

NSTA AREA CONFERENCE ON SCIENCE EDUCATION

SEATTLE, WA

DECEMBER 12-14, 2019



Fostering a Culture for Science

[www.nsta.org/seattle](http://www.nsta.org/seattle)

#NSTA19



National  
Science  
Teaching  
Association



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

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AND CAREER-READY AMERICA

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**National  
Science  
Teaching  
Association**

Seattle, WA Area Conference  
**DECEMBER 12–14, 2019**



## **NSTA 2019 Area Conference on Science Education** *Fostering a Culture for Science* Seattle, Washington • December 12–14, 2019

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**Presenters, key information,  
and complete session descriptions  
on Conference App:**

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

### **National Science Teaching Association**

1840 Wilson Blvd.  
Arlington, VA 22201-3000  
703-243-7100  
E-mail: [conferences@nsta.org](mailto:conferences@nsta.org)  
[www.nsta.org](http://www.nsta.org)

### **NSTA Affiliates**

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

#### **Jeanne Chowning**

NSTA Director, District XVII,  
and Senior Director  
Fred Hutchinson Cancer Research  
Center  
Seattle, WA

#### **Jonathan Frostad**

Science Teacher and Specialist  
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Oak Harbor, WA

#### **Carmen Kardokus**

K–12 Science Specialist  
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### *Conference Advisory Board Liaison*

#### **David Crowther**

2017–2018 NSTA President and  
Director/Professor  
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Reno, NV

### *Strand Leader: Providing STEM Pathways for the Future*

#### **Kate Lindholm**

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### *Strand Leader: Building Partnerships for Effective Science Education*

#### **Midge Yergen**

Science Educator  
West Valley Junior High School  
Yakima, WA

### *Strand Leader: Finding Joy in Experiencing Science*

#### **Alfonso Garcia Arriola**

Science Educator  
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### *Guides Manager*

#### **Scott McComb**

Science Educator  
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### *Manager of Services for People with Special Needs*

#### **Dana Marsden**

Science Educator  
Mountlake Terrace High School  
Mountlake Terrace, WA

### *Volunteers Manager*

#### **Judy Shaw**

Field Supervisor  
University of Washington Tacoma  
Tacoma, WA

## President's Welcome: Making Science Learning Lifelong, Life-wide, and Life-deep



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



John P. McNamara



Bob Sotak



Lisa Chen

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

Emeritus Professor  
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Pullman, WA 99163  
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### Program Coordinator

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### Local Arrangements Coordinator

#### Lisa Chen

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# Registration, Travel, and Hotels

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## 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.

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## Online Session Evaluations and Tracking Professional Development

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

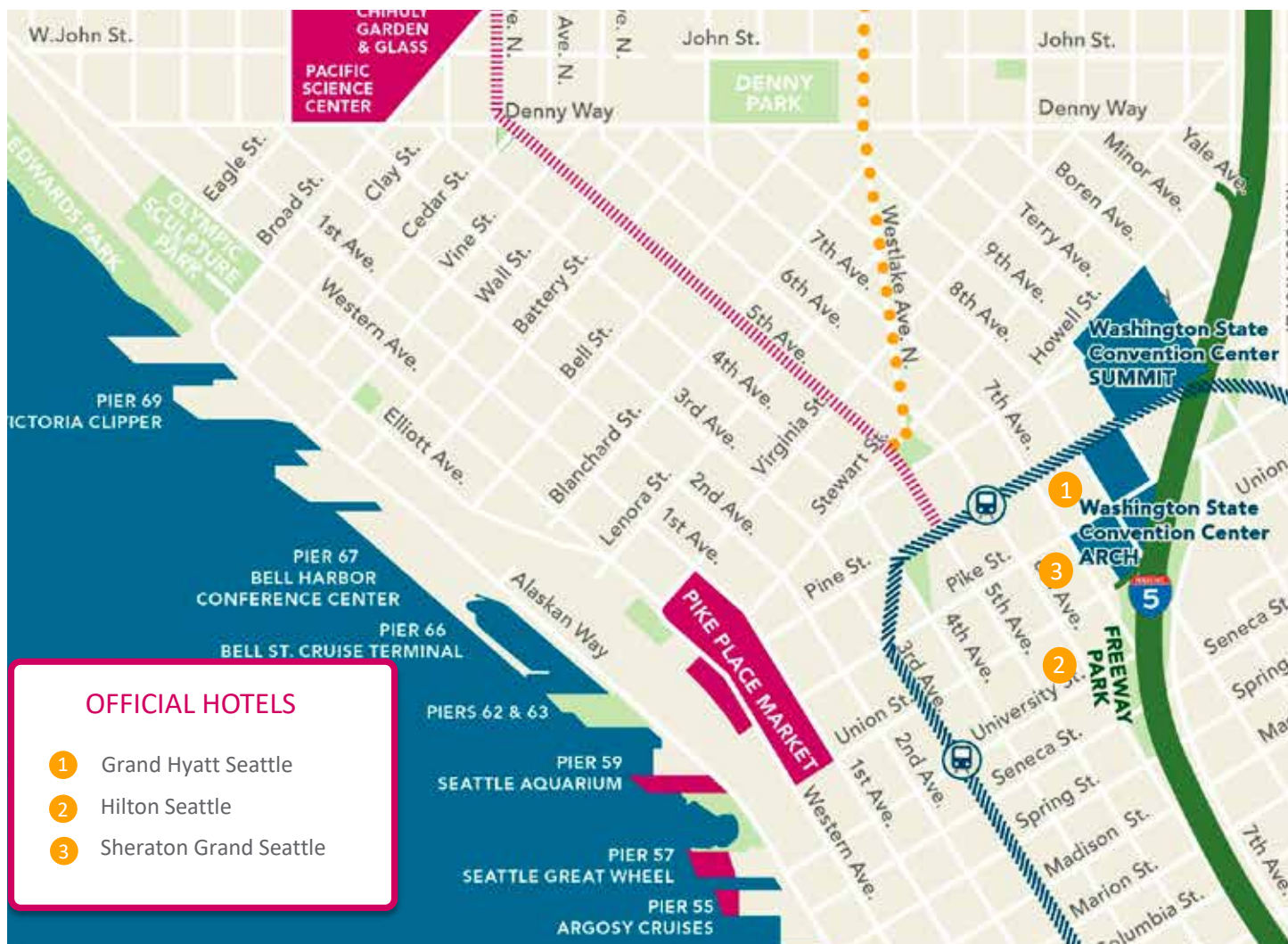
Help NSTA's **GREEN** efforts by completing session evaluations online **December 12–January 2** while the session is fresh in your mind! During the conference, session evaluations can be completed on the computers at the Presenters/Presiders booth in the Attendee Services Area. **And this year, we're 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](http://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.



## 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



—Photo courtesy of David Newman/ Visit Seattle

### 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](http://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/3ITv1L3](http://bit.ly/3ITv1L3).



# 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.



GREAT MINDS

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](http://greatminds.org/science)

## PhD SCIENCE™

SEE US AT  
BOOTH #202



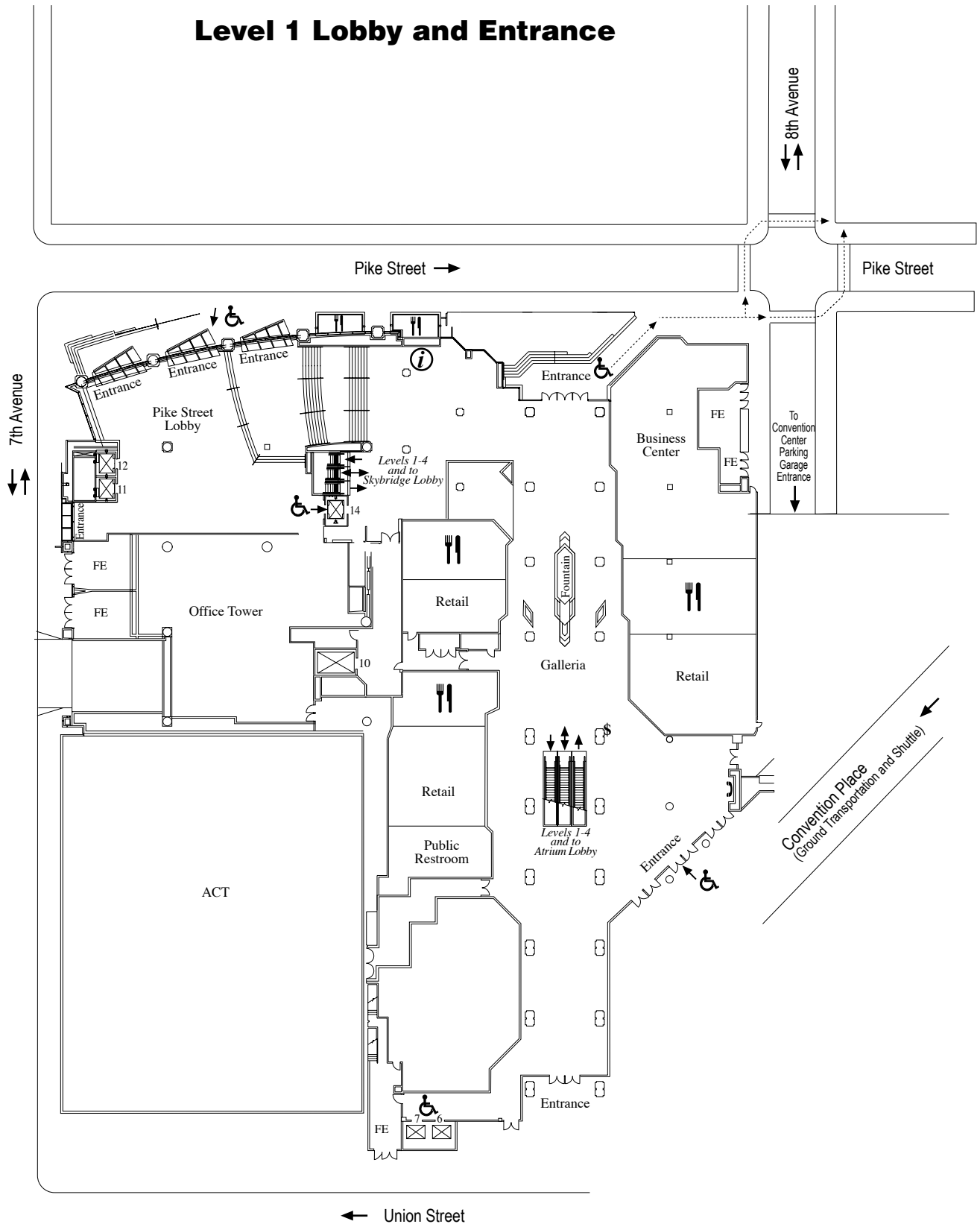
**Inspiring** students to wonder about the world and **empowering** them to make sense of it.

**Harnessing the Wind: Energy Transfer and Transformation**

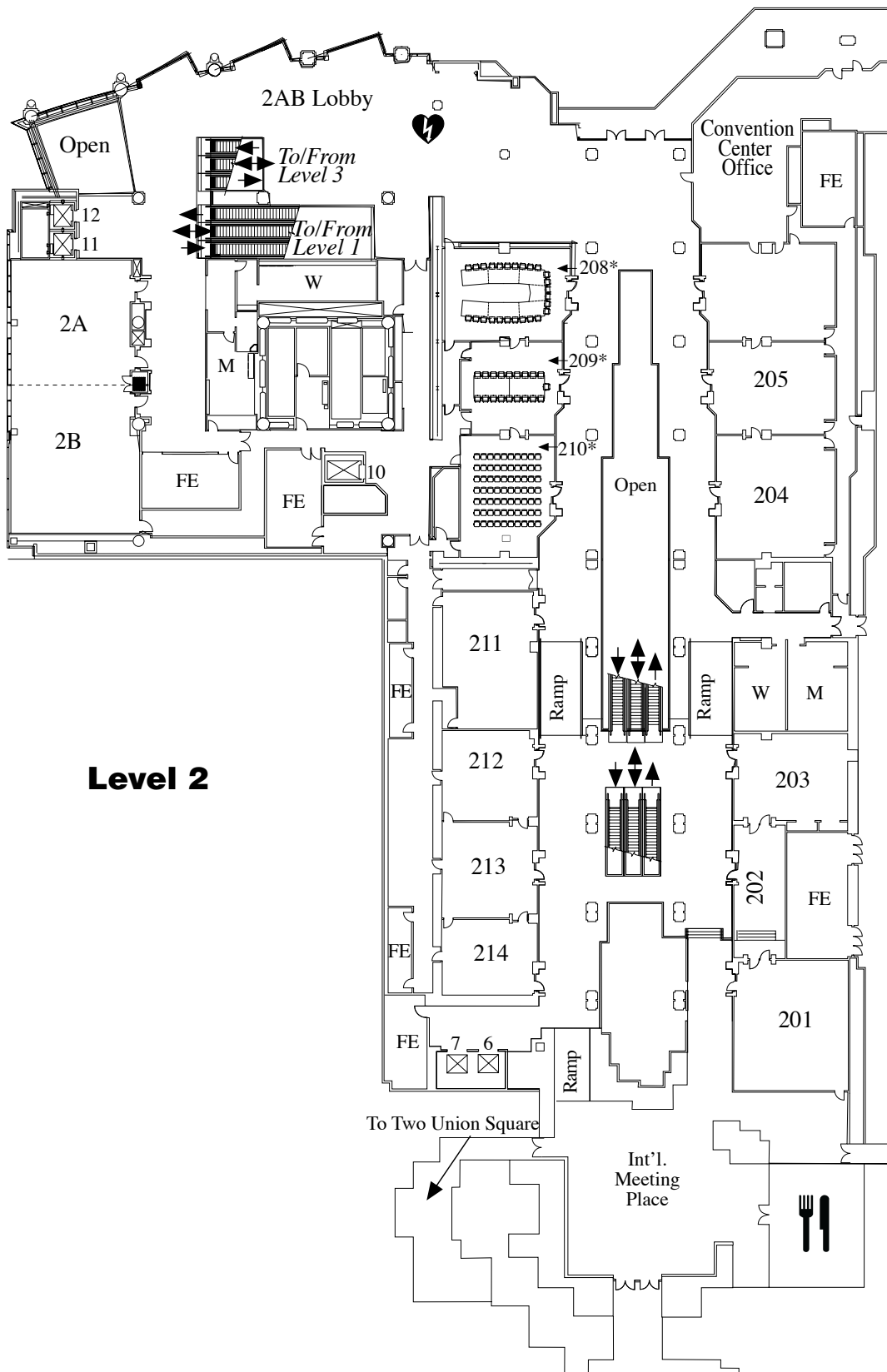
Dec. 13 | 2:00–3:00 PM | Washington State Convention Center, 401

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.

# Washington State Convention Center

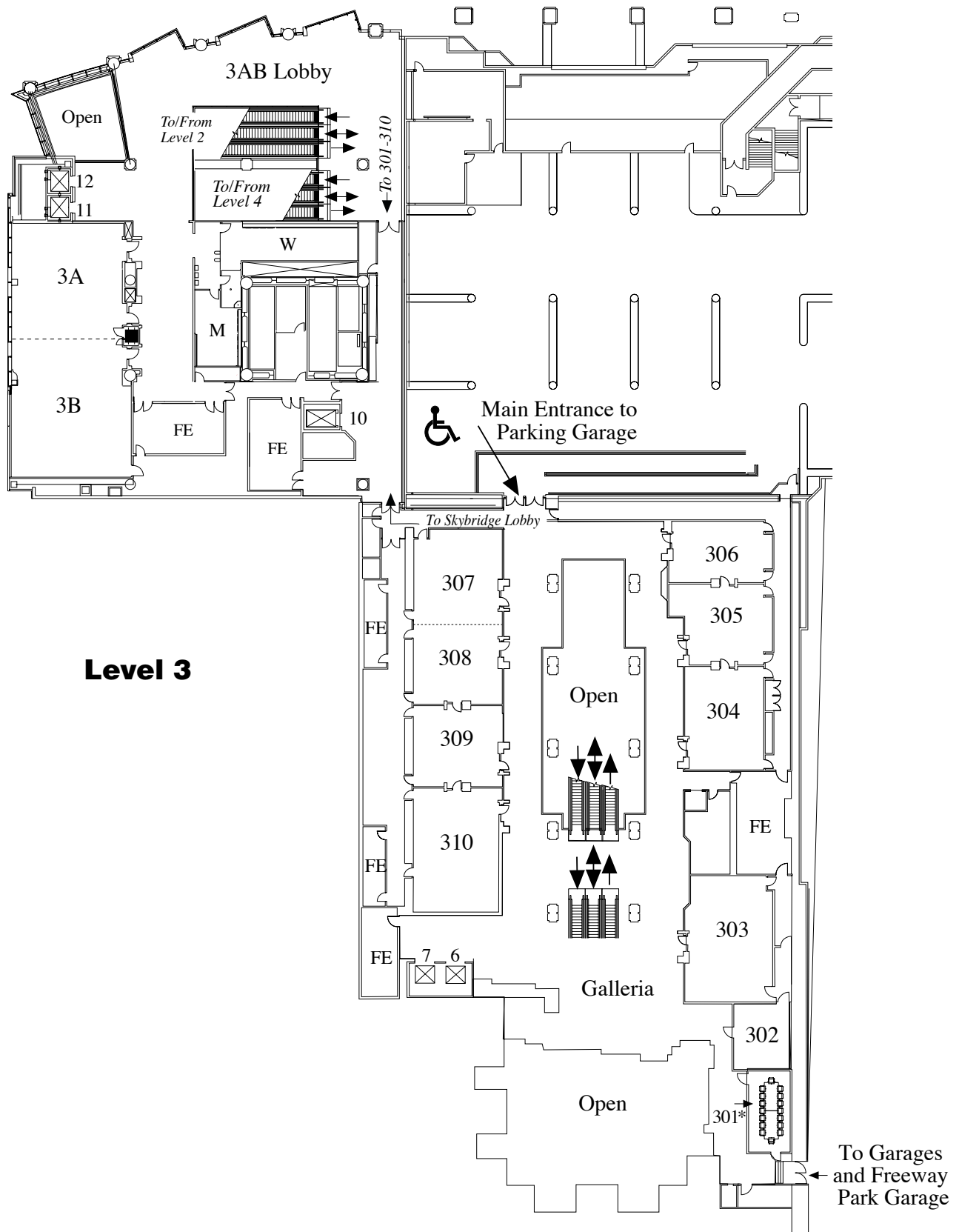


# Washington State Convention Center



**Level 2**

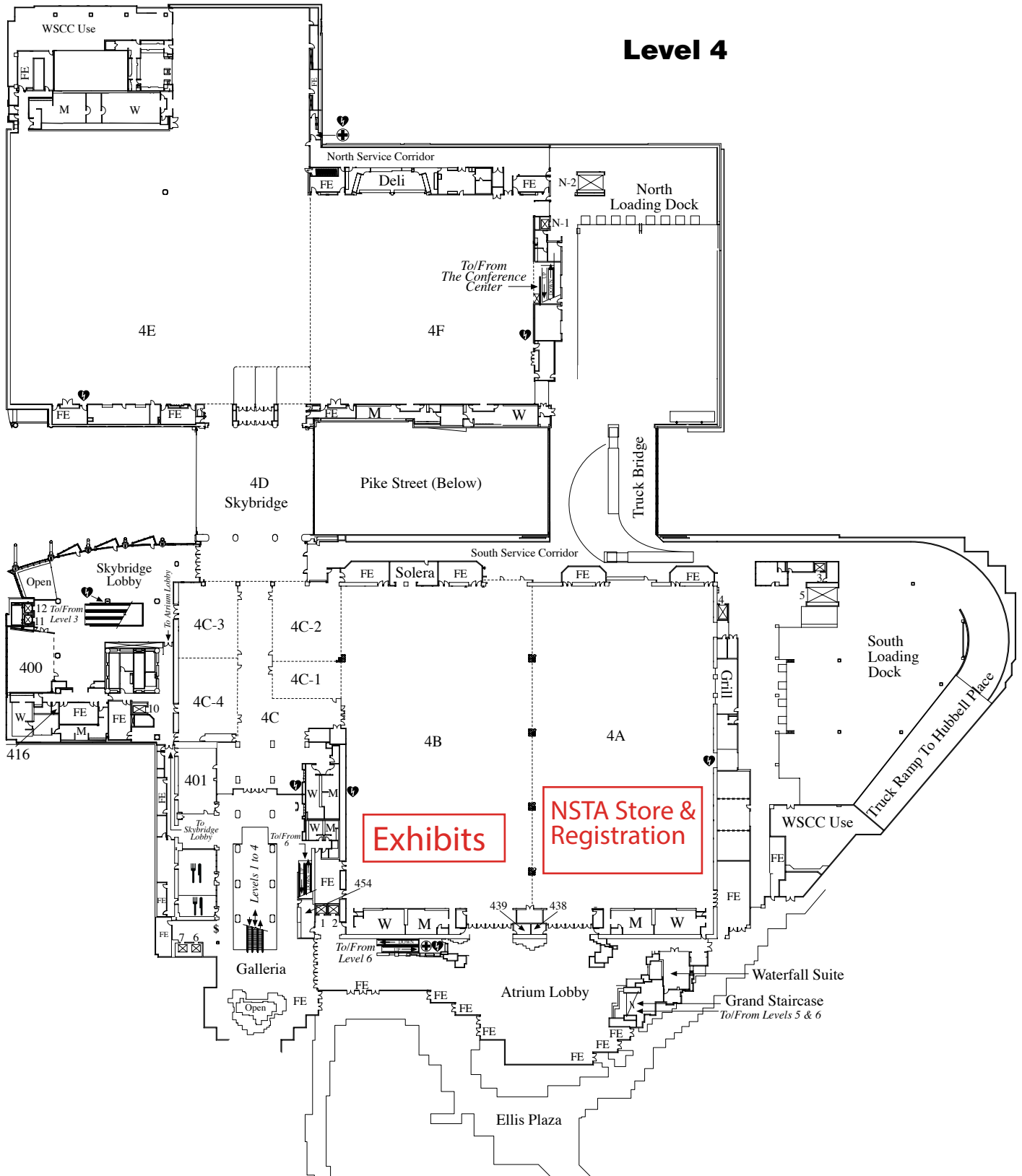
# Washington State Convention Center



**Level 3**

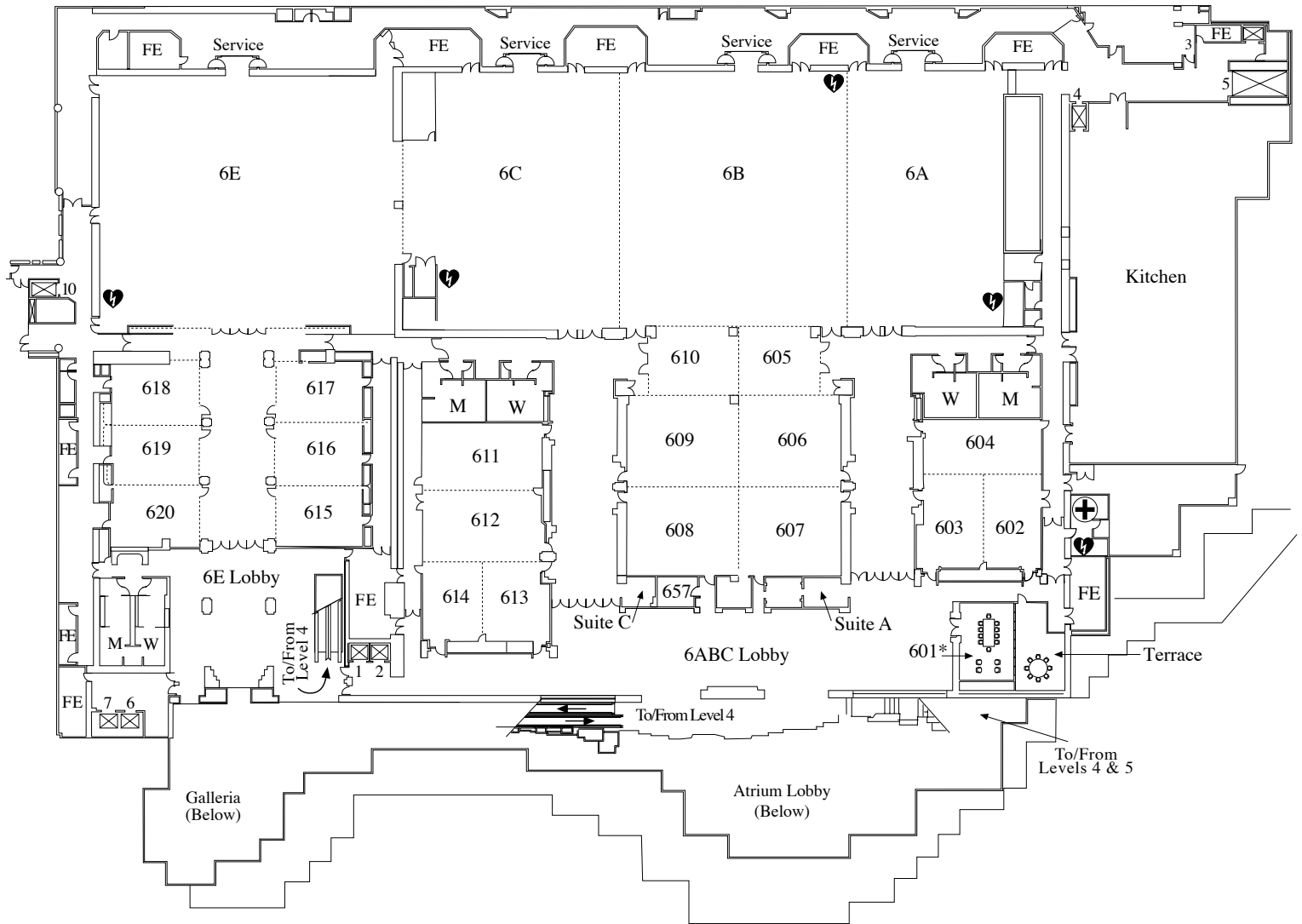
# Washington State Convention Center

## Level 4

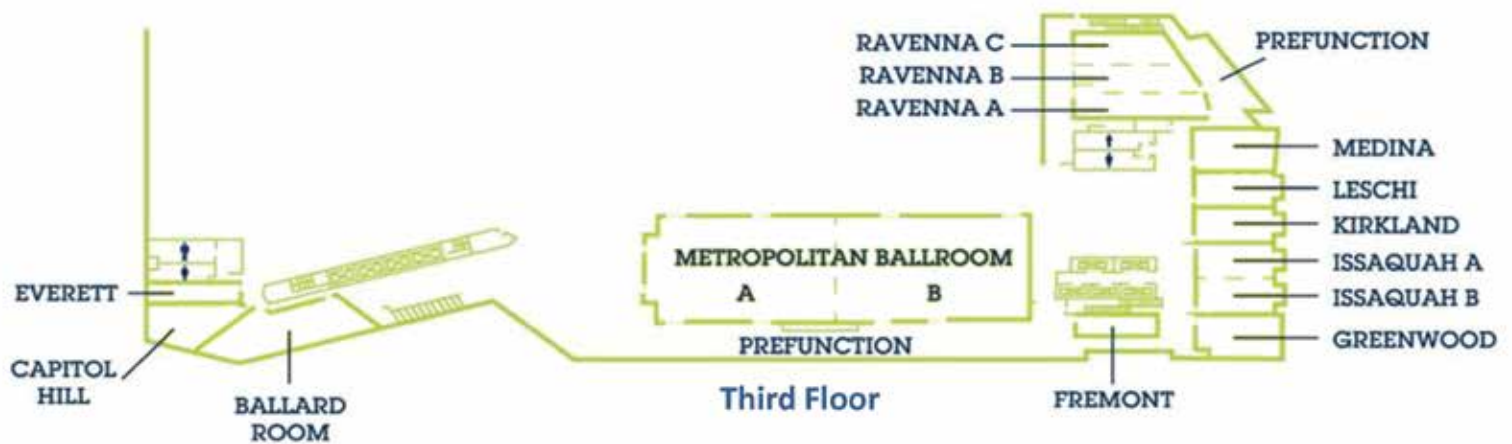
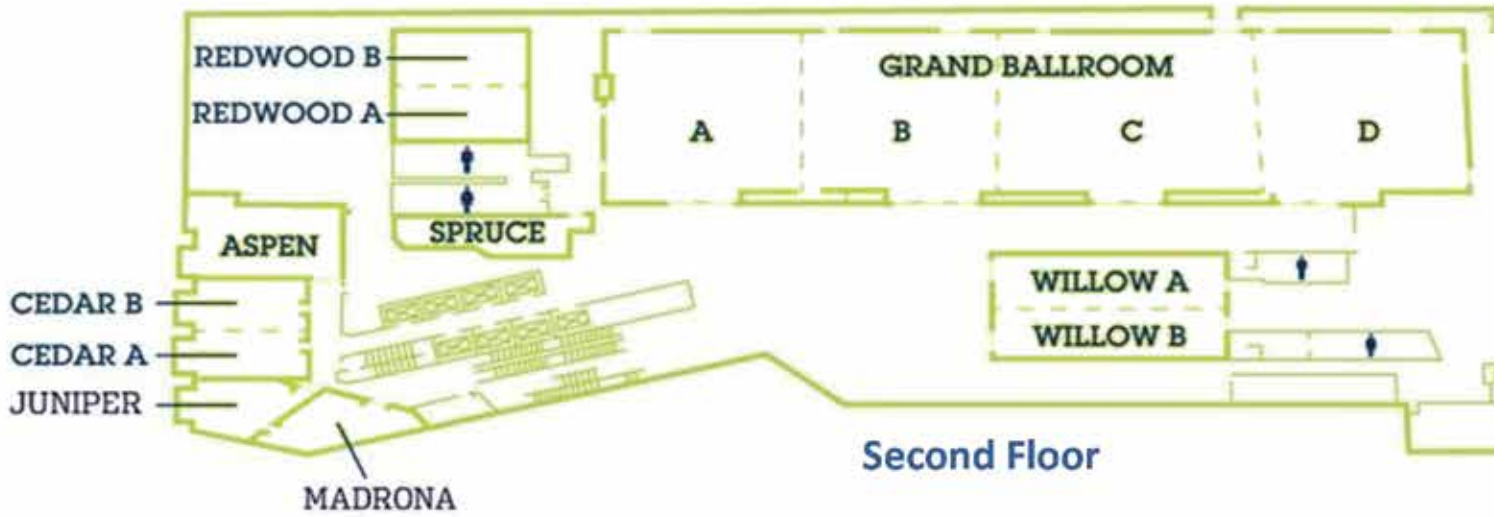


# Washington State Convention Center

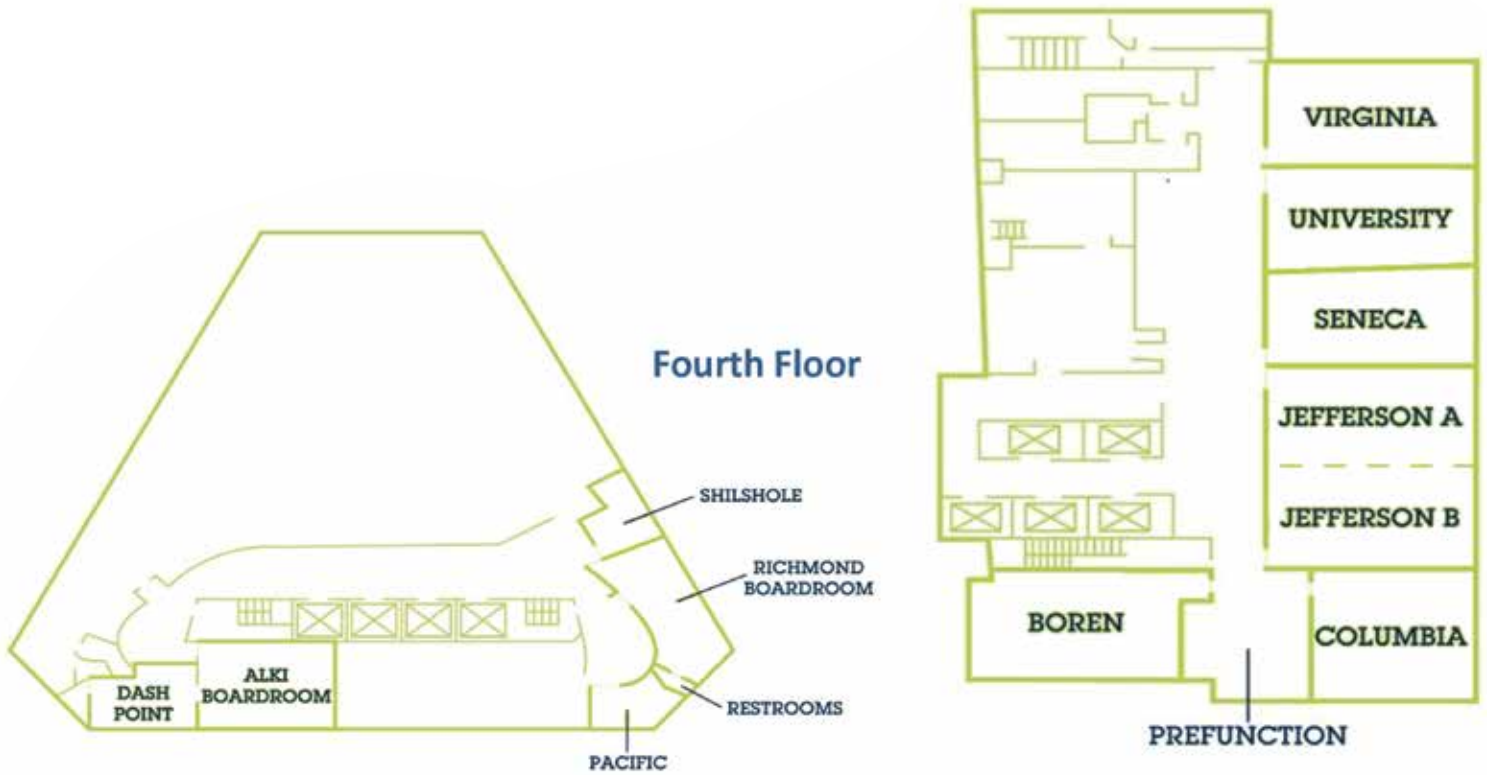
## Level 6



# Sheraton Grand Seattle



# Sheraton Grand Seattle





# 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](http://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

### 9th Annual STEM Forum & Expo, hosted by NSTA

Louisville, Kentucky—July 22–24, 2020

### 10th Annual STEM Forum & Expo, hosted by NSTA

Detroit, Michigan—July 28–30, 2021

### Area Conferences on Science Education

#### 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

# 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](http://www.nsta.org/conferenceproposals)



# Visit the NSTA STORE

FREE  
Shipping  
for on-site Book  
Purchases!



## STORE HOURS

Wednesday, December 11	4:30–7:00 PM
Thursday, December 12	7:30 AM–5:30 PM
Friday, December 13	7:30 AM–4:30 PM
Saturday, December 14	8:00 AM–12 Noon

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](http://www.nsta.org/store) to make a purchase today, or call 800-277-5300.



National  
Science  
Teaching  
Association

Presenters, key information, and complete session descriptions on Conference App:

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

<b>Thursday, December 12</b>	
8:00–9:00 AM	First-Timer Conference Attendees' Orientation . . . . . 15, 29 (Is This Your First NSTA Conference?)
9:15–10:30 AM	Keynote Presentation: Nalini Nadkarni, . . . . . 19, 29 <i>sponsored by National Geographic Learning   Cengage</i>
11:00 AM–5:00 PM	Exhibits . . . . . 27 <i>(Exclusive exhibit / exhibitor workshop hours: 11:00 AM–12:30 PM)</i>
2:00–3:00 PM	Featured Presentation: Jonathan Plucker . . . . . 33
<b>Friday, December 13</b>	
8:00 AM–1:30 PM	High School Chemistry Day . . . . . 40, 44
8:00 AM–1:30 PM	Middle School Chemistry Day . . . . . 40, 43
8:00 AM–1:30 PM	Engineering Day . . . . . 40, 44
9:00 AM–4:00 PM	Exhibits . . . . . 40 <i>(Exclusive exhibit / exhibitor workshop hours: 3:00–4:00 PM)</i>
9:30–10:30 AM	Featured Presentation: Robert Schwartz . . . . . 42
12:30–1:30 PM	Featured Presentation: Chris Reykdal . . . . . 46
2:45–3:30 PM	Meet the Presidents and Board/Council . . . . . 44
<b>Saturday, December 14</b>	
9:00 AM–12 Noon	Exhibits . . . . . 53

# Download the Conference App!

**Connect. Share. Engage.**

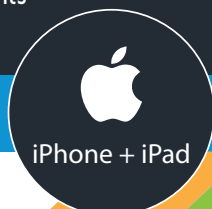
By downloading the conference app, you'll be able to easily manage your schedule and maximize your conference experience. Start mapping out your journey today!

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



Download now at [www.nsta.org/conferenceapp](http://www.nsta.org/conferenceapp)





### 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*

## Conference Program • Conference Strands

The Seattle Conference Committee has planned the conference around these three strands, enabling you to focus on a specific area of interest or need.

### 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](http://www.nsta.org/conferenceapp)

# NSTA Partnership School Program



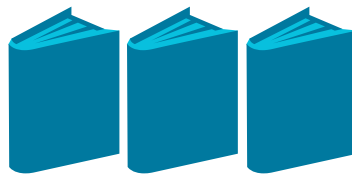
## Each Partner School receives these benefits:

- ✔ **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



National  
Science  
Teaching  
Association

Admission to NSTA short courses is by ticket only. Tickets, if still available, can be purchased at the NSTA Attendee Services. See Conference App or Seattle session browser for complete descriptions.

### 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](http://www.arduino.cc/en/main/software)). For more information, visit [centerforneurotech.org](http://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



Photo courtesy of Nick Gould Photography

SC-4: Increasing Student Engagement Through “Aha!” Moments: Supporting the NGSS with Process Oriented Guided Inquiry Learning (POGIL)

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](http://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** **\$38**

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 differ-

*Tickets for this educational trip can be purchased (space permitting) at NSTA Attendee Services. See Conference App or Seattle session browser for complete description.*

ence 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.*



**T-1: Fermentation Science: A Behind-the-Scenes Look at Hale’s Ales Brewery**

—Photo courtesy of Hale’s Ales Brewery

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

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

## Disciplinary Core Ideas

Disciplinary Core Ideas in Physical Science	Disciplinary Core Ideas in Life Science	Disciplinary Core Ideas in Earth and Space Science	Disciplinary Core Ideas in Engineering, Technology, and the Application of Science
<p><b>PS1: Matter and Its Interactions</b>                      PS1.A: Structure and Properties of Matter                      PS1.B: Chemical Reactions                      PS1.C: Nuclear Processes</p> <p><b>PS2: Motion and Stability: Forces and Interactions</b>                      PS2.A: Forces and Motion                      PS2.B: Types of Interactions                      PS2.C: Stability and Instability in Physical Systems</p> <p><b>PS3: Energy</b>                      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</p> <p><b>PS4: Waves and Their Applications in Technologies for Information Transfer</b>                      PS4.A: Wave Properties                      PS4.B: Electromagnetic Radiation                      PS4.C: Information Technologies and Instrumentation</p>	<p><b>LS1: From Molecules to Organisms: Structures and Processes</b>                      LS1.A: Structure and Function                      LS1.B: Growth and Development of Organisms                      LS1.C: Organization for Matter and Energy Flow in Organisms                      LS1.D: Information Processing</p> <p><b>LS2: Ecosystems: Interactions, Energy, and Dynamics</b>                      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</p> <p><b>LS3: Heredity: Inheritance and Variation of Traits</b>                      LS3.A: Inheritance of Traits                      LS3.B: Variation of Traits</p> <p><b>LS4: Biological Evolution: Unity and Diversity</b>                      LS4.A: Evidence of Common Ancestry and Diversity                      LS4.B: Natural Selection                      LS4.C: Adaptation                      LS4.D: Biodiversity and Humans</p>	<p><b>ESS1: Earth’s Place in the Universe</b>                      ESS1.A: The Universe and Its Stars                      ESS1.B: Earth and the Solar System                      ESS1.C: The History of Planet Earth</p> <p><b>ESS2: Earth’s Systems</b>                      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</p> <p><b>ESS3: Earth and Human Activity</b>                      ESS3.A: Natural Resources                      ESS3.B: Natural Hazards                      ESS3.C: Human Impacts on Earth Systems                      ESS3.D: Global Climate Change</p>	<p><b>ETS1: Engineering Design</b>                      ETS1.A: Defining and Delimiting an Engineering Problem                      ETS1.B: Developing Possible Solutions                      ETS1.C: Optimizing the Design Solution</p> <p><b>ETS2: Links Among Engineering, Technology, Science, and Society</b>                      ETS2.A: Interdependence of Science, Engineering, and Technology                      ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World</p>

# JOIN US

9TH ANNUAL

**STEM**

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

## 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**



LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
2B Convention Center	Do We Really Have to Stop Eating Salmon to Save the Southern Resident Orca Whales?		
201 Convention Center	A New Twist on DNA Extraction		
203 Convention Center	Engaging the Youngest Learners: Science and Literacy as Parallel Processes ----- Integrating Theoretical Concepts into STEM for Promoting Preschoolers' Development		
204 Convention Center	Schoolyard Surfaces in Our Watersheds		
205 Convention Center	Thinking Machines: Build an Artificial Neural Network in Your Classroom (SC-1) By Ticket Only; \$25 8:00–11:00 AM		
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		

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
3A Convention Center	Inquiry in Action: Investigating Matter K–5		
303 Convention Center	Authentic Student-Framed Engineering Problems, Criteria, Constraints, and Argumentation Using Two New STEM Teaching Tools		
304 Convention Center	Do You Need a New Science Lab? Win a Shell Science Lab Makeover (\$20,000 Value) for Your School		
307/308 Convention Center	Making Your Claim Outdoors: Trees as Habitats		
309 Convention Center	Building Awareness of Ocean Acidification in a Coastal Community		
310 Convention Center	Oxygen Minimum Zone, OMG!		
Exhibit Hall 4A Convention Center			<b>NSTA Exhibits!</b> 11:00 AM–5:00 PM
401 Convention Center		Exhibitor Workshop Using Maggots, Flies, and Flesh to Solve a Mystery! <i>(Sponsor: Texas Instruments)</i>	
4C-2 Convention Center		Exhibitor Workshop Dynamic Demonstrations from Flinn Scientific <i>(Sponsor: Flinn Scientific, Inc.)</i>	Exhibitor Workshop 360Science: A Whole New Twist on Science Kits <i>(Sponsor: Flinn Scientific, Inc.)</i>

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
4C-4 Convention Center		<b>Exhibitor Workshop</b> Criteria and Constraints: Raising the Bar for Rigor Grades 3–5 <i>(Sponsor: Carolina Biological Supply Co.)</i>	<b>Exhibitor Workshop</b> Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher <i>(Sponsor: Carolina Biological Supply Co.)</i>
603 Convention Center	STEM-LA Learning Through VR (8:00–8:30 AM)		
604 Convention Center		<b>Exhibitor Workshop</b> Analyzing and Interpreting Data Using TCI's <i>Bring Science Alive!</i> <i>(Sponsor: TCI)</i>	<b>Exhibitor Workshop</b> Using a Variety of Methods to Assess for the Three Dimensions <i>(Sponsor: TCI)</i>
605/610 Convention Center			<b>Exhibitor Workshop</b> Modern Biology Is Revolutionizing Human Lives! Are Your Students Prepared? <i>(Sponsor: Bio-Rad Laboratories)</i>
606 Convention Center		<b>Exhibitor Workshop</b> Beyond CER Labels: Supporting Authentic Scientific Argumentation in the Classroom <i>(Sponsor: Amplify)</i>	<b>Exhibitor Workshop</b> Lead with Phenomena and the Three Dimensions Will Follow <i>(Sponsor: Amplify)</i>
607 Convention Center	<b>Exhibitor Workshop</b> FOSS: 10 Minutes to Improving Science Achievement <i>(Sponsor: Delta Education/School Specialty Science–FOSS)</i>	<b>Exhibitor Workshop</b> Making Sense of Phenomena with FOSS <i>(Sponsor: Delta Education/School Specialty Science–FOSS)</i>	<b>Exhibitor Workshop</b> FOSS Wave Properties and Information Technologies <i>(Sponsor: Delta Education/School Specialty Science–FOSS)</i>
608 Convention Center	<b>Exhibitor Workshop</b> IQWST: Literacy Strategies for the Middle School Classroom <i>(Sponsor: Activate Learning)</i>	<b>Exhibitor Workshop</b> Project-Based Inquiry Science™ (PBIScience): Creating “Coherence and Science Storylines” for Middle School <i>(Sponsor: Activate Learning)</i>	<b>Exhibitor Workshop</b> Reading, Writing, Talking, and DOING Science: Literacy Strategies in the Elementary Classroom <i>(Sponsor: Activate Learning)</i>
609 Convention Center		<b>Exhibitor Workshop</b> Space Science for the Modern, Interactive Classroom <i>(Sponsor: Simulation Curriculum Corp.)</i>	<b>Exhibitor Workshop</b> Solving Crimes with Science: Forensics for Your Classroom <i>(Sponsor: AEOP)</i>
611 Convention Center	<b>Exhibitor Workshop</b> 5 E’sy Ways to Investigate Proteins and Enzyme Action <i>(Sponsor: 3D Molecular Designs)</i>	<b>Exhibitor Workshop</b> Dynamic DNA—One Model to Teach It All <i>(Sponsor: 3D Molecular Designs)</i>	

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION61	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>612 Convention Center</b>	<b>Exhibitor Workshop</b> pH Scale <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Distilling Aromatic Hydrocarbons <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Chemical Formula and Amino Acids <i>(Sponsor: Lab-Aids, Inc.)</i>
<b>613/614 Convention Center</b>	<b>Exhibitor Workshop</b> Introducing Your Students to Gene Editing with CRISPR <i>(Sponsor: Edvotek, Inc.)</i>	<b>Exhibitor Workshop</b> Left at the Scene of the Crime <i>(Sponsor: Edvotek, Inc.)</i>	<b>Exhibitor Workshop</b> Transform Your Class into a Neuroscience Laboratory <i>(Sponsor: Edvotek, Inc.)</i>
<b>615–617 Convention Center</b>	NSTA Press Session: Reading, Writing, and Reasoning in the Schoolyard		
<b>618 Convention Center</b>	Using Middle Level Field Experiences as a Stepping-Stone to Career Pathways in the Natural Sciences		
<b>619 Convention Center</b>	Citizen Science: Engage All Students in Authentic Outdoor Science Research		
<b>Ballroom 6B Convention Center</b>	Is This Your First NSTA Conference? First-Timer Conference Attendees' Orientation		
<b>Ballroom 6E Convention Center</b>	<b>Keynote Presentation</b> <b>9:15–10:30 AM</b> Tapestry Thinking—Weaving Diverse Threads of Science and Society Speaker: Nalini Nadkarni <i>Sponsor: National Geographic Learning   Cengage</i>		

LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>2A Convention Center</b>	Making Chemistry Fun for Everyone	Experience Integration	
<b>2B Convention Center</b>	Equity in Science Education Roundtable		NSTA Press Session: Fact or Phony? Successful Strategies to Promote Media Literacy
<b>201 Convention Center</b>	Teach Evolution with the World's Most Extravagant Birds	Opioids and the Science of Addiction	Does Black English Stand Between Black Students and Success in Science?
<b>203 Convention Center</b>	A Multi-District Movement Toward NGSS: The Northwest LASER Alliance	Building Equity in the Elementary Classroom Through NGSS Implementation with Principal-Teacher Teams  STEM It Up! Providing a Model for Integration and Career Exploration Through STEM-Focused Professional Development for Elementary Teachers	Cross-Curricular Learning with a Science and Integrated STEM Focus: Optimizing Student Learning and Maximizing Efficiency of Instruction While Embracing All Aspects of STEM
<b>204 Convention Center</b>		Spark Students' Curiosity with Chemistry!	
<b>205 Convention Center</b>	Measuring Sea Level from Space	OpenSciEd: Curricula for Exemplary Middle School Science Teaching and Learning	Tackling Structural Inequities Through Student-Centered Science
<b>211 Convention Center</b>	Innovate Your Classroom with Authentic Learning Experiences		Using National Science Olympiad STEM Classroom Materials to Address NGSS Crosscutting Concepts and Content
<b>212 Convention Center</b>		Designing to Understand: Design-Based Biotechnical Learning	Designing a STEAM Curriculum for Girls: Six Years of Iteration at Lake Washington Girls Middle School
<b>213 Convention Center</b>		NGSS Through Instructional Unit Adaptation	The Joy of Discovery: How Anchor Phenomenon Sparks Engagement in Science Learning  The T in STEM: A Double-Edged Sword

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
214 Convention Center		Using NSTA as Your Online Textbook—for Professors!	
3A Convention Center		Innovative Life Science Activities for Preservice and Inservice Elementary Teachers	STEM-ify Your Middle School Science Classroom
3B Convention Center		STEM-Selected Tradebooks Enrich Minds	
303 Convention Center		Constructing Research Vessels and Supporting Ocean Science Education	Stacking Vocabulary Strategies
304 Convention Center	ASTE-Sponsored Session: Using a STEM Observation Protocol to Improve Your Instruction	CSSS-Sponsored Session: Science Investigations at the Center of Student Learning	NSELA-Sponsored Session: Design Principles for Successful STEM Education
307/308 Convention Center	Teaching Scientific Discoveries Using Library of Congress Primary Sources	Moving from Anchoring Event to Equity	Projects for Environmental Action
309 Convention Center	Modeling as a Tool to Drive Responsive Instruction That Promotes Deeper Learning	Building an Amazing Summer School Program: The Harrowing, Real-Life Experience of Three Science Teachers Using Place-Based Education ----- Using Design Thinking in the Classroom	Increasing Student Understanding by Integrating Video Lectures into Your Science Course ----- Incorporating Video Lab Conclusions into Student Digital Lab Reports
310 Convention Center	Modeling Cardiac Physiology	Breathing Easier: A Place-Based Curriculum to Engage Young Students in Discussion and Action Around Environmental Justice	Star Dust in the Classroom (3:30–4:00 PM)
401 Convention Center		Exhibitor Workshop Are You Moody? (Sponsor: Texas Instruments)	Exhibitor Workshop Make Tools in Schools and Craft Stick Bending Program (Sponsor: Sequim Community MakerSpace)

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
4C-3 Convention Center	<b>Exhibitor Workshop</b> Pearson AP Science, Mastering Basics <i>(Sponsor: Pearson)</i>	<b>Exhibitor Workshop</b> Pearson AP Science, Mastering Advanced Practices <i>(Sponsor: Pearson)</i>	
4C-4 Convention Center	<b>Exhibitor Workshop</b> Increasing the Sophistication of Student Thinking: Need for K–5 Learning Progressions <i>(Sponsor: Carolina Biological Supply Co.)</i>	<b>Exhibitor Workshop</b> Next Generation Dissection <i>(Sponsor: Carolina Biological Supply Co.)</i>	<b>Exhibitor Workshop</b> Phenomenal Classroom Critters <i>(Sponsor: Carolina Biological Supply Co.)</i>
603 Convention Center		Making Science Learning Lifelong, Life-wide, and Life-deep: Incorporating Out-of-School (Informal) STEM Learning Experiences in the Classroom	
604 Convention Center		<b>Exhibitor Workshop</b> Experience a Critical Global Resource: The Amazon Rain Forest! <i>(Sponsor: EcoTeach)</i>	<b>Exhibitor Workshop</b> Like a Cardiologist <i>Sponsor: KIMSeattle (Kids in Medicine &amp; Science, Seattle)</i>
605/610 Convention Center		<b>Exhibitor Workshop</b> Learn to Infuse NGSS Science and Engineering Practices with an Engaging Activity <i>(Sponsor: Bio-Rad Laboratories)</i>	<b>Exhibitor Workshop</b> Think Like an Engineer in Your Biology Class <i>(Sponsor: Bio-Rad Laboratories)</i>
606 Convention Center	<b>Exhibitor Workshop</b> Snails, Robots, and Biomimicry: Phenomena and 3-D Instruction for Grades K–5 <i>(Sponsor: Amplify)</i>		
607 Convention Center	<b>Exhibitor Workshop</b> Science for All Students— Access and Equity <i>(Sponsor: Delta Education/School Specialty Science–FOSS)</i>	<b>Exhibitor Workshop</b> Tackling Engineering, Technology, and the Application of Science (MS-ETS) with FOSS Variables and Design <i>(Sponsor: Delta Education/School Specialty Science–FOSS)</i>	
608 Convention Center	<b>Exhibitor Workshop</b> Systems Thinking Applied to Planet Earth’s Greatest Challenges <i>(Sponsor: Activate Learning)</i>	<b>Exhibitor Workshop</b> IQWST: Using Anchoring Phenomena and Driving Question Boards to Spark Student Questioning <i>(Sponsor: Activate Learning)</i>	<b>Exhibitor Workshop</b> Active Physics: Project-Based Learning for Content and Creativity <i>(Sponsor: Activate Learning)</i>
609 Convention Center		<b>Exhibitor Workshop</b> Student Engineering in Photovoltaics <i>(Sponsor: CE, Clean Energy Bright Futures)</i>	<b>Exhibitor Workshop</b> Create Immersive, NGSS-Focused Science Experiences with PocketLab <i>(Sponsor: PocketLab)</i>

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>611 Convention Center</b>	<b>Exhibitor Workshop</b> Get a Move On! Modeling Molecular Transport Across the Cell Membrane <i>(Sponsor: MSOE Center for BioMolecular Modeling)</i>	<b>Exhibitor Workshop</b> Connecting CRISPR Biotechnology to What You Already Teach <i>(Sponsor: MSOE Center for BioMolecular Modeling)</i>	
<b>612 Convention Center</b>	<b>Exhibitor Workshop</b> NGSS—Ecology: Introduction of a New Species <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> NGSS—Energy: Are These Bulbs Heating Up Our Energy Bill? <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> NGSS—Weather and Climate: Atmosphere, Climate, and Global Warming <i>(Sponsor: Lab-Aids, Inc.)</i>
<b>613/614 Convention Center</b>	<b>Exhibitor Workshop</b> Exploring STEAM with Transformation <i>(Sponsor: Edvotek, Inc.)</i>	<b>Exhibitor Workshop</b> Cancer Investigators: Medical Diagnostics in Your Classroom <i>(Sponsor: Edvotek, Inc.)</i>	<b>Exhibitor Workshop</b> Sweet Science: Exploring Complex Mixtures with Biotechnology <i>(Sponsor: Edvotek, Inc.)</i>
<b>615–617 Convention Center</b>	<b>NSTA Press Session:</b> Argument-Driven Inquiry in Grades 3–5: Three-Dimensional Investigations That Integrate Literacy and Mathematics	<b>NSTA Press Session: Science Curriculum Topic Study:</b> Connecting Scientific Practices, Core Ideas, and Crosscutting Concepts	<b>NSTA Press Session:</b> <i>Picture-Perfect STEM Lessons: Using Children’s Books to Inspire STEM Learning</i>
<b>618 Convention Center</b>	<b>Middle School Students Investigating and Promoting Coexistence with Urban Carnivores</b> (12:30–1:00 PM)		<b>Storm Drain Detectives: A Community Partnership</b>  <b>Systems Thinking for Outdoor School</b>
<b>619 Convention Center</b>	<b>Creating Community Connections: Enhancing Student Learning Through Local Partnerships</b>	<b>Lessons from and for Makerspaces</b>	<b>Early Exposure: Promoting STEM Education Opportunities Among Underrepresented Students at the Elementary Level</b> (3:30–4:00 PM)
<b>620 Convention Center</b>	<b>NSTA Press Session: <i>Uncovering Students’ (and Teachers’) Ideas About Engineering and Technology</i></b>	<b>Defining Life: Teaching Biology from a New Perspective</b>	<b>Win the Grant Writing Game: Grant Writing Strategies for You and Your Chemistry Students</b>
<b>Ballroom 6A Convention Center</b>		<b>Featured Presentation</b> Teaching and Learning for Creativity Throughout the Life Span Speaker: Jonathan Plucker <b>(FINDING JOY strand)</b>	<b>Harry Potter Episodes as Stimulators for Motivation, Creative Thinking, and Science Concept Development</b>

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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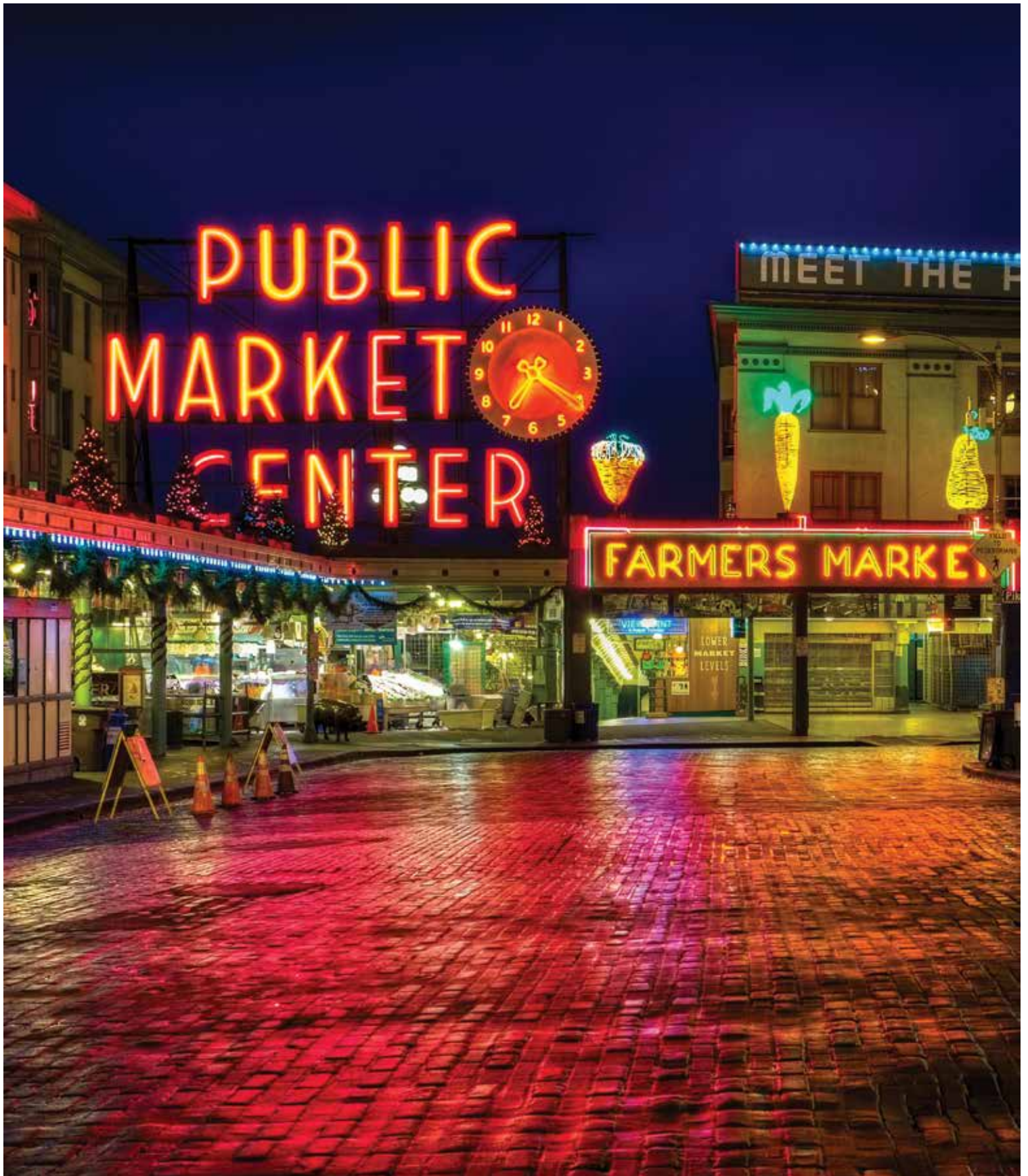
LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
Aspen Sheraton	Innovative and Integrated: STEM Activities from Chinese Classrooms		
Cedar Sheraton	NESTA Session: Social Media Can Be Used as a Tool in the Classroom for Learning? Get Outta Here!		
Willow Sheraton	Taking on Big Science Challenges Across Districts: How a District Science Network Can Build Capacity and Advance Equity		
Grand Ballroom A Sheraton	Climate Science Education: Empowering Teachers Through Adult-Learning Experiences Forest School: An NGSS Partnership (PARTNERSHIPS strand)		
Grand Ballroom B Sheraton	Powering Student Success Through STEM Awareness and Exploration: Blending Career Connected Learning with Science Learning (STEM strand)		
Grand Ballroom D Sheraton	“Where Do I Fit In?” Engaging Students’ Identities in Equitable Life Science Curriculum (FINDING JOY strand)		
Ballard Sheraton	Blending the E and the S in STEM (SC-2) By Ticket Only; \$20 8:00–11:00 AM (STEM strand)		
Issaquah Sheraton	Building Bonds with STEM Industry		
Metropolitan B Sheraton	Wild Worms: High School Students Collaborate with a University Lab on a Real Research Project		

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>Aspen Sheraton</b>	NGSS@NSTA Forum Session: <i>The NSTA Atlas of the Three Dimensions</i>	NSTA-WIDA Session: Equitable 3-D Science Education for Multilingual Learners: New Resources from the NSTA-WIDA Affiliation	
<b>Cedar Sheraton</b>	CESI-Sponsored Session: <i>Belle's Journey</i> —Integration Using an Outstanding Science Trade Book	ASTE-Sponsored Session: A Vision for Capturing Fundamental Shifts in NGSS-Focused Instruction	NARST-Sponsored Session: A Mixed Methods Study That Compares Learning Gains Associated with Serious Gameplay and Hands-On Science
<b>Redwood Sheraton</b>	NMLSTA-Sponsored Session: Whirligigs: Watching, Wondering, Working Together—Wow!		Invisible Forest: Use STEAM to Explore the Final Frontier
<b>Willow Sheraton</b>	NESTA Session: Addressing the NGSS Through Topographic Maps and Profiles	NGSS@NSTA Forum Session: Designing and Using Equitable Three-Dimensional Formative Assessments to Support Meaningful NGSS Investigations	
<b>Grand Ballroom A Sheraton</b>		Building Classroom Climate Change Connections: How to Develop and Lead a STEM Seminar for Teacher Professional Development ( <b>PARTNERSHIPS strand</b> )	
<b>Grand Ballroom B Sheraton</b>	Building Our Nation's Future Cybersecurity Professionals ( <b>STEM strand</b> )	Using DNA Technology to Exonerate the Innocent ( <b>STEM strand</b> )	Everyday Engineers: Supporting NGSS and Engineering Learning Through Everyday Knowledge ----- Makerspace in the K–5 Classroom ( <b>STEM strand</b> )
<b>Grand Ballroom D Sheraton</b>	Spark Student Thinking: Using Modeling to Effectively Engage Students with Phenomena ( <b>FINDING JOY strand</b> )	Crafting Three-Dimensional Formative Assessments ( <b>FINDING JOY strand</b> )	National Geographic's Geo-Inquiry Process in Action! ( <b>FINDING JOY strand</b> )
<b>Ballard Sheraton</b>	Taste Buds in Your Gut? Exploring Taste, Sweeteners, and Glucose Homeostasis	Equilibrium: The Key to Student Success	Building a Periodic Table Unit Plan Using American Association of Chemistry Teachers (AACT) Resources
<b>Issaquah Sheraton</b>	Using Pop Culture and Polymers to Create Inquisitive Minds		Using Modeling in Chemistry to Reach All Learners

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>Metropolitan B Sheraton</b>	NGSS Practices: Developing and Using Models to Teach Science		
<b>Jefferson Sheraton</b>	Connecting Natural Selection and Speciation	Cars: A Fundamental Look at How They Work and the Science Involved	Love Acronyms? Then RSVP to This Session ASAP!







LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>2A Convention Center</b>	From Harmony to Humpbacks	Building Literacies: From STEM Books to the Beautiful Outdoors	Getting Students to Talk More (Productively)
<b>2B Convention Center</b>			School Energy Experts
<b>201 Convention Center</b>	Phenomenon-Based Learning Using Digitized Museum Objects	Underwater Remotely Operated Vehicle Engineering	
<b>203 Convention Center</b>	Nurture Through Nature (How Four Teachers Stumbled Their Way into Building the Most Innovative School Club in the Country)	Creating Classrooms Where Science Inquiry Thrives: Where Students Are Highly Engaged in Science Exploration and Develop a Lifelong Love of Science	Finding Joy in Outdoor Learning
<b>204 Convention Center</b>	Engineerize It!		Using Lab Notebooks in the Preschool and Elementary Classroom
<b>211 Convention Center</b>		Setting the Table to Support Three-Dimensional Professional Learning	
<b>212 Convention Center</b>	Three-Dimensional High School Science OER Course Project	Making Redox Corrosion Chemistry Practical, Relevant, Engaging, and Fun!	Student Science Project Competitions, Part 1: Practicing Professional Research and Development
<b>213 Convention Center</b>	Making Lives Better Through a Prosthetic Hand Engineering Challenge	NSTA's Online Resources and Communities	Focusing on Microscopy to Magnify Student Learning
<b>214 Convention Center</b>	NSTA/ASTE Present 2020 Standards for Science Teacher Preparation		

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>3A Convention Center</b>	ACS Middle Level Session: Particles of a Liquid and Changes of State	ACS Middle Level Session: The Water Molecule and Dissolving	ACS Middle Level Session: Chemical Reactions—Breaking and Making Bonds
<b>3B Convention Center</b>	ASEE Session: Cardboard Bots! Interactive Fun with Coding and Electronics	ASEE Session: How Can Students’ Everyday Knowledge Support Science Learning Through Engineering Design?	ASEE Session: Teaching Engineering for Social Justice
<b>303 Convention Center</b>	ACS High School Session One: Relating Structure and Properties: Exploring the Nature and Properties of Ionic and Covalent Compounds—Composition, State, and Conductivity	ACS High School Session Two: Relating Structure and Properties: Constructing Science Ideas About Ionic Bond Strength—Solubility and Melting Point	ACS High School Session Three: Interparticle Forces in Covalent Compounds—Melting Point, Viscosity, and Vapor Pressure
<b>304 Convention Center</b>	A Community Partnership That Fosters Authentic Learning Experiences	Making Waves: Seismic Waves Activities and Demonstrations	A Teacher’s Toolbox for Lab Safety
<b>307/308 Convention Center</b>		Using Natural Objects for Inquiry in the Classroom	What Works, What Lasts, and Why
<b>310 Convention Center</b>	Order Up a Helping of Forensics, with a Side of Maggots!	The Good, The Bad of Corrosion: Why We Need to Study It	Ivory Cache: Using DNA Technology for Conservation Biology
<b>Exhibit Hall 4A Convention Center</b>		<b>NSTA Exhibits!</b> 9:00 AM–4:00 PM	
<b>401 Convention Center</b>	<b>Exhibitor Workshop</b> Make Tools in Schools and Craft Stick Bending Program <i>(Sponsor: Sequim Community MakerSpace)</i>	<b>Exhibitor Workshop</b> Teach STEM Subjects in England! <i>(Sponsor: Quantum Scholars)</i>	<b>Exhibitor Workshop</b> STEMulating the Heart with Code! <i>(Sponsor: Texas Instruments)</i>
<b>4C-1 Convention Center</b>	<b>Exhibitor Workshop</b> Who Is Baby Whale’s Father? DNA Fingerprinting Solves the Mystery! <i>(Sponsor: MiniOne Systems)</i>	<b>Exhibitor Workshop</b> Influenza Outbreak Investigation: Using Molecular Methods and Bioinformatics to Understand Diagnostics and Epidemiology <i>(Sponsor: MiniOne Systems)</i>	<b>Exhibitor Workshop</b> To Taste or Not to Taste! PTC Genotype Determination by Electrophoresis <i>(Sponsor: MiniOne Systems)</i>

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

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>611 Convention Center</b>	<b>Exhibitor Workshop</b> Genes in Space: Genetics on the International Space Station, Free Loaner Equipment, Curriculum, and More! <i>(Sponsor: miniPCR bio)</i>	<b>Exhibitor Workshop</b> P51 Glow Labs: Investigate DNA and Other Macromolecules Through Fluorescence <i>(Sponsor: miniPCR bio)</i>	<b>Exhibitor Workshop</b> Are You a Night Owl? A Morning Lark? The Answer May Be in Your Genes <i>(Sponsor: miniPCR bio)</i>
<b>612 Convention Center</b>	<b>Exhibitor Workshop</b> NGSS—Evolution: Embryo-OH! <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> NGSS—Chemical Reactions: Developing a Prototype <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> NGSS—Land, Water, and Human Interactions: Cutting Canyons and Building Deltas <i>(Sponsor: Lab-Aids, Inc.)</i>
<b>613/614 Convention Center</b>	<b>Exhibitor Workshop</b> Quick and Easy Experiments Using the Latest Technology <i>(Sponsor: Vernier Software &amp; Technology)</i>	<b>Exhibitor Workshop</b> Common Biology Experiments Using the Latest Technology <i>(Sponsor: Vernier Software &amp; Technology)</i>	<b>Exhibitor Workshop</b> Common Middle School Experiments Using the Latest Technology <i>(Sponsor: Vernier Software &amp; Technology)</i>
<b>615–617 Convention Center</b>	<b>NSTA Press Session:</b> <i>Next Time You See a Bee</i>	<b>NSTA Press Session:</b> Developing and Using 3-D Formative Assessment Probes	<b>NSTA Press Session:</b> <i>Solar Science Provides Three-Dimensional Learning Experiences About the Sun, Earth, and Moon</i>
<b>618 Convention Center</b>	Engineering Design in the Middle School Classroom		<b>STEAM Collaboration:</b> Offering Equitable, Community-Centered Science Learning for Students (11:30 AM–12 Noon)
<b>619 Convention Center</b>	Coast Connections: Environmental Literacy Through Strong Partnerships		What Elementary and Middle School Teachers Can Learn from Engineers
<b>Ballroom 6A Convention Center</b>		<b>Featured Presentation</b> Building Grades 9–14 STEM/CTE Career Pathways Systems—Lessons from the Field Speaker: Robert Schwartz <b>(STEM strand)</b>	
<b>Ballroom 6B Convention Center</b>			NESTA Earth System Science Share-a-Thon

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>2A Convention Center</b>	Let's Get Wet—Wind, Water, and Weather for Grades PreK–3		
<b>2B Convention Center</b>	Giving Students the Power		
<b>201 Convention Center</b>	Teaching Soils Is Fun and Educational	<i>Shark Tank</i> –Themed Projects for Students Grappling with Climate Change	
<b>203 Convention Center</b>	STEM, Equity, and Leadership	Creating Global Citizens in Elementary: An Integrated Exploration of Habitats, Migration, and Leadership (2:00–2:30 PM)	
<b>204 Convention Center</b>	Mastering Models in Elementary Science	Electrical Circuits with Bristlebots	
<b>212 Convention Center</b>	Phenomenon: What, Where, When, Why?	Coral Reefs, Fragile Wonders Under Threat: Bring Vibrant Environmental Stewardship Lessons to Your Students with Free NOAA Resources	
<b>213 Convention Center</b>	Building STEM PBL with Research Experiences for Teachers and Students	Motivating Shifts in Teaching Practice Through Development and Use of Unit Storylines Anchored in Phenomena ----- Orienting Communities, Building Leaders, and Administrators to NGSS Implementation in Districts	
<b>214 Convention Center</b>	Partnering with NSTA to Personalize Professional Learning for Your School or District	Building Equity in Formative Assessment: Making Sense of Student Responses to Inform Instruction	
<b>3A Convention Center</b>	ACS Middle Level Session: Chemical Reactions—Ocean Acidification		

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>3B Convention Center</b>	ASEE Session: ASEE’s K–12 Outreach—Engineering Go For It (eGFI), TeachEngineering, Link Engineering, and the National Science Digital Library	NSTA Press Session: Argument-Driven Inquiry in the Life, Physical, and Earth-Space Sciences: Lab Investigations for Grades 6–8	
<b>303 Convention Center</b>	ACS High School Session Four: Relating Structure and Properties: Demonstrating Understanding of Bond Strength and Interparticle Attractions		
<b>304 Convention Center</b>	Polymers: Basics for the Science Classroom		
<b>307/308 Convention Center</b>	Engineering Matters: Reaching Underrepresented Populations in STEM	Science in Your Schoolyard: Using Local Phenomena and Schoolyard Investigations to Engage Students	
<b>310 Convention Center</b>	Game On!	Neuroscience + Engineering + Technology: Neural Engineering for Secondary STEM Classrooms	
<b>Exhibit Hall Entrance Convention Center</b>			<b>Special Session</b> Meet the Presidents and Board/Council (2:45–3:30 PM)
<b>401 Convention Center</b>	<b>Exhibitor Workshop</b> Zombie Apocalypse! <i>(Sponsor: Texas Instruments)</i>	<b>Exhibitor Workshop</b> Harnessing the Wind: Energy Transfer and Transformation <i>(Sponsor: Great Minds)</i>	<b>Exhibitor Workshop</b> Opportunities for Washington State Secondary Science Teachers at Fred Hutchinson Cancer Research Center <i>(Sponsor: Science Education Partnership at Fred Hutchinson Cancer Research Center)</i>
<b>4C-1 Convention Center</b>	<b>Exhibitor Workshop</b> DNA Forensics Solves the Murder Mystery of Dr. Ward <i>(Sponsor: MiniOne Systems)</i>	<b>Exhibitor Workshop</b> DNA Tracking for Elephant Conservation <i>(Sponsor: MiniOne Systems)</i>	
<b>4C-2 Convention Center</b>		<b>Exhibitor Workshop</b> Science Poetry! Using Performance Literature to Put the “A” in STEAM Across the Curriculum <i>(Sponsor: Southern Science Supply)</i>	

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>4C-3 Convention Center</b>	<b>Exhibitor Workshop</b> From Gene to Protein— Explore Genetic Medicine with BioInteractive <i>(Sponsor: HHMI BioInteractive)</i>	<b>Exhibitor Workshop</b> Bringing Lessons to Life with HHMI BioInteractive’s Phenomenal Images <i>(Sponsor: HHMI BioInteractive)</i>	<b>Exhibitor Workshop</b> Improve Math Literacy Using Data Points from HHMI BioInteractive <i>(Sponsor: HHMI BioInteractive)</i>
<b>4C-4 Convention Center</b>	<b>Exhibitor Workshop</b> Hands-On Activities to Model Sampling, Habitat Degradation, and Animal Choice <i>(Sponsor: Carolina Biological Supply Co.)</i>	<b>Exhibitor Workshop</b> Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs <i>(Sponsor: Carolina Biological Supply Co.)</i>	
<b>604 Convention Center</b>	<b>Exhibitor Workshop</b> Blast Off with TCI Engineering Design for Middle School <i>(Sponsor: TCI)</i>	<b>Exhibitor Workshop</b> Ride the Wave with <i>Bring Science Alive!</i> <i>(Sponsor: TCI)</i>	
<b>605/610 Convention Center</b>		<b>Exhibitor Workshop</b> It’s in Their DNA! Teach Personalized Medicine with Students’ Own DNA <i>(Sponsor: Bio-Rad Laboratories)</i>	<b>Exhibitor Workshop</b> Mushroom Ecology and Why It Matters for Biofuel Production <i>(Sponsor: Bio-Rad Laboratories)</i>
<b>606 Convention Center</b>	<b>Exhibitor Workshop</b> Light Waves and Skin Cancer: Phenomena and 3-D Instruction for Grades 6–8 <i>(Sponsor: Amplify)</i>		
<b>607 Convention Center</b>	<b>Exhibitor Workshop</b> Let’s Improve Student Achievement Through STEM Teacher Actions and STEM Certification <i>(Sponsor: National Institute for STEM Education)</i>		
<b>608 Convention Center</b>	<b>Exhibitor Workshop</b> Crash Barrier: How to Design a STEM Engineering Challenge <i>(Sponsor: PASCO)</i>	<b>Exhibitor Workshop</b> Stoichiometry Made Easy: A Mole Story <i>(Sponsor: PASCO)</i>	<b>Exhibitor Workshop</b> Easy Titration: Breaking the Equivalence Curve <i>(Sponsor: PASCO)</i>
<b>609 Convention Center</b>	<b>Exhibitor Workshop</b> Phenomenal Phenomena <i>(Sponsor: Houghton Mifflin Harcourt)</i>	<b>Exhibitor Workshop</b> NGSS Laboratories <i>(Sponsor: Houghton Mifflin Harcourt)</i>	<b>Exhibitor Workshop</b> K–2 Engineering with Solar Panels and Shade Structures <i>(Sponsor: CE, Clean Energy Bright Futures)</i>
<b>611 Convention Center</b>	<b>Exhibitor Workshop</b> Attract Students to Water Concepts with Magnetic Water Molecule Models <i>(Sponsor: 3D Molecular Designs)</i>	<b>Exhibitor Workshop</b> “Going with the Flow” of Genetic Information <i>(Sponsor: MSOE Center for BioMolecular Modeling)</i>	<b>Exhibitor Workshop</b> Touch a Nerve with Hands-On Modeling of Neuronal Communication <i>(Sponsor: 3D Molecular Designs)</i>

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>612 Convention Center</b>	<b>Exhibitor Workshop</b> What Is a Species? <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Cell Differentiation and Gene Expression <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Photosynthesis and Respiration Shuffle <i>(Sponsor: Lab-Aids, Inc.)</i>
<b>613/614 Convention Center</b>	<b>Exhibitor Workshop</b> Common Physics Experiments Using the Latest Technology <i>(Sponsor: Vernier Software &amp; Technology)</i>	<b>Exhibitor Workshop</b> Robots, Coding, and Science: A Complete STEM Experience <i>(Sponsor: Vernier Software &amp; Technology)</i>	<b>Exhibitor Workshop</b> Common Chemistry Experiments Using the Latest Technology <i>(Sponsor: Vernier Software &amp; Technology)</i>
<b>615–617 Convention Center</b>		<b>NSTA Press Session: Eureka!</b> K–2 and Grades 3–5 Science Activities and Stories	
<b>618 Convention Center</b>	<b>Love Where You Science: A Context for Place-Based Experiential Learning</b> ----- Faculty Development Toward Inclusive, Student-Centered Teaching in STEM: Theory vs. Practice	<b>Developing Evaluation Criteria to Ensure Equitable Outcomes for Instructional Materials</b> ----- Constructing Coherent Conceptual Storylines	
<b>619 Convention Center</b>	<b>Cultural Formative Assessment: Designing Equitable Formative Assessments to Build on Learners’ Interests and Knowledge</b>		
<b>Ballroom 6A Convention Center</b>	<b>Featured Presentation</b> Inside—Outside: The Diverse World of Learning Speaker: Chris Reykdal <b>(PARTNERSHIPS strand)</b>	<b>CESI-Sponsored Session:</b> Mysteries as Motivators: Storylines, Discrepant Events, and Imagineering Make Science Wonderful!	

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>Aspen Sheraton</b>	Gene to Protein: Helping Students Connect DNA to Protein Structure and Function		Making Physics Fun for Everyone
<b>Cedar Sheraton</b>	Authentic Integration of the Four Components of STEM	NESTA Session: Integrating Climate Change Across the High School Curriculum	NSTA-WIDA Session: Seamless Integration of 3-D Science and Language Using Phenomena to Drive Instruction and Facilitate Science Discourse
<b>Redwood Sheraton</b>	NGSS Practices: Engaging in Argument from Evidence	Become a National Geographic Certified Educator	Science Practices: Effective, Fun, and Relevant
<b>Grand Ballroom A Sheraton</b>		30+ Fantastic Physics Teaching Ideas Found on Social Media! <b>(PARTNERSHIPS strand)</b>	Engaging Early Learners Through Cross-Curricular Integrated STEM Experiences <b>(PARTNERSHIPS strand)</b>
<b>Grand Ballroom B Sheraton</b>	Innovate and Impact: Design Thinking Across Disciplines in the Elementary Classroom <b>(STEM strand)</b>	Using Student Voice to Increase STEM Aspirations <b>(STEM strand)</b>	Engaging Grades 3–8 Students with Structural Shapes and Other Rich Hands-On STEM Experiences to Advance Learning for All Students <b>(STEM strand)</b>
<b>Grand Ballroom D Sheraton</b>		The Key to Success = Student Engagement: Strategies, Activities and Resources That Increase Student Interest and Achievement <b>(FINDING JOY strand)</b>	Establishing Connections in Environmental Science by Engaging Learners and ... So You Have a Makerspace...Now What? Developing Engaging, Meaningful Projects That Support and Connect to Your Science Curriculum <b>(FINDING JOY strand)</b>
<b>Ballard Sheraton</b>	Engineering Design to Study Physics	Catalyzing a Systems Approach to Studying Scientific Wellness, Disease, and Health Careers	
<b>Issaquah Sheraton</b>		Teaching Students to Build Systems Models from the News	Climate Science for Teachers: Using the NSTA Position Statement

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>Metropolitan A Sheraton</b>		Increasing Student Engagement Through “Aha!” Moments: Supporting the <i>NGSS</i> with Process Oriented Guided Inquiry Learning (POGIL) (SC-4) By Ticket Only; \$60 9:00 AM–3:00 PM (FINDING JOY strand)	
<b>Jefferson Sheraton</b>	STEM, Creativity, and Innovation—Proven Pathway to a Well-Rounded Education	Equitable Groupwork: Designing True Group Tasks	
<b>Capitol Hill Sheraton</b>	Building Bridges Between Biology and Health Through Type 2 Diabetes Education (SC-3) By Ticket Only; \$20 8:00–11:00 AM (PARTNERSHIPS strand)		

LOCATION	12:30–1:30 PM	2:00–3:00 PM	3:30–4:30 PM
<b>Cedar Sheraton</b>	NARST-Sponsored Session: A Macro- and Micro-Analysis of Teacher-Developed Integrated STEM Curriculum		
<b>Redwood Sheraton</b>	The Under-Representation Curriculum: Exploring Equity in STEM	NMLSTA-Sponsored Session: What Goes Up Must Come Down—Investigating Parachutes	
<b>Grand Ballroom A Sheraton</b>	Partners in Science Program Sponsored by M.J. Murdock Charitable Trust ----- Traveling Science Teacher: Opportunities Are at Your Fingertips <b>(PARTNERSHIPS strand)</b>		
<b>Grand Ballroom B Sheraton</b>	From Microplastics to Ocean Acidification: Engaging with Environmental Issues to Meet NGSS <b>(1:00–1:30 PM)</b> <b>(STEM strand)</b>		
<b>Grand Ballroom D Sheraton</b>	Before the Phenomena: An Interdisciplinary Foundation to Prepare Learners to Interact with Phenomena <b>(FINDING JOY strand)</b>		
<b>Ballard Sheraton</b>	Data Collection, Analysis, and Reporting in a Digital Laboratory	Using Models to Teach High School Chemistry Topics	
<b>Issaquah Sheraton</b>	NSELA-Sponsored Session: Developing Leadership for the Next Generation	CSSS-Sponsored Session; ClimeTime in Washington State	
<b>Jefferson Sheraton</b>	Exploring Genetics Through Genetic Disorders	Forensics: Science in the Real World	
<b>Metropolitan A Sheraton</b>			WSTA Awards Reception Ticket Required 6:00–8:00 PM

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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—Photo courtesy of Dennis Wise / Burke Museum

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](http://www.burkemuseum.org)).

LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>2A Convention Center</b>	How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions	Practical Applications: Assessing Human and Environmental Hazards in the Lab and in the Home	Learning About Watersheds with NGSS and Models
<b>2B Convention Center</b>	PolyWhat? Application of STEM Using Polymers	Model Me This: 3D Modeling (and Printing!) in the Classroom	NGSS Practices: Analyzing and Interpreting Data to Construct Explanations
<b>201 Convention Center</b>	How Can We Produce Fog for a Spooky Scene? Engaging Students Through Authentic Science and Engineering Practices	Injecting Viruses into the Curriculum	Using STEM Activities to Enhance Literacy Engagement
<b>203 Convention Center</b>		Student Science Project Competitions, Part 2: Organizing and Presenting Project Results	Using Apps to Teach Tree Appreciation
<b>204 Convention Center</b>	STEM-ify Your Classroom Supply List with Green Chemistry!	Science in the Early Childhood Classroom	
<b>205 Convention Center</b>	Jazz Up Student Science and Engineering Practices with Birds	Building from Student Prior Knowledge to Make Science Accessible to All	
<b>211 Convention Center</b>	A Unique Ice Core Investigation That Integrates the Three Dimensions of NGSS and STEM		
<b>212 Convention Center</b>	Meteorology 101: Weather for Teachers		Evaluating and Enhancing Teacher Education Programs and School-University Partnerships for Practice-Based STEM Teacher Preparation ----- Adding Modern Physics to the Traditional Physics Curriculum
<b>213 Convention Center</b>		Professional Development Strategies for Building Local and Regional Capacity with NGSS	Building Community Through Writing Science Curriculum

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>214 Convention Center</b>	Astronomy and Aerospace Engineering	When Two Heads Are Better Than One: Effective Co-Teaching in the Secondary Science Classroom	Water Like Wine—Reflects the Region Where It's Produced (11:30 AM–12 Noon)
<b>3A Convention Center</b>	Equity in STEM Careers and Classroom Experiences Fostering STEM Enthusiasm	Chemistry Can Be Fun with the ACS ChemClub Program	Melting Sea Stars Mystery: Investigating a Locally-Relevant Phenomenon Integrating Climate Science, Evolution, and Computational Inquiry
<b>3B Convention Center</b>	Leveraging Research Practice Partnerships to Support Effective and Ongoing Teacher Professional Development	Increasing Student Engagement by Incorporating Roles in Collaborative Team Learning	The "Ins" and "Outs" of a Squid Dissection with the Oregon Sea Grant Marine Education Program
<b>303 Convention Center</b>	To Bee or Not to Bee... Students Track Pollinators in Their School and Community as They Become Citizen Scientists	Learn to Build Drug Models You Can Teach Your Students to Build	University of Puget Sound Nature in the Classroom Program
<b>304 Convention Center</b>	Analyzing Hazards and Risks in High School Chemistry Labs	Scale, Proportion, Quantity: Stoichiometry Simplified via NGSS	Environmental Monitoring with Aerial Drones (11:30 AM–12 Noon)
<b>305 Convention Center</b>	Building Curricula Around Phenomenon (8:30–9:00 AM)		
<b>307/308 Convention Center</b>	Coral Cores and Climate Change	Where Have All The Bees Gone? Supporting All Students Through Problem-Based Enhanced Language Learning (PBELL)	Science Communication for Middle School and High School Teachers
<b>309 Convention Center</b>	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	Nesting an Honors Course in a High School Science Class ----- The Substitute Dilemma	Two Deserts, One Sky: Connecting Students Half a World Apart by Teaching Each About Their Own Desert ----- See the World as a Citizen Scientist
<b>310 Convention Center</b>	Let's Build a Fan Cart	Designing a Martian Habitat for Potatoes	Say What? Getting Students to Learn and Use Scientific Vocabulary Words

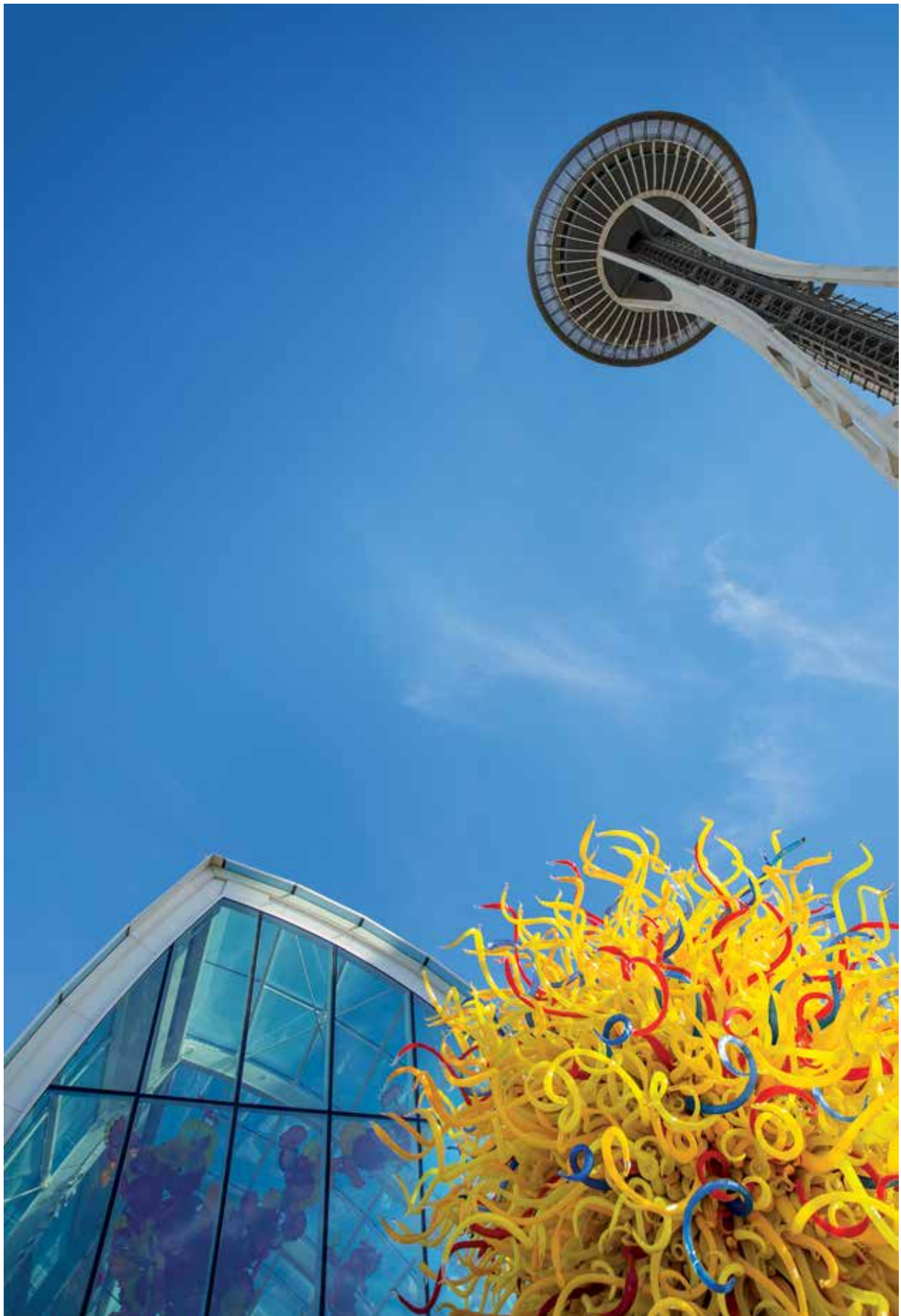
Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>Exhibit Hall 4A Convention Center</b>		<b>NSTA Exhibits!</b> 9:00 AM–12 Noon	
<b>401 Convention Center</b>	Student Modeling of Isometric Structures in Organic and Biological Molecules	Will Computers Take Our Jobs? A Brief Workshop on Teaching Artificial Neural Networks in the Classroom	Vacationing the Solar System: Plausible?
<b>4C-1 Convention Center</b>		Fostering Interdisciplinary Climate Change Activities	
<b>4C-2 Convention Center</b>	Educating for a Green Economy (EGE): Connecting Students to Green Jobs in Washington State <b>(STEM strand)</b>	Revitalizing STEM Education Through Manufacturing Apprenticeships ----- Promoting Equity Through a Common High School Science Sequence: One District's Journey <b>(STEM strand)</b>	Diverse Learners Tackle Plastic Pollution <b>(FINDING JOY strand)</b>
<b>4C-3 Convention Center</b>	Cancer Medicine Focus Connects Students to Real-Life STEM Applications of Biomaterials Technologies	Cancer Medicine Focus Connects Students to Real-Life STEM Applications of Cryopreservation <b>(FINDING JOY strand)</b>	NSTA Press Session: <i>Never Stop Wondering</i>
<b>4C-4 Convention Center</b>	DIG Field School: Paleontologists and Teachers Working and Learning Together <b>(PARTNERSHIPS strand)</b>	NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think! <b>(PARTNERSHIPS strand)</b>	Geo-Inquiry in the Science Classroom ----- Stormwater Stewards: Empowering Students Within Their Watershed <b>(PARTNERSHIPS strand)</b>
<b>604 Convention Center</b>	<b>Exhibitor Workshop</b> Ramp It Up! Science and Engineering Practices in the NGSS <i>(Sponsor: TCI)</i>		
<b>605/610 Convention Center</b>	Assessing Three-Dimensional Learning By Separate Registration 8:00 AM–5:00 PM		
<b>609 Convention Center</b>		<b>Exhibitor Workshop</b> STEAM: Bringing Scientific Illustration to Life <i>(Sponsor: Curio Interactive)</i>	

Earth & Space Science	Engineering & Tech	Life Science	Physical Science	Informal Science	General Science
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LOCATION	8:00–9:00 AM	9:30–10:30 AM	11:00 AM–12 Noon
<b>611 Convention Center</b>	<b>Exhibitor Workshop</b> A Microscopic to Molecular Perspective in Modeling Chromosomes <i>(Sponsor: MSOE Center for BioMolecular Modeling)</i>	<b>Exhibitor Workshop</b> Using Water Models to Uncover Misconceptions in Chemistry <i>(3D Molecular Designs)</i>	
<b>612 Convention Center</b>	<b>Exhibitor Workshop</b> Using Climate Proxies to Learn About Earth’s Climate History <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Prospecting for Mineral Ore <i>(Sponsor: Lab-Aids, Inc.)</i>	<b>Exhibitor Workshop</b> Calling All Carbons <i>(Sponsor: Lab-Aids, Inc.)</i>
<b>615–617 Convention Center</b>	<b>NSTA Press Session: Argument-Driven Inquiry in Biology, Chemistry, and Physics: Lab Investigations for Grades 9–12</b>	<b>NSTA Press Session: Instructional Sequence Matters, Grades 3–5</b>	<b>NSTA Press Session: “What Is the Difference Between Weather and Climate?”</b>
<b>Ballroom 6A Convention Center</b>		<b>WSTA General Membership Meeting (9:00–10:30 AM)</b>	





—Photo courtesy of Visit Seattle



—Photo courtesy of Jacob Slaton

Complete Exhibitor listings, as well as Exhibitor Workshops are available on the NSTA Conference App. To download, visit:

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

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8:00–9:00am	Quick and Easy Experiments Using the Latest Technology
9:30–10:30am	Common Biology Experiments Using the Latest Technology
11:00–12:00pm	Common Middle School Experiments Using the Latest Technology
12:30–1:30pm	Common Physics Experiments Using the Latest Technology
2:00–3:00pm	Robots, Coding, and Science: A Complete STEM Experience
3:30–4:30pm	Common Chemistry Experiments Using the Latest Technology



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