NSTA AREA CONFERENCE ON SCIENCE EDUCATION

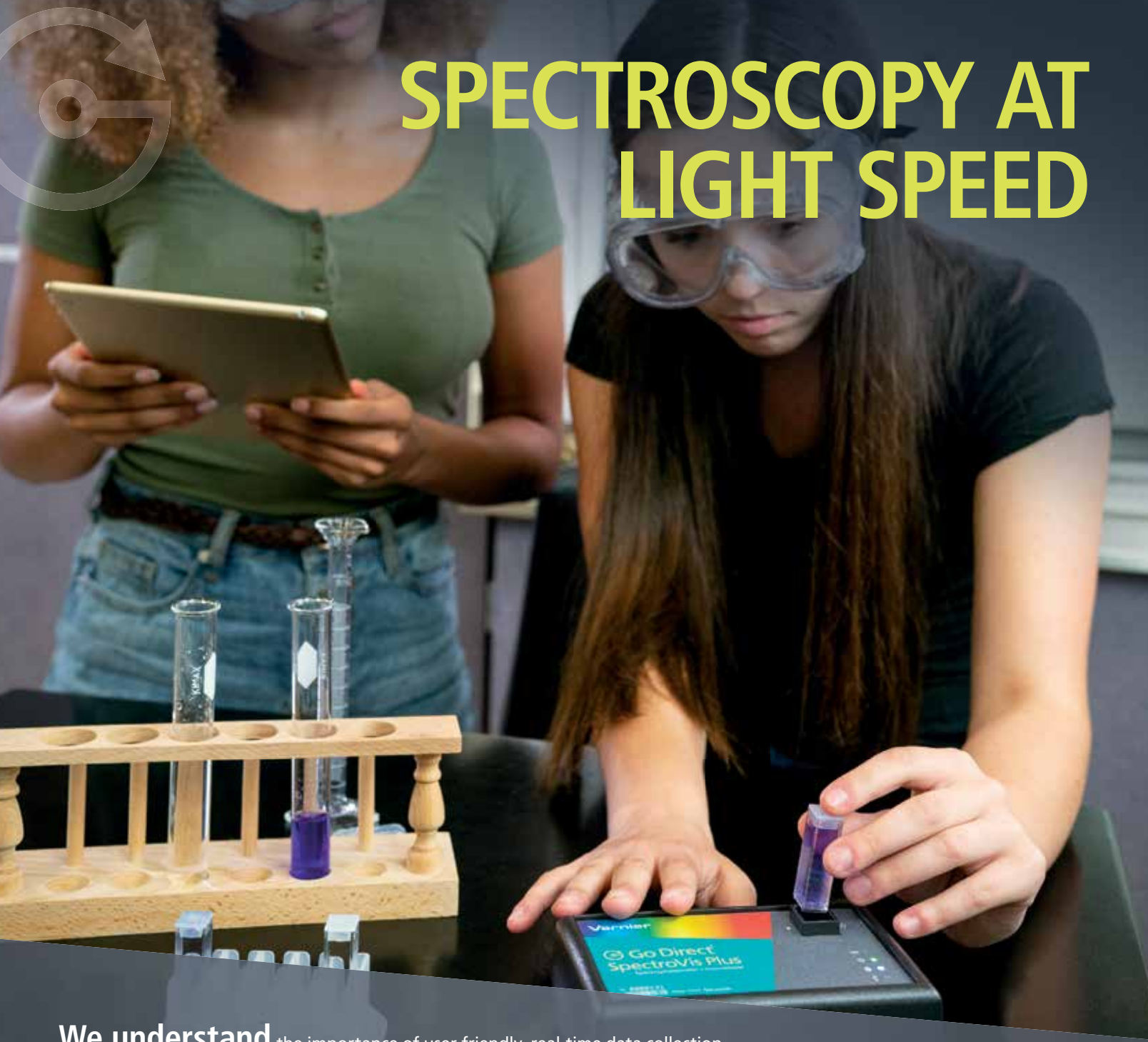
ELEVATING SCIENCE:
Digging Deeper

RENO, NV

OCTOBER 11–13, 2018

#NSTA18

NSTA National Science Teachers Association



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School Is IN!

Your NSTA member benefits are begging to be used...like your Science Store discount to stock up on your book collection for the year. Also, as a member you'll save on conference registration to our upcoming fall conferences coming to a city near you!

Only at NSTA can you get these savings and top-notch professional development. Visit *www.nsta.org/conferences* to register.

National Harbor, MD	Charlotte, NC
Nov. 15–17	Nov. 29–Dec. 1

Share your #onlyatNSTA moments with us on Twitter @NSTA

Learn about all your membership benefits at *www.nsta.org/membership*

NSTA National Science Teachers Association

Visit the NSTA STORE

Registration Lobby

STORE HOURS

Wednesday, Oct. 10	5:00 PM – 7:30 PM
Thursday, Oct. 11	7:30 AM – 5:30 PM
Friday, Oct. 12	7:30 AM – 4:30 PM
Saturday, Oct. 13	8:00 AM – 12 Noon

Travel light with **FREE Shipping** for in-store orders!

We have the latest resources for science teachers, including new releases and bestsellers!

- Purchase fun NSTA-branded gear—unique hats, shirts, mugs, and more.
- Join NSTA to get member pricing: 20% off bestseller NSTA Press® titles.
- Ask about our NSTA gift cards—great gift idea!

Download the conference app or follow #NSTA18 for special giveaways, contests, and more throughout the conference!

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

NSTA National Science Teachers Association

NSTA 2018 Area Conference on Science Education

Elevating Science: Digging Deeper

Reno, Nevada • October 11–13, 2018

Reno, NV Area Conference
October 11 – 13, 2018

National Science Teachers Association

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

NSTA Affiliates

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

Welcome to Reno: Elevating Science: Digging Deeper

Left to Right: Megan Beckam, Camille Stegman, and Sylvia Scoggin

Welcome to Reno, the "Biggest Little City in the World"! The conference committee is honored that you are here to join your fellow educators as we engage in our theme of "Elevating Science: Digging Deeper." Our three conference strands were chosen based on the current needs of science teachers both regionally and beyond:

- *Developing Persistence: The Power of Experience:* Sessions focus on the struggles and triumphs of learning and explanation development.
- *Advancing Three-Dimensional Classroom Culture:* Choose hands-on sessions that fit with where you are in the learning continuum.
- *Cultivating Constructive Partnerships:* How can you move beyond the walls of your classroom to collaborate with colleagues, informal educators, scientists, and the community?

We hope that you plan your schedule to take advantage of the many opportunities for learning and collaborating available from featured keynote speakers to engaging short courses to events like Engineering Day, and, of course, all of the fantastic sessions! Consider hearing NSTA's president, Christine Anne Royce, moderate Children's Literature: Using Phenomena to Uncover Student Questions and don't forget to check out the Exhibit Hall. Thank you to all who have helped to put this conference together; we truly appreciate your dedication and service!

We are excited that you are here and look forward to meeting you! As science educators and leaders, you have the expertise and vison to take science education forward. Please stop by the NSSTA booth to learn more about how we can support you in your teaching and learning and get great recommendations on local eats and events!

2018 Reno Area Conference Committee Leaders
Megan Beckam, Camille Stegman, and Sylvia Scoggin

Reno Conference Committee

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

Conference Chairperson

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Gia Torcaso
Spanish Springs High School
Sparks, NV

Program Committee

Strand Leader: Developing Persistence: The Power of Experience
Kristoffer Carroll
Southern Nevada Regional Professional Development Program
North Las Vegas, NV

Strand Leader: Advancing Three-Dimensional Classroom Culture
John R. Taylor
Southern Utah University
Cedar City, UT

Strand Leader: Cultivating Constructive Partnerships
Deb Novak
NSTA Director, District XIII, and
New Mexico Museum of Natural History & Science
Albuquerque, NM

Program Representatives
Stacy Cohen
Regional Professional Development Program (RPDP)
North Las Vegas, NV

Lisa Hegdahl
McCaffrey Middle School
Galt, CA

President's Welcome

Together, We Advocate for Science Education: Tenacity—Leadership—Collaboration

What better place to start our fall conference season than in Reno and the Sierra Nevada Range! The Conference Planning Team appropriately picked "Elevating Science: Digging Deeper" for the theme of this conference as the Sierra Nevada range sits upon normal faults that are responsible for the uplift of these mountains. The following three strands help all of us dig deep in the learning and design process in order to find ways to elevate our understanding and that of our students.

The strand titled *Developing Persistence: The Power of Experience* is at the heart of what we as educators do every day. Persistence is what we strive to instill in our students by providing carefully constructed experiences for all students in order to help them climb higher and reach new heights in their understanding.

Whether a novice or an expert, digging into the *Advancing Three-Dimensional Classroom Culture* strand will help attendees uncover their understanding of 3-D instruction and enhance their ability to develop storylines, and integrate the crosscutting concepts and the science and engineering practices into their lesson design.

Finally, the *Cultivating Constructive Partnerships* stands asks educators to bring together team members from across their district, local businesses, and the community in order to advocate for their students, for science, and for the importance of science education in today's world.

I encourage each of you to reach for new heights as you engage in your own learning by participating in keynote presentations, selected strand sessions, exhibit hall displays, and more than 200 sessions, as well as taking advantage of special offers from local venues.

Again, a special thank you to the conference planning committee for developing all of these topics and opportunities that provide professional experiences and development. May you have an outstanding experience with your colleagues and fellow NSTA members as you dig deep into learning and make strides to elevate not only the importance of science but also that of science education.

Christine Anne Royce
2018–2019 NSTA President

Sponsors and Contributors to the Reno Conference

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

Sponsors

Discovery Dome
National Geographic Learning | Cengage
Nevada State Science Teachers Association (NSSTA)
Southwest Airlines
Texas Instruments
Vernier Software & Technology

Contributors

American Chemical Society
American Society for Engineering Education
Nevada Space Center
Terry Lee Wells Nevada Discovery Museum (The Discovery)

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

NSTA Conferences Go Green!

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

Conference Previews

Gone are the days of bulky, newspaper-style advance programs. 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 conference app and our website using the Session Browser. Scheduling information on our website and app 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 inks that are formulated with bio-renewable resins and vegetable oils.

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.

Reno-Sparks Convention Center and Atlantis Casino Resort Spa's Green Practices

The **Reno-Sparks Convention Center** Green is committed to reducing its carbon footprint. Its recycling and waste reduction initiatives include:

Recycling and Waste Reduction: Our food and beverage provider, SAVOR, is committed to the following initiatives:

- 95% of all disposable products are biodegradable.
- We recycle 100% of fryer oil.
- We plan to recycle 100% of all cardboard and paper by the end of 2018.
- We plan to be composting all relevant waste by June 2019.
- We plan to be recycling all glass and aluminum by June 2019.
- We plan to utilize 100% biodegradable straws by the end of 2018.

The **Atlantis Casino Resort Spa** has taken many steps toward making green initiatives a possibility. The Green Building Initiative (GBI) awarded the property with the Four Green Globes certification for its energy-efficient measures such as light sensors, energy management systems, and variable speed drives to capture measurable energy savings. Atlantis was the first casino in Northern Nevada to launch an organics recycling program. Along with that program, the resort features EPA-approved mattresses, low-energy light bulbs, water efficient shower heads, biodegradable laundry detergents and soaps, and energy efficient dishwashers. These initiatives are among the many changes this resort has made to decrease its carbon footprint.

"Go Green" at the Reno 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.
- If you prefer to bring handouts to your session, use double-sided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the conference.
- Evaluate sessions attended via the conference app.

Meeting Location and Times

The conference hotels are Atlantis Casino Resort Spa and Peppermill Resort Spa Casino. Conference registration, exhibits, the NSTA Community Hub, the NSTA Store, exhibitor workshops, and many sessions will be located at Reno-Sparks Convention Center. Other sessions and events will be held at the Atlantis. The conference will begin on Thursday, October 11, at 8:00 AM, and end on Saturday, October 13, at 12 Noon.

Registration

Registration is required for participation in all conference activities and the exhibits. If you registered in advance, then you should have received a registration confirmation by e-mail. Proceed to "Express Check-In" located in the Registration Lobby during the registration hours listed below to print your official badge and secure conference materials. This lapel badge is your "ticket of admission" to the Exhibit Hall and all conference activities except those for which a separate fee is stated.

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

Wed., Oct. 10	5:00–7:00 PM
Thu., Oct. 11	7:00 AM–5:00 PM
Fri., Oct. 12	7:00 AM–4:00 PM
Sat., Oct. 13	7:30 AM–12 Noon

If you misplace your badge, present your personal ID at Attendee Services in the Registration Area and you will be issued a replacement. Only one replacement badge will be issued.

Ground Transportation to/from Airport

Reno-Tahoe International Airport is within a 10-minute ride of all the major hotels in the area. The airport is proud to offer a variety of convenient travel options, including taxis, limousines, and rideshare.

NSTA's designated conference hotels Atlantis Resort and Peppermill Resort provide complimentary shuttle service to/from the airport (shuttles are located on the lower level at baggage claim).

Uber and Lyft are also options for travel to/from the airport. Passengers may be dropped off anywhere along the front curb of the terminal building. Pickup is allowed in the ground transportation area located north of baggage claim. Follow signs outside of the D Doors, at the far north end of baggage claim, and look for the rideshare shelter.

Taxi service is located on the lower level at baggage claim. Average taxi fare to/from the airport is $15.

—*Photo courtesy of* VisitRenoTahoe.com

Getting Around Town

You'll find that the Atlantis and Peppermill, attractions, restaurants, and nightlife are located within comfortable walking distance of each other. Or you can take one of the RTC–Regional Transportation Commission Washoe County Nevada buses. Call RTC Customer Service at 775-348-RIDE (348-7433) to locate the bus stop location nearest you. Visit *www.rtcwashoe.com/public-transportation* for more information.

Parking

The Convention Center has 1,900 parking spaces; A and B lots are the closest to the NSTA meeting space at the Convention Center. Parking is $10 per day. The Atlantis and Peppermill both offer complimentary parking and complimentary valet parking.

Airlines

NSTA has made arrangements with several major airlines to offer discounted fares to Reno conference attendees. Visit *www.nsta.org/renotravel* for details.

Discounted Rental Cars

Alamo Car Rentals—Receive discounts by booking online at *www.alamo.com* and providing the Discount Code number CD#LEADERS or calling Alamo at 844-354-6962.

Hertz Car Rentals—Receive discounts by booking online at *www.hertz.com* and providing the Discount Code number #1170024 or calling Alamo at 800-654-3131.

Registration, Travel, and Hotels

1. **Atlantis Casino Resort Spa–Reno**
   (Headquarters Hotel)
   3800 S. Virginia St.

2. **Peppermill Resort Spa Casino**
   2707 S. Virginia St.

Shuttle transportation between the Peppermill Resort Spa Casino (outside the main hotel entrance) and the Convention Center will be provided courtesy of the Peppermill, as follows:

Wed., Oct. 10	4:30–7:30 PM
Thurs. Oct. 11	6:30–9:30 AM/3:30–6:30 PM
Fri. Oct. 12	6:30–9:30 AM/2:00–5:00 PM
Sat., Oct. 13	7:00 AM–1:00 PM

If you have questions or concerns regarding your housing, please contact Orchid.Events (during business hours) Monday through Friday, 7:00 AM–6:00 PM MT at 877-352-6710, or e-mail *help@orchid.events*. After hours and on Saturday, call 801-243-4476.

—*Photo courtesy of Jacob Slaton*

The NSTA Conference app provides all the tools necessary for a successful experience!

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 more. You are sure to discover something new and exciting to take back to your classroom. Also make sure to stop by the Teacher's Lounge in the Exhibit Hall where we will have a variety of fun activities for you to enjoy. And finally, don't miss out on winning a Southwest airline ticket and FREE registration for the 2019 National Conference in St. Louis by engaging with exhibitors and banking poker chips for your chance to win! For complete details, visit the NSTA Community Hub, located at booth# 715.

The lapel badge issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities. Maps of the Exhibit Hall and others meetings rooms will be accessible via our Conference app (see page 24). See page 95 for a complete list of exhibitors and contact information.

Exhibit Hall Hours. Located in Hall 3, exhibits will be open for viewing during the following hours:

Thu., Oct. 11	11:00 AM–5:00 PM
Fri., Oct. 12	9:00 AM–4:00 PM
Sat., Oct. 13	9:00 AM–12 Noon

Did you know that NSTA offers Exclusive Exhibits Hall and Exhibitor Workshop hours? During these hours, there are no teacher sessions scheduled and it's a perfect time to visit the exhibits or engage in an exhibitor workshop and discover all the products and services companies and organizations have to offer.

Thu., Oct. 11	11:00 AM–12:30 PM
Fri., Oct. 12	3:00–4:00 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 103 for a complete listing of exhibitor workshops.

NSTA Store

Visit us at the NSTA 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 classroom supplies. We offer convenient free shipping for book purchases to addresses within the United States when you place your order on-site at the conference. *Note:* Free shipping is not offered to international addresses or for NSTA gear purchases.

We've lined up a number of unique opportunities for conference-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—including *Engineering in the Life Sciences, 9–12; Reading Nature: Engaging Biology Students With Evidence From the Living World; Instructional Sequence Matters, Grades 6–8: Structuring Lessons With the* NGSS *in Mind; The Power of Assessing: Guiding Powerful Practices;* and *Eureka, Again! K–2 Science Activities and Stories*—and our newest children's books from NSTA Kids, *Exemplary Evidence: Scientists and Their Data* and *The Beaks of Birds*
- "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
- Daily book and gear specials, product giveaways, and more.

Presenters and Presiders Check-In

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

NSTA Community Hub

Be sure to stop by the NSTA Community Hub, located at Booth #715 in the Exhibit Hall. While you're there, ask us about the prizes you can win! Find out more about the benefits of becoming an NSTA member, including all the best professional development and resources a science educator needs.

The NSTA Community Hub will be open during exhibit hall hours.

Meet the Presidents and Board/Council

Be sure to stop by Friday from 2:45 to 3:30 PM at the entrance to Hall 3 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!

We will be giving away **several gift cards for use in the NSTA Store totaling $100.** Must be present to win. Drawing will take place at 3:20 PM.

Wi-Fi in Convention Center and Atlantis

Limited complimentary Wi-Fi is offered in all concourse and lobby areas of the Convention Center with speeds up to 256k up/down. The SSID is Free WIFI, with no password and is meant for light web browsing. You can purchase Wi-Fi for use in the meeting rooms and the exhibit hall for $12.95/day. Call Smart City at 888-446-6911.

The Atlantis provides complimentary Wi-Fi throughout its property. No password is needed; simply go online and agree to the Atlantis terms.

RenoTahoe Table

Please visit us in the Registration Lobby of the Convention Center for maps of Reno and Tahoe and visitor planners detailing activites and restaurants in the area.

Wednesday	3:00–7:00 PM
Thursday	9:00 AM–5:00 PM
Friday	8:00 AM–4:00 PM

NSSTA and CSTA Booth

The Nevada State Science Teachers Association (NSSTA) and the California Science Teachers Association (CSTA) booth is located in the Registration Lobby of the Convention Center. The booth will have membership forms and information about science activities in Nevada, as well as our neighboring state, California. Also, NSSTA has arranged reservations at several downtown restaurants. Stop by our booth to sign up with your friends or to make new ones!

Reno's Friday Night on the Town!

Start Your Evening with a Welcome Reception

Hosted by the Nevada State Science Teachers Association (NSSTA)
Sponsored by National Geographic Learning | Cengage

Friday, October 12 • 6:00–8:00 PM
Terry Lee Wells Nevada Discovery Museum*

Tour the Terry Lee Wells Nevada Discovery Museum and join us for hors d'oeuvres and beer/wine. Enjoy a few stories with our guest speaker Zeb Hogan, a National Geographic Explorer and host of *Monster Fish.*

Tickets, if still available, may be purchased at the NSSTA Booth for $10. All ticket fees will be donated to the Discovery Museum. Each ticket includes a free drink token during the event. Pick up your drink token at the Cengage Booth (#408) by 3:00 PM on Friday.

Afterwards, attend our "Dine About Town" at some great Reno downtown restaurants.
NSSTA has arranged reservations at several downtown restaurants close to the museum.
Stop by the NSSTA booth to sign up with your friends or to make new ones.

**Uber to the museum for approximately $10*

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 experience. Search sessions, exhibitors, and speakers to build a schedule of your favorites. Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, Atlantis, and Exhibit Hall; social media plugins; and a note-taking tool. Visit *www.nsta.org/conferenceapp* to download the app.

Audiovisual Needs

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

- A15, Convention Center
- Treasures A, Atlantis

First Aid Services/Mothers Room

The first aid room is located outside Hall 3 of the Convention Center, across from Rooms D5 and F10. For emergencies, dial 1 from any Convention Center house phone or call 775-827-7629; your call will be directed to security who can dispatch the EMT.

A mothers/lactation room will be available during conference hours. You may request a key to this room at the Conference Services booth in the Registration Lobby of the Convention Center.

Lost and Found

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

All lost-and-found items in the Atlantis will be turned in at the Security/Lost and Found office. Please contact a security officer at extension #4544 or 775-335-4544.

Graduate Credit Opportunity

Reno conference attendees can earn one (1) or two (2) graduate-level credit/units in professional development through Dominican University of California course **#EDUO 9031.** Cost is $95 for one credit/unit or $190 for two credits/units.

Learn more about the assignment requirements at *bit.ly/2QI3KFQ.*

Deadline is November 30, 2018.

Business Services

Located on the second floor next to the Arcade, the Atlantis Business Center services include photocopies and laser prints (color and black/white), faxes, computer stations with internet access, and complimentary printing of boarding passes. Shipping services via UPS and FedEx are also offered. Hours are:

Monday–Friday	7:00 AM–6:00 PM
Saturday–Sunday	Closed

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 completing session evaluations on our conference app October 11–25, 2018, while the session is fresh in your mind!

To evaluate a session, attendees should follow these steps:

- Using the conference app, first click **My Planner** and log in with your e-mail address and password.
- Once logged in, click **Home** and then select **Session & Workshop Listings** to find the session you wish to evaluate.
- Once you have pulled up the session listing, then click the **Rate** icon to evaluate the session.
- When finished evaluating the session, click the **Save** 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.

On or before November 6, 2018, NSTA will e-mail attendees instructions for accessing their respective transcripts. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

Special offers for Reno Area Conference Registrants

Terry Lee Wells Nevada Discovery Museum (The Discovery)

nvdm.org

The Terry Lee Wells Nevada Discovery Museum (The Discovery) is offering reduced admission to NSTA conference registrants for $6 per adult (must show NSTA conference badge at admissions desk). This offer is valid October 11–14, 2018.

The Discovery is Northern Nevada's home for hands-on science exploration. The Discovery boasts 67,000 square feet of ever-changing, hands-on galleries and exhibits focused on science, technology, engineering, art, history, and invention—all designed to inspire curiosity, creativity, and the joy of lifelong learning in all who visit.

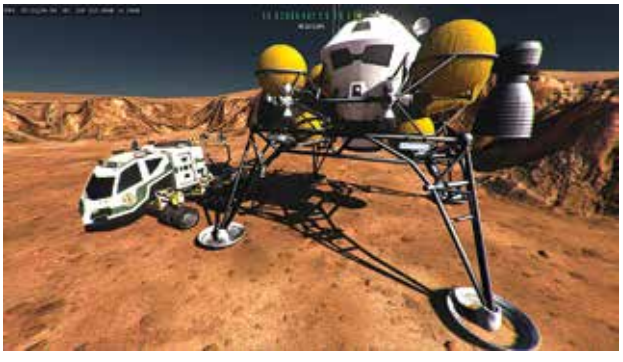
Museum Hours

Tuesday, Thursday, Friday, and Saturday: 10:00 AM–5:00 PM
Wednesday: 10:00 AM–8:00 PM
Sunday: 12 Noon–5:00 PM

490 S. Center St. • Downtown Reno
775-786-1000

The Nevada Space Center and National Automobile Museum

www.nevadachallenger.org



The Nevada Space Center® and National Automobile Museum are offering a special combo admission to all NSTA conference attendees and their family members for the entire month of October as part of October Skies Aerospace Month. Please show your badge at the Reception Desk. Adults: $10; Youth 6–18: $4.

Come explore one of the top automobile museums in the world. We are currently featuring an exhibit on race cars as well as the "Be the Astronaut" exhibit by way of Space Center Houston. Named one of 12 "must-see" exhibits in the country, "Be the Astronaut" incorporates interactive video game technology, actual NASA data sets, and physical artifacts. This is one of only three places in the world where you can use actual NASA reconnaissance data to drive a rover simulation on the Moon or Mars!

Experience science, technology, engineering and math through some of the most amazing vehicles ever conceived!

Hours

Monday–Saturday: 9:30 AM–5:30 PM
Sunday: 10:00 AM–4:00 PM

Located on the Truckee River at 10 S. Lake Street in downtown Reno

WANT QUALITY NGSS LESSONS, BUT CAN'T FIND THEM?

BE A PART OF THE SOLUTION.

Help fill the void of quality materials by submitting what you are creating to Achieve's Science Peer Review Panel (Science PRP). Receive detailed, evidence-based feedback and suggestions for improvement and get recognized for your hard work.

The Science PRP is working to build a library of excellent instructional materials that embody the NGSS and are freely available to teachers. Check out high-quality examples online and submit yours for a review free of charge today!

GO TO NEXTGENSCIENCE.ORG/PRP TO FIND OUT HOW TO SUBMIT MATERIALS.

If you'd like feedback on commercial or proprietary materials, go to ACHIEVE.ORG/REVIEWS to learn more.

NEXT GENERATION SCIENCE STANDARDS
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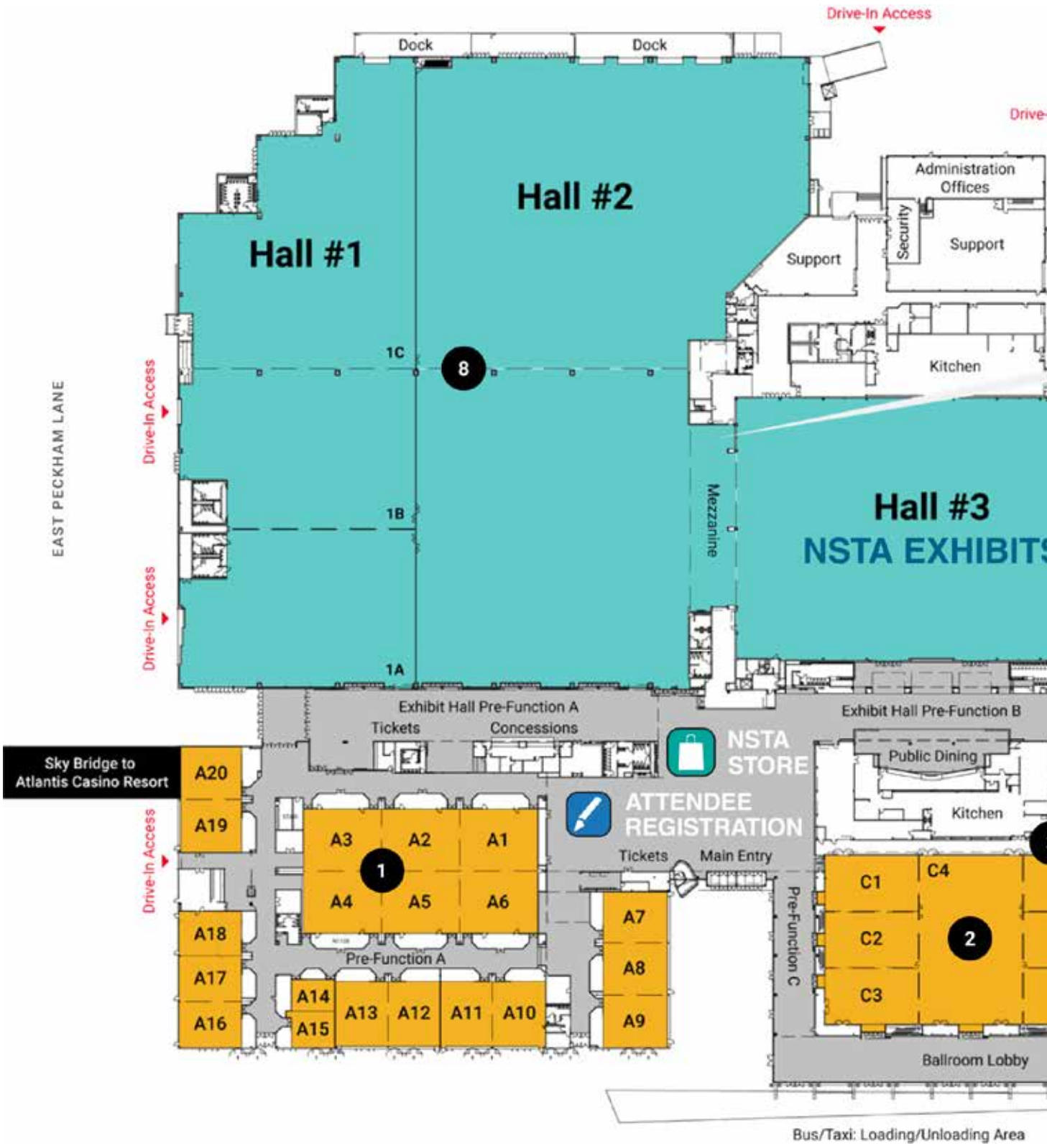
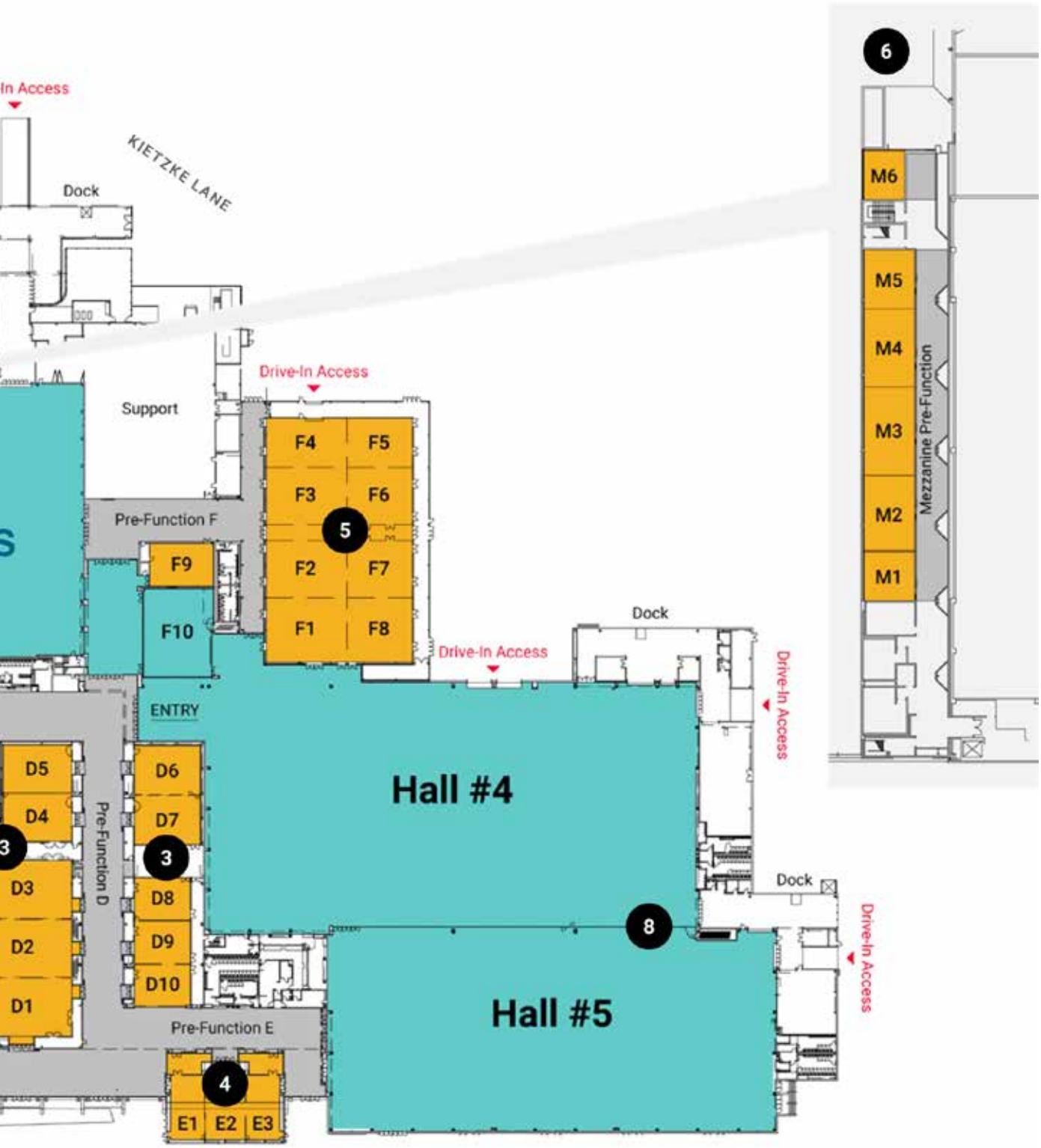
HIGH QUALITY NGSS DESIGN
ACHIEVE.ORG

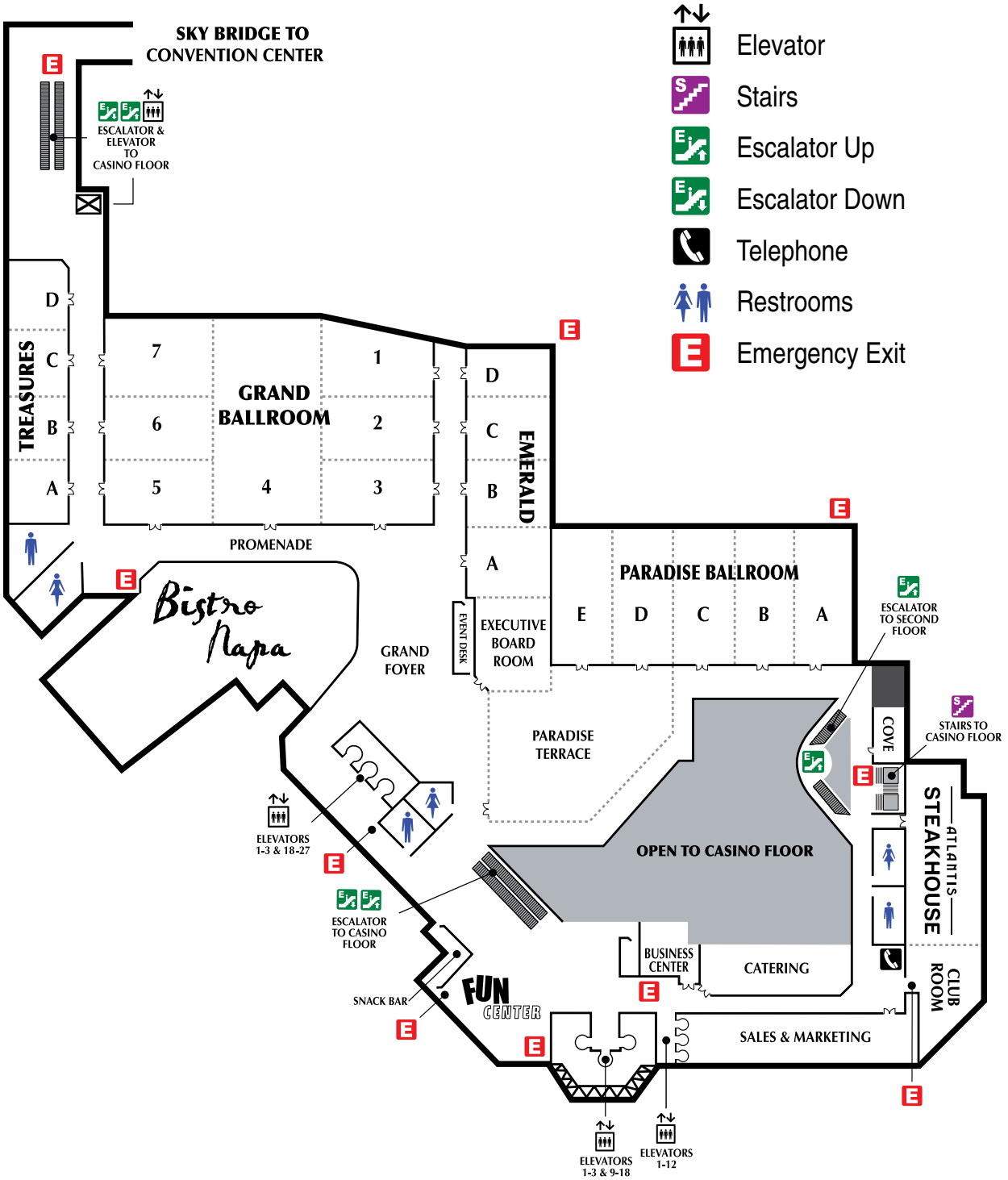

Drive-In Access
Dock
Dock
Hall #2
Hall #1
Administration Offices
Security
Support
Support
Kitchen
EAST PECKHAM LANE
Drive-In Access
1C
8
1B
Drive-In Access
1A
Mezzanine
Hall #3
NSTA EXHIBITS
Exhibit Hall Pre-Function A
Tickets
Concessions
Exhibit Hall Pre-Function B
Sky Bridge to Atlantis Casino Resort
A20
A19
NSTA STORE
Public Dining
ATTENDEE REGISTRATION
Kitchen
Drive-In Access
A3
A2
A1
1
A4
A5
A6
Tickets
Main Entry
A7
A8
A9
C1
C4
C2
2
C3
Pre-Function C
A18
A17
A16
Pre-Function A
A14
A15
A13
A12
A11
A10
Ballroom Lobby
Bus/Taxi: Loading/Unloading Area

Convention Center



Atlantis Casino Resort Spa

Second Floor



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#STEMforum

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NSTA Mission Statement

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

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All cities are subject to change pending final negotiation.

National Conferences on Science Education

St. Louis, Missouri
April 11–14, 2019

Boston, Massachusetts
April 2–5, 2020

Chicago, Illinois
April 8–11, 2021

Houston, Texas
March 31–April 3, 2022

8th Annual STEM Forum & Expo, *hosted by NSTA*
San Francisco, California—July 24–26, 2019

9th Annual STEM Forum & Expo, *hosted by NSTA*
Louisville, Kentucky—July 22–24, 2020

10th Annual STEM Forum & Expo, *hosted by NSTA*
Detroit, Michigan—July 28–30, 2021

Area Conferences on Science Education

2018 Area Conferences

National Harbor, Maryland—November 15–17
Charlotte, North Carolina—November 29–December 1

2019 Area Conferences

Salt Lake City, Utah—October 24–26
Cincinnati, Ohio—November 14–16
Seattle, Washington—December 12–14

2020 Area Conferences

Pittsburgh, Pennsylvania—October 29–31
New Orleans, Louisiana—November 19–21
Phoenix, Arizona—December 10–12

2021 Area Conferences

Portland, Oregon—October 28–30
National Harbor, Maryland—November 11–13
Los Angeles, California—December 9–11

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#NSTA19

NSTA National Science Teachers Association

Keynote Presentation

Wild Technology: Adventures with Open-Source Sensors, Drones, and National Geographic

Thursday, October 11
9:15–10:30 AM

Shah Selbe
Founder, Conservify, and National Geographic Explorer & Fellow

Speaker sponsored by National Geographic Learning | Cengage.

(See page 38 for details.)

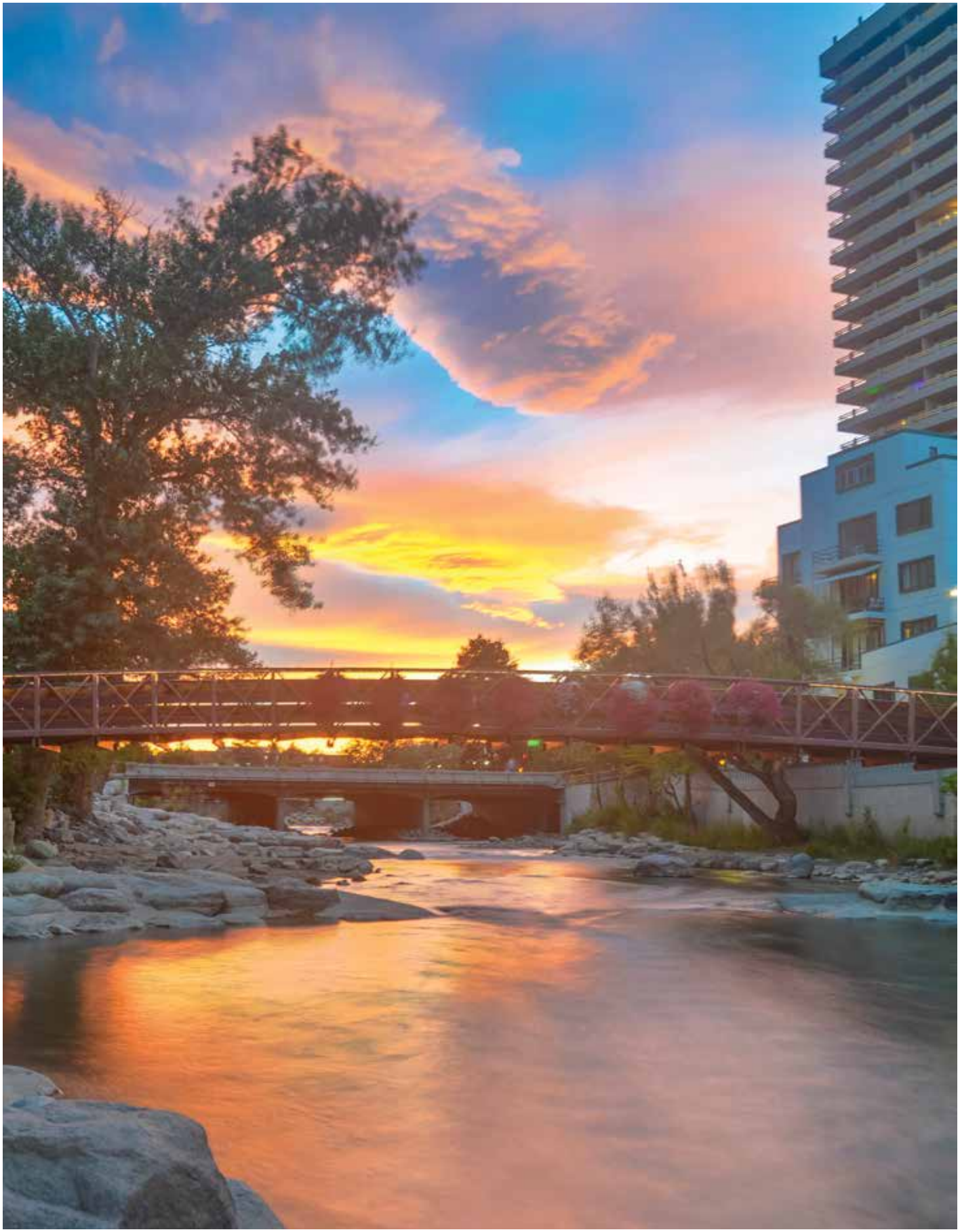
Is This Your First NSTA Conference?

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 34 for details.

Thursday, October 11

Friday, October 12

Saturday, October 13



—*Photo courtesy of* VisitRenoTahoe.com

In the late 1800s, Reno was established right next to the first bridge to cross the Truckee River. Now several city bridges and a river walk span this scenic river.

The Reno 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.

Advancing Three-Dimensional Classroom Culture

Educator understanding of three-dimensional learning is a continuum—from having a firm grasp of the structure of the three dimensions, to integrating appropriate science practices and crosscutting concepts, to developing grade-level storylines based on phenomena. In this strand, participants will be able to choose hands-on/interactive sessions based on their needs.

Cultivating Constructive Partnerships

Teaching can be isolating. Learn how to move beyond your four walls and collaborate with colleagues, informal educators, scientists, and the community. Increase opportunities to advocate for your students' science learning while you build your leadership skills. Learn how to enhance your professional growth by using the expertise in your building and your community. In this strand, presenters will showcase collaboration with business and industry, informal science organizations, policy stakeholders, and colleagues.

Developing Persistence: The Power of Experience

Failure or delayed success has surprising benefits to students, teachers, and administrators—it often initiates meaningful learning experiences. Nurturing such experiences is part of three-dimensional learning; educators should support students in developing their own explanations, ideas, and solutions. Sessions in this strand will focus on the struggles and triumphs that drive learning and explanation development. Learn from your peers' experiences in persisting as they negotiate the terrain of facilitating science learning for the next generation.

Advancing Three-Dimensional Classroom Culture

Thursday, October 11

8:00–9:00 AM
Ingredients for Productive Discourse in a Science Classroom

12:30–3:30 PM
Chemical Engineering for Middle School

2:00–3:00 PM
Featured Presentation: Supporting Equitable 3-D Science Learning Using Assessment, Phenomena, and Community Engagement (Speaker: Philip Bell)

2:00–5:00 PM
Short Course: Developing Assessments to Advance Three-Dimensional Classroom Culture (SC-1: ticket required)

3:30–4:30 PM
Anatomy of an *NGSS* Unit

Friday, October 12

8:00–9:00 AM
How Did the Elk Cross the Road?

9:30–10:30 AM
Space Sailing with NASA's BEST Educators Engineering Design Process

11:00 AM–12 Noon
Participation Structures to Support Equitable 3-D Group Work

2:00–3:00 PM
Designing and Enacting *NGSS* Classroom Experiences: Examples from High School Biology

Saturday, October 13

8:00–9:00 AM
Using Virtual Field Trips to Gather Inquiry-Based Evidence

11:00 AM–12 Noon
A Unique Ice Core Investigation That Integrates the Three Dimensions of *NGSS* and STEM

Cultivating Constructive Partnerships

Thursday, October 11

8:00–9:00 AM
Stories in the Snow: Citizen Science in the Sierras

12:30–1:30 PM
Connecting Students to the Sea

3:30–4:30 PM
The Innovator Within: Solving Real-World Problems

Friday, October 12

8:00–9:00 AM
12 For Life: A Model Partnership Between Schools and Business

9:30–10:30 AM
Featured Presentation: How Do You Scale Innovation?
(Speaker: Sarah Young)

11:00 AM–12 Noon
Creating a Sense of Place Through Collaborative Learning

12:30–1:30 PM
Critter Crossings in the Classroom: Wildlife Awareness Through Cross-Curricular Integration and Collaboration with Nevada Department of Transportation Makes Learning Meaningful!

Saturday, October 13

8:00–9:00 AM
The Cat in the Hat Knows a Lot About… Early Science Learning in Communities

9:30–10:30 AM
Discover Natural History Museum Resources and Engage in Arthropod Activities

11:00 AM–12 Noon
The Monarch Movement: A PBL Experience

Developing Persistence: The Power of Experience

Thursday, October 11

8:00–9:00 AM
Document-Based Questions in Science

12:30–1:30 PM
Revise, Refine, Rejuvenate, Repeat!

2:00–3:00 PM
Global Solutions in a Classroom World

3:30–4:30 PM
You Want Me to Do What?

Friday, October 12

8:00–9:00 AM
Pieces of the Persistence Puzzle

9:30–10:30 AM
Phenomenal Biology

11:00 AM–12 Noon
Featured Presentation: A Woman in Mission Control
(Speaker: Marianne Dyson)

12:30–1:30 PM
Developing Productive Discourse

2:00–3:00 PM
WIDA Session: Engaging English Language Learners in Science and Mathematics

Saturday, October 13

9:30–10:30 AM
Using a Blended Classroom to Develop Student Conceptual Understanding Over Time

11:00 AM–12 Noon
Making Space for Making in the Classroom

NSTA Press Sessions

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

Thursday, October 11

8:00–9:00 AM	Developing and Using 3-D Formative Assessment Probes
12:30–1:30 PM	Argument-Driven Inquiry in Biology, Chemistry, and Physics—Lab Investigations for Grades 9–12
2:00–3:00 PM	*From Flower to Fruit*
3:30–4:30 PM	Get Prepared for the January 2019 Total Lunar Eclipse Using NSTA Press's *Solar Science*

Friday, October 12

8:00–9:00 AM	*Teaching for Conceptual Understanding in Science*
9:30–10:30 AM	Uncovering Middle School and High School Student Ideas with Digital Devices
	Eureka! K–2 and 3–5 Science Activities and Stories
11:00 AM–12 Noon	Uncovering 3-D Ideas About Matter and Energy
12:30–1:30 PM	*Everyday Science Mysteries*
2:00–3:00 PM	Argument-Driven Inquiry in Grades 3–5

Saturday, October 13

8:00–9:00 AM	Engage Your Students! *Designing Meaningful STEM Lessons*
9:30–10:30 AM	Argument-Driven Inquiry in the Life, Physical, and Earth/Space Sciences: Lab Investigations for Grades 6–8
11:00 AM–12 Noon	Engineering in the Life Sciences for Grades 9–12

Meetings and Social Functions

Friday, October 12

NGSS Workshop, Level 1: Making Sense of Three-Dimensional Teaching and Learning
(By Separate Registration Only)
Grand Ballroom 4, Atlantis.....8:00 AM–5:00 PM

NGSS Workshop, Level 2: Designing Three-Dimensional Lessons and Units Workshop
(By Separate Registration Only)
Grand Ballroom 2/3, Atlantis.....8:00 AM–5:00 PM

ASTE Northwest Regional Business Meeting
Executive Boardroom, Atlantis ..... 12:30–1:30 PM

ASTE Northwest Regional Research Discussion
Executive Boardroom, Atlantis ..... 2:00–3:00 PM

Nevada State Science Teachers Association Member Meeting and Social (Open to Current NSSTA Members)
Grand Ballroom 5, Atlantis..... 4:00–5:00 PM

Nevada State Science Teachers Association Welcome Reception
(By ticket through NSSTA)
Off-site (The Discovery) ..... 6:00–8:00 PM

Saturday, October 11

NGSS Workshop, Level 1: Making Sense of Three-Dimensional Teaching and Learning
(By Separate Registration Only)
Grand Ballroom 4, Atlantis.....8:00 AM–5:00 PM

NGSS Workshop, Level 2: Designing Three-Dimensional Lessons and Units Workshop
(By Separate Registration Only)
Grand Ballroom 2/3, Atlantis.....8:00 AM–5:00 PM

ACS Chemistry for Life™

Sponsored by the American Chemical Society

High School Chemistry Day

Connecting Structure and Properties: Building and Applying Knowledge for Grades 9–12

Friday, October 12, 8:00 AM–1:30 PM
D3, Convention Center

Solutions to real-world problems involving chemistry are complex and explanations of relevant phenomena are multifaceted. A deep understanding of how the particle-level structures of substances affect their macroscopic properties is necessary if students are to develop explanations and design solutions to complex problems. Explore how to engage students in challenging problems and help them learn to collect and explore data in order to develop a scientific understanding of structure-property relationships. Demonstrate students' learning through relevant-to-their-lives applications.

8:00–9:00 AM	**Exploring the Nature and Properties of Ionic and Covalent Compounds—Composition, State, and Conductivity**
9:30–10:30 AM	**Constructing Science Ideas About Ionic Bond Strength—Solubility and Melting Point**
11:00 AM–12 Noon	**Interparticle Forces in Covalent Compounds—Melting Point, Viscosity, and Vapor Pressure**
12:30–1:30 PM	**Relating Structure and Properties—Demonstrating Understanding of Bond Strength and Interparticle Attractions**

Middle School Chemistry Day

Middle School Chemistry—Big Ideas About the Very Small

Friday, October 12, 8:00 AM–1:30 PM
D2, 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	**The Water Molecule and Dissolving**
11:00 AM–12 Noon	**ACS Chemical Reactions—Breaking and Making Bonds**
12:30–1:30 PM	**ACS Chemical Reactions—Ocean Acidification**

Engineering Day at NSTA

Sponsored by the American Society for Engineering Education

Friday, October 12, 8:00 AM–1:30 PM
D4, Convention Center

The American Society for Engineering Education (ASEE) has put together a public/private partnership to develop ways of engaging elementary, middle school, and high school students and teachers in engineering. Participants will learn about innovative, hands-on, project-based engineering activities, courses, curriculum options, events, outreach programs, professional development, and competitions designed to increase 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 *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	**Using Computer Modeling to Innovate Science Education**
9:30–10:30 AM	**GenCyber Wyoming: COWPOKES, Professional Development, Camp, and Experiences**
11:00 AM–12 Noon	**Science Teacher Lessons Showcasing Engineering from RAMPED II**
12:30–1:30 PM	**Microbe Art and the Artful Craft of Science**

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.

3D Developing Assessments to Advance Three-Dimensional Classroom Culture (SC-1)

Elizabeth De los Santos *(xdelossantos@unr.edu),* University of Nevada, Reno
Carrie Cook *(ccook@lindenschools.org),* Linden Middle School, Linden, MI
Science Focus: GEN, NGSS
Level: Grades 6–12
Date: Thursday, October 11, 2:00–5:00 PM
Location: Grand Ballroom 5, Atlantis
Ticket Price: $20

A key way for teachers to support a three-dimensional (3-D) culture in their classrooms is to use 3-D assessments that are designed to meet the vision of the NGSS. However, there is a lack of high-quality 3-D assessments readily available to teachers. In this short course, you will learn how to design 3-D assessments by brainstorming scenarios for eliciting student understanding and using task formats to build questions that engage students with the scenario. Participants will receive resources such as STEM Teaching Tool #29: Steps to Designing a Three-Dimensional Assessment.

—Photo courtesy of Elizabeth De los Santos

—Photo courtesy of Mary Whaley

Ocean Plastic Pollution: Issues and Solutions (SC-2)

Mary Whaley *(mwhaley@mbayaq.org),* Monterey Bay Aquarium, Monterey, CA
Science Focus: ESS3.C, PS1.A, CCC6, SEP1
Level: Grades 6–8
Date: Friday, October 12, 9:00 AM–12 Noon
Location: Grand Ballroom 5, Atlantis
Ticket Price: $30

Enrich your classroom with *NGSS*-focused activities surrounding plastic pollution issues and solutions. Activities will highlight plastic's physical and chemical properties, including density and buoyancy. Not only will we emphasize looking at the impacts of prolific plastic use, but we will also explore solutions to plastic pollution, alternatives to single-use plastics, and empowering students to tackle environmental problems without experiencing ecofatigue.

This short course will include strategies to encourage critical thinking about environmental issues and methods to help students gain awareness and examination of everyday resources and uses. Empower your students to become part of the plastic pollution solution! Door prizes and resources!

Three Dimensions of the *Next Generation Science Standards (NGSS)*

Science and Engineering Practices

SEP1 Asking Questions and Defining Problems
SEP2 Developing and Using Models
SEP3 Planning and Carrying Out Investigations
SEP4 Analyzing and Interpreting Data
SEP5 Using Mathematics and Computational Thinking
SEP6 Constructing Explanations and Designing Solutions
SEP7 Engaging in Argument from Evidence
SEP8 Obtaining, Evaluating, and Communicating Information

Crosscutting Concepts

CCC1 Patterns
CCC2 Cause and Effect: Mechanism and Explanation
CCC3 Scale, Proportion, and Quantity
CCC4 Systems and System Models
CCC5 Energy and Matter: Flows, Cycles, and Conservation
CCC6 Structure and Function
CCC7 Stability and Change

Disciplinary Core Ideas

Disciplinary Core Ideas in Physical 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
PS3.B: Conservation 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.B: Electromagnetic Radiation
PS4.C: Information Technologies and Instrumentation

Disciplinary Core Ideas in Life Science

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

Disciplinary Core Ideas in Earth and Space Science

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

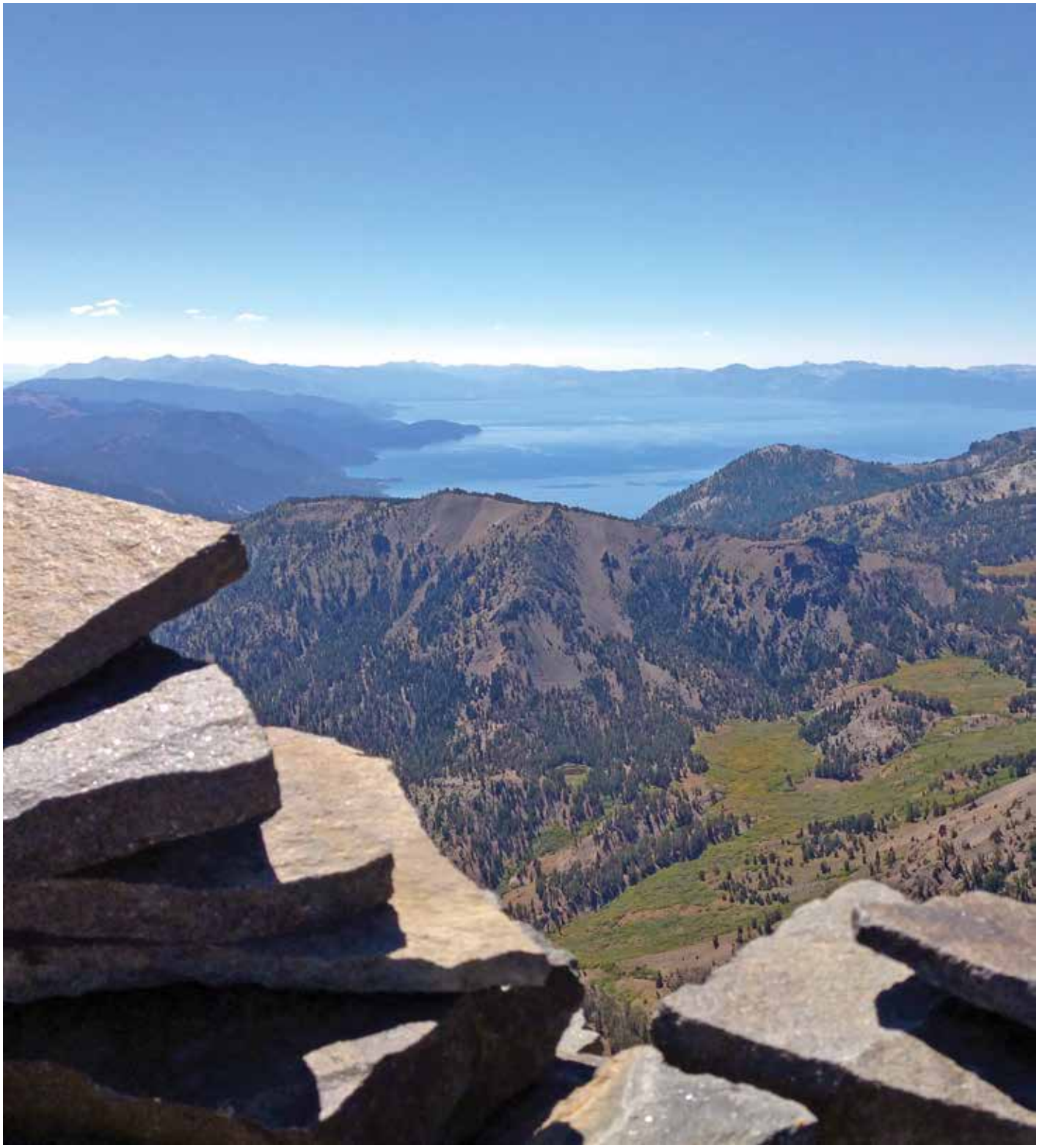
ESS2: Earth's Systems
ESS2.A: Earth Materials and Systems
ESS2.B: Plate Tectonics and Large-Scale System Interactions
ESS2.C: The Roles of Water in Earth's Surface Processes
ESS2.D: Weather and Climate
ESS2.E: Biogeology

ESS3: Earth and Human Activity
ESS3.A: Natural Resources
ESS3.B: Natural Hazards
ESS3.C: Human Impacts on Earth Systems
ESS3.D: Global Climate Change

Disciplinary Core Ideas in Engineering, Technology, and the Application of Science

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



—*Photo courtesy of* VisitRenoTahoe.com

Thirty miles south of Reno, Mount Rose is a majestic focal point of the Sierra Nevada.

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

NSTA Reno Area Conference on Science Education
Professional Development Documentation Form

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

On or before November 6, 2018, NSTA will e-mail attendees instructions for accessing their respective Reno transcripts. 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:** _____

To evaluate a session via the conference app, first click **My Planner** and log in with your e-mail address and password. Once logged in, click **Home** and then select **Session & Workshop Listings** to find the session you wish to evaluate. Once you have pulled up the session listing, then click the **Rate** icon to evaluate the session. When finished evaluating the session, click the **Save** button. Repeat this process for each session attended. See page 11 of the program for additional information.

Sample Questions:

1. 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.
2. The session met my needs.
3. The information presented was clear and well organized.
4. Safe practices were employed.
5. The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press® sessions).
6. The session should be repeated at another NSTA conference.

Sample Responses:
1=Strongly Agree 2=Agree 3=Neutral 4=Disagree 5=Strongly Disagree

Thursday, October 11 8:00 AM–5:00 PM

Start Time	End Time	Activity/Event Title

Friday, October 12 8:00 AM–5:00 PM

Start Time	End Time	Activity/Event Title

Saturday, October 13 8:00 AM–5:00 PM

Start Time	End Time	Activity/Event Title

8:00–9:00 AM Presentations

Stories in the Snow: Citizen Science in the Sierras
(Grades 6–12) *Grand Ballroom 7, Atlantis*
Science Focus: ESS2.D, INF, SEP1, SEP3
Mackenzie Peterson (@drisciencealive; *mackenzie.peterson@dri.edu),* **Amelia Gulling** (@drisciencealive; *amelia.gulling@dri.edu),* and **Meghan Collins** *(meghan.collins@dri.edu),* Desert Research Institute, Reno, NV
Every snowflake has a story to tell. Learn how the Desert Research Institute is gathering weather and climate data with the help of local citizen scientists.

Document-Based Questions in Science
(Grades 1–5) *A7, Convention Center*
Science Focus: GEN, SEP1, SEP2, SEP7, SEP8
Jillian Welch *(jwelch@washoeschools.net),* **Marie Scilacci** *(marie.scilacci@washoeschools.net),* **Megan Conley** *(mconley@washoeschools.net),* and **Megan Tilton** *(mtilton@washoeschools.net),* Kate Smith Elementary School, Sparks, NV
See how to incorporate STEM content within literacy using Document-Based Questions (DBQs) in science. DBQs guide students in analyzing information from scientific documents.

Ingredients for Productive Discourse in a Science Classroom
(Grades 3–12) *A8, Convention Center*
Science Focus: GEN, SEP
Lissa Gilmore *(lgilmore@sjcoe.net),* San Joaquin County Office of Education, Stockton, CA
Charalee Cunningham *(ccunningham@lodiusd.net),* Lodi (CA) Unified School District
Find out how to support the science and engineering practices by using explanatory and exploratory discourse to make sense of phenomena.

NSTA Press® Session: Developing and Using 3-D Formative Assessment Probes
(Grades K–12) *C3, Convention Center*
Science Focus: GEN, NGSS
Page Keeley (@CTSKeeley; *pagekeeley@gmail.com),* 2008–2009 NSTA President, and The Keeley Group, Fort Myers, FL
Explore how the *Uncovering Student Ideas in Science* probes can be modified for three-dimenstional formative assessment and learn how to develop your own 3-D probe.

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

Science Area

A science area category is associated with each session. These categories are abbreviated on theScience Focus line for each session listing.

The science areas and their abbreviations are:

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

NGSS

See page 31 for a complete list of the *NGSS* codes used in this program.

Strands

The Reno 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.

Advancing Three-Dimensional Classroom Culture

Cultivating Constructive Partnerships

Developing Persistence: The Power of Experience

The following icons will be used throughout this program.

NSTA Press® Sessions

NGSS@NSTA Forum Sessions

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

Achieve Your Science Standards Through Hands-On Experiences
(Grades 1–12) *D5, Convention Center*
Science Focus: LS
Julie Watson (@NvDOW; *jwatson@ndow.org)* and **Tricia Dutcher** (@NvDOW; *tdutcher@ndow.org),* Nevada Dept. of Wildlife, Reno
The Nevada Department of Wildlife can help you achieve your science standards with engaging experiences. Join us for an overview of what we offer.

Climate Literacy → Climate Solutions
(Grades 5–12) *D8, Convention Center*
Science Focus: ESS3.D
Jeannine Montgomery (@NOAAeducation; *jeannine.montgomery@noaa.gov),* NOAA Office of Education, Washington, DC
Want to teach climate literacy but don't know where to start? The National Oceanic and Atmospheric Administration offers a spectrum of online lesson plans, videos, data sets, webinars, and more that will inform and inspire students to engineer solutions to climate concerns.

Phenomenal Notebooking: Putting the Interaction into Interactive Notebooks
(Grades 6–12) *D9/10, Convention Center*
Science Focus: GEN, NGSS
Jennifer Weibert (@ngssfresno; @carter_m35), Fresno County Office of Education, Fresno, CA
Curious how the science and engineering practices and crosscutting concepts translate into a notebook? Resources for SEPs and notebook integration will be provided.

STEM in the Summer: Travel Experiences for Teachers
(Grades P–12) *E1, Convention Center*
Science Focus: GEN
Anne Artz *(aartz@ucsd.edu),* The Preuss School UCSD, La Jolla, CA
Make your summer a time to get out and see the world! Come learn ways to receive travel experience and professional development training and get paid to do it! This session provides information on a variety of summer learning opportunities for STEM teachers at all grade levels.

Is This Your First NSTA Conference? First-Timer Conference Attendees' Orientation
(General) *F1/2/7/8, 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

Using Unplugged Robotics to Teach Elementary Students About Cybersecurity
(Grades K–5) *A19, Convention Center*
Science Focus: ETS1, ETS2.B, CCC4, SEP1, SEP2, SEP6
Keith Rand, Washoe County School District, Reno, NV
Young students learn a simple programming language to make robots (students role playing with or without game tokens) complete tasks in core subject areas.

Inquiry in Action: Investigating Matter K–5
(Grades K–5) *A20, Convention Center*
Science Focus: ESS2, PS1.A, PS1.B, CCC6, SEP2, SEP3, SEP6
James Kessler, American Chemical Society, Washington, DC
What makes it rain? M&Ms vs. Skittles? Baking soda vs. baking powder? Hands-on activities with free animations help your elementary students build foundational concepts in chemistry.

Beyond Spaceship Earth
(Grades 4–7) *C2, Convention Center*
Science Focus: ESS, SEP1, SEP3, SEP6
Becky Wolfe *(beckyw@childrensmuseum.org),* The Children's Museum of Indianapolis, IN
Explore classroom STEM investigations related to the International Space Station. Discover opportunities to apply science practices through designing experiments or engineering solutions for the ISS.

Using Concepts Inspired by Natural History Museums and Collections for Interactive Science Lessons
(Grades 2–8) *D1, Convention Center*
Science Focus: LS1.A, LS2.A
Cynthia Scholl *(cynthia.scholl@gmail.com),* **Anne Espeset, Elizabeth De los Santos** *(xdelossantos@unr.edu),* **Julie Stoughton** *(jstoughton@cabnr.unr.edu),* and **Elizabeth Leger** *(ealeger@gmail.com),* University of Nevada, Reno
Explore several *NGSS*-focused lessons investigating plant structure and learn how these relate to current scientific research.

A System for Systems Thinking
(Grades K–12) *D2, Convention Center*
Science Focus: LS2, CCC4, CCC5, CCC7, SEP2, SEP8
Patrick Moyle *(pmoyle@wested.org)* and **Kirsten Daehler** *(kdaehle@wested.org),* Making Sense of SCIENCE at WestEd, Redwood City, CA
Lisa Snyder *(lsnyder@musd.net),* Manteca (CA) Unified School District
Explore boundaries, components, interactions, and inputs/outputs of a variety of biological systems. Then apply five principles of systems thinking to make sense of the world.

Do Your Students Really Understand Chemical Equilibrium?
(Grades 9–College) *D3, Convention Center*
Science Focus: PS
Greg Dodd *(gbdodd@gmail.com),* Retired Educator, Pennsboro, WV
Learn methods to overcome common student misconceptions. Take part in a hands-on lab with a chemical equilibrium having a large K value. Handouts.

Evaluate Your Sessions Online!

This year, we're giving away an Apple iPad mini 4 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 11 for details.)

Let's Get Wet—Wind, Water, and Weather for Grades PreK–3

(Grades P–3) *D4, Convention Center*

Science Focus: ESS

Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, OH

Don't look now, but the *CCSS* asks that you teach Earth 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!

STEM-ulating Activities on Human Ecology

(Grades 6–8) *D6, Convention Center*

Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2.A, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC7, SEP3, SEP6

Sue Gonyou *(sgrun716@aol.com),* Population Connection, Washington, DC

Discover innovative ways to teach middle schoolers about human-environmental interactions, while also building STEM skills through problem solving, mathematical modeling, interactive technology, and more!

Interactive STEM Energy Curriculum for Real-World Application

(Grades 6–12) *D7, Convention Center*

Science Focus: GEN, NGSS

Vanessa Robertson *(vanessa@envirolution.org),* Envirolution, Reno, NV

Todd Markey *(tmarkey@washoeschools.net),* North Valleys High School, Reno, NV

Terin Kirk *(tkirk@washoeschools.net),* O'Brien STEM Academy, Reno, NV

Dive into a Project ReCharge hands-on STEM lesson and become energy detectives. Engage students to reduce their school's carbon footprint while saving energy and money.

8:00–9:00 AM Exhibitor Workshops

Developing and Using Models with Augmented Reality

(Grades 3–5) *A10, Convention Center*

Science Focus: ESS

Sponsor: ScienceFLEX & MakerSpace/School Specialty

Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN

Go on a journey to the center of Earth and explore its layers through digital modeling. Seamlessly blend hands-on experiences, technology, leveled readers, and science notebooks with Delta Education's new ScienceFLEX modules. Leave with readers, equipment, and a lesson you can try with your students next week.

Ten Minutes to Improving Science Achievement

(Grades 3–8) *A11, Convention Center*

Science Focus: GEN

Sponsor: Delta Education/School Specialty Science–FOSS

Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley

The word "assessment" can strike fear into the hearts of teachers and students. Join FOSS developers to learn how assessment can be transformed into an integrated teaching tool that both grades 3–8 teachers and students can embrace to create a classroom culture that motivates effort and growth mind-set to improve learning.

Martian Genetics: A DNA and Electrophoresis Exploration

(Grades 6–College) *A12, Convention Center*

Science Focus: LS

Sponsor: Edvotek, Inc.

Brian Ell, Edvotek Inc., Washington, DC

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? Learn how to explore the relationship between genotype and phenotype and how to see DNA in your middle school classroom.We will cover both DNA extraction using spooling and the separation of simulated DNA fragments using electrophoresis.

Under the Influence: Proteins, Enzymes, and How Water Drives Structure and Function

(Grades 9–College) *A13, Convention Center*

Science Focus: ETS2, LS1, PS1, PS2, PS3, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP2, SEP5, SEP6

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

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

Investigate enzyme structure/function and the role water plays in protein folding using 5E instructional design. Engage students with molecular phenomena by exploring and explaining the properties of water and enzyme structure and function using hands-on/minds-on materials. Elaborate and evaluate with an insecticide enzyme inhibition model.

Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1

(Grades K–1) *A17, Convention Center*

Science Focus: ESS2.D, ESS3.B, ETS1.A, ETS1.B, PS3.B, CCC2, SEP

Sponsor: Amplify

Sophia Lambertsen and **Rebecca Abbott,** The Lawrence Hall of Science, University of California, Berkeley

Experience how students investigate why the sky looks different in various parts of the world while figuring out Earth's place in the universe. Get a hands-on dive into Amplify Science for Grades K–1, engaging with this new *NGSS*-designed curriculum from The Lawrence Hall of Science.

***NGSS*—Body Systems: Gas Exchange**

(Grades 6–8) *A2, Convention Center*

Science Focus: LS1.A, PS3.D, CCC4, SEP3, SEP4

Sponsor: Lab-Aids, Inc.

Toby Chou, The Waverly School, Pasadena, CA

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.

Go on a Cell Quest! Teaching Cell Structure Through Gaming

(Grades 6–12) *A6, Convention Center*

Science Focus: LS

Sponsor: CPO Science/School Specialty Science

Judy Elgin Jensen, Concord Data Corp., Plant City, FL

Your quest, should you choose to accept it, is to explore cell structure in 3-D with new CPO Science Link Cell Quest! Go on a cell structure and function adventure using cutting-edge Augmented Reality, and then use your knowledge to complete a quest in one of eight different cell types.

—Photo courtesy of Jacob Slaton

9:15–10:30 AM Keynote Presentation

Wild Technology: Adventures with Open-Source Sensors, Drones, and National Geographic

(General) *C4, Convention Center*

Science Focus: GEN

Speaker sponsored by National Geographic Learning | Cengage

Shah Selbe (@shahselbe), Founder, Conservify, and National Geographic Explorer and Fellow, Los Angeles, CA

Presider and Introduction: Christine Anne Royce, NSTA President, and Shippensburg University, Shippensburg, PA

Platform Guests: Shah Selbe; Christine Anne Royce; David Crowther, NSTA Retiring President, and University of Nevada, Reno; Dennis Schatz, NSTA President-Elect, and Pacific Science Center, Seattle, WA; Richard Jones, NSTA Director, District XVI, and University of Hawaii West Oahu, Kapolei; Beverly Lousignont, President, Nevada State Science Teachers Association (NSSTA), and Sage Elementary School, Elko, NV; Camille T. Stegman, Chairperson, NSTA Reno Area Conference, and Raggio Research Center for STEM Education, University of Nevada, Reno; Megan Beckam, Program Coordinator, NSTA Reno Area Conference, and University of Nevada, Reno; Sylvia Scoggin, Local Arrangements Coordinator, NSTA Reno Area Conference, and Washoe County Schools, Reno, NV

Over the last few years, Conservify has built open-source conservation technologies for use in the field on National Geographic expeditions and through our network of scientists and conservationists. This has taken us to places like Peru's Boiling River, Botswana's Okavango Delta, Canada's Banff National Park, Congo's lowland gorilla reserves, and many more. Shah will discuss some of our experiences in building open-source sensors/IoT, drones, and other tools to help better protect and understand the planet we live in. Shah will cover how leveraging engineering and technology has allowed him to go on expeditions helping wildlife species all over the world.

Shah Selbe is the founder of Conservify and a National Geographic Explorer and Fellow. He started his career as a spacecraft propulsion engineer but is now a conservation technologist, where he works with communities, NGOs, and developing countries to identify and deploy technologies that can help with their greatest conservation challenges.

9:30–10:30 AM Exhibitor Workshops

Engineer Excitement in Your Classroom with a Carolina STEM Challenge®

(Grades 6–12) *A1, Convention Center*

Science Focus: PS, SEP

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Rockets zoom and race cars zip through hands-on activities that engage your middle school and high school students. Apply creative problem-solving skills and engineering practices to chemistry and physical science challenges. Experience how Carolina makes it easy to incorporate STEM and three-dimensional learning into your classroom.

How to Argue in an Elementary Science Class

(Grades 3–5) *A10, Convention Center*

Science Focus: GEN

Sponsor: ScienceFLEX & MakerSpace/School Specialty

Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN

Help students develop scientific argumentation skills by making claims based on observable evidence. Put these skills into practice with lessons from ScienceFLEX, as we prove (or disprove) fundamental science concepts. Leave with readers, equipment, and a lesson you can try with your students next week.

FOSS for All Students—Access and Equity

(Grades K–5) *A11, Convention Center*

Science Focus: GEN

Sponsor: Delta Education/School Specialty Science–FOSS

Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley

Providing equitable learning opportunities for all students requires knowing the curriculum, understanding the diverse needs of students, and responding effectively to those needs. Join us for a closer look at how the FOSS program provides both universal access and targeted instruction for your most vulnerable elementary students.

Exploring STEAM with Transformation

(Grades 6–College) *A12, Convention Center*

Science Focus: LS

Sponsor: Edvotek, Inc.

Brian Ell, Edvotek Inc., Washington, DC

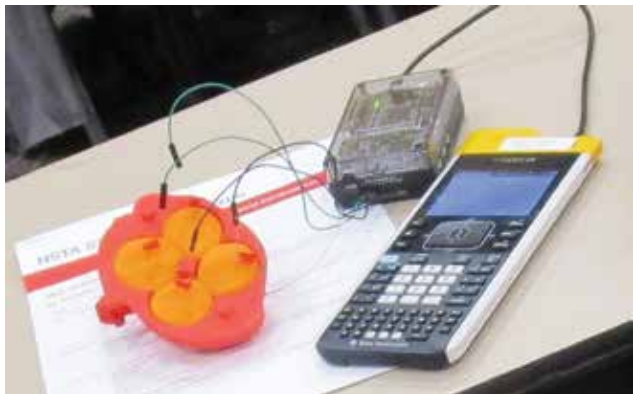
Transforming bacteria with plasmids that express brightly colored or fluorescent proteins is an unforgettable way to teach the central dogma of molecular biology. Why not take it a step further and see the art your students can create

using their transformed bacteria? We will review tips and tricks to maximize classroom success and also ask you to dust off your paintings skills! Artistic? Our favorite design will win a free kit.

Dynamic DNA: More Than Just A's, T's, G's, and C's
(Grades 8–College) *A13, Convention Center*
Science Focus: ETS, LS1, LS3, LS4, CCC1, CCC6, CCC7, SEP2
Sponsor: 3D Molecular Designs
Tim Herman *(herman@msoe.edu),* MSOE Center for Bio-Molecular Modeling, Milwaukee, WI
Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI
Explore a variety of hands-on/minds-on instructional materials that introduce students to DNA as a double-stranded helical molecule, as information (a sequence of A's, T's, G's and C's) that encodes proteins, and as a 3.2 billion base-pair genome. Analyze the β-globin gene to discover the anatomy of a gene.

Harnessing Spider Silk: Phenomena and 3-D Instruction for Grades 6–8
(Grades 6–8) *A17, Convention Center*
Science Focus: LS1.A, LS1.B, LS3, LS4.B, CCC6, SEP1, SEP2, SEP6, SEP7, SEP8
Sponsor: Amplify
Sophia Lambertsen and **Rebecca Abbott,** The Lawrence Hall of Science, University of California, Berkeley
Experience how students investigate how to breed spiders whose silk can be used for medical purposes, while figuring out principles of genes, traits, and reproduction. Get a hands-on dive into the newest curriculum from The Lawrence Hall of Science, designed from the ground up for *NGSS.*

AccuSTEMize Your Students to Perseverance Through Engineering.
(Grades K–5) *A18, Convention Center*
Science Focus: PS, SEP2
Sponsor: Houghton Mifflin Harcourt
Damon Smerchek, Houghton Mifflin Harcourt, Boston, MA
Take a hands-on journey through engineering tasks that follow a learning progression from primary to intermediate that builds knowledge that will be applied throughout the journey. The integration of 3-D learning, specifically the science and engineering practices, make this immediately applicable to your K–5 classroom. Participants need to come ready to interact, create, and, most importantly, have fun.



***NGSS*—Evolution: Investigating Embryology**
(Grades 6–8) *A2, Convention Center*
Science Focus: LS4.A, CCC1, CCC6, SEP4
Sponsor: Lab-Aids, Inc.
Toby Chou, The Waverly School, Pasadena, CA
Students analyze and interpret skeletal and embryological images to identify patterns of similarities and differences across species that look very different as mature animals. Students identify patterns of similarities throughout developmental time to infer evolutionary relationships not obvious in the mature animals. Relates to MS-LS4-3 (Biological Evolution: Unity and Diversity).

Year-Round Solutions for Success in AP Chemistry from Flinn Scientific
(Grades 9–12) *A5, Convention Center*
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Mike Marvel, Flinn Scientific, Inc., Batavia, IL
Join Flinn as we share AP chemistry demonstrations, labs, inquiry activities, and digital courseware! Come learn about new ways to engage your advanced students. Our activities meet the learning objectives and skills your students need to be successful.

Energy Quest: Visualizing Cell Pathways Using Augmented Reality
(Grades 6–12) *A6, Convention Center*
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Judy Elgin Jensen, Concord Data Corp., Plant City, FL
Get ENERGIZED about teaching energy pathways with the CPO Science Link Energy Quest module—featuring cutting-edge Augmented Reality. Through collaborative game board play and manipulating 3D imagery with a swipe of a finger, students will be clamoring to earn 32 ATP and synthesize glucose molecules.

11:00 AM–12 Noon Exhibitor Workshops

Solve the Mystery of the Beads in a Bottle

(Grades 6–12) *A1, Convention Center*

Science Focus: PS1

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Make sense of density with the Smithsonian's STCMS™ Matter and Its Interactions unit. Experience three-dimensional learning with this unit that uses a density phenomenon at its core. Leave with a better understanding of how student-planned investigations enhance their understanding.

Embedding Practices and Crosscutting Concepts into Hands-On Science

(Grades 3–5) *A10, Convention Center*

Science Focus: GEN, NGSS

Sponsor: ScienceFLEX & MakerSpace/School Specialty

Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN

Find out how to unleash the power of these two dimensions. Come be a student and experience ScienceFLEX lessons that give the crosscutting concepts and science and engineering practices the attention they deserve. Leave with materials and strategies you can use in your classroom next week.

Argumentation and Explanation in FOSS

(Grades K–5) *A11, Convention Center*

Science Focus: GEN, SEP2, SEP6, SEP7

Sponsor: Delta Education/School Specialty Science–FOSS

Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley

Investigate phenomena and experience how elementary students create models, construct explanations, and engage in argumentation from evidence in FOSS lessons. Explore how these *NGSS* science and engineering practices complement and reinforce each other to enhance student learning. Leave with instructional strategies to support student sensemaking.

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

(Grades 6–College) *A12, Convention Center*

Science Focus: LS

Sponsor: Edvotek, Inc.

Brian Ell, Edvotek Inc., Washington, DC

Explore genetic diversity using forensic science! Your students become crime scene investigators as they analyze biological evidence using blood typing and DNA fingerprinting. An agglutination test is used to conclusively identify crime scene samples as "blood" and to preliminarily screen suspects by ABO type. Next, gel electrophoresis is used to create DNA profiles from crime scene and suspect samples.

Using Models to Uncover Student Misconceptions in Chemistry

(Grades 5–9) *A13, Convention Center*

Science Focus: ESS2, ESS3, LS1, LS2, PS1, PS2, CCC1, CCC2, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

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

Uncover students' conceptual understanding of atoms, molecules, and compounds using *NGSS* science and engineering modeling practices. Explore chemistry topics in polarity, pH, density, solubility, bonding, and much more with three-dimensional teaching and learning manipulatives! Make learner thinking visible through student-centered simulations of dissociation and neutralization. Great formative assessment probes provided!

Thermal Energy from Impact Science: A Middle School *NGSS* Unit

(Grades 6–8) *A16, Convention Center*

Science Focus: PS3

Sponsor: Impact Science Education, Inc.

Ladie Malek *(ladie.malek@impactscience.com),* Impact Science Education, Inc., El Cerrito, CA

Can we make thermal energy concepts real and understandable for middle school students? Absolutely! Come preview our Thermal Energy unit, which makes tough concepts tangible and gives students a chance to design their own new and improved solar cookers!

What's So Phenomenal About Phenomena?

(Grades K–8) *A17, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

Rebecca Abbott and **Sophia Lambertsen,** The Lawrence Hall of Science, University of California, Berkeley

You've probably heard about phenomenon-based instruction. Figure out what this actually means and how it's embodied in an *NGSS*-designed curriculum. Leaders from The Lawrence Hall of Science will deliver this interactive presentation to unpack the meaning of phenomenon-based instruction through sharing the Hall's research-based pedagogy.

Awesome Activities for the *NGSS* Elementary Classroom

(Grades K–5) *A18, Convention Center*

Science Focus: ETS1, LS, PS, CCC2, CCC4, SEP2, SEP5

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, HMH Author, Broadcast Host, and Global Educator, North Falmouth, MA

Explore the pedagogy changes inherent to *NGSS* 3-D teaching as you apply them to activities in both science and engineering. From constructing a model backbone that illustrates systems and models, to exploring the engineering of a simple paper clip wheel-and-axle, you will experience understanding through the facilitation of process experiences.

***NGSS*—Chemical Reactions: Designing Better Chemical Batteries**

(Grades 6–8) *A2, Convention Center*

Science Focus: ETS1.B, ETS1.C, PS1.B, CCC5, SEP6

Sponsor: Lab-Aids, Inc.

Toby Chou, The Waverly School, Pasadena, CA

Students investigate how chemical energy can be transformed via a chemical process into electrical energy. After building a prototype wet cell, students brainstorm improvements and build, test, and evaluate new prototypes to meet a set of predetermined criteria within specified constraints.

Biotechnology: The Science of Our Age—Are Your Students Prepared?

(Grades 9–College) *A3, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

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

Glowing cats? Designer babies! Empower students to be independent thinkers. Learn from a leader in biotechnology teaching how to build your lab program step-by-step with equipment, supplies, and student credentials.

Solving Crimes with Science—Forensics for Your Classroom

(Grades 5–12) *A5, Convention Center*

Science Focus: INF, GEN

Sponsor: AEOP

Sue Whitsett, AEOP Project Director, NSTA, Arlington, VA

Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, VA

With shows like *CSI* and *NCIS,* forensics is very popular with students these days. Come experience hands-on forensic activities that you can take back to your science classroom. Don't commit the crime of letting this workshop pass you by! Also, learn about the AEOP GEMS and UNITE programs that give students the chance to experience STEM enrichment over the summer!

Modular Robotics: Constructing Explanations and Designing Solutions at K–8

(Grades K–8) *A6, Convention Center*

Science Focus: ETS

Sponsor: CPO Science/School Specialty Science

Vincent Zaccardi, School Specialty Science, Naperville, IL

Encourage inquisitiveness and unlock your students' inner inventor with Cubelets—blocks that magnetically connect to make robots. Use the robotic operations THINK, SENSE, and ACT to solve problems, create, and then design solutions. Answer questions like "What sensory input is needed to solve my design challenge?" with Cubelets!

Reno's Friday Night on the Town!

Join us for the NSSTA Welcome Reception on Friday at The Discovery. Tickets, if still available, may be purchased at the NSSTA booth for $10. See page 10 for details.

11:00 AM–5:00 PM Exhibits

Hall 3, Convention Center

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

12:30–1:30 PM Presentations

What Is STEM?

(General) *Grand Ballroom 6, Atlantis*

Science Focus: GEN, NGSS

Calen Evans *(calen.evans@gmail.com),* Lemelson STEM Academy, Reno, NV

"STEM" is all the buzz and is a word being used throughout education, but what is STEM really? What does it look like in the classroom? How can it be implemented? We will break down the individual principles of STEM education, explore how they are integrated, and discuss tools for implementing STEM in your classroom.

Collaborating with Scientists Made Easy

(Grades K–6) *A19, Convention Center*

Science Focus: GEN, SEP3

Kalani Eggington, Westminster College, Salt Lake City, UT

Helpful steps will be provided for elementary teachers who wish to collaborate with scientists. Examples will be provided from collaborative experiences between elementary teachers from Salt Lake City, Utah, and scientists from the Great Salt Lake Institute.

3D Chemical Engineering for Middle School

(Grades 6–11) *A8, Convention Center*

Science Focus: PS, CCC1, CCC4

Julie Smith *(julieltapresident@gmail.com),* Lennox Middle School, Lennox, CA

Ryan Williams (@edtech_williams; *rwillemc2@gmail.com),* Lennox (CA) School District

Design devices to make potable water from the ocean, make super strong composite materials from trash, and more! All activities are simple and Monday doable.

Connecting Students to the Sea

(Grades 7–8) *A9, Convention Center*

Science Focus: ESS, LS2, CCC1, SEP1

Jennifer Hartigan *(jenny@chart4.com),* Lincoln Middle School, Alameda, CA

Join a NOAA Teacher at Sea to learn how she brought a NOAA field experience and scientists into the classroom. Hear about a series of lessons designed to bring NOAA science and scientists into the classroom. Students learn about the ecological relationships among organisms in the California Current, which flows through several National Marine Sanctuaries.

Introducing the Teacher Institute for Evolutionary Science (TIES)

(Grades 6–12) *D5, Convention Center*

Science Focus: LS4, SEP7

Heather Witt (@tortugahiker; *torrehl@nv.ccsd.net),* Arbor View High School, Las Vegas, NV

TIES helps teachers seeking leadership roles in their communities and empowers middle school science teachers to teach evolution confidently through free online resources and webinars.

Cars: Science Lessons That DRIVE Science Concepts

(Grades 7–12) *D8, Convention Center*

Science Focus: ETS, PS1.A, PS1.B, PS2, PS3, CCC2, CCC3, CCC4, CCC6, CCC7, SEP2, SEP4

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

Receive an overview of the chemistry, science, and physics involved in the modern automobile. This is for the science teacher with limited knowledge of how a car works.

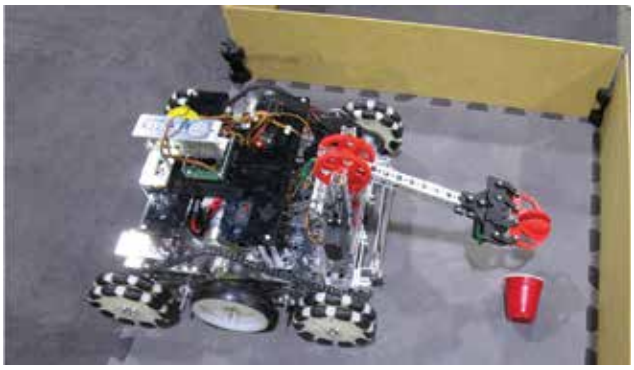
Performance Assessments Combining Math and Science

(Grades 6–12) *D9/10, Convention Center*

Science Focus: GEN, CCC

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

Discover how math and science teachers can collaborate to develop performance assessments that use relevant content allowing students to make stronger interdisciplinary connections.



12:30–1:30 PM Hands-On Workshops

Using Modeling Activities in the High School Chemistry Class

(Grades 9–College) *Grand Ballroom 7, Atlantis*

Science Focus: PS, SEP2

Kimberly Duncan (@chemduncan; *kimberly.z.duncan@gmail.com),* American Association of Chemistry Teachers, Washington, DC

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

Getting Students to Ask Great Questions: Question Formulation Technique

(General) *Treasures C/D, Atlantis*

Science Focus: GEN

Roger Cramer (@tahoecramer1; *rcramer@dcsd.k12.nv.us),* Douglas County School District, Minden, NV

The Question Formulation Technique is a protocol to get students to ask great questions. Spark their curiosity and give them voice in your classroom with this technique.

Climate Change Toolbox

(Grades 7–9) *A20, Convention Center*

Science Focus: ESS

Susan Kaiser, Pine Middle School, Reno, NV

Athena Klock *(athenaklock@yahoo.com),* Pine Middle School, Reno, NV

Drill down into several tools for engaging students to explore factors contributing to climate change. The key activity allows teams to model albedo in the classroom and measure changes in carbon dioxide gas and using different colored substrates. You will be able to facilitate student data collection of changes in the Earth system model. Seeing is believing.

Revise, Refine, Rejuvenate, Repeat!

(Grades K–2) *A7, Convention Center*

Science Focus: ETS1, SEP

Carolyn Cook (@CarolynDCook; *cdcook@carson.k12.nv.us*), Mark Twain Elementary School, Carson City, NV

Rachel Croft (@rachelycroft; *rcroft@carson.k12.nv.us),* Bordewich Bray Elementary School, Carson City, NV

Use the engineering practices to construct, test, and revise hands-on STEM projects that can be taken back to your classroom.

NGSS@NSTA Forum: Selecting Phenomena to Motivate Student Sensemaking

(Grades K–12) *C2, Convention Center*

Science Focus: GEN, NGSS

Tricia Shelton (@TdiShelton; *tshelton@nsta.org),* Standards Implementation Specialist, NSTA, Arlington, VA

The right phenomena are key ingredients in successful three-dimensional teaching and learning. Emphasis will be placed on what makes some phenomena better than others and how to use them successfully in the classroom.

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

(Grades 9–12) *C3, Convention Center*

Science Focus: ESS, LS, PS, CCC, SEP

Victor Sampson (@drvictorsampson; *victor.sampson@utexas.edu),* The University of Texas at Austin

Learn about Argument-Driven Inquiry and how it can help students use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

CSSS-Sponsored Session: Designing and Using Equitable 3-D Formative Assessments to Support Meaningful *NGSS* Investigations
(General) *D1, Convention Center*
Science Focus: GEN, NGSS
Philip Bell (@philiplbell; *pbell@uw.edu),* University of Washington, Seattle
Ellen Ebert *(ellen.ebert@k12.wa.us),* Washington Office of Superintendent of Public Instruction, Olympia
Come examine samples of student responses and explore how to design cognitive assessments of three-dimensional learning and engage in sense-making to interpret student responses.

Using Hands-On Performance Assessment in Grades 3–5 Classrooms
(Grades 3–5) *D4, Convention Center*
Science Focus: GEN, NGSS
Deborah Tucker *(deborahlt@aol.com),* Independent Science Education Consultant, Napa, CA
Grant Gardner *(grantmgardner@msn.com),* Assessment Services, Inc., Pepperell, MA
Explore hands-on performance assessment and its relationship to students' mastering the science practices, DCIs, and *CCSS.* Engage in a hands-on performance task.

12:30–1:30 PM Exhibitor Workshops

Phenomenal Classroom Critters
(Grades K–12) *A1, 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, simple, hands-on, three-dimensional activities that use a variety of insects and arthropods. Learn about care and handling, as well as easy ways to introduce phenomena. Additional resources available online for your classroom.

Making Science Accessible Through Blended Hands On and ELA
(Grades 3–5) *A10, Convention Center*
Science Focus: GEN
Sponsor: ScienceFLEX & MakerSpace/School Specialty
Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN
Show off your inner-reading-teacher in a hands-on science setting! Come be a student and experience ScienceFLEX lessons that integrate informational text and notebooking alongside hands-on science. Leave with readers, strategies, equipment, and a lesson you can try with your students next week.

Structure and Function in Madagascar Hissing Cockroaches
(Grades 6–8) *A11, Convention Center*
Science Focus: LS
Sponsor: Delta Education/School Specialty Science–FOSS
Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley
Explore the phenomenon of structure and function with live Madagascar hissing cockroaches. Discover how students engage in three-dimensional learning as they explore and compare systems in multicellular organisms in the FOSS Next Generation Diversity of Life Course for middle school.

Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR
(Grades 9–College) *A12, Convention Center*
Science Focus: LS
Sponsor: Edvotek, Inc.
Brian Ell, Edvotek Inc., Washington, DC
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. We will use PCR to distinguish between PTC alleles. Tips and tricks will be shared along the way to ensure experimental success!

"Going with the Flow" of Genetic Information
(Grades 9–College) *A13, Convention Center*
Science Focus: ETS1, LS1, LS3, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman *(herman@msoe.edu),* MSOE Center for Bio-Molecular Modeling, Milwaukee, WI
Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI
Guide your students in the development and use of models as tools for "making sense" of phenomena. Learn how to help your students "think with models" to explain the cellular processes of transcription and translation as they relate to a genome-sequencing molecular story. Handouts!

Teaching Weather from Impact Science: A Middle School *NGSS* Unit
(Grade 6) *A16, Convention Center*
Science Focus: ESS2.D
Sponsor: Impact Science Education, Inc.
Ladie Malek *(ladie.malek@impactscience.com),* Impact Science Education, Inc., El Cerrito, CA
Why does it rain? How do clouds form? What causes wind? Can we make these weather phenomena understandable for students? Absolutely! Come preview our *NGSS* weather unit that makes these concepts understandable for students through hands-on activities and modeling!

***NGSS*—Land, Water, and Human Interactions: Modeling Nutrients as Contaminants**
(Grades 6–8) *A2, Convention Center*
Science Focus: ESS2.C, ESS3.C, CCC2, SEP2, SEP3, SEP6
Sponsor: Lab-Aids, Inc.
Toby Chou, The Waverly School, Pasadena, CA
Students use a model to gather evidence about the interaction of soil, water, and fertilizers in a laboratory investigation to understand how human activities have altered the environment. They apply the crosscutting concept of cause and effect to human activity and environmental impacts.

Engineering Design Solutions with Wind Turbines
(Grades 6–12) *A6, Convention Center*
Science Focus: ETS
Sponsor: CPO Science/School Specialty Science
Vincent Zaccardi, School Specialty Science, Naperville, IL
Plan, build, test, and refine your designs to engineer your very own wind turbine with CPO Science Link Wind Turbine module. With STEM activities and an *NGSS* approach, you will try to generate the highest voltage using three different blade types or even design your own!

12:30–2:30 PM Presentation

AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity
(Grades 6–College) *E1, Convention Center*
Science Focus: GEN, SEP
Natacia Campbell, NSTA Director, Multicultural/Equity in Science Education, and Joliet (IL) Public Schools District 86
Sharon Delesbore, Fort Bend ISD, Rosharon, TX
Honoring the life of George Washington Carver, join AMSE in conjunction with the NSTA Multicultural/Equity Committee as we dialogue to create action plans to incorporate equitable opportunities for ALL students in science.

2:00–3:00 PM Featured Presentation

3D

Supporting Equitable 3-D Science Learning Using Assessment, Phenomena, and Community Engagement
(General) *C1, Convention Center*
Science Focus: GEN, NGSS

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

Presider: John Taylor, Strand Leader, NSTA Reno Area Conference, and Southern Utah University, Cedar City

All students have the right to develop a deep understanding of the natural world in ways that support their goals and those of their community. Creating learning experiences that are inclusive and culturally responsive are best practices in this regard. This talk will highlight how formative assessment, meaningful phenomena, and community engagement can support equity and justice in science education. In the process, participants will investigate a collection of open education resources called STEM Teaching Tools designed to support the professional learning of science educators.

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.

2:00–3:00 PM Presentations

Do You Need a Science Lab? Win a Shell Science Lab Makeover ($20,000 Value) for Your School

(Grades 6–12) *A19, Convention Center*

Science Focus: GEN

Ruth Ruud *(ruudruth61@gmail.com),* Cleveland State University, Cleveland, OH

Are you a K–12 science teacher in need of a science lab makeover? Attend this session and learn how you can apply to win the Shell Science Lab or Regional Makeover! You will have an opportunity to actually begin to complete the application and have your questions answered.

Creative Approaches to Teaching Science Methods to Preservice Teachers

(College) *A20, Convention Center*

Science Focus: ETS2, SEP

Logan Caldwell (@LoganRCaldwell; *lprvette@memphis.edu),* The University of Memphis, TN

Discover methodologies to connect preservice teachers to science in the real world. These ideas will inspire them to integrate science and engineering practices into teaching.

INF **Creating Successful Out-of-School Learning Experiences for Your Students**

(Grades K–8) *A8, Convention Center*

Science Focus: INF, NGSS

Meghan Schiedel *(mschiedel@nvdm.org),* Terry Lee Wells Nevada Discovery Museum, Reno, NV

Jennifer Robinson (@sierranvjourney; *jennifer@sierranevadajourneys.org),* Sierra Nevada Journeys, Reno

Learn about the research-based benefits of informal science education and gain tips for conducting a successful standards-based science field trip with your students. The presenters are from two local science-based nonprofits: the Terry Lee Wells Nevada Discovery Museum and Sierra Nevada Journeys

She Get It from Her Mama: Using Recursive Modeling to Assess Conceptual Understanding of Mechanisms of Inheritance

(Grades 6–12) *D5, Convention Center*

Science Focus: LS1, LS3, CCC6, SEP2

Heather Witt (@tortugahiker; *torrehl@nv.ccsd.net),* Arbor View High School, Las Vegas, NV

Review a conceptual storyline, bundling HS-LS1-1 and HS-LS3-1, that engages students in recursive modeling to build and assess three-dimensional understanding of the phenomenon of inherited traits.

Making Redox Practical, Relevant, Engaging, and Fun Corrosion Chemistry!

(Grades 6–12) *D8, Convention Center*

Science Focus: ESS, ETS, PS, CCC, SEP1, SEP2, SEP3, SEP4, SEP5

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

Discover real-world examples using labs and demonstrations that make reactivity, oxidation/reduction, and corrosion exciting, practical, and easy to teach and learn. I will share STEM connections and a CD of information.

High School Teachers: Birds of a Feather

(Grades 9–12) *D9/10, Convention Center*

Science Focus: GEN, INF, NGSS

Megan Beckam *(mbeckam@unr.edu),* University of Nevada, Reno

Facilitated by NSTA's High School Committee, join in to discover NSTA resources, participate in discussions and share high school needs/concerns in your state. How can we help?

2:00–3:00 PM Hands-On Workshops

Teaching Environmental Sustainability Using a Free Place-Based Watershed Model

(Grades 5–12) *Grand Ballroom 7, Atlantis*

Science Focus: LS2, CCC4, SEP2, SEP4, SEP5

Carolyn Staudt (@cjstaudt; *cstaudt@concord.org),* Curriculum/Professional Developer, Concord, MA

Jerry Valadez *(jerry@cswnetwork.org),* SAM Academy, Inc., Sanger, CA

Model My Watershed is a free web-based application that invites students to explore the condition of their local watershed with a scientifically valid watershed model.

Global Solutions in a Classroom World

(Grades 6–9) *A7, Convention Center*

Science Focus: GEN, SEP

Sarah Andres *(andresb@nv.ccsd.net),* Hyde Park Middle School, Las Vegas, NV

Gain an understanding of engineering design as it is applied to science topics and student engagement. Take-home ideas/materials will be shared.

NGSS@NSTA Forum: Passing the Sniff Test, What Are Publishers Really Telling You in Their Alignment Claims?

(Grades K–12) *C2, Convention Center*

Science Focus: GEN, NGSS

Vanessa Wolbrink (@vawolb), Achieve, Inc., Washington, DC

What does it mean when a publisher claims their materials are "100% aligned to the *NGSS*"? Come dive into some of the most common claims about the *NGSS* alignment that currently exist in the marketplace. Working together, we will evaluate these claims, as well as develop and practice strategies for talking to publishers about how well their materials meet teachers' needs.

NSTA Press® Session: *From Flower to Fruit*
(Grades K–5) *C3, Convention Center*
Science Focus: LS1, LS2
Richard Konicek-Moran *(rkonicek@gmail.com),* Professor Emeritus, UMass Amherst, MA
Kathleen Konicek-Moran *(kathleen.konmor@gmail.com),* Botanical Illustrator and Nature Artist, Bradenton, FL
Add botany to your curriculum. See how this is done using our book, *From Flower to Fruit,* as a guide.

Strengthening Science Reasoning and Language for All Students Through Active 3-D Learning
(Grades 3–8) *D1, Convention Center*
Science Focus: GEN, SEP6, SEP7, SEP8
Rita MacDonald *(rkmacdonald@wisc.edu),* Wisconsin Center for Education Research, Madison
David Crowther (@Dtcrowther; *crowther@unr.edu),* NSTA Retiring President, and University of Nevada, Reno
Explore balloon-popping (or not popping) and learn how to engage ALL students in the collaborative reasoning and complex discussion of the rigorous and sophisticated 3-D framework.

Snap Circuits and Such: Engaging Students with Science Clubs
(Grades P–12) *D2, Convention Center*
Science Focus: GEN, INF
Vivian Michalik, Douglas County School District, Minden, NV
Facilitate a minimal prep science club that develops students' scientific practices while building community relationships and encouraging family involvement. (Bonus: Nevada Educator Performance Framework points!)

Explore Chemistry Beyond the Classroom with ChemClubs
(Grades 9–12) *D3, Convention Center*
Science Focus: PS, INF
Karen Kaleuati (@ACSChemClubs; *k_kaleuati@acs.org),* American Chemical Society, Washington, DC
The ACS ChemClub program provides free fun and educational materials! Learn about the program, try out a few activities, and take home some resources.

Using Hands-On Performance Assessment in Middle Grades
(Grades 5–9) *D4, Convention Center*
Science Focus: GEN, NGSS
Deborah Tucker *(deborahlt@aol.com),* Independent Science Education Consultant, Napa, CA
Grant Gardner (@Assessmentserv; *grantmgardner@msn.com),* Assessment Services, Inc., Pepperell, MA
Engage in a hands-on performance task and discover an effective formative assessment strategy for three-dimensional learning.

Decoding Starlight: From Photons to Pixels to Images—Using Science and Art
(Grades 7–12) *D6, Convention Center*
Science Focus: ESS1.A, ETS2.A, PS4.B, CCC1, CCC4, SEP2, SEP4
Pamela Perry *(pperry@lewistonpublicschools.org),* Lewiston High School, Lewiston, ME
Donna Young *(dlyoung.nso@gmail.com),* NASA/NSO UoL Coordinator, Bullhead City, AZ
Produce a photon intensity image of a supernova remnant using NASA X-ray data and convert the image into a public release image with this STEAM activity.

Engineering Cantilever Spans: Messy Engagement for All Ages
(Grades P–12) *D7, Convention Center*
Science Focus: ETS, SEP
Brian Crosby (@bcrosby; *bcrosby@washoeschools.net)* and **Lou Loftin** *(lloftin@washoeschools.net),* Nevada's Northwest Regional Professional Development Program, Reno
Build cantilever spans (bridges) while exploring the engineering design process and collecting data your students analyze. STEAM activity included!

2:00–3:00 PM Exhibitor Workshops

The Smithsonian Presents ENERGY in ACTION

(Grades K–8) *A1, Convention Center*

Science Focus: PS3

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

How does energy move and change? Answer this question and others while experiencing one of the new modules from the Smithsonian Science for the Classroom™ series. Understand and use the Energy Model Diagram to construct an evidence-based explanation supporting the claim that energy can move and change.

Boosting the Makerspace Experience for Young Scientists!

(Grades 3–5) *A10, Convention Center*

Science Focus: GEN

Sponsor: ScienceFLEX & MakerSpace/School Specialty

Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN

Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for elementary students, 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®.

Exploring Kinetic Energy Transfers in Collisions

(Grades 6–8) *A11, Convention Center*

Science Focus: PS3

Sponsor: Delta Education/School Specialty Science–FOSS

Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley

Explore how potential energy is related to kinetic energy by planning and carrying out a collision investigation. Engage as students to make sense of data to develop an understanding of energy transfers in the FOSS Next Generation Gravity and Kinetic Energy Course for middle school.

Cancer Investigators: Medical Diagnostics in Your Classroom

(Grades 7–College) *A12, Convention Center*

Science Focus: LS

Sponsor: Edvotek, Inc.

Brian Ell, Edvotek Inc., Washington, DC

Cancer contributes to almost one in every four deaths in the United States. Fortunately, innovations in biomedical research have improved our understanding of the differences between normal and cancer cells. We will use microscopy and electrophoresis to explore the hallmarks of cancer.

Building the Human Connection with National Geographic Learning

(Grades K–5) *A16, Convention Center*

Science Focus: GEN

Sponsor: National Geographic Learning | Cengage

Pam Caffery *(pam.caffery@cengage.com),* National Geographic Learning | Cengage, Boston, MA

No one exemplifies a positive science-linked image than National Geographic with its diverse group of National Geographic Explorers. National Geographic Learning invites you to view our Exploring Science program and learn how students make the connections with our National Geographic Explorers, building opportunities for students to see themselves in science.

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

(Grades 6–College) *A18, Convention Center*

Science Focus: GEN

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (SD) 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 Diane France helped to develop this free middle school and high school forensic science lesson.

***NGSS*—Weather and Climate: Atmosphere, Climate, and Global Warming**

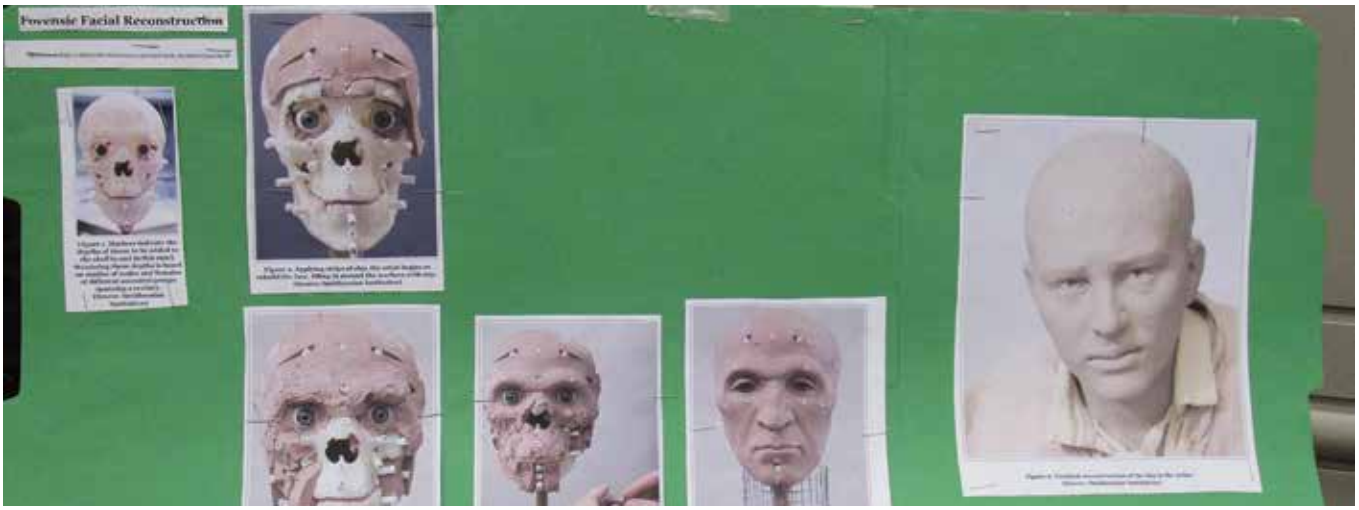
(Grades 6–8) *A2, Convention Center*

Science Focus: ESS2, ESS3.D, CCC1, CCC2, CCC4, CCC7, SEP1, SEP4, SEP5, SEP7

Sponsor: Lab-Aids, Inc.

Toby Chou, The Waverly School, Pasadena, CA

Students look at historical data spanning the past 100 years to try to understand the causes of current global warming. They ask questions related to the data to figure out what the evidence indicates and to better understand how human activities relate to global warming. Relates to MS-ESS2-6 (Earth's Systems) and MS-ESS3-5 (Earth and Human Activity).



Fascinate Your Students with Glowing Bacteria
(Grades 9–College) *A3, Convention Center*
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, CA
Make bacteria glow fluorescent green in this hands-on transformation lab. Bacterial transformation is one of the most important techniques in genetic modification and medicine production.

Positively Engaging Demos and Labs for Chemistry from Flinn Scientific
(Grades 9–12) *A5, Convention Center*
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Mike Marvel, Flinn Scientific, Inc., Batavia, IL
Come join Flinn as we go through interactive and fun activities for your first-year chem students! Learn multiple ways to keep class interesting and ensure students understand the concepts. Entice students with the beauty of chemistry!

Are You Crazy About Genetics?
(Grades 6–12) *A6, Convention Center*
Science Focus: LS3
Sponsor: CPO Science/School Specialty Science
Vincent Zaccardi, School Specialty Science, Naperville, IL
Heredity comes alive when you use hands-on models to create crazy creatures in a unique collaborative program. Study the relationship between DNA, genes, mitosis, meiosis, traits, alleles, phenotypes, and genotypes with tools and strategies everyone is CRAZY about!

2:00–5:00 PM Short Course

3D **Developing Assessments to Advance Three-Dimensional Classroom Culture (SC-1)**
(Grades 6–12) *Tickets Required; $20* *Grand Blrm. 5, Atlantis*
Science Focus: GEN, NGSS
Elizabeth De los Santos *(xdelossantos@unr.edu),* University of Nevada, Reno
Carrie Cook *(ccook@lindenschools.org),* Linden Middle School, Linden, MI
For description, see page 30.

3:30–4:00 PM Presentations

ASTE-Sponsored Session: Science Leaders Unite! Exploring and Defining Science Teacher Leadership
(General) *A14, Convention Center*
Science Focus: GEN
Jennifer Mayo (@spacegirljenn; *sprout_66@hotmail.com),* Portland (OR) Public Schools
Science teacher leaders of all types are invited to explore and describe science teacher leadership. Participants will connect with fellow science leaders and actively contribute to current research.

SCST-Sponsored Session: Yes, You Can! Improving Student Outcomes by Providing an Authentic Research Experience in the Classroom
(Grades 9–College) *E1, Convention Center*
Science Focus: GEN, SEP
Jessica Habashi *(jessica.habashi@usu.edu),* Utah State University Brigham City
Discover how to create a publication-worthy authentic research experience for your students, even if your campus lacks research faculty or dedicated laboratory space.

3:30–4:30 PM Featured Presentation

Experience: The Brain's Most Powerful Influence

(General) *C1, Convention Center*

Science Focus: GEN

Kenneth Wesson (*kenawesson@aol.com*), Educational Consultant: Neuroscience, San Jose, CA

Presider: Stacy Cohen, Program Representative, NSTA Reno Area Conference, and Southern Nevada Regional Professional Development Program, North Las Vegas

Although a famous author once said, "you are what you read," evidence-based research from cognitive science informs us instead that "you are what you experience." Our past experiences not only shape who we become, they also literally shape the very architecture and processing idiosyncrasies inside each human brain. While some behaviors are genetically predetermined, others are experience-dependent. To the brain, practice does not make "perfect." Instead, repeated practice makes "permanent" neural circuits that preserve memories of what we have experienced, and determines our future learning capabilities.It has been said that knowledge and information will be doubling every 73 days by the year 2020. The mountain of available factual information increases daily, but specific facts are easily forgotten. However, our experiences will determine our thinking and behavior for a lifetime.

Kenneth Wesson is a former faculty member and administrator in higher education. He delivers keynote addresses on the neuroscience of learning for educational organizations and institutions throughout the United States and overseas. Kenneth's audiences range from early childhood specialists to college- and university-level educators. His international audiences have included educators and administrative officers from six of the world's seven continents. Kenneth's research is frequently published and referenced in Parents *Magazine, HealthNet, and the journal* Brain World. *He is an active member of Scientists without Borders and serves on the advisory boards for the Korean Institute of Brain Science, Kids at Science, and the International Association of STEM Leaders. Kenneth can be seen on PBS specials on human learning and the teenage brain, and his "Brain-STEM" presentations underscore the learner benefits of merging the latest research from cognitive science with the goals of STEM education.*

3:30–4:30 PM Presentations

NARST-Sponsored Session: Exploring the Human Body Systems and Engaging in 3-D Learning Through Immersive Game Play

(Grades 4–6) *Treasures C/D, Atlantis*

Science Focus: GEN, SEP

Georgia Hodges (@gawoodhodges; *georgia.hodges@gmail.com)* and **Kayla Flanagan** (@Kay_pritch; *kpritchard44@gmail.com),* University of Georgia, Athens

Bring your Chromebook or laptop to experience the SYSTEMS learning environment. This environment is designed for grades 4–6 learners and engages students in science practices.

You Want Me to Do What?!

(Grades K–6) *A7, Convention Center*

Science Focus: GEN

Beverly Lousignont (@BLousignont; *blousignont@gmail.com),* Sage Elementary School, Spring Creek, NV

Jennifer Andersen *(janderse@ecsdnv.net),* Mountain View Elementary School, Elko, NV

Too many expectations! Learn ways to be a creative and effective teacher in all content areas. Walk away with your own integrated lesson planning ideas.

3D

Anatomy of an *NGSS* Unit

(Grades 6–12) *A8, Convention Center*

Science Focus: GEN, NGSS

Jennifer Weibert (@carter_m35), Fresno County Office of Education, Fresno, CA

Understand the true power of an *NGSS* unit by learning how to develop a coherent storyline that is phenomena-, practice-, content-, and standards-based.

The Innovator Within: Solving Real-World Problems

(Grades 1–12) *A9, Convention Center*

INF

Science Focus: INF, SEP

Craig Rosen (@RosenCraig; @drisciencealive; *craig.rosen@dri.edu*), Desert Research Institute, Las Vegas, NV

Sarah Gobbs-Hill *(sgobbs-hill@nvdm.org),* Terry Lee Wells Nevada Discovery Museum, Reno

There are many problems in the world that need to be solved. Turn your classrooms into centers for innovation and bring along partners to help.

3:30–4:30 PM Hands-On Workshops

STEAM It UP: Are You Learning to Read or Reading to Learn Using Literacy with Science?

(Grades K–5) *Grand Ballroom 7, Atlantis*

Science Focus: GEN

Ava Pugh and **Rhonda Mann,** University of Louisiana at Monroe

Presider: Sherlyn Powell *(spowell@ulm.edu),* University of Louisiana at Monroe

This session provides hands-on STEM/STEAM activities merging science and literacy across the curriculum asking, "Are you learning to read or reading to learn?"

NGSS@NSTA

NGSS@NSTA Forum Session: Designing and Using Equitable Formative Assessments to Support Meaningful 3-D Science Investigations

(General) *C2, Convention Center*

Science Focus: GEN, INF, NGSS

Philip Bell (@philiplbell; *pbell@uw.edu)* and **Nancy Price** *(pricenj@uw.edu),* University of Washington, Seattle

Come examine samples of student responses and explore how to design formative assessments of three-dimensional learning and engage in sense-making to interpret student responses.

INF

NSTA Press® Session: Get Prepared for the January 2019 Total Lunar Eclipse Using NSTA Press's *Solar Science*

(Grades 5–8) *C3, Convention Center*

Science Focus: ESS, INF, CCC, SEP

Dennis Schatz (@DinoManSchatz; *dschatz@pacsci.org),* NSTA President-Elect, and Pacific Science Center, Seattle, WA

NSTA Press's *Solar Science,* an astronomy curriculum resource that is *NGSS*-focused, is the perfect resource to prepare you for the 2019 total lunar eclipse. Come explore some of the many effective learning experiences.

Outdoor Science…Literally!

(Grades K–8) *D1, Convention Center*

Science Focus: GEN, CCC

Steve Rich (@bflyguy; *bflywriter@comcast.net*), University of West Georgia, Carrollton

Notebooks, journals, and children's books connect students to active learning in the school yard. This NSTA Press®/ NSTA Kids author will show you how. Free seeds.

Complementing Phenomena-Driven Instruction with Visible Thinking Routines

(Grades 6–12) *D2, Convention Center*

Science Focus: GEN, NGSS

Marlene Gutierrez (@malengucci; *mgutie@jeffersonunion.net),* Terra Nova High School, Pacifica, CA

Discover how visible thinking routines—such as See, Think, and Wonder—can help guide student thinking as they start investigating a phenomenon.

Analyzing Hazards and Risks in High School Chemistry Labs

(Grades 9–12) *D3, Convention Center*

Science Focus: PS, SEP3

Marta Gmurczyk *(m_gmurczyk@acs.org),* American Chemical Society, Washington, DC

Irene Cesa *(irenecesa@gmail.com),* American Chemical Society, Chicago Section, Wheaton, IL

The American Chemical Society has produced *Guidelines for Chemical Laboratory Safety in Secondary Schools.* The guidelines also outline a protocol, designated by the acronym RAMP, for designing and writing improved safety procedures for chemistry experiments. We will explore examples and applications of the four principles of safety: Recognize the hazard; Analyze the risk of the hazard; Mitigate the risk; and Prepare for emergencies, as well as show examples on how to integrate RAMP into lab activities.

Launch into Engineering with Catapults

(Grades 3–8) *D4, Convention Center*

Science Focus: ETS1, PS

Karen Ostlund (@karen_ostlund; *klostlund@utexas.edu),* 2012–2013 NSTA President, and The University of Texas at Austin

Make a craft stick catapult to learn about how energy transformations result in launching projectiles; then design and use an improved catapult to "Storm the Castle!"

Modeling, Gaming, and Critical Thinking: The Power of Play

(Grades 7–12) *D6, Convention Center*

Science Focus: ESS2, ESS3, ETS, LS2, PS2

Mary Kay Wagner, Nevada Div. of Environmental Protection, Carson City

Hunter Merritt *(hunter.merritt@usace.army.mil),* U.S. Army Corps of Engineers, Sacramento District, Sacramento, CA

Tim Robinson *(timothyr@unr.edu),* University of Nevada, Reno

Modeling, simulation, and gaming enhance understanding of complex systems and improve decision-making. Come play with teaching tools that translate classroom-learning goals into competitive STEM careers!

Getting Your School Board on Board for *NGSS*

(Grades K–12) *D7, Convention Center*

Science Focus: PS2.A

Lois Sherwood (@lolo_sherwood; *lolo.sherwood@gmail.com),* Port Townsend High School, Port Townsend, WA

Teachers will practice a workshop that they can present to their school board/administrators to engage them in three-dimensional learning and help them understand the implications of *NGSS* for teaching and learning.

3:30–4:30 PM Exhibitor Workshops

Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens

(Grades 9–12) *A1, Convention Center*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Explore animal diversity by comparing anatomical adaptations of four popular vertebrates. Participants dissect a preserved pig, rat, dogfish, or frog. They then discuss similarities and differences in the observed structures of the specimens. This is an excellent comparative dissection activity that employs three-dimensional instruction and features Carolina's Perfect Solution specimens.

How to Argue in an Elementary Science Class

(Grades 3–5) *A10, Convention Center*

Science Focus: GEN

Sponsor: ScienceFLEX & MakerSpace/School Specialty

Mary Anne Feller, Sts. Peter and Paul Catholic School, Haubstadt, IN

Help students develop scientific argumentation skills by making claims based on observable evidence. Put these skills into practice with lessons from ScienceFLEX, as we prove (or disprove) fundamental science concepts. Leave with readers, equipment, and a lesson you can try with your students next week.

Wave Properties and Information Technologies
(Grades 6–8) *A11, Convention Center*
Science Focus: PS4
Sponsor: Delta Education/School Specialty Science–FOSS
Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley
Engage in activities using lasers and optical fibers in the new FOSS Next Generation Waves Course for middle school. Explore the phenomena of refraction and reflection that allow information transfer by fiber-optic technology, and identify connections to the three dimensions of *NGSS*.

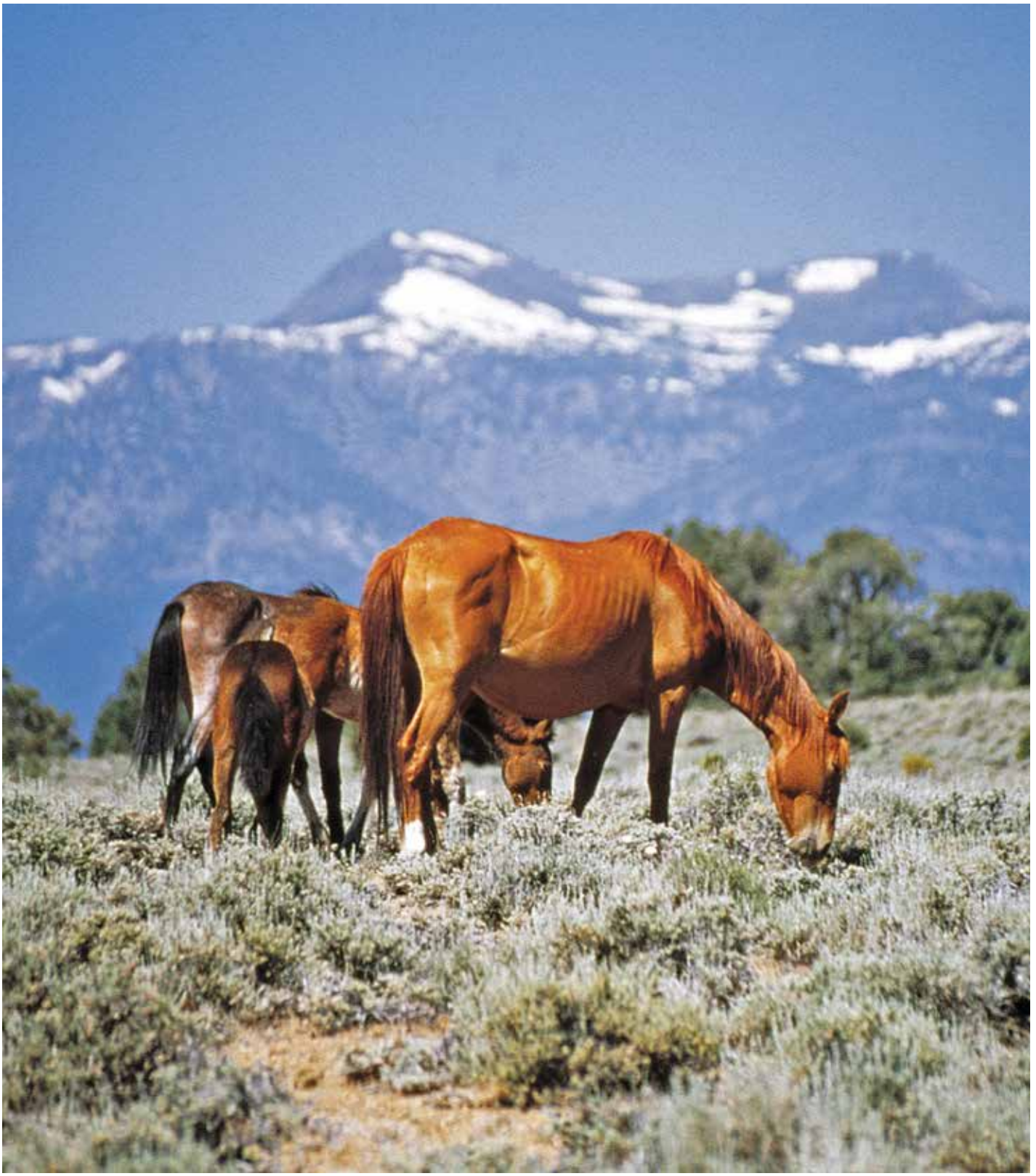
What's in My Lunch? Using Biotechnology to Detect GMOs and Common Allergens
(Grades 9–College) *A12, Convention Center*
Science Focus: LS
Sponsor: Edvotek, Inc.
Brian Ell, Edvotek Inc., Washington, DC
Biotech got its first break with the domestication of animals and plants and the use of microorganisms to make cheese, bread, beer, and wine. We want to bring the field back to these rich roots with two of our most delectable experiments! Discover how to identify foods containing GMOs by separating amplified DNA using gel electrophoresis. Next, use the enzyme-linked immunosorbent assay (ELISA) to detect common food allergens.

Zombies Get OUT!
(Grades 6–12) *A18, Convention Center*
Science Focus: PS
Sponsor: Texas Instruments
Wendy Peel and **Fred Fotsch,** Texas Instruments, Dallas
Zombies are people, too! But you don't want them in your house. Join us to build a humane zombie repulsion device using a calculator, flashlight, and a little ingenuity. This session will combine some physical science with a little coding (no coding experience required) to create an exciting STEM project for your middle school or high school science class.

***NGSS*—Energy: Hot Bulbs**
(Grades 6–8) *A2, Convention Center*
Science Focus: PS3.A, PS3.B, CCC5, SEP3, SEP4
Sponsor: Lab-Aids, Inc.
Toby Chou, The Waverly School, Pasadena, CA
Students apply their understanding of the concepts of energy transfer and transformation to compare the efficiencies of two different types of light bulbs. They do so by measuring the amount of thermal energy produced by the two bulbs, applying the law of conservation of energy, and calculating how much of the electrical energy supplied was converted into light energy.

Are Increased Incidences of Infection the Result of Climate Change?
(Grades 9–College) *A3, Convention Center*
Science Focus: ESS3, LS
Sponsor: Bio-Rad Laboratories
Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, CA
Why does climate change matter to me? There have been increased reports of infections with symptoms such as gastroenteritis, bloody stools, fever, and dark blisters. Find out which suspected microbes are associated with this increase and why they may be more common as the average temperature on Earth increases.

Atomic Structure: Fun with Atoms, Ions, and Bonding Through Modeling
(Grades 6–12) *A6, Convention Center*
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Vincent Zaccardi, School Specialty Science, Naperville, IL
Experience innovative activities to introduce atomic structure with the CPO Science Link Atom Building Game and Periodic Table Tiles. Collaborate in groups using hands-on equipment to break misconceptions about atomic models, explore why so many models are needed in chemistry, and identify the limitations of each.



—*Photo courtesy of* VisitRenoTahoe.com

Descended from horses brought to the Americas by the Spanish, a large herd of feral horses or "Mustangs" roam the Virginia Range, an area of about 30 square miles located in northern Nevada just east of Reno.

8:00–9:00 AM Presentations

Pieces of the Persistence Puzzle
(Grades P–2) *A7, Convention Center*
Science Focus: GEN
Anne Lowry *(alowrynews1@yahoo.com),* Aleph Academy, Reno, NV
See how reflective documentation, questions, and provocations work together to develop persistence in students. Practice using these techniques to further a specific science exploration.

12 For Life: A Model Partnership Between Schools and Business
(Grades 10–12) *A9, Convention Center*
Science Focus: GEN
Rachel Sayer Kakesh (@rachelsayer1; *rachel.kakesh@carrollcountyschools.com),* Carroll County Schools, Carrollton, GA
Discover how Carroll County Schools has improved its graduation rate and promoted STEM education in underrepresented groups through a partnership with Southwire Company.

NSTA Press® Session: *Teaching for Conceptual Understanding in Science*
(General) *C3, Convention Center*
Science Focus: GEN
Richard Konicek-Moran *(rkonicek@gmail.com),* Professor Emeritus, UMass Amherst, MA
Kathleen Konicek-Moran *(kathleen.konmor@gmail.com),* Botanical Illustrator and Nature Artist, Bradenton, FL
Explore what it really means to teach science for conceptual understanding and leave with new strategies and ways of thinking about teaching and learning.

Making Quality Science Instruction Accessible and Equitable to ALL K–6 Students: Using Differentiation Strategies and Resources
(Grades K–8) *D1, Convention Center*
Science Focus: GEN, NGSS
Donna Knoell *(dknoell@sbcglobal.net),* Educational Consultant, Overland Park, KS
Leave with research-based strategies and resources to differentiate instruction, making science accessible and engaging for all students. Discover ways to increase participation, engagement, and advance learning. Handouts.

Leveraging Social Media to Improve Collaboration
(General) *D5, Convention Center*
Science Focus: ETS
Lauren Slanker (@MsSlanker307; *lslanker@gmail.com),* Museum of Science and Industry, Chicago, IL
Tap into how to use social media (e.g., Twitter and Blogger) to learn from others within and outside of your home districts.

The Answer You Get Depends on the Question You Ask
(Grades 1–11) CANCELED *D8, Convention Center*
Science Focus: GEN, SEP
Sandra Leiterman (@saleiterman; *saleiterman@gmail.com),* University of Arkansas at Little Rock
Using a project-based instruction template, learn how to write the driving question that students find so interesting and actually want to answer!

Introduction to Productive Talk
(Grades K–12) *D9/10, Convention Center*
Science Focus: GEN, SEP
Nicole Vick (@MsVickScience; *nicole.vick78@gmail.com),* Great Minds, Avon, IL
Kristin Rademaker (@krademaker; *krad70@gmail.com),* Harlem High School, Machesney Park, IL
Discover strategies to support student reasoning and discourse. Implementing *NGSS* means enabling a community of learners. Join us for a crash course in Productive Talk!

Increasing Gender Diversity: A Girls in STEAM Conference Toolkit
(Grades 6–12) *F9, Convention Center*
Science Focus: GEN, INF
Shaoni Bandy, The Preuss School UCSD, La Jolla, CA
Find out how to create a Girls in STEAM Conference at your school to increase diversity and inclusion within STEAM courses, clubs, and programs.

8:00–9:00 AM Hands-On Workshops

How Do the Solar System and Its Objects Affect Life on Earth? A Sample Middle School Unit on Space
(Grades 6–8) *Paradise A, Atlantis*
Science Focus: ESS1.A, ESS1.B, PS2.B, CCC1, SEP2, SEP7
Lori Henrickson (@MsLorisStory; *henrile@nv.ccsd.net),* Clark County School District, Las Vegas, NV
Experience a sample lesson and the storyline of a phenomenon-based unit driven by student questions about Earth and space that builds toward MS-ESS1-1, MS-ESS1-2, MS-ESS1-3, and MS-PS2-4.

Interlacing Excitement for Science with Nonfiction Reading
(Grades 2–6) *A19, Convention Center*
Science Focus: GEN
Linda Linnen, Retired Teacher, Aurora, CO
Explore many invigorating and stimulating ideas to teach science through reading and writing to your most reluctant students. Practical lessons and strategies will be provided for immediate classroom implementation.

3D **How Did the Elk Cross the Road?**
(Grades 6–12) *A8, Convention Center*
Science Focus: LS2.C, CCC1, CCC2, SEP1, SEP4, SEP7
Eric Proctor *(eproctor@azgfd.gov),* Arizona Game and Fish Department, Phoenix
Wildlife populations struggle with crossing highways that fragment their habitats. Working in teams, you will analyze data and propose solutions. Can you engineer an answer?

INF **Science Teaching, Learning, and Identity Through Community Science Workshops and Makerspaces**
(General) *C2, Convention Center*
Science Focus: INF, ESS2, LS2, ETS1, ESS3
Jerry Valadez *(jerry@cswnetwork.org*), SAM Academy, Inc., Sanger, CA
Frederick Nelson (@fredn56; *fnelson@csufresno.edu*), California State University, Fresno
Inclusive Community Science Workshops and makerspaces in schools, libraries, and communities foster STEM learning, creativity, innovation, and identity through play, making, and positive social interactions.

ACS Middle Level Session One: Solids, Liquids, Gases, and Changes of State
(Grades 6–8) *D2, Convention Center*
Science Focus: PS1.A
James Kessler, American Chemical Society, Washington, DC
Explore solids, liquids, and changes of state through hands-on activities and molecular model animations from the free 5E lesson plans at *middleschoolchemistry.com.*

ACS High School Session One: Exploring the Nature and Properties of Ionic and Covalent Compounds—Composition, State, and Conductivity
(Grades 9–12) *D3, Convention Center*
Science Focus: PS, CCC, SEP
Kimberly Duncan (@chemduncan; *kimberly.z.duncan@gmail.com),* American Association of Chemistry Teachers, Washington, DC
Discover how to elicit and explore students' initial ideas and models of chemical compounds by using engaging phenomena in relevant contexts. Learn also how to engage students in data analysis to allow them to build an understanding of the structure and properties of ionic and covalent compounds.

ASEE Session: Using Computer Modeling to Innovate Science Education
(Grades 4–5) *D4, Convention Center*
Science Focus: ETS, INF, CCC3, CCC4
Jacqueline Leonard *(jleona12@uwyo.edu),* University of Wyoming, Laramie
Adrienne Unertl *(aunertl@uinta1.com),* Uinta County School District #1, Evanston, WY
Motivate student learning using computer modeling tools to create images of wildlife to learn about science and ecosystems while also learning to code.

Biomagnification in Ocean Food Webs: You Are What You Eat
(Grades 9–12) *D7, Convention Center*
Science Focus: ESS3, LS, SEP2
Beth Callaghan (@bethofall; *bcallaghan@mbayaq.org),* Monterey Bay Aquarium, Monterey, CA
Explore the phenomena of bioaccumulation and biomagnification and learn about a consequence that plastic has on our ocean food web through an engaging simulation activity.

Instructing the Hands-On Science Classroom
(Grades 7–12) *E2, Convention Center*
Science Focus: ETS1, SEP
Melissa Jones *(mjones@ecsdnv.net),* Carlin Combined School, Carlin, NV
Initiating a hands-on science experience in the classroom can be a daunting task. Discover one teacher's secrets to implementing and maintaining a hands-on science classroom.

NESTA Session: Investigating the Mercalli Scale Through Lived Experience
(Grades 3–College) *F1/2/7/8, Convention Center*
Science Focus: ESS2.B, ESS3.B, CCC1, SEP2, SEP4
Richard Jones (@mtzennmaster; *rmjones7@hawaii.edu),* University of Hawaii–West Oahu, Kaploei
Earthquakes are typically reported in Richter magnitude scale, which doesn't necessarily relate to the destruction shown in the media. The Mercalli Scale offers another alternative.

8:00–9:00 AM Exhibitor Workshops

Hands-On Activities to Model Habitat Preference and Population Sampling
(Grades K–12) *A1, Convention Center*
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Nurture students' curiosity! Investigate and model methods used by scientists to estimate population sizes. Plan and carry out experiments to observe the habitat preference of bess beetles and millipedes. Let the excitement in your classroom begin!

Demystifying 3-D, the *NGSS,* and STEM Literacy Through the Phenomenon of Earthquakes
(Grades 3–10) *A10, Convention Center*
Science Focus: ESS3.B, PS4.A, CCC1
Sponsor: STEMscopes
Terry Talley *(ttalley@acceleratelearning.com),* STEMscopes, Houston, TX
Join us as we demystify STEM, *NGSS,* 3-D, and the 5E model. We will be creating and using models of waves, seeing patterns through simulations, and designing authentic and engaging solutions in this study of the phenomenon of earthquakes.

Motion Graphing: Connecting Math Concepts to Displacement, Speed, and Velocity
(Grades 9–12) *A11, Convention Center*
Science Focus: PS2.A, CCC4, SEP5
Sponsor: PASCO
Ronn Fieldhouse, PASCO, Roseville, CA
Help your students make the connection between their math lessons on graphing and slope to the real world by studying the motion of objects. Join us for a hands-on workshop to engage students with a lab activity from PASCO's *Essential Physics* curriculum using the amazing Smart Cart!

Integrating Chromebook™ with Vernier Data-Collection Technology
(Grades 3–College) *A12, Convention Center*
Science Focus: ETS, PS
Sponsor: Vernier Software & Technology
David Carter, Vernier Software & Technology, Beaverton, OR
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. 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.

Determine the Genotype for PTC Taster Versus Non-Taster by Electrophoresis
(Grades 7–College) *A13, Convention Center*
Science Focus: LS3, CCC1, CCC2, SEP4
Sponsor: MiniOne Systems
Richard Chan *(info@theminione.com),* MiniOne Systems, San Diego, CA
Learn and get hands-on experience teaching Mendelian genetics and genotyping by doing electrophoresis. You will pour, load, and run a gel; capture a gel image; analyze the results; and correlate the ability to taste PTC phenotype to genotype. See how you can teach hands-on molecular genetics lab in one classroom session.

Making the Literacy Connection, National Geographic Learning Style

(Grades K–5) *A16, Convention Center*

Science Focus: GEN

Sponsor: National Geographic Learning | Cengage

Pam Caffery *(pam.caffery@cengage.com),* National Geographic Learning | Cengage, Boston, MA

No one does literacy better than National Geographic! Get introduced to *Exploring Science* and its integration of literacy and science. Participants will experience how literacy builds connections through a variety lessons.

Assessment for Learning in the Age of *NGSS:* Revealing Student Thinking and Taking Action

(Grades K–8) *A17, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

Sophia Lambertsen and **Rebecca Abbott,** The Lawrence Hall of Science, University of California, Berkeley

Explore the formative assessment system for Amplify Science, which is designed to help teachers monitor and support students' three-dimensional learning by providing timely, actionable, and credible information to teachers and suggesting specific instructional responses tailored to that information.

Are You Moody?

(Grades 6–College) *A18, Convention Center*

Science Focus: PS

Sponsor: Texas Instruments

Fred Fotsch, Texas Instruments, Dallas

We will bring science and coding together as participants learn to do some basic coding (no experience necessary) while developing a mood ring! The science of color mixing is explored while determining the right body temperature thresholds. Is fuchsia flirty? Should green be groovy? It's up to you!

Cell Differentiation and Gene Expression

(Grades 9–12) *A2, Convention Center*

Science Focus: LS1.A, LS1.B, LS3.A, LS3.B, CCC1, CCC4, CCC6, SEP2, SEP6

Sponsor: Lab-Aids, Inc.

Virginia Rehberg, Wilson High School, Tacoma, WA

Students often have trouble conceptualizing how selective gene expression works. We will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the new *Science and Global Issues: Biology* program from SEPUP and Lab-Aids. Activities focus on ways to integrate selective gene expression as a relevant and engaging sustainability issue.

Forensic DNA Fingerprinting Plus Engineering on a Budget

(Grades 9–College) *A3, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Bio-Rad Laboratories

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

Crime scene DNA recovered, suspects identified, a mystery to solve—it's a job for. . .your students! From pieces to prototype, have your students design, build, and use working electrophoresis units to solve the crime. Learn to make an engaging DNA fingerprinting lesson that is both engineering based and cheaper.

Explaining Natural Selection Using HHMI BioInteractive Resources

(Grades 9–College) *A4, Convention Center*

Science Focus: ESS3.B, LS3, LS4, CCC, SEP4, SEP6

Sponsor: HHMI BioInteractive

Bernice O'Brien *(bobrien@bisd303.org),* Bainbridge High School, Bainbridge Island, WA

Why do some mice have dark fur and others light fur? Get hands-on experience with free classroom-ready HHMI BioInteractive resources using the story of the rock pocket mouse to explore natural selection. Learn how students can develop an explanation for this engaging phenomenon by exploring all three dimensions of *NGSS.*

Flinn Favorite Biology Activities and Games

(Grades 9–12) *A5, Convention Center*

Science Focus: LS

Sponsor: Flinn Scientific, Inc.

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

Students learn better and faster when they are actively involved in hands-on activities that are not only fun, but create learning opportunities along the way. We will share some inquiry-based labs, interactive demonstrations, and collaborative games you can use to motivate your students.

EarthComm: A Project-Based Earth and Space Systems Science Program Developed by the American Geosciences Institute

(Grades 9–12) *A6, Convention Center*

Science Focus: ESS

Sponsor: Activate Learning

Marilyn Schmidt, Activate Learning, Aurora, CO

Recent developments and the increasing societal importance of Earth-related issues have created a need for understanding the Earth's systems. The American Geosciences Institute's new edition of *EarthComm,* and its project-based Earth systems approach can help you implement the practices and goals of the *NGSS.*

8:00 AM–5:00 PM Meetings

NGSS Workshop, Level 1: Making Sense of Three-Dimensional Teaching and Learning

(By Separate Registration Only) *Grand Ballroom 4, Atlantis*

Participants build a solid understanding of the three dimensions and how they integrate, and take home a powerful toolkit of resources to further their implementation efforts.

NGSS Workshop, Level 2: Designing Three-Dimensional Lessons and Units Workshop

(By Separate Registration Only) *Grand Blrm. 2/3, Atlantis*

Participants deepen their understanding of three-dimensional teaching and learning by focusing on developing storylines and learning how to use their resources to support broader implementation efforts in their schools and districts.

9:00 AM–12 Noon Short Course

Ocean Plastic Pollution: Issues and Solutions (SC-2)

(Grades 6–8) *Tickets Required; $30* *Grand Blrm. 5, Atlantis*

Science Focus: ESS3.C, PS1.A, CCC6, SEP1

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

For description, see page 30.

9:00 AM–4:00 PM Exhibits

Hall 3, Convention Center

Did you know that NSTA offers exclusive exhibit hall and exhibitor workshop hours today from 3:00 to 4:00 PM? During these hours there are no teacher sessions scheduled and it's a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

9:30–10:30 AM Featured Presentation

How Do You Scale Innovation?

(General) *C1, Convention Center*

Science Focus: GEN

Sarah Young (@YoungUTed; *sarah.young@schools.utah.gov),* Coordinator for Digital Teaching and Learning, Utah State Office of Education, Salt Lake City

Presider: Deb Novak, Strand Leader, NSTA Reno Area Conference, and New Mexico Museum of Natural History and Science, Albuquerque

Do you have a great idea? Of course you do, you are a SCIENCE TEACHER! This presentation will focus on how to take that great idea and scale it with constructive partnerships.Come learn how to take your innovation to the next level by creating a community of leaders that support your students.

Sarah Young currently provides leadership as Digital Teaching and Learning Coordinator with the Utah State Board of Education, and she was previously the K–12 Science Specialist and the STEM Liaison for Utah. As coordinator for Digital Teaching and Learning, Sarah plans, develops, promotes, implements, and evaluates programs in digital and personalized learning. She also coordinates with colleges, universities, and other educational institutions to improve the preservice and inservice education of teachers, administrators, and other school personnel. This includes administering state and federal grants, implementing and monitoring state and federal legislation, and providing technical support in the area of current research-based practices.

9:30–10:30 AM Presentations

Isopods! Or How We Learned to Stop Worrying and Love the Roly Poly

(Grades 3–5) *A20, Convention Center*

Science Focus: LS1.A, LS2, CCC2, CCC4, CCC6, SEP

Alyssa Park (@missparkses; *apark@dcsd.k12.nv.us)* and **Jeff Johnston** *(realworldsci@gmail.com),* Douglas County School District, Gardnerville, NV

Lauren Spires *(lspires@dcsd.k12.nv.us),* Minden Elementary School, Minden, NV

We will share the district-level and collaborative design, implementation, and refinement of a grade 4 life science kit following the 5E lesson plan model.

Phenomenal Biology

(Grades 9–11) *A7, Convention Center*

Science Focus: LS, SEP

Sarah Richardson (@BiologyNV); Virginia City High School, Virginia City, NV

Phenomena in biology can lead to major successes and failures. Join the conversation of what has worked and bring your "phenomena"l biology ideas to share.

NSTA Press® Session: Uncovering Middle School and High School Student Ideas with Digital Devices

(Grades 6–College) *C3, Convention Center*

Science Focus: GEN, NGSS

Page Keeley (@CTSKeeley; *pagekeeley@gmail.com),* 2008–2009 NSTA President, and The Keeley Group, Fort Myers, FL

Ray Barber (@raylbarber; *rbarber@chicousd.org),* Pleasant Valley High School, Chico, CA

Explore how a variety of apps and devices can be used with the *Uncovering Student Ideas in Science* probes and formative assessment classroom techniques (FACTs).

DRI GreenBox Partnerships

(Grades 1–12) *D5, Convention Center*

Science Focus: GEN, SEP2, SEP3

Brian Fitzgerald *(bcfitzgerald@yahoo.com)* and **Mackenzie Peterson** (@drisciencealive; *mackenzie.peterson@dri.edu),* Desert Research Institute, Reno, NV

Bring cutting-edge science and real-world experience to the classroom. Explore how the Desert Research Institute's preK–12 education program pairs seasoned educators with scientists to design high-quality STEM resources.

Using Common Language to Build Partnerships and Support for *NGSS*

(Grades K–12) *D9/10, Convention Center*

Science Focus: GEN, NGSS

Jessica Sawko (@jesica_sawko; *jessica@cascience.org),* California Science Teachers Association, Folsom

Jessica Howard (@CDEFoundation; *jessica@cdefoundation.org),* CDE Foundation, Los Angeles, CA

Stephen Blake *(stephengblake@gmail.com),* Children Now, Sacramento, CA

Engage with collaboratively developed communication tools and learn how the use of common language has grown partnerships and support for *NGSS* in California.

NSELA-Sponsored Session: NSELA Tools for Leaders I

(General) *E2, Convention Center*

Science Focus: GEN

Missi Zender-Sakach *(missiz@summitesc.org),* Summit Educational Service Center, Cuyahoga Falls, OH

The National Science Education Leadership Association's "Tools for Leaders" session provides an opportunity to learn about NSELA's initiatives to "Advocate, Communicate, and Educate."

What Is the (Augmented) Reality of Your Science Lab?

CANCELED

(General) *E3, Convention Center*

Science Focus: GEN

Sandra Leiterman (@saleiterman; *saleiterman@gmail.com),* University of Arkansas at Little Rock

Recent research has shown that the use of augmented reality can improve both science lab skills as well as student attitudes toward science.

Bring the World to Your Classroom

(Grades K–12) *F9, Convention Center*

Science Focus: GEN

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

Come learn how to develop global competency by participating in global learning programs that support all subjects and grade levels and open the world for your students.

9:30–10:30 AM Hands-On Workshops

Bringing Robotics into the K–5 Classroom
(Grades K–5) *A19, Convention Center*
Science Focus: ETS
Catherine Pozarski Connolly and **Tim Robinson** *(timothyr@unr.edu),* University of Nevada, Reno
David Crowther (@Dtcrowther; *crowther@unr.edu),* NSTA Retiring President, and University of Nevada, Reno
Engage in hands-on explorations of robotics for K–5 classrooms! Take away ideas, lesson plans, games, and more for use in the elementary setting!

3D INF **Space Sailing with NASA's BEST Educators Engineering Design Process**
(Grades 5–9) *A8, Convention Center*
Science Focus: ETS1, INF
Laurie Cook *(laurie.cook@okstate.edu),* Oklahoma State University, Palmdale, CA
Participants will engage in the engineering design process as they design, create, and test a prototype of NASA's space sail.

NSTA Press® Session: *Eureka!* K–2 and 3–5 Science Activities and Stories
(Grades K–5) *A9, Convention Center*
Science Focus: GEN, NGSS
Donna Farland-Smith *(farlandsmith@aol.com),* The Ohio State University at Mansfield
Participate in lessons linking nonfiction historical trade books and science content for the *Eureka!* series for grades K–2 and 3–5.

Our Approach to Curriculum Development: Creating Engaging *NGSS*-Focused Storylines
(Grades K–8) *D1, Convention Center*
Science Focus: GEN, NGSS
Teresa Barski *(teresa.barski@successacademies.org)* and **Rachel Seys** *(rachel.seys@successacademies.org),* Success Academy Charter Schools, New York, NY
Learn a curriculum development process and leave with several creative new ways to generate storylines that meet the *NGSS.*

ACS Middle Level Session Two: The Water Molecule and Dissolving
(Grades 6–8) *D2, Convention Center*
Science Focus: PS1.A
James Kessler, American Chemical Society, Washington, DC
Explore the characteristics of the water molecule and the process of dissolving through hands-on activities and molecular animations from the free 5E lessons at *middleschoolchemistry.com.*

ACS High School Session Two: Constructing Science Ideas About Ionic Bond Strength—Solubility and Melting Point
(Grades 9–12) *D3, Convention Center*
Science Focus: PS, CCC, SEP
Kimberly Duncan (@chemduncan; *kimberly.z.duncan@gmail.com),* American Association of Chemistry Teachers, Washington, DC
Experience strategies for engaging students in analyzing and interpreting data to discover the structural factors that affect the solubility and melting point of ionic compounds. Explore how to help students use their findings to revise their original models and create solutions to relevant problems in the surrounding world.

ASEE Session: GenCyber Wyoming: COWPOKES, Professional Development, Camp, and Experiences
(Grades 6–College) *D4, Convention Center*
Science Focus: GEN, INF, SEP5, SEP8
Mike Borowczak (@mborowczak; *mike.borowczak@uwyo.edu)* and **Andrea Burrows** (@SciEdBurrows; *andrea.burrows@uwyo.edu),* University of Wyoming, Laramie
Explore the world of programmable microbit-based wearable badges (from experiences of teachers and students in Summer 2018).

Sharing Evolution Resources for Middle School Science Teachers
(Grades 6–8) *D6, Convention Center*
Science Focus: LS4, SEP7
Jennifer Panczyszyn (@jpscigirl), Clark County School District, Las Vegas, NV
The Teacher Institute for Evoluntionary Science (TIES) helps teachers seeking leadership roles in their communities and empowers middle school science teachers to teach evolution confidently through free online resources and webinars.

What Is the Difference Between Weather and Climate?

(Grades 6–12) *D7, Convention Center*

Science Focus: ESS2.D, ESS3.D, CCC1, CCC2, CCC4, CCC7, SEP7

Laura Tucker *(lauratucker98368@gmail.com),* Consultant, Port Townsend, WA

Using a probe from the popular *Uncovering Student Ideas in Earth and Environmental Science* book, the co-author will share student responses to address this key concept for teaching climate change.

ASTE-Sponsored Session: Integrating Engineering Design with Science and Language Arts Within the Context of *NGSS*

(Grades 3–5) *D8, Convention Center*

Science Focus: ETS1

Hasan Deniz *(hasan.deniz@unlv.edu),* **Erdogan Kaya** *(kaya@unlv.nevada.edu),* and **Ezgi Yesilyurt** *(yesilyur@unlv.nevada.edu),* University of Nevada, Las Vegas

We will engage in an engineering design activity that lends itself to integration of science content, as well as reading and writing activities for upper elementary grades.

NESTA Session: Ice Cores and Climate Change

(Grades 3–College) *F1/2/7/8, Convention Center*

Science Focus: ESS2.C, ESS2.D, ESS3.C, ESS3.D, CCC1, CCC4, CCC7, SEP2, SEP3, SEP4

Richard Jones (@mtzennmaster; *rmjones7@hawaii.edu),* **Carrie Tome** *(ctome@hawaii.edu),* and **Sarah Glancy** (@SarahEl91525554; *sglancy@hawaii.edu),* University of Hawaii–West Oahu, Kaploei

Ice cores tell a story of climate change that you can share with your students. Come learn how to construct and model ice cores with simple materials.

INF **Designing Project-Based Learning to Build on Failure While Engaging All Learners**

(Grades K–12) *F3, Convention Center*

Science Focus: GEN, INF

John Loehr *(jfloehr@soinc.org),* Science Olympiad, Oakbrook Terrace, IL

Learn how to design, or modify, Project-Based Learning activities so that failure can be a teachable moment and engage all learners using a framework from Science Olympiad.

9:30–10:30 AM Exhibitor Workshops

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

(Grades 9–12) *A1, Convention Center*

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Ready for a dissection that is on the cutting edge? With this "real" classroom autopsy, easily revitalize your mammalian structure and function lesson while employing three-dimensional instruction. Participants dissect a Carolina's Perfect Solution pig by modeling the protocols of a professional forensic pathologist. Come experience our exclusive Perfect Solution specimens.

Demystifying 3-D, the *NGSS,* and STEM Literacy Using the Phenomenon of Light

(Grades 3–9) *A10, Convention Center*

Science Focus: PS4.B, CCC1, SEP3, SEP5, SEP6

Sponsor: STEMscopes

Terry Talley *(ttalley@acceleratelearning.com),* STEMscopes, Houston, TX

Join us as we look at a new approach to engage students in reading, writing, and using math to describe phenomena in collaborative learning groups. Learn ways to guide students toward mastery and high achievement in *NGSS* and three-dimensional learning.

Data Collection and Simulations to Help Take the Pressure Out of Understanding Gas Laws

(Grades 9–12) *A11, Convention Center*

Science Focus: PS1.A, CCC1, SEP3

Sponsor: PASCO

Ronn Fieldhouse, PASCO, Roseville, CA

Help students understand gas laws by integrating real-life phenomena, data collection, and virtual simulations in this hands-on workshop from PASCO. Engage students with a relatable activity and then collect and analyze quantitative data using the Wireless Pressure sensor and SPARKvue software. Interactives from *Essential Chemistry* help students develop the mental models of gas particles that truly explain bulk-scale gas properties.

Chemistry with Vernier
(Grades 9–12) *A12, Convention Center*
Science Focus: ETS, PS
Sponsor: Vernier Software & Technology
David Carter, Vernier Software & Technology, Beaverton, OR
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 data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

DNA Forensics Solves the Murder Mystery of Dr. Ward
(Grades 6–12) *A13, Convention Center*
Science Focus: LS3, CCC1, CCC2, SEP3, SEP4, SEP7
Sponsor: MiniOne Systems
Richard Chan *(info@theminione.com),* MiniOne Systems, San Diego, CA
In this hands-on MiniLab, students analyze hair, fingerprint, and DNA evidences from the crime scene to determine who is the killer. You will learn how to get your students to pour, load, and run a gel; capture a gel image; and analyze the results using electrophoresis to perform DNA analysis for forensics.

DNA Glow Lab: A New Way to Investigate DNA Structure
(Grades 6–College) *A16, Convention Center*
Science Focus: LS1, LS3, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Sponsor: miniPCR
Bruce Bryan *(bruce@minipcr.com),* **Robert Dennison** *(robert@minipcr.com),* and **Sebastian Kraves** *(team@minipcr.com),* miniPCR, Cambridge, MA
A completely new approach to studying DNA in the classroom! Have your students directly investigate how factors like temperature, pH, and genetic sequence affect DNA structure. Go beyond building paper and candy models; use modern biotechnology techniques to introduce an authentic lab component to your DNA unit…and it glows!

Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5
(Grades 2–5) *A17, Convention Center*
Science Focus: ESS2.D, ESS3.B, ETS, CCC1, SEP1, SEP3, SEP4, SEP5, SEP7, SEP8
Sponsor: Amplify
Sophia Lambertsen and **Rebecca Abbott,** The Lawrence Hall of Science, University of California, Berkeley
Experience how students investigate which locations are most suitable for a population of orangutans while analyzing data and figuring out principles of global weather and climate patterns. Get a hands-on deep dive into the newest curriculum from The Lawrence Hall of Science, designed from the ground up for *NGSS.*

STEMulating the Heart with Code!
(Grades 6–College) *A18, Convention Center*
Science Focus: LS
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (SD) School District
Fred Fotsch, Texas Instruments, Dallas
Join us as we combine biology and coding to create an artificial heart! With some basic materials, construct a four-chambered heart and then innervate it with an artificial nervous system. From there, you will write some very simple code (no coding experience required) to bring your heart to life! If time permits, you will also create an AED (automated external defibrillator)! Appropriate for middle school and high school students.

Photosynthesis and Respiration Shuffle
(Grades 9–12) *A2, Convention Center*
Science Focus: LS1.C, LS2.B, PS3, CCC4, CCC5, SEP2, SEP6
Sponsor: Lab-Aids, Inc.
Virginia Rehberg, Wilson High School, Tacoma, WA
Students have major misconceptions about photosynthesis and cellular respiration, but this content is essential for understanding how matter and energy flows, both at the micro (cellular) and macro (ecosystem) levels. Using a computer simulation, a hands-on activity, and notebooking and discussion strategies, expose student thinking—all from SEPUP's new *Science and Global Issues: Biology* program from Lab-Aids.

—*Photo courtesy of Jacob Slaton*

Think Like an Engineer in Your Biology Class
(Grades 9–College) *A3, Convention Center*
Science Focus: LS, SEP
Sponsor: Bio-Rad Laboratories
Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, CA
Incorporate *NGSS* science and engineering practices in your biology class by engaging students to define the problem of world hunger. Considering constraints, students will design a treatment plan (solution) for protein-energy malnutrition, in the form of an evidence-based argument.

HHMI Is Phenomenal! Using BioInteractive to Create Phenomena-Based Lessons
(Grades 6–12) *A4, Convention Center*
Science Focus: ESS1.C, ESS2.B, ESS3.C, ESS3.D, LS2.C, LS4.B, LS4.C, CCC1, CCC2, CCC7, SEP1, SEP4, SEP5, SEP6
Sponsor: HHMI BioInteractive
James Clark *(ngsiteam1@gmail.com),* Retired Educator, Pleasanton, CA
Samantha Johnson *(smjohnson@slzusd.org),* Arroyo High School, San Lorenzo, CA
Struggling to find phenomena? Learn how you can use the many free resources available at HHMI BioInteractive to anchor phenomena-based three-dimensional lessons. The *NGSS* require students to investigate phenomena. Participants will create and leave with 5E lessons that facilitate students' explanations of natural phenomena and a mini HHMI phenomena bank.

Flipping AP Biology with FlinnPrep
(Grades 10–11) *A5, Convention Center*
Science Focus: LS, SEP
Sponsor: Flinn Scientific, Inc.
Mike Marvel, Flinn Scientific, Inc., Batavia, IL
Flipping your AP Biology class can help create an engaging and active classroom, focused on mastering the science practices. Learn how FlinnPREP™, a supplemental digital curriculum with assessment solution, can ease your transition by providing video, images, and written content in a condensed form. Learn to use this tool to assess student understanding and as a jumping-off point for teaching modeling.

Building a Rigorous and Equitable Discourse Culture
(Grades K–12) *A6, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Activate Learning
Heather Milo, Activate Learning, Greenwich, CT
At its core, *NGSS* promotes a culture that values publicizing, working with, and working on student thinking. This requires us to guide and assess student participation in the sociocultural aspects of our classrooms, but how do we begin to make that shift with students? We will use the phenomenon-based middle school curriculum Investigating and Questioning our World through Science and Technology (IQWST®) to gain strategies that can be implemented in any science classroom.

11:00 AM–12 Noon Featured Presentation

A Woman in Mission Control

(General) *C1, Convention Center*

Science Focus: GEN

Marianne Dyson (@mariannedyson; *m@mdyson.com),* Author and Former NASA Flight Controller, Houston, TX

Presider: Kristoffer Carroll, Strand Leader, NSTA Reno Area Conference, and Southern Nevada Regional Professional Development Program, North Las Vegas

Author Marianne Dyson shares her personal experience earning a degree in physics and becoming one of the first women to join the problem-solving team in Mission Control prior to and during the first Space Shuttle flights.

Marianne Dyson was one of NASA's first female flight controllers, serving as a Flight Activities Officer during the first Space Shuttle flights, the subject of her memoir, A Passion for Space. *Since leaving NASA, Marianne has shared her passion through writing and appearances. Her children's nonfiction books have won top awards for writing and science content. Marianne has coauthored two books with* Apollo 11's *Buzz Aldrin for National Geographic (including* Welcome to Mars, *which was an NSTA Best STEM Book). She speculates about the future through articles and science fiction published most often in* Ad Astra, *the magazine of the National Space Society, and* Analog Science Fiction *magazine. For more information, visit* www.mdyson.com.

11:00 AM–12 Noon Presentations

NSTA's Online Resources and Communities

(General) *A19, Convention Center*

Science Focus: GEN, NGSS

Flavio Mendez (@fljmendez; *flavio_m@nsta.org*), Assistance Executive Director, NSTA Learning Center, NSTA, Arlington, VA

The NSTA Learning Center and the NGSS@NSTA Hub provide educators with thousands of free resources and opportunities—as well as a professional peer community—that support professional learning and classroom instruction. Get a free SciPack. NSTA gift cards will be raffled!

Creating a Sense of Place Through Collaborative Learning

(Grades P–3) *A9, Convention Center*

Science Focus: LS2, PS4, INF, CCC2, CCC7, SEP1

Elizabeth Nunez *(nunezelizabeth0218@yahoo.com)* and **Lakisha Kincherlow,** Paterson (NJ) Public Schools

Norma Menchon (@MenchonNorma; *menchon@aol.com),* Paterson School No. 2, Paterson, NJ

Latoya Nelson-Piccott (@heymsnelson; *lnelsonpiccott@ppsstaff.org),* Paterson Public School 26, Paterson, NJ

Join us as we explore how community partnerships helped us develop a deeper connection to our local resources and build a collaborative network to promote teacher and student learning.

NSTA Press® Session: Uncovering 3-D Ideas About Matter and Energy

(Grades K–12) *C3, Convention Center*

Science Focus: PS, CCC, SEP

Page Keeley (@CTSKeeley; *pagekeeley@gmail.com),* 2008–2009 NSTA President, and The Keeley Group, Fort Myers, FL

Explore how the collection of K–12 matter and energy formative assessment probes can be used to support three-dimensional assessment, instruction, and learning.

NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think!
(Grades 1–12) *D8, Convention Center*
Science Focus: ESS
Jeannine Montgomery (@NOAAeducation; *jeannine.montgomery@noaa.gov),* NOAA Office of Education, Washington, DC
The National Oceanic and Atmospheric Administration has hundreds of facilities and professional communicators across the nation. Get connected to guest speakers, field trips, and local and national professional development opportunities.

Eureka! Science Trade Books—Good as Gold!
(Grades P–12) *E1, Convention Center*
Science Focus: GEN
Emily Brady *(ebrady@nsta.org),* Director, Special Projects, Content, NSTA, Arlington, VA
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!

NSELA-Sponsored Session: NSELA Tools for Leaders II
(General) *E2, Convention Center*
Science Focus: GEN
Missi Zender-Sakach *(missiz@summitesc.org),* Summit Educational Service Center, Cuyahoga Falls, OH
The National Science Education Leadership Association's "Tools for Leaders" session provides an opportunity to learn about NSELA's initiatives to "Advocate, Communicate and Educate."

Science for Service Learning Success
(Grades K–12) *E3, Convention Center*
Science Focus: GEN, CCC
Kate Burton (@k8burton; @STEAMTrinityATL; *kburton@trinityatl.org),* Trinity School, Atlanta, GA
To move beyond charity to service learning, science topics afford students with avenues for learning and growth inside the classroom and out in their community.

Developing a K–12 Research-Practice Partnership for Transformative Science Education
(General) *F9, Convention Center*
Science Focus: GEN
Elizabeth De los Santos *(xdelossantos@unr.edu)* and **Candice Guy-Gaytán** (@GuyCandice; *cgaytan@unr.edu),* University of Nevada, Reno
Sylvia Scoggin *(sscoggin@washoeschools.net),* Washoe County School District, Reno, NV
Join us as we describe our work developing a K–12 research-practice partnership between the University of Nevada, Reno and Washoe County School District to transform science classrooms.

11:00 AM–12 Noon Hands-On Workshops

Connecting Natural Selection and Speciation

(Grades 9–12) *Paradise A, Atlantis*

Science Focus: LS4, CCC2, SEP4, SEP7

Molly Malone *(molly.malone@utah.edu),* and **Louisa Stark,** The University of Utah, Salt Lake City

What drives the diversification of life? Examine the process of speciation through a real-world example of genetic variation, natural selection, and reproductive isolation in action.

Building an In-House Curriculum: Let the Adventure Begin

(Grades K–5) *A20, Convention Center*

Science Focus: GEN

Jeff Johnston *(realworldsci@gmail.com),* Douglas County School District, Gardnerville, NV

In 1988, the Douglas County School District implemented Nevada's first kit-based elementary science program. This curriculum is developed in-house and supported through a centralized science resource center. As we mark the 30th anniversary of our program, come learn how the curriculum was developed, piloted, and delivered to our students. The latest units are *NGSS* focused, NEPF scored, and supportive of ELA strategies. Participants will get a taste of our newest units by engaging in several activities while leaving with resources from our latest kits.

3D Participation Structures to Support Equitable 3-D Group Work

(Grades 7–12) *A8, Convention Center*

Science Focus: ESS1, LS2

Michele Cheyne (@mcheyne1; *michele.cheyne@knowlesteachers.org),* Knowles Science Teaching Foundation, Moorestown, NJ

Bernice O'Brien (@bernice_obrien; *bobrien@bisd303.org),* Bainbridge High School, Bainbridge Island, WA

Engage in a strategy for promoting more equitable participation for all students during three-dimensional lessons. You will be ready to use it Monday.

STEM and *NGSS:* Two Converging Paths

(Grades K–12) *C2, Convention Center*

Science Focus: GEN, SEP

Wendy Binder *(wbinder@nsta.org),* SPIR Project Director, NSTA, Arlington, VA

Tricia Shelton (@TdiShelton; *tshelton@nsta.org),* Standards Implementation Specialist, NSTA, Arlington, VA

In which ways are *NGSS* and STEM initiatives in harmony with each other? We will explore the *NGSS* vision for a scientifically literate society and how this vision is mutually supportive of STEM education, focusing on aspects of the designed world through the application of science and engineering practices.

Taking Trade Books and Science Outdoors

(Grades P–6) *D1, Convention Center*

Science Focus: GEN, CCC

Steve Rich (@bflyguy; *bflywriter@comcast.net),* University of West Georgia, Carrollton

Christine Anne Royce (@caroyce; *caroyce@aol.com),* NSTA President, and Shippensburg University, Shippensburg, PA

The co-authors' practical lessons from *Teaching Science Through Trade Books* merge with strategies from the *Outdoor Science* author, activating student learning on concepts from nature.

ACS Middle Level Session Three: ACS Chemical Reactions—Breaking and Making Bonds

(Grades 6–8) *D2, Convention Center*

Science Focus: PS1.B

James Kessler, American Chemical Society, Washington, DC

Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations using the free 5E lessons at *middleschool-chemistry.com.*

ACS High School Session Three: Interparticle Forces in Covalent Compounds—Melting Point, Viscosity, and Vapor Pressure

(Grades 9–12) *D3, Convention Center*

Science Focus: PS, CCC, SEP

Kimberly Duncan (@chemduncan; *kimberly.z.duncan@gmail.com),* American Association of Chemistry Teachers, Washington, DC

Experience strategies for engaging students in analyzing and interpreting data to discover the structural factors that affect the solubility and melting point of covalent compounds. Explore how to help students use their findings to revise their original models and create solutions to relevant problems in the surrounding world.

ASEE Session: Science Teacher Lessons Showcasing Engineering from RAMPED II
(Grades 1–12) *D4, Convention Center*
Science Focus: ETS, INF, CCC, SEP
Andrea Burrows (@SciEdBurrows; *andrea.burrows@uwyo.edu),* **Mike Borowczak** (@mborowczak; *mike.borowczak@uwyo.edu),* **Garrett Burrows** *(gburrows@uwyo.edu),* and **Nic Robinson** (@NicRobinson16), University of Wyoming, Laramie
RAMPED stands for Robotics, Applied Mathematics, Physics, and Engineering Design. Experience hands-on science-related activities from this program that explore using the three dimensions of the *NGSS* with a focus on engineering.

INF **Aero Design Challenge**
(Grades 5–8) *D6, Convention Center*
Science Focus: ETS1, INF
Jon Welte (*jon@hiller.org*) and **Linh Fanger,** Hiller Aviation Museum, San Carlos, CA
Explore engineering in this hands-on workshop as we build and test a working glider, and then fly in competition to find the best of the best!

Friction in Motion
(Grades 7–10) *D7, Convention Center*
Science Focus: PS2, SEP4, SEP5
Jacklyn Bonneau *(bonneau@wpi.edu),* Professional Development, North Grosvenordale, CT
Pave the way for new learning with a new twist on the understanding of friction using constant speed vehicles. Exploring the moving vehicle brings the level of understanding deeper for younger students.

NESTA Shares: Going Beyond the Controversy: Promoting Critique, Evaluation, and Argument in Earth Science
(Grades 6—College) *F1/2/7/8, Convention Center*
Science Focus: ESS, SEP
Doug Lombardi *(doug.lombardi@temple.edu),* Temple University, Philadelphia, PA
Emphasis will be placed on instructional scaffolds for Earth science topics that help students critically evaluate connections between evidence and alternative scientific explanations.

How to Read Like Scientists
(Grades 3–12) *F3, Convention Center*
Science Focus: GEN
Ann Berg *(abergtravels@gmail.com),* Cambridge-Isanti Schools, Cambridge, MN
Explore strategies through interactive activities and discussion that support success in reading science nonfiction and, most importantly, scientific inquiry.

11:00 AM–12 Noon Exhibitor Workshops

Introduction to Wisconsin Fast Plants®
(Grades K–12) *A1, Convention Center*
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the versatility of Wisconsin Fast Plants. These quick-growing plants engage students and are ideal for all grade levels. Easily integrate disciplinary core ideas, crosscutting concepts, and practices in life cycle, heredity and inheritance, variation and evolution, and environmental science lessons. Learn to plant, pollinate, and teach with Fast Plants.

STEM Teacher-Science Teacher: What's the Difference?
(General) *A10, Convention Center*
Science Focus: GEN, INF
Sponsor: STEMscopes
Virginia Rhame *(vrhame@nise.institute),* National Institute for STEM Education, Houston, TX
STEM integration into science brings out the unique nature of STEM. There is a need to shift instructional strategies. Getting a STEM certificate encourages shifting through self-reflection and growth.

Take Your Students on a Quest! A Real-World Problem-Based Learning Project That Incorporates All Three Dimensions of *NGSS*

(Grades K–8) *A11, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Pearson

Chuck McMillan, Pearson, Boston, MA

Take your students on a Quest! These real-world Problem-Based Learning projects incorporate all three dimensions of the *NGSS*. Experience a Quest! bringing classroom concepts to life as students are immersed in a world of discovery to help solve real-world problems through a combination of hands-on and digital simulations.

Biology with Vernier

(Grades 9–12) *A12, Convention Center*

Science Focus: ETS, LS

Sponsor: Vernier Software & Technology

David Carter, Vernier Software & Technology, Beaverton, OR

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.

Career-Connected Classroom® Forensic Facial Reconstruction

(Grades 7–College) *A13, Convention Center*

Science Focus: GEN

Sponsor: KIMSeattle: Kids in Medicine & Science

Lael McAuliffe *(info@kimseattle.org)* and **Joanie Block** *(info@kimseattle.org),* KIMSeattle (Kids in Medicine & Science, Seattle), WA

KIMSeattle introduces Forensic Facial Reconstruction, a contemporary curriculum kit that includes full-scale models, professional-grade supplies, and ready-to-teach materials. This authentic laboratory experience is scenario based to hook students' imaginations and intersects science, art, and history. Perfect for upper middle through high school, including AP Bio.

Are You a Night Owl? A Morning Lark? The Answer May Be in Your Genes

(Grades 8–College) *A16, Convention Center*

Science Focus: LS1, LS3, LS4, SEP

Sponsor: miniPCR

Robert Dennison *(robert@minipcr.com),* **Bruce Bryan** *(bruce@minipcr.com),* and **Sebastian Kraves** *(team@minipcr.com),* miniPCR, Cambridge, MA

The miniPCR Sleep Lab links the genetic control of circadian rhythms to students' own DNA. Use PCR to amplify a locus associated with preference for morning versus evening activity, and DNA gel electrophoresis to read your own circadian genotype. Students explore a genetic association in an authentic research investigation.

Integration in Middle Grades: Implementing an *NGSS* Approach to Cross-Disciplinary Teaching and Learning

(Grades 6–8) *A17, Convention Center*

Science Focus: GEN, NGSS

Sponsor: Amplify

Sophia Lambertsen and **Rebecca Abbott,** The Lawrence Hall of Science, University of California, Berkeley

Figure out what it means to teach in an integrated way within a unit and across a full year of science. Participants will dive into the Amplify Science Integrated Sequence for Grades 6–8, designed to support deep and coherent learning of disciplinary core ideas while providing opportunities to apply and connect across domains.

Zombie Apocalypse!

(Grades 6–12) *A18, Convention Center*

Science Focus: LS

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (SD) School District

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

What Is a Species?
(Grades 9–12) *A2, Convention Center*
Science Focus: LS4.A, CCC1, CCC2, SEP6, SEP7, SEP8
Sponsor: Lab-Aids, Inc.
Virginia Rehberg, Wilson High School, Tacoma, WA
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 determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.

Become a GMO Investigator
(Grades 9–College) *A3, Convention Center*
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe *(damon_tighe@bio-rad.com),* Bio-Rad Laboratories, Hercules, CA
Regardless of where you stand in the GM debate, wouldn't it be interesting to know which foods you eat are GM foods? This hands-on workshop teaches basics of DNA extraction, PCR, and electrophoresis and how they are used to test grocery store food products for the presence of GM foods.

Exploring Trophic Cascades: Some Species Are More Equal Than Others
(Grades 7–12) *A4, Convention Center*
Science Focus: LS2, LS4.C, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP1, SEP2, SEP4, SEP7
Sponsor: HHMI BioInteractive
Cheryl Ann Hollinger *(biobabe07@hotmail.com),* HHMI BioInteractive, Chevy Chase, MD
How do we know which organisms and processes determine the organization of natural ecosystems? Discover an HHMI BioInteractive film and supporting activities on trophic cascades and the effects of keystone species. Free *NGSS*-focused materials that translate the revolutionary work of scientists into classroom-ready resources will be highlighted.

Moving from Learning to Read and Write…to Reading and Writing to Learn: Literacy Strategies in the Science Classroom
(Grades 6–8) *A6, Convention Center*
Science Focus: GEN, CCC, SEP8
Sponsor: Activate Learning
Ellen Mintz, Charleston County School District, Charleston, SC
Experience a lesson from Investigating and Questioning our World through Science and Technology (IQWST®) that draws on the most recent research on literacy learning in the context of science. Walk away with core strategies for incorporating academic language more fluently through thinking, reading, writing, and talking science! Uses the IQWST unit "How Can I Make New Stuff from Old Stuff?"

12:30–1:00 PM Presentation

SCST-Sponsored Session: Writing Exam Questions as a Learning Tool
(Grades 9–College) *E1, Convention Center*
Science Focus: GEN
Yoojin Choi *(yjchoi@northpark.edu),* North Park University, Chicago, IL
Do students learn better when they write practice exam questions?

12:30–1:30 PM Meeting

ASTE Northwest Regional Business Meeting
Executive Boardroom, Atlantis
Members of ASTE and anyone interested in the Northwest ASTE region—please join us for our annual business meeting.

12:30–1:30 PM Presentations

Using Virtual Simulations to Enhance Three-Dimensional Learning

(Grades 6–College) *Treasures C/D, Atlantis*

Science Focus: GEN, NGSS

Brian Lenze (@CCSDBlendED; *lenzeb@nv.ccsd.net),* Clark County School District, Las Vegas, NV

Lesli Anne Wertin *(wertila@nv.ccsd.net),* Nevada Learning Academy, Las Vegas

Virtual simulations provide a dynamic learning experience and help facilitate a three-dimensional classroom culture. Come learn more!

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

(Grades K–12) *A19, Convention Center*

Science Focus: GEN, NGSS

Acacia McKenna *(amckenna@nsta.org),* Director, Competitions, NSTA, Arlington, VA

Sue Whitsett *(swhitsett@nsta.org),* AEOP Project Director, 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. Free food and a gift bag will be distributed to each participant.

Critter Crossings in the Classroom: Wildlife Awareness Through Cross-Curricular Integration and Collaboration with Nevada Department of Transportation Makes Learning Meaningful!

(Grades K–6) *A9, Convention Center*

Science Focus: GEN, NGSS

Donna Wood (@wood3rd; *dwood@washoeschools.net),* Washoe County School District, Reno, NV

Help drive instruction with a Project-Based Learning unit that integrates STEM, *NGSS,* and *CCSS* to increase grade 2 students' awareness of interdependent relationships in our Northern Nevada ecosystems and highway safety. Hear how we collaborated with the Nevada Department of Transportation to provide students with an authentic audience for their written proposals/projects and in-depth information about Animal Crossings and highway safety in Northern Nevada.

Modeling Stellar Evolution and Supernovas Using NASA Images, Data, and STEM Analysis Tools

(Grades 8–12) *C2, Convention Center*

Science Focus: ESS1.A, ETS1.B, ETS2.A, PS1.B, PS1.C, PS2, PS3.B, PS3.C, PS4.B, PS4.C, CCC1, CCC2, CCC4, CCC7, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

Donna Young *(dlyoung.nso@gmail.com),* NASA/NSO UoL Coordinator, Bullhead City, AZ

Model stellar evolution processes using NASA images, plot H-R diagram transitions, and determine the chemistry and physics of supernovas using NASA STEM image analysis tools.

NSTA Press® Session: *Everyday Science Mysteries*

(Grades 1–8/College) *C3, Convention Center*

Science Focus: GEN

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

Kathleen Konicek-Moran *(kathleen.konmor@gmail.com),* Botanical Illustrator and Nature Artist, Bradenton, FL

See how this series can enliven literacy in your classroom, and lead to scientific research activities.

Strategies to Enable K–8 Students to Read Science Content with Understanding, and Communicate Concepts and Their Findings Effectively

(Grades K–8) *D1, Convention Center*

Science Focus: GEN, NGSS

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

Leave with content literacy strategies to enable students to read science text and visuals with understanding, and to communicate concepts, observations, and investigative findings orally and in writing. Handouts.

Put On Your 3-D Glasses!

(Grades 1–12) *D5, Convention Center*

Science Focus: GEN, NGSS

Nathan Heiselt, Leah Madison, and **Mackenzie Peterson** (@driscienceealive; *mackenzie.peterson@dri.edu),* Desert Research Institute, Reno, NV

Take part in identifying ways that three-dimensional learning can be integrated into current curricula to assist students in achieving mastery rather than just "covering the topic." Participants will receive an exemplar lesson plan as well.

—*Photo courtesy of Jacob Slaton*

Digital Notebooks: The Perfect Tool for Collection, Reflection, and Collaboration
(General) *D7, Convention Center*
Science Focus: GEN
Jacqueline McCune (@jaci_mc), Northwest Regional Professional Development Program, Carson City, NV
Digital student notebooks are easier than ever! Integrate images, data, graphs, text, as well as other enhancements with free resources that students will love. Soon, you won't need to find space to store physical notebooks, you can view them from the comfort of your home, and students will enjoy creating them.

Empowering the Novice: Supporting the Next Generation of STEM Teachers
(Grades 6–College) *D8, Convention Center*
Science Focus: GEN
Mandi Collins *(mmcollins@unr.edu)* and **Megan Beckam** *(mbeckam@unr.edu),* University of Nevada, Reno
Hear from a panel of preservice, first-year, and mentor teachers as they share successes and challenges of becoming next generation STEM educators.

CSSS-Sponsored Session: Leadership in Science Education: Addressing Equity and Access
(Grades P–12) *E3, Convention Center*
Science Focus: GEN
Ellen Ebert *(ellen.ebert@k12.wa.us),* Washington Office of Superintendent of Public Instruction, Olympia
Andre DeLeon (@ScienceNVy; *adeleon@doe.nv.gov),* Nevada Dept. of Education, Carson City
Engage with state science supervisors and university researchers to explore approaches to equity and work toward developing equity strategies for your school or district.

12:30–1:30 PM Hands-On Workshops

JetStream: An Online School for Weather
(Grades 4–College) *Paradise A, Atlantis*
Science Focus: ESS
Dennis Cain *(dennis.cain@noaa.gov),* NOAA National Weather Service, Fort Worth, TX
JetStream is a free online resource from the National Weather Service, with lesson plans and demonstrations for classroom teaching on various aspects of weather.

Primary Students Can Do Science!
(Grades K–2) *A20, Convention Center*
Science Focus: GEN, NGSS
Camille Stegman (@nevadascience; *camille.stegman@gmail.com),* Raggio Research Center for STEM Education, Reno, NV
Allie Brolsma *(abrolsma@storey.k12.nv.us),* Hugh Gallagher Elementary School, Virginia City, NV
Learn how to help your young students think for themselves and make connections that help them make claims, use evidence, and reason…all by talking less and asking the right questions.

Developing Productive Discourse
(Grades 3–5) *A7, Convention Center*
Science Focus: GEN, SEP
Connie Thomson (@conniethomson7), Northeastern Nevada Regional Professional Development Program, Elko
Learn structures and protocols to implement in the classroom to support students in developing the skills necessary to engage in productive discourse in order to make meaning of concepts.

ACS Middle Level Session Four: ACS Chemical Reactions—Ocean Acidification
(Grades 6–8) *D2, Convention Center*
Science Focus: PS1.B
James Kessler, American Chemical Society, Washington, DC
Explore how excess carbon dioxide in the atmosphere makes water more acidic through hands-on activities from the free 5E lesson plans at *middleschoolchemistry.com.*

ACS High School Session Four: Relating Structure and Properties—Demonstrating Understanding of Bond Strength and Interparticle Attractions
(Grades 9–12) *D3, Convention Center*
Science Focus: PS, CCC, SEP
Kimberly Duncan (@chemduncan; *kimberly.z.duncan@gmail.com),* American Association of Chemistry Teachers, Washington, DC
Discover how to help students integrate results and ideas from multiple explorations of the properties and structure of ionic and covalent compounds to build explanations and construct arguments based on structure-property relationships.

ASEE Session: Microbe Art and the Artful Craft of Science
(Grades 3–12) *D4, Convention Center*
Science Focus: ETS1, LS1.A, INF, CCC1, CCC3, CCC4, SEP2, SEP8
Andrea Burrows (@SciEdBurrows; *andrea.burrows@uwyo.edu),* **Garrett Burrows** *(gburrows@uwyo.edu),* and **Nic Robinson** (@NicRobinson16), University of Wyoming, Laramie
Christy Belardo *(christy.belardo@gmail.com),* Mohonk Preserve, New Paltz, NY
Complement science content and instruction through art and creative endeavors. Create a microbe art project that can be used in a middle school or secondary K–12 science classroom.

NESTA Earth System Science Share-a-Thon
(Grades P–12) *F1/2/7/8, Convention Center*
Science Focus: ESS, CCC4, SEP
Richard Jones (@mtzennmaster; *rmjones7@hawaii.edu),* University of Hawaii–West Oahu, Kaploei
Join more than 20 NESTA members and other education specialists as they share their favorite *NGSS*-congruent classroom activities. Lots of free resources!

Tragedy of the Commons
(Grade 10) *F3, Convention Center*
Science Focus: LS2, SEP6
Tenna Walker *(tennawalkernsta@gmail.com),* Wells Junior/Senior High School, Wells, NV
Tragedy of the Commons is a theory that explains how natural human behaviors can use, abuse, and exploit common resources. Take part in a variety of hands-on experiences around the need for environmental protection regulations.

12:30–1:30 PM Exhibitor Workshops

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher
(Grades 9–12) *A1, Convention Center*
Science Focus: PS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Explore easy, engaging, and safe chemistry activities that guarantee a reaction in your students. Whether you're new to chemistry or feeling out of your element, create excitement with hands-on labs, demonstrations, and Carolina's digital content. These lab activities support three-dimensional learning and work every time, not just periodically.

Using Argumentation to Discuss Phenomena: Increasing Student Voice in the STEM Classroom
(Grades 3–College) *A10, Convention Center*
Science Focus: GEN
Sponsor: STEMscopes
Terry Talley *(ttalley@acceleratelearning.com),* STEMscopes, Houston, TX
Reduce teacher talk and increase purposeful student talk as we model consensus building through argumentation around intriguing science phenomena that matter. ELA skills and the 21st-century skills of communication and collaboration are a must in the STEM classroom.

Integrating Chromebook with Vernier Data-Collection Technology
(Grades 3–College) *A12, Convention Center*
Science Focus: ETS, PS
Sponsor: Vernier Software & Technology
David Carter, Vernier Software & Technology, Beaverton, OR
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. 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.

Get a Move On! Modeling Molecular Transport Across the Cell Membrane

(Grades 8–College) *A13, Convention Center*

Science Focus: ETS1, LS1, PS1, CCC1, CCC2, CCC3, CCC6, CCC7, SEP1, SEP2, SEP6, SEP7, SEP8

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

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

Support three-dimensional learning with materials that engage your students in an exploration of the unique chemical and physical properties of water and the phospholipid bilayer that separates cells from their surrounding environment. Construct a model to explain diffusion, osmosis, as well as active and passive transport across cell membranes.

Ecology from Impact Science: A Middle School *NGSS* Unit

(Grade 7) *A16, Convention Center*

Science Focus: LS

Sponsor: Impact Science Education, Inc.

Ladie Malek *(ladie.malek@impactscience.com),* Impact Science Education, Inc., El Cerrito, CA

Stability and change are natural conditions in an ecosystem. But some disturbances are disruptive in a more permanent way. Can we make these concepts meaningful for students? Absolutely! Come preview our *NGSS* ecology unit that gets students involved through games, observations, hands-on activities, and mathematical modeling!

pH Scale

(Grades 9–12) *A2, Convention Center*

Science Focus: PS, SEP4, SEP5

Sponsor: Lab-Aids, Inc.

Andrew Uy, Loyola High School of Los Angeles, CA

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 versus pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from *A Natural Approach to Chemistry* program.

Authentically Embedding ESS PEs in Biology and Chemistry with HHMI

(Grades 6–12) *A4, Convention Center*

Science Focus: ESS2.B, ESS2.D, ESS3.C, ESS3.D, LS4.A, LS4.B, LS4.C, PS1.A, PS3.B, CCC2, CCC5, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6

Sponsor: HHMI BioInteractive

James Clark *(ngsiteam1@gmail.com),* Retired Educator, Pleasanton, CA

Samantha Johnson *(smjohnson@slzusd.org),* Arroyo High School, San Lorenzo, CA

Embedding Earth and space science performance expectations into chemistry and biology curricula is challenging. This innovative HHMI workshop will highlight ways teachers can use current BioInteractive resources as the crosswalk between chemistry, biology, and ESS performance expectations. Leave with free high-quality resources you can use to build three-dimensional storylines.

STEM Challenge: Keeping Students Engaged with Problem-Solving

(Grades 6–9) *A5, Convention Center*

Science Focus: GEN, NGSS

Sponsor: AEOP

Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, VA

The practices included in the *NGSS* are all based on exploring and solving problems. The act of engaging students in this problem solving can often be a problem itself. Join in to solve puzzles that you can take back to the classroom. Also hear about the online STEM competition, eCYBERMISSION, that gives students a chance to explore and solve problems using science and engineering and discover how you and your students can participate at no cost.

Active Physics: The Leading Project-Based High School Physics Program Capturing the Essence of the *NGSS* and STEM

(Grades 9–12) *A6, Convention Center*

Science Focus: ETS1, PS

Sponsor: Activate Learning

Matthew Anthes-Washburn, Master Teacher/Facilitator, Portland, OR

Learn how you can implement STEM and *NGSS* in your physics, Physics First, or physical science classroom. Gain an understanding of the benefits of the embedded engineering design cycle. Learn how physicists, teachers, and science educators collaborated to design this innovative, NSF-funded, and research-based project-driven curriculum that has demonstrated significant success to engage ALL students and increase student performance.

1:00–1:30 PM Presentation

SCST-Sponsored Session: Mnemonic Mechanisms for Making Memories

(Grades 9–College) *E1, Convention Center*

Science Focus: LS1.A

Thayne Sweeten *(thayne.sweeten@usu.edu),* Utah State University Brigham City

Get introduced to mnemonic memory concepts, along with examples, to apply as tools in teaching and learning.

2:00–2:30 PM Presentations

Watershed Partners: A Citizen Science Project

(Grades 5–12) *D8, Convention Center*

Science Focus: LS, SEP3, SEP8

Debra Cheever-Follett *(dcheever2014@gmail.com),* Hawaii State Dept. of Education, Honolulu

Tina Chan (@Kaneohescience; *808tinachan@gmail.com),* Highlands Intermediate School, Pearl City, HI

We all share the watershed area in our communities. Our participation in the Opihi Project connects our students to college at a young age. They get to collect data and be a citizen scientist on a study by the University of Hawaii at Manoa.

A Collaborative Network: Building STEM Education Through Community Partnerships

(Grades K–12) *E3, Convention Center*

Science Focus: GEN

Janie Kimble *(jkimble@ecsdnv.net),* Carlin Combined School, Carlin, NV

Networking can seem intimidating and difficult to initiate. Hear how one teacher leveraged networking to increase STEM exposure by providing access to industry and community professionals.

2:00–3:00 PM Meeting

ASTE Northwest Regional Research Discussion

Executive Boardroom, Atlantis

Join us to engage in discussion on the teacher education work being done by science educators across the Northwest ASTE region.

2:00–3:00 PM Presentations

Cinema Science: Physics

(Grades 5–8) *Paradise A, Atlantis*

Science Focus: ETS, PS2, PS3, CCC2, CCC4, CCC5, CCC6, SEP2, SEP3, SEP6, SEP8

Kelly Gooden *(mrsyoung3@cox.net),* The Alexander Dawson School at Rainbow Mountain, Las Vegas, NV

Get "reel" with your grade 8 students as they investigate concepts in science investigations, engineering design, energy, motion and stability, and force and interactions through the lens of Hollywood movies.

The Best STEM Books for Kids: What Are They, How Are They Selected, How to Use Them!

(Grades P–8) *A19, Convention Center*

Science Focus: GEN

Emily Brady, Director, Special Projects, Content, NSTA, Arlington, VA

Wondering how to add literacy to your STEM lessons? Come learn about NSTA's initiative "Best STEM Books" and how to identify and integrate the Best STEM Books.

Polymers: Teaching "Hard" Concepts with Gooey Labs

(Grades 8–12) *D5, Convention Center*

Science Focus: PS, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP

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

Enhance and deepen science and math concepts taught in traditionally "fun" polymer labs. Add more scientific processes to make them inquiry based. Take home a CD of information.

Lessons from the Field: One Middle School's Experience Implementing Standards-Based Planning, Instruction, and Reporting Using *NGSS*

(Grades K–12) *E1, Convention Center*

Science Focus: GEN, NGSS

Peter Dohrenwend *(pdohrenwend@asij.ac.jp)* and **Jessica Gould** *(jessgould@yahoo.com),* The American School In Japan, Chofu-shi, Tokyo

We will share a collection of lessons learned from our school's "on the ground" experience implementing *NGSS* for planning, instruction, and reporting.

The NSF and *NGSS* in the Ruby Mountains of Elko, Nevada

(Grades 7–College) *E2, Convention Center*

Science Focus: ESS

Brian Zeiszler (@GBCteachers; *bzeiszler@gmail.com),* Great Basin College, Elko, NV

NSF grant monies at Great Basin College allow educators and students the opportunity to study unique northeastern Nevada mountain ranges.

Using the NSTA Learning Center as an Online Textbook

(College) *F3, Convention Center*

Science Focus: GEN

Flavio Mendez (@fljmendez; *flavio_m@nsta.org*), Assistance Executive Director, NSTA Learning Center, NSTA, Arlington, VA

Megan Doty (@Megan_NSTA; *mdoty@nsta.org*), eLearning Engagement Specialist, NSTA, Arlington, VA

Professors are invited to learn how to use the NSTA digital resources and the Learning Center as an online textbook when teaching science preservice teachers.

INF **Expanding Your Science Classroom Through Science Olympiad**

(Grades K–12) *F9, Convention Center*

Science Focus: GEN, INF

John Loehr *(jfloehr@soinc.org),* Science Olympiad, Oakbrook Terrace, IL

Learn how Science Olympiad participation can be used to expand your science instruction through partnerships.

2:00–3:00 PM Hands-On Workshops

Developing Primary Teachers' Abilities in 3-D Science Teaching and Learning

(Grades K–2) *A20, Convention Center*

Science Focus: PS, CCC, SEP

Camille Stegman *(camilles@unr.edu),* Raggio Research Center for STEM Education, Reno, NV

Allie Brolsma *(abrolsma@storey.k12.nv.us),* Hugh Gallagher Elementary School, Virginia City, NV

Teaching the *NGSS* at the primary level is easy with a little help from your educator colleagues. Get introduced to several activities that K–2 teachers can use in the classroom, as well as suggestions for finding the time and confidence to teach those lessons. Leave with tools to create your own unique three-dimensional lessons through the process of lesson study and collaborative work.

WIDA Session: Engaging English Language Learners in Science and Mathematics

(Grades 1–12) *A7, Convention Center*

Science Focus: PS3, SEP

Yvonne Williams (@WIDAConsortium; @YwilliamsELL; *ywilliams2@wisc.edu)* and **Melissa Paton** (@WIDAConsortium; *mpaton@wisc.edu),* Wisconsin Center for Education Research, Madison

In this interactive session, we'll explore the latest strategies and supports to engage English language learners in the science and engineering practices.

3D **Designing and Enacting *NGSS* Classroom Experiences: Examples from High School Biology**

(Grades 9–12) *A8, Convention Center*

Science Focus: LS

Candice Guy-Gaytán (@GuyCandice; *cgaytan@unr.edu),* University of Nevada, Reno

Cynthia Passmore *(cpassmore@ucdavis.edu)* and **Chris Griesemer** *(cdgriesemer@ucdavis.edu),* University of California, Davis

Discover research-based and teacher-tested strategies for designing and implementing *NGSS* lessons that support students in developing and using models.

Chain Reactions: Failure That Leads to Success
(Grades 3–8) *C2, Convention Center*
Science Focus: ETS1, PS2.A, PS3.B, CCC2, CCC4, CCC5, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8
Katelyn Howard *(kate@weirdworldscience.com),* Shaw Middle School, Sparks, NV
Improve student grit through student-centered engineering design lessons involving Rube Goldberg machines.

NSTA Press® Session: Argument-Driven Inquiry in Grades 3–5
(Grades 3–5) *C3, Convention Center*
Science Focus: GEN, NGSS
Victor Sampson (@drvictorsampson; *victor.sampson@utexas.edu),* The University of Texas at Austin
Discover Argument-Driven Inquiry and how it can help students learn how to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

NMLSTA-Sponsored Session: Greetings from Mars
(Grades 5–10) *D6, Convention Center*
Science Focus: ESS, SEP
Melissa Sleeper (@scicrzy; *onewhosleeps3@aol.com),* Gifford Middle School, Vero Beach, FL
Sitting in today's middle school classrooms are the future colonists of Mars. Learn engaging activities that will prepare them for sending "Greetings from Mars!"

Neurons, Nervous Systems, and Engineering: Designing a Helmet to Protect the Brain as You Enjoy Your Sport
(Grades 7–10) *D7, Convention Center*
Science Focus: LS
Maryanne Pella-Donnelly *(mdonnell@chicousd.org)* and **Corinna Kirkland-Caplan** *(corinnakc@gmail.com),* Chico Junior High School, Chico, CA
This unit teaches understanding of neurons, the nervous system and parts of the brain. We'll then engineer helmets to protect mannequin heads, as well as research brain injuries.

NESTA Shares: Explore Free, Interactive Earth Science Resources
(Grades 6–12) *F1/2/7/8, Convention Center*
Science Focus: ESS, CCC4, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8
Cheryl Ann Hollinger, HHMI BioInteractive, Chevy Chase, MD
Come explore free classroom-ready resources for your Earth science or Living Earth courses, including free apps, activities, and videos!

2:00–3:00 PM Exhibitor Workshops

Structures and Functions K–5: What Is the Learning Progression?
(Grades K–5) *A1, Convention Center*
Science Focus: GEN, NGSS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
How does the structure of plants and bessbugs help these organisms survive? Why does *NGSS* suggest students learn better through a coherent learning progression? Can science be taught in 30-minute lessons? Experience a fun inquiry-based workshop to answer these questions.

Get Your Chemistry in Gear: Problem-Based Learning in Your Chemistry Classroom
(Grades 9–12) *A11, Convention Center*
Science Focus: PS
Sponsor: Pearson
Shannon Petree, Pearson, Boston, MA
Chemistry is everywhere. We live it, breathe it, and see it every day. But do we really understand it? How do your students approach it? What does STEM look like? Chemistry should be relevant, engaging, and a hands-on experience for all learners. During this interactive workshop, come experience easy-to-implement Problem-Based Learning strategies that you can take home to your classroom.

Integrating iPad with Vernier Data-Collection Technology
(Grades 3–College) *A12, Convention Center*
Science Focus: ETS, PS
Sponsor: Vernier Software & Technology
David Carter, Vernier Software & Technology, Beaverton, OR
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. Learn how Vernier supports teachers who use iPads in their classroom. Experiments such as "Boyle's Law," "Grip Strength Comparison," and "Ball Toss" will be conducted.

Touch a Nerve with Hands-On Modeling of Neuronal Communication

(Grades 9–College) *A13, Convention Center*

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

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, WI

Engage students by exploring response to neuronal stimuli by incorporating three-dimensional learning and hands-on/minds-on models. Construct a neuronal synapse model with a sodium potassium pump, and calcium, sodium, and potassium channels. Model resting and action potentials and neurotransmitter release. Develop explanations of ways drugs and toxins disturb neuronal communication. Handouts.

Earth Systems from Impact Science: A Middle School *NGSS* Unit

(Grades 6–7) *A16, Convention Center*

Science Focus: ESS2.B

Sponsor: Impact Science Education, Inc.

Ladie Malek *(ladie.malek@impactscience.com),* Impact Science Education, Inc., El Cerrito, CA

What evidence do we have for tectonic plates and their movement? And if the mantle is solid, how can tectonic plates move? Come preview our *NGSS* Earth Systems unit, which gets students involved in modeling these phenomena for a deeper understanding of Earth systems!

Awesome Activities for the *NGSS* Middle School Classroom

(Grades 6–8) *A18, Convention Center*

Science Focus: ESS, ETS1, PS2, CCC2, CCC4, CCC6, SEP2, SEP5

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, HMH Author, Broadcast Host, and Global Educator, North Falmouth, MA

Explore the pedagogy changes inherent to *NGSS* 3-D teaching as you apply them to activities in both science and engineering. From constructing an inclinometer to exploring the science of flight and forces to designing and launching balloon rockets, you'll experience understanding through the facilitation of process experiences.

Distilling Aromatic Hydrocarbons

(Grades 9–12) *A2, Convention Center*

Science Focus: PS

Sponsor: Lab-Aids, Inc.

Andrew Uy, Loyola High School of Los Angeles, CA

We distill water to purify it, or so we think. So why does the clear distillate from apple cider smell like apples? Join us and find out! Using a clever test-tube distillation apparatus, distill the essence of vanilla and the scent of mint…and even learn how to make brandy from wine! Distillation is a crucial process in chemical engineering and technology, yet few students ever get to explore the process.

Conserving Panda Populations Through Understanding Their Reproductive Endocrinology

(Grades 9–College) *A3, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

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

Can your students save the giant pandas? See how your students can explore challenging topics such as homeostatic regulation and the effect of reproductive hormones, immunological responses, and ecosystem balance all at once as they engineer a hormone detection system that can be used for giant panda population conservation efforts.

Using DNA to Explore Lizard Phylogeny with HHMI BioInteractive

(Grades 6–12) *A4, Convention Center*

Science Focus: ESS2.B, LS4, CCC1, CCC6, SEP1, SEP4

Sponsor: HHMI BioInteractive

Bernice O'Brien *(bobrien@bisd303.org),* Bainbridge High School, Bainbridge Island, WA

Discover how you can use free classroom-ready HHMI BioInteractive resources to engage students in differentiated group work. You will get hands-on experience with instructional strategies designed to support all biology learners as we dive into a case study on the effects of natural selection on an isolated anole lizard population.

Yearlong Learning: Turning a STEM Project into an Authentic Learning Experience!
(Grades 6–9) *A5, Convention Center*
Science Focus: ETS
Sponsor: AEOP
Matthew Hartman, eCYBERMISSION Content Manager, NSTA, Arlington, VA
Are your students working on science fair projects that don't advance their science or engineering knowledge? Are they copying projects they find online? Find out how to inspire students to choose authentic topics and what to do after the project is "done." Hear about eCYBERMISSION, a web-based STEM competition that promotes real-life science and engineering by investigating problems in the local community and exploring possible solutions using scientific inquiry and the engineering design process.

Engage ALL Students by Integrating Engineering and Science into Daily Life
(Grades 8–12) *A6, Convention Center*
Science Focus: ETS
Sponsor: Activate Learning
Marilyn Schmidt, Activate Learning, Aurora, CO
Learn about Engineering the Future 2.0, a new curriculum for grades 8–12 that meets the Standards for Technological Literacy and the *NGSS*. This curriculum engages students in solving daily problems of shelter, transportation, and entertainment by applying core ideas of energy, systems, and modeling.

2:45–3:30 PM Special Session

Meet the Presidents and Board/Council
(General) *Exhibit Hall 3 Entrance, Convention Center*
Science Focus: GEN
Be sure to stop by for this special session. Come "meet and greet" 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! We will be giving away several gift cards for use in the NSTA Store totaling $100. Must be present to win. Drawing will take place at 3:20 PM.

3:30–4:30 PM Exhibitor Workshops

littleBits in Grades 3–8 STEM Classrooms
(Grades 3–8) *A11, Convention Center*
Science Focus: GEN
Sponsor: Pearson
Michael Comer, Pearson, Boston, MA
Makerspaces are everywhere! From classrooms to your public library, these new learning spaces are being turned into centers of innovation. Come see how using littleBits, the award-winning electronic modules, can help infuse STEM learning into your classroom experience. Participants will explore the littleBits components as they create a solution to a design challenge.

Physics and Physical Science with Vernier
(Grades 7–12) *A12, Convention Center*
Science Focus: PS
Sponsor: Vernier Software & Technology
David Carter, Vernier Software & Technology, Beaverton, OR
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.

Genome Editing with CRISPR: Connections to What You Already Teach

(Grades 9–College) *A13, Convention Center*

Science Focus: ETS, LS1, LS3, LS4, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP6, SEP7

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, WI

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

The development of CRISPR/Cas9 gene editing technology is revolutionizing the biological sciences. Explore physical models of this technology that will engage your students in a deeper understanding of foundational concepts of biology, and further your discussion of ethical issues associated with editing the human genome.

NGSS Engineering: Hands-On Approach Using Self-Powered Vehicles

(Grades 5–8) *A18, Convention Center*

Science Focus: ETS, PS, CCC2, CCC4, CCC6, SEP2, SEP3, SEP5

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, HMH Author, Broadcast Host, and Global Educator, North Falmouth, MA

Experience the *NGSS* approach to engineering as you participate in a hands-on design and construction challenge. Join Michael for an informative and entertaining journey into the fundamentals of the *NGSS* middle school engineering standards, as you plan, design, constuct, and evaluate several self-powered vehicles.

Chemical Formula and Amino Acids

(Grades 9–12) *A2, Convention Center*

Science Focus: ETS1, PS2.C

Sponsor: Lab-Aids, Inc.

Andrew Uy, Loyola High School of Los Angeles, CA

What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these fundamental concepts in chemistry. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some elegant, intuitive, and well-differentiated lessons that allow students of all levels to master the chemical formula and thereby move confidently into a deeper understanding of chemistry.

Algae Blooms: Agriculture, Ecology, and Economy

(Grades 9–College) *A3, Convention Center*

Science Focus: LS

Sponsor: Bio-Rad Laboratories

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

Teach photosynthesis and cellular respiration together in the context of the dead zone in the Gulf of Mexico. Using algae beads together with an algae bloom case study, your students can engage in authentic inquiry investigations to learn about two connected processes and their ecological and economical implications.

Mathematics and Computational Thinking with HHMI: Authentic Data and Practices

(Grades 6–12) *A4, Convention Center*

Science Focus: ESS2.E, ESS3.C, ESS3.D, LS2.A, LS2.B, LS2.C, LS4.B, LS4.C, LS4.D, CCC1, CCC2, CCC3, CCC7, SEP1, SEP4, SEP5, SEP7, SEP8

Sponsor: HHMI BioInteractive

James Clark *(ngsiteam1@gmail.com),* Retired Educator, Pleasanton, CA

Samantha Johnson *(smjohnson@slzusd.org),* Arroyo High School, San Lorenzo, CA

Want to incorporate the science and engineering practices of mathematics and computational thinking into your biology class? Come see how to authentically integrate this practice into your current content. We will highlight free BioInteractive resources that allow students to engage with math in traditional and nontraditional ways, including data collection, infographics, and more.

4:00–5:00 PM Meeting

Nevada State Science Teachers Association Member Meeting and Social

(Open to Current NSSTA Members) *Grand Ballroom 5, Atlantis*

Come join your fellow NSSTA members for current annual updates, introductions to Board members, and the latest scoop on science education in Nevada.

6:00–8:00 PM Networking Opportunity

Reno's Friday Night on the Town! (Nevada State Science Teachers Association Welcome Reception)

(Tickets Required; $10) *Off-site (The Discovery)*

Sponsored by National Geographic Learning | Cengage

Start your evening with a Welcome Reception hosted by the Nevada State Science Teachers Association (NSSTA). Tour the Terry Lee Wells Nevada Discovery Museum and join us for hors d'oeuvres and beer/wine. Enjoy a few stories with our guest speaker Zeb Hogan, a National Geographic Explorer and host of *Monster Fish*.

Tickets, if still available, may be purchased at the NSSTA Booth for $10. All ticket fees will be donated to the Discovery Museum. Each ticket includes a free drink token during the event. Pick up your drink token at the Cengage Booth (#408) by 3:00 PM on Friday.

Afterwards, attend our "Dine About Town" at some great Reno downtown restaurants. NSSTA has arranged reservations at several downtown restaurants close to the museum. Stop by the NSSTA booth to sign up with your friends or to make new ones.

Note: An Uber to the museum is approximately $10.

—*Photo courtesy of* Zeb Hogan

National Geographic Explorer Zeb Hogan, host of *Monster Fish*, is the guest speaker at the NSSTA Welcome Reception at the Terry Wells Nevada Discovery Museum. Above, Zeb holds a 117 cm taimen in the Eg-Uur River in northern Mongolia.

—*Photo courtesy of* VisitRenoTahoe.com

Nicknamed "The Biggest Little City in the World," Reno is the most populous city in the Nevada outside the Las Vegas Valley.

8:00–9:00 AM Presentation

Struggling with 3D Printing in the STEM Classroom?
(Grades 6–12) *Paradise B, Atlantis*
Science Focus: GEN, CCC3, CCC4, SEP2
Nadene Klein (@nadeneklein11; *nakopff@dcsdk12.org),* Daniel C. Oakes High School, Castle Rock, CO
This is a simple idea if you have limited access to a 3D printer and/or are tentative yourself in bringing 3D printing into your classroom. You'll be shown how to increase engagement with this student-centered STEM project.

The Cat in the Hat Knows a Lot About...Early Science Learning in Communities
INF
(Grades P–2) *A9, Convention Center*
Science Focus: PS, INF, CCC1, CCC2, CCC3, CCC4, CCC5, CCC6, SEP
Aaron Morris, Public Broadcasting Service, Arlington, VA
Monica Quintero, FACES, Las Vegas, NV
Jessica Russell *(jrussell@vegaspbs.org),* Vegas PBS, Las Vegas, NV
The Cat in the Hat is ready to go on a science adventure! Explore free *NGSS*-focused digital and hands-on resources that encourage families to play with science together.

Spark Students' Curiosity with Chemistry!
(Grades K–12) *D2, Convention Center*
Science Focus: PS, INF
Karen Kaleuati *(k_kaleuati@acs.org),* American Chemical Society, Washington, DC
Learn about the various free resources—games, lesson plans, grants, and more—available from the American Chemical Society (ACS). Attendees will walk away with resources.

Freshwater Stewardship: Equip Your Student-Scientists with Cutting-Edge Resources from NOAA
(Grades 1–12) *D8, Convention Center*
Science Focus: ESS2, LS
Jeannine Montgomery (@NOAAeducation; *jeannine.montgomery@noaa.gov),* NOAA Office of Education, Washington, DC
Drought. Flooding. Fire. Water Pollution. Algal Blooms. Water rationing. Freshwater is the lifeblood of our planet, and our future depends on the next generation of environmental stewards to preserve the health of our watersheds. The National Oceanic and Atmospheric Administration and National Weather Service have a wealth of online lesson plans, videos, data sets, webinars, and more to help you inform and inspire students to action in research, stewardship, and resource management for our vital freshwater ecosystems.

8:00–9:00 AM Hands-On Workshops

3-D Natural Selection
(Grades 9–12) *Grand Ballroom 5, Atlantis*
Science Focus: LS4, CCC1, CCC2, SEP4, SEP7
Molly Malone *(molly.malone@utah.edu)* and **Louisa Stark,** The University of Utah, Salt Lake City
Explore a curriculum module that guides students in interpreting published scientific data to learn about natural selection and write an evidence-based argument. Visit *teach.genetics.utah.edu* for details on this free module.

Infusing, Scaffolding, STEM/STEAM, 5E Model, and Crosscutting the Curriculum…What More Could You Ask?
(Grades K–5) *Paradise A, Atlantis*
Science Focus: GEN, CCC
Ava Pugh and **Sherlyn Powell,** University of Louisiana at Monroe
Presider: Rhonda Mann, University of Louisiana at Monroe
This hands-on STEM/STEAM session features Science inferencing, Technology implementation, Engineering synectics, and Mathematical patterns by infusing and crosscutting the curriculum with the book, *Somewhere Today.*

3D **Using Virtual Field Trips to Gather Inquiry-Based Evidence**
(Grades 4–12) *A8, Convention Center*
Science Focus: ESS2.A, ESS2.C, CCC3, SEP7
Kathryn Fitzpatrick *(kfitzpatrick@washoeschools.net),* Dilworth STEM Academy, Sparks, NV
Learn how to create and use virtual field trips to increase engagement and scaffold students of all ages in writing evidence-based arguments.

NSTA Press® Session: Engage Your Students! *Designing Meaningful STEM Lessons*
(Grades 3–10) *C3, Convention Center*
Science Focus: ETS1, CCC4, SEP2, SEP6, SEP7
Jackie Speake Dwyer (@JackieSpeake; @DrScienceGeek; *Jackie.Speake@DrScienceGeek.com),* Learning Sciences International, Pittsburgh, PA
Milton Huling (@Mhuling1Milt; *mhuling1@juno.com),* Polk County Public Schools, Bartow, FL
Calling all nerds and geeks! Learn how to StEMTify lessons through engineering design, constructivism, inquiry, 5E instructional model, and claims, evidence, reasoning.

Integrating the Three Dimensions
(Grades K–12) *D3, Convention Center*
Science Focus: GEN, NGSS
Charalee Cunningham *(ccunningham@lodiusd.net),* Lodi (CA) Unified School District
Engage in a model activity and identify how the disciplinary core ideas, practices, and crosscutting concepts are integrated into instruction.

Student Supports for Persistence in Developing Explanations
(Grades 3–9) *D4, Convention Center*
Science Focus: GEN, SEP3, SEP4, SEP6, SEP7, SEP8
Kelly Moore (@kellyramey; *kellyramey@mac.com),* Tennessee Tech University, Cookeville
Explore how to use different student supports to encourage students to use argumentation and explanations in the STEM classroom to engage them in inquiry-based activities.

Designing *NGSS*-Focused Curricula Using Comparison Phenomenon with Owl Pellets and Albatross Bolus
(Grades 5–9) *D6, Convention Center*
Science Focus: LS2, CCC2, CCC6, SEP1, SEP3, SEP7
Ari Leventhal (@whistlingpirate; *aaron_leventhal@dpsk12.org),* Denver Green School, Denver, CO
Examine an ecosystem unit with effective hands-on phenomena to drive successful *NGSS*-type storylines to engage students in science thinking and questions.

Using Data Sets to Generate a STEM Research Question
(Grades 7–12) *E2, Convention Center*
Science Focus: GEN, SEP
Pamela J. Schaefer *(pjsffn@msn.com),* Retired Public School Science Teacher and Administrator, Parsippany, NJ
Authentic scientific inquiry begins with good questions! Discover how to use online data sets to guide students in formulating questions of interest with investigative potential.

Natural Hazards and Their Lethality
(Grades 6–10) *F3, Convention Center*
Science Focus: ESS3.B, CCC2, CCC3, SEP4, SEP5, SEP7, SEP8
Arthur Beauchamp *(acbeauchamp@ucdavis.edu),* University of California, Davis
Engage in an Earth science lesson emphasizing Analyzing and Interpreting Data and Mathematical and Computational Thinking while examining the causes and lethality of natural hazards.

8:00–9:00 AM Exhibitor Workshops

Make Any Classroom a Makerspace
(Grades K–12) *A11, Convention Center*
Science Focus: GEN
Sponsor: Pearson
Obie Martin, Pearson, Logansport, IN
Makerspaces are everywhere, from television to your public library. Make your classroom into a makerspace without a lot of equipment or cost. All you need is the right attitude and the willingness to promote your students' innovated thinking. Come try it out for yourself in this fun hands-on workshop.

Using Climate Proxies to Learn About Earth's Climate History
(Grades 9–12) *A2, Convention Center*
Science Focus: ESS2, ESS3, ETS1
Sponsor: Lab-Aids, Inc.
Lisa Martin-Hansen, California State University, Long Beach
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. Analyze and graph samples of replicas of these organisms to determine relative warm and cold periods in the past 200,000 years. This activity is from *EDC Earth Science,* a new NSF-supported high school program from Lab-Aids.

8:00 AM–5:00 PM Meetings

NGSS Workshop, Level 1: Making Sense of Three-Dimensional Teaching and Learning

(By Separate Registration Only) *Grand Ballroom 4, Atlantis*

Participants build a solid understanding of the three dimensions and how they integrate, and take home a powerful toolkit of resources to further their implementation efforts.

NGSS Workshop, Level 2: Designing Three-Dimensional Lessons and Units Workshop

(By Separate Registration Only) *Grand Ballroom 2/3, Atlantis*

Participants deepen their understanding of three-dimensional teaching and learning by focusing on developing storylines and learning how to use their resources to support broader implementation efforts in their schools and districts.

9:00 AM–12 Noon Exhibits

Hall 3, 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

Advancing Scientific Literacy with Lesson Plans That Meet the _CCSS_ and _NGSS_

(Grades 9–12) *Paradise B, Atlantis*

Science Focus: ESS, ETS, LS, PS, CCC, SEP

Christine Suh *(c_suh@acs.org)* and **Kathleen Cooper** (@ACSChemMatters; *kmcooper15@gmail.com),* American Chemical Society, Washington, DC

Are you asked to incorporate reading and writing into your lessons to support literacy in language arts? We have the right lesson plans for you!

Using a Blended Classroom to Develop Student Conceptual Understanding Over Time

(Grades 6–12) *A7, Convention Center*

Science Focus: GEN, CCC, SEP2, SEP6

Jennifer Panczyszyn (@jpscigirl), Clark County School District, Las Vegas, NV

Come learn what blended science instruction can look like in practice to help support student sense-making. Leave with tips and tricks for getting started designing your own blended classroom.

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

(Grades 9–12) *D2, Convention Center*

Science Focus: PS, CCC, SEP

Kenetia Thompson and **Karen Kaleuati,** American Chemical Society, Washington, DC

Hear about grant opportunities available to high school chemistry teachers (including those from the American Chemical Society) and the process for writing a fundable proposal.

Understanding Scale: A Differentiated and Integrated Lesson for Teaching Students About the Scale of Earth, Moon, and Mars

(Grades 6–8) *D3, Convention Center*

Science Focus: ESS1.B, CCC3, SEP2, SEP5

Merryn Cole *(merryncole@gmail.com),* University of Nevada, Las Vegas

Discussion includes a lesson where a scale model of Earth, Moon, and Mars is created in the classroom. Differentiation and math-science integration opportunities are included.

Preservice Teachers in the Peruvian Amazon: Enhancing Science Teaching and Learning

(Grades 7–College) *D8, Convention Center*

Science Focus: GEN, SEP

Janelle Johnson (STEMequity; *jjohn428@msudenver.edu),* **Mariska Hamstra,** and **Cassandra Hayter** *(chayter@msudenver.edu),* Metropolitan State University of Denver, CO

A university professor and three preservice secondary science teachers participated in the Educator Academy in the Amazon. This session shares the units/lessons they designed.

9:30–10:30 AM Hands-On Workshops

DNA, Proteins, and the Molecular Unity of Life
(Grades 9–12) *Grand Ballroom 5, Atlantis*
Science Focus: LS1, CCC1, CCC2, SEP4
Molly Malone *(molly.malone@utah.edu),* The University of Utah, Salt Lake City
What shapes the characteristics of living things? Materials that explore molecular processes fundamental to life and set the stage for Evolution or Genetics units. Visit *teach.genetics.utah.edu* for information.

Project-/Problem-Based Learning: Let's Bring It to Life
(Grades K–5) *Paradise A, Atlantis*
Science Focus: GEN, CCC
Ava Pugh and **Sherlyn Powell,** University of Louisiana at Monroe
Presider: Rhonda Mann, University of Louisiana at Monroe
Conduct hands-on activities using Project-/Problem-Based Learning while merging science and crosscutting the curriculum. Take home a CD with activities.

Beyond Treasure Maps
(Grades P–2) *A19, Convention Center*
Science Focus: GEN
Anne Lowry *(alowrynews1@yahoo.com),* Aleph Academy, Reno, NV
Mapping is a highly adaptable and high-interest way to integrate STEM into the classroom. Come create and use maps to answer questions. Resources provided.

Discover Natural History Museum Resources and Engage in Arthropod Activities
INF
(Grades 1–8) *A9, Convention Center*
Science Focus: LS1.A, LS1.B, INF, CCC1, CCC6, SEP1
Anne Espeset, Cynthia Scholl *(cynthia.scholl@gmail.com),* **Julie Stoughton** *(jstoughton@cabnr.unr.edu),* **Candice Guy-Gaytán,** (@GuyCandice; *cgaytan@unr.edu),* **Elizabeth Leger** *(ealeger@gmail.com),* and **Chris Feldman,** University of Nevada, Reno
Use live and pinned arthropod specimens in scientist-led *NGSS*-focused activities. Find out how natural history museum specimens can be used in your classroom and develop your own dichotomous key to identify native invertebrates in your region.

NSTA Press® Session: Argument-Driven Inquiry in the Life, Physical, and Earth/Space Sciences: Lab Investigations for Grades 6–8
(Grades 6–8) *C3, Convention Center*
Science Focus: ESS, LS, PS, CCC, SEP
Victor Sampson (@drvictorsampson; *victor.sampson@utexas.edu),* The University of Texas at Austin
Learn about Argument-Driven Inquiry and how it can help students learn how to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

Embracing the Productive Struggle While Validating Success: A Lesson in Infinite Chocolate
(Grades K–8) *D1, Convention Center*
Science Focus: GEN, NGSS
Teresa Barski *(teresa.barski@successacademies.org)* and **Rachel Seys** *(rachel.seys@successacademies.org),* Success Academy Charter Schools, New York, NY
Elicit inquiry learning in your science classroom. Participants will understand what each component of the BSCS 5Es looks like when scholars are the drivers of constructing scientific understanding.

Smart Devices: Data Collection, Analysis, and Reporting
(Grades 9–College) *F3, Convention Center*
Science Focus: GEN
Greg Dodd *(gbdodd@gmail.com),* Retired Educator, Pennsboro, WV
Discover how to make smart devices an essential tool in your science laboratory. Handouts.

9:30–10:30 AM Exhibitor Workshops

UnBEElievable

(Grades 9–12) *A11, Convention Center*

Science Focus: ETS1, LS

Sponsor: Pearson

Chuck McMillan, Pearson, Boston, MA

Biology teachers will participate in a real-world case study where they will investigate and learn about Colony Collapse Disorder with bees. Teachers will group together and simulate a bee colony that is being forced to meet many of today's challenges (increasing usage of pesticides and fungicides, and growing numbers of parasites). Participants will engage in the engineering design process to find a way to collect pollen and pollinate a field of almonds after the bees go missing. By the end of this session, teachers will be able to demonstrate a deeper understanding of how authentic experiences can help drive instruction of key biology concepts and skills in the classroom through the use of real-world case studies and engineering design process.

Middle School Matters: Modeling with Magnetic Water Molecules

(Grades 5–9) *A13, Convention Center*

Science Focus: ESS2, ESS3, LS1, LS2, PS1, PS2, CCC, SEP1, SEP2, SEP5

Sponsor: 3D Molecular Designs

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, WI

ENGAGE students by modeling chemical and physical properties of water using magnetic water molecules. EXPLORE common phenomena such as density, erosion, and weathering. Construct physical representations to EXPLAIN the phases of water, density, and solubility. ELABORATE on the water cycle and its impact on the ecosystem. EVALUATE student learning with models.

Electricity and Magnetism from Impact Science: A Middle School *NGSS* Unit

(Grade 8) *A16, Convention Center*

Science Focus: ESS, ETS, PS2

Sponsor: Impact Science Education, Inc.

Ladie Malek *(ladie.malek@impactscience.com),* Impact Science Education, Inc., El Cerrito, CA

Electricity and magnetism are back in the grade 8 curriculum. How do we teach them in a way that is interesting and empowering for all students, without expensive components? We will preview our electricity and magnetism unit that ties in Earth science, engineering, and systems thinking—all using inexpensive materials.

Prospecting for Mineral Ore

(Grades 9–12) *A2, Convention Center*

Science Focus: ESS3, ETS1

Sponsor: Lab-Aids, Inc.

Lisa Martin-Hansen, California State University, Long Beach

How do geologists look for mineral ore? In this activity from *EDC Earth Science,* participants search for a layer of rock containing a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems—gathering data to decide where the deposit is located. This is no "cookie mining" activity!

9:30–11:30 AM Featured Panel

Children's Literature: Using Phenomena to Uncover Student Questions

(Grades K–6) *C2, Convention Center*

Science Focus: GEN


Christine Anne Royce


Kelly Milner Halls


Patricia Newman


Steve Rich


Dennis Schatz


Pamela Turneer

Moderator: Christine Anne Royce ((@caroyce; *caroyce@aol.com*), NSTA President, and Shippensburg University, Shippensburg, PA

Panelists:
Kelly Milner Halls, Children's Author, Spokane, WA
Patricia Newman (@PatriciaNewman), Author, Carmichael, CA
Steve Rich (@bflyguy), University of West Georgia, Carrollton, GA
Dennis Schatz (@DinoManSchatz), Senior Advisor, Seattle, WA
Pamela Turner, Author, Oakland, CA

This innovative Author's Panel offers an opportunity for teachers to walk away with new and practical ideas of how to use the phenomena present in many children's books. Learn what to look for in good science literature, how to help students develop their own questions about phenomena, and how to formulate investigations to answer students' questions. During this special session, children's authors will interact with teachers in an informal manner, collaborating on ways children's literature makes phenomena come alive.

Kelly Milner Halls has written high-interest nonfiction for young readers for the past 25 years. Her best known books are *Albino Animals, Tales of the Cryptids, Saving the Baghdad Zoo, Alien Investigation, In Search of Sasquatch, Ghostly Evidence, Courageous Canine,* and *Tiger In Trouble.* In 2017 she published two middle grade novels, *Blazing Courage* and *Dive Into Danger.* Her newest titles are *Death Eaters: Meet the Scavengers, Gross Science Projects, Goo Makers,* and *Simple Science Projects,* all scheduled for publication in the fall of 2018.

Patricia Newman is author of the Sibert Honor book *Sea Otter Heroes: The Predators That Saved an Ecosystem;* as well as *Zoo Scientists to the Rescue,* a Bank Street College of Education Best Children's Book; Green Earth Book Award winner *Plastic, Ahoy! Investigating the Great Pacific Garbage Patch;* Booklist Editor's Choice title *Ebola: Fears and Facts;* and picture book *Neema's Reason to Smile.* Her award-winning books show kids how their actions can ripple around the world.

Steve Rich writes books based on his experiences as a science teacher, state science specialist, a nature lover, and a father. He most recently worked for the Georgia Department of Education as the coordinator for the Math Science Partnership. His NSTA Press® books include the popular teacher book, *Outdoor Science: A Practical Guide.* He is also the author of books for children, including the NSTA Kids book, *Mrs. Carter's Butterfly Garden,* a 2015 Outstanding Science Trade Book, based on his experiences helping former U.S. First Lady Rosalynn Carter establish a butterfly garden at her home in Plains, GA, at the Jimmy Carter National Historic Site.

Dennis Schatz is the NSTA president-elect, senior advisor at the Pacific Science Center, and field editor for NSTA's *Connected Science Learning* journal. He is the author of 25 science books for children, including *Explore A T.rex,* the *Fossil Detective* series of four books, and the popular *Totally* series of six books *(Totally Dinosaurs* in 2000 to *Totally Sea Creatures* in 2003). His most recent children's books are *The Amazing Squishy T.rex* and *When the Sun Goes Dark,* which was released just in time for the 2017 total solar eclipse.

Pamela S. Turner was an international health consultant and health policy researcher before turning to writing for children and young adults. Her books *Gorilla Doctors, The Frog Scientist, Life on Earth and Beyond, The Dolphins of Shark Bay, A Life in the Wild,* and *Project Seahorse* have been named NSTA Outstanding Science Trade Books; and *The Frog Scientist* and *Crow Smarts* have won the AAAS/Subaru SB&F Science Writing Prize.

11:00–11:30 AM Presentation

Grounding STEM Education Programs in *NGSS* Practices

(Grades 6–12) *E2, Convention Center*

Science Focus: GEN, NGSS

David Lockett (@DavidJLockett; *david.lockett@lwcharterschools.com),* Bok Academy, Lake Wales, FL

Interested in exploring ways to support classroom teaching in integrating the *NGSS* practices? Want to move toward an inquiry-based approach in which students take more responsibility for their learning? Join me for grounding STEM education programs in *NGSS* practices.

11:00 AM–12 Noon Presentations

NARST-Sponsored Session: The Triad Project: Meeting the Professional Development Challenges of the *NGSS*

(Grades K–12) *Grand Ballroom 5, Atlantis*

Science Focus: GEN, NGSS

Al Schademan *(aschademan@csuchico.edu)* and **Mimi Miller** *(mmiller@csuchico.edu),* California State University, Chico

The Triad Project is designed to simultaneously engage teacher candidates, cooperating teachers, and science education faculty in professional development around the *NGSS*.

3D **A Unique Ice Core Investigation That Integrates the Three Dimensions of *NGSS* and STEM**

(Grades 7–12) *A8, Convention Center*

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

Donna Young *(dlyoung.nso@gmail.com),* NASA/NSO UoL Coordinator, Bullhead City, AZ

Explore a multidisciplinary open-ended investigation that incorporates absolute and relative dating, anomalies, historical context, volcanoes, solar proton events, energy cycles, Earth systems, terrestrial events, and supernovas.

The Monarch Movement: A PBL Experience

(Grades K–5) *A9, Convention Center*

Science Focus: LS4

Ryan Linton (@LintonRJ), **Jean Donley** *(jdonley@washoeschools.net),* and **Cori Zancanella** *(cnzancanella@gmail.com),* Smithridge STEM Academy, Reno, NV

Join us to learn how one team of teachers collaborated with each other and community members to plan an elementary life science Project-Based Learning unit. Leave with resources to implement this project, including how to establish a monarch way station at your school.

NSTA Press® Session: Engineering in the Life Sciences for Grades 9–12

(Grades 9–12) *C3, Convention Center*

Science Focus: ETS1, LS

Rodney Custer *(rod.custer@bhsu.edu),* Black Hills State University, Spearfish, SD

Katheryn Kennedy (@kbkennedy7; *kbkennedy7@gmail.com),* Stevens Institute of Technology, Hoboken, NJ

Cory Culbertson *(ceculbe@ilstu.edu),* Illinois State University, Normal

Join us for an overview of the recently released NSTA publication, *Engineering in the Life Sciences, 9–12*. Discussion includes the value of engineering in the sciences, an overview of the book's contents, and a brief discussion of professional development challenges and opportunities.

Grow Beasts: Growing Understanding Through Active Engagement and Investigation

(Grades 1–3) *D1, Convention Center*

Science Focus: GEN

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

Grow Beasts—plunk 'em in water and five days later they've grown! Ideal vehicles for measurement, prediction, and experimentation. Leave with a classroom plan and a Grow Beast!

NGSS Chemistry and Biology Model Making with Animation, Art, and Movie-Making
(Grades 6–College) *D3, Convention Center*
Science Focus: GEN, INF, NGSS
Julie Smith *(julieltapresident@gmail.com),* Lennox Middle School, Lennox, CA
Student "movie making" brings chemistry and biology concepts to life! Combine simple apps, technology, animation, and art to transform content from hard to cool!

Phenomena, Questions, and Models
(Grades 4–12) *D8, Convention Center*
Science Focus: GEN, CCC, SEP1, SEP2, SEP7
Kelly Moore (@kellyramey; *kellyramey@mac.com),* Tennessee Tech University, Cookeville
Investigate the use of anchoring phenomena in lessons with an emphasis on the science and engineering practices. We will discuss the integration of questioning, models, and phenomena in a three-dimensional learning classroom.

11:00 AM–12 Noon Hands-On Workshops

Innovation Protocols: Shifting Instruction via PLCs
(Grades K–12) *Paradise A, Atlantis*
Science Focus: GEN, NGSS
Kirsten Daehler *(kdaehle@wested.org)* and **Patrick Moyle** *(pmoyle@wested.org),* Making Sense of SCIENCE at WestEd, Redwood City, CA
Lisa Snyder *(lsnyder@musd.net),* Manteca (CA) Unified School District
Use protocols developed for Professional Learning Communities that help teachers explore the *NGSS* and make essential instructional shifts. Leave with tools that set teams up for success!

Developing _NGSS_-Focused Short Stories to Launch a Unit and Hook Students into Science Learning
(Grades P–7) *A19, Convention Center*
Science Focus: GEN, NGSS
Gabriella Gini (@gabriellagini; *ggini@cps.edu),* Academy for Urban School Leadership (AUSL), Chicago, IL
Explore *NGSS*-focused short stories that support social emotional learning and vocabulary development, while providing a meaningful context for science learning. Create one for your students.

Making Space for Making in the Classroom
(Grades 1–8) *A7, Convention Center*
Science Focus: ETS
Meghan Schiedel *(mschiedel@nvdm.org)* and **Sarah Gobbs-Hill** *(sgobbs-hill@nvdm.org),* Terry Lee Wells Nevada Discovery Museum, Reno
At this maker session, we will use everyday materials and techniques you can bring to the classroom to offer your students a rich, iterative experience.

Rotting Fruit and Disappearing Dead Stuff: Models, Flows, and Systems
(Grades 4–7) *D4, Convention Center*
Science Focus: LS1.A, LS2.A, LS2.B, CCC1, CCC4, CCC5, SEP2, SEP6, SEP7
Barbara Woods *(bwoods@galt.k12.ca.us),* Galt Joint Union Elementary School District, Galt, CA
Explore questions such as "where did it go?" while making sense of everyday occurrences where matter changes and dead matter disappears. Or does it?

Mystery Class Seasons Challenge: Tracking Sunlight to Solve a Mystery
(Grades 5–12) *D6, Convention Center*
Science Focus: ESS1, INF, CCC1, SEP4
Meg Gebert *(meg.gebert@cox.net),* Tucson (AZ) Unified School District
Come join a global game of hide-and-seek! Track seasonal changes in sunlight and then investigate other clues to find 10 secret sites around the world.

The Ricewheel Challenge: Hands-On/Minds-On STEM
(Grades 3–12) *D7, Convention Center*
Science Focus: ETS1
Brian Crosby (@bcrosby; *bcrosby@washoeschools.net)* and **Lou Loftin** *(lloftin@washoeschools.net),* Nevada's Northwest Regional Professional Development Program, Reno
Use the engineering design process to design a ricewheel (think waterwheel but with rice) to lift a weight in an engaging, challenging inquiry activity.

Engineering Design: Success and Improvement
(Grades 9–12) *F3, Convention Center*
Science Focus: ETS1, PS2.A, SEP3, SEP4, SEP5, SEP6
Jacklyn Bonneau *(bonneau@wpi.edu),* Professional Development, North Grosvenordale, CT
See how engineering design and 3D printing of lab equipment help students explore physics relationships and bring focus iteration to create the best solution.

11:00 AM–12 Noon Exhibitor Workshops

UnBEElievable

(Grades 9–12) *A11, Convention Center*

Science Focus: ETS1, LS

Sponsor: Pearson

Chuck McMillan, Pearson, Boston, MA

Biology teachers will participate in a real-world case study where they will investigate and learn about Colony Collapse Disorder with bees. Teachers will group together and simulate a bee colony that is being forced to meet many of today's challenges (increasing usage of pesticides, fungicides, and growing numbers of parasites). Participants will engage in the engineering design process to find a way to collect pollen and pollinate a field of almonds after the bees go missing. By the end of this session, teachers will be able to demonstrate a deeper understanding of how authentic experiences can help drive instruction of key biology concepts and skills in the classroom through the use of real-world case studies and engineering design process.

A Visual Journey Through the Human Cell Using Watercolor Landscapes

(Grades 9–College) *A13, Convention Center*

Science Focus: LS1, PS1, CCC3, CCC4, CCC6, SEP1, SEP3

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman *(herman@msoe.edu),* MSOE Center for BioMolecular Modeling, Milwaukee, WI

Gina Vogt *(gina.vogt@3dmoleculardesigns.com),* 3D Molecular Designs, Milwaukee, WI

Use vibrant watercolor landscapes to explore the molecular world in the cellular context within which proteins function. David Goodsell's Tour of the Human Cell Panorama traces the production and secretion of antibodies. His Flu Fight: Immunity and Infection Panorama illustrates how antibodies work to block the influenza infection cycle.

Calling All Carbons

(Grades 9–12) *A2, Convention Center*

Science Focus: ESS2, ESS3

Sponsor: Lab-Aids, Inc.

Lisa Martin-Hansen, California State University, Long Beach

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.

—Photo courtesy of Jacob Slaton

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

Biology/Life Science	B
Chemistry/Physical Science	C
Computer Science	CS
Earth/Space Science	EA
Engineering	ENG
Environmental Science	ENV
Integrated/General Science	G
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Physics/Physical Science	PH
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Exhibit Hall maps are available on the conference app.

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The National Science Teachers Association administers and provides support to U.S. Army Educational Outreach Programs that engage students in real-world STEM experiences. Learn about eCYBERMISSION, an online competition free to grades 6–9 students, as well as GEMS and Camp Invention, summer STEM enrichment programs for grades K–12 teachers and students.

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3D Molecular Designs (Booth #309)

Thursday, Oct 11	8:00–9:00 AM	A13, Convention Center	Under the Influence: Proteins, Enzymes, and How Water Drives Structure and Function (p. 37)
Thursday, Oct 11	9:30–10:30 AM	A13, Convention Center	Dynamic DNA: More Than Just A's, T's, G's, and C's (p. 39)
Thursday, Oct 11	11:00 AM–12 Noon	A13, Convention Center	Using Models to Uncover Student Misconceptions in Chemistry (p. 40)
Friday, Oct 12	12:30–1:30 PM	A13, Convention Center	Get a Move On! Modeling Molecular Transport Across the Cell Membrane (p. 76)
Friday, Oct 12	2:00–3:00 PM	A13, Convention Center	Touch a Nerve with Hands-On Modeling of Neuronal Communication (p. 80)
Saturday, Oct 13	9:30–10:30 AM	A13, Convention Center	Middle School Matters: Modeling with Magnetic Water Molecules (p. 89)

Activate Learning (Booth #315)

Friday, Oct 12	8:00–9:00 AM	A6, Convention Center	EarthComm: A Project-Based Earth and Space Systems Science Program Developed by the American Geosciences Institute (p. 60)
Friday, Oct 12	9:30–10:30 AM	A6, Convention Center	Building a Rigorous and Equitable Discourse Culture (p. 66)
Friday, Oct 12	11:00 AM–12 Noon	A6, Convention Center	Moving from Learning to Read and Write…to Reading and Writing to Learn: Literacy Strategies in the Science Classroom (p. 72)
Friday, Oct 12	12:30–1:30 PM	A6, Convention Center	Active Physics: The Leading Project-Based High School Physics Program Capturing the Essence of the *NGSS* and STEM (p. 76)
Friday, Oct 12	2:00–3:00 PM	A6, Convention Center	Engage ALL Students by Integrating Engineering and Science into Daily Life (p. 81)

Amplify (Booth #702)

Thursday, Oct 11	8:00–9:00 AM	A17, Convention Center	Patterns in the Sky: Phenomena and 3-D Instruction for Grades K–1 (p. 37)
Thursday, Oct 11	9:30–10:30 AM	A17, Convention Center	Harnessing Spider Silk: Phenomena and 3-D Instruction for Grades 6–8 (p. 39)
Thursday, Oct 11	11:00 AM–12 Noon	A17, Convention Center	What's So Phenomenal About Phenomena? (p. 40)
Friday, Oct 12	8:00–9:00 AM	A17, Convention Center	Assessment for Learning in the Age of *NGSS*: Revealing Student Thinking and Taking Action (p. 60)
Friday, Oct 12	9:30–10:30 AM	A17, Convention Center	Establishing an Orangutan Reserve: Phenomena and 3-D Instruction for Grades 2–5 (p. 65)
Friday, Oct 12	11:00 AM–12 Noon	A17, Convention Center	Integration in Middle Grades: Implementing an *NGSS* Approach to Cross-Disciplinary Teaching and Learning (p. 71)

Army Educational Outreach Program (AEOP) (Booth #610)

Thursday, Oct 11	11:00 AM–12 Noon	A5, Convention Center	Solving Crimes with Science—Forensics for Your Classroom (p. 41)
Friday, Oct 12	12:30–1:30 PM	A5, Convention Center	STEM Challenge: Keeping Students Engaged with Problem-Solving (p. 76)
Friday, Oct 12	2:00–3:00 PM	A5, Convention Center	Yearlong Learning: Turning a STEM Project into an Authentic Learning Experience! (p. 81)

Bio-Rad Laboratories (Booth #609)

Thursday, Oct 11	11:00 AM–12 Noon	A3, Convention Center	Biotechnology, the Science of Our Age…Are Your Students Prepared? (p. 41)
Thursday, Oct 11	2:00–3:00 PM	A3, Convention Center	Fascinate Your Students with Glowing Bacteria (p. 50)
Thursday, Oct 11	3:30–4:30 PM	A3, Convention Center	Are Increased Incidences of Infection the Result of Climate Change? (p. 55)
Friday, Oct 12	8:00–9:00 AM	A3, Convention Center	Forensic DNA Fingerprinting Plus Engineering on a Budget (p. 60)
Friday, Oct 12	9:30–10:30 AM	A3, Convention Center	Think Like an Engineer in Your Biology Class (p. 66)
Friday, Oct 12	11:00 AM–12 Noon	A3, Convention Center	Become a GMO Investigator (p. 72)
Friday, Oct 12	2:00–3:00 PM	A3, Convention Center	Conserving Panda Populations Through Understanding Their Reproductive Endocrinology (p. 80)
Friday, Oct 12	3:30–4:30 PM	A3, Convention Center	Algae Blooms: Agriculture, Ecology, and Economy (p. 82)

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Carolina Biological Supply Co. (Booth #501)

Thursday, Oct 11	9:30–10:30 AM	A1, Convention Center	Engineer Excitement in Your Classroom with a Carolina STEM Challenge® (p. 38)
Thursday, Oct 11	11:00 AM–12 Noon	A1, Convention Center	Solve the Mystery of the Beads in a Bottle (p. 40)
Thursday, Oct 11	12:30–1:30 PM	A1, Convention Center	Phenomenal Classroom Critters (p. 44)
Thursday, Oct 11	2:00–3:00 PM	A1, Convention Center	The Smithsonian Presents ENERGY in ACTION (p. 49)
Thursday, Oct 11	3:30–4:30 PM	A1, Convention Center	Comparative Vertebrate Anatomy with Carolina's Perfect Solution® Specimens (p. 54)
Friday, Oct 12	8:00–9:00 AM	A1, Convention Center	Hands-On Activities to Model Habitat Preference and Population Sampling (p. 59)
Friday, Oct 12	9:30–10:30 AM	A1, Convention Center	Autopsy: Forensic Dissection Featuring Carolina's Perfect Solution® Pigs (p. 64)
Friday, Oct 12	11:00 AM–12 Noon	A1, Convention Center	Introduction to Wisconsin Fast Plants® (p. 70)
Friday, Oct 12	12:30–1:30 PM	A1, Convention Center	Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 75)
Friday, Oct 12	2:00–3:00 PM	A1, Convention Center	Structures and Functions K–5: What Is the Learning Progression? (p. 79)

CPO Science/School Specialty Science (Booth #801)

Thursday, Oct 11	8:00–9:00 AM	A6, Convention Center	Go on a Cell Quest! Teaching Cell Structure through Gaming (p. 37)
Thursday, Oct 11	9:30–10:30 AM	A6, Convention Center	Energy Quest: Visualizing Cell Pathways Using Augmented Reality (p. 39)
Thursday, Oct 11	11:00 AM–12 Noon	A6, Convention Center	Modular Robotics: Constructing Explanations and Designing Solutions at K–8 (p. 41)
Thursday, Oct 11	12:30–1:30 PM	A6, Convention Center	Engineering Design Solutions with Wind Turbines (p. 45)
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Thursday, Oct 11	3:30–4:30 PM	A6, Convention Center	Atomic Structure: Fun with Atoms, Ions, and Bonding through Modeling (p. 55)

Delta Education/School Specialty Science—FOSS (Booth #801)

Thursday, Oct 11	8:00–9:00 AM	A11, Convention Center	Ten Minutes to Improving Science Achievement (p. 36)
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Edvotek, Inc. (Booth #504)

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Thursday, Oct 11	12:30–1:30 PM	A12, Convention Center	Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR (p. 44)
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Flinn Scientific, Inc. (Booth #508)

Thursday, Oct 11	9:30–10:30 AM	A5, Convention Center	Year-Round Solutions for Success in AP Chemistry from Flinn Scientific (p. 39)
Thursday, Oct 11	2:00–3:00 PM	A5, Convention Center	Positively Engaging Demos and Labs for Chemistry from Flinn Scientific (p. 50)
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HHMI BioInteractive (Booth #400)

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Friday, Oct 12	9:30–10:30 AM	A4, Convention Center	HHMI Is Phenomenal! Using BioInteractive to Create Phenomena-Based Lessons (p. 66)
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Friday, Oct 12	3:30–4:30 PM	A4, Convention Center	Mathematics and Computational Thinking with HHMI: Authentic Data and Practices (p. 82)

Houghton Mifflin Harcourt (Booth #401)

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Impact Science Education, Inc. (Booth #405)

Thursday, Oct 11	11:00 AM–12 Noon	A16, Convention Center	Thermal Energy from Impact Science: A Middle School *NGSS* Unit (p. 40)
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KIMSeattle: Kids in Medicine & Science (Booth #612)

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Lab-Aids, Inc. (Booth #703)

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miniPCR (Booth #404)

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Friday, Oct 12	11:00 AM–12 Noon	A16, Convention Center	Are You a Night Owl? A Morning Lark? The Answer May Be in Your Genes (p. 71)

MSOE Center for BioMolecular Modeling (Booth #311)

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National Geographic Learning | Cengage (Booth #408)

Thursday, Oct 11	2:00–3:00 PM	A16, Convention Center	Building the Human Connection with National Geographic Learning (p. 49)
Friday, Oct 12	8:00–9:00 AM	A16, Convention Center	Making the Literacy Connection, National Geographic Learning Style (p. 60)

PASCO (Booth #701)

Friday, Oct 12	8:00–9:00 AM	A11, Convention Center	Motion Graphing: Connecting Math Concepts to Displacement, Speed, and Velocity (p. 59)
Friday, Oct 12	9:30–10:30 AM	A11, Convention Center	Data Collection and Simulations to Help Take the Pressure Out of Understanding Gas Laws (p. 64)

Pearson (Booth #509)

Friday, Oct 12	11:00 AM–12 Noon	A11, Convention Center	Take Your Students on a Quest! A Real-World Problem-Based Learning Project That Incorporates All Three Dimensions of *NGSS* (p. 71)
Friday, Oct 12	2:00–3:00 PM	A11, Convention Center	Get Your Chemistry in Gear: Problem-Based Learning in Your Chemistry Classroom (p. 79)
Friday, Oct 12	3:30–4:30 PM	A11, Convention Center	littleBits in Grades 3-8 STEM Classrooms (p. 81)
Saturday, Oct 13	8:00–9:00 AM	A11, Convention Center	Make Any Classroom a Makerspace (p. 86)
Saturday, Oct 13	9:30–10:30 AM	A11, Convention Center	UnBEElievable (p. 89)
Saturday, Oct 13	11:00 AM–12 Noon	A11, Convention Center	UnBEElievable (p. 93)

ScienceFLEX & MakerSpace/School Specialty (Booth #801)

Thursday, Oct 11	8:00–9:00 AM	A10, Convention Center	Developing and Using Models with Augmented Reality (p. 36)
Thursday, Oct 11	9:30–10:30 AM	A10, Convention Center	How to Argue in an Elementary Science Class (p. 38)
Thursday, Oct 11	11:00 AM–12 Noon	A10, Convention Center	Embedding Practices and Crosscutting Concepts into Hands-On Science (p. 40)
Thursday, Oct 11	12:30–1:30 PM	A10, Convention Center	Making Science Accessible through Blended Hands-On and ELA (p. 44)
Thursday, Oct 11	2:00–3:00 PM	A10, Convention Center	Boosting the Makerspace Experience for Young Scientists! (p. 49)
Thursday, Oct 11	3:30–4:30 PM	A10, Convention Center	How to Argue in an Elementary Science Class (p. 54)

STEMscopes (Booth #709)

Friday, Oct 12	8:00–9:00 AM	A10, Convention Center	Demystifying 3-D, the *NGSS*, and STEM Literacy Through the Phenomenon of Earthquakes (p. 59)
Friday, Oct 12	9:30–10:30 AM	A10, Convention Center	Demystifying 3-D, the *NGSS*, and STEM Literacy Using the Phenomenon of Light (p. 64)
Friday, Oct 12	11:00 AM–12 Noon	A10, Convention Center	STEM Teacher-Science Teacher: What's the Difference? (p. 70)
Friday, Oct 12	12:30–1:30 PM	A10, Convention Center	Using Argumentation to Discuss Phenomena: Increasing Student Voice in the STEM Classroom (p. 75)

Texas Instruments (Booth #409)

Thursday, Oct 11	2:00–3:00 PM	A18, Convention Center	Using Maggots, Flies, and Flesh to Solve a Mystery! (p. 49)
Thursday, Oct 11	3:30–4:30 PM	A18, Convention Center	Zombies Get OUT! (p. 55)
Friday, Oct 12	8:00–9:00 AM	A18, Convention Center	Are You Moody? (p. 60)
Friday, Oct 12	9:30–10:30 AM	A18, Convention Center	STEMulating the Heart with Code! (p. 65)
Friday, Oct 12	11:00 AM–12 Noon	A18, Convention Center	Zombie Apocalypse! (p. 71)

Vernier Software & Technology (Booth #500)

Friday, Oct 12	8:00–9:00 AM	A12, Convention Center	Integrating Chromebook™ with Vernier Data-Collection Technology (p. 59)
Friday, Oct 12	9:30–10:30 AM	A12, Convention Center	Chemistry with Vernier (p. 65)
Friday, Oct 12	11:00 AM–12 Noon	A12, Convention Center	Biology with Vernier (p. 71)
Friday, Oct 12	12:30–1:30 PM	A12, Convention Center	Integrating Chromebook with Vernier Data-Collection Technology (p. 75)
Friday, Oct 12	2:00–3:00 PM	A12, Convention Center	Integrating iPad® with Vernier Data-Collection Technology (p. 79)
Friday, Oct 12	3:30–4:30 PM	A12, Convention Center	Physics and Physical Science with Vernier (p. 81)

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Notes

Advertisers

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FRIDAY
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FREE HANDS-ON WORKSHOPS

No pre-registration required

Time	Room #A12
8:00–9:00 a.m.	Integrating Chromebook™ with Vernier Data-Collection Technology
9:30–10:30 a.m.	Chemistry with Vernier
11:00–12:00 p.m.	Biology with Vernier
12:30–1:30 p.m.	Integrating Chromebook™ with Vernier Data-Collection Technology
2:00–3:00 p.m.	Integrating iPad® with Vernier Data-Collection Technology
3:30–4:30 p.m.	Physics and Physical Science with Vernier

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