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- 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 WiFi information
- Learn more about the exhibitor and sponsors
- Find out where NSTA events are happening
- Tweet while you are in sessions or attending events
- Receive important updates and notifications

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Visit: www.nsta.org/conferenceapp

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

NSTA Affiliates
Association for Multicultural Science Education (AMSE)
Association for Science Teacher Education (ASTE)
Association of Science-Technology Centers (ASTC)
Council for Elementary Science International (CESI)
Council of State Science Supervisors (CSSS)
National Association for Research in Science Teaching (NARST)
National Middle Level Science Teachers Association (NMLSTA)
National Science Education Leadership Association (NSELA)
Society for College Science Teachers (SCST)
The 8th Annual STEM Forum & Expo, hosted by NSTA

NSTA and the STEM Forum Steering Committee are extremely grateful to the following companies and organizations for their generous support and contributions to the 8th Annual STEM Forum & Expo, hosted by NSTA.

**Sponsors**

Great Minds
National Math + Science Initiative
Pitsco Education
PlaySTEAM
STEMscopes—Accelerate Learning
TeacherGeek Inc.

**STEM Partners**

American Institute of Architects (AIA)
International Technology and Engineering Educators Association (ITEEA)
NCTM (National Council of Teachers of Mathematics)
STEMx

**Contributors**

American Institute of Architects Committee on Architecture for Education
The National Academies of Sciences, Engineering, and Medicine
National Science Foundation
Northrop Grumman
STEM3 Academy
STEMx
Welcome to the 8th Annual STEM Forum & Expo, hosted by NSTA

Dear STEM Forum & Expo Participants:

Welcome to San Francisco, “The City By the Bay.” This summer the National Science Teaching Association, along with our program partners, welcomes you to the 8th Annual STEM Forum & Expo. Like the bridges found throughout this fair city, the STEM Forum & Expo hopes to build bridges within STEM education between formal and informal educators, plus between institutions of learning, the public sector, and governmental agencies from around the world. We come together this week to learn, network, and share the best, and most innovative, practices in STEM learning.

In addition, this forum continues NSTA’s commitment to a deeper understanding of and greater participation in STEM learning for all learners. Working collectively and in concert with all academic disciplines in formal and informal education settings, we strive with this STEM Forum to move forward and improve our world’s environment, culture, and quality of life for all individuals through STEM education. The STEM fields continue to play a key role in economic prosperity, global stability, and the advancement of global enterprise. By coming together and sharing our knowledge and expertise in STEM, we are able to help our students stay globally competitive in terms of innovation, while demonstrating real-life applications and relevance to the concepts we are teaching.

We hope this year’s forum will invigorate you, boost your energy and enthusiasm for STEM learning, and provide you with unparalleled opportunities to engage in dialogue, gather resources, and network with like-minded colleagues. This conference is designed to provide you with information and resources to become successful with the next steps of implementing STEM into your place of learning and teaching. We encourage you to embrace the potential that STEM can add to your educational settings by using the tools, knowledge, and resources you will accumulate.

In conclusion, we are thrilled to bring to you this highly specialized professional development event that enables us, as educators, to grow as professionals, inspire your youth, and foster inclusivity and diversity within STEM. We hope you find the presentations, workshops, panels, speakers, and exhibits informative and useful.

Do take some time this week to explore this amazing city, and visit some of the historic sites, museums, parks, and gardens. You will find STEM applications all around you in San Francisco. On behalf of the Steering Committee and NSTA, thank you for making STEM a priority by attending this forum. We wish you a productive and meaningful stay in San Francisco.

Jennifer C. Williams, Steering Committee Chair,
8th Annual STEM Forum & Expo, hosted by NSTA

Dennis Schatz, 2019–2020 NSTA President
Meeting Location and Times
The STEM Forum attendee and exhibitor services, the exhibits, the NSTA Store, and all sessions will be located at Moscone Center West. The STEM Forum & Expo will begin on Wednesday, July 24, at 10:30 AM, starting with Program Partner sessions, along with a First-Timers session from 1:30 to 2:30 PM, followed by the Student Panel, and an Opening Exhibits Reception. The Thursday keynote presentation will be given by Bernard A. Harris, Jr., former astronaut and CEO of the National Math + Science Initiative, 4:30 to 5:30 PM.

The STEM Forum & Expo will end on Friday with a Closing Session from strand leaders, 4:30 to 5:30 PM.

Express Check-In
Registration is required for participation in all forum activities and the exhibits. Express Check-In and Attendee Services are located in the Level 1 Lobby of Moscone Center West. 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., July 24 10:00 AM–6:30 PM
- Thu., July 25 7:00 AM–5:30 PM
- Fri., July 26 7:00 AM–5:30 PM

The NSTA Store is located in the Level 2 Lobby of Moscone Center West and will be open the following hours:

- Wed., July 24 10:00 AM–6:30 PM
- Thu., July 25 7:30 AM–4:30 PM
- Fri., July 26 7:30 AM–4:30 PM

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.

Transportation Discounts
SuperShuttle is offering 10% off airport rides at San Francisco International Airport (SFO); Oakland International Airport (OAK); and Norman Y. Mineta San José International Airport (SJC).

To receive the NSTA discount, visit bit.ly/31UBaqn (discount code is JMGSK).

For additional travel discounts, including airfare and car rental, visit www.nsta.org/stemtravel.

First-timers, Preservice Teachers and New Teachers Session
Come learn about the STEM Forum & Expo program and networking opportunities for registrants who are first-time attendees. Join us for tips on navigating the forum and learn how to make the most of the amazing opportunities available over the next few days.

Is This Your First NSTA Conference?
First-Timers Session
Wednesday, July 24
1:30–2:30 PM
Moscone Center West, 2024
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 (PT) at 877-352-6710 (toll-free) or 801-505-4611. After hours and on Saturday, call 801-243-4476.

1. Hotel Zelos San Francisco
   12 4th St.

2. Intercontinental San Francisco Hotel
   888 Howard St.

3. San Francisco Marriott Marquis Hotel
   (Headquarters Hotel)
   780 Mission St.

Shuttle service will not be provided as all hotels are within walking distance of Moscone Center West.
NSTA Exhibits

The NSTA Exhibit Hall is a must-see! NSTA brings you the leading STEM education companies and organizations to showcase products, services, curricula, and much more. You’ll discover something new and exciting in the world of STEM 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 forum activities. A map display of the Exhibit Hall is accessible via our Conference app. A complete list of exhibitors is on page 45.

Exhibit Hall Hours. Located in Level 1 Exhibit Hall of Moscone Center West, exhibits will be open for viewing during the following hours:

Opening Exhibits Reception
Wed., July 24 4:30–6:30 PM

Exhibits
Thu., July 25 9:15 AM–3:00 PM
Fri., July 26 9:15 AM–3:00 PM

Exhibitor Workshops. Exhibitor-sponsored workshops for STEM teachers are offered throughout the forum. 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 Moscone Center West
NSTA is pleased to announce that 2019 STEM Forum attendees will have access to a robust Wi-Fi service, available in the public/common areas and meeting rooms of Moscone Center West. However, this Wi-Fi is not accessible in the Exhibit Hall. There is no password.

Network: NSTA19

NSTA Community Hub
Also, be sure to stop by NSTA Community Hub, located at Booth 313 in the Exhibit Hall. Find out more about how we are celebrating our 75th anniversary and the benefits of becoming an NSTA member, including all the best professional development and resources a STEM educator needs.

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 Moscone Center West, the Marriott Marquis, 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 for information.

Graduate-Level Credit Opportunity
8th Annual STEM Forum & Expo, hosted by NSTA attendees can earn one or two graduate-level credits/units in professional development through Dominican University of California (dominicancaonline.com) course EDUO 9034. Participants must attend the STEM Forum, complete the required assignments, and pay a fee of $95 for one credit/unit or $190 for two credits/units. To learn more about the assignment requirements and registration, visit bit.ly/2I8pI2N or stop by the Dominican University of California booth located in the Level 1 lobby of Moscone Center West during the following hours:

Wednesday 8:00 AM–4:00 PM
Thursday 8:00 AM–4:00 PM
Friday 8:00 AM–5:00 PM

Register within three weeks of the STEM Forum ending date.

Special Offer for STEM Forum & Expo registrants
Westfield San Francisco Centre • 865 Market St., San Francisco, CA 94103

Located within walking distance of Moscone Center West, Westfield San Francisco Centre is a shopping destination with theaters, restaurants, and department stores. Westfield San Francisco Centre is extending its Black Card Program to STEM Forum & Expo registrants. It’s as simple as showing your badge to the Westfield Concierge, on centre’s Level 1, to redeem your Westfield San Francisco Centre Black Card. For more information, visit www.westfield.com/sanfrancisco/sfcblackcardprogram.html.
Help NSTA’s GREEN efforts by completing session evaluations online July 24—August 5, 2019, while the session is fresh in your mind! During the STEM Forum, session evaluations can be completed on the computers at the Presenters/Presiders counter in the Attendee Services Area.

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

- Go to the STEM Forum web page: www.nsta.org/stemforum
- 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 August 6, 2019, 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.
Level One

Minna Street

Exhibits
Exhibit Hall
Lobby
Registration/Express Check-In

Shuttles Drop-Off
Howard Street

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

Science, technology, engineering, and math (STEM) instruction can be fun and engaging for students at any grade level with technology from Vernier Software & Technology.

INSPIRE STEM CURIOSITY IN YOUR STUDENTS.

¹ BUSINESS CENTER FOR A COLLEGE- AND CAREER-READY AMERICA

Visit learn.vernier.com
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**

**2019 Area Conferences**  
Salt Lake City, Utah—October 24–26  
Cincinnati, Ohio—November 14–16  
Seattle, Washington—December 12–14

**2020 Area Conferences**  
Pittsburgh, Pennsylvania—October 29–31  
New Orleans, Louisiana—November 19–21  
Phoenix, Arizona—December 10–12

**2021 Area Conferences**  
Portland, Oregon—October 28–30  
National Harbor, Maryland—November 11–13  
Los Angeles, California—December 9–11
Keynote Presentation

Thursday, July 25, 4:30–5:30 PM

Bernard A. Harris, Jr.
Author, Former NASA Astronaut and Chief Executive Officer, National Math + Science Initiative

Dream Beyond

From modest beginnings to soaring to unbelievable heights, Bernard Harris’ maxim is that with the right attitude, your altitude has no limit. Author of the book, Dream Walker: A Journey of Achievement and Inspiration, Dr. Harris is currently the CEO of the National Math + Science Initiative, aimed at improving teacher effectiveness and student achievement in STEM education across the country.

The first African American to walk in space, Bernard Harris is a medical doctor, a former NASA scientist and astronaut, and former CEO and managing partner of successful venture capital firm. While at NASA, he conducted research in musculoskeletal physiology and clinical investigations of space adaptation and developed in-flight medical devices to extend astronaut stays in space.

NSTA wishes to thank National Math + Science Initiative for sponsoring this speaker.

(See page 29 for location.)

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

Visit: www.nsta.org/conferenceapp

First-Timers Orientation

Come learn about the STEM Forum & Expo program and networking opportunities for registrants who are first-time attendees. See page 4 for details.

Wednesday, July 24

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9:15 AM–3:00 PM Exhibits .......................... 28
9:30–10:30 AM Sessions, Exhibitor Workshops .......................... 24–28
10:30 AM–12 Noon Elementary STEM Showcase! .......................... 28
11:00 AM–12 Noon Sessions, Exhibitor Workshops .......................... 24–28
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3:00–4:00 PM Sessions, Exhibitor Workshops .......................... 29–32
4:30–5:30 PM Keynote Presentation: Bernard A. Harris, Jr. .......................... 29

Friday, July 26

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9:30–10:30 AM Sessions, Exhibitor Workshops .......................... 34–38
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11:00 AM–12 Noon Sessions, Exhibitor Workshops .......................... 34–38
1:30–2:30 PM Sessions, Exhibitor Workshops .......................... 39–42
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4:30–5:30 PM Closing Session: That’s a Wrap … a STEM-tastic Celebration. . . . 39
## American Institute of Architects

**Wednesday, July 24**

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<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–11:30 AM</td>
<td>Reimagining Spaces for STEM and STEAM: An Architectural Design Workshop for Elementary Educators</td>
<td>2002, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Reimagining Spaces for STEM and STEAM: An Architectural Design Workshop for High School Educators</td>
<td>2003, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Reimagining Spaces for STEM and STEAM: An Architectural Design Workshop for Middle Level Educators</td>
<td>2014, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Imagining Makerspaces for STEM/STEAM: An Architecture Design Workshop for Elementary Educators</td>
<td>2002, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Imagining Makerspaces for STEM/STEAM: An Architecture Design Workshop for Middle Level Educators</td>
<td>2003, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Imagining Makerspaces for STEM/STEAM: An Architecture Design Workshop for High School Educators</td>
<td>2014, Moscone West</td>
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## International Technology and Engineering Educators Association

**Wednesday, July 24**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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</thead>
<tbody>
<tr>
<td>10:30–11:30 AM</td>
<td>Elementary STEM Building Blocks: EbD TEEMS PreK–6</td>
<td>2001, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Secondary STEM Design-Driven Problem Solving: EbD for Grades 6–12</td>
<td>2016, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Jump-Starting I-STEM for All Children</td>
<td>3006, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>The Computer Science and Computational Thinking of STEM</td>
<td>2001, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Engineering for Social Good: EbD™ PreK–12</td>
<td>2016, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>So Now You’re a STEM Teacher…Now What?</td>
<td>3006, Moscone West</td>
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</tbody>
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## National Council of Teachers of Mathematics

**Wednesday, July 24**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–11:30 AM</td>
<td>Bring the “M” in STEM to Life! Considerations, Challenges, and Opportunities!</td>
<td>2006, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Geometry Project: “Design a School”</td>
<td>2018, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Catalyzing Change in High School Mathematics and How It Relates to STEM</td>
<td>2006, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>High-Quality Mathematics Instruction Is STEM Education</td>
<td>2018, Moscone West</td>
</tr>
</tbody>
</table>

## STEMx

**Wednesday, July 24**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:30–11:30 AM</td>
<td>Recognizing Excellent STEM Teaching Through Micro-credentials</td>
<td>2020, Moscone West</td>
</tr>
<tr>
<td>10:30–11:30 AM</td>
<td>Strength in Numbers—Building an Effective STEM Ecosystem</td>
<td>2022, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Leveraging Partnerships to Create Authentic Learning Experiences for Students and Teachers</td>
<td>2008, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Innovative Strategies for Engaging Parents/Families Teachers, Guidance Counselors, Higher Education, and Business Partners to Expand Pathways to STEM Careers</td>
<td>2020, Moscone West</td>
</tr>
<tr>
<td>12 Noon–1:00 PM</td>
<td>Ensuring Equity and Access in STEM for ALL</td>
<td>2022, Moscone West</td>
</tr>
</tbody>
</table>
2019 NSTA Area Conferences on Science Education

This Is the Place for Monumental Science
SALT LAKE CITY, UT
OCT. 24–26

Science: The Bridge to Endless Possibilities
CINCINNATI, OH
NOV. 14–16

Fostering a Culture for Science
SEATTLE, WA
DEC. 12–14

NSTA thanks our local committees

John R. Taylor
Conference Chairperson
Southern Utah University

Josh Stowers
Program Coordinator
Brigham Young University

Dawn Monson
Local Arrangements Coordinator
Utah Science Teachers Association

Angela McMurry
Conference Chairperson
Arcanum High School

Paula Roberts
Program Coordinator
Mahoning County Educational Service Center

Leslie Silbernagel
Local Arrangements Coordinator
Northwest Local School District

John P. McNamara
Conference Chairperson
Washington State University

Bob Sotak
Program Coordinator
Sotak Consulting Services

Lisa Chen
Local Arrangements Coordinator
Shoreline School District

Learn more about the NSTA Area Conferences at
www.nsta.org/conferences

#NSTA19

Use Code 5for4 to Get 5 Registrations for the Price of 4
Wednesday, July 24

1:30–2:30 PM  First-Timers Orientation
NSTA Board and Council • Room 2024, Moscone Center West

2:30–4:00 PM  Student Panel Discussion: The Power of STEM Education
Panel Moderator: Matt Hartman, eCYBERMISSION Content Manager • Room 2006, Moscone Center West

Thursday, July 25

8:00–9:00 AM  Featured Panels/Hands-On Workshops
• Connecting the STEM Pipeline from K to Career (Sponsored by Northrop Grumman)
  Panel Moderator: Steve Wallis, Da Vinci High School • Room 2003, Moscone Center West
• The Federal STEM Plan: A Starting Point for State STEM Initiatives (Sponsored by STEMx)
  Panel Moderator: Regina Schofield, Battelle • Room 2008, Moscone Center West
• Using 3D Printers and Design Thinking to Create Career Pathways Workshop
  Room 2002, Moscone Center West
• English Language Learners in STEM Subjects (Sponsored by The National Academies of Sciences, Engineering, and Medicine)
  Panel Moderator: K. Renae Pullen, Caddo Parrish Public Schools • Room 2006, Moscone Center West
• NSTA/NCTM STEM Ambassadors: STEM Up Your Classroom (Sponsored by National Science Foundation)
  Panel Moderator: Brian Langley, Novi High School • Room 2014, Moscone Center West
• STEM and Special Needs—Strategies for Success (Sponsored by STEM 3 Academy)
  Room 2001, Moscone Center West
• Trends in STEM Education and Their Impact
  Panel Moderator: Kavita Gupta, Monta Vista High School • Room 2016, Moscone Center West

10:30 AM–12 Noon  Elementary STEM Showcase! (sponsored by Great Minds, Pitsco Education, and PlaySTEAM)
Exhibit Hall, Moscone Center West
**Keynote Presentation: Dream Beyond**

*Thursday, July 25*

4:30–5:30 PM  **Keynote Presentation: Bernard A. Harris, Jr.**  
*Sponsored by National Math + Science Initiative*  
Room 2001/2003/2014/2016, Moscone Center West

---

**Friday, July 26**

8:00–9:00 AM  **Featured Panels/Hands-On Workshops**

- **Connecting the STEM Pipeline from K to Career**  
  *Sponsored by Northrop Grumman*  
  Panel Moderator: Steve Wallis, Da Vinci High School  
  Room 2003, Moscone Center West

- **The Federal STEM Plan: A Starting Point for State STEM Initiatives**  
  *Sponsored by STEMx*  
  Panel Moderator: J. Wesley Hall, STEMx at Battelle  
  Room 2008, Moscone Center West

- **Using 3D Printers and Design Thinking to Create Career Pathways Workshop**  
  Room 2002, Moscone Center West

- **English Language Learners in STEM Subjects**  
  *Sponsored by The National Academies of Sciences, Engineering, and Medicine*  
  Panel Moderator: K. Renae Pullen, Caddo Parrish Public Schools  
  Room 2006, Moscone Center West

- **NSTA/NCTM STEM Ambassadors: STEM Up Your Classroom**  
  *Sponsored by National Science Foundation*  
  Panel Moderator: Brian Langley, Novi High School  
  Room 2014, Moscone Center West

- **STEM and Special Needs—Strategies for Success**  
  *Sponsored by STEM3 Academy*  
  Room 2001, Moscone Center West

- **Trends in STEM Education and Their Impact**  
  Panel Moderator: Kavita Gupta, Monta Vista High School  
  Room 2016, Moscone Center West

9:30–10:30 AM  **2018 NSTA/NCTM STEM Ambassador Share-a-Thon**  
Lobby #3, Moscone Center West

11:00 AM–12 Noon  **Featured Workshop: Designing, Inspiring, Resilient Settings for STEM/STEAM/STREAM**  
*Sponsored by American Institute of Architects Committee on Architecture for Education*  
Room 2002, Moscone Center West

4:30–5:30 PM  **Closing Session: That’s a Wrap…A STEM-tastic Celebration**  
Room 2006, Moscone Center West

- Jennifer Williams, Steering Committee Chair, 8th Annual STEM Forum & Expo, Isidore Newman School
- Adriana Guerra, Teacher, E.P. Foster STEM Academy
- Brandi Leggett, Instructional Coach, Rosehill Elementary School
- Kavita Gupta, AP Chemistry Teacher, Monta Vista High School
- Kerri Murphy, Teacher, Norton High School
- Karen Hays, Youth Programs Manager, Denver Zoo
- Elizabeth Allan, NSTA President-Elect, and Professor of Biology, University of Central Oklahoma
Lower Elementary/Early Childhood

Students in the lower elementary grades are beginning to understand the world around them and the role they play in it. They are instinctively curious and want to make sense of their surroundings. By providing students with inquiry-based experiences in Science, Technology, Engineering, and Mathematics, we can unlock each student’s natural curiosity and help them understand the world in an engaging way. The foundational skills learned and mastered through the integration of STEM during the early years, if done right, will help these students become critical thinkers and makers who can innovate the future they will be a part of. Sessions in this strand will emphasize open-ended and active exploration, learning through play, and hands-on investigation of the real world through the lens of NGSS.

Upper Elementary

How do we respond to research that indicates that by the time our students reach the fourth grade, a third of them will lose interest in science? To reverse this trend and ignite their interest in future STEM careers, elementary students need quality learning activities and experiences that spark curiosity, promote confidence, support the rigor of current standards, and develop a solid foundation in the STEM areas so that they are prepared to both work and live in the 21st century. The sessions in this strand showcase hands-on, interactive programs and instructional strategies that support STEM and have been successfully integrated into the elementary core curriculum.

Middle Level

Engaging students through opportunities to explore STEM fields of study that support the NRC Framework and the Next Generation Science Standards is a top priority at the middle school level. A successful middle school STEM program allows students to create, innovate, communicate, collaborate, and iterate projects that are driven by their own interests. The sessions in this strand showcase learning environments where Science, Technology, Engineering, and Mathematics interconnect to serve as a vehicle for discovery, innovation, and independent problem solving while also meeting rigorous content standards.

High School

In preparation for entry to college and industry, students must be able to apply their understanding in the context of real-world problem solving. In STEM for grades 9–12, educators help students succeed and progress through the pipeline, as they gain access to pathways for rewarding and productive careers. Here, STEM is integrated in classroom-based practices that highlight innovative, hands-on, student-centered approaches that seek to nurture curiosity, motivation, and achievement in these fields. See how educators are impacting student interest and teacher instruction and hear what is required to scale this across subject areas, schools, and districts. Workshops in this strand showcase the creative ways educators are addressing the challenges of engaging students in STEM while meeting the NGSS and Common Core Math standards.

Building STEM Ecosystems: Community Partnerships

Successful STEM programs incorporate hands-on and real-life applications where students develop the skills and mind-sets needed to answer complex questions, investigate global issues, and develop solutions to real-world challenges. School and district leaders cannot create these opportunities on their own. They need to leverage the resources and expertise of experts by building partnerships to create STEM ecosystems to assist educators and to provide students with these prospects. Building partnerships with community organizations—including: business/industry, informal educators, home school educators, after-school programming, and education-focused entities—help to provide STEM experiences and connect preK–16 schools and universities to valuable resources needed to support the development of these skills. Leveraging those partnerships can be the key to preparing students and supporting teachers to meet the needs of a dynamic workforce that is constantly changing. The sessions in this strand highlight select preK–16 partnership initiatives that have been successfully implemented and have demonstrated positive outcomes. In addition, school administrators will learn ways to assess the effectiveness of these partnerships on student and teacher performance.

Postsecondary

Join our community of postsecondary educators as important and relevant topics in STEM education are discussed and debated in this unique Edcamp/unconference format. Participation in STEM research and research on STEM teaching and learning is a primary focus for college and university faculty. Interdisciplinary research in the STEM fields provides both the mode for the NGSS science and engineering practices as well as the foundation for the disciplinary core ideas. STEM research is, by nature, interdisciplinary and crosscutting. Sessions in this strand will highlight pedagogical and discipline-based research on STEM teaching and learning as well as research in the areas of effective professional development, preservice education, and STEM fields of study.
Great Minds® curriculum ranks among the top performers in independent reviews, and district leaders highly recommend it.

Join us at Booth # 213 to find out why.

**Elementary STEM Showcase**
Thursday | 10:30 a.m.–12:30 p.m.

**Hands-on Workshop**
Rising Flood Waters: Engineering Design Challenge
Thursday | 3:00 p.m.–4:00 p.m.

greatminds.org
### Wednesday At-A-Glance

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>10:30–11:30 AM</th>
<th>12 Noon–1:00 PM</th>
<th>2:30–4:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001 Moscone West</td>
<td>ITEEA Session: Elementary STEM Building Blocks: EbD TEEMS PreK–6</td>
<td>ITEEA Session: The Computer Science and Computational Thinking of STEM</td>
<td></td>
</tr>
<tr>
<td>2002 Moscone West</td>
<td>AIA Session: Reimagining Spaces for STEM and STEAM: An Architectural Design Workshop for Elementary Educators</td>
<td>AIA Session: Imagining Makerspaces for STEM/STEAM: An Architecture Design Workshop for Elementary Educators</td>
<td></td>
</tr>
<tr>
<td>2006 Moscone West</td>
<td>NCTM Session: Bring the “M” in STEM to Life! Considerations, Challenges, and Opportunities!</td>
<td>NCTM Session: Catalyzing Change in High School Mathematics and How It Relates to STEM</td>
<td>Opening Session: Student Panel Discussion: The Power of STEM Education</td>
</tr>
<tr>
<td>2008 Moscone West</td>
<td>STEMx Session: Advancing Computer Science in Your State...What Is Your Plan?</td>
<td>STEMx Session: Leveraging Partnerships to Create Authentic Learning Experiences for Students and Teachers</td>
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</tr>
<tr>
<td>2014 Moscone West</td>
<td>AIA Session: Reimagining Spaces for STEM and STEAM: An Architectural Design Workshop for Middle Level Educators</td>
<td>AIA Session: Imagining Makerspaces for STEM/STEAM: An Architecture Design Workshop for Middle Level Educators</td>
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<tr>
<td>2018 Moscone West</td>
<td>NCTM Session: Geometry Project: “Design a School”</td>
<td>NCTM Session: High-Quality Mathematics Instruction Is STEM Education</td>
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<tr>
<td>2020 Moscone West</td>
<td>STEMx Session: Recognizing Excellent STEM Teaching Through Micro-credentials</td>
<td>STEMx Session: Innovative Strategies for Engaging Parents/Families, Teachers, Guidance Counselors, Higher Education, and Business Partners to Expand Pathways to STEM Careers</td>
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</tbody>
</table>

**Lower Elementary**  **Upper Elementary**  **Middle Level**  **High School**  **Partnerships**  **Postsecondary**  **Exhibitor Workshops**
## Complete Session Details on App

### Wednesday At-A-Glance

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<thead>
<tr>
<th>LOCATION</th>
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<tbody>
<tr>
<td>2022 Moscone West</td>
<td>STEMx Session: Strength in Numbers—Building an Effective STEM Ecosystem</td>
<td>STEMx Session: Ensuring Equity and Access in STEM for ALL</td>
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<tr>
<td>Level 1 Exhibit Hall Moscone West</td>
<td>Assessing Three-Dimensional Learning Workshop Ticket Required; By Preregistration Only</td>
<td>ITEEA Session: Jump-Starting I-STEM for All Children</td>
<td>ITEEA Session: So Now You’re a STEM Teacher… Now What?</td>
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<tr>
<td>3006 Moscone West</td>
<td>3010 Moscone West</td>
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<th>LOCATION</th>
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<th>4:30–6:30 PM</th>
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<tr>
<td>2024 Moscone West</td>
<td>First-Timers’ Orientation</td>
<td>Opening Exhibits Reception</td>
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<tr>
<td>Level 1 Exhibit Hall Moscone West</td>
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# Thursday At-A-Glance

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<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
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</thead>
</table>
| **2000 Moscone West** | **Exhibitor Workshop**  
Shape Determines How Objects Function to Solve a Problem  
(Sponsor: Carolina Biological Supply Co.) | **Exhibitor Workshop**  
Implementing AR/VR in District STEAM Programs  
(Sponsor: zSpace) |  |
| **2001 Moscone West** | **Featured Hands-On Workshop**  
STEM and Special Needs—Strategies for Success  
(Sponsored by STEM3 Academy) | **Starting a School Garden with a Shoestring Budget** |  |
| **2002 Moscone West** | **Featured Hands-On Workshop**  
Using 3D Printers and Design Thinking to Create Career Pathways | **Bridging the STEM Acronym:**  
Seamless Integration of Science and Math |  |
| **2003 Moscone West** | **Featured Panel**  
Connecting the STEM Pipeline from K to Career  
(Sponsored by Northrop Grumman) | **One, Two, Three, Four... First-Graders Love to Explore... with Sound!** |  |
| **2004 Moscone West** | **Exhibitor Workshop**  
Make Any Classroom a Makerspace  
(Sponsor: Pearson) | **Exhibitor Workshop**  
Using the Chemistry Lab for STEM Exploration Before Explaining  
(Grades 6–12)  
(Sponsor: Pearson) |  |
| **2005 Moscone West** | **Exhibitor Workshop**  
NGSS—Designing Ocean Breakwaters  
(Sponsor: Lab-Aids, Inc.) | **Exhibitor Workshop**  
NGSS—Exploring Energy Efficiency  
(Sponsor: Lab-Aids, Inc.) |  |
| **2006 Moscone West** | **Featured Panel**  
English Language Learners in STEM Subjects  
(Sponsored by The National Academies of Sciences, Engineering, and Medicine) | **Using Shadow Puppets to Create a Cross-Curricular STEAM Unit** |  |
| **2007 Moscone West** | **Exhibitor Workshop**  
Robots, Coding, and Science: A Complete STEM Experience  
(Sponsor: Vernier Software & Technology) | **Exhibitor Workshop**  
Quick and Easy Experiments Using the Latest Technology  
(Sponsor: Vernier Software & Technology) |  |
| **2008 Moscone West** | **Featured Panel**  
The Federal STEM Plan: A Starting Point for State STEM Initiatives  
(Sponsored by STEMx) | **Gender Equity and Small Group Participation in a Laser Security System STEM Unit** |  |
<table>
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<tr>
<td>2009 Moscone  West</td>
<td><strong>Featured Panel</strong> &lt;br&gt;NSTA/NCTM STEM Ambassadors &lt;br&gt;STEM Up Your Classroom (Sponsored by National Science Foundation)</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;STEMinar: Let's Improve Student Achievement Through STEM Teacher Actions and STEM Certification (Sponsor: STEMscopes)</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;STEMinar: Let's Engage Students Through Phenomena-Based Science Instruction (Sponsor: STEMscopes)</td>
</tr>
<tr>
<td>2010 Moscone  West</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Are You Moody? (Sponsor: Texas Instruments)</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Come on Over and Code a Rover! (Sponsor: Texas Instruments)</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Creating Learning Experiences That Are Inclusive and Fun! (Sponsor: Activate Learning)</td>
</tr>
<tr>
<td>2011 Moscone  West</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Complementing Phenomena-Driven Instruction with Visible Thinking Routines (Sponsor: Activate Learning)</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;WIDA-Sponsored Session: Bringing ELLs into STEM, New Resources from the NSTA-WIDA Affiliation</td>
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<tr>
<td>2014 Moscone  West</td>
<td><strong>Featured Panel</strong> &lt;br&gt;Trends in STEM Education and Their Impact</td>
<td><strong>WIDA-Sponsored Session</strong> &lt;br&gt;Bring ELLs into STEM, New Resources from the NSTA-WIDA Affiliation</td>
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<tr>
<td>2016 Moscone  West</td>
<td><strong>Featured Panel</strong> &lt;br&gt;NSTA/NCTM STEM Ambassadors &lt;br&gt;STEM Up Your Classroom (Sponsored by National Science Foundation)</td>
<td><strong>Pascal's Pyramid: Visited (and Revisited)!</strong></td>
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<tr>
<td>2018 Moscone  West</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Systems and System Models and Dance</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;How Tinkering Can Grow Imagination and Creativity in STEM</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;How Far Can Two Wheels Take You?</td>
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<tr>
<td>2020 Moscone  West</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;How Far Can Two Wheels Take You?</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Using a Web-Based Graphing Tool to Analyze and Interpret Local and National Weather and Climate Data for Patterns and Change</td>
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<td>2022 Moscone  West</td>
<td><strong>Exhibitor Workshop</strong> &lt;br&gt;Creating Learning Experiences That Are Inclusive and Fun! (Sponsor: Activate Learning)</td>
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<tbody>
<tr>
<td>3000 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Beginner Forensics: A Murder in the Art Room!&lt;br&gt;(Sponsor: Edvotek, Inc.)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;STEM Education at the Molecular Level: 3D Visualization and More&lt;br&gt;(Sponsor: Wavefunction, Inc.)</td>
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<tr>
<td>3001 Moscone West</td>
<td>Sea Otters, More Than a Pretty Face: An Inquiry into Trophic Cascades</td>
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<td>3002 Moscone West</td>
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<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Engineering Fidget Toys: An Integrated Science and ELA Unit</td>
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<tr>
<td>3003 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Dynamic DNA: One Model to Teach It All&lt;br&gt;(Sponsor: 3D Molecular Designs)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Attract Students to Water Concepts with Magnetic Water Molecule Models&lt;br&gt;(Sponsor: 3D Molecular Designs)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Modeling the Flow of Genetic Information!&lt;br&gt;(Sponsor: MSOE Center for BioMolecular Modeling)</td>
</tr>
<tr>
<td>3004 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Designing and Building Batteries&lt;br&gt;(Sponsor: Nasco Education)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Building Classroom Equity Through Curiosity&lt;br&gt;(Sponsor: Project Lead The Way, Inc.)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Awesome STEM Activities!&lt;br&gt;(Sponsor: Flinn Scientific, Inc.)</td>
</tr>
<tr>
<td>3005 Moscone West</td>
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<td><strong>Exhibitor Workshop</strong>&lt;br&gt;How to Code Your H2O!</td>
<td><strong>Building STEM PBL with Research Experiences for Teachers and Students</strong></td>
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<tr>
<td>3006 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;STEM: Human Learning at Its Best</td>
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<td>3007 Moscone West</td>
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<tr>
<td>3008 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Creating and Navigating the Classroom Culture Maze</td>
<td><strong>STEMulating PBL</strong></td>
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<td>3009 Moscone West</td>
<td><strong>El Niño-La Niña:</strong> The Atmosphere-Ocean Connection</td>
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<tr>
<td>3010 Moscone West</td>
<td>Access for All Strategies in Teaching Computer Science</td>
<td>Mission: NASA's Mars 2020 Name the Rover Student Essay Contest</td>
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<tr>
<td>3011 Moscone West</td>
<td>The “M” in STEM: Could It Mean Statistics?</td>
<td>Turning Misinformation into Educational Opportunities</td>
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<tr>
<td>3012 Moscone West</td>
<td>Integrating STEM and MWEE: A Multidisciplinary Approach to Teaching Project-Based Environmental Education</td>
<td>Build San Francisco</td>
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<tr>
<td>3014 Moscone West</td>
<td>Do You Need a Science Lab? Win a Shell Science Lab Makeover ($20,000 Value) for Your School</td>
<td>Building a Vibrant STEM Ecosystem Through Manufacturing Apprenticeships</td>
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<tr>
<td>3016 Moscone West</td>
<td></td>
<td>Using National Science Olympiad STEM Classroom Materials to Address NGSS Crosscutting Concepts and Content</td>
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<tr>
<td>3018 Moscone West</td>
<td>Family STEM Night: The Ultimate Community Outreach</td>
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<tr>
<td>3020 Moscone West</td>
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<td>Partnering Through Practices</td>
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<tr>
<td>3022 Moscone West</td>
<td>Preparing Students for Actual Science</td>
<td>A Cross-Disciplinary Pedagogic Field Laboratory for Exploring Teaching and Learning of Heat, Temperature, and Energy</td>
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</table>
### Thursday At-A-Glance

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<thead>
<tr>
<th>LOCATION</th>
<th>8:00 AM–5:00 PM</th>
<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
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<tbody>
<tr>
<td>3024 Moscone West</td>
<td></td>
<td>Embedding Claims, Evidence, Reasoning, and Rebuttal in Inquiry-Based Labs</td>
<td>How to Use the Orton-Gillingham Method in the STEM/STEAM Science Classroom</td>
</tr>
<tr>
<td>Level 1 Exhibit Hall Moscone West</td>
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<td><strong>NSTA Exhibits! (9:15 AM–3:00 PM)</strong></td>
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<tr>
<td>Exhibit Hall Moscone West</td>
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<td></td>
<td><strong>Elementary STEM Showcase! (10:30 AM–12 Noon) (See sponsors on page 7)</strong></td>
</tr>
<tr>
<td>Pacific H–I Marriott Marquis</td>
<td>Shell Science Lab Regional Challenge Winners Workshop (By Invitation Only)</td>
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</tbody>
</table>

**LOCATION**
- Shell Science Lab Regional Challenge Winners Workshop (By Invitation Only)

**Exhibit Hall Moscone West**
- Embedding Claims, Evidence, Reasoning, and Rebuttal in Inquiry-Based Labs
- How to Use the Orton-Gillingham Method in the STEM/STEAM Science Classroom

**Elementary STEM Showcase!**
- (10:30 AM–12 Noon) (See sponsors on page 7)
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</table>
| 2000 Moscone West | **Exhibitor Workshop**  
Criteria and Constraints: Raising the Bar for Rigor  
(Sponsor: Carolina Biological Supply Co.) |                                                                              |                                                                              |
| 2001 Moscone West |                                                                              |                                                                              |                                                                              |
| 2002 Moscone West | Animals Are Engineers                                                        | Investigating Properties of Water with Paper Clips                           |                                                                              |
| 2003 Moscone West |                                                                              |                                                                              |                                                                              |
| 2004 Moscone West | **Exhibitor Workshop**  
Make Science Real with Problem-Based Learning  
(Sponsor: Pearson) |                                                                              |                                                                              |
| 2005 Moscone West | **Exhibitor Workshop**  
Teaching Science Through Conservation  
(Sponsor: U.S. Fish and Wildlife Service) |                                                                              |                                                                              |
| 2006 Moscone West | Robotics, Coding, Engineering, Oh My!                                        | Materials, Equipment, Phenomena: Indispensable Links to Teaching and Learning Science |                                                                              |
| 2007 Moscone West | **Exhibitor Workshop**  
Student Performance of Content-Rich Literature, The Power of STEAM  
(Sponsor: Southern Science Supply) | **Exhibitor Workshop**  
Climate Change Hands-On Investigations with Real-World Data  
(Sponsor: PocketLab by Myriad Sensors) |                                                                              |
| 2008 Moscone West | **NSTA Press® Session:**  
A Head Start on Life Science |                                                                              |                                                                              |

**Keynote Presentation**  
Dream Beyond  
(Speaker: Bernard Harris, Jr.)  
(Sponsored by National Math + Science Initiative)
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</table>
| 2009 Moscone West | **Exhibitor Workshop**  
STEMinar: Let’s Use the SEs to Provide Equity and Access for All Students in STEM  
(Sponsor: STEMscopes) |                                                        |                                                    |
| 2010 Moscone West | **Exhibitor Workshop**  
Zombie Apocalypse  
(Sponsor: Texas Instruments) | **Exhibitor Workshop**  
This IS Rocket Science!  
(Sponsor: Estes Industries) |                                                    |
| 2011 Moscone West | **Exhibitor Workshop**  
Creating “Coherence and Science Storylines” for Middle School  
(Sponsor: Activate Learning) |                                                        |                                                    |
| 2018 Moscone West |                                                        | **Bring Back the Bees!** |                                                    |
| 2020 Moscone West |                                                        | **Using Children’s Literature to Integrate Science and Engineering** |                                                    |
| 2024 Moscone West | **Block It Out:**  
Coding Robots in STEM Classes | **STEM: Teaching Across Disciplines** |                                                    |
| 3000 Moscone West | **Exhibitor Workshop**  
Electricity and Magnetism from Impact Science—A Middle School NGSS Unit  
(Sponsor: Impact Science Education, Inc.) | **Exhibitor Workshop**  
Rising Flood Water: Engineering Design Challenge  
(Sponsor: Great Minds) |                                                    |
| 3001 Moscone West | **STEM Is a State of Mind:**  
Start with a Good Book | **Phenomena to Scenario:**  
Intentionally Moving from Inquiry to STEM Application |                                                    |
<p>| 3002 Moscone West | <strong>Equity: Building the Foundation</strong> | <strong>Presenting Wetland Research Using Basic Circuitry and Paper Circuits</strong> |                                                    |</p>
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<tr>
<td>3003 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;5 E'sy Ways to Investigate Proteins and Enzyme Action&lt;br&gt;(Sponsor: 3D Molecular Designs)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;A Microscopic to Molecular Perspective in Modeling Chromosomes&lt;br&gt;(Sponsor: MSOE Center for BioMolecular Modeling)</td>
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<td>3004 Moscone West</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;NASA Educator Professional Development Collaborative: Exploring the Connection Between Makerspaces and X-Planes&lt;br&gt;(Sponsor: Texas State University)</td>
<td><strong>Exhibitor Workshop</strong>&lt;br&gt;Conductive Tape and You: Creating Paper-Based Circuity Projects&lt;br&gt;(Sponsor: Nasco Education)</td>
</tr>
<tr>
<td>3005 Moscone West</td>
<td></td>
<td>STEM Up Math Class with a LEGO® MINDSTORMS® EV3 Robot</td>
</tr>
</tbody>
</table>
| 3006 Moscone West | Making It Better!<br>Moving from Science to STEM | |}

- **Lower Elementary**
- **Upper Elementary**
- **Middle Level**
- **High School**
- **Partnerships**
- **Postsecondary**
- **Exhibitor Workshops**
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<th>3:00–4:00 PM</th>
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<tbody>
<tr>
<td>3012 Moscone West</td>
<td>Water Like Wine—Reflects the Region Where It's Produced</td>
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<tr>
<td>3014 Moscone West</td>
<td>NGSS—Engineering with Electromagnet</td>
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<tr>
<td>3016 Moscone West</td>
<td>Localize, Leverage, and Learn—Tennessee's Rural STEM Collaborative</td>
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<tr>
<td>3018 Moscone West</td>
<td>Creating Diverse Community Outreach Opportunities Through Immersive Games</td>
<td>Micro-Credentialing Urban Science Teachers' Action Research to Improve Student Learning</td>
</tr>
<tr>
<td>3020 Moscone West</td>
<td>Preparing the Next Generation of STEM Teacher Leaders</td>
<td>Community-Centered STEM: Use a Botanic Garden as Your University Field Site</td>
</tr>
<tr>
<td>3022 Moscone West</td>
<td>Interested in Science? So Are Our Students—Using the Virtual Environment to Connect</td>
<td></td>
</tr>
<tr>
<td>3024 Moscone West</td>
<td>Two, Four, Six, Eight... This Is How We Integrate!</td>
<td></td>
</tr>
</tbody>
</table>
NSTA wants to reward you! As a loyal member of NSTA, we want to reward you when you refer your friends for NSTA membership.

Your friends will each receive $10 off of the cost of membership.*
You will receive a $10 gift card each time one of your friends joins NSTA.

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## Friday At-A-Glance

### Complete Session Details on App

<table>
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<tr>
<th>LOCATION</th>
<th>8:00–9:00 AM</th>
<th>9:30–10:30 AM</th>
<th>11:00 AM–12 Noon</th>
</tr>
</thead>
</table>
| 2000 Moscone West | **Exhibitor Workshop**  
A Lesson in Engineering—Building the Ultimate Classroom Electrophoresis System  
(Sponsor: MiniOne Systems) | **Exhibitor Workshop**  
Implementing AR/VR in District STEAM Programs  
(Sponsor: zSpace) |                                                   |
| 2001 Moscone West | **Featured Hands-On Workshop**  
STEM and Special Needs—Strategies for Success  
(Sponsored by STEM3 Academy) | **Introducing Engineering Through Play:**  
Opportunities to Engage Primary Students in STEM | **Give the Ocean a Voice:**  
A Marine Debris Inquiry |
| 2002 Moscone West | **Featured Hands-On Workshop**  
Using 3D Printers and Design Thinking to Create Career Pathways | **Featured Hands-On Workshop**  
Designing, Inspiring, Resilient Settings for STEM/STEAM/STREAM  
(Sponsored by AIA Committee on Architecture for Education) |                                                   |
| 2003 Moscone West | **Featured Panel**  
Connecting the STEM Pipeline from K to Career  
(Sponsored by Northrop Grumman) | **Exploring the Everyday STEM Connections Encountered in the Young Child’s World** | **Critical Thinking Through Crosscutting Concepts** |
| 2004 Moscone West | **Exhibitor Workshop**  
Using Phenomena and Data Analysis to Explore Population Dynamics  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop**  
Teaching NGSS Science and Engineering Practices Using HHMI Data Points  
(Sponsor: HHMI BioInteractive) | **Exhibitor Workshop**  
Constructing Scientific Explanations with HHMI BioInteractive  
(Sponsor: HHMI BioInteractive) |
| 2005 Moscone West | **Exhibitor Workshop**  
NGSS—Designing Better Chemical Batteries  
(Sponsor: Lab-Aids, Inc.) |                                                   | **Exhibitor Workshop**  
NGSS—Waves: Make an Abstract Concept Become Visible!  
(Sponsor: Lab-Aids, Inc.) |
| 2006 Moscone West | **Featured Panel**  
English Language Learners in STEM Subjects  
(Sponsored by The National Academies of Sciences, Engineering, and Medicine) | **Digital Humanity:**  
The Familiar and Unfamiliar | **Preschool/Kindergarten:**  
Starting Science Early |
| 2007 Moscone West | **Exhibitor Workshop**  
Establishing an Orangutan Reserve: Investigating Weather Patterns to Design Solutions  
(Sponsor: Amplify) |                                                   | **Exhibitor Workshop**  
Embedded and Immersive Engineering  
(Sponsor: Amplify) |
| 2008 Moscone West | **Featured Panel**  
The Federal STEM Plan: A Starting Point for State STEM Initiatives  
(Sponsored by STEMx) | **Bringing the Joy of STEM Cooking to the Classroom** | **Entry into Innovation:**  
Engineering for Early Learners |

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Lower Elementary | Upper Elementary | Middle Level | High School | Partnerships | Postsecondary | Exhibitor Workshops
<table>
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<th>LOCATION</th>
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<th>11:00 AM–12 Noon</th>
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<tbody>
<tr>
<td>2009 Moscone West</td>
<td>Exhibitor Workshop&lt;br&gt;STEMinar: Let's Examine the New CAST (California Science Test) Assessments in Grades 3–12 (Sponsor: STEMscopes)</td>
<td>Exhibitor Workshop&lt;br&gt;STEMinar: Let's Use Claim-Evidence-Reasoning (CER) to Frame Scientific Explanations in Your Classroom (Sponsor: STEMscopes)</td>
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<tr>
<td>2010 Moscone West</td>
<td>Exhibitor Workshop&lt;br&gt;Genes in Space: Genetics on the Space Station, Free Loaner Equipment, Curricula, and More! (Sponsor: miniPCR Bio)</td>
<td>Exhibitor Workshop&lt;br&gt;STEMulating the Heart with Code! (Sponsor: Texas Instruments)</td>
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<tr>
<td>2011 Moscone West</td>
<td>Exhibitor Workshop&lt;br&gt;Engage ALL Students by Integrating Engineering and Science into Daily Life (Sponsor: Activate Learning)</td>
<td>Exhibitor Workshop&lt;br&gt;Making the Invisible Visible (Sponsor: Houghton Mifflin Harcourt)</td>
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<tr>
<td>2014 Moscone West</td>
<td>Featured Panel&lt;br&gt;NSTA/NCTM STEM Ambassadors&lt;br&gt;Featured Panel: STEM Up Your Classroom (Sponsored by National Science Foundation)</td>
<td>Implementing Meaningful Passion Projects</td>
<td>STEM Day: Bring STEM to ALL Students</td>
</tr>
<tr>
<td>2016 Moscone West</td>
<td>Featured Panel&lt;br&gt;Trends in STEM Education and Their Impact</td>
<td>Explore How STEM Helped in the Hunt for Typhoid Mary</td>
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<td>2018 Moscone West</td>
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<td>Modeling Precipitating Change While Embedding Computational Thinking into the Middle School Science Classrooms</td>
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<tr>
<td>2020 Moscone West</td>
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<td>Sensing Science Through Modeling Matter for Kindergartners</td>
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<tr>
<td>2022 Moscone West</td>
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<td>Teaching STEAM Through a Problem-Based Paleontology Exploration</td>
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<tr>
<td>2024 Moscone West</td>
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<td></td>
<td>WIDA-Sponsored Session: Doing and Talking Science with English Language Learners</td>
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Lower Elementary  | Upper Elementary  | Middle Level  | High School  | Partnerships  | Postsecondary  | Exhibitor Workshops  |
## Friday At-A-Glance

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<tr>
<td>Lobby (3rd Floor) Moscone West</td>
<td><strong>2018 NSTA/NCTM STEM Ambassador Share-a-Thon</strong></td>
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<tr>
<td>3000 Moscone West</td>
<td>Exhibitor Workshop <strong>Awesome STEM Activities!</strong></td>
<td>Exhibitor Workshop <strong>Earthquake Towers: A Middle School STEAM Project from Impact Science</strong></td>
<td>Exhibitor Workshop <strong>Teaching with Virtual Specimens: Venture into the AR/VR Science Class</strong></td>
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<td></td>
<td>(Sponsor: Flinn Scientific, Inc.)</td>
<td>(Sponsor: Impact Science Education, Inc.)</td>
<td>(Sponsor: Animalearn)</td>
</tr>
<tr>
<td>3001 Moscone West</td>
<td></td>
<td>Teaching Ecosystems? Blend Interactive Technology, Hands-On Activities, Along with Going Outdoors</td>
<td>Taking STEM Outside</td>
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<tr>
<td>3002 Moscone West</td>
<td></td>
<td>Planning with a Purpose: Connecting Math and Science Through the Practices in Grades 3–5 Classrooms</td>
<td></td>
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<tr>
<td>3003 Moscone West</td>
<td>Exhibitor Workshop <strong>Exploring DNA Structure and Function with Physical Models</strong></td>
<td>Exhibitor Workshop <strong>Connecting CRISPR Biotechnology to What You Already Teach</strong></td>
<td>Exhibitor Workshop <strong>Using Models in Formative Assessments to Uncover Chemistry Misconceptions</strong></td>
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<td>(Sponsor: 3D Molecular Designs)</td>
<td>(Sponsor: MSOE Center for BioMolecular Modeling)</td>
<td>(Sponsor: 3D Molecular Designs)</td>
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<td>3004 Moscone West</td>
<td>Exhibitor Workshop <strong>Ink Chromatography and Invisible Inks</strong></td>
<td>Exhibitor Workshop <strong>One Device to Collect Force, Pressure, and Temperature Data!</strong></td>
<td>Exhibitor Workshop <strong>Building Classroom Equity Through Curiosity</strong></td>
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<td>(Sponsor: Nasco Education)</td>
<td>(Sponsor: Nasco Education)</td>
<td>(Sponsor: Project Lead The Way, Inc.)</td>
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<tr>
<td>3005 Moscone West</td>
<td></td>
<td>Beyond Spaceship Earth</td>
<td>Leveraging Technology to Promote Powerful STEM Learning</td>
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<tr>
<td>3006 Moscone West</td>
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<td>STEAM Rising: Beyond the Buzzwords!</td>
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<tr>
<td>3007 Moscone West</td>
<td>Exhibitor Workshop <strong>Socio-Scientific Reasoning: Develop Higher-Order Thinking Skills in STEM Classroom</strong></td>
<td>Exhibitor Workshop <strong>Integrating Fear-Free Hands-On Programming into STEM and Agriculture Classes</strong></td>
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<tr>
<td>3008 Moscone West</td>
<td>Explore Building Mousetrap Vehicles to Integrate Science, Technology, Engineering, and Mathematics (STEM)</td>
<td>When the Wheels Are Turning, the Students Are Learning!</td>
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<td>3009 Moscone West</td>
<td>Anatomy of Saving a Life</td>
<td>STEM Up Math Class with Computing</td>
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<td>3010 Moscone West</td>
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<td>A Socially Conscious Electrical Design Unit</td>
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<td>3011 Moscone West</td>
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<td>Starting and Maintaining a Successful Robotics Program</td>
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<tr>
<td>3012 Moscone West</td>
<td>Yes, You Can! Tips and Tricks for Presenting at an NSTA Conference</td>
<td>Transforming University-District STEM Ecosystems to Promote Equity and Access for English Language Learners</td>
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<tr>
<td>3014 Moscone West</td>
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<td>Storyline Redesign: Upcycling Science Kits to Support NGSS</td>
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<tr>
<td>3016 Moscone West</td>
<td>An Innovative Model for the Role of Nonprofits in Building STEM Ecosystems</td>
<td>Oil Spill: Calling All Environmental Engineers!</td>
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<tr>
<td>3018 Moscone West</td>
<td></td>
<td>What Is the State of STEM in America? Establishing Community and Corporate Partnerships to Grow the STEM Talent Pipeline</td>
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<tr>
<td>3020 Moscone West</td>
<td>NSTA Press® Session: Argument-Driven Inquiry in Grades 3–5: Three-Dimensional Investigations That Integrate Literacy and Mathematics</td>
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## Friday At-A-Glance

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<td>3022 Moscone West</td>
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<td>Activism in the Science Classroom: Where to Draw the Line?</td>
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<td>3024 Moscone West</td>
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<td>NASA Aeronautics: Meeting the Standards Through Real-World Applications</td>
<td>Scaffolding STEM Identity Exploration During the Easley Space Camp</td>
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<tr>
<td>Level 1 Exhibit Hall Moscone West</td>
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<td>NSTA Exhibits! (9:15 AM–3:00 PM)</td>
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## Complete Session Details on App

### Friday At-A-Glance

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<th>3:00–4:00 PM</th>
<th>4:30–5:30 PM</th>
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<tr>
<td>2000 Moscone West</td>
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<td>2001 Moscone West</td>
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<td>2003 Moscone West</td>
<td>Making Math Invitational</td>
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<tr>
<td>2004 Moscone West</td>
<td>Exhibitor Workshop “Anchoring” Your Life Science Course with HHMI BioInteractive Lactase Activities (Sponsor: HHMI BioInteractive)</td>
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<tr>
<td>2005 Moscone West</td>
<td>Exhibitor Workshop Get Your Game On: Game-Based Learning with Legends of Learning! (Sponsor: Legends of Learning)</td>
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<tr>
<td>2006 Moscone West</td>
<td>Narrative: The Link to Learning Science</td>
<td>Building a Culture of Collaboration for STEAM Integration</td>
<td>Closing Session That’s a Wrap… A STEM-tastic Celebration</td>
</tr>
<tr>
<td>2007 Moscone West</td>
<td>Exhibitor Workshop Six Benefits of Using Robotics with Young Learners—Play with KIBO! (Sponsor: KinderLab Robotics, Inc.)</td>
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<td>2008 Moscone West</td>
<td>Picture This: Teaching STEM Through StoryTime</td>
<td>Learning Scientific Inquiry and Reading Strategies Through Storytelling</td>
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Lower Elementary  Upper Elementary  Middle Level  High School  Partnerships  Postsecondary  Exhibitor Workshops
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| 2009 Moscone West | **Exhibitor Workshop**  
STEMinar: Let's Create a STEM Ecosystem to Support Campus Improvement in a Community  
(*Sponsor: STEMscopes*) |                                                                                     |
| 2010 Moscone West | **Exhibitor Workshop**  
Save a Nickel and Learn to Trickle  
(*Sponsor: Texas Instruments*) |                                                                                     |
| 2011 Moscone West | **Exhibitor Workshop**  
Creating Challenges for Middle School and High School Science  
(*Sponsor: Houghton Mifflin Harcourt*) |                                                                                     |
| 2014 Moscone West |                                                                                                 | **Science Through Social Justice—The Brooklyn Way!**                            |
| 2016 Moscone West | **Use Design Thinking to Navigate Cross-Curricular Collaboration** | **Making the Argument: How Connecting Science and Mathematics Practices Can Improve Student Discourse** |
| 2018 Moscone West | **How Big? The Crucial Importance of Proportional Reasoning** | **Applications of Global Collaborative STEM Education** |
| 2020 Moscone West |                                                                                                 | **Energize Your Middle School Classroom with eesmarts NGSS-Focused Lessons** |
| 2022 Moscone West |                                                                                                 | **Engendering Science Conceptual Understanding Within STEM-Related Project-Based Challenges** |
| 2024 Moscone West | **Creating Effective STEM-Focused Makerspaces: Integrated STEM and Robotics—What and How?** | **Solar Car Design Project** |

**Lower Elementary** | **Upper Elementary** | **Middle Level** | **High School** | **Partnerships** | **Postsecondary** | **Exhibitor Workshops** |
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<th>3:00–4:00 PM</th>
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</table>
| 3000 Moscone West     | **Exhibitor Workshop**  
Wire a Toy House: A Middle School STEAM Project from Impact Science  
*(Sponsor: Impact Science Education, Inc.)* |                                                                                 |
| 3001 Moscone West     |                                                                                 | **Making Sense of Science Through Songwriting**                               |
| 3002 Moscone West     | **Using Meaningful 3D Design when Creating a STEM Unit**                       | **Engineering for Social Impact**                                            |
| 3003 Moscone West     | **Exhibitor Workshop**  
UrbanEngineers: Building a Resilient and Adaptive 21st-Century City  
*(Sponsor: HouseStories, Inc.)* |                                                                                 |
| 3004 Moscone West     | **Exhibitor Workshop**  
Creating Circuits on LEGO®: Crazy Circuits Curriculum  
*(Sponsor: Nasco Education)* |                                                                                 |
| 3005 Moscone West     | **Teaching STEM with Weather in Grade 3**                                     |                                                                                 |
| 3006 Moscone West     | **Teaching Engineering, Motion, and Energy Through Rube Goldberg**            | **STEM Team Challenges in the Elementary Classroom**                         |
| 3007 Moscone West     |                                                                                 | **The Good Life-DC: A Simulation of Project-Based Learning in the Classroom** |
| 3008 Moscone West     | **Connecting Math and Science Through Technology: Making Data Analysis Easy** | **Order Up a Helping of Forensics, with a Side of Maggots**                   |

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**Lower Elementary**  |  **Upper Elementary**  |  **Middle Level**  |  **High School**  |  **Partnerships**  |  **Postsecondary**  |  **Exhibitor Workshops**
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<tr>
<td>3010 Moscone West</td>
<td>How to Support Teachers for Successful STEM Implementation</td>
<td>Using Python to Enhance Teaching Algebra 2</td>
</tr>
<tr>
<td>3012 Moscone West</td>
<td>STEM in the Urban Community</td>
<td>Coasting with Newton's Laws</td>
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<tr>
<td>3014 Moscone West</td>
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<td>Crash into STEM with the Insurance Institute for Highway Safety in the Classroom</td>
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<tr>
<td>3016 Moscone West</td>
<td>Creating Sustainable Partnerships for Your School</td>
<td>Introducing Cyber and STEM Curricula into the Classroom</td>
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<tr>
<td>3018 Moscone West</td>
<td>Teaching with Technology: Using EPA’s EnviroAtlas in the Classroom to Empower Tomorrow’s Decision-Makers</td>
<td>Design a Better World: Engaging Students Through Community Design Challenges</td>
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<tr>
<td>3022 Moscone West</td>
<td>Nontraditional Students: New Prospects for Qualified STEM Educators at Rider University</td>
<td>Why Professional Educators Need to Connect with Innovation Technology Communities</td>
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<tr>
<td>3024 Moscone West</td>
<td>Systematically Engaging in Systems: System Thinking and Learning</td>
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**LOWER ELEMENTARY** | **UPPER ELEMENTARY** | **MIDDLE LEVEL** | **HIGH SCHOOL** | **PARTNERSHIPS** | **POSTSECONDARY** | **EXHIBITOR WORKSHOPS**
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3Doodler Inc. #500  
 Activate Learning #111  
 AeroRacers Inc. #110  
 Algae Research Supply #211  
 American Epoxy Scientific #229  
 Amplify #210  
 Anatomology #320  
 Animalearn #405  
 Army Educational Outreach Program (AEOP) #311  
 Astronomical Society of the Pacific #319  
 Beyond Labz #113  
 Bio-Rad Laboratories #204  
 Blue communication #105  
 Bone Clones, Inc. #214  
 California Science Teachers Association #328  
 Carolina Biological Supply Co. #222  
 CELLINK #527  
 Discovery Education™ #509  
 Edvotek Inc. #300  
 Estes Industries #429  
 Flashforge USA, Inc. #218  
 Flinn Scientific, Inc. #401  
 Foldscope Instruments, Inc. #507  
 Foundation for Family Science & Engineering #420  
 GRACE Communications Foundation #120  
 Great Minds LLC #213  
 Green Ninja #414  
 Hager Sharp #506  
 HHMI BioInteractive #201  
 HouseStories #219  
 Idaho National Laboratory #121  
 Impact Science Education, Inc. #406  
 Innovative Genomics Institute #525  
 International Technology and Engineering Educators Association #314  
 K12IRC.org #100  
 Kid Spark Education #520  
 KinderLab Robotics, Inc. #407  
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 LAXCO, Inc. #124  
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 MakeCrate #207  
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 McGraw-Hill Education #522  
 Microduino, Inc. #413  
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 miniPCR Bio #206  
 MSOE Center for BioMolecular Modeling #503  
 Museum of Science, Boston – EiE #302  
 Nasco #419  
 National Council of Teachers of Mathematics #312  
 National Geographic Learning | Cengage #510  
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 National Institute of Biomedical Imaging and Bioengineering, NIH #318  
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 U.S. Fish and Wildlife Service #325  
 Vernier Software & Technology #200  
 Wavefunction, Inc. #305  
 Weber Scientific #115  
 WorldStrides #518  
 zSpace #404
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STORE HOURS

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<td>Wednesday, July 24</td>
<td>10:00 AM–6:30 PM</td>
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<tr>
<td>Thursday, July 25</td>
<td>7:30 AM–4:30 PM</td>
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<tr>
<td>Friday, July 26</td>
<td>7:30 AM–4:30 PM</td>
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SAVE THE DATE

20/20 SCIENCE
EXPANDING THE VISION
BOSTON April 2–5 2020

OVER 1,200 SESSIONS
NETWORK WITH MORE THAN 10,000 EDUCATORS
350+ EXHIBITORS WITH CUTTING-EDGE RESOURCES
AND MUCH MORE!

NSTA is holding its 68th national conference next year

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

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

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