studies on Mount St. Helens (p. 109)
9:30-10:30 AM	9-12	B116, Conv. Center	Tracking the Spread of Infectious Diseases: Human and Animal (p. 111)
9:30-10:30 AM	3-С	E146, Conv. Center	Using Local Native Landscapes to Broaden Environmental Education:
			GLOBE Opportunities (p. 110)
9:30-10:30 AM	3-С	Oregon, DoubleTree	Magical Illusions and Scintillating Simulations for STEM (p. 108)
9:30-10:30 AM	7-С	E144, Conv. Center	Beet Armyworm Invasion: Breeding Better Plants with Natural
			Diversity (p. 110)
9:30-10:30 AM	3-5	D131, Conv. Center	Decode a Fish (p. 109)
9:30-10:30 AM	2-5	D133/134, Conv. Center	Regurgitation and Argumentation: Teaching Scientific Practices Using Owl
			Pellets (p. 110)
11:00 AM-12 Noon	9-С	D137, Conv. Center	Student-Designed Research on Sleep, Memory, and Emotional
			Regulation (p. 112)
11:00 AM-12 Noon	8-12	D139, Conv. Center	Using the World Issue of Food Security to Teach Multiple NGSS (p. 113)
11:00 AM-12 Noon	9–C	E144, Conv. Center	Molecular Modeling as a Tool for Understanding Cancer and Other Types
			of Genetic Disease (p. 113

Physical Science

Thursday

8:00–9:00 AM	10-C	E141, Conv. Center	Analyzing Supernova Remnants Using Spectroscopy, NASA Data, and STEM (p. 42)
8:00-9:00 AM	6-8	B117/118, Conv. Center	Wave Properties and Information Transfer (p. 43)
8:00-9:00 AM	6-8	B116, Conv. Center	Gas Exchange (p. 43)
8:00-9:00 AM	6-12	B113, Conv. Center	CPO's Link TM with Car and Ramp: Force, Motion, and Variables (p. 43)
8:00-9:00 AM	6-12	A108/109, Conv. Center	Engineer Physical Science Excitement with a Carolina STEM Challenge® (p. 43)
8:00-9:00 AM	9-12	C122, Conv. Center	Incorporating CCSS for Literacy in Science and Technical Subjects into
			Introductory Chemistry Investigations (p. 40)
8:00-9:00 AM	K-12	D131, Conv. Center	NASA Is with You When You Fly: Principles of Flight and Four Forces (p. 41)
8:00-9:00 AM	6-12	Morrison, DoubleTree	Bioplastic—Going from Synthetic to Natural Polymers (p. 39)
8:30-9:00 AM	8-10	B110, Conv. Center	"Keep on Rolling" with STEM (p. 44)
9:30-10:30 AM	9-12	A108/109, Conv. Center	Keep Calm and Chemistry On: Successful Lab Activities for the New
			Chemistry Teacher (p. 46)
9:30-10:30 AM	5-C	A103/104, Conv. Center	Dive In with Magnetic Water Molecules (p. 46)
9:30–10:30 AM	6-8	A107, Conv. Center	Science Storylines: Developing Three-Dimensional Lessons That Build on Student Curiosity (p. 46)

Schedule at a Glance Physical Science

11:00 AM-12 Noon	K-5	A107, Conv. Center	Riding the Wave with TCI (p. 48)
11:00 AM-12 Noon	K-5	A108/109, Conv. Center	Waves, Waves, Waves: Building Models to Explain Phenomena (p. 48)
12:30-1:00 PM	4–9	Alaska/Idaho, DoubleTree	It's All Matter with Matter Tag (p. 50)
12:30-1:30 PM	9-12	C122, Conv. Center	Meet the Standards and Enhance Your Chemistry Classroom with Other
			People's Money (p. 51)
12:30-1:30 PM	6-8	D131, Conv. Center	Ocean Plastic Pollution: Examining Issues and Solutions in a Middle School
			Classroom (p. 52)
12:30-1:30 PM	6-12	D133/134, Conv. Center	Inquiring Minds Want to Know (p. 52)
12:30-1:30 PM	8-12	A103/104, Conv. Center	Constructing and Crossing Cell Membranes (p. 53)
2:00-3:00 PM	8-12	D133/134, Conv. Center	Ocean Acidification as a Way to Teach Multidisciplinary Science and
			NGSS (p. 57)
2:00-3:00 PM	8-C	A103/104, Conv. Center	The Many Jobs of Proteins: Enzymes in the Spotlight (p. 59)
2:00-3:00 PM	K-5	B117/118, Conv. Center	What Does Conceptual Modeling Look Like in an Elementary Classroom?
2:00-3:00 PM	6-8	B116, Conv. Center	Chemical Batteries (p. 60)
2:00-3:00 PM	9-12	B114/115, Conv. Center	Teaching Forensics with Real Crime Scene Investigation Techniques from
			Flinn Scientific (p. 60)
2:00-3:00 PM	6-12	D139, Conv. Center	Science from the Stratosphere: STEM Activities in the Infrared (p. 57)
2:00-3:00 PM	5-С	Oregon Blrm. 204, Conv. Center	NESTA Shares: Using the CLEAN Collection of Resources to Teach Energy and Climate (p. 58)
2:00-3:00 PM	9-12	C122, Conv. Center	Using Pop Culture and Polymers to Create Inquisitive Minds (p. 56)
3:30-4:30 PM	6-8	B116, Conv. Center	Reclaiming the Metal (p. 65)
3:30-4:30 PM	6-12	B113, Conv. Center	CPO Science's Link [™] Module: Learning About Chemistry Models (p. 65)
3:30-4:30 PM	5-12	Ross Island, DoubleTree	PolyWhat? Understanding What a Polymer Is (Polymer 101) (p. 61)
5:00-6:00 PM	6-10	D131, Conv. Center	Looking for a Way to Teach Matter and Energy Through a Model-Based
			Approach? (p. 67)
5:00-6:00 PM	9-12	D139, Conv. Center	Connect Chemistry to Your World with ChemClub (p. 67)
5:00-6:00 PM	6-8	E141, Conv. Center	Light in the Deep Sea (p. 67)
5:00-6:00 PM	5-7	E143, Conv. Center	Communicating Science Through Narrative Writing (p. 68)
5:00-6:00 PM	6-11	B110, Conv. Center	Using the National Science Olympiad and STEM to Address NGSS
			Crosscutting Concepts and Content (p. 66)

Friday

8.00 9.00 AM	9 12	E142 Conv. Center	NSTA Pross® Sossion, Argument Driven Inquiry in Chamistery Lab Investigations
0.00-9.00 MM)=12	L1+2, Conv. Center	for Grades 9–12 (p. 73)
8:00–9:00 AM	6-12	E141, Conv. Center	Using Recreational UAVs (Drones) for STEM Activities and Science Fair Projects (p. 73)
8:00–9:00 AM	9–C	E143, Conv. Center	AAPT Session: Physics and Engineering in the Classroom and After-School Clubs I: Using Microcontrollers to Collect and Display Results in Fun and Exciting Ways (p. 73)
8:00-9:00 AM	9-12	B113, Conv. Center	Modeling Climate Change Impacts: Dissolving Carbon Dioxide (p. 75)
8:00-9:00 AM	6-8	E146, Conv. Center	ACS Middle Level Session: Solids, Liquids, Gases, and Changes of State (p. 73)
8:00-9:00 AM	6-8	B116, Conv. Center	Waves (p. 75)
8:00-9:00 AM	4-8	A107, Conv. Center	Fun with Freewheelers! Teaching Science and Math with Manipulatives (p. 74)
8:00–9:00 AM	6-8	B114/115, Conv. Center	Hands-On Integrated Science Activities for Middle School from Flinn Scientific (p. 75)
8:00-10:00 AM	9-12	E145, Conv. Center	ACS Session One: Energy in Chemistry—A Macroscopic View (p. 77)
9:30–10:30 AM	9–12	D133/134, Conv. Center	Integrating Green Chemistry and Engineering Design into Every Classroom: Interactive Workshop for High School Educators (p. 79)
9:30-10:30 AM	9-12	B116, Conv. Center	pH Scale and Math Modeling (p. 81)
9:30-10:30 AM	6-12	C122, Conv. Center	Basic Polymer Science for the Science Classroom (p. 78)
9:30-10:30 AM	2-8	B114/115, Conv. Center	3-2-1 Blast Off! (p. 81)
9:30-10:30 AM	6-8	E146, Conv. Center	ACS Middle Level Session: Density: A Molecular View (p. 80)
9:30-10:30 AM	9-12	A105, Conv. Center	Chemistry with Vernier (p. 80)

Schedule at a Glance Physical Science

9:30–10:30 AM	9–12	B113, Conv. Center	Exploring Misconceptions: Speed and Velocity (p. 81) STEM $= 100000000000000000000000000000000000$
9:30-10:30 AM	G	A102/104 C C	3D D : (; f (l D; C : Cl (20))
9:30-10:30 AM	9–C	A103/104, Conv. Center	3D Printing for the BioScience Classroom (p. 80)
9:30–10:30 AM	9–C	E143, Conv. Center	Clubs II: Using an Arduino to Collect Data and Control Motors (p. 80)
9:30-10:30 AM	5-C	Oregon, DoubleTree	Chemistry Concepts STEAM-ified (p. 78)
9:30–10:30 AM	G	E147/148, Conv. Center	Learning About Global Climate Change in a Physics Course for Prospective Teachers (p. 80)
10:30 AM-12:30 PM	9-12	E145, Conv. Center	ACS Session Two: Energy in Chemistry—A Particulate View (p. 83)
11:00 AM-12 Noon	6-8	E146, Conv. Center	ACS Middle Level Session: The Water Molecule and Dissolving (p. 86)
11:00 AM-12 Noon	P-12	A107, Conv. Center	Hands-On Tools for Teaching the Science of Solar Energy (p. 87)
11:00 AM-12 Noon	9–C	E143, Conv. Center	AAPT Session: Physics and Engineering in the Classroom and After-School Clubs III: Student miniROVs in the Classroom, the Field, and in Student Competitions (p. 86)
11:00 AM-12 Noon	6-8	E142, Conv. Center	NSTA Press® Session: Argument-Driven Inquiry in Physical and Life Science: Lab Investigations for Grades $6-8$ (p. 86)
11.00 AM-12 Noon	9_12	B116 Conv Center	Chemical Formula and Amino Acids (n. 88)
11:00 AM-12 Noon	6-12	B113 Conv Center	Exploring Misconceptions: There Is a Difference Between Heat and
11.00 AWI-12 WOOI	0-12	Biris, conv. center	Temperature? (p. 88)
12:30-1:30 PM	K-5	D131, Conv. Center	Squeezing Time In for STEM (p. 90)
12:30-1:30 PM	9-12	C122, Conv. Center	Solids: The Neglected "State" of Chemistry (p. 89)
12:30-1:30 PM	6-8	E146, Conv. Center	ACS Middle Level Session: Chemical Reactions: Breaking and Making
			Bonds (p. 91)
12:30-1:30 PM	5-C	E142, Conv. Center	NSTA $Press$ Session: Argumentation in the Physical Science/Physics
			Science Classroom (p. 91)
12:30-1:30 PM	9–12	E143, Conv. Center	AAPT Session: Developing an Energy Policy for the U.S. (p. 91)
12:30–1:30 PM	5-12	B119, Conv. Center	Coral Reefs: Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources (p. 89)
3:00-5:00 PM	9-12	E145, Conv. Center	ACS Session Three: Energy in Chemistry—An Atomic View (p. 96)
3:30-4:30 PM	9–C	E143, Conv. Center	AAPT Session: How to Make Holograms Using the Litiholo Home Holography Kit (p. 98)
3·30-4·30 PM	7-12	A105 Conv Center	Physics and Physical Science with Vernier (n. 99)
3·30-4·30 PM	K-8	F141 Conv Center	No-Hassle Messy Science with a Wow! Chemical Reactions (p. 98)
3·30-4·30 PM	8-12	D130 Conv Center	Strengthen Your STEM Lessons with the NSTA High School Committee
5.50 1.50 I.H	0 12		Activities (p. 97)
3:30-4:30 PM	8-12	D140, Conv. Center	Corrosion: Chemistry Made Simple, Relevant, and Fun (p. 98)
3:30-4:30 PM	10-12	D135, Conv. Center	Beyond Differential Instruction (p. 98)
3:30-4:30 PM	6-12	D133/134, Conv. Center	Teaching Engineering (p. 98)
3:30-4:30 PM	9-C	C123, Conv. Center	Enzymes: Technology Inspired by Nature (p. 99)
3:30-4:30 PM	9-12	B116, Conv. Center	Energy Flow Through an Ecosystem (p. 99)
5:00-5:30 PM	5-9	D138, Conv. Center	Newton's Laws on Gym Scooters (p. 100)
5:00-6:00 PM	7-12	B110, Conv. Center	Teach Engineering Principles on the Cheap with Concrete (p. 101)
5:00-6:00 PM	5-8	Hawthorne/Sellwood, DoubleTree	Smart Skies LineUp With Math (p. 101)
5:00-6:00 PM	9–12	Oregon, DoubleTree	Integrating Green Chemistry and Engineering Design into Every Classroom for High School Educators (p. 101)
5:00-6:00 PM	K-12	Ross Island, DoubleTree	Spark Students' Curiosity with Chemistry! (p. 101)
5:00-6:00 PM	3-6	D131, Conv. Center	Shared Goals in the New Science and Language Arts Standards for Grades $3-6$ (p. 101)
5:00-6:00 PM	1–7	D133/134. Conv. Center	Reach Higher with Projectiles and the NGSS (p. 102)
5:00-6:00 PM	8-12	Alaska/Idaho. DoubleTree	Old Polymer Labs with 21st-Century Learning
5:30-6:00 PM	8-12	D130, Conv. Center	Using Issues-Based Culminating Projects to Bring STEM to Introductory
			Chemistry (p. 102)
Saturday

8:00-9:00 AM	7-С	E144, Conv. Center	What Do You Mean I Have to Teach Engineering? (p. 106)
8:00-9:00 AM	P-3	D131, Conv. Center	Let's Get Physical: From Force and Friction to Water and Weather (p. 106)
8:00-9:00 AM	4-8	E146, Conv. Center	Inquiry Matters: Identify Unknown Liquids (p. 107)
8:00-9:00 AM	7-12	D135, Conv. Center	Constructing Equitable STEM Activities for All (p. 106)
9:30-10:30 AM	8-12	D130, Conv. Center	A Fun and Relevant Way to Teach Physical Science (Chemistry) Concepts (p. 109)
9:30-10:30 AM	7-12	D139, Conv. Center	A STEM Activity for Physics and Physical Science (p. 110)
9:30-10:30 AM	3-С	Oregon, DoubleTree	Magical Illusions and Scintillating Simulations for STEM (p. 108)
9:30-10:30 AM	3-5	3 Sisters, DoubleTree	Engineering a Robot to Do the Job (p. 109)
9:30-10:30 AM	P-2	D135, Conv. Center	Goldilocks, an Engineer? (p. 110)
9:30-10:30 AM	7–C	C123, Conv. Center	Build a Box: Engineering Food Dye Electrophoresis for NGSS (p. 111)
9:30-10:30 AM	K-8	E143, Conv. Center	No-Hassle Messy Science with a Wow! Atoms, Molecules, and Density (p. 110)
11:00 AM-12 Noon	8-12	D139, Conv. Center	Using the World Issue of Food Security to Teach Multiple NGSS (p. 113)
11:00 AM-12 Noon	7-С	B110, Conv. Center	A Unique Ice Core Investigation that Integrates the Three Dimensions of
			the NGSS and STEM (p. 111)
11:00 AM-12 Noon	3-5	D133/134, Conv. Center	ASTE-Sponsored Session: Integrating ELA and Math with NGSS-Based
			Activities for Elementary Teachers (p. 113)

General Science Education

Thursday

8:00-9:00 AM	K-6	D137, Conv. Center	Differentiating K-6 Science Instruction to Enable All Students to Inquire,
			Explore, Participate, and Achieve Success (p. 40)
8:00–9:00 AM	9–C	Hawthorne/Sellwood, DoubleTree	Advising Our High School Students Toward STEM Degrees and Careers (p. 41)
8:00–9:00 AM	K-11	Ross Island, DoubleTree	Engaging Students in Science Through Virtual Field Trips (p. 39)
8:00–9:00 AM	6-C	Oregon, DoubleTree	Teachers Bridging School and Workplace: Summer in Industry (p. 39)
8:00–9:00 AM	K-8	D140, Conv. Center	Using Learning Progressions to Better Integrate Instruction and Assessment in Three Dimensions (p. 40)
8:00-9:00 AM	G	Oregon Blrm. 203, Conv. Center	Is This Your First NSTA Conference? First-Timer Conference Attendees'
8.00 9.00 AM	4.8	E143 Conv. Contor	Teach Students to Pead Like Scientists! (n. 42)
8.00 9.00 AM	+-0	B119 Conv Center	Where Art and Science Meet $(p, 40)$
8.00 9.00 AM	5 9	E145 Copy Center	NMI STA Sponsored Session: Calling All Middle Level Teachers! (p. 40)
8.00 9.00 AM	5-) K)	B111/112 Conv. Center	Teach Next Can Like Your Hair Is on Firel (n. 43)
8.00 9.00 AM	R-2 P 2	C124 Conv. Center	Experience Amplify Science: Crades K 1 (p. 44)
8:30_9:00 AM	K_{-12}	D138 Conv. Center	Planning for Three-Dimensional Learning (p. 44)
9.30_10.30 A M	2_5	C124 Conv. Center	Experience Amplify Science: Grades 2–5 (p. 47)
9.30-10.30 AM	25 6-12	B113 Conv Center	Solving the Mystery of STEM Using Forensic Science (n. 46)
9.30–10.30 AM	0-12 2-5	B111/112 Conv Center	SEPs Made Fasy (n. 46)
9.30-10.30 AM	2-5 K-5	B117/118 Conv. Center	Engage Students in FOSS Next Generation (n. 47)
9:30-10:30 AM	6-12	$C_{120}/121$ Conv. Center	Using Maggots Elies and Elesh to Solve a Mysteryl (n. 47)
10.30-11.30 AM	G 12	NSTA Science Store	Sean Carroll Booking Signing: The Serengeti Rules: The Ouest to Discover How
10.50 11.50 1101	G	No III belence blore	Life Works, and Why It Matters (p. 44)
11:00 AM-12 Noon	K-12	B114/115, Conv. Center	Engaging Students in Authentic Science Experiences Using Digital Tools (p. 50)
11:00 AM-12 Noon	K-5	B117/118, Conv. Center	The Reflective Assessment Practice: Improving Science Achievement in 10
			Minutes (p. 50)
11:00 AM-12 Noon	6-8	C124, Conv. Center	Experience Amplify Science: Middle School (p. 50)
12:30-1:00 PM	9-С	B110, Conv. Center	Biotechnology Education with a Focus on Careers (p. 50)
12:30-1:00 PM	K-6	D137, Conv. Center	CSSS Session: Presidential Award for Excellence in Mathematics and Science Teaching (p. 50)
12:30-1:30 PM	G	D138, Conv. Center	NSELA-Sponsored Session: Tools for Science Leaders, Part 1 (p. 51)

12:30-1:30 PM	3-12	Morrison, DoubleTree	Time Will Tell: Use of Time-Lapse Photography and Digital Storytelling to Observe Change (p. 51)
12:30-1:30 PM	5-12	A106, Conv. Center	Gains in the Education of Mathematics and Science: What Can GEMS Do for You? (p. 53)
12:30-1:30 PM	G	E141, Conv. Center	Planning and Designing Safe and Sustainable Science Facilities That Meet the NGSS (Science Facilities 101) (p. 52)
12:30-1:30 PM	K-9	Hawthorne/Sellwood, DoubleTree	Designing Elementary Preservice Teacher Preparation Courses with a Focus on STEM-Rich Making Practices (p. 52)
12:30-1:30 PM	1 - 8	E143, Conv. Center	iPadography: Using Devices in the Classroom for More Than Just Photos (p. 53)
12:30-1:30 PM	6-12	D139, Conv. Center	Making Science Accessible Through Technology: Using QR Codes and Video to Construct and Assess Student Comprehension (p. 52)
12:30-1:30 PM	K-5	B117/118, Conv. Center	Scientific Practices: What Does Argumentation Look Like in an Elementary Classroom? (p. 54)
12:30-1:30 PM	K-8	C124, Conv. Center	What Is Amplify Science? (p. 54)
12:30-1:30 PM	K-12	B119, Conv. Center	NGSS@NSTA Forum Session: Developing Coherent Storylines of NGSS Lessons (p. 51)
12:30-1:30 PM	6-12	C120/121, Conv. Center	Zombie Apocalypse! (p. 54)
1:00 - 1:30 PM	5-9	Alaska/Idaho, DoubleTree	Crafting a Cosmos (p. 55)
1:00 - 1:30 PM	9-C	B110, Conv. Center	Students Reading Real Science: Primary Literature in the Classroom (p. 55)
2:00-2:30 PM	9-С	D137, Conv. Center	A Transformational Model for Science Instruction in a 21st-Century Classroom (p. 55)
2:00-3:00 PM	K-12	Hawthorne/Sellwood, DoubleTree	Argumentation in the Science Classroom (p. 57)
2:00-3:00 PM	6-12	D136, Conv. Center	AMSE-Sponsored Session: Moving to Teacher as Facilitator: NGSS and Critical Pedagogy (p. 57)
2:00-3:00 PM	P-8	E142, Conv. Center	NSTA Press® Session: Outdoor Science with Birds, Books, and Butterflies (p. 58)
2:00-3:00 PM	G	E141, Conv. Center	Science Facilities 102: The Architects Have Started Without Me…What Do I Do Now? (p. 58)
2:00-3:00 PM	6-12	B110, Conv. Center	Using Digital Tools to Check for Understanding (p. 56)
2:00-3:00 PM	1-6	E145, Conv. Center	"Phenomenal" Strategies for Teaching NGSS (p. 58)
2:00-3:00 PM	3-8	Morrison, DoubleTree	Increasing Science Engagement and Achievement Through Content Literacy (p. 56)
2:00-3:00 PM	5-C	E146, Conv. Center	So Your Students Won't Talk (Argue)? (p. 58)
2:00-3:00 PM	G	Oregon Blrm. 201, Conv. Center	Featured Presentation: How Should Districts and Schools Focus Professional Development When Starting to Implement <i>NGSS</i> ? (p. 56)
2:00-3:00 PM	K-5	A108/109, Conv. Center	Bring Visual Science into K-5 Classrooms—It's a Game Changer! (p. 59)
2:00-3:00 PM	3-5	B111/112, Conv. Center	Increase Your 3-D Vision of NGSS (p. 59)
2:00-3:00 PM	P-5	A107, Conv. Center	Integrating Literacy and Science—The Wow Factor (p. 59)
2:00-3:00 PM	K-12	C120/121, Conv. Center	The Value of Writing Scientific Explanations in STEM (p. 60)
2:00-3:00 PM	G	C125/126, Conv. Center	Stop Creating Lesson Plans—Start Creating Learning Experiences (p. 60)
2:00-3:00 PM	1-12	A106, Conv. Center	The HMH Science Dimensions of NGSS (p. 59)
2:00-3:00 PM	K-12	B119, Conv. Center	NGSS@NSTA Forum Session: Selecting Phenomena to Motivate Student Sensemaking (p. 56)
3:30-4:30 PM	7–12	D135, Conv. Center	Inclusion: Strategies for Helping Students with Disabilities in the Science Classroom (p. 63)
3:30-4:30 PM	9–12	D133/134, Conv. Center	Problems and Phenomena: Engaging Your Students in Three-Dimensional NGSS Learning! (p. 63)
3:30-4:30 PM	K	E145, Conv. Center	NGSS Storyline Coherence for Kindergarten: Phenomena and Context- Based Units of Study for Kindergarten (p. 63)
3:30-4:30 PM	G	E142, Conv. Center	NSTA Press® Session: Teaching for Conceptual Understanding in Science (p. 62)
3:30-4:30 PM	G	Oregon Blrm. 203, Conv. Center	ASTE-Sponsored Session: Sharing Innovative Program Designs for Professional Development and Research in Science Education (p. 62)
3:30-4:30 PM	6-C	E146, Conv. Center	Zombies Don't Stand a Chance Against STEM! (p. 64)
3:30-4:30 PM	K-12	Oregon, DoubleTree	How to Implement STEM and <i>NGSS</i> into Your Classroom Through the Use of NSTA Competitions (p. 61)

3.30 4.30 PM	0 12	C122 Conv. Contor	The Air We Presthe, Authentic Student Pessarch on Indeer/Outdeer Air
5:50- 7 :50 I M	9-12	C122, Conv. Center	Ω
3:30-4:30 PM	K-12	Alaska/Idaho, DoubleTree	Leadership for Three-Dimensional Teaching and Learning: The
			Washington Science Fellows Program (p. 61)
3:30-4:30 PM	K-5	B111/112, Conv. Center	Liven Up Literacy with Science (p. 65)
3:30-4:30 PM	K-12	B119, Conv. Center	NGSS@NSTA Forum Session: How Should Districts and Schools Focus
			Professional Development When Implementing NGSS? (p. 61)
3:30-4:30 PM	6–9	A106, Conv. Center	Group Work: Using Student Collaboration in the Middle School Science
			Classroom (p. 64)
4:00-4:30 PM	6-12	B110, Conv. Center	iPrize: A Transdisciplinary Innovation Competition (p. 65)
5:00-6:00 PM	4–C	Oregon, DoubleTree	Moving Toward an NGSS Through Project-Based Learning (p. 66)
5:00-6:00 PM	K-6	E142, Conv. Center	NSTA Press® Session: Inside or Out: The Perfect Place for Connecting
			Outdoor Science and Children's Tradebooks (p. 68)
5:5:00-6:00 PM	K-12	Ross Island, DoubleTree	Unraveling NGSS Implementation: Key Points and Discussion (p. 66)
5:00-6:00 PM	K-6	E145, Conv. Center	Preparing Educators to Meet the Demands of NGSS Through a Three-
			Dimensional Professional Development Model (p. 68)
5:00-6:00 PM	G	Morrison, DoubleTree	Authors Needed! Publish Your Teaching Idea in an NSTA Journal (p. 66)
5:00-6:00 PM	6-C	Alaska/Idaho, DoubleTree	Modeling to Promote Accountable Talk (p. 66)

Friday

8:00-8:30 AM	6-12	B110, Conv. Center	Edible Labs (p. 71)
8:00-9:00 AM	3-12	Morrison, DoubleTree	Let the Tablet Tell a Science (Digital) Story! (p. 71)
8:00-9:00 AM	3-10	Hawthorne/Sellwood, DoubleTree	Science Practices: Effective, Fun, and Relevant (p. 72)
8:00-9:00 AM	9-12	C122, Conv. Center	Using Data Proactively to Guide Differentiated Instruction (p. 71)
8:00-9:00 AM	4–C	D132, Conv. Center	Using Problem-Based Learning to Promote Authentic Research and
			Problem Solving and Excite Interest for Students of All Levels (p. 71)
8:00-9:00 AM	K-8	D131, Conv. Center	Promising Practices in STEM Education for English Language Learners (p. 72)
8:00-9:00 AM	K-2	D130, Conv. Center	STEM in the Primary Classroom (p. 71)
8:00-9:00 AM	G	Oregon, DoubleTree	STEM P3: A Statewide Programs/Policy Partnership to Advance PreK-12
			STEM Education (p. 71)
8:00-9:00 AM	G	D138, Conv. Center	NARST-Sponsored Session: The Efficacy of Multi-Level Professional
			Development for Elementary, Middle School, and High School Teachers (p. 72)
8:00-9:00 AM	3-С	D137, Conv. Center	AMSE-Sponsored Session: Building an Equitable Science Classroom
			Community: Strategies by and for Teachers (p. 72)
8:00-9:00 AM	6-C	D135, Conv. Center	Infect Your Science Classroom with Math (p. 73)
8:00-9:00 AM	G	D133/134, Conv. Center	Three-Dimensional Formative Assessment (p. 72)
8:00-9:00 AM	6-8	C124, Conv. Center	Implementing Science Seminars and Scientific Argumentation with Amplify
			Science (p. 76)
8:00-9:00 AM	3-12	A105, Conv. Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 74)
8:00-9:00 AM	K-12	C120/121, Conv. Center	STEM Literacy: Strategies for Making Complex Text Meaningful (p. 75)
8:00-9:00 AM	G	C125/126, Conv. Center	Stop Creating Lesson Plans—Start Creating Learning Experiences (p. 76)
8:00-10:00 AM	K-6/C	Multnomah, DoubleTree	Articulating the "Why": Science in the Elementary Years (p. 76)
9:30-10:00 AM	K-5	D130, Conv. Center	3-D Outdoor Learning Strategies (p. 78)
9:30-10:30 AM	3-8	D131, Conv. Center	Developing Project-Based Learning Units in Partnership with STEM
			Professionals: Real-World Project Examples (p. 79)
9:30-10:30 AM	6-12	Hawthorne/Sellwood, DoubleTree	Do I Really Want Them to Argue? (p. 79)
9:30-10:30 AM	6-12	E141, Conv. Center	Do You See What I See? (p. 79)
9:30-10:30 AM	K-12	Morrison, DoubleTree	The Role of Community Partnerships in FieldSTEM Plus (p. 78)
9:30-10:30 AM	4-8	Alaska/Idaho, DoubleTree	Yes! You Can Teach Computer Science with Scalable Game Design! (p. 78)
9:30-10:30 AM	9-12	E144, Conv. Center	Teach an Old Dog New Tricks: Engaging Older Students in STEM
9:30-10:30 AM	6-12	D140, Conv. Center	GAUGE: A Novel NGSS-Based Grading System (p. 79)
9:30-10:30 AM	G	Oregon Blrm. 201, Conv. Center	Featured Presentation: Implicit Bias and Its Effect on Diverse Youth (p. 77)

9:30-10:30 AM	P-3	Oregon Blrm. 203, Conv. Center	CESI-Sponsored Session: Integrating Science for Young Children with an Outdoor Focus (n. 80)
9·30-10·30 AM	P_6	D137 Conv. Center	Solving the Mystery of the Megaflood with Fourth-Graders! (n. 78)
9.30-10.30 AM	6-8	A108/109 Copy Center	Learning By Arguing: Claims Evidence and Reasoning (n. 81)
9.30_10.30 AM	K_12	$C_{120}/121$ Conv. Center	Building the Skills of Argumentation and Collaboration in STEM (p. 82)
9:30-10:30 AM	к 12 7–С	Ross Island DoubleTree	Baby Carrots Are Killing You! (p. 78)
9.30-10.30 AM	7–С С	A106 Copy Center	FOI D-tastic Science Notebooks via Dinah Zike's Notebook Foldables (n. 81).
9.30 10.30 AM	5 8	A107 Conv. Center	Discourse Tools for Equitable and Bigorous Talk (p. 81)
10.30_12.30 PM	K = 6/C	Multhomah DoubleTree	Taking Stock and Planning for Three-Dimensional Science Teaching and
10.30-12.30 1 10	K-0/ C	Multionian, Double free	Learning in Elementary Schools (p. 83)
11:00 AM-12 Noon	K-12	Hawthorne/Sellwood, DoubleTree	Transitioning Instructional Materials for the NGSS (p. 85)
11:00 AM-12 Noon	С	B119, Conv. Center	The NSTA Learning Center: A Tool to Develop Preservice Teachers (p. 84)
11:00 AM-12 Noon	G	D130, Conv. Center	Eureka! Science Trade Books—Good as Gold! (p. 84)
11:00 AM-12 Noon	G	Morrison, DoubleTree	Identity Crisis? From Science Teacher to District-Based Science Specialist (p. 84)
11:00 AM-12 Noon	K-8	D136, Conv. Center	Teaching Science Practices and the Nature of Science (p. 85)
11:00 AM-12 Noon	1-5	D131, Conv. Center	Transforming Elementary Grade-Level Science Demonstrations from Ordinary to Inquiry (p. 85)
11.00 AM-12 Noon	4–C	Oregon DoubleTree	Dazzling Decentions: Discrepant Events That Delight and Mystify! (p. 84)
11.00 AM-12 Noon	P-8	Oregon Blrm 203 Conv Center	CESI-Sponsored Session: Elementary Science Share-a-Thon (p. 86)
11.00 AM-12 Noon	G	D138 Conv Center	NSELA-Sponsored Session: Tools for Science Leaders. Part 2 (p. 85)
11:00 AM-12 Noon	6-12	C122 Conv. Center	Do You Need a New Science Lab? (n. 84)
11:00 AM-12 Noon	P_5	Oregon Blrm 201 Conv Center	Featured Presentation: Beyond the Blender Metaphor of Integration: NGSS
		oregon zanar zor, contri conter	as a Lever for Transforming Educational Opportunities for Elementary
11 00 AN 12 M	V 10		Learners (p. 85) $M = \{F, N\}$
11:00 AM-12 Noon	K-12	B114/115, Conv. Center	Magnify Your Mind!—With The Private Eye® (p. 88)
11:00 AM-12 Noon	6-12	C120/121, Conv. Center	Using Maggots, Files, and Fiesh to Solve a Mystery! (p. 88)
11:00 AM-12 Noon	9–12	E144, Conv. Center	How to Engage Students in Three-Dimensional Learning Around NGSS: Two Examples Units (p. 86)
11:00 AM-12 Noon	1-5	C125/126, Conv. Center	CONNECTIONS: Three-Dimensional Learning by National Geographic
			Explorers (p. 88)
11:00 - 5:30 PM	6-12	Mt. Hood, DoubleTree	SC-2: Supporting the <i>NGSS</i> with Process-Oriented Guided Inquiry Learning (POGIL) (p. 89)
12:30-1:30 PM	3-12	Ross Island, DoubleTree	Deliver Your Science Content with iPads in Your 1:1 Classroom (p. 89)
12:30–1:30 PM	P-12	Alaska/Idaho, DoubleTree	Strategies and Tools for Ensuring Each K–12 Student Has a STEM Future (p. 89)
12:30–1:30 PM	K-12	Oregon, DoubleTree	The NGSS@NSTA Hub (p. 89)
12·30–1·30 PM	K-5	D131 Conv Center	Squeezing Time In for STEM
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3:30-4:30 PM	4-12	Oregon, DoubleTree	The Multi-Level Classroom: Differentiation to Reach All Students in Science (p. 97)
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3:30-4:30 PM	K-8	E147/148, Conv. Center	How to Assess Three-Dimensional Learning in Your Classroom: Building Tasks That Elicit NGSS Practices (p. 99)
3:30 - 5:00 PM	G	D132, Conv. Center	Equity in Science Education Roundtable (p. 100)
5:00-5:30 PM	6-12	D140, Conv. Center	What Does STEM Education Look Like in Grades 6–12 Science Classrooms? (p. 100)
5:00-6:00 PM	9-12	C122, Conv. Center	Stories in the Secondary Science Classroom (p. 101)
5:00-6:00 PM	6-12	E141, Conv. Center	Yes, You Can Teach Circuits and Programming!
5:00-6:00 PM	9-С	D137, Conv. Center	Perspectives on Time as a Means of Optimizing Science Instruction in a Diverse Classroom (p. 101)
5:00-6:00 PM	8-12	Alaska/Idaho, DoubleTree	Old Polymer Labs with 21st-Century Learning
5:30-6:00 PM	7–9	D140, Conv. Center	Linking the Three Dimensions of Science Education Using the Framework and the NGSS (p. 102)

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			Teaching Strategies to Engage Students in the Science Classroom (p. 105)
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8:00-9:00 AM	9-12	C122, Conv. Center	Advancing Scientific Literacy with Inquiry Lesson Plans Using Science
			Reading Materials (p. 105)
8:00-9:00 AM	6-12	D138, Conv. Center	The Art of Communicating Science: A Practical Toolkit (p. 105)
8:00-9:00 AM	K-12	Alaska/Idaho, DoubleTree	NOAA in Your Backyard: Free Professional Development and Local
			Educator Resources Are Closer Than You Think! (p. 105)
8:00-9:00 AM	3-12	D139, Conv. Center	DIG Field School: Paleontologists and Teachers Together in the Field
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8:00-9:00 AM	G	Ross Island, DoubleTree	Grey Matter: Learning and Teaching Science with the Brain in Mind (p. 105)
8:00-9:00 AM	K-6	Morrison, DoubleTree	Supporting Elementary Literacy Development Through Science: Three Key
			Strategies for Shifting Elementary Science Kits to Improve Literacy Skill
			Development (p. 105)
8:00-9:00 AM	K-12	E145, Conv. Center	How to Make Science Instruction Compelling for Students: Designing
			Formative Assessments to Build on Learners' Interests and Knowledge (p. 107)
9:30-10:30 AM	K-12	Alaska/Idaho, DoubleTree	Developing a Leadership PD Toolkit for the Next Generation of Science
			Education Leaders (p. 108)
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			Science (p. 112)
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			Integration of All STEM Disciplines: Explorations with Physical
			Structures, Plants, and Everyday Household Tools (p. 111)
11:00 AM-12 Noon	K-12	Alaska/Idaho, DoubleTree	STEM Teaching Tools: Linking Research and Practice (p. 111)
11:00 AM-12 Noon	9-12	C122, Conv. Center	Interactive Notebooks in the Secondary Science Classroom (p. 112)
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Informal Science Education

Thursday

12:30-1:30 PM	G	Ross Island, DoubleTree	ISE Science in the Community Forum: Highlighting Programs and
			Practices that Bridge In-School and Out-of-School STEM Learning (p. 51)
1:00-4:00 PM	2-6	3 Sisters/Mt. Bachelor, DoubleTree	SC-1: NASA's Exploration of the Solar System: Activities for Out-of-School
			Time (p. 55)
2:30-3:00 PM	5-12	Alaska/Idaho, DoubleTree	Space-Age STEM: Virgin Galactic's Virtual Connection, Mentorship, and
			Experimentation Hangouts (p. 61)
5:00-6:00 PM	6-11	B110, Conv. Center	Using the National Science Olympiad and STEM to Address NGSS
			Crosscutting Concepts and Content (p. 66)
5:00-6:00 PM	9-12	D139, Conv. Center	Connect Chemistry to Your World with ChemClub (p. 67)

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9:30-10:30 AM	K-12	B110, Conv. Center	Leveling the Playing Field: After-School STEM Coaching Model (p. 78)
9:30–10:30 AM	9–C	E143, Conv. Center	AAPT Session: Physics and Engineering in the Classroom and After-School Clubs II: Using an Arduino to Collect Data and Control Motors (p. 80)
9:30–10:30 AM	K-5	D139, Conv. Center	ASEE Session: Engineering a Pathway to STEM: Advancing Elementary Level Engineering Education Through Innovative Programs and Partnerships (p. 79)
11:00 AM–12 Noon	9–C	E143, Conv. Center	AAPT Session: Physics and Engineering in the Classroom and After-School Clubs III: Student miniROVs in the Classroom, the Field, and in Student Competitions (p. 86)
11:00 AM-12 Noon	G	D132, Conv. Center	ASTC-Sponsored Session: Informal Science Educators Networking Brown Bag Lunch (p. 85)
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12:30–1:30 PM 2:00–3:00 PM 3:30–4:30 PM 5:00–5:30 PM	3-8 3-8 5-C 5-10	D138, Conv. Center C125/126, Conv. Center B119, Conv. Center Morrison, DoubleTree	Developing Science Process Skills Through Schoolyard Investigations (p. 90) The STEM Design Challenge (p. 95) Globe at Night Citizen Science Program (p. 97) Science Outside: No Box Needed (p. 100)

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9:30-10:30 AM	G	B119, Conv. Center	NARST-Sponsored Session: Resisting Racist, Classist, Neoliberalism in Science Education (p. 108)

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	11:00 a.m.–12:00 p.m.	Biology with Vernier
	12:30–1:30	Integrating Chromebook [™] with Vernier Data-Collection Technology
	2:00–3:00	Integrating iPad [®] with Vernier Data-Collection Technology
	3:30-4:30	Physics and Physical Science with Vernier





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