Nearly all of the 30 fastest-growing occupations in the next decade will require at least some background in STEM.¹

Vernier Software & Technology helps teachers instill curiosity and hone problem-solving skills through innovative technology and engaging investigations. With our technology, teachers can prepare students for careers in an ever-evolving, STEM-focused world.

INSPIRE STEM CURIOSITY IN YOUR STUDENTS.

¹ BUSINESS CENTER FOR A COLLEGE-AND CAREER-READY AMERICA
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**Presenters, key information, and complete session descriptions on Conference App:**

Visit: [www.nsta.org/conferenceapp](http://www.nsta.org/conferenceapp)

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**NSTA Affiliates**

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

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

Contributors
American Chemical Society
American Society for Engineering Education

Seattle Conference Committee

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Tacoma, WA
President’s Welcome: Making Science Learning Lifelong, Life-wide, and Life-deep

Welcome to Seattle: Fostering a Culture for Science

Welcome to the NSTA Area Conference in Seattle. The planning committee has done an outstanding job of embracing my presidential theme Making Science Learning Lifelong, Life-wide, and Life-deep.

• Lifelong: Making science learning something people engage in throughout their lives.
• Life-wide: Making science learning something people experience in a variety of situations throughout the day/year (e.g., school, home, afterschool, museums, and summer camp).
• Life-deep: Encouraging people to engage in science learning at a level that is right for them (e.g., enjoy following science in the media; participating in a citizen science project; becoming an amateur astronomer; becoming a science-based professional).

You will see that the conference uses the presidential theme to think about how science is pervasive throughout life:
• Providing STEM Pathways for the Future recognizes it is critical that we develop and encourage all students to pursue a range of science opportunities in STEM classes. This strand helps educators see how they can provide opportunities for each student to learn about and experience STEM pathways.
• Building Partnerships for Effective Science Education shows how collaborative partnerships in science enrich student learning, as well as create lifelong, life-wide, and life-deep experiences for students. Partnerships can be peer to peer, team to team, across curricular areas, as well as outside the classroom. This strand provides participants with strategies to increase partnerships through collaboration, thereby deepening the learning experience of our students.
• Finding Joy in Experiencing Science promotes a scientifically literate society by instilling a love of science in students. All people need to understand topics and make personal, professional, and civic decisions based on scientific evidence. This strand provides participants with ways of encouraging student engagement in science and learning about successful strategies for promoting student enjoyment in science.

My thanks to the conference planning committee for developing an outstanding program with more than 300 sessions, exhibit hall displays, and ways for you to network with science educators from across the region. May you have an outstanding experience during your time at the conference.

Dennis Schatz
2019–2020 NSTA President

Welcome to Seattle: Fostering a Culture for Science

The NSTA Seattle Conference Committee welcomes our friends and colleagues to the NSTA Area Conference “Fostering a Culture for Science” in Seattle. We are happy to provide this inclusive, intensive professional development experience and hope you enjoy the season in Seattle before, during, and after this conference. We have a wide-ranging program for teachers of all subjects and grades, all embraced in the real expectation of “All Standards for All Students.” Our hope is you will find a wealth of teaching and learning approaches that make science learning—as well as all learning—available to all students no matter their place or situation.

The conference theme Fostering a Culture for Science embodies the real idea that science and STEM learning is available and realistic for all students to help provide not just a workforce able to use science and technology for the betterment of all, but also a scientifically literate society. Our committee members have planned sessions that provide a breadth and depth of subjects and approaches that will improve science literacy and preparation for life and careers for our students.

We believe that we all together are:
• Providing STEM Pathways for the Future: We are giving all students the opportunity to pursue a range of science opportunities in STEM classes. Students need hope for earning living family wages and being productive contributors to our society.
• Building Partnerships for Effective Science Education: We are making collaborative partnerships in all of education that creates lifelong, life-wide, and life-deep experiences (Thanks to President Dennis Schatz!). Participants will learn strategies to increase partnerships through collaboration throughout education, employment, and society.
• Finding Joy in Experiencing Science: Students who gain a love and understanding of science will become a scientifically literate society. All people need to be able to find hope and understanding in all science topics and make personal, professional, and civic decisions based on scientific evidence. Participants will learn how to increase engagement in science.

While you are here, take the time to enjoy the season (mild and snow-free) in Seattle, visit the great museums of art and science, enjoy excellent seafood, and experience the technologically excellent and socially responsible research and business activities in the area. We thank you for being an enthusiastic and able teacher—interested in fostering a culture of science learning and application for all.

2019 Seattle Conference Committee Leaders
John P. McNamara, Bob Sotak, and Lisa Chen

Conference Chair
John P. McNamara
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NSTA Seattle Area Conference on Science Education
Meeting Location and Times

The conference headquarters hotel is the Sheraton Grand Seattle. Conference registration, Express Check-in, the exhibits, and the NSTA Store will be located at the Washington State Convention Center. Most sessions will be held at the Convention Center, as well as the Sheraton.

The conference will begin with concurrent sessions on Thursday, December 12, at 8:00 AM and end on Saturday, December 14, at 12 Noon.

New Badge Reprint Fee

If you misplace or forget your badge, there will be a reprint fee of $20 for a replacement badge. To have a replacement badge printed, please proceed to Attendee Services and present your personal ID to be issued a replacement. Note: Only ONE replacement badge will be issued.

Express Check-In

Registration is required for participation in all conference activities and the exhibits. Express Check-In, Attendee Services, and the NSTA Store are located in Exhibit Hall 4A of the Convention Center. Proceed to Express Check-In to print your official badge and secure conference materials. Express Check-In and Attendee Services will be open the following hours:

Wed., Dec. 11 5:00–7:00 PM
Thu., Dec. 12 7:00 AM–5:00 PM
Fri., Dec. 13 7:00 AM–4:00 PM
Sat., Dec. 14 7:30 AM–12 Noon

Purchasing Ticketed Events

The Seattle short courses and educational trip require a separate fee and ticket. You may purchase tickets, space permitting, at Attendee Services. See the Conference Program section (starting on page 22) for details.

Getting Around Town

The Seattle Streetcar, the South Lake Union Line, has a stop located at Westlake Avenue and Olive Way, roughly a half-mile walk from the Convention Center. The line has seven stops, including Lake Union’s 12-acre waterfront park. The South Lake Union line also conveniently connects to Link light rail, Monorail, and Metro Transit.

Seattle Center Monorail is a beloved landmark. The Monorail provides a fun, quick, and convenient link between downtown Seattle and Seattle Center, home to the Space Needle, Pacific Science Center, Museum of Pop Culture, The Children’s Museum, and a host of theatrical and cultural experiences.

Online Session Evaluations and Tracking Professional Development

All attendees can evaluate sessions online while simultaneously tracking their professional development certification.

Help NSTA’s GREEN efforts by completing session evaluations online December 12–January 2 while the session is fresh in your mind! During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Attendee Services Area. And this year, we’re giving away an Apple iPad mini 5 Wi-Fi tablet to a lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!

To evaluate a session using our online browser, attendees should follow these steps:

Note: Our session evaluation system is designed to work from a computer using our online browser. Do not evaluate sessions using smartphones/tablets. Session Evaluations cannot be completed via the conference app.

- Go to the designated conference site link. www.nsta.org/seattle
- Click on the “Attendee Info” tab, navigate to the “Attendee Service Center Login.”
- Login: E-mail; Password:
- Select the Session Evaluations tab.
- Find the Session that you have attended, then click on the Start button.
- Follow the step-by-step process.
- Repeat for each session to evaluate.

On or before January 3, 2020, attendees will be e-mailed 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.
Registration, Travel, and Hotels

Housing Questions or Concerns?
If you have questions or concerns regarding your housing, contact Orchid.Events (during business hours) Monday through Friday, 6:00 AM–5:00 PM (PST) at 877-352-6710 (toll-free) or 801-505-4611. After hours and on Saturday, call 801-505-4134.

1. Grand Hyatt Seattle
   721 Pine St.

2. Hilton Seattle
   1301 6th Ave.

3. Sheraton Grand Seattle
   (Headquarters Hotel)
   1400 6th Ave.

Shuttle service will not be provided as all hotels are within walking distance of Washington State Convention Center.
Conference Resources

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

Go to Express Check-In to print your official badge. This badge is your “ticket of admission” to the Exhibit Hall and all non-ticketed conference activities. A map display of the Exhibit Hall is accessible via our Conference app. A complete list of exhibitors is on page 57.

Exhibit Hall Hours. Located in Exhibit Hall 4A of the Convention Center, exhibits will be open for viewing during the following hours:

- Thu., Dec. 12 11:00 AM–5:00 PM
- Fri., Dec. 13 9:00 AM–4:00 PM
- Sat., Dec. 14 9:00 AM–12 Noon

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.

Presenters and Presiders Check-In
If you are presenting or presiding at a session, please check in at the Presenters/Presiders counter in the Attendees Services Area.

Wi-Fi at Convention Center
Complimentary Wi-Fi is available in all public spaces, and meeting rooms of the Convention Center, excluding the Exhibit Hall.

Network: NSTA Conference
Password: science2019

*Note: Password is case sensitive.

NSTA Community Hub
Be sure to stop by the NSTA Community Hub, located at Booth #525 in the Exhibit Hall. While you’re there, ask us about our #reachforthestars initiative and redeem your coupon to spin our 75th Anniversary Prize wheel! Find out more about the benefits of becoming an NSTA member, our professional learning opportunities, and NSTA Press books. The NSTA Community Hub will be open during exhibit hall hours.

Go on NSTA’s Scavenger Hunt! NSTA has placed periodic table pieces around the exhibit hall and session rooms that spell NSTA. Take a picture with each correct piece and show us your pictures at the NSTA Community Hub for a chance to win a HUGE #NSTA20 conference experience. Follow our twitter account for clues on each periodic table piece location.

NSTA Conference App
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, as well as maps of the Convention Center, Sheraton, and the Exhibit Hall. Plus, you’re able to find key information on conference resources, such as First Aid, AV rooms, and Business Services. Available for iPhone and Android devices, download from the respective app stores or visit www.nsta.org/conferenceapp.

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.

Graduate-Level Credit Opportunity
Seattle area conference attendees can earn one (1) or two (2) graduate-level credit/units in professional development through Dominican University of California course #9039. To obtain credit/units, you must be registered for the Seattle area conference, complete the required assignments, and pay a fee of $95 for one credit/unit or $190 for two credits/units. An NSTA transcript is also required. Register for graduate-level credit by Monday, December 30, 2019, and submit the required assignments by Sunday, January 26, 2020. For complete details, visit bit.ly/31Tv1l3.
Washington State Clock Hours

WSTA is an approved professional development “clock hour” provider in the State of Washington. For certificate renewal and salary advancement, teachers are required to accrue advanced educational credits. Clock hours may be used to earn these necessary credits.

For a fee of $30, WSTA will offer clock hours to Washington State teachers attending the Seattle conference. At the beginning of your conference experience, simply stop by the Washington Science Teachers Association booth to pick up a conference Clock Hour Verification Form and Conference Evaluation Form. Please complete the Verification Form as you attend each session. Return the completed Verification Form, Conference Evaluation, and the $30 clock hour payment to the Washington Science Teachers Association booth to process your paperwork and receive your clock hours. The WSTA booth is located in Exhibit Hall 4A in the NSTA Attendee Services area.

PhD SCIENCE™

Great Minds®, the nonprofit behind Eureka Math®/EngageNY Math, now offers PhD Science™ to support three-dimensional science teaching and learning.

✓ Aligned to NGSS
✓ Approved for adoption
✓ Available to pilot

Join us at Booth #202
for a hands-on workshop

greatminds.org/science

Harnessing the Wind: Energy Transfer and Transformation
Dec. 13 | 2:00–3:00 PM | Washington State Convention Center, 401

In this hands-on workshop, you’ll build a windmill and observe energy transfer (CC.5), create an anchor model (SEP.2) to record how windmills work (PS3.B), then develop a driving question board (SEP.1) to guide learning.
Need help navigating?

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

First-Timer Attendee Session  
Thursday, December 12, 8:00–9:00 AM
Ballroom 6B, Washington State Convention Center

Enjoy the view of our K–12 science programs in our new catalog!

Grades K–12
2019–2020 Catalog
Mathematics
Science
Social Studies
Reading / Language Arts
ESL/ELD
World Languages
Advanced, Honors, and Electives
Career and Technical Education

NGL.Cengage.com/Catalogs
Conference Resources • Future Conferences

All cities are subject to change pending final negotiation.

National Conferences on Science Education

Boston, Massachusetts
April 2–5, 2020

Chicago, Illinois
April 8–11, 2021

Houston, Texas
March 31–April 3, 2022

Chicago, Illinois
April 8–11, 2021

Houston, Texas
March 31–April 3, 2022

Area Conferences on Science Education

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

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

Share Your Ideas!

NSTA’s Conferences on Science Education

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

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

Proposal Deadline:
12/03/2019

2020 Area Conferences
Pittsburgh, PA
October 29–31
New Orleans, LA
November 19–21
Phoenix, AZ
December 10–12

Proposal Deadline:
1/15/2020

2021 National Conference
Chicago, IL
April 8–11

Proposal Deadline:
4/15/2020

To submit a proposal, visit www.nsta.org/conferenceproposals
Visit the NSTA STORE

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

- Fun NSTA-branded gear—unique hats, shirts, mugs, and more
- Meet your favorite NSTA Press authors
- Ask about our NSTA gift cards—great gift ideas!

Download the conference app or follow #NSTA19 for special giveaways, contests, and more throughout the conference!

Visit www.nsta.org/store to make a purchase today, or call 800-277-5300.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thursday, December 12</td>
<td></td>
</tr>
<tr>
<td>8:00–9:00 AM</td>
<td>First-Timer Conference Attendees’ Orientation \dot{\dot{\dot{\dot{\dot{\dot{15, 29}}}}}}</td>
</tr>
<tr>
<td></td>
<td>(Is This Your First NSTA Conference?)</td>
</tr>
<tr>
<td>9:15–10:30 AM</td>
<td>Keynote Presentation: Nalini Nadkarni, \dot{\dot{\dot{\dot{\dot{\dot{19, 29}}}}}}</td>
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<tr>
<td></td>
<td>sponsored by National Geographic Learning</td>
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<tr>
<td>11:00 AM–5:00 PM</td>
<td>Exhibits \dot{\dot{\dot{\dot{\dot{\dot{27}}}}}}</td>
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<tr>
<td></td>
<td>(Exclusive exhibit / exhibitor workshop hours: 11:00 AM–12:30 PM)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>Featured Presentation: Jonathan Plucker \dot{\dot{\dot{\dot{\dot{\dot{33}}}}}}</td>
</tr>
<tr>
<td>Friday, December 13</td>
<td></td>
</tr>
<tr>
<td>8:00 AM–1:30 PM</td>
<td>High School Chemistry Day \dot{\dot{\dot{\dot{\dot{\dot{40, 44}}}}}}</td>
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<tr>
<td>8:00 AM–1:30 PM</td>
<td>Middle School Chemistry Day \dot{\dot{\dot{\dot{\dot{\dot{40, 43}}}}}}</td>
</tr>
<tr>
<td>8:00 AM–1:30 PM</td>
<td>Engineering Day \dot{\dot{\dot{\dot{\dot{\dot{40, 44}}}}}}</td>
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<tr>
<td>9:00 AM–4:00 PM</td>
<td>Exhibits \dot{\dot{\dot{\dot{\dot{\dot{40}}}}}}</td>
</tr>
<tr>
<td></td>
<td>(Exclusive exhibit / exhibitor workshop hours: 3:00–4:00 PM)</td>
</tr>
<tr>
<td>9:30–10:30 AM</td>
<td>Featured Presentation: Robert Schwartz \dot{\dot{\dot{\dot{\dot{\dot{42}}}}}}</td>
</tr>
<tr>
<td>12:30–1:30 PM</td>
<td>Featured Presentation: Chris Reykdal \dot{\dot{\dot{\dot{\dot{\dot{46}}}}}}</td>
</tr>
<tr>
<td>2:45–3:30 PM</td>
<td>Meet the Presidents and Board/Council \dot{\dot{\dot{\dot{\dot{\dot{44}}}}}}</td>
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<tr>
<td>Saturday, December 14</td>
<td></td>
</tr>
<tr>
<td>9:00 AM–12 Noon</td>
<td>Exhibits \dot{\dot{\dot{\dot{\dot{\dot{53}}}}}}</td>
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</tbody>
</table>

Download the Conference App!


By downloading the conference app, you’ll be able to easily manage your schedule and maximize your conference experience. Start mapping out your journey today!

**With the app, you’ll be able to:**

- Search sessions, exhibitors, and speakers to build a schedule of your favorites
- Filter the sessions you’re interested in by strand and type to customize an agenda that is just right for you
- Access maps of the Exhibit Hall, Convention Center, and hotels while you are on the move
- Pull up the all-important Wi-Fi information
- Learn more about the exhibitors and sponsors
- Find out where NSTA events are happening
- Tweet while you are in sessions or attending events
- Receive important updates and notifications

**Available for download on**

- iPhone + iPad
- Android

Visit: [www.nsta.org/conferenceapp](http://www.nsta.org/conferenceapp)

Download now at [www.nsta.org/conferenceapp](http://www.nsta.org/conferenceapp)
Conference Program • Featured Speakers

Keynote Presentation: Nalini Nadkarni
Professor, Dept. of Biological Sciences, The University of Utah
(Sponsored by National Geographic Learning | Cengage)

Tapestry Thinking—Weaving Diverse Threads of Science and Society

Thursday, Dec. 12
9:15–10:30 AM
Ballroom 6E, Convention Center
(page 29)

Featured Presentations

Thursday, Dec. 12
2:00–3:00 PM • Ballroom 6A
Convention Center

Jonathan Plucker
Julian C. Stanley Endowed Professor of Talent Development
Johns Hopkins University
Baltimore, MD
(page 33)

Strand: Finding Joy in Experiencing Science

Friday, Dec. 13
9:30–10:30 AM • Ballroom 6A
Convention Center

Robert Schwartz
Senior Research Fellow
Harvard Graduate School of Education
Cambridge, MA
(page 42)

Strand: Providing STEM Pathways for the Future

Friday, Dec. 13
12:30–1:30 PM • Ballroom 6A
Convention Center

Chris Reykdal
Superintendent of Public Instruction
State of Washington
Olympia, WA
(page 46)

Strand: Building Partnerships for Effective Science Education
Providing STEM Pathways for the Future

STEM begins with science, therefore it is critical that we develop and encourage all students to pursue a range of science opportunities in STEM classes. This will serve them well as they enter the job force and their adult lives. Science experiences must start at the preK level to ensure each student has a STEM future. Students need hope for earning living family wages and being productive contributors to our society. This strand will help teachers see how they can provide opportunities for each student to learn about and experience STEM pathways, incorporating three-dimensional learning as described in NGSS and other standards based on the Framework.

Building Partnerships for Effective Science Education

Building collaborative partnerships in science enriches student learning, as well as creating lifelong, life-wide, and life-deep experiences for students. Partnerships can be peer to peer, team to team, across curricular areas, as well as outside the classroom. We specifically invite Career and Technical Education–related workshops that focus on the scientific aspects of this strand. This strand will provide participants with strategies to increase partnerships through collaboration, thereby deepening the learning experience of our students.

Finding Joy in Experiencing Science

To promote a scientifically literate society, it is imperative to instill in our students a love of science. Students need opportunities to be engaged in the scientific process and find happiness and hope in the scientific endeavor. All people need to be able to understand topics and make personal, professional, and civic decisions based on scientific evidence. In this strand, participants will learn about various ways of encouraging student engagement in science and learn about successful strategies for promoting student enjoyment in science throughout the learning process.

Help us with your feedback...and get a chance for a free Apple iPad mini 5

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

When you evaluate a session, you get entered into a drawing for a chance to win an Apple iPad mini 5 Wi-Fi tablet courtesy of the NSTA Conference Department.

To evaluate a session using our online conference browser, click on Attendee Info tab and navigate to Attendee Service Center Login then log in with your e-mail address and password. Once logged in, select the Session Evaluations tab. Find the session that you have attended, then click the Start button. Follow the step-by-step process.

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

- WE’RE GIVING AWAY an APPLE IPAD MINI 5 WI-FI TABLET

• CONFERENCE APP

www.nsta.org/conferenceapp
NSTA Partnership School Program

Each Partner School receives these benefits:

- **NSTA membership** for all teachers in the school building
- **One free conference registration** for a teacher/administrator to a STEM Forum or an NSTA Conference
- **Recognition** as an NSTA Partner School
- **One print journal** for the school building and e-journals for every teacher/member in the school
- **One hard copy of NSTA Reports** (newspaper) with e-Reports for every teacher/member in the school
- **Access to Learning Center Forums**, including collections of NGSS and STEM resources differentiated by grades
- **An initial one-on-one conversation** with NSTA to determine which products and services can best support school-wide professional learning goals
- **Participation in three virtual conferences** per year, exploring critical topics for STEM and NGSS integration
- **Access** to a national NGSS and STEM listserv and 16 other listservs

In addition, each teacher gets discounts on

- **NSTA conferences and workshops**
- **NSTA Press books**
- **Enhanced e-books**
Thinking Machines: Build an Artificial Neural Network in Your Classroom (SC-1)
Level: Grades 7–College
Date/Time: Thursday, December 12, 8:00–11:00 AM
Location: 205, Convention Center
Ticket Price: $25

Discover how to use Arduinos to build a working Artificial Neural Network. ANNs are currently used in fields such as data mining, internet search engines, and machine vision applications (e.g., Google’s self-driving cars). ANNs differ from conventional computer programs in that they are designed to “learn” to accomplish a task based upon the principles that underlie learning in biological neural networks. Hands on with free student-tested curriculum available! Bring a laptop with Arduino software preloaded (www.arduino.cc/en/main/software). For more information, visit centerforneurotech.org.

Blending the E and the S in STEM (SC-2)
Level: Grades 4–8
Strand: Providing STEM Pathways for the Future
Date/Time: Thursday, December 12, 8:00–11:00 AM
Location: Ballard, Sheraton
Ticket Price: $20

We will explore the integration of engineering into science classrooms in ways that motivate deep learning of science and engineering via doable instructional shifts. This research-based and reality-driven approach is based on tested resources built on a research foundation for layering the NGSS engineering design process into elementary classrooms and secondary science courses.

Building Bridges Between Biology and Health Through Type 2 Diabetes Education (SC-3)
Level: Grades 8–12
Strand: Building Partnerships for Effective Science Education
Date/Time: Friday, December 13, 8:00–11:00 AM
Location: Capitol Hill, Sheraton
Ticket Price: $20

The phenomenon of type 2 diabetes anchors core ideas about homeostasis, nutrition, population traits, gene-environment interactions, cell signaling, and more. Participants will experience three-dimensional–designed lessons and activities from our diabetes collection, created for introductory and advanced biology classes. Included are four activities: the use of a glucose homeostasis model board; a population trait inheritance simulation using beans, including a discussion of the role of race in health outcomes; our Yeast Feast lab in which yeast are used as a bioassay for glucose; and a cell signaling lab in which participants experience the “glucose blocker” Gymnema herbal tea. For more information, visit gsoutreach.gs.washington.edu.

Increasing Student Engagement Through “Aha!” Moments: Supporting the NGSS with Process Oriented Guided Inquiry Learning (POGIL) (SC-4)
Level: Grades 6–College
Strand: Finding Joy in Experiencing Science
Date/Time: Friday, December 13, 9:00 AM–3:00 PM
Location: Metropolitan A, Sheraton
Ticket Price: $60

Immerse yourself in collaborative learning to explore connections between POGIL strategies and the NGSS. Experience the roles, teamwork, and process skills that engage students and improve content mastery and retention. Appropriate for grades 6–college science instructors, Process Oriented Guided Inquiry Learning (POGIL) is a research-based instructional strategy that seeks to simultaneously incorporate the performance expectations, science and engineering practices, and crosscutting concepts of NGSS. These student-centered learning strategies support all students, from English language learners and special education to gifted, as they create their own understanding of fundamental STEM concepts by working through carefully designed guided inquiry activities. Bring your curiosity along with a pencil. Plan for a break for lunch on own.
Fermentation Science: A Behind-the-Scenes Look at Hale's Ales Brewery

T-1 Thursday, Dec. 12 1:30–4:00 PM

Have you ever wondered how people can transform plain water and a few simple ingredients into the vast array of spirituous beverages enjoyed by people all over the world? For most of human history, fermentation has been an integral part of our culture. On this tour, you will explore the fascinating fermentation process of in-depth brewing. This expedition will take you to one of Seattle’s most iconic beverage production facilities, Hale’s Ales Brewery in the historic Ballard neighborhood. You will learn firsthand from master brewers how biology, chemistry, and physics converge in the different processes of brewing beer. You will dive into topics such as yeast microbiology, enzyme action, carbon dioxide production, and water chemistry. By the end of the tour, you will be a fermentation aficionado, having mastered the difference between lagers and ales, as well as how the treatment of the raw ingredients affect the final flavors. The tour will finish with a sensory analysis of products guided by trained olfactory experts and a tasting.

Note: Must be of legal drinking age, 21 or older. ID required to participate.

Meet your educational trip leader at the 9th Avenue and Pike Street entrance of the Convention Center at least 15 minutes before departure time.

Tickets for this educational trip can be purchased (space permitting) at NSTA Attendee Services. See Conference App or Seattle session browser for complete description.
### Three Dimensions of the Next Generation Science Standards (NGSS)

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

#### Disciplinary Core Ideas

**Disciplinary Core Ideas in Physical Science**
- PS1: Matter and Its Interactions
  - 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.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.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
JOIN US

9TH ANNUAL STEM
Forum & Expo
HOSTED BY NSTA
Louisville, Kentucky
July 22–24, 2020

• Experience hands-on sessions that enhance your ongoing development and improve your STEM knowledge.
• Explore ways to foster integration of research-based methods into the STEM curriculum.
• Network with colleagues and hone your STEM leadership skills.
• Compare project- and research-based activities that tackle issues of real-world relevance.
• Discover the aspirations of students who share their interests in STEM opportunities and careers.
• Check out the hottest tools and resources for STEM educators.
• Get the keys to success in developing partnerships with informal education groups, business, industry, and governmental agencies.

This dynamic event brings together educators and organizations that are actively implementing STEM programs in their schools or districts.

Come prepared to learn tactics that work, build your professional learning network, connect with effective outreach programs and partnerships, discover new resources, and build a strong curriculum.

#STEMforum
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>8:00–9:00 AM</th>
<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
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<tbody>
<tr>
<td>2B Convention Center</td>
<td>Do We Really Have to Stop Eating Salmon to Save the Southern Resident Orca Whales?</td>
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<tr>
<td>201 Convention Center</td>
<td>A New Twist on DNA Extraction</td>
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<tr>
<td>203 Convention Center</td>
<td>Engaging the Youngest Learners: Science and Literacy as Parallel Processes Integrating Theoretical Concepts into STEM for Promoting Preschoolers' Development</td>
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<tr>
<td>204 Convention Center</td>
<td>Schoolyard Surfaces in Our Watersheds</td>
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</table>
| 205 Convention Center | Thinking Machines: Build an Artificial Neural Network in Your Classroom (SC-1)  
By Ticket Only: $25 8:00–11:00 AM |                                                                             |                                                                                |
<p>| 211 Convention Center | Model Stellar Evolution and Supernovas Using NASA Images, Data, and STEM Analysis Tools |                                                                             |                                                                                |
| 212 Convention Center | Breaking Out of the Boring Science Classroom!                                  |                                                                             |                                                                                |
| 213 Convention Center | Working to Meet the NGSS in Secondary Science in Districts                      |                                                                             |                                                                                |
| 214 Convention Center | Data in the Classroom: Use NOAA Resources to Bring Scientific Data to Your Classroom |                                                                             |                                                                                |</p>
<table>
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<th>LOCATION</th>
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<tbody>
<tr>
<td>3A Convention Center</td>
<td>Inquiry in Action: Investigating Matter K–5</td>
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<tr>
<td>303 Convention Center</td>
<td>Authentic Student-Framed Engineering Problems, Criteria, Constraints, and Argumentation Using Two New STEM Teaching Tools</td>
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<tr>
<td>304 Convention Center</td>
<td>Do You Need a New Science Lab? Win a Shell Science Lab Makeover ($20,000 Value) for Your School</td>
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<tr>
<td>307/308 Convention Center</td>
<td>Making Your Claim Outdoors: Trees as Habitats</td>
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<td>309 Convention Center</td>
<td>Building Awareness of Ocean Acidification in a Coastal Community</td>
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<td>310 Convention Center</td>
<td>Oxygen Minimum Zone, OMG!</td>
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<td>Exhibit Hall 4A Convention Center</td>
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<td>401 Convention Center</td>
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<td>4C-2 Convention Center</td>
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**NSTA Exhibits!**

11:00 AM–5:00 PM

- **Exhibitor Workshop**
  - Using Maggots, Flies, and Flesh to Solve a Mystery!
  - (Sponsor: Texas Instruments)

- **Exhibitor Workshop**
  - Dynamic Demonstrations from Flinn Scientific
  - (Sponsor: Flinn Scientific, Inc.)

- **Exhibitor Workshop**
  - 360Science: A Whole New Twist on Science Kits
  - (Sponsor: Flinn Scientific, Inc.)

**Earth & Space Science**  **Engineering & Tech**  **Life Science**  **Physical Science**  **Informal Science**  **General Science**
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<tr>
<td>4C-4 Convention Center</td>
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<td>Exhibitor Workshop</td>
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<td>Criteria and Constraints: Raising the Bar for</td>
<td>Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher</td>
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<td>Rigor Grades 3–5</td>
<td>(Sponsor: Carolina Biological Supply Co.)</td>
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<tr>
<td>603 Convention Center</td>
<td>STEM-LA Learning Through VR</td>
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<td>604 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>Analyzing and Interpreting Data</td>
<td>Using a Variety of Methods to Assess for the</td>
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<td>Using TCI’s <em>Bring Science Alive!</em></td>
<td>Three Dimensions</td>
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<td>(Sponsor: TCI)</td>
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<td>605/610 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>Modern Biology Is</td>
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<td>Revolutionizing Human Lives!</td>
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<td>Are Your Students Prepared?</td>
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<td>(Sponsor: Carolina Biological Supply Co.)</td>
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<td>606 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>Beyond CER Labels:</td>
<td>Lead with Phenomena and the Three Dimensions</td>
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<td>Supporting Authentic Scientific Argumentation</td>
<td>Will Follow (Sponsor: Amplify)</td>
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<td>in the Classroom</td>
<td>(Sponsor: Amplify)</td>
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<td>607 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>FOSS: 10 Minutes to Improving Science Achievement</td>
<td>FOSS Wave Properties and Information Technologies</td>
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<td>(Sponsor: Delta Education/School Specialty Science–FOSS)</td>
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<td>608 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>IQWST: Literacy Strategies for the Middle School</td>
<td>Project-Based Inquiry Science™</td>
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<td>Classroom (Sponsor: Activate Learning)</td>
<td>(PBIScience): Creating “Coherence and Science</td>
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<td>Storylines” for Middle School</td>
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<td>(Sponsor: Activate Learning)</td>
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<td>609 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>Space Science for the Modern, Interactive</td>
<td>SOLving Crimes with Science: Forensics for Your</td>
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<td>Classroom (Sponsor: Simulation Curriculum Corp.)</td>
<td>Classroom (Sponsor: AEOP)</td>
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<td>611 Convention Center</td>
<td>Exhibitor Workshop</td>
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<td>5 Easy Ways to Investigate Proteins and Enzyme</td>
<td>Dynamic DNA—One Model to Teach It All</td>
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<td>Action (Sponsor: 3D Molecular Designs)</td>
<td>(Sponsor: 3D Molecular Designs)</td>
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</table>
| 612 Convention Center | **Exhibitor Workshop**  
|                | **pH Scale**  
|                | *(Sponsor: Lab-Aids, Inc.)*                      | **Exhibitor Workshop**  
|                | **Distilling Aromatic Hydrocarbons**             | *(Sponsor: Lab-Aids, Inc.)*                      |
| 613/614 Convention Center | **Exhibitor Workshop**  
|                | **Introducing Your Students to Gene Editing with CRISPR**  
|                | *(Sponsor: Edvotek, Inc.)*                        | **Exhibitor Workshop**  
|                | **Left at the Scene of the Crime**               | *(Sponsor: Edvotek, Inc.)*                        |
|                |                                                   | **Exhibitor Workshop**  
|                |                                                   | **Transform Your Class into a Neuroscience Laboratory**  
|                |                                                   | *(Sponsor: Edvotek, Inc.)*                        |
| 615–617 Convention Center | **NSTA Press Session:**  
|                | **Reading, Writing, and Reasoning in the Schoolyard** |                                                   |                                                   |
| 618 Convention Center | **Using Middle Level Field Experiences as a Stepping-Stone to Career Pathways in the Natural Sciences** |                                                   |                                                   |
| 619 Convention Center | **Citizen Science: Engage All Students in Authentic Outdoor Science Research** |                                                   |                                                   |
| Ballroom 6B Convention Center | **Is This Your First NSTA Conference?**  
|                | **First-Timer Conference Attendees’ Orientation** |                                                   |                                                   |
| Ballroom 6E Convention Center |                                                   |                                                   | **Keynote Presentation**  
|                |                                                   |                                                   | **9:15–10:30 AM**  
|                |                                                   |                                                   | **Tapestry Thinking—Weaving Diverse Threads of Science and Society**  
|                |                                                   |                                                   | **Speaker: Nalini Nadkarni**  
|                |                                                   |                                                   | **Sponsor: National Geographic Learning | Cengage**
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>12:30–1:30 PM</th>
<th>2:00–3:00 PM</th>
<th>3:30–4:30 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A Convention Center</td>
<td>Making Chemistry Fun for Everyone</td>
<td>Experience Integration</td>
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<tr>
<td>2B Convention Center</td>
<td>Equity in Science Education Roundtable</td>
<td></td>
<td>NSTA Press Session: Fact or Phony? Successful Strategies to Promote Media Literacy</td>
</tr>
<tr>
<td>201 Convention Center</td>
<td>Teach Evolution with the World's Most Extravagant Birds</td>
<td>Opioids and the Science of Addiction</td>
<td>Does Black English Stand Between Black Students and Success in Science?</td>
</tr>
<tr>
<td>203 Convention Center</td>
<td>A Multi-District Movement Toward NGSS: The Northwest LASER Alliance</td>
<td>Building Equity in the Elementary Classroom Through NGSS Implementation with Principal–Teacher Teams</td>
<td>Cross-Curricular Learning with a Science and Integrated STEM Focus: Optimizing Student Learning and Maximizing Efficiency of Instruction While Embracing All Aspects of STEM</td>
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<tr>
<td>204 Convention Center</td>
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<td>Spark Students’ Curiosity with Chemistry!</td>
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<tr>
<td>205 Convention Center</td>
<td>Measuring Sea Level from Space</td>
<td>OpenSciEd: Curricula for Exemplary Middle School Science Teaching and Learning</td>
<td>Tackling Structural Inequities Through Student-Centered Science</td>
</tr>
<tr>
<td>211 Convention Center</td>
<td>Innovate Your Classroom with Authentic Learning Experiences</td>
<td></td>
<td>Using National Science Olympiad STEM Classroom Materials to Address NGSS Crosscutting Concepts and Content</td>
</tr>
<tr>
<td>212 Convention Center</td>
<td></td>
<td>Designing to Understand: Design-Based Biotechnical Learning</td>
<td>Designing a STEAM Curriculum for Girls: Six Years of Iteration at Lake Washington Girls Middle School</td>
</tr>
<tr>
<td>213 Convention Center</td>
<td></td>
<td>NGSS Through Instructional Unit Adaptation</td>
<td>The Joy of Discovery: How Anchor Phenomenon Sparks Engagement in Science Learning</td>
</tr>
</tbody>
</table>

Earth & Space Science  Engineering & Tech  Life Science  Physical Science  Informal Science  General Science
## Complete Session Details on App

### Thursday At-A-Glance

<table>
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<tr>
<th>LOCATION</th>
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<th>3:30–4:30 PM</th>
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<tbody>
<tr>
<td>214 Convention Center</td>
<td>Using NSTA as Your Online Textbook—for Professors!</td>
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<tr>
<td>3A Convention Center</td>
<td>Innovative Life Science Activities for Preservice and Inservice Elementary Teachers</td>
<td></td>
<td>STEM-ify Your Middle School Science Classroom</td>
</tr>
<tr>
<td>3B Convention Center</td>
<td>STEM-Selected Tradebooks Enrich Minds</td>
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<tr>
<td>303 Convention Center</td>
<td>Constructing Research Vessels and Supporting Ocean Science Education</td>
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<td>Stacking Vocabulary Strategies</td>
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<tr>
<td>304 Convention Center</td>
<td>ASTE-Sponsored Session: Using a STEM Observation Protocol to Improve Your Instruction</td>
<td>CSSS-Sponsored Session: Science Investigations at the Center of Student Learning</td>
<td>NSELA-Sponsored Session: Design Principles for Successful STEM Education</td>
</tr>
<tr>
<td>307/308 Convention Center</td>
<td>Teaching Scientific Discoveries Using Library of Congress Primary Sources</td>
<td>Moving from Anchoring Event to Equity</td>
<td>Projects for Environmental Action</td>
</tr>
<tr>
<td>309 Convention Center</td>
<td>Modeling as a Tool to Drive Responsive Instruction That Promotes Deeper Learning</td>
<td>Building an Amazing Summer School Program: The Harrowing, Real-Life Experience of Three Science Teachers Using Place-Based Education</td>
<td>Increasing Student Understanding by Integrating Video Lectures into Your Science Course Incorporating Video Lab Conclusions into Student Digital Lab Reports</td>
</tr>
<tr>
<td>310 Convention Center</td>
<td>Modeling Cardiac Physiology</td>
<td>Breathing Easier: A Place-Based Curriculum to Engage Young Students in Discussion and Action Around Environmental Justice</td>
<td>Star Dust in the Classroom (3:30–4:00 PM)</td>
</tr>
<tr>
<td>401 Convention Center</td>
<td>Exhibitor Workshop Are You Moody? (Sponsor: Texas Instruments)</td>
<td>Exhibitor Workshop Make Tools in Schools and Craft Stick Bending Program (Sponsor: Sequim Community MakerSpace)</td>
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<tr>
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<tr>
<td>4C-3 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Pearson AP Science, Mastering Basics (Sponsor: Pearson)</td>
<td><strong>Exhibitor Workshop</strong> Pearson AP Science, Mastering Advanced Practices (Sponsor: Pearson)</td>
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</tr>
<tr>
<td>4C-4 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Increasing the Sophistication of Student Thinking: Need for K–5 Learning Progressions (Sponsor: Carolina Biological Supply Co.)</td>
<td><strong>Exhibitor Workshop</strong> Next Generation Dissection (Sponsor: Carolina Biological Supply Co.)</td>
<td><strong>Exhibitor Workshop</strong> Phenomenal Classroom Critters (Sponsor: Carolina Biological Supply Co.)</td>
</tr>
<tr>
<td>603 Convention Center</td>
<td>Making Science Learning Lifelong, Life-wide, and Life-deep: Incorporating Out-of-School (Informal) STEM Learning Experiences in the Classroom</td>
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<tr>
<td>604 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Experience a Critical Global Resource: The Amazon Rain Forest! (Sponsor: EcoTeach)</td>
<td><strong>Exhibitor Workshop</strong> Like a Cardiologist (Sponsor: KIMSeattle (Kids in Medicine &amp; Science, Seattle))</td>
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<tr>
<td>605/610 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Learn to Infuse NGSS Science and Engineering Practices with an Engaging Activity (Sponsor: Bio-Rad Laboratories)</td>
<td><strong>Exhibitor Workshop</strong> Think Like an Engineer in Your Biology Class (Sponsor: Bio-Rad Laboratories)</td>
<td></td>
</tr>
<tr>
<td>606 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Snails, Robots, and Biomimicry: Phenomena and 3-D Instruction for Grades K–5 (Sponsor: Amplify)</td>
<td></td>
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</tr>
<tr>
<td>607 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Science for All Students—Access and Equity (Sponsor: Delta Education/School Specialty Science–FOSS)</td>
<td><strong>Exhibitor Workshop</strong> Tackling Engineering, Technology, and the Application of Science (MS-ETS) with FOSS Variables and Design (Sponsor: Delta Education/School Specialty Science–FOSS)</td>
<td></td>
</tr>
<tr>
<td>608 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Systems Thinking Applied to Planet Earth’s Greatest Challenges (Sponsor: Activate Learning)</td>
<td><strong>Exhibitor Workshop</strong> IQWST: Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning (Sponsor: Activate Learning)</td>
<td><strong>Exhibitor Workshop</strong> Active Physics: Project-Based Learning for Content and Creativity (Sponsor: Activate Learning)</td>
</tr>
<tr>
<td>609 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Student Engineering in Photovoltaics (Sponsor: CE, Clean Energy Bright Futures)</td>
<td><strong>Exhibitor Workshop</strong> Create Immersive, NGSS-Focused Science Experiences with PocketLab (Sponsor: PocketLab)</td>
<td></td>
</tr>
<tr>
<td>LOCATION</td>
<td>12:30–1:30 PM</td>
<td>2:00–3:00 PM</td>
<td>3:30–4:30 PM</td>
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</tbody>
</table>
| 611 Convention Center | Exhibitor Workshop  Get a Move On! Modeling Molecular Transport Across the Cell Membrane  
          (Sponsor: MSOE Center for BioMolecular Modeling) | Exhibitor Workshop  Connecting CRISPR Biotechnology to What You Already Teach  
          (Sponsor: MSOE Center for BioMolecular Modeling) | Exhibitor Workshop  NGSS—Weather and Climate: Atmosphere, Climate, and Global Warming  
          (Sponsor: Lab-Aids, Inc.) |
| 612 Convention Center | Exhibitor Workshop  NGSS—Ecology: Introduction of a New Species  
          (Sponsor: Lab-Aids, Inc.) | Exhibitor Workshop  NGSS—Energy: Are These Bulbs Heating Up Our Energy Bill?  
          (Sponsor: Lab-Aids, Inc.) | Exhibitor Workshop  Sweet Science: Exploring Complex Mixtures with Biotechnology  
          (Sponsor: Edvotek, Inc.) |
| 613/614 Convention Center | Exhibitor Workshop  Exploring STEAM with Transformation  
          (Sponsor: Edvotek, Inc.) | Exhibitor Workshop  Cancer Investigators: Medical Diagnostics in Your Classroom  
          (Sponsor: Edvotek, Inc.) |  |
| 618 Convention Center | Middle School Students Investigating and Promoting Coexistence with Urban Carnivores  
          (12:30–1:00 PM) | Storm Drain Detectives: A Community Partnership | Systems Thinking for Outdoor School |
| 619 Convention Center | Creating Community Connections: Enhancing Student Learning Through Local Partnerships | Lessons from and for Makerspaces | Early Exposure: Promoting STEM Education Opportunities Among Underrepresented Students at the Elementary Level  
          (3:30–4:00 PM) |
| 620 Convention Center | NSTA Press Session: Uncovering Students’ (and Teachers’) Ideas About Engineering and Technology | Defining Life: Teaching Biology from a New Perspective | Win the Grant Writing Game: Grant Writing Strategies for You and Your Chemistry Students |
| Ballroom 6A Convention Center | Featured Presentation  Teaching and Learning for Creativity Throughout the Life Span  
          Speaker: Jonathan Plucker (FINDING JOY strand) |  | Harry Potter Episodes as Stimulators for Motivation, Creative Thinking, and Science Concept Development |

Earth & Space Science | Engineering & Tech | Life Science | Physical Science | Informal Science | General Science
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>8:00–9:00 AM</th>
<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen Sheraton</td>
<td>Innovative and Integrated: STEM Activities from Chinese Classrooms</td>
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<tr>
<td>Cedar Sheraton</td>
<td>NESTA Session: Social Media Can Be Used as a Tool in the Classroom for Learning? Get Outta Here!</td>
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<tr>
<td>Willow Sheraton</td>
<td>Taking on Big Science Challenges Across Districts: How a District Science Network Can Build Capacity and Advance Equity</td>
<td></td>
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<tr>
<td>Grand Ballroom A Sheraton</td>
<td>Climate Science Education: Empowering Teachers Through Adult-Learning Experiences Forest School: An NGSS Partnership (PARTNERSHIPS strand)</td>
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<tr>
<td>Grand Ballroom B Sheraton</td>
<td>Powering Student Success Through STEM Awareness and Exploration: Blending Career Connected Learning with Science Learning (STEM strand)</td>
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<tr>
<td>Grand Ballroom D Sheraton</td>
<td>“Where Do I Fit In?” Engaging Students’ Identities in Equitable Life Science Curriculum (FINDING JOY strand)</td>
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<tr>
<td>Ballard Sheraton</td>
<td>Blending the E and the S in STEM (SC-2) By Ticket Only; $20 8:00–11:00 AM (STEM strand)</td>
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<tr>
<td>Issaquah Sheraton</td>
<td>Building Bonds with STEM Industry</td>
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<tr>
<td>Metropolitan B Sheraton</td>
<td>Wild Worms: High School Students Collaborate with a University Lab on a Real Research Project</td>
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<tr>
<td>LOCATION</td>
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<tr>
<td>Aspen Sheraton</td>
<td>NGSS@NSTA Forum Session: <em>The NSTA Atlas of the Three Dimensions</em></td>
<td>NSTA-WIDA Session: Equitable 3-D Science Education for Multilingual Learners: New Resources from the NSTA-WIDA Affiliation</td>
<td></td>
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<tr>
<td>Redwood Sheraton</td>
<td>NMLSTA-Sponsored Session: Whirligigs: Watching, Wondering, Working Together—Wow!</td>
<td></td>
<td>Invisible Forest: Use STEAM to Explore the Final Frontier</td>
</tr>
<tr>
<td>Willow Sheraton</td>
<td>NESTA Session: Addressing the NGSS Through Topographic Maps and Profiles</td>
<td>NGSS@NSTA Forum Session: Designing and Using Equitable Three-Dimensional Formative Assessments to Support Meaningful NGSS Investigations</td>
<td></td>
</tr>
<tr>
<td>Grand Ballroom A Sheraton</td>
<td>Building Classroom Climate Change Connections: How to Develop and Lead a STEM Seminar for Teacher Professional Development (PARTNERSHIPS strand)</td>
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<tr>
<td>Grand Ballroom B Sheraton</td>
<td>Building Our Nation’s Future Cybersecurity Professionals (STEM strand)</td>
<td>Using DNA Technology to Exonerate the Innocent (STEM strand)</td>
<td>Everyday Engineers: Supporting NGSS and Engineering Learning Through Everyday Knowledge Makerspace in the K–S Classroom (STEM strand)</td>
</tr>
<tr>
<td>Ballard Sheraton</td>
<td>Taste Buds in Your Gut? Exploring Taste, Sweeteners, and Glucose Homeostasis</td>
<td>Equilibrium: The Key to Student Success</td>
<td>Building a Periodic Table Unit Plan Using American Association of Chemistry Teachers (AACT) Resources</td>
</tr>
<tr>
<td>Issaquah Sheraton</td>
<td>Using Pop Culture and Polymers to Create Inquisitive Minds</td>
<td></td>
<td>Using Modeling in Chemistry to Reach All Learners</td>
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**Earth & Space Science**  **Engineering & Tech**  **Life Science**  **Physical Science**  **Informal Science**  **General Science**
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<tbody>
<tr>
<td>Metropolitan B Sheraton</td>
<td>NGSS Practices: Developing and Using Models to Teach Science</td>
<td>Connecting Natural Selection and Speciation</td>
<td>Cars: A Fundamental Look at How They Work and the Science Involved</td>
</tr>
<tr>
<td>Jefferson Sheraton</td>
<td>Love Acronyms? Then RSVP to This Session ASAP!</td>
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<tbody>
<tr>
<td>2A Convention Center</td>
<td>From Harmony to Humpbacks</td>
<td>Building Literacies: From STEM Books to the Beautiful Outdoors</td>
<td>Getting Students to Talk More (Productively)</td>
</tr>
<tr>
<td>2B Convention Center</td>
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<td>School Energy Experts</td>
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<tr>
<td>201 Convention Center</td>
<td>Phenomenon-Based Learning Using Digitized Museum Objects</td>
<td>Underwater Remotely Operated Vehicle Engineering</td>
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<tr>
<td>204 Convention Center</td>
<td>Engineerize It!</td>
<td></td>
<td>Using Lab Notebooks in the Preschool and Elementary Classroom</td>
</tr>
<tr>
<td>211 Convention Center</td>
<td></td>
<td>Setting the Table to Support Three-Dimensional Professional Learning</td>
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<tr>
<td>212 Convention Center</td>
<td>Three-Dimensional High School Science OER Course Project</td>
<td>Making Redox Corrosion Chemistry Practical, Relevant, Engaging, and Fun!</td>
<td>Student Science Project Competitions, Part 1: Practicing Professional Research and Development</td>
</tr>
<tr>
<td>213 Convention Center</td>
<td>Making Lives Better Through a Prosthetic Hand Engineering Challenge</td>
<td>NSTA’s Online Resources and Communities</td>
<td>Focusing on Microscopy to Magnify Student Learning</td>
</tr>
<tr>
<td>214 Convention Center</td>
<td>NSTA/ASTE Present 2020 Standards for Science Teacher Preparation</td>
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<tbody>
<tr>
<td>3A Convention Center</td>
<td>ACS Middle Level Session: Particles of a Liquid and Changes of State</td>
<td>ACS Middle Level Session: The Water Molecule and Dissolving</td>
<td>ACS Middle Level Session: Chemical Reactions—Breaking and Making Bonds</td>
</tr>
<tr>
<td>304 Convention Center</td>
<td>A Community Partnership That Fosters Authentic Learning Experiences</td>
<td>Making Waves: Seismic Waves Activities and Demonstrations</td>
<td>A Teacher’s Toolbox for Lab Safety</td>
</tr>
<tr>
<td>307/308 Convention Center</td>
<td></td>
<td>Using Natural Objects for Inquiry in the Classroom</td>
<td>What Works, What Lasts, and Why</td>
</tr>
<tr>
<td>310 Convention Center</td>
<td>Order Up a Helping of Forensics, with a Side of Maggots!</td>
<td>The Good, The Bad of Corrosion: Why We Need to Study It</td>
<td>Ivory Cache: Using DNA Technology for Conservation Biology</td>
</tr>
<tr>
<td>Exhibit Hall 4A Convention Center</td>
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<tr>
<td>401 Convention Center</td>
<td>Exhibitor Workshop Make Tools in Schools and Craft Stick Bending Program (Sponsor: Sequim Community MakerSpace)</td>
<td>Exhibitor Workshop Teach STEM Subjects in England! (Sponsor: Quantum Scholars)</td>
<td>Exhibitor Workshop STEMulating the Heart with Code! (Sponsor: Texas Instruments)</td>
</tr>
<tr>
<td>4C-1 Convention Center</td>
<td>Exhibitor Workshop Who Is Baby Whale’s Father? DNA Fingerprinting Solves the Mystery! (Sponsor: MiniOne Systems)</td>
<td>Exhibitor Workshop Influenza Outbreak Investigation: Using Molecular Methods and Bioinformatics to Understand Diagnostics and Epidemiology (Sponsor: MiniOne Systems)</td>
<td>Exhibitor Workshop To Taste or Not to Taste! PTC Genotype Determination by Electrophoresis (Sponsor: MiniOne Systems)</td>
</tr>
</tbody>
</table>

**NSTA Exhibits!**

9:00 AM–4:00 PM
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>8:00–9:00 AM</th>
<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
</tr>
</thead>
</table>
| 4C-2 Convention Center | **Exhibitor Workshop** Flinn Favorite Biology Activities and Games  
(Sponsor: Flinn Scientific, Inc.) | **Exhibitor Workshop** Engaging Students in Citizen Science Through WildCam Gorongosa  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop** Awesome STEM Activities!  
(Sponsor: Flinn Scientific, Inc.) |
| 4C-3 Convention Center | **Exhibitor Workshop** Telling Engaging Stories with HHMI BioInteractive's Storyline Tools  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop** Exploring Trophic Cascades: Some Species Are More Equal than Others  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop** Talking Allowed! Using Science Discourse for Equity in Grades 6–8  
(Sponsor: Carolina Biological Supply Co.) |
| 4C-4 Convention Center | **Exhibitor Workshop** Engineer Physical Science Excitement with a Carolina STEM Challenge®  
(Sponsor: Carolina Biological Supply Co.) | **Exhibitor Workshop** Introduction to Wisconsin Fast Plants®  
(Sponsor: Carolina Biological Supply Co.) | **Exhibitor Workshop** The Opioid Epidemic: Exploring the Genetic Associations of Opioid Abuse  
(Sponsor: Bio-Rad Laboratories) |
| 604 Convention Center | **Exhibitor Workshop** Introducing the Nervous System with Models  
(Sponsor: Dana Foundation) | **Exhibitor Workshop** Are Increased Incidences of Infection the Result of Climate Change?  
(Sponsor: Bio-Rad Laboratories) | **Exhibitor Workshop** Embedded and Immersive Engineering  
(Sponsor: Amplify) |
| 605/610 Convention Center | **Exhibitor Workshop** Investigate Photosynthesis and Cellular Respiration with Algae Beads for Gen Bio  
(Sponsor: Bio-Rad Laboratories) | **Exhibitor Workshop** Let’s DIVE-in to Engineering and the Engineering Design Process  
(Sponsor: STEMscopes) | **Exhibitor Workshop** Using Argumentation to Discuss Phenomena  
(Sponsor: STEMscopes) |
| 606 Convention Center | **Exhibitor Workshop** How to Use Phenomena to Make Gains in Inquiry  
(Sponsor: STEMscopes) | **Exhibitor Workshop** Access and Rigor: Three-Dimensional Science for English Language Learners  
(Sponsor: Amplify) | **Exhibitor Workshop** STEM Challenge: Keeping Students Engaged with Problem Solving  
(Sponsor: AEOP) |
| 607 Convention Center | **Exhibitor Workshop** Photosynthesis and Respiration: Light and Dark Reactions Quantified with Technology  
(Sponsor: PASCO) | **Exhibitor Workshop** Investigating Enzyme Activity: Finding the Optimal Conditions  
(Sponsor: PASCO) | **Exhibitor Workshop** Speed and Velocity: Lessons with Motion Graphs  
(Sponsor: PASCO) |
| 608 Convention Center | **Exhibitor Workshop** STEM Challenge: Keeping Students Engaged with Problem Solving  
(Sponsor: AEOP) | **Exhibitor Workshop** Earth Science for the Modern, Interactive Classroom  
(Sponsor: Simulation Curriculum Corp.) | **Exhibitor Workshop** STEM Using Alternative Energy  
(Sponsor: Houghton Mifflin Harcourt) |
| 609 Convention Center | **Exhibitor Workshop** Flinn Favorite Biology Activities and Games  
(Sponsor: Flinn Scientific, Inc.) | **Exhibitor Workshop** Exploring Trophic Cascades: Some Species Are More Equal than Others  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop** Talking Allowed! Using Science Discourse for Equity in Grades 6–8  
(Sponsor: Carolina Biological Supply Co.) |

Earth & Space Science | Engineering & Tech | Life Science | Physical Science | Informal Science | General Science
## Friday At-A-Glance

**Complete Session Details on App**

<table>
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<tr>
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<tbody>
<tr>
<td>611 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Genes in Space: Genetics on the International Space Station, Free Loaner Equipment, Curriculum, and More! (Sponsor: miniPCR bio)</td>
<td><strong>Exhibitor Workshop</strong> P51 Glow Labs: Investigate DNA and Other Macromolecules Through Fluorescence (Sponsor: miniPCR bio)</td>
<td><strong>Exhibitor Workshop</strong> Are You a Night Owl? A Morning Lark? The Answer May Be in Your Genes (Sponsor: miniPCR bio)</td>
</tr>
<tr>
<td>612 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> NGSS—Evolution: Embry-OH! (Sponsor: Lab-Aids, Inc.)</td>
<td><strong>Exhibitor Workshop</strong> NGSS—Chemical Reactions: Developing a Prototype (Sponsor: Lab-Aids, Inc.)</td>
<td><strong>Exhibitor Workshop</strong> NGSS—Land, Water, and Human Interactions: Cutting Canyons and Building Deltas (Sponsor: Lab-Aids, Inc.)</td>
</tr>
<tr>
<td>613/614 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Quick and Easy Experiments Using the Latest Technology (Sponsor: Vernier Software &amp; Technology)</td>
<td><strong>Exhibitor Workshop</strong> Common Biology Experiments Using the Latest Technology (Sponsor: Vernier Software &amp; Technology)</td>
<td><strong>Exhibitor Workshop</strong> Common Middle School Experiments Using the Latest Technology (Sponsor: Vernier Software &amp; Technology)</td>
</tr>
<tr>
<td>615–617 Convention Center</td>
<td>NSTA Press Session: Next Time You See a Bee</td>
<td>NSTA Press Session: Developing and Using 3-D Formative Assessment Probes</td>
<td>NSTA Press Session: Solar Science Provides Three-Dimensional Learning Experiences About the Sun, Earth, and Moon</td>
</tr>
<tr>
<td>618 Convention Center</td>
<td>Engineering Design in the Middle School Classroom</td>
<td></td>
<td>STEAM Collaboration: Offering Equitable, Community-Centered Science Learning for Students (11:30 AM–12 Noon)</td>
</tr>
<tr>
<td>619 Convention Center</td>
<td>Coast Connections: Environmental Literacy Through Strong Partnerships</td>
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<td>What Elementary and Middle School Teachers Can Learn from Engineers</td>
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<tr>
<td>Ballroom 6B Convention Center</td>
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<tr>
<th>LOCATION</th>
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<tbody>
<tr>
<td>2A Convention Center</td>
<td>12:30–1:30 PM</td>
<td>Let's Get Wet—Wind, Water, and Weather for Grades PreK–3</td>
</tr>
<tr>
<td>2B Convention Center</td>
<td>2:00–3:00 PM</td>
<td>Giving Students the Power</td>
</tr>
<tr>
<td>201 Convention Center</td>
<td>3:30–4:30 PM</td>
<td>Teaching Soils Is Fun and Educational</td>
</tr>
<tr>
<td>203 Convention Center</td>
<td>12:30–1:30 PM</td>
<td>STEM, Equity, and Leadership</td>
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<tr>
<td>204 Convention Center</td>
<td>2:00–3:00 PM</td>
<td>Mastering Models in Elementary Science</td>
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<tr>
<td>204 Convention Center</td>
<td>3:30–4:30 PM</td>
<td>Electrical Circuits with Bristlebots</td>
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<tr>
<td>212 Convention Center</td>
<td>12:30–1:30 PM</td>
<td>Phenomenon: What, Where, When, Why?</td>
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<tr>
<td>212 Convention Center</td>
<td>2:00–3:00 PM</td>
<td>Coral Reefs, Fragile Wonders Under Threat: Bring Vibrant Environmental</td>
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<tr>
<td>212 Convention Center</td>
<td>3:30–4:30 PM</td>
<td>Stewardship Lessons to Your Students with Free NOAA Resources</td>
</tr>
<tr>
<td>213 Convention Center</td>
<td>12:30–1:30 PM</td>
<td>Building STEM PBL with Research Experiences for Teachers and Students</td>
</tr>
<tr>
<td>213 Convention Center</td>
<td>2:00–3:00 PM</td>
<td>Motivating Shifts in Teaching Practice Through Development and Use of Unit</td>
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<tr>
<td>213 Convention Center</td>
<td>3:30–4:30 PM</td>
<td>Storylines Anchored in Phenomena</td>
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<tr>
<td>214 Convention Center</td>
<td>12:30–1:30 PM</td>
<td>Partnering with NSTA to Personalize Professional Learning for Your School</td>
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<tr>
<td>214 Convention Center</td>
<td>2:00–3:00 PM</td>
<td>or District</td>
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<tr>
<td>214 Convention Center</td>
<td>3:30–4:30 PM</td>
<td>Building Equity in Formative Assessment: Making Sense of Student Responses</td>
</tr>
<tr>
<td>3A Convention Center</td>
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<td>ACS Middle Level Session: Chemical Reactions—Ocean Acidification</td>
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<tr>
<td>3B Convention Center</td>
<td>ASEE Session: ASEE's K–12 Outreach—Engineering Go For It (eGFI), TeachEngineering, Link Engineering, and the National Science Digital Library</td>
<td>NSTA Press Session: Argument-Driven Inquiry in the Life, Physical, and Earth-Space Sciences: Lab Investigations for Grades 6–8</td>
</tr>
<tr>
<td>303 Convention Center</td>
<td>ACS High School Session Four: Relating Structure and Properties: Demonstrating Understanding of Bond Strength and Interparticle Attractions</td>
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<tr>
<td>304 Convention Center</td>
<td>Polymers: Basics for the Science Classroom</td>
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<tr>
<td>307/308 Convention Center</td>
<td>Engineering Matters: Reaching Underrepresented Populations in STEM</td>
<td>Science in Your Schoolyard: Using Local Phenomena and Schoolyard Investigations to Engage Students</td>
</tr>
<tr>
<td>310 Convention Center</td>
<td>Game On!</td>
<td>Neuroscience + Engineering + Technology: Neural Engineering for Secondary STEM Classrooms</td>
</tr>
<tr>
<td>Exhibit Hall Entrance Convention Center</td>
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<tr>
<td>401 Convention Center</td>
<td>Exhibitor Workshop Zombie Apocalypse! (Sponsor: Texas Instruments)</td>
<td>Exhibitor Workshop Harnessing the Wind: Energy Transfer and Transformation (Sponsor: Great Minds)</td>
</tr>
<tr>
<td>4C-1 Convention Center</td>
<td>Exhibitor Workshop DNA Forensics Solves the Murder Mystery of Dr. Ward (Sponsor: MiniOne Systems)</td>
<td>Exhibitor Workshop DNA Tracking for Elephant Conservation (Sponsor: MiniOne Systems)</td>
</tr>
<tr>
<td>4C-2 Convention Center</td>
<td></td>
<td>Exhibitor Workshop Science Poetry! Using Performance Literature to Put the “A” in STEAM Across the Curriculum (Sponsor: Southern Science Supply)</td>
</tr>
<tr>
<td>Special Session</td>
<td>Meet the Presidents and Board/Council (2:45–3:30 PM)</td>
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<tr>
<td>4C-3 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> From Gene to Protein—Explore Genetic Medicine with BioInteractive (Sponsor: HHMI BioInteractive)</td>
<td><strong>Exhibitor Workshop</strong> Bringing Lessons to Life with HHMI BioInteractive’s Phenomenal Images (Sponsor: HHMI BioInteractive)</td>
<td><strong>Exhibitor Workshop</strong> Improve Math Literacy Using Data Points from HHMI BioInteractive (Sponsor: HHMI BioInteractive)</td>
</tr>
<tr>
<td>4C-4 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Hands-On Activities to Model Sampling, Habitat Degradation, and Animal Choice (Sponsor: Carolina Biological Supply Co.)</td>
<td><strong>Exhibitor Workshop</strong> Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs (Sponsor: Carolina Biological Supply Co.)</td>
<td></td>
</tr>
<tr>
<td>604 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Blast Off with TCI Engineering Design for Middle School (Sponsor: TCI)</td>
<td><strong>Exhibitor Workshop</strong> Ride the Wave with Bring Science Alive! (Sponsor: TCI)</td>
<td></td>
</tr>
<tr>
<td>605/610 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Light Waves and Skin Cancer: Phenomena and 3-D Instruction for Grades 6–8 (Sponsor: Amplify)</td>
<td><strong>Exhibitor Workshop</strong> It’s in Their DNA! Teach Personalized Medicine with Students’ Own DNA (Sponsor: Bio-Rad Laboratories)</td>
<td><strong>Exhibitor Workshop</strong> Mushroom Ecology and Why It Matters for Biofuel Production (Sponsor: Bio-Rad Laboratories)</td>
</tr>
<tr>
<td>606 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Let’s Improve Student Achievement Through STEM Teacher Actions and STEM Certification (Sponsor: National Institute for STEM Education)</td>
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<tr>
<td>607 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Crash Barrier: How to Design a STEM Engineering Challenge (Sponsor: PASCO)</td>
<td><strong>Exhibitor Workshop</strong> Stoichiometry Made Easy: A Mole Story (Sponsor: PASCO)</td>
<td><strong>Exhibitor Workshop</strong> Easy Titration: Breaking the Equivalence Curve (Sponsor: PASCO)</td>
</tr>
<tr>
<td>608 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Phenomenal Phenomena (Sponsor: Houghton Mifflin Harcourt)</td>
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<tr>
<td>609 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> NGSS Laboratories (Sponsor: Houghton Mifflin Harcourt)</td>
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<tr>
<td>611 Convention Center</td>
<td><strong>Exhibitor Workshop</strong> Attract Students to Water Concepts with Magnetic Water Molecule Models (Sponsor: 3D Molecular Designs)</td>
<td><strong>Exhibitor Workshop</strong> “Going with the Flow” of Genetic Information (Sponsor: MSOE Center for BioMolecular Modeling)</td>
<td><strong>Exhibitor Workshop</strong> Touch a Nerve with Hands-On Modeling of Neuronal Communication (Sponsor: 3D Molecular Designs)</td>
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</tbody>
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Earth & Space Science  Engineering & Tech  Life Science  Physical Science  Informal Science  General Science
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>12:30–1:30 PM</th>
<th>2:00–3:00 PM</th>
<th>3:30–4:30 PM</th>
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</thead>
</table>
| **612 Convention Center** | Exhibitor Workshop  
What Is a Species?  
(Sponsor: Lab-Aids, Inc.)                                                      | Exhibitor Workshop  
Cell Differentiation  
and Gene Expression  
(Sponsor: Lab-Aids, Inc.)                                                      | Exhibitor Workshop  
Photosynthesis and  
Respiration Shuffle  
(Sponsor: Lab-Aids, Inc.)                                                      |
| **613/614 Convention Center** | Exhibitor Workshop  
Common Physics Experiments Using the Latest Technology  
(Sponsor: Vernier Software & Technology)                                   | Exhibitor Workshop  
Robots, Coding, and Science:  
A Complete STEM Experience  
(Sponsor: Vernier Software & Technology)                                     | Exhibitor Workshop  
Common Chemistry Experiments Using the Latest Technology  
(Sponsor: Vernier Software & Technology)                                     |
| **615–617 Convention Center** |                                                                                 | NSTA Press Session: Eureka!  
K–2 and Grades 3–5 Science Activities and Stories                              |                                                                                |
| **618 Convention Center** | Love Where You Science: A Context for Place-Based Experiential Learning       | Developing Evaluation Criteria to Ensure Equitable Outcomes for Instructional Materials  
---  
Constructing Coherent Conceptual Storylines                                     |                                                                                |
| **619 Convention Center** | Cultural Formative Assessment: Designing Equitable Formative Assessments to Build on Learners’ Interests and Knowledge |                                                                                |                                                                                |
| **Ballroom 6A Convention Center** | Featured Presentation  
Inside—Outside: The Diverse World of Learning  
Speaker: Chris Reykdal  
(PARTNERSHIPS strand)                                                            | CESI-Sponsored Session:  
Mysteries as Motivators: Storylines, Discrepant Events,  
and Imagineering Make Science Wonderful                                       |                                                                                |
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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Aspen Sheraton</td>
<td>Gene to Protein: Helping Students Connect DNA to Protein Structure and Function</td>
<td></td>
<td>Making Physics Fun for Everyone</td>
</tr>
<tr>
<td>Cedar Sheraton</td>
<td>Authentic Integration of the Four Components of STEM</td>
<td>NESTA Session: Integrating Climate Change Across the High School Curriculum</td>
<td>NESTA-WIDA Session: Seamless Integration of 3-D Science and Language Using Phenomena to Drive Instruction and Facilitate Science Discourse</td>
</tr>
<tr>
<td>Redwood Sheraton</td>
<td>NGSS Practices: Engaging in Argument from Evidence</td>
<td>Become a National Geographic Certified Educator</td>
<td>Science Practices: Effective, Fun, and Relevant</td>
</tr>
<tr>
<td>Grand Ballroom A</td>
<td></td>
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<tr>
<td>Grand Ballroom B</td>
<td>Innovate and Impact: Design Thinking Across Disciplines in the Elementary Classroom (STEM strand)</td>
<td>Using Student Voice to Increase STEM Aspirations (STEM strand)</td>
<td>Engaging Grades 3–8 Students with Structural Shapes and Other Rich Hands-On STEM Experiences to Advance Learning for All Students (STEM strand)</td>
</tr>
<tr>
<td>Grand Ballroom D</td>
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<tr>
<td>Ballard Sheraton</td>
<td>Engineering Design to Study Physics</td>
<td>Catalyzing a Systems Approach to Studying Scientific Wellness, Disease, and Health Careers</td>
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<tr>
<td>Issaquah Sheraton</td>
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Earth & Space Science  Engineering & Tech  Life Science  Physical Science  Informal Science  General Science
## Friday At-A-Glance

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<th>11:00 AM–12 Noon</th>
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</thead>
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<tr>
<td>Metropolitan A Sheraton</td>
<td>Increasing Student Engagement Through “Aha!” Moments: Supporting the NGSS with Process Oriented Guided Inquiry Learning (POGIL) (SC-4) By Ticket Only: $60 9:00 AM–3:00 PM (FINDING JOY strand)</td>
<td>STEM, Creativity, and Innovation—Proven Pathway to a Well-Rounded Education</td>
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<tr>
<td>Jefferson Sheraton</td>
<td>Equitable Groupwork: Designing True Group Tasks</td>
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<tr>
<td>Capitol Hill Sheraton</td>
<td>Building Bridges Between Biology and Health Through Type 2 Diabetes Education (SC-3) By Ticket Only: $20 8:00–11:00 AM (PARTNERSHIPS strand)</td>
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**Categories:** Earth & Space Science, Engineering & Tech, Life Science, Physical Science, Informal Science, General Science
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<tr>
<th>LOCATION</th>
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<tbody>
<tr>
<td>Cedar Sheraton</td>
<td>NARST-Sponsored Session: A Macro- and Micro-Analysis of Teacher-Developed Integrated STEM Curriculum</td>
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<tr>
<td>Grand Ballroom A Sheraton</td>
<td>Partners in Science Program Sponsored by M.J. Murdock Charitable Trust Traveling Science Teacher: Opportunities Are at Your Fingertips (PARTNERSHIPS strand)</td>
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<tr>
<td>Grand Ballroom B Sheraton</td>
<td>From Microplastics to Ocean Acidification: Engaging with Environmental Issues to Meet NGSS (1:00–1:30 PM) (STEM strand)</td>
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<tr>
<td>Grand Ballroom D Sheraton</td>
<td>Before the Phenomena: An Interdisciplinary Foundation to Prepare Learners to Interact with Phenomena (FINDING JOY strand)</td>
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<tr>
<td>Ballard Sheraton</td>
<td>Data Collection, Analysis, and Reporting in a Digital Laboratory</td>
<td>Using Models to Teach High School Chemistry Topics</td>
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</tr>
<tr>
<td>Issaquah Sheraton</td>
<td>NSELA-Sponsored Session: Developing Leadership for the Next Generation</td>
<td>CSSS-Sponsored Session; ClimeTime in Washington State</td>
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<tr>
<td>Jefferson Sheraton</td>
<td>Exploring Genetics Through Genetic Disorders</td>
<td>Forensics: Science in the Real World</td>
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<tr>
<td>Metropolitan A Sheraton</td>
<td>WSTA Awards Reception Ticket Required 6:00–8:00 PM</td>
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</table>
Show your NSTA Conference badge on Thursday, Dec. 12, and Friday, Dec. 13, from 1:00 to 5:00 PM at the Burke Museum, 4300 15th Ave. NE, and receive complimentary admission (www.burkemuseum.org).
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<th>LOCATION</th>
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<tbody>
<tr>
<td>2A Convention Center</td>
<td>How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions</td>
<td>Practical Applications: Assessing Human and Environmental Hazards in the Lab and in the Home</td>
<td>Learning About Watersheds with NGSS and Models</td>
</tr>
<tr>
<td>2B Convention Center</td>
<td>PolyWhat? Application of STEM Using Polymers</td>
<td>Model Me This: 3D Modeling (and Printing!) in the Classroom</td>
<td>NGSS Practices: Analyzing and Interpreting Data to Construct Explanations</td>
</tr>
<tr>
<td>201 Convention Center</td>
<td>How Can We Produce Fog for a Spooky Scene? Engaging Students Through Authentic Science and Engineering Practices</td>
<td>Injecting Viruses into the Curriculum</td>
<td>Using STEM Activities to Enhance Literacy Engagement</td>
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<tr>
<td>202 Convention Center</td>
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<td>203 Convention Center</td>
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<tr>
<td>204 Convention Center</td>
<td>STEM-ify Your Classroom Supply List with Green Chemistry!</td>
<td>Science in the Early Childhood Classroom</td>
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<tr>
<td>205 Convention Center</td>
<td>Jazz Up Student Science and Engineering Practices with Birds</td>
<td>Building from Student Prior Knowledge to Make Science Accessible to All</td>
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<tr>
<td>211 Convention Center</td>
<td>A Unique Ice Core Investigation That Integrates the Three Dimensions of NGSS and STEM</td>
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<tr>
<td>212 Convention Center</td>
<td>Meteorology 101: Weather for Teachers</td>
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<tr>
<td>213 Convention Center</td>
<td>Professional Development Strategies for Building Local and Regional Capacity with NGSS</td>
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<td>Building Community Through Writing Science Curriculum</td>
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NSTA Seattle Area Conference on Science Education
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<tr>
<th>LOCATION</th>
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<tbody>
<tr>
<td>214 Convention Center</td>
<td>Astronomy and Aerospace Engineering</td>
<td>When Two Heads Are Better Than One: Effective Co-Teaching in the Secondary Science Classroom</td>
<td>Water Like Wine—Reflects the Region Where It’s Produced (11:30 AM–12 Noon)</td>
</tr>
<tr>
<td>3A Convention Center</td>
<td>Equity in STEM Careers and Classroom Experiences Fostering STEM Enthusiasm</td>
<td>Chemistry Can Be Fun with the ACS ChemClub Program</td>
<td>Melting Sea Stars Mystery: Investigating a Locally-Relevant Phenomenon Integrating Climate Science, Evolution, and Computational Inquiry</td>
</tr>
<tr>
<td>3B Convention Center</td>
<td>Leveraging Research Practice Partnerships to Support Effective and Ongoing Teacher Professional Development</td>
<td>Increasing Student Engagement by Incorporating Roles in Collaborative Team Learning</td>
<td>The “Ins” and “Outs” of a Squid Dissection with the Oregon Sea Grant Marine Education Program</td>
</tr>
<tr>
<td>303 Convention Center</td>
<td>To Bee or Not to Bee... Students Track Pollinators in Their School and Community as They Become Citizen Scientists</td>
<td>Learn to Build Drug Models You Can Teach Your Students to Build</td>
<td>University of Puget Sound Nature in the Classroom Program</td>
</tr>
<tr>
<td>304 Convention Center</td>
<td>Analyzing Hazards and Risks in High School Chemistry Labs</td>
<td>Scale, Proportion, Quantity: Stoichiometry Simplified via NGSS</td>
<td>Environmental Monitoring with Aerial Drones (11:30 AM–12 Noon)</td>
</tr>
<tr>
<td>305 Convention Center</td>
<td>Building Curricula Around Phenomenon (8:30–9:00 AM)</td>
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<tr>
<td>307/308 Convention Center</td>
<td>Coral Cores and Climate Change</td>
<td>Where Have All The Bees Gone? Supporting All Students Through Problem-Based Enhanced Language Learning (PBELL)</td>
<td>Science Communication for Middle School and High School Teachers</td>
</tr>
<tr>
<td>309 Convention Center</td>
<td>Student Voice Surveys: What Are They Trying to Tell Us? Science Teacher Leadership: Peer-to-Peer Collaboration for District-Wide Implementation of the NGSS Vision</td>
<td>Nesting an Honors Course in a High School Science Class The Substitute Dilemma</td>
<td>Two Deserts, One Sky: Connecting Students Half a World Apart by Teaching Each About Their Own Desert See the World as a Citizen Scientist</td>
</tr>
<tr>
<td>310 Convention Center</td>
<td>Let's Build a Fan Cart</td>
<td>Designing a Martian Habitat for Potatoes</td>
<td>Say What? Getting Students to Learn and Use Scientific Vocabulary Words</td>
</tr>
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<tbody>
<tr>
<td>Exhibit Hall 4A Convention Center</td>
<td><strong>NSTA Exhibits!</strong>&lt;br&gt;9:00 AM–12 Noon</td>
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<tr>
<td>401 Convention Center</td>
<td>Student Modeling of Isometric Structures in Organic and Biological Molecules</td>
<td>Will Computers Take Our Jobs? A Brief Workshop on Teaching Artificial Neural Networks in the Classroom</td>
<td>Vacationing the Solar System: Plausible?</td>
</tr>
<tr>
<td>4C-1 Convention Center</td>
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<td>Fostering Interdisciplinary Climate Change Activities</td>
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<tr>
<td>4C-2 Convention Center</td>
<td>Educating for a Green Economy (EGE): Connecting Students to Green Jobs in Washington State (STEM strand)</td>
<td>Revitalizing STEM Education Through Manufacturing Apprenticeships</td>
<td>Diverse Learners Tackle Plastic Pollution (FINDING JOY strand)</td>
</tr>
<tr>
<td>4C-3 Convention Center</td>
<td>Cancer Medicine Focus Connects Students to Real-Life STEM Applications of Biomaterials Technologies</td>
<td>Cancer Medicine Focus Connects Students to Real-Life STEM Applications of Cryopreservation (FINDING JOY strand)</td>
<td>NSTA Press Session: Never Stop Wondering</td>
</tr>
<tr>
<td>4C-4 Convention Center</td>
<td>DIG Field School: Paleontologists and Teachers Working and Learning Together (PARTNERSHIPS strand)</td>
<td>NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think! (PARTNERSHIPS strand)</td>
<td>Geo-Inquiry in the Science Classroom</td>
</tr>
<tr>
<td>604 Convention Center</td>
<td>Exhibitor Workshop Ramp It Up! Science and Engineering Practices in the NGSS (Sponsor: TCI)</td>
<td></td>
<td>Stormwater Stewards: Empowering Students Within Their Watershed (PARTNERSHIPS strand)</td>
</tr>
<tr>
<td>605/610 Convention Center</td>
<td>Assessing Three-Dimensional Learning By Separate Registration 8:00 AM–5:00 PM</td>
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<tr>
<td>609 Convention Center</td>
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<td>Exhibitor Workshop STEAM: Bringing Scientific Illustration to Life (Sponsor: Curio Interactive)</td>
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**Earth & Space Science**  **Engineering & Tech**  **Life Science**  **Physical Science**  **Informal Science**  **General Science**
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<td><strong>611 Convention Center</strong></td>
<td>Exhibitor Workshop A Microscopic to Molecular Perspective in Modeling Chromosomes <em>(Sponsor: MSOE Center for BioMolecular Modeling)</em></td>
<td>Exhibitor Workshop Using Water Models to Uncover Misconceptions in Chemistry <em>(3D Molecular Designs)</em></td>
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<tr>
<td><strong>612 Convention Center</strong></td>
<td>Exhibitor Workshop Using Climate Proxies to Learn About Earth’s Climate History <em>(Sponsor: Lab-Aids, Inc.)</em></td>
<td>Exhibitor Workshop Prospecting for Mineral Ore <em>(Sponsor: Lab-Aids, Inc.)</em></td>
<td>Exhibitor Workshop Calling All Carbons <em>(Sponsor: Lab-Aids, Inc.)</em></td>
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<tr>
<td><strong>Ballroom 6A Convention Center</strong></td>
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<td>WSTA General Membership Meeting <em>(9:00–10:30 AM)</em></td>
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Collaborate with Fellow Educators

Free Hands-on Workshops
Friday, December 13th, 2019

Join us for an interactive and collaborative workshop where you’ll learn about classroom-ready experiments through a variety of hands-on investigations with probeware.

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<td>Quick and Easy Experiments Using the Latest Technology</td>
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<td>9:30–10:30am</td>
<td>Common Biology Experiments Using the Latest Technology</td>
</tr>
<tr>
<td>11:00–12:00pm</td>
<td>Common Middle School Experiments Using the Latest Technology</td>
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<tr>
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<td>Common Physics Experiments Using the Latest Technology</td>
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<td>3:30–4:30pm</td>
<td>Common Chemistry Experiments Using the Latest Technology</td>
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NATIONAL CONFERENCE ON SCIENCE EDUCATION

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350+ EXHIBITORS WITH CUTTING-EDGE RESOURCES
AND MUCH MORE!

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2020 SCIENCE
EXPANDING THE VISION
BOSTON April 2–5 2020

NSTA is holding its 68th national conference next year

The theme is 20/20 Science: Expanding the Vision. Conference program strands include:

• The Long View: Building a Lifelong Passion for Science
• Learning Science in All Spaces and Places: Near and Far
• Thinking, Acting, and Communicating Like Scientists: A Focus on Disciplinary Literacy
• Aligning the Lenses: Authentic, Three-Dimensional Measurement of Student Learning

For more information, please visit www.nsta.org/boston #NSTA20