NSTA AREA CONFERENCE ON SCIENCE EDUCATION

MAKING WAVES
MOVING SCIENCE FORWARD!

MILWAUKEE
NOVEMBER 9-11
2017

#NSTA17
PASCO
Always your choice for lab equipment
Now your choice for curriculum

Booth #601

Core Curriculum and Much More

- LMS & Google Classroom integration
- Interactive simulations and equations
  - Award-winning lab equipment
  - Innovative assessment tools
- Lessons follow 5E Design
- Infinite Test Bank access

4 FREE Workshops • Friday, Nov 10th, 2017 • Room #202A
(See program for more details.)
NSTA Book Club Membership

Save up to 50% on our bestselling titles...

When you sign up for or renew your NSTA membership, select the book club membership option, choose three books from any grade level and on topics readers love—NGSS, STEM, literacy, assessment, and more—then wait for your favorite books to arrive on your doorstep while enjoying all of your other NSTA member benefits.

See all membership options, including regular, new teacher, and institutional memberships, at www.nsta.org/membership

Become an NSTA Book Club Member at www.nsta.org/bookclub
Inspired by the Inductees of the National Inventors Hall of Fame, our preschool through 9th grade programs are designed to impact young minds through fun, hands-on activities infused with the spirit of innovation!

Come visit us at Booth #311!
Welcome to Milwaukee: Making Waves: Moving Science Forward!

Welcome to Wisconsin and the Milwaukee Area Conference on Science Education. Our conference theme is “Making Waves: Moving Science Education Forward!” We hope you’ll join us in this work to champion science in our communities and connect with fellow science educators as we learn together.

Our conference strands are based on needs we’ve heard from teachers across Wisconsin and beyond:

- **Buoying Up Literacy with Science** focuses on connections between science and literacy, particularly at the elementary level.
- **Navigating STEM Through the NGSS** focuses on how 3-D science is a core part of a STEM or makerspace initiative, particularly with the connections to engineering inherent to the NGSS.
- **Preparing All Students for the Voyage** focuses on strategies to equitably engage all students in authentic science experiences.

In the words of famous former Green Bay Packers coach Vince Lombardi, “People who work together will win, whether it be against complex football defenses, or the problems of modern society.” Let’s work together November 9–11 in Milwaukee!

2017 Milwaukee Area Conference Committee Leaders
Kevin Anderson, Ray Scolavino, and Michelle Griffin-Wenzel

Milwaukee Conference Committee

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

**Conference Chairperson**
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**Manager of Services for People with Special Needs**
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Milwaukee, WI

**Program Committee**

**Strand Leader: Preparing All Students for the Voyage**
Michelle Griffin-Wenzel
Germantown High School
Germantown, WI

**Strand Leader: Navigating STEM Through the NGSS**
Kevin Niemi
University of Wisconsin–Madison
Madison, WI

**Strand Leader: Buoying Up Literacy with Science**
John Whitsett
2007–2008 NSTA President, and
Retired Teacher/Curriculum Director
Oshkosh, WI

**Conference Advisory Board Liaison**
Ana Appel
Ascend Charter Schools
Brooklyn, NY
Welcome to the NSTA Area Conference in Milwaukee. This fifth-largest city in the Midwest is best known for its breweries (yes, that is why the baseball team is called the Milwaukee Brewers) and you must try those deep fried cheese curds! Along with the wonderful food, you’ll find historic neighborhoods, museums, and river cruises. The conference team has worked hard to bring you great speakers and sessions for this conference! The conference theme is *Making Waves: Moving Science Forward*. Along with this theme, the conference committee has planned the conference around three strands that explore topics of current significance.

The first strand is *Preparing All Students for the Voyage*. In a science- and technology-driven society, equity means that all students should have access to the three dimensions of the NGSS to be prepared to participate as productive citizens. Successful achievement of disciplinary core ideas, science and engineering practices, and crosscutting concepts demands strategies that address a diverse set of learners, including but not limited to students with special needs, English language learners, gifted and talented students, urban and rural students, and those in other underserved groups. This strand will demonstrate how teachers can provide equitable science and engineering learning opportunities that engage ALL students in constructing meaning about the world around them.

The second strand is *Navigating STEM Through the NGSS*. STEM has become a buzzword attached to everything from a two-hour project on Friday to a fully integrated learning program. A common definition of STEM education emphasizes its interdisciplinary approach coupled with real-world lessons. The focus of this strand is on creating authentic preK–12 cross-curricular connections and engaging students in real-world applications using NGSS. The NGSS integrates science with other STEM disciplines, as well as literacy. This strand will increase participants’ understanding of the way the NGSS can be applied when implementing STEM lessons that are field tested and research based.

The final strand is *Buoying Up Literacy with Science*. Effective science instruction boosts literacy. Scientifically literate students obtain, evaluate, and communicate information. Integrating science and language arts instruction allows educators to support students from multiple angles. Reading, writing, listening, and speaking can be woven into science in meaningful mediums. In this strand, participants will develop an understanding of how science can support literacy and literacy instruction.

I encourage you to take full advantage of this conference to improve your knowledge of making science accessible for all students, not only through these selected strands, but through the other featured speakers, sessions, professional learning opportunities, as well as the exhibit hall. Take time to find new colleagues and share ideas with others. I am sure that you will agree with me that NSTA provides a unique and exciting opportunity to hone your teaching craft and create new ideas to use with your students. I look forward to seeing you here in Milwaukee!

David T. Crowther  
2017–2018 NSTA President

Sponsors and Contributors to the Milwaukee Conference

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

**Sponsors**

HHMI BioInteractive  
Southwest Airlines  
Texas Instruments  
Vernier Software & Technology  
Wisconsin Society of Science Teachers

**Contributors**

American Association of Physics Teachers (AAPT) and Milwaukee Area AAPT Members  
American Chemical Society Education Division  
American Society for Engineering Education (ASEE)  
Discovery World  
Harley-Davidson Museum®

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

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

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

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

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

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

### Wisconsin Center’s Green Practices
The Wisconsin Center is committed to minimizing waste, pollution, and its carbon footprint. Its energy and water conservation, recycling, and waste reduction initiatives include:

**Energy Conservation:** HVAC controls have been recalibrated and re-commissioned in Wisconsin Center, resulting in 10–15% energy-use reductions. Hot water sensors in the systems automatically recalibrate according to outside air temperatures. High-efficiency, variable speed drives and water circulation pumps have been installed in Wisconsin Center HVAC systems, resulting in 10–12% energy-use reductions. Motion-sensor lighting controls in restrooms and elevators reduce electricity use approximately 35–60%. Ongoing relamping and fixture replacement to utilize high-pressure sodium, compact fluorescent, LED, and other high-efficiency light sources.

**Water Conservation:** “Low flow” restroom fixtures have been installed and are controlled by motion sensors and automatic shutoffs. Metal “fills” in Wisconsin Center HVAC cooling towers have been replaced with high-efficiency units, reducing the use of both water and chemicals.

**Recycling and Waste Reduction.** Levy Restaurants use 100% or high recycled-content and fully recyclable or compostable disposable food service items. Comprehensive, single-stream solid waste recycling has been implemented in cooperation with Waste Management, Inc. and Levy Restaurants. Wisconsin Center has received silver certification under Waste Management’s Green Leader™ program.

### “Go Green” at the Milwaukee Conference!
- **Recycle** your conference programs in the clearly marked recycle bins located throughout Wisconsin Center.
- **Recycle** or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- **In advance of the conference,** presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- **If you prefer to bring handouts to your session,** use double-sided printing and/or recycled paper.
- **Walk** or use public transportation when possible at the conference.
- **Bring** your own refillable water bottle to the conference.
- **Evaluate** sessions attended online.
Meeting Location and Times
The conference hotels are Hyatt Regency Milwaukee, Fairfield Inn & Suites by Marriott Milwaukee Downtown, Hampton Inn & Suites Milwaukee Downtown, and Hilton Milwaukee City Center. Conference registration, exhibits, the NSTA Hub, the NSTA Science Store, exhibitor workshops, and many sessions will be located at Wisconsin Center. Other sessions and events will be held at the Hyatt Regency Milwaukee. The conference will begin on Thursday, November 9, at 8:00 AM, and end on Saturday, November 11, at 12 Noon.

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

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

<table>
<thead>
<tr>
<th>Day</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Wed., Nov. 8</td>
<td>5:00–7:00 PM</td>
</tr>
<tr>
<td>Thu., Nov. 9</td>
<td>7:00 AM–5:00 PM</td>
</tr>
<tr>
<td>Fri., Nov. 10</td>
<td>7:00 AM–4:00 PM</td>
</tr>
<tr>
<td>Sat., Nov. 11</td>
<td>7:30 AM–12 Noon</td>
</tr>
</tbody>
</table>

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

Ground Transportation to/from Airport
The General Mitchell International Airport (MKE) is approximately eight miles south of Wisconsin Center/downtown Milwaukee. Taxi fares average $22–$25 to downtown Milwaukee. GO Riteway provides airport shuttles at the Mitchell Airport. To book a shuttle or get fare quotes, visit www.go Riteway.com/fleet/airport-shuttles.

Getting Around Town
Getting around the Milwaukee area is very convenient. Many of the city’s most popular attractions and a wide variety of restaurants are within easy walking distance. For an indoor option, the 1.75-mile skywalk network connects directly to Wisconsin Center and several hotels. Visit bit.ly/2w7Twyq to access a skywalk map. Bus route information is available at ridemcts.com.

Parking
The parking lot for Wisconsin Center is located at 500 W. Wells Street and offers a daily rate of $15 with an overnight rate of $20 (parking rates subject to change). There are also many parking ramps within easy walking distance. Visit www.parkmilwaukee.com for a complete listing or check with your hotel on their parking availability.

Airlines
NSTA has made arrangements with several major airlines to offer discounted fares to Milwaukee conference attendees. Visit www.nsta.org/milwaukeetravel for details.

Discounted Rental Cars
The toll-free number to contact an NSTA-designated car rental company is:
Enterprise 800-593-0505 16AH230
* go to www.enterprise.com and use “16AH230” in the "Optional: Coupon, Customer or Corporate Number" box, click on "search" and enter PIN "NST."

—Photo courtesy of Visit Milwaukee
NSTA Milwaukee Area Conference
November 9–11, 2017
Making Waves: Moving Science Forward!

Registration, Travel, and Hotels

If you have questions or concerns regarding your housing, please contact Orchid.Events (during business hours) Monday through Friday, 9:00 AM–8:00 PM ET at 877-352-6710 (toll-free) or 801-505-4611, or e-mail help@orchid.events. Available Monday–Friday, 9:00 AM–8:00 PM ET. After hours and on Saturday, call 801-505-4134.

1. Hyatt Regency Milwaukee (Headquarters Hotel)
   333 W. Kilbourn Ave.

2. Fairfield Inn & Suites by Marriott Milwaukee Downtown
   710 N. Old World 3rd St.

3. Hampton Inn & Suites Milwaukee Downtown
   176 W. Wisconsin Ave.

4. Hilton Milwaukee City Center
   509 W. Wisconsin Ave.

Shuttle service will not be provided as all hotels are within walking distance to the Wisconsin Center.
Conference Resources

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

The lapel badge e-mailed to you before the conference, or issued to you at registration on-site, is your “ticket of admission” to the Exhibit Hall and all conference activities. Maps of the Exhibit Hall and others meetings rooms will be accessible via our Conference app (see page 11). See page 93 for a complete list of exhibitors and contact information.

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

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

Thu., Nov. 9 11:00 AM–12:30 PM
Fri., Nov. 10 3:00–4:00 PM

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

Exhibitor Workshops. Exhibitor-sponsored workshops for science teachers are offered throughout the conference. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 103 for a complete listing of exhibitor workshops.

NSTA Science Store
Visit us at the NSTA Science Store to explore a wide selection of resources and gear you’ll love! You’ll find hundreds of books that uniquely blend accurate science content with sound teaching strategies for science educators of all grade ranges and disciplines. Not only do we have books covering a wide range of topics to help you sharpen your content knowledge and hone your teaching methods, but we also carry a complete line of NSTA gear you can’t find anywhere else—such as T-shirts, mugs, and classroom supplies.

We offer convenient free shipping for book purchases to addresses within the United States when you place your order on-site at the conference. *Note: Free shipping is not offered to international addresses or for NSTA gear purchases. We’ve lined up a number of unique opportunities for conference-goers:

- Exclusive author signings and meet-and-greet opportunities
- Our latest books—including Argument-Driven Inquiry in Physics, Volume 1: Mechanics Lab Investigations for Grades 9–12; Beyond the Egg Drop: Infusing Engineering Into High School Physics; Eureka! Grade 3–5 Science Activities and Stories; Toward High School Biology; and Picture-Perfect STEM Lessons, K–2 and 3–5: Using Children’s Books to Inspire STEM Learning—and our newest children’s books from NSTA Kids, such as When the Sun Goes Dark, Next Time You See a Cloud, and Notable Notebooks: Scientists and Their Writings
- “I Love Science” and NSTA gear products to show your love of science and pride in teaching
- Member discounts of 20% on NSTA Press® items and 10% on books from other publishers
- Daily book and gear specials, product giveaways, and more.

Presenters and Presiders Check-In
If you are presenting or presiding at a session, please check in at the Presenters/Presiders check-in counter in the Registration Area.
NSTA Hub
Come by the NSTA Hub located on the Mezzanine level of Wisconsin Center to meet NSTA staff and board members to learn more about NSTA membership and become part of the group that is crafting the future of science education. Win great prizes, including airfare on Southwest Airlines to the 2018 NSTA Atlanta National Conference on Science Education. We’ll be handing out our new #ONLYatNSTA tweetshirts—come by and get one while supplies last!

Meet the Presidents and Board/Council
Be sure to stop by Friday from 2:45 to 3:30 PM at the entrance to Hall A for a special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference!

One lucky person who attends this event will be eligible to win a $100 gift certificate to the NSTA Science Store. Must be present to win. Drawing will take place at 3:20 PM.

Wi-Fi in Wisconsin Center and Hyatt Regency
Limited complimentary Wi-Fi is available throughout Wisconsin Center for checking e-mail and casual internet access only. It’s called “Wisconsin Center Free Public WIFI.” No password is required, but you must accept the terms of use.

The Hyatt Regency provides complimentary Wi-Fi in its meeting rooms. A table tent card with instructions for accessing the network will appear on the head table in each session room.

Welcome and Information Center
A Welcome and Information Center is located at the Visit Milwaukee desk on the first floor of Wisconsin Center, near the main entrance. Here you’ll find information on tourist attractions, transportation, restaurant recommendations, and more. The center will be staffed the following hours:

<table>
<thead>
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</tbody>
</table>

WSST Booth
The Wisconsin Society of Science Teachers (WSST) booth is located in the Hall A Lobby of Wisconsin Center. The booth will have membership forms and information about science activities in Wisconsin. Stop by to say hello, learn how we can keep you up to date on the latest happenings in our area, and pick up some great commemorative items!

Welcome Reception
Hosted by the Wisconsin Society of Science Teachers
All conference participants welcome!

Thursday, November 9 • 6:30–8:30 PM
UWM School of Freshwater Sciences

Enjoy hors d’oeuvres, beer, wine, and soda.

Tickets are $20 and can be purchased at either the door or at the WSST booth in the Hall A Lobby of Wisconsin Center

Additional activities include:
- Team Trivia from 7:15 to 8:15 PM (free). Register your team of 3–5 at the WSST booth OR at the event.
- Wisconsin Beer Tasting from 7:00 to 8:00 PM (additional $15 fee). Learn about the different types of beer, featuring beers from Wisconsin.

Shuttles will pick up participants at all four conference hotels starting at 6:15 PM. Last bus departs UWM at 8:45 PM.
Conference Resources

The NSTA Conference App
Navigate the conference from the palm of your hand! The NSTA Conference app provides all the tools necessary for a successful conference experience.

Features include the ability to view session and workshop listings by time and presenter; maps of the Convention Center, Hyatt, and Exhibit Hall; social media plugins; and a note-taking tool. Visit www.nsta.org/conferenceapp to download the app. Please make sure to create a CrowdCompass account when logging in to be able to export any notes taken within the app. Note: The NSTA Conference app does not sync to our online Personal Scheduler.

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

- First Aid Room (back of house by Grand Ballroom A), Wisconsin Center
- Byron Kilbourn, Hyatt

Concurrent session presenters may also complete evaluations for their own sessions in order to track professional development credit. A Professional Development Documentation Form is included following page 32 to help attendees keep track of sessions/events attended that are NOT available for online session evaluation. This form can also be used to take notes on sessions attended that are available for online session evaluation.

Beginning December 4, 2017, an attendee can view his or her transcript at the NSTA Learning Center (learningcenter.nsta.org) by first logging on and then clicking “My Profile” under the Welcome. Here you’ll find a “Certificates” tab, which you can use to access your transcript. Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, etc.). In addition, the NSTA Learning Center offers professional development experiences (online and face-to-face) for your long-term growth and professionalism.

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

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 visiting the conference session browser to complete session evaluations online, November 9–22, 2017. During the conference, session evaluations can be completed on the computers at the Presenters/Presiders check-in counter in the Registration Area. And this year, we’re giving away an Apple iPad mini 4 Wi-Fi tablet to one lucky attendee who completes a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win!

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

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Graduate Credit Opportunity
Milwaukee conference attendees can earn one graduate-level credit hour in professional development through University of Wisconsin Oshkosh course Sec Ed 715: Current Trends in Curriculum & Instruction: Science Teaching Strategies. Cost is $200.

Learn more about the assignment requirements at bit.ly/2k64IQj.

Deadline is December 15, 2017.
Conference Resources

First Aid Services/Mothers Rooms
The first aid office is located outside Grand Ballroom B (street level) of Wisconsin Center. For emergencies, contact the Public Safety Department at extension 6165 from an in-house phone or call 414-908-6165.

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

Lost and Found
All lost-and-found items will be turned in at the Exhibitor Registration counter in Hall A at Wisconsin Center.

Business Services
Located on the Mezzanine Level, the Wisconsin Center Business Center is complimentary and self-service. Services include photocopies and laser prints (color and black/white), faxes, and computer stations with internet access. Shipping services are not offered. Hours are:

- Monday–Friday, 8:00 AM–4:00 PM
- Saturday–Sunday, closed

Located on the lobby level of the hotel (1st floor), the Hyatt Regency Business Center is available 24 hours a day. Services include complimentary printing of boarding passes, FedEx shipping supplies, use of computers for browsing, and a multifunction printer for an additional fee.

Special Offer for NSTA Conference Attendees

Discovery World is offering special discounted $10 admission to all NSTA Milwaukee Area Conference attendees, November 9–11. Please remember to show your badge at the Ticket Counter.

Come explore Wisconsin’s largest science and technology center featuring interactive exhibits such as Physics & You, pet stingrays in the Reiman Aquarium, and, on weekends, make fun and creative projects in the Kohl’s Design It! Lab.

Join us on Saturday, November 11, for our amazing Girls & STEM event aimed at inspiring young girls to envision themselves as engineers, designers, scientists, innovators, entrepreneurs, and the leaders of the future.

Discovery World is open Thursdays and Fridays, 9:00 AM–4:00 PM and Saturdays, 10:00 AM–5:00 PM. We are located on Milwaukee’s lakefront at 500 North Harbor Drive, in between the Milwaukee Art Museum and the Summerfest Grounds.

—Photo courtesy of Mike Weiss
The Harley-Davidson Museum®
Special Offer!

The Harley-Davidson Museum is offering reduced admission to NSTA Milwaukee Area Conference attendees for $14 per adult (must show badge at front desk).

This offer is available November 8–12, 2017.

A walk through the museum is a walk through the history of America. With an unrivaled collection of Harley-Davidson® motorcycles and memorabilia, a 20-acre park-like campus, and a calendar full of events, the Harley-Davidson Museum is one of Milwaukee’s top tourist destinations for visitors from around the globe.

400 W Canal St., Milwaukee, WI 53201
1-877-HD-MUSEUM or 414-287-2789
h-dmuseum.com
EXHIBITS • SHOP • RESTAURANT • FREE PARKING

Help us with your feedback...and get a chance for a free Apple iPad mini 4

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

When you log on to www.nsta.org/milwaukeebrowser and fill out an evaluation by clicking on the “evaluate session” button below the session you attended, you get entered into a drawing for a chance to win an Apple iPad mini 4 Wi-Fi tablet courtesy of the NSTA Conference Department.

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

• WE’RE GIVING AWAY an APPLE iPAD MINI 4 Wi-Fi TABLET

• CONFERENCE APP

To access the app, visit www.nsta.org/conferenceapp
NSTA Milwaukee Area Conference on Science Education

Wisconsin Center

WEST KILBOURN AVENUE

Upper Level

Exhibit Hall

A B C D

NSTA EXHIBITS

Exhibit Hall Pre-Function

ATTENDEE REGISTRATION

NSTA STORE

Open to Below

Exhibit Hall

THURSDAY

WSST Science Olympiad

FRIDAY

Pre-Service Exploratorium

NORTH SIXTH STREET

NORTH FOURTH STREET

WEST WISCONSIN AVENUE
Conference Resources • Headquarters Staff

Executive Office
David Evans, Executive Director
Michelle Butler, Executive Administrator and Manager

Board Relations
Michelle Butler, Executive Administrator and Manager
Shawn Crowder, Administrative Coordinator

Data Analytics
Todd Wallace, Assistant Executive Director and CIO

Human Resources
Irene Dooley, Assistant Executive Director
Janine Smith, HR Benefits Manager and Generalist

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NSTA Mission Statement

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

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Conference Resources • Future Conferences

All cities are subject to change pending final negotiation.

National Conferences on Science Education

Atlanta, Georgia
March 15–18, 2018

St. Louis, Missouri
April 11–14, 2019

Boston, Massachusetts
April 2–5, 2020

Chicago, Illinois
April 8–11, 2021

Area Conferences on Science Education

2017 Area Conferences

New Orleans, Louisiana—November 30–December 2

2018 Area Conferences

Reno, Nevada—October 11–13
National Harbor, Maryland—November 15–17
Charlotte, North Carolina—November 29–December 1

7th Annual STEM Forum & Expo, hosted by NSTA

Philadelphia, Pennsylvania—July 11–13, 2018

Share Your Ideas!

NSTA’s CONFERENCES ON SCIENCE EDUCATION

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

7th Annual STEM Forum & Expo, hosted by NSTA


Proposal Deadline: 12/4/2017

2018 Area Conferences

Reno, NV....................October 11–13
National Harbor, MD....November 15–17
Charlotte, NC.............November 29–December 1

Proposal Deadline: 1/16/2018

2019 National Conference

St. Louis, MO..............April 11–14

Proposal Deadline: 4/16/2018

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

ATLANTA
MARCH 15–18 2018

Science State of Mind

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Over 1,200 sessions
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FEBRUARY 9, 2018

CONFERENCE STRANDS

Focusing On Evidence of 3-D Learning
Imagine Science as the Foundation for STEM
Reflecting on Access for All Students
Comprehending the Role of Literacy in Science

Learn more and register
www.nsta.org/atlanta
#NSTA18
General Session

The Serengeti Rules: The Quest to Discover How Life Works and Why It Matters
Thursday, November 9, 9:15–10:30 AM

Sean B. Carroll
Vice President for Science Education, Howard Hughes Medical Institute, Chevy Chase, Md.

Be sure to join Sean after his talk at Booth #722 in the Exhibit Hall, where he will be signing copies of his book, The Serengeti Rules. Books will be available for purchase at the booth while supplies last.

Speaker sponsored by HHMI BioInteractive.

(See page 37 for details.)

Thursday, November 9

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

Thanks to the generosity of Southwest Airlines we’re giving away three round-trip tickets on Southwest Airlines for educators to attend the NSTA National Conference in Atlanta, March 15–18, 2018!

The drawings will be held at:
• 4:00 PM, Thursday
• 2:00 PM, Friday
• 10:00 AM, Saturday

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

Is This Your First NSTA Conference?

Yes, you say? Then you are invited to attend a special session on Thursday, 8:00–9:00 AM. Learn how you can gain the most from your conference experience and have fun doing it! See page 34 for details.
Empower your students and unleash their curiosity for science and discovery.

Vernier introduces Go Direct™ sensors. Wireless or USB—the versatility is built into these affordable sensors, so you have the flexibility to choose. All Go Direct sensors connect directly to student computers, Chromebooks, or mobile devices, so there’s no interface needed. That’s freedom, versatility, and boundless opportunity.

Learn more at www.vernier.com/unbound
The Milwaukee Conference Committee has planned the conference around these three strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

**Preparing All Students for the Voyage**
In a science- and technology-driven society, equity means that all students should have access to the three dimensions of the NGSS to be prepared to participate as productive citizens. Successful achievement of disciplinary core ideas, science and engineering practices, and crosscutting concepts demands strategies that address a diverse set of learners, including but not limited to students with special needs, English language learners, gifted and talented students, urban and rural students, and those in other underserved groups. This strand will demonstrate how teachers can provide equitable science and engineering learning opportunities that engage ALL students in constructing meaning about the world around them.

**Navigating STEM Through the NGSS**
STEM has become a buzzword attached to everything from a two-hour project on Friday to a fully integrated learning program. A common definition of STEM education emphasizes its interdisciplinary approach coupled with real-world lessons. The focus of this strand is on creating authentic preK–12 cross-curricular connections and engaging students in real-world applications using NGSS. The NGSS integrates science with other STEM disciplines, as well as literacy. This strand will increase participants’ understanding of the way the NGSS can be applied when implementing STEM lessons that are field tested and research based.

**Buoying Up Literacy with Science**
Effective science instruction boosts literacy. Scientifically literate students obtain, evaluate, and communicate information. Integrating science and language arts instruction allows educators to support students from multiple angles. Reading, writing, listening, and speaking can be woven into science in meaningful mediums. In this strand, participants will develop an understanding of how science can support literacy and literacy instruction.
Conference Program • Conference Strands

Navigating STEM Through the NGSS

Thursday, November 9

8:00–9:00 AM
Elementary STEM Response To Intervention (RTI)

12:30–3:30 PM
From Exploring Ecosystems to Writing Reports and Explanations—ELLs Focus on Language

2:00–3:00 PM
Using Pop Culture and Polymers to Create Inquisitive Minds

3:30–4:30 PM
Teaching Literacy in Physics

5:00–6:00 PM
Fusing Science and English Language Arts

Friday, November 10

8:00–9:00 AM
Preservice and Inservice Teachers Tackling and Jibing Toward Integrated STEM and the Science and Engineering Practices

9:30–10:30 AM
Featured Presentation: Growing Power and the Good Food Revolution
(Speaker: Will Allen)

11:00 AM–12 Noon
Project-Based Learning in an Early Elementary and Early Childhood Classroom

12:30–1:30 PM
Using the Science of Flight to Teach NGSS and Free Student Flights

2:00–3:00 PM
Using Models to Teach Shapes and Kinds of Land and Bodies of Water

Saturday, November 11

8:00–9:00 AM
Using Local Citizen Science to Teach the Engineering Design Process

8:30–9:00 AM
From Earth to Sky—Using Drones to Map 3-D Surfaces

9:30–10:30 AM
Animal Multimedia Inspires Learning and Engagement

11:00 AM–12 Noon
Investigating Clean Energy Systems: Connecting Classrooms to University Research

Buoying Up Literacy with Science

Thursday, November 9

8:00–9:00 AM
Bringing the 4th of July into Your Classroom: Model-Based Inquiry at Its Finest!

12:30–1:30 PM
CSI Mammoth: Using Social Studies to Teach Science Investigations

2:00–3:00 PM
Engineering Your Approach to Creative Problem Finding and Design Solutions

3:30–4:30 PM
PolyWhat? Application of STEM Using Polymers

5:00–5:30 PM
Intermolecular Forces Unit Plan with NGSS Focus

5:00–6:00 PM
Explaining Phenomena and Designing Solutions

Friday, November 10

8:00–9:00 AM
Riding the Wave of Integration: Science and Children’s Literature

9:30–10:30 AM
Making Waves at the Discourse Level: Promoting High-Quality Dialogue with English Language Learners

11:00 AM–12 Noon
Featured Presentation: Doing and Talking Science with English Learners
(Speaker: Rita MacDonald)

12:30–1:30 PM
Digital Storytelling—Not Just for Language Arts Classes

2:00–3:00 PM
Uncovering the Awesomeness of Our Science Students
Conference Program • Conference Strands

Preparing All Students for the Voyage

**Thursday, November 9**
8:00–9:00 AM
Physics Labs for Everyone

12:30–1:30 PM
Creating a Technology-Based, Student-Centered Classroom

2:00–3:00 PM
Featured Presentation: Fallacy of Fairness
(Speaker: Jo Handelsman)

3:30–4:30 PM
Children’s Books as Hooks to Teach NGSS Science Practices

**Friday, November 10**
8:00–9:00 AM
Igniting Creativity for STEM Innovation: Focus On Gifted/Advanced Learners

9:30–10:30 AM
Using National Science Olympiad STEM Events to Address NGSS Crosscutting Concepts and Content

11:00 AM–12 Noon

12:30–1:30 PM
Data Is Not a Four-Letter Word: Use NOAA Resources to Build Student Proficiency in Data Analysis

2:00–3:00 PM
Badging as a Vehicle for Engaging All Learners

**Saturday, November 11**
11:00 AM–12 Noon
Not Just Flowers…STEM, Too: Reaching All Students Through Plants and Nature

Digital Observation Tech Skills: Student-Led Inquiry to Transects of Change

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**TEACHERS: Your Mission – Should You Choose to Accept**

**NSTA eCYBERMISSION**

**Mission Protocol**

1. **Assemble a Team**
2. **Register Yourself and Your Students**
3. **Choose a Mission Challenge**
4. **Work your Mission Challenge**
5. **Submit Your Mission Folder**

**TEACHER/TEAM ADVISOR**
The primary role of the Team Advisor is to provide student teams with assistance. Specifically, the Team Advisor is expected to:
- Self-register on the site
- Assist teams in choosing a Mission Challenge
- Monitor team activity on the Discussion Forums and Team Talk
- Monitor student safety at all times
- Review the team’s Mission Folder submission
- Submit the Team Mission Folder

**STUDENT TEAMS (3-4 students)**
The student team role is to:
- Investigate a problem in their community
- Choose a Mission Challenge to help address that problem
- Complete their Mission Folder

**Students Register:**
https://www.ecybermission.com/Student/Registration

**Teachers Register:**
https://www.ecybermission.com/Advisor/Registration
NSTA Press Sessions

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

**Thursday, November 9**
8:00–9:00 AM  Creating a STEM Culture for Teaching and Learning
12:30–1:30 PM  *Argument-Driven Inquiry in Physics: Mechanics Lab Investigations for Grades 9–12*
2:00–3:00 PM  Uncovering Students’ (and Teachers’) Ideas in Science, Engineering, and Mathematics with Formative Assessment Probes and Techniques
3:30–4:30 PM  *EUREKA! Grade 3–5 Science Activities and Stories*
5:00–6:00 PM  *Argument-Driven Inquiry in Physical Science: Lab Investigations for Grades 6–8*

**Friday, November 10**
8:00–9:00 AM  Uncovering Student Ideas in Science with 3-D Assessment Probes
9:30–10:30 AM  *Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12*
12:30–1:30 PM  Uncovering Student Ideas About Science with Formative Assessment Probes and Literacy Capacities
2:00–3:00 PM  Creating Classroom Narrative: Fitting Science Reasoning Problems and Open-Ended Investigation into a Curriculum

Meetings and Social Functions

**Thursday, November 9**
Wisconsin Society of Science Teachers (WSST) Welcome Reception  
(By Ticket Through WSST; $20)  
UWM School of Freshwater Sciences ........... 6:30–8:30 PM

**Friday, November 10**
Discover the NGSS Train-the-Trainer Workshop  
(By Preregistration Only)  
Regency B, Hyatt..........................8:00 AM–5:00 PM

Wisconsin Society of Science Teachers (WSST) Member Reception  
(For WSST members and Wisconsin teachers)  
Vue East (21st Floor), Hyatt ................. 5:00–7:00 PM
Chemistry Day at NSTA
*Sponsored by the American Chemical Society
Education Division*

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

Friday, November 10, 8:00 AM–2:30 PM
102B, Wisconsin Center

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

8:00–10:00 AM  **Relating Structure and Properties:**
*Eliciting and Visualizing Student Initial Ideas*

10:30 AM–12 Noon  **Relating Structure and Properties:**
*Constructing Science Ideas Through Exploring Data*

12:30–2:30 PM  **Relating Structure and Properties:**
*Demonstrating Understanding Through Integration and Application of Knowledge*

Middle School Chemistry Day
*Sponsored by the American Chemical Society*

**Middle School Chemistry—**
*Big Ideas About the Very Small*

Friday, November 10, 8:00 AM–1:30 PM
102A, Wisconsin Center

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

8:00–9:00 AM  **Solids, Liquids, Gases, and Changes of State**

9:30–10:30 AM  **The Water Molecule and Dissolving**

11:00 AM–12 Noon  **Chemical Reactions—Breaking and Making Bonds**

12:30–1:30 PM  **ACS Chemical Reactions—Ocean Acidification**
Engineering Day at NSTA

Sponsored by the American Society for Engineering Education

Friday, November 10, 8:00 AM–3:00 PM
102E, Wisconsin Center

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

8:00–9:00 AM  Arduino/STEM Projects for Physical Science Students
9:30–10:30 AM  K–5 Engineering: Integrating Engineering and Design into the Curriculum
11:00 AM–12 Noon  Engineering Education: Simple Electronics and Microcontrollers for the Classroom

12:30–1:30 PM  NGSS, 3-D Learning, and the Design and Use of Classroom Assessment
2:00–3:00 PM  ASEE’s K–12 Outreach: Engineering, Go For It (eGFI); Teach Engineering; Link Engineering; and the National Science Digital Library

Physics Day at NSTA

Sponsored by the American Association of Physics Teachers and Milwaukee Area AAPT Members

Friday, November 10, 8:00 AM–3:00 PM
102D, Wisconsin Center

The American Association of Physics Teachers offers a full day of physics content. Physics Day consists of interactive hands-on workshops and sessions covering important physics topics for today’s world. Each of these workshops or sessions is organized by experienced physics educators and designed to deal with innovative teaching methods and/or hard-to-express concepts that can be immediately applied in your classroom.

8:00–9:00 AM  IceCube Neutrino Observatory at the South Pole
9:30–10:30 AM  Living and Working at the South Pole

11:00 AM–12 Noon  Teach Science with IceCube Neutrino Observatory
12:30–1:30 PM  Integrating Engineering into Physics
2:00–3:00 PM  Video-Based Experiments
Association for Multicultural Science Education (AMSE)
President: Sharon Delesbore
Friday, November 10
12:30—2:30 PM  George W. Carver Conversation Series on Diversity and Equity  Executive C/D, Hyatt

Association for Science Teacher Education (ASTE)
President: Gillian Roehrig
Thursday, November 9
12:30—1:30 PM  Simplifying the Planning of Lessons, Units, and Courses for NGSS Using “Phenomena First” Approaches for the Life Sciences  Lakeshore C, Hyatt

Council for Elementary Science International (CESI)
President: James McDonald
Friday, November 10
9:30—10:30 AM  Integrating Science and Literacy: Proven Strategies Developed from Evidence-Based Practices  103D, Wisconsin Center
12:30—1:30 PM  Using Toys to Teach Physics  103D, Wisconsin Center

National Association for Research in Science Teaching (NARST)
President: Barbara A. Crawford
Thursday, November 9
2:00—3:00 PM  Integrating Science and Technology in Engineering Design Challenges to Teach Nature of Science  Lakeshore C, Hyatt

Friday, November 10
11:00 AM—12 Noon  Using Maker Activities and Formative Assessment Strategies to Enhance Computational Thinking Skills, Physics, and Engineering Learning  Lakeshore C, Hyatt

National Middle Level Science Teachers Association (NMLSTA)
Co-Presidents: Terri Hebert and Mary Lou Lipscomb
Thursday, November 9
2:00—3:00 PM  Surf’s Up  102B, Wisconsin Center

Friday, November 10
12:30—1:30 PM  Science Fairs: Relevant in 2017 or Is It Time for a Change?  103E, Wisconsin Center

National Science Education Leadership Association (NSELA)
President: Bob Sotak
Friday, November 10
9:30—10:30 AM  Tools for Science Leaders Session 1  Milwaukee, Hyatt
11:00 AM—12 Noon  Tools for Science Leaders Session 2  Milwaukee, Hyatt
### Science and Engineering Practices

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

### Crosscutting Concepts

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

### Disciplinary Core Ideas

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Operational since 1872, the Milwaukee Pierhead Light is an active lighthouse that has been listed on the National Register of Historic Places since September 2012.
All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional learning certification (based on clock hours). Use this form to keep track of all sessions/events attended during the Milwaukee conference. Sessions/events such as exhibit hall visits may not be available for online evaluation. However, these events still qualify for professional learning.

Beginning December 4, 2017, Milwaukee transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org) by logging on with your Milwaukee Badge ID# and and first clicking on My Profile under the Welcome. Here you’ll find a Certificates tab to access your transcript. Keep this form and use it to add the following activities to your Baltimore transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee’s individual profile.

First Name: __________________   Last Name: __________________  Badge ID# _____________________

Evaluate sessions by accessing the conference session browser: www.nsta.org/milwaukeebrowser. You will need your badge number to evaluate sessions. See page 11 of the conference program for instructions. Note: Our session evaluation system is designed to work from a computer and while it may work on smartphones/tablets, it is not really designed for them. And don’t forget, the more sessions you attend and evaluate, the more chances you have to win an Apple iPad mini 4 Wi-Fi!

Sample Questions:
1. I selected this session:
   a. for immediate classroom use.
   b. based on the reputation of the speaker.
   c. to improve my personal pedagogical knowledge/skill.
   d. to improve my science content knowledge.

2. The session met my needs.

3. The information presented was clear and well organized.

4. Safe practices were employed.

5. The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press® sessions).

6. The session should be repeated at another NSTA conference.

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

Thursday, November 9,  8:00 AM–6:00 PM

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We’re giving an Apple iPad mini 4 to one lucky attendee who evaluates sessions that he or she attends. The more sessions you attend and evaluate, the more chances you have to win!
### Friday, November 10, 8:00 AM–5:00 PM

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### Saturday, November 11, 8:00 AM–5:00 PM

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8:00–8:30 AM Presentation
Throw That Textbook Out to Sea!
(Grades 4–12) Lakeshore C, Hyatt
Science Focus: GEN, SEP
Sandra Leiterman (@saleiterman; saleiterman@gmail.com), University of Arkansas at Little Rock
Whether you want to test the waters or make waves...this session will give you a take-home template, as well as tips and planning techniques to turn your classroom from textbook based to Project Based!

8:00–9:00 AM Presentations
Coding in K–5 Classrooms...Start Them Early!
(Grades P–5) Lakeshore A/B, Hyatt
Science Focus: ETS, CCC1, SEP
Joan Biese (@gr1teacher; jbiese@seymour.k12.wi.us), Rock Ledge Primary Center, Seymour, Wis.
Computer science/coding websites and apps abound, with several focusing on young K–5 learners. Get them interested early; there are many benefits across the curriculum!

The Lady Who Put Salt in Her Coffee: STEM and Literacy
(Grade 8) Milwaukee, Hyatt
Science Focus: PS
Vito Dipinto (vdipinto@nl.edu), National Louis University at Wheeling, Ill.
Anthony Tournis, ASPIRA Haugan Middle School, Chicago, Ill.
Experience a novel grade 8 chemistry curriculum using storytelling to engage students in their science learning.

Elementary STEM Response To Intervention (RTI)
(Grades 3–5) 101 C/D, Wisconsin Center
Darrell McDaniel (@dmcDaniel5253; darrell.mcdaniel@cpsb.org), Calcasieu Parish School Board, Lake Charles, La.
Receive details about the pilot year of Elementary STEM RTI implementation in Louisiana’s Calcasieu Parish School District. Find out how you can replicate and modify the program.

The ideas and opinions expressed in the conference sessions, and in any handout materials provided, are those of the presenter. They are not those of the National Science Teachers Association nor can any endorsement by NSTA be claimed.
Bringing the 4th of July into Your Classroom: Model-Based Inquiry at Its Finest!
(Grades 6–8) 101B, Wisconsin Center
Science Focus: GEN, SEP
Andrew Bean (apbean@cps.edu), Dever Elementary School, Chicago, Ill.
Join in uncovering the basis for writing a model-based inquiry unit through the lens of a fascinating puzzling phenomenon: Why are fireworks different colors?

NSTA Press® Session: Creating a STEM Culture for Teaching and Learning
(General) Ballroom A, Wisconsin Center
Science Focus: GEN, NGSS
Jeffrey Weld (jeff.weld@uni.edu), Iowa Governor’s STEM Advisory Council, Cedar Falls
Hot off the NSTA Press, this book is for teachers, administrators, business partners, community members, parents, scholars, and policymakers who seek to be up-to-speed on the many elements of STEM, from curriculum to professional development to assessment to partnerships to licensing and more.

Is This Your First NSTA Conference? First-Timer Conference Attendees’ Orientation
(General) Ballroom D, Wisconsin Center
Science Focus: GEN
NSTA Board and Council
Feeling overwhelmed by all there is to see and do at an NSTA conference on science education? Join us for an interactive exploration through the program, the conference app, and NSTA’s social media. By the end of the session, you will know just how to get the most from your conference experience in addition to building new networks with science colleagues.

Evaluate Your Sessions Online!
This year, we’re giving away a Apple iPad mini 4 Wi-Fi tablet to one lucky attendee who completes a session evaluation!
Remember, the more sessions you attend and evaluate, the more chances you have to win! (See page 11 for details.)
Engineering the Maker Movement in Your Classroom
(Grades 9–College) Regency C, Hyatt
Science Focus: ETS1, SEP6
Rachelle Haroldson, University of Wisconsin–River Falls
Jessica Hoida, Kettle Moraine High School, Wales, Wis.
Learn about the history, resources, and activities from the maker movement that address the NGSS engineering practices to embed into your classroom.

Large K Equilibrium
(Grades 9–College) Regency D, Hyatt
Science Focus: GEN, SEP
Gregory Dodd (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.
Emphasis will be placed on Large K Equilibrium and methods to overcome common student misconceptions. Take part in a “hands-on” equilibrium lab.

Physics Labs for Everyone
(Grades 9–12) 101A, Wisconsin Center
Science Focus: PS, SEP
Patrick Carter (pcart40@yahoo.com), Kaneland High School, Maple Park, Ill.
Perform 10 great labs that all physics students can do, and that use common lab equipment. Learn how to incorporate them into your unit plans.

Polymers: Teaching “Hard” Concepts with Gooey Labs
(Grades 6–12) 102A, Wisconsin Center
Science Focus: ETS, PS, CCC, SEP2, SEP3, SEP4, SEP6
Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash.
Enhance and deepen science and math concepts taught in traditionally “fun” polymer labs. Add more scientific processes to make them inquiry based. Take home a CD of information.

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

First-Timer Attendee Session Thursday, November 9, 8:00–9:00 AM
Ballroom D, Wisconsin Center
Thursday, 8:00–9:00 AM

Exploring the Science and Engineering Practices
(Grades K–12) 103C, Wisconsin Center
Science Focus: GEN, SEP
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.
Come explore science and engineering practices (such as constructing explanations and developing models) that are central to the vision of education described in the Framework and the NGSS.

8:00–9:00 AM Exhibitor Workshops

NGSS Waves: Protect Your Eyes!
(Grades 6–8) 201B, Wisconsin Center
Sponsor: Lab-Aids, Inc.
Cynthia Sanchez, North-Grand High School, Chicago, Ill.
Investigate wave properties before gathering evidence that energy varies with different colors of light. Start with tubes to investigate sound and then use a light station to explore light. Finally, experiment with colors and energy levels using a phosphorescent material.

How to Argue in a Middle School Science Class
(Grades 5–8) 202A, Wisconsin Center
Science Focus: GEN, SEP7
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Help students develop scientific argumentation skills by making claims based on observable evidence. Put these skills into practice with lessons from Delta Science Modules, as we prove (or disprove) fundamental science concepts. Leave with readers, equipment, and a lesson that you can try with your students next week.

Ten Minutes to Improving Science Achievement
(Grades K–8) 202B, Wisconsin Center
Science Focus: GEN
Sponsor: Delta Education/School Specialty Science–FOSS
Kathy Long, The Lawrence Hall of Science, University of California, Berkeley
"Assessment" can strike fear and trepidation into the hearts of teachers and students. Join FOSS developers to learn how assessment can be transformed into an integrated teaching tool that teachers and students in grades 3–8 can embrace to create a classroom culture that motivates effort and growth to improve achievement.

CPO Science Biology Energy QUEST: Teaching Cell Energy Pathways
(Grades 5–12) 202D, Wisconsin Center
Science Focus: LS
Sponsor: CPO Science/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Get ENERGIZED about teaching energy pathways with our latest LINK supplementary learning module, amplified by cutting-edge Augmented Reality. Through collaborative gameboard play, a content-rich digital curriculum, and by manipulating smartphone-ready 3D imagery with a swipe of a finger, students will be clamoring to earn 32 ATP and synthesize C6H12O6 molecules.

Incorporating STEM into the Classroom (High School Science)
(Grades 9–12) 202E, Wisconsin Center
Science Focus: ETS1, CCC, SEP
Sponsor: Activate Learning
Gary Curts, STEM Implementation Specialist/Retired Educator, Dublin, Ohio
Bringing STEM into the classroom by involving students in engineering design to solve a real-world problem gives students the opportunity to apply crosscutting concepts and disciplinary core ideas as well as demonstrate the NGSS science and engineering practices. Join us as we share how we have integrated STEM and the engineering design cycle into our core Earth science, chemistry, physics, and physical science courses.
Martian Genetics: An Electrophoresis Exploration
(Grades 6—College) 203 D/E, Wisconsin Center
Science Focus: ETS, LS
Sponsor: Edvotek, Inc.

Brian Ell (info@edvotek.com), Tom Cynkar, and Maria Dayton, Edvotek Inc., Washington, D.C.

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

8:30–9:00 AM Presentation
Guiding Middle School Students in Developing Their Explanations of the Seasons Through a Modeling-to-Learn Approach
(Grades 6–8) Lakeshore C, Hyatt
Science Focus: ESS1.B, ESS2.D, CCC1, SEP2
Kyle Peters, Reek Elementary School, Lake Geneva, Wis.
Liezl Gapinski (hohenshl@uw.edu), University of Wisconsin—Whitewater

Join us to experience a modeling-to-learn approach used with middle school students to develop their causal explanations of the seasons for transfer to your classroom.

9:15–10:30 AM General Session
The Serengeti Rules: The Quest to Discover How Life Works and Why It Matters
(General) Ballroom C, Wisconsin Center
Science Focus: LS

Sponsored by HHMI BioInteractive

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

Presider and Introduction: David Crowther, NSTA President, and University of Nevada, Reno

Platform Guests: Sean B. Carroll; David Crowther; Mary Gromko, NSTA Retiring President, Colorado Springs, Colo.; Christine Anne Royce, NSTA President-Elect, and Shippensburg University, Shippensburg, Pa.; Nicole Vick, NSTA Director, District XII, and Galesburg High School North, Galesburg, Ill.; Kevin Anderson, Chairperson, NSTA Milwaukee Area Conference, and Wisconsin Dept. of Public Instruction, Madison; Ray Scalavino, President, Wisconsin Society of Science Teachers, Program Coordinator, NSTA Milwaukee Area Conference, and University of Wisconsin—Milwaukee; Michelle Griffin-Wenzel, Local Arrangements Coordinator, NSTA Milwaukee Area Conference, and Germantown High School, Germantown, Wis.; David Evans, NSTA Executive Director, Arlington, Va.

How does nature produce the right numbers of zebras and lions on the African savanna, or fish in the ocean? How do our bodies produce the right numbers of cells in our organs and bloodstream? How does life work? Biologist and author Sean B. Carroll tells stories from his book, The Serengeti Rules, of the pioneering scientists who sought the answers to such simple, yet profoundly important questions, and shows how their discoveries matter for our health and the health of the planet we depend upon.

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

Be sure to join Sean after his talk at Booth #722 in the Exhibit Hall, where he will be signing copies of his book, The Serengeti Rules. Books will be available for purchase at the booth while supplies last.
9:30–10:30 AM  Exhibitor Workshops

The Power of Modeling in K–8 Classrooms
(Grades K–8) 201A, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Amplify
Sophia Lambertsen and Rebecca Abbott, The Lawrence Hall of Science, University of California, Berkeley
How can students create and use models to enhance, explain, and expand their thinking? Experience a variety of ways students deepen and demonstrate their understanding of scientific phenomena through the use of models. Engage with K–8 exemplars from Amplify Science, the new NGSS-designed curriculum from The Lawrence Hall of Science.

NGSS Ecology: Modeling the Introduction of a New Species
(Grades 6–8) 201B, Wisconsin Center
Science Focus: LS2.B, LS2.C, CCC4, CCC5, SEP2
Sponsor: Lab-Aids, Inc.
Cynthia Sanchez, North-Grand High School, Chicago, Ill.
How does a new species affect the flow of matter and energy in an ecosystem? This card sort–style activity models the introduction of a new species with special attention to the effect on existing predators and producers. This activity is from the new SEPUP middle level Ecology unit, revised and updated for the NGSS and published by Lab-Aids. Take home free samples of the activity.

Coding with First Graders? The Smithsonian Says YES!
(Grades K–5) 201 C/D, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Join us for this engaging hands-on workshop with investigations for teaching coding to young children. From the new Smithsonian Science for the Classroom™ series, the “How Can We Send a Message Using Sound?” module is designed to use the NGSS practices that make the standards come alive.

Makerspaces with Options for All Students
(Grades 4–8) 202A, Wisconsin Center
Science Focus: ETS
Sponsor: Delta Education and Frey Scientific
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
For students to develop the proper range of skills required of “makers”—a makerspace should provide tools and resources to help them grow as scientists. Many makerspaces now include supplemental curriculum options that give students who are curious about science the resources designed for exploring classroom concepts in a maker setting.

What Does Argumentation Look Like in an Elementary Classroom?
(Grades K–5) 202B, Wisconsin Center
Science Focus: GEN, SEP7
Sponsor: Delta Education/School Specialty Science—FOSS
Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS Next Generation Program developers to learn about science practices within the context of active investigations. Experience analyzing and interpreting data, constructing explanations, and engaging in argumentation from evidence as tools to deepen student learning within a FOSS lesson. Find out about transitioning to FOSS Next Generation.

Year-Round Solutions for Success in AP Chemistry from Flinn Scientific
(Grades 9–12) 202C, Wisconsin Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Mike Marvel (mmarvel@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Join Flinn as we share AP Chemistry demonstrations, labs, inquiry activities, and more! Come learn about new ways to engage your advanced students. Our activities are aligned to the learning objectives and skills your students need to be successful. Prepare your students for the first day of class with FlinnPREP™, a new online review of foundational chemistry concepts. Handouts and door prizes. AP is a trademark of the College Board.

CPO’s Wind Turbine: A STEM Approach to Engineering and Design
(Grades 5–12) 202D, Wisconsin Center
Science Focus: ETS, SEP
Sponsor: CPO Science/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
CPO’s Link Wind Turbine learning module lets students learn in a real-time digital platform and engineer a wind turbine. Students build, test, and revise their designs. LINK uses STEM activities and an NGSS approach giving students an understanding of how to apply the Engineering Cycle and demonstrate understanding.
Literacy in the Context of Science in the Middle School Classroom
(Grades 5–8) 202E, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Activate Learning
Ellen Mintz (emintz621@gmail.com), Charleston County School District, Charleston, S.C.
Experience a lesson that demonstrates the integration of literacy strategies in the context of science. This includes the incorporation of academic language in written responses in science notebooks and oral discourse in conjunction with investigations using an interactive word wall.

Analyzing and Interpreting Data Using TCI’s Bring Science Alive!
(Grades K–5) 203A, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: TCI
Brian Thomas, TCI, Cincinnati, Ohio
Get your students to do more than just read a graph, chart, or statement. Participants will be immersed in a Bring Science Alive! classroom where students analyze and interpret data and construct an argument based on research.

Keep Your Head Above Water with Magnetic Water Molecule Models
(Grades 4–College) 203B, Wisconsin Center
Science Focus: ESS2, ESS3, ETS, LS1, LS4, PS1, PS2, CCC, SEP
Sponsor: 3D Molecular Designs
Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, Wis.
ENGAGE students by modeling chemical and physical properties of water using hands-on/minds-on magnetic water molecules. EXPLORE common water phenomena such as density, erosion, and weathering. EXPLAIN the phases of water, density, and solubility. ELABORATE on the water cycle and its impact on the ecosystem. EVALUATE student learning with models.

Exploring the Genetics of Taste: SNP Analysis of the PTC Gene Using PCR
(Grades 9–College) 203 D/E, Wisconsin Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Maria Dayton (info@edvotek.com), Tom Cynkar, and Brian Ell, Edvotek Inc., Washington, D.C.
Explore the relationship between genotype and phenotype using Phenylthiocarbamide (PTC). Some think PTC tastes bitter, while others find it tasteless. The ability to taste PTC has been linked to variations in a taste receptor gene. Come learn how to use PCR to distinguish between PTC alleles. Free gift!

11:00 AM–12 Noon  Exhibitor Workshops

Space Docking Failure: Phenomena and 3-D Instruction for Grades 6–8
(Grades 6–8) 201A, Wisconsin Center
Science Focus: PS2, CCC, SEP
Sponsor: Amplify
Sophia Lambertsen and Rebecca Abbott, The Lawrence Hall of Science, University of California, Berkeley
Experience how students investigate a failed spacecraft docking while figuring out principles of force and motion and engaging in three-dimensional learning. Participants will get a hands-on dive into Amplify Science for grades 6–8, engaging with this new NGSS-designed curriculum from The Lawrence Hall of Science.

NGSS Reproduction: Breeding Critters—More Traits
(Grades 6–8) 201B, Wisconsin Center
Science Focus: LS1, LS3, CCC1, CCC2, SEP2, SEP6
Sponsor: Lab-Aids, Inc.
Cynthia Sanchez, North-Grand High School, Chicago, Ill.
Students model and explain additional patterns of inheritance as they explore cause-and-effect relationships for additional traits of the critters. These patterns help them model and explain the wide variation that can result from sexual reproduction. This activity provides an opportunity to assess student work related to MS-LS3-2.

Autopsy: Forensic Dissection Featuring Carolina’s Perfect Solution® Pigs
(Grades 9–12) 201 C/D, Wisconsin Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Ready for a forensic dissection that is on the cutting edge? Engage students and revitalize your mammalian structure and function lessons with a real classroom autopsy. Participants dissect a Carolina’s Perfect Solution pig by modeling the protocols of a professional forensic pathologist. Come experience our exclusive Perfect Solution preserved specimens.
Thursday, 11:00 AM–12 Noon

OK, Class, Please Open Your Science Notebooks…
(Grades K–8) 202A, Wisconsin Center
Science Focus: GEN
Sponsor: Delta Education/School Specialty Science
Kathy Armstrong, Northside Elementary School, Midway, Ky.
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.
Experience the feeling of starting with a blank notebook and filling it with new ideas to make sense of the world around you. Leave with ideas and strategies to improve student notebooking in your own classroom.

What Does Conceptual Modeling Look Like in Grades K–5 Classrooms?
(Grades K–5) 202B, Wisconsin Center
Science Focus: PS, CCC
Sponsor: Delta Education/School Specialty Science—FOSS
Brian Campbell, The Lawrence Hall of Science, University of California, Berkeley
Join FOSS Next Generation Program developers to explore how students construct models about phenomena. Experience active investigations from two grade levels and create models about physical science concepts. Find out how student models can be used to guide future instruction within the FOSS program.

Putting the “E” in STEM: Engineering in the Middle School Science Classroom
(Grades 6–9) 202C, Wisconsin Center
Science Focus: ETS, SEP
Sponsor: AEOP
Alexandra Wakely, eCYBERMISSION Outreach Specialist, NSTA, Arlington, Va.
Many science teachers are working on bringing engineering (the E in STEM) into their science classes. But with limited time, state requirements, and plenty of science content to cover, it can be a challenge. Discussion centers on the value of integrating engineering into your science classes and tips on how to make the integration seamless. There will also be an explanation of the online STEM competition eCYBERMISSION and how it relates to engineering in the science classroom.

CPO’s LINK Genetics Learning Modules: Crazy Traits and Crazy Chromosomes
(Grades 5–12) 202D, Wisconsin Center
Science Focus: LS
Sponsor: CPO Science/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
CPO Science’s LINK learning modules for genetics use NGSS strategies in a real-time digital learning environment. Students can study the relationship between DNA, genes and mitosis, meiosis, traits, alleles, phenotypes, and genotypes. Heredity comes alive as you use hands-on models to create crazy creatures in a unique collaborative program.

Project-Based Inquiry Science™ (PBIS): Creating “Coherence and Science Storylines” for Middle School Science
(Grades 6–8) 202E, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Activate Learning
Mary Starr (mary@starrscience.com), Michigan Mathematics and Science Centers Network, Plymouth
STEM learning requires integration! Powerful questions and coherent storylines help solve the integration challenge. PBIS is built around interesting and meaningful Big Questions and Big Challenges, supporting the integration of science and engineering, engaging ALL students in high-quality STEM learning, and embracing the vision of the Framework and NGSS.

5 E’sy Ways to Investigate Enzymes!
(Grades 8–College) 203B, Wisconsin Center
Science Focus: LS1, LS3, LS4, PS1, PS2, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6
Sponsor: 3D Molecular Designs
Gina Vogt (gina.vogt@3dmoleculardesign.com), 3D Molecular Designs, Milwaukee, Wis.
ENGAGE students in investigating enzyme structure/function using multiple modeling strategies. EXPLORE and EXPLAIN catabolism, anabolism, and competitive/noncompetitive inhibition with hands-on/minds-on instructional materials. ELABORATE on insecticide inhibition at an enzyme active site resulting in unintended consequences. EVALUATE student learning with an enzyme molecular story. Handouts!
Left at the Scene of the Crime: Introduction to Forensic Science
(Grades 6–College) 203 D/E, Wisconsin Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Brian Ell (info@edvotek.com), Maria Dayton, and Tom Cynkar, Edvotek Inc., Washington, D.C.
Explore genetic diversity using forensic science! Your students become crime scene investigators as they analyze biological evidence using DNA fingerprinting, a technique that identifies people via genetic differences. Gel electrophoresis is used to create DNA fingerprints from crime scene and suspect samples. A match between samples suggests which suspect committed the crime. Free gift for attendees!

11:00 AM–5:00 PM  Exhibits
Hall A, Convention Center
Did you know that NSTA offers exclusive exhibit hall and exhibitor workshop hours today from 11:00 AM to 12:30 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

Thursday, 11:00 AM–12 Noon
Download our conference app for a social experience you don’t want to miss.

- Search sessions, exhibitors, and speakers to build a schedule of your favorites
- Access maps with pinpoint locations
- Take notes within app
- Bookmark an interesting speaker
- Share the play-by-play with social media channels
- Tweet a memorable quote from a session
- Access conference FAQs

Available for download on

iPhone + iPad
Android

www.nsta.org/conferenceapp

Powered by:
Thursday, 12:30–1:30 PM

12:30–1:30 PM  Presentations

**NGSS and the Small High School—An Out-of-This-World Solution?**
(Grades 9–12) Lakeshore A/B, Hyatt

Science Focus: GEN, NGSS

**Allison Fuelling** (@ajfuelling; afuelling@marshallschools.org), **Joseph Wells** (@MrWellsMHS; JWells@marshallschools.org), and **Danielle Bendt** (@MrsBendt66; dbendt@marshallschools.org), Marshall High School, Marshall, Wis.

Our small rural district is struggling to meet the NGSS while at the same time offering students the option for multiple advanced science courses. We would like to share our ideas with other districts and problem solve some challenges we are facing. How does your district address the breadth of the NGSS? Feedback welcomed.

**ASTE-Sponsored Session: Simplifying the Planning of Lessons, Units, and Courses for NGSS Using “Phenomena First” Approaches for the Life Sciences**
(Grades 6–12) Lakeshore C, Hyatt

Science Focus: LS

**Rachelle Haroldson**, **Keaton Anderson** (@SweetKeat24; @MrAScienceClass; keaton.anderson.24@gmail.com), and **Joel Donna** (@joelddonna; joel.donna@uwrf.edu), University of Wisconsin–River Falls

Find out how to simplify your research-based planning for NGSS for life science. Engage in a model mitosis lesson and then explore tools and curricula.

**NGSS and Visual Literacy: A STEAM Approach**
(Grades 8–11) Milwaukee, Hyatt

Science Focus: PS

**Vito Dipinto** (vdipinto@nl.edu), National Louis University at Wheeling, Ill.

**Andrew Bean** (apbean@cps.edu), Dever Elementary School, Chicago, Ill.

**Frank Prill** (frankprilljr@gmail.com), Bolingbrook High School, Bolingbrook, Ill.

**Anthony Tournis** (ajtournis@gmail.com), ASPIRA Haugan Middle School, Chicago, Ill.

Come learn a variety of visual literacy skills you can use in your secondary physical science classroom.

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**Creating a Technology-Based, Student-Centered Classroom**
(Grades 6–12) 101A, Wisconsin Center

Science Focus: GEN

**Matthew Senese** (@MrSenese; msenese@d155.org) and **William Janshego** (@MrJanshego; wjanshego@d155.org), Prairie Ridge High School, Crystal Lake, Ill.

Improve science curriculum through the incorporation of ePortfolios, GAFE, and inquiry activities to replace the standard PowerPoint presentations and paper-based classroom.

**Put on Your 3-D Assessment Glasses**
(Grades K–12) 102C, Wisconsin Center

Science Focus: ESS1.B, ETS

**Cary Sneider** (carysneider@gmail.com), Portland State University, Portland, Ore.

NGSS performance expectations mean that authentic assessment must allow you to observe what your students can do, not just see their answers on a test.

**Using the NSTA Learning Center as an Online Textbook**
(Grades 9–College) 103A, Wisconsin Center

Science Focus: GEN

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

**Eric Brunsell** (@; brunsele@uwosh.edu), NSTA Director, Professional Development in Science Education, and University of Wisconsin Oshkosh

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

**Killing Two Birds with One Notebook**
(Grades K–8) 103B, Wisconsin Center

Science Focus: GEN, NGSS

**Seth Marie Westfall** (sethmariwestfall@gmail.com), Racine (Wis.) Unified School District

Explore methods and ideas for integrating reading, writing, listening, and speaking into science instruction through the use of interactive science notebooks. Examples of elementary and middle school notebooks will be presented. Review student examples and begin to create your own model interactive notebook. CCSS and NGSS correlations will be shared.
Solids: The Neglected “State” of Chemistry  
(Grades 9–12)  
103E, Wisconsin Center  
Science Focus: PSI  
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.  
Use solids to make chemistry more relevant for students. Hands-on STEM activities using solid materials (metals/polymers/ceramics) make concepts easier to teach/learn. NGSS correlations will be shared and you’ll receive a CD of information.

(Grades 9–12)  
Ballroom A, Wisconsin Center  
Science Focus: PS, CCC, SEP  
Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin  
Learn about Argument-Driven Inquiry and how it can help students learn how to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

Climate Literacy → Climate Solutions  
(Grades K–12)  
Ballroom B, Wisconsin Center  
Science Focus: ESS, CCC  
June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.  
Want to teach climate literacy but don’t know where to start? The National Oceanic and Atmospheric Administration (NOAA) offers a spectrum of online lesson plans, videos, data sets, webinars, and more that can inform and inspire students to engineer solutions to climate concerns.

NESTA and AMS Share: DataStreme’s 3-D Learning Tools to Support Essential Earth Science Concepts  
(General)  
Ballroom D, Wisconsin Center  
Science Focus: ESS, CCC, SEP  
Wendy Abshire (@AMSeducation; wabshire@ametsoc.org), American Meteorological Society, Washington, D.C.  
Free professional development opportunity! Check out the very successful American Meteorological Society (AMS) DataStreme Project, three courses full of real-world data to explore weather, water, and climate science.

12:30–1:30 PM  
Hands-On Workshops  
Integration of Science and Literacy Equals Improved Achievement  
(Grades 3–8)  
Regency A, Hyatt  
Science Focus: GEN  
Linda Linnen, Retired Teacher, Aurora, Colo.  
Experience how to integrate reading, writing, speaking, and listening, plus CCSS strategies and science notebooking into daily science lessons.

Designing and Evaluating Project-Based Activities to Foster 3-D Learning  
(Grades K–12)  
Regency B, Hyatt  
Science Focus: GEN, NGSS  
John Loehr (jfloehr@soinc.org), Science Olympiad, Oakbrook Terrace, Ill.  
Learn how to create and evaluate Project-Based Learning activities that address the three dimensions of the NGSS using a framework from Science Olympiad.

How to Read Like Scientists!  
(Grades 4–10)  
Regency C, Hyatt  
Science Focus: GEN  
Ann Berg (aberg@c-ischools.org), Cambridge Middle School, Cambridge, Minn.  
Explore strategies through interactive activities and discussion that support success in reading science nonfiction and, most importantly, scientific inquiry.

CSI Mammoth: Using Social Studies to Teach Science Investigations  
(Grades 2–6)  
101B, Wisconsin Center  
Science Focus: ESS, LS3, LS4.A, CCC1, CCC2, SEP3, SEP7  
Jennifer Edginton (edginton@kenosha.org) and Doug Dammann (dldammann@kenosha.org), Kenosha Public Museum, Kenosha, Wis.  
Join Kenosha Public Museum educators to learn the science behind a mysterious mammoth site from the Ice Age. Featuring hands-on activities and free lessons.

Evidence and Explanations: Energy Changes and Transformations in a Bouncing, Flashing Ball  
(Grades 3–8)  
102A, Wisconsin Center  
Karen Ostlund (@karen_ostlund; klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin  
Come play with a bouncing, flashing ball to make observations as evidence to explain types of energy changes and transfers.
**Decoding Starlight: From Photons to Pixels to Images—Using Science and Art**  
(Grades 7–12)  
102D, Wisconsin Center  
**Donna Young** (dlyoung.nso@gmail.com), NASA NSO STEM Coordinator, Bullhead City, Ariz.  
Produce a photon intensity image of a supernova remnant using NASA X-ray data, and then convert the image into a public release image with this STEAM activity.

**Connecting Content, Critical Thinking, and Creativity Through Trade Books**  
(Grades 3–6)  
102E, Wisconsin Center  
Science Focus: GEN, CCC1, CCC3, CCC6  
**Christine Anne Royce** (@caroyce; caroyce@aol.com), NSTA President-Elect, and Shippensburg University, Shippensburg, Pa.  
Investigate a series of activities to help integrate science and literacy skills. These activities use trade books focused on critical thinking, creativity, and developmentally appropriate content.

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**12:30–1:30 PM Exhibitor Workshops**

**Puppet Theater Engineering: Phenomena and 3-D Instruction for Grades K and 1**  
(Grades K–1)  
201A, Wisconsin Center  
Science Focus: PS, CCC, SEP  
Sponsor: Amplify  
**Sophia Lambertsen** and **Rebecca Abbott**, The Lawrence Hall of Science, University of California, Berkeley  
Experience how students design shadow scenery and sound effects while figuring out the principles of light and sound and engaging in three-dimensional learning. Get a hands-on dive into Amplify Science for grades K–1, engaging with this new K–8 NGSS-designed curriculum from The Lawrence Hall of Science.

**NGSS Biomedical Engineering: Get a Grip!**  
(Grades 6–8)  
201B, Wisconsin Center  
Science Focus: ETS, LS1.A, CCC6, SEP1, SEP2, SEP5, SEP6  
Sponsor: Lab-Aids, Inc.  
**Cynthia Sanchez**, North-Grand High School, Chicago, Ill.  
Use the approach of biomimicry to design, test, evaluate, and redesign a mechanical gripping device to meet criteria. An iterative process is used to optimize the device by investigating the relationship between structure and function and applicable technology.

**Hands-On Science with Classroom Critters**  
(Grades K–12)  
201 C/D, Wisconsin Center  
Science Focus: LS  
Sponsor: Carolina Biological Supply Co.  
**Carolina Teaching Partner**  
Add action and excitement to your science class with live organisms! Discover fun hands-on activities with pill/sow bugs, termites, bessbugs, and butterflies you can use in your labs. Learn about care and handling, as well as easy ways to introduce inquiry. Additional resources available online.

**What in the World Are Crosscutting Concepts?**  
(Grades K–8)  
202A, Wisconsin Center  
Science Focus: GEN, CCC  
Sponsor: Delta Education/School Specialty Science  
**Kathy Armstrong**, Northside Elementary School, Midway, Ky.  
**Derrick Wood**, Distance Learning Coordinator, Louisville, Ky.  
Crosscutting concepts may be the most misunderstood dimension of the NGSS. Come be a student and experience Delta Science Module lessons that unleash the power of the crosscutting concepts and give them the attention they deserve. Leave with materials and strategies that you can use in your classroom next week.

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—Photo courtesy of Jennifer Williams and Mary Ellen Hamner
Wave Properties and Information Transfer
(Grades 6–9) 202B, Wisconsin Center
Science Focus: PS4, CCC, SEP
Sponsor: Delta Education/School Specialty Science–FOSS
Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
Engage in activities using lasers and optical fibers in the new FOSS Next Generation Waves Course for middle school. Explore properties of refraction and reflection that allow information transfer by fiber-optic technology, and identify connections to the three dimensions of NGSS.

Out-of-School STEM Enrichment: AEOP Program Design Collaboration
(Grades K–12) 202C, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: AEOP
Come learn what AEOP can do for your students’ STEM enrichment outside of school time! This workshop is hosted by the Army Educational Outreach Program (AEOP), sponsors of out-of-school programs across the nation for K–12 students. Join in to get a chance to work with colleagues in developing your ideal (fictional) program and seeing how it stacks up to the programs offered by AEOP!

Modular Robotics for Elementary and Middle School: CUBELETS!
(Grades 3–8) 202D, Wisconsin Center
Science Focus: ETS
Sponsor: Frey Scientific/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Encourage students to be inquisitive and unlock their inner inventor! Learn about types of robotic operations: THINK, SENSE, and ACT in a hands-on hour using Cubelets, blocks that can instantly connect and perform robot functions. What sensory input is needed? What output is generated? How many classroom applications are there?

Structuring Discussion to Be Equitable and Rigorous
(Grades K–12) 202E, Wisconsin Center
Science Focus: PS2, SEP2, SEP6, SEP7, SEP8
Sponsor: Activate Learning
Heather Milo (hmilo@activatelearning.com), Activate Learning, Greenwich, Conn.
The Framework promotes learning as a fundamentally social endeavor supported by collaborative and communicative norms. Yet, sustaining these norms requires teachers to examine and support K–12 students’ ways of talking so they all are able to articulate, make sense of, and evaluate each other’s ideas. Walk away with ready-to-use tools that foster and assess productive talk. This session uses the IQWST™ unit, How Will It Move?

Getting Students Through the Cellular Membrane
(Grades 6–College) 203B, Wisconsin Center
Science Focus: LS1, PS1, PS2, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6
Sponsor: 3D Molecular Designs
Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, Wis.
Support three-dimensional learning with materials that engage your students in an exploration of rare chemical and physical properties of water and the membranes that separate cells from their surrounding environment. Construct a model to explain diffusion, osmosis, and active and passive transport of molecules across the cell membrane.

Cancer Investigators: Medical Diagnostics in Your Classroom
(Grades 9–College) 203 D/E, Wisconsin Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Brian Ell (info@edvotek.com), Tom Cynkar, and Maria Dayton, Edvotek Inc., Washington, D.C.
Cancer contributes to almost one in every four deaths in the United States. Fortunately, innovations in biomedical research have improved our understanding of the differences between normal and cancer cells. In this hands-on workshop, participants use microscopy and electrophoresis to explore the hallmarks of cancer. Free gift for attendees!
Thursday, 12:30–3:30 PM

12:30–3:30 PM  Hands-On Workshop
From Exploring Ecosystems to Writing Reports and Explanations—ELLs Focus on Language
(Grades 3–6)  Executive C/D, Hyatt
Science Focus: LS1.C, CCC5, SEP2, SEP6
Holly Rosa (hrosa@bostonpublicschools.org), Boston (Mass.) Public Schools
Tracy Hodgson-Drysdale (tdrysdal@lesley.edu), Lesley University, Cambridge, Mass.
Find out how you can guide English language learners from everyday language to academic language, and from rich science talk to engaging science writing.

1:30–3:30 PM  Presentation
Showcase of Wisconsin Science Olympiad
(General)  Hall B Lobby, Wisconsin Center
Science Focus: GEN, INF, NGSS
Forrest Schultz (@Wisciolympiad; schultef@uwstout.edu), University of Wisconsin–Stout, Menomonie
Scott Gundrum (scoots@mrgundrum.com), Slinger High School, Slinger, Wis.
Nicole Williams (williams@muhs.edu), Marquette University High School, Milwaukee, Wis.
Experience the excitement of Science Olympiad as students and coaches in Wisconsin share their competitive STEM events at walk-up stations. Enjoy firsthand teaching and learning of STEM at its finest!

2:00–3:00 PM  Featured Presentation
Fallacy of Fairness
(General)  102C, Wisconsin Center
Science Focus: GEN
Jo Handelsman (@jo44atWID; jo.handelsman@wisc.edu), Director, Wisconsin Institutes for Discovery, Madison
Presider: Michelle Griffin-Wenzel, Strand Leader, and Germantown High School, Germantown, Wis.
Most educators intend to teach all students. In fact, many of us see students’ failures as a referendum on our own performance. But in reality, in science education we do not reach all students equally due to external factors that are out of our control as well as what happens in the classroom, which we are empowered to change. Girls and ethnic minority students are often disadvantaged by the teaching methods we use and by the impact of our unintended biases on our expectations of certain students and, consequently, their performance. We can work toward leveling the playing field and improving learning for all students by adopting active learning methods and being vigilant about expression of our own unconscious biases. We will discuss the evidence for unconscious bias and the power of individual will to change its impact.

Jo Handelsman was appointed by former President Barack Obama as the associate director for Science at the White House Office of Science and Technology Policy (OSTP) where she served for three years until January 2017. Jo received her PhD at the University of Wisconsin–Madison in Molecular Biology and has since authored over 100 papers, 30 editorials, and 3 books. She is responsible for groundbreaking studies in microbial communication and work in the field of metagenomics. Notably, in 2011, Jo received the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring from President Obama and in 2012, Nature named her one of “ten people who mattered this year” for her research on gender bias in science. Jo is the director of the Wisconsin Institute for Discovery at the University of Wisconsin–Madison.
2:00–3:00 PM Presentations

Fostering a Great Lakes Community of Practice with the Center for Great Lakes Literacy
(Grades 4–12) Executive A/B, Hyatt
Science Focus: ETS1, INF, SEP2, SEP3, SEP6
Kathleen Kline (@ks_kline; kkline@aquawisc.edu), University of Wisconsin Sea Grant Institute, Madison
Lynn Kurth (lynn.kurth@maps.k12.wi.us), Prairie River Middle School, Merrill, Wis.
Delve into how the Center for Great Lakes Literacy fosters a community of practice among educators who are passionate about the Great Lakes.

Creating a Coding Culture in the Classroom
(Grades P–6) Lakeshore A/B, Hyatt
Science Focus: GEN, NGSS
Byron Gilliland (@byron_gilliland; byron.gilliland@winona.k12.mn.us), Jefferson Elementary STEM School, Winona, Minn.
Discover ways to create a culture inclusive to coding in the classroom. Explore methods to create excitement and engage preK–6 students in coding/programming activities.

NARST-Sponsored Session: Integrating Science and Technology in Engineering Design Challenges to Teach Nature of Science
(Grades 6–9) Lakeshore C, Hyatt
Science Focus: ETS1
Allison Antink-Meyer (@AntinkMeyer; aameyer@ilstu.edu), Illinois State University, Normal
Discussion centers on three engineering design challenges that integrate science, engineering, and technology and how to use STEM to teach nature of science.

Using Engineering Design to Collaboratively Create Engineering Design
(Grades 2–College) Regency C, Hyatt
Science Focus: ETS1
Ken Turner, Jr. (kturner@dbq.edu), University of Dubuque, Iowa
Melissa Kirby (@KirbyScience; kirbym@kmsd.edu), Kettle Moraine High School, Wales, Wis.
The problem-solving orientation of engineering design is the perfect means for teachers to use when collaboratively creating a lesson or unit using engineering design.

Using Pop Culture and Polymers to Create Inquisitive Minds
(Grades 6–12) 101 C/D, Wisconsin Center
Science Focus: PS, SEP1, SEP2, SEP6, SEP7, SEP8
Sherri Rukes (sherri.rukes@d128.org), Libertyville High School, Libertyville, Ill.
Ever wonder how to get more students interested in what you teach? Add some pop culture and a pop culture project to make the connection with your students. Take home a CD.

High School Teachers: Birds of a Feather
(Grades 9–12) 101A, Wisconsin Center
Science Focus: GEN, NGSS
Steve Wood (swood@d125.org), Adlai E. Stevenson High School, Lincolnshire, Ill.
Facilitated by NSTA’s High School Committee, come discover NSTA resources, participate in discussions, and share high school needs/concerns in your state. How can we help?

Engineering Your Approach to Creative Problem Finding and Design Solutions
(Grades 6–12) 101B, Wisconsin Center
Science Focus: ETS, CCC4, CCC5, SEP1
Dorothy Ginnett (dorothyginnett@gmail.com), Auburndale High School, Auburndale, Wis.
Creatively brainstorm integration of authentic place-based issues to pursue engineering problem finding and design solutions that positively impact your local school or community.

STEM and Trade Books: Strange Bedfellows
(Grades P–8/College) 103A, Wisconsin Center
Science Focus: GEN
Juliana Texley (texley1j@cmich.edu), 2014–2015 NSTA President, and Science Writer/Instructor, New Baltimore, Mich.
Wondering how to add literacy to your STEM lessons? Come learn about NSTA’s initiative, “Best STEM Books” and how to identify them.
Thursday, 2:00–3:00 PM

California Science Project Session: Academic Language Development in Science Through Literacy
(Grades 4–12) 103C, Wisconsin Center
Arthur Beauchamp (@Dr_Dialogue; acbeauchamp@ucdavis.edu), University of California, Davis
Melanie Villanueva (@MrsVChemistry; melaniem5@hotmail.com), Sweetwater Union High School District, Chula Vista, Calif.
Set your students up for success in navigating scientific discourse. Learn several techniques for getting students to generate academic language both verbally and in writing.

2:00–3:00 PM Hands-On Workshops

Evolution: DNA and the Unity of Life
(Grades 9–12) Regency A, Hyatt
Science Focus: LS4, CCC1, CCC2, SEP2, SEP4, SEP7
Molly Malone (molly.malone@utah.edu), The University of Utah, Salt Lake City
Explore a curriculum unit integrating three-dimensional learning with published scientific data to address core ideas in biochemistry, common ancestry, heredity, natural selection, and speciation. Visit learn.genetics.utah.edu for more information.

iPad: Data Collection, Analysis, and Student Lab Reporting
(Grades 7–College) Regency B, Hyatt
Science Focus: ETS, SEP
Gregory Dodd (gbdodd@gmail.com), Retired Educator, Pennsboro, W.Va.
Join this hands-on workshop demonstrating the enormous potential of iPads for data collection, analysis, and student lab reporting in the science laboratory. Handouts!

Instructional Stakeholder Relationships
(Grades K–8) Regency D, Hyatt
Science Focus: ESS3
Christopher Thompson (christopher.thompson@rusd.org), Racine (Wis.) Unified School District
Nancy Carlson, Hawthorn Hollow Nature Sanctuary and Arboretum, Kenosha, Wis.
Kathy Huncosky (khuncos@wested.org), Making Sense of SCIENCE at WestEd, Madison, Wis.
Learn how to create mutually beneficial partnerships between a school district, a community, and national-based learning organizations to create place-based learning.

Assistance from the Retiree Committee
(General) 103E, Wisconsin Center
Science Focus: GEN
Lloyd Barrow (barrowl@missouri.edu), Professor Emeritus, University of Missouri, Columbia
Come pick up suggestions from the NSTA Retiree Committee as you plan your retirement.

Launching an Elementary Science Program
(Grades P–5) 102A, Wisconsin Center
Science Focus: ETS
Kim Stilwell (@kimstilwellNSTA; kstilwell@nsta.org), Manager, New Business Development, NSTA, Arlington, Va.
Need ideas for where to start with building an elementary STEM program or enhancing your current program? The initial steps in building an elementary STEM program can be an overwhelming thought. We will share our success stories and how using Picture-Perfect Science resources became part of the foundation to a successful implementation. Leave with links to helpful resources and ideas on how to start an elementary STEM program.

NMLSTA-Sponsored Session: Surf’s Up
(Grades 4–8) 102B, Wisconsin Center
Science Focus: ESS2.C, SEP
Liz Martinez, Illinois Mathematics and Science Academy, Aurora
Dive into graphing and modeling as we explore the topography of the ocean floor from a surfing perspective.

Come On Board as We Show You Around Picture-Perfect Science Lessons!
(Grades P–8) 102E, Wisconsin Center
Science Focus: GEN, NGSS
Georgia Littleton (georgia.littleton@boonevilleschools.com), Garnetta Bonner, and Barbette Smithson (barbette.smithson@boonevilleschools.com), Booneville Elementary School, Booneville, Ark.
Allow us to demonstrate our gratification to Picture-Perfect Science Lessons. These lessons incorporate science, math, and literacy while captivating the attention of elementary students.
NSTA Press® Session: Uncovering Students’ (and Teachers’) Ideas in Science, Engineering, and Mathematics with Formative Assessment Probes and Techniques  
*(General)*  
Ballroom A, Wisconsin Center  
Science Focus: GEN, NGSS  
**Page Keeley** (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  
Experience examples of how the *Uncovering Student Ideas* assessment probes and Formative Assessment Classroom Techniques (FACTs) can be used to elicit students’ STEM-related ideas and inform instruction.

**NESTA and ESIP: Got a Drone? Try This!**  
*(Grades 7–12)*  
Ballroom D, Wisconsin Center  
Science Focus: ESS  
**Margaret Mooney** (margaret.mooney@ssec.wisc.edu), University of Wisconsin–Madison  
Engage students in STEM using recreational Unmanned Aerial Vehicles (UAVs, or drones)! Learn about a free e-book from the Federation of Earth Science Information Partners (ESIP) Education and try teacher-developed drone activities.

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**2:00–3:00 PM  Exhibitor Workshops**

**Using Maggots, Flies, and Flesh to Solve a Mystery!**  
*(Grades 6–12)*  
201A, Wisconsin Center  
Science Focus: GEN  
Sponsor: Texas Instruments  
**Stacy Thibodeaux,** David Thibodaux STEM Magnet Academy, Youngsville, La.  
**Jeffrey Lukens,** Sioux Falls (S.Dak.) School District  
A decomposing corpse is found in a field. Four possible missing persons fit the description. But who is it? Using clues near the scene will help determine identity. Forensic anthropologist Diane France helped to develop this free middle school and high school forensic science lesson.

**Chemical Batteries**  
*(Grades 6–8)*  
201B, Wisconsin Center  
Sponsor: Lab-Aids, Inc.  
**Cynthia Sanchez,** North-Grand High School, Chicago, Ill.  
Although we live a battery-powered lifestyle, most of us (students included) have no idea how batteries actually work. In this hands-on workshop, we will engage in an activity from *Issues and Physical Science* from Lab-Aids. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.

**Collecting Evidence: How Does an Owl Get All That Energy?**  
*(Grades K–5)*  
201 C/D, Wisconsin Center  
Science Focus: LS, CCC, SEP  
Sponsor: Carolina Biological Supply Co.  
**Carolina Teaching Partner**  
Join us to experience a lesson from Carolina’s Building Blocks of Science® elementary curriculum. The lesson uses modeling to solve the problem, “Which animals provide energy for owls?” Leave with a set of ideas for using modeling with your students.

**Boosting the Makerspace Experience for Young Scientists!**  
*(Grades K–3)*  
202A, Wisconsin Center  
Science Focus: ETS  
Sponsor: Delta Education and Frey Scientific  
**Kathy Armstrong,** Northside Elementary School, Midway, Ky.  
**Darrick Wood,** Distance Learning Coordinator, Louisville, Ky.  
Makerspaces are popping up everywhere, providing a creative space to explore questions and solve problems. But for younger students, tackling STEM-related challenges requires a foundation in science investigation. Help young scientists build the skills needed for independent exploration in their makerspaces with programs like SCIENCE IN A NUTSHELL.
Identifying Energy Transfers in Motors and Generators  
(Grades 6–8)  
202B, Wisconsin Center
Science Focus: PS3, CCC, SEP
Sponsor: Delta Education/School Specialty Science—FOSS
Jessica Penchos, The Lawrence Hall of Science, University of California, Berkeley
Dissect a motor to identify its components and make claims about energy transfers in the new FOSS Next Generation Electromagnetic Force Course for middle school. Compare the motor components to those of a generator and consider sustainability of energy sources. Identify connections to the three dimensions of NGSS.

Flinn Scientific’s Exploring Chemistry™: Connecting Content Through Experiments  
(Grades 9–12)  
202C, Wisconsin Center
Science Focus: PS
Sponsor: Flinn Scientific, Inc.
Mike Marvel (mmarvel@flinnsci.com) and Jillian Saddler (jsollider@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Join us as we showcase the features and benefits of our Exploring Chemistry kits! We will highlight integrated lab and learning activities for some of the major topics in your chemistry curriculum. The experiments, demos, and Process-Oriented Guided Inquiry Learning (POGIL™) activities ensure that students really understand the concepts and get a glimpse of the underlying simplicity and beauty of chemistry. Handouts and door prizes.

Solving the Mystery of STEM Using Forensic Science  
(Grades 5–12)  
202D, Wisconsin Center
Science Focus: GEN
Sponsor: Frey Scientific/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
Conduct STEM-focused beginner forensic activities that connect scientific investigations to analysis and investigative skills. Solve “cases” involving fingerprinting, blood spatter, and document or fabric analysis. Using a digital learning environment with simple supplies, we will apply basic mathematic principles, plus integrate reading and writing strategies with Frey Scientific’s Forensics Kit.

Literacy in the Context of Science in the Elementary Classroom  
(Grades K–5)  
202E, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Activate Learning
Ellen Mintz (emintz621@gmail.com), Charleston County School District, Charleston, S.C.
Experience a lesson that demonstrates the integration of literacy strategies in the context of science. This includes the incorporation of academic language in written responses in science notebooks and oral discourse in conjunction with investigations using an interactive word wall.

Engineering Design in the NGSS  
(Grades 6–8)  
203A, Wisconsin Center
Science Focus: ETS1
Sponsor: TCI
Matt Moorman, TCI, Kalamazoo, Mich.
Join us and become immersed in a Bring Science Alive! investigation designed to reach all learners and make engineering design fun and engaging. Experience this lesson from the student perspective as you take on the role of an engineer defining problems, developing solutions, and testing to best solve the problem.

Communicating Science Through Lab Notebooking  
(Grades 9–College)  
203C, Wisconsin Center
Science Focus: GEN
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Maintaining a proper lab notebook is key to communicating processes and findings to build on your results. It can also be the difference between winning a patent or not. Learn about critical elements for good documentation and rubrics for assessment of student notebooks.

Detecting the Silent Killer: Clinical Detection of Diabetes  
(Grades 9–College)  
203 D/E, Wisconsin Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Maria Dayton (info@edvotek.com), Brian Ell, and Tom Cynkar, Edvotek Inc., Washington, D.C.
Over 380 million people worldwide are afflicted by diabetes, a disease that causes high blood sugar. Due to genetic predisposition and high-calorie, low-activity lifestyles, that number continues to grow. Without early treatment, diabetes causes severe medical complications. In this exploration, you will diagnose diabetes using simulated urinalysis and ELISA tests. Free gift for attendees!
3:30–4:30 PM  Presentations

The Power of Science Literacy: A Success Story
(Grades 9–12)  Lakeshore A/B, Hyatt
Science Focus: GEN, SEP1, SEP4, SEP7, SEP8
Caroline Milne (@MrsMilneBiology; cmilne@barrington220.org), Vanessa Fennig (@MrsFennig; vfennig@barrington220.org), Colleen Zenner (@czenner_edu; czenner@barrington220.org), and Michelle Anderson (manderson@barrington220.org), Barrington High School, Barrington, Ill.
Increase student engagement with successful literacy strategies. Walk away with resources and assessments that are easy to implement and adaptable for high school science.

Teaching Literacy in Physics
(Grades 10–College)  101 C/D, Wisconsin Center
Science Focus: PS, SEP7, SEP8
Rachael Lancor (rlancor@edgewood.edu), Edgewood College, Madison, Wis.
Writing helps students to articulate their ideas and build scientific arguments. Various assignments that we have used in our courses will be shared.

PolyWhat? Application of STEM Using Polymers
(Grades 5–12)  101B, Wisconsin Center
Science Focus: ETS1, PS, CCC, SEP
Sherri Rukes (sherri.rukes@d128.org), Libertyville High School, Libertyville, Ill.
Deepen your students’ STEM experience by adding various polymer inquiry/engineering design challenges. Take “traditionally fun” polymer activities and turn them into NGSS investigations to create more critical thinkers in the classroom.

Equity in Science Education Roundtable
(General)  102B, Wisconsin Center
Science Focus: GEN
Natacia Campbell (@NataciaCampbell; natacia.campbell@gmail.com), NSTA Director, Multicultural/Equity in Science Education, and Joliet (Ill.) Public Schools District 86
Join us in sharing equity concerns and resources for enhancing equity and access in science education programs. Find out what NSTA is doing to support equity nationwide.

Do You Need a New Science Lab?
(Grades 6–12)  103A, Wisconsin Center
Science Focus: GEN
Ruth Ruud (ruudruh61@gmail.com), Cleveland State University, Cleveland, Ohio
Win a Shell Science Lab Makeover ($20,000 value) for your school! Are you a middle school or high school science teacher in need of a science lab makeover? Attend this session and learn how you can apply to win the Shell Science Lab Makeover. You will have an opportunity to actually begin to complete the application and have your questions answered.

NGSS-Based Performance Assessments and Rubrics
(Grades 3–12)  103B, Wisconsin Center
Science Focus: GEN, SEP2, SEP3, SEP4
Kevin Anderson (@wisdpiscience; mrkja@yahoo.com), Chairperson, NSTA Milwaukee Area Conference, and Wisconsin Dept. of Public Instruction, Madison
Come learn how to create NGSS-focused performance tasks and rubrics as I share examples.

Authors Wanted! How to Get Published in an NSTA Journal
(General)  103E, Wisconsin Center
Science Focus: GEN
Linda Froschauer (fro2@me.com), Field Editor, Science & Children, and 2006–2007 NSTA President, Pasadena, Calif.
Patty McGinnis (pattymcginnis1@gmail.com), Field Editor, Science Scope, and Arcola Intermediate School, Eagleville, Pa.
Meet with NSTA’s journal editors to learn how to successfully prepare and submit an article for publication.
3:30–4:30 PM  Hands-On Workshops

Ingredients of Productive Science Talk in the Classroom  
(Grades P–12)  
Executive A/B, Hyatt
Science Focus: GEN
Kathy Huncosky (khuncos@wested.org), Making Sense of SCIENCE at WestEd, Madison, Wis.
Kirsten Daehler (kdaehler@wested.org), Making Sense of SCIENCE at WestEd, Los Alamitos, Calif.
Discover how to support productive scientific discourse in the classroom. Help students make sense of complex science ideas through evidence-based discussions.

Teach Evolution with the World’s Most Extravagant Birds  
(Grades 6–12)  
Regency A, Hyatt
Science Focus: LS4, CCC1, CCC2, CCC4, CCC6, CCC7
Kelly Schaeffer (@BirdSleuth; kms448@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.
Watch out Darwin’s finches, a brighter bird is the new biology teacher in town! Learn to teach evolution and natural selection through the birds-of-paradise.

Twitter for Student Engagement: Tweets of Science Communication from My Classroom  
(Grades 9–College)  
Regency B, Hyatt
Science Focus: GEN, SEP8
Michelle Frack (@NutmegSomething; mfrack@hawk.iit.edu), Illinois Institute of Technology, Chicago
Purposefully use Twitter in your science course to improve content connections, engagement, information dissemination, and learning community while counteracting social media negatives with best practices.

Teaching Around “Daily” Learning Targets  
(Grades 10–12)  
Regency D, Hyatt
Science Focus: GEN
Christy Bradley, Tremper High School, Kenosha, Wis.
Daily learning targets or “I can statements” give students empowerment of their own learning. Find out how to guide students through this process to maximize student learning.

Children’s Books as Hooks to Teach NGSS Science Practices  
(Grades K–8)  
101A, Wisconsin Center
Science Focus: GEN, SEP
Selina Bartels (selina.bartels@cuchicago.edu), Concordia University Chicago, River Forest, Ill.
Judith Lederman (ledermanj@iit.edu), Norman Lederman (ledermann@iit.edu), and Dionysius Gnanakkan (dgnanakk@hawk.iit.edu), Illinois Institute of Technology, Chicago
Learn to engage young children in science investigations inspired by children’s books. Take away ideas to empower children to ask and answer their own questions.

Rock Cycle Uno  
(Grades 6–8)  
102D, Wisconsin Center
Science Focus: ESS2.A, CCC7, SEP2
Ray Avedian (ravedian@smmusd.org) and Pamela Sever (psever@smmusd.org), John Adams Middle School, Santa Monica, Calif.
Students learn the rock cycle by playing a fun game of cards.

Electricity Made Simple  
(Grades 6–12)  
102E, Wisconsin Center
Science Focus: PS, CCC, SEP
Lawrence Scheckel (lscheckel@charter.net), Retired Educator, Tomah, Wis.
This hands-on session is for those who know very little about basic electricity and need ideas on how to teach simple electrical circuits. Handouts.

Explore, Read, Write, and More with Rocks, Soil, and Sand  
(Grades P–1)  
103D, Wisconsin Center
Science Focus: ESS
Terrie Schmoldt (schmoldttr@evansville.k12.wi.us), Levi Leonard Elementary School, Evansville, Wis.
Have you ever had a rock collection? Read about, examine, explore, and discuss rocks through a variety of hands-on activities and then journal about it!

NSTA Press® Session: EUREKA! Grade 3–5 Science Activities and Stories  
(Grades 3–5)  
Ballroom A, Wisconsin Center
Science Focus: GEN, SEP
Donna Farland-Smith (farlandsmith@aol.com), The Ohio State University at Mansfield
Participate in some of the 27 lessons linking nonfiction historical trade books and science content for grades 3–5.
Astronomy Activities for Your Classroom  
(Grades 4–12)  
Ballroom B, Wisconsin Center  
Science Focus: ESS1, PS2, CCC1, CCC3, CCC4, CCC7, SEP2, SEP5  
Donald Powers (DT-Powers@wiu.edu), Western Illinois University, Macomb  
Leave with a variety of low-budget hands-on astronomy activities that you can immediately use in your classroom.

NESTA and CIMSS Share GOES-16 STEM Resources!  
(Grades 6–12)  
Ballroom D, Wisconsin Center  
Science Focus: ESS2.D, ESS3  
Margaret Mooney (@UWCIMSS; margaret.mooney@ssec.wisc.edu), University of Wisconsin–Madison  
Craig Phillips (@capte8baraboo; cphillips@barabooschools.net) and Brian Witthun (@sciandmathguy; bwitthun@barabooschools.net) Jack Young Middle School, Baraboo, Wis.  
GOES-16 is a NOAA weather satellite with incredible technological advancements, perfect for STEM education. Bring your laptop or tablet to explore new GOES-16 resources.

3:30–4:30 PM  Exhibitor Workshops

Zombie Apocalypse!  
(Grades 6–12)  
201A, Wisconsin Center  
Science Focus: GEN  
Sponsor: Texas Instruments  
Jeffrey Lukens, Sioux Falls (S.Dak.) School District  
Be part of a zombie apocalypse! Learn about disease-spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

Investigating a Cliff Model  
(Grades 6–8)  
201B, Wisconsin Center  
Science Focus: ESS2.C, CCC4, CCC7, SEP2, SEP3, SEP4, SEP6  
Sponsor: Lab-Aids, Inc.  
Cynthia Sanchez, North-Grand High School, Chicago, Ill.  
Engineer a coastal breakwater (from the Issues and Earth Science “Erosion and Deposition” unit from Lab-Aids) and analyze the trade-offs of the design. Explore how the natural world is influenced by our engineered world, creating more societal issues that must be solved through science and engineering. See how SEPUP embeds the practices and uses real issues to powerfully deliver content learning.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher  
(Grades 9–12)  
201 C/D, Wisconsin Center  
Science Focus: PS  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Looking for lab activities that work every time, not just periodically? Explore easy, engaging, and safe chemistry activities that can produce a reaction from your students. Whether you’re new to chemistry or feeling out of your element, learn ways to create excitement with hands-on labs, digital content, and demonstrations.

How to Argue in the Elementary Science Class  
(Grades K–4)  
202A, Wisconsin Center  
Science Focus: GEN, SEP7  
Sponsor: Delta Education/School Specialty Science  
Kathy Armstrong, Northside Elementary School, Midway, Ky.  
Darrick Wood, Distance Learning Coordinator, Louisville, Ky.  
Help students develop scientific argumentation skills by making claims based on observable evidence. Put these skills into practice with lessons from Delta Science Modules, as we prove (or disprove) fundamental science concepts. Leave with readers, equipment, and a lesson that you can try with your students next week.

Evolutionary Evidence in the Fossil Record  
(Grades 6–8)  
202B, Wisconsin Center  
Science Focus: LS4, CCC, SEP  
Sponsor: Delta Education/School Specialty Science–FOSS  
Ann Moriarty, The Lawrence Hall of Science, University of California, Berkeley  
What does the fossil record tell us about how life has changed over time? Explore evolutionary history through hands-on activities from the new FOSS Next Generation Heredity and Adaptation Course for middle school, and identify connections to the three dimensions of NGSS.
CPO Science LINK Learning Module: Chemistry and the Periodic Table
(Grades 5–12) 202D, Wisconsin Center
Science Focus: PS
Sponsor: CPO Science/School Specialty Science
Kat Mills, School Specialty Science, Rosharon, Tex.
Erik Benton, CPO Science/School Specialty Science, Nashua, N.H.
CPO Science’s new LINK Chemistry learning module is an NGSS approach that lets students experience innovative activities to learn about atomic structure and the periodic table. Use a digital learning environment with hands-on equipment to study bonding, isotopes, subatomic particles, ions, balancing equations, energy levels, and periodicity. Door prizes.

Science Storylines and the Driving Question Board: Keeping NGSS Curricula Student Driven
(Grades K–12) 202E, Wisconsin Center
Science Focus: GEN, CCC6, SEP2
Sponsor: Activate Learning
Heather Milo (hmilo@activatelearning.com), Activate Learning, Greenwich, Conn.
What if K–12 lessons could both meet the standards and leverage student curiosity about the natural world? Join us for an engaging workshop on storyline coherence as a means to not only have pedagogy meet the NGSS, but also build on students’ wonderment questions using the Driving Question Board. This session uses the IQWST™ unit, How Can I Smell Things from a Distance?

Enzymes: Technology Inspired by Nature
(Grades 9–College) 203C, Wisconsin Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
With rising greenhouse gases, scientists look to nature for a biofuel solution. Cellobiase enzyme, an engine for cellulosic biofuel production, takes center stage. Use an inquiry-based approach to extract enzyme, test activity, and design experiments to study how pH, temperature, and concentrations affect reaction rates.

Environmental Toxicology Using Edvotek’s New EZ-elegans
(Grades 9–College) 203 D/E, Wisconsin Center
Science Focus: LS
Sponsor: Edvotek, Inc.
Maria Dayton (info@edvotek.com), Brian Ell, and Tom Cynkar, Edvotek Inc., Washington, D.C.
Model organisms allow scientists to investigate biological questions that cannot be studied in humans. Learn how Edvotek’s EZ-elegans simplifies culturing C. elegans in your classroom. Then, explore effects of environmental factors on C. elegans using a simple locomotion assay. Integrate STEM concepts with data collection and statistics. Free gift for attendees!
5:00–5:30 PM Presentations

Spiraling Content and Using Exit-Level Performance Rubrics to Document Academic Growth
(Grades 6–9) 102A, Wisconsin Center
Science Focus: GEN
D.J. Huddleston (swimdad_x2@frontier.com), D.C. Everest Senior High School, Schofield, Wis.
Spiraling content curriculum around core umbrella standards and using exit-level performance rubrics allow students, educators, and parents to monitor academic growth toward targeted outcomes.

Using Seminars as a Form of Alternative Assessment
(Grades 9–12) 102E, Wisconsin Center
Science Focus: GEN
Mary Chuboff (@mchuboff; mchuboff@athensacademy.org), Athens Academy, Athens, Ga.
Socratic seminars continue the tradition of Socrates, the classical Greek philosopher who taught his followers by asking questions. Today, Socratic dialogue can transform students’ learning experience in classrooms through high school and beyond. When facilitated by a teacher, the Socratic method can lead to improved student achievement, increased motivation, and a more respectful classroom culture.

Intermolecular Forces Unit Plan with NGSS Focus
(Grades 9–12) 103A, Wisconsin Center
Science Focus: PS1
Michelle Vlahovic (michelle_vlahovic@glenbard.org), Glenbard (Ill.) District 87
Participate in the entire unit with handouts and example work on HS-PS1-3. Plan and conduct an investigation to gather evidence to compare the structure of substances at the bulk scale to infer the strength of electrical forces between particles. Students experience science, identify patterns, collaborate with peers, and present their work.

Tick! Tack! A Clock Is Ticking: Integrating Engineering Practices into Your Classroom
(Grades 3–8) 103D, Wisconsin Center
Science Focus: ETS, SEP
Eun Kyung Ko (@eun.ko@nl.edu), National Louis University, Skokie, Ill.
From CCSS to NGSS and even engineering practice, elementary science teachers just need an idea of where to start. Imagine selecting a book from CCSS appendix B informational text and designing an engineering project!

Using Lab Practicals to Assess NGSS Science and Engineering Practices in the Physics Classroom
(Grades 9–12) 103E, Wisconsin Center
Science Focus: PS, SEP
Shannon Feineis (sfeineis@barrington220.org), Stephanie Marry (smarry@barrington220.org), and Daniel Carnduff (@carnduffphysics; crndg6@aol.com), Barrington High School, Barrington, Ill.
Barrington High School physics teachers use lab practicals to assess NGSS science and engineering practices as part of their unit summative assessments. Equipment, prompts, rubrics, and sample lab summatives will be demonstrated and discussed.
**5:00–6:00 PM  Presentations**

**A Simple Classroom Test to Assess the Effects of Chemicals on Learning and Memory in Fishes**  
(Grades 7–12)  
Milwaukee, Hyatt  
Renee Hesselbach (hesselba@uwm.edu) and Dan Weber (dweber@uwm.edu), University of Wisconsin–Milwaukee  
Experience a hands-on module for your classroom exploring the toxic effects of environmental agents on zebrafish learning as a model for human health.

**Pursuing Meaningful and Deeper Learning**  
(Grades 9–12)  
Regency D, Hyatt  
Science Focus: GEN, SEP1, SEP7  
Joe Kulesza (joseph_kulesza@glenbard.org) and Eric Day (eric_day@glenbard.org), Glenbard North High School, Carol Stream, Ill.  
Inspire your students toward meaningful and deeper learning by embedding traditional learning targets within broader goals that traverse all types of student and personal interests.

**Polymers: Basics for the Science Classroom**  
(Grades 7–12)  
103B, Wisconsin Center  
Science Focus: PS1  
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.  
Simple demonstrations, labs, and activities bring STEM-relevant polymers into your curriculum. Concepts include formation, classification, structure, and properties. I’ll share NGSS correlations and a CD of activities/information.

**NSTA Press® Session: Argument-Driven Inquiry in Physical Science: Lab Investigations for Grades 6–8**  
(Grades 6–8)  
Ballroom A, Wisconsin Center  
Science Focus: PS, CCC, SEP  
Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin  
Learn about Argument-Driven Inquiry and how it can help students learn to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

**5:00–6:00 PM  Hands-On Workshops**

**Fusing Science and English Language Arts**  
(Grades P–1)  
Lakeshore A/B, Hyatt  
Science Focus: LS1.B, LS4.A  
Amanda Herlache (amherlache@gbaps.org), Green Bay (Wis.) Area Public School District  
Angela La Combe, Curriculum Coordinator, Green Bay, Wis.  
Have you used a read aloud to spark student interest in science? Explore using read alouds as the foundation for an integrated unit of study.

**Explaining Phenomena and Designing Solutions**  
(Grades K–5)  
101B, Wisconsin Center  
Science Focus: PS2, CCC1, CCC2, SEP1, SEP6  
Nancy Karre (nancy@bcamsc.org), Battle Creek Area Math and Science Center, Battle Creek, Mich.  
Use phenomena and designing solutions to drive student engagement and learning. Experience an activity from an NGSS-focused lesson that makes science knowledge relevant and purposeful.

**Teaching the Human Dimensions of Climate Change**  
(Grades 6–12)  
102B, Wisconsin Center  
Howard Aprill (howard.aprill@milwaukeecountywi.gov), Wehr Nature Center, Franklin, Wis.  
Discover online resources as well as hands-on activities to connect climate change with human activities (past and present) and assess risks to different global communities.

**All Kids Welcome: Success in Science Regardless of Background and Resources**  
(Grades 1–6)  
102D, Wisconsin Center  
Science Focus: GEN  
Kristi Zenchak (zenchak@oakton.edu), Oakton Community College, Des Plaines, Ill.  
John Zenchak (jjzenchak@noctrl.edu), North Central College, Naperville, Ill.  
Experience activities that cut across limitations of student background and school resources, yet use inquiry to teach scientific process skills and grade-appropriate content.
5:30–6:00 PM  Presentations
Moving Your District Forward in STEM and NGSS
(Grades K–12)  103D, Wisconsin Center
Science Focus: GEN, NGSS
Andrew West (awest@waunakee.k12.wi.us) and Tammy Rademacher, Waunakee Community High School, Waunakee, Wis.
Aimee Spahos, Waunakee Intermediate School, Waunakee, Wis.
Jessica North (jessicanc@waunakee.k12.wi.us), Waunakee Middle School, Waunakee, Wis.
Denise Farnsworth (dfarnsworth@waunakee.k12.wi.us), Prairie Elementary School, Waunakee, Wis.
Jodi Ryan (jodiryan@waunakee.k12.wi.us), Arboretum Elementary School, Waunakee, Wis.
Ken Penfield (kpenfield@waunakee.k12.wi.us), Heritage Elementary School, Waunakee, Wis.
Use a science leadership team model to encourage NGSS and STEM opportunities in K–12 classrooms.

What Are They Thinking? Using ONPAR to Assess 3-D Thinking in Students
(Grades 6–8)  103E, Wisconsin Center
Science Focus: GEN, NGSS
Linda Malkin, University of Wisconsin–Madison
Are you struggling to assess three-dimensional learning in your diverse classroom? Learn how ONPAR digital tools can inform teaching and learning for middle school students.

6:30–8:30 PM  Networking Opportunity
Wisconsin Society of Science Teachers (WSST) Welcome Reception
(By Ticket Through WSST, $20)  UWM School of Freshwater Sciences
All conference participants are invited to this welcome reception is for all WSST members and Wisconsin teachers to meet with their professional organization and socialize. Enjoy hors d’oeuvres, beer, wine, and soda.

Special activities include:
• A 3–5 member Team Trivia Competition for prizes (free)
• Wisconsin Beer Tasting Seminar (additional $15 fee)

Tickets, if still available, may be purchased for $20 at the WSST Booth.
Shuttles will pick up participants at all four conference hotels starting at 6:15 PM. Last bus departs UWM at 8:45 PM.
Atop the Wisconsin Gas Building is a 21-foot-tall weather beacon shaped as a natural gas flame that indicates the weather forecast by its color and flicker.
8:00–9:00 AM  Presentations

Using Standards-Based Grading Principles with a Percentage-Based Grading System
(Grades 6–12)  Executive C/D, Hyatt
Science Focus: GEN
Matthew Senese (@MrSenese; msenese@d155.org) and William Janshego (@MrJanshego; wjanshego@d155.org), Prairie Ridge High School, Crystal Lake, Ill.
Get tools to implement standards-based grading principles in order to effectively assess student learning and instruction in a traditional percentage-based grading system.

Engaging the Adult Learner: Powerful Professional Learning Strategies for Implementing NGSS in Your Schools
(General)  Lakeshore A/B, Hyatt
Science Focus: GEN, NGSS
Elissa Hoffman (@choffman; eahoffman@gbaps.org), Michael Friis (@friisicle; mtfrisi@gbaps.org), and Amanda Herlache (amherlache@gbaps.org), Green Bay (Wis.) Area Public School District
Leverage the power of the NGSS to design effective and engaging PD sessions for adult learners. Leave with practical strategies to implement immediately!

Reaching ALL of Your Students in Your iPad 1:1 Classroom
(Grades 5–12)  Regency C, Hyatt
Science Focus: GEN, NGSS
Diane Kasparie, Quincy Notre Dame High School, Quincy, Ill.
Deliver your high-quality standards-based science curriculum, assess students’ understanding, and keep students engaged in your iPad 1:1 classroom to ensure genuine student learning, painlessly! BYOD!

Igniting Creativity for STEM Innovation: Focus On Gifted/Advanced Learners
(Grades K–12)  101A, Wisconsin Center
Dorothy Ginnett (dorothyginnett@gmail.com), Auburndale High School, Auburndale, Wis.
Explore strategies to close the science excellence gap, including identification of advanced/gifted potential from diverse populations, stimulating student creativity and advanced learning challenges.

Preservice and Inservice Teachers Tacking and Jibing Toward Integrated STEM and the Science and Engineering Practices
(Grades K–6)  101B, Wisconsin Center
Science Focus: GEN, SEP1, SEP2, SEP3
Matthew Vick (mervick@wi.rr.com), University of Wisconsin–Whitewater
Encounter methods to connect inservice teachers with preservice teachers to integrate the science and engineering practices into their teaching through innovative “third space” methods course structures.

AAPT Session: IceCube Neutrino Observatory at the South Pole
(Grades 6–College)  102D, Wisconsin Center
Science Focus: ESS, PS
Francis Halzen, Wisconsin IceCube Particle Astrophysics Center, Madison
Hear about the design and science of the biggest and strangest telescope ever built, the IceCube Neutrino Observatory at the South Pole.

Enabling K–6 Students to Understand the Impact of STEM and the Integration of All Its Disciplines
(Grades K–6)  103B, Wisconsin Center
Science Focus: GEN, NGSS
Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, Kans.
Join me as I model integration of STEM disciplines in classroom explorations by analyzing and constructing physical structures and everyday household objects to advance learning and ignite engagement and creativity. Handouts.

Science, Technology, and Literacy: Ideas for the Elementary Classroom
(Grades 1–6)  103E, Wisconsin Center
Science Focus: GEN
Jane Savatski (@teachtwo), Janet Berry Elementary School, Appleton, Wis.
Use Chromebooks or iPads to simultaneously teach and learn about science and literacy concepts. Most elementary classroom teachers face the challenge of teaching multiple disciplines in a limited amount of time. Walk away with ideas for using technology to internalize science and literacy concepts.
NSTA Press® Session: Uncovering Student Ideas in Science with 3-D Assessment Probes  
(Grades K–12)  
Ballroom A, Wisconsin Center  
Science Focus: GEN, NGSS  
Page Keeley (@CTSKeeley; pagekeeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  
Experience how formative assessment probes from the Uncovering Student Ideas series elicit evidence of students’ disciplinary core ideas while providing the opportunity to use science practices and crosscutting concepts.

8:00–9:00 AM Hands-On Workshops

Forest Ecosystems: Trees of Life  
(Grades K–8)  
Regency A, Hyatt  
Georgia Littleton (georgia.littleton@boonevilleschools.com), Garnetta Bonner, and Barbette Smithson (barbette.smithson@boonevilleschools.com), Booneville Elementary School, Booneville, Ark.  
Join us in a STEM exploration of the ecosystems surrounding the forests and trees of the world. Lesson plans and literacy connections supplied.

Introducing Students to Linguistics: The Science of Language  
(Grades 6–12)  
Regency D, Hyatt  
Science Focus: GEN, NGSS  
Suzanne Loosen (loosensa@milwaukee.k12.wi.us), Milwaukee (Wis.) Public Schools  
Kelsie Pattillo (kelsie@uwm.edu), University of Wisconsin–Milwaukee  
Learn about language science and how to incorporate it as a STEM unit. Topics include anatomy and speech production, voice waves, and mathematical/computational skills.

Riding the Wave of Integration: Science and Children’s Literature  
(Grades 3–6)  
101 C/D, Wisconsin Center  
Science Focus: ESS, ETS, PS  
Christine Anne Royce (@caroyce; caroyce@aol.com), NSTA President-Elect, and Shippensburg University, Shippensburg, Pa.  
Maximize instructional time while meeting both the NGSS and CCSS by riding the wave of integration by pairing selected children’s literature and three-dimensional investigations.

ACS Middle Level Session One: Solids, Liquids, Gases, and Changes of State  
(Grades 6–8)  
102A, Wisconsin Center  
Science Focus: PS  
James Kessler, American Chemical Society, Washington, D.C.  
Explore solids, liquids, gases, and changes of state through hands-on activities and molecular model animations from the free 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lesson plans at middleschoolchemistry.com.

ASEE Session: Arduino/STEM Projects for Physical Science Students  
(Grades 9–12)  
102E, Wisconsin Center  
Science Focus: ETS1, ETS2.B, PS, SEP1, SEP3  
Mark McAtee (mark_mcatee@natronaschools.org), Roosevelt High School, Casper, Wyo.  
Incorporate Arduino projects and programing into your existing curriculum, meeting NGSS with technology. Have your students learn programming and circuit prototyping using readily available Arduino microprocessors with a variety of projects.

It’s Cooler by the Lake!  
(Grades 6–8)  
103C, Wisconsin Center  
Science Focus: ESS2, ESS3, INF, CCC2, CCC4, CCC5, CCC7, SEP1, SEP2, SEP4, SEP7  
Taylor Fusinatto (@fusinatto1210; fusinatto@district65.net), Dr. Bessie Rhodes School of Global Studies, Skokie, Ill.  
Emily Stankovic (@Stankovic_NMS; stankovic@district65.net), Nichols Middle School, Evanston, Ill.  
Use art, technology, and citizen science to engage all students in understanding the important freshwater system in their community.
Imagine That! Creative Problem Solving Through Engineering and Puppetry  
(Grades P–K)  
103D, Wisconsin Center  
Science Focus: GEN, CCC  
Discover how the connections between the engineering method and puppetry can enhance your teaching and empower children’s creative problem-solving skills and habits of mind!

8:00–9:00 AM Exhibitor Workshops

Integrate Instruction and Assessment in Three Dimensions Using Learning Progressions  
(Grades K–8)  
201A, Wisconsin Center  
Science Focus: GEN, NGSS  
Sponsor: Amplify  
Rebecca Abbott and Sophia Lambertsen, The Lawrence Hall of Science, University of California, Berkeley  
Explore how learning progressions may be used to organize a coherent sequence of instruction for a unit, define the focus and timing of assessments, and enable actionable inferences about students’ progress. Engage with K–8 exemplars from Amplify Science, the new NGSS-designed curriculum from The Lawrence Hall of Science.

Photosynthesis and Respiration Shuffle  
(Grades 9–12)  
201B, Wisconsin Center  
Sponsor: Lab-Aids, Inc.  
Dawn Posekany, Solon High School, Solon, Iowa  
Students have major misconceptions about photosynthesis and cellular respiration, but this content is essential for understanding matter and energy, both at the micro (cellular) and macro (ecosystem) levels. Using a computer simulation, a hands-on activity, and notbooking/discussion strategies, expose student thinking—all from SEPUP’s new Science & Global Issues: Biology program from Lab-Aids.

Hands-On Activities to Model Habitat Preference and Population Sampling  
(Grades K–12)  
201 C/D, Wisconsin Center  
Science Focus: LS  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Watch and learn! First you’ll learn about sampling methods and get hands-on experience using transects. Then you’ll use inquiry to develop experiments to observe the habitat preference of bess beetles, millipedes, and other insects. This engaging workshop gives you new inquiry-based tools to nurture student curiosity.

Untangling Electric Circuits: STEM Activities from Essential Physics  
(Grades 7–12)  
202A, Wisconsin Center  
Sponsor: PASCO scientific  
Ronn Fieldhouse, PASCO scientific, Roseville, Calif.  
Students are often confused when learning the basics of circuits because they cannot directly observe the phenomenon, or they become lost in tangled wires. There is a simpler way for students to learn the basics of circuits and have the freedom to easily explore their circuit designs to gain a deeper understanding of electrical concepts. Get hands on with new technology to discover a better way to teach circuits!

Science Teacher/STEM Teacher—What’s the Difference?  
(Grades K–11)  
202B, Wisconsin Center  
Science Focus: GEN, SEP  
Sponsor: STEMscopes  
Judy Zimny (jzimny@NISE.institute), Accelerate Learning, Inc., Houston, Tex.  
Distinguishing between science and STEM is important as teachers integrate STEM into their practice. Join us to discuss the unique nature of STEM, the research-based instructional strategies necessary to support its outcomes, and a STEM certification pathway that encourages self-reflection and growth in STEM teaching.
Enhance Your Science Course with POGIL™ Activities
(Grades 7—College) 202C, Wisconsin Center
Science Focus: LS, PS
Sponsor: Flinn Scientific, Inc.

Jillian Saddler (jsaddler@flinnsci.com) and Mike Marvel (mmarvel@flinnsci.com), Flinn Scientific, Inc., Batavia, Ill.
Create a more student-centered science classroom! Discover strategies for incorporating Process Oriented Guided-Inquiry Learning (POGIL) activities into your biology and chemistry courses, including free sample activities. POGIL activities guide students to construct new understandings while encouraging critical thinking, problem solving, and collaboration. Learn how to integrate POGIL with lab and demos for a complete hands-on science experience!

Ideas for Teaching About Earthquakes and Earth Structure
(Grades K–12) 202D, Wisconsin Center
Science Focus: ESS2.B
Sponsor: Pearson Learning Services
Michael Wysession, Washington University in St. Louis, Mo.
Join geophysics professor Michael Wysession as he discusses exciting new discoveries about earthquakes and the structure of Earth and provides examples of activities that can be directly incorporated into NGSS-focused curricula. Also, receive an overview of many of the K–12 educational tools developed at Incorporated Research Institutions for Seismology (IRIS).

Integrating Chromebook with Vernier Data-Collection Technology
(Grades 3–College) 202E, Wisconsin Center
Science Focus: ETS, PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

Elephant Biology and Conservation with HHMI BioInteractive
(Grades 8—College) 203 D/E, Wisconsin Center
Sponsor: HHMI BioInteractive
Amy Fassler (fasslera@marshfieldschools.org), Marshfield High School, Marshfield, Wis.
The story of elephants is a powerful case study for teaching biological concepts. Explore different techniques used to count elephants as we model the Great Elephant Census and discover free HHMI BioInteractive resources to show students how scientific research can guide conservation efforts.

Science and Engineering Practices in the NGSS
(Grades K–8) 203A, Wisconsin Center
Science Focus: GEN, SEP
Sponsor: TCI
Brian Thomas, TCI, Cincinnati, Ohio
Join TCI and participate in an engaging Bring Science Alive! investigation that has your elementary students developing solutions and making sense of the natural and designed world. Participants will experience this lesson from the student perspective as they carry out investigations, build models, and learn skills to analyze and interpret data, develop solutions, and communicate their methods just like professional scientists and engineers!

PTC Taster Lab—From Genotype to Phenotype
(Grades 6—College) 203B, Wisconsin Center
Science Focus: LS1, LS3, LS4, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Sponsor: miniPCR
Robert Dennison and Sebastian Kraves (seb@minipcr.com), miniPCR, Cambridge, Mass.
A single nucleotide change in your DNA can make you a super taster. Come explore the molecular genetics of taste using PCR and gel electrophoresis. Learn how to amplify and analyze your own genes, linking your PTC taste receptor DNA sequence to your own taster phenotype.
How to Use Pop Culture in Your Life Science Class
(Grades 9–College) 203C, Wisconsin Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Use popular science to engage high school and college students in your classroom. See how popular TV and movies connect to real-world science discoveries and issues. Learn to use examples like DNA fingerprinting to make gel electrophoresis the foundation of a fun hands-on lab that increases student involvement and understanding.

8:00–10:00 AM Hands-On Workshop
ACS High School Session One: Relating Structure and Properties: Eliciting and Visualizing Students’ Initial Ideas
(Grades 9–12) 102B, Wisconsin Center
Science Focus: PS, CCC, SEP
Chad Bridle (@sciencebridle; cbridle1@gpsbulldogs.org), Grandville High School, Grandville, Mich.
Jennifer Keil (jenniferkeil11@gmail.com) and Marta Gmurczyk (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.
Rebecca Stober (beckystober@gmail.com), Mapleton Expeditionary School of the Arts, Denver, Colo.
Saul Trevino (srt0589@gmail.com), Houston Baptist University, Houston, Tex.
Discover how to elicit and explore students’ initial ideas and models of chemical compounds by using engaging phenomena in relevant contexts. Learn also how to engage students in data analysis to allow them to build an understanding of the structure and properties of ionic and covalent compounds.

8:00 AM–5:00 PM Meeting
Discover the NGSS Train-the-Trainer Workshop
(By Preregistration Only) Regency B, Hyatt
This workshop gives teacher leaders a solid understanding of the NGSS, tools for conducting teacher training, and the confidence they need to be leaders.

8:30–9:00 AM Presentation
Making the Leap to a Digital Course
(Grades 9–12) Executive A/B, Hyatt
Science Focus: GEN
Mary Chuboff (@mchuboff; mchuboff@athensacademy.org), Athens Academy, Athens, Ga.
Join me for a demonstration on how to gather resources into a single, easily updated electronic space that can make students, teachers, and parents willing to toss the textbook!

9:00 AM–4:00 PM Exhibits
Hall A, Convention Center
Did you know that NSTA offers exclusive exhibit hall and exhibitor workshop hours today from 3:00 to 4:00 PM? During these hours there are no teacher sessions scheduled and it’s a perfect time to visit the exhibits and discover all the products and services companies and organizations have to offer. Some exhibitors will offer materials for sale throughout the conference.

9:30–10:00 AM Presentation
From Proteins to Climate Change—Biotech in Action
(Grades 9–12) Lakeshore A/B, Hyatt
Science Focus: ESS, LS
Elizabeth Jesse (@sciencewiscedu; ejesse2@wisc.edu) and Benjamin Minkoff (bminkoff@wisc.edu), University of Wisconsin Biotechnology Center, Madison
Use the most plentiful protein on the planet—RuBisCO—to teach the DNA → RNA → protein pathway of molecular biology through hands-on activities that use current research methods.
9:30–10:30 AM  Featured Presentation
Growing Power and the Good Food Revolution
(General) 102C, Wisconsin Center
Science Focus: INF

Will Allen (@GrowingPower; will@growingpower.org), Founder and CEO, Growing Power, Milwaukee, Wis.

Presider: Kevin Niemi, Strand Leader, NSTA Milwaukee Area Conference, and University of Wisconsin–Madison

The son of a sharecropper, Will Allen had no intention of ever becoming a farmer himself. But after years in professional basketball and as an executive for KFC and Procter & Gamble, Will cashed in his retirement fund for a two-acre plot a half mile away from Milwaukee’s largest public housing project. The area was a food desert, with only convenience stores and fast-food restaurants to serve the needs of local residents. In the face of financial challenges and daunting odds, Will built the country’s preeminent urban farm—a food and educational center that now produces enough vegetables and fish year-round to feed thousands of people. Growing Power has sought to prove how local food systems can help troubled youths, dismantle racism, create jobs, bring urban and rural communities closer together, and improve public health. Today, Growing Power helps develop community food systems across the country.

Will Allen is an urban farmer who is transforming the planning, cultivation, production, and delivery of good, healthy food to urban and rural populations. After a career in professional basketball and a number of years in corporate sales and marketing at Procter & Gamble, in 1993 Will returned to his roots as a farmer to purchase the last remaining registered farm in the City of Milwaukee, where he established and functions as Farmer, Founder, and CEO of the world-preeminent urban farm and nonprofit organization, Growing Power.

In 2008, Will was a John D. and Katherine T. MacArthur Foundation Fellow and “genius grant” winner. In 2010, Time Magazine named him to its list of 100 World’s Most Influential People. A member of the Clinton Global Initiative, Will was invited to the White House to join First Lady Michelle Obama in launching “Let’s Move!”—her signature leadership program to reverse the epidemic of childhood obesity in America.

Will continues to bring good food to people all over the world to help end poverty through Growing Power’s National Headquarters in Milwaukee.

9:30–10:30 AM  Presentations
Boost Books, Cultivate Curiosity!
(Grades K–2) Executive A/B, Hyatt
Science Focus: GEN

Joan Biese (@gr1teacher; jbiese@seymour.k12.wi.us), Rock Ledge Primary Center, Seymour, Wis.

Nonfiction, fiction, and even poetry books can connect young readers to foundational science ideas. Maximize your busy schedule by combining science with literacy!

Developing Creativity in an Assessment-Driven Environment
(Grades 6–College) Executive C/D, Hyatt
Science Focus: GEN, NGSS

Ken Turner, Jr. (kturner@dbq.edu), University of Dubuque, Iowa

Developing creativity through the perspectives of science, writing, and graphic design is the goal of this collaborative presentation. Come share!

NSELA-Sponsored Session: Tools for Leaders Session 1
(Grades K–12) Milwaukee, Hyatt
Science Focus: GEN

Larry Plank (@nselascience; larry.plank@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
Bob Sotak (@nselascience; bobsotak@gmail.com), NSEA President, and Science/STEM Education Consultant, Edmonds, Wash.

The National Science Education Leadership Association welcomes you to join science leaders from around the nation who will share successful tools and best practices for leaders in science education. These tools can be curricular, instructional, or managerial in nature.

Making Waves at the Discourse Level: Promoting High-Quality Dialogue with English Language Learners
(Grades 1–9) 101 C/D, Wisconsin Center
Science Focus: PS4.A, SEP7

Matthew Vick (mevick@wi.rr.com) and Melanie Schneider (schneidm@uww.edu), University of Wisconsin–Whitewater

Learn strategies for teaching vocabulary at multiple levels, supporting oral discourse for English language learners, and engaging students in argument based on evidence.

AAPT Session: Living and Working at the South Pole (General) 102D, Wisconsin Center Science Focus: ETS2, PS, CCC7 Kate Miller (kate.miller@apsva.us), Washington-Lee High School, Arlington, Va. Katherine Shirey (@katemyshire; katey.shirey@knowlesteachers.org), Knowles Science Teaching Foundation, Moorestown, N.J. Ever wonder what it would be like to live and work at the South Pole? Find out from two teachers who did!


Making Redox Practical, Relevant, Engaging, and Fun Corrosion Chemistry! (Grades 7–12) 103B, Wisconsin Center Science Focus: PS Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, Wash. Join me for real-world examples using labs, demonstrations, and examples that make reactivity, oxidation/reduction, and corrosion exciting, practical, and easy to teach and learn. I’ll share STEM connections and a CD of information.

Taking NGSS Outside: The Benefits, Strategies, and Evidence of Outdoor Learning (Grades 6–8/College) 103C, Wisconsin Center Science Focus: LS2 Mary Beth Factor (@Trees4Tomorrow; marybeth@treesfortomorrow.com), Trees for Tomorrow, Eagle River, Wis. NGSS and outdoor learning go hand in hand and serve to meet the needs of diverse learners. Strategies of implementation and stories of application will be shared!

NSTA Press® Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12 (Grades 9–12) Ballroom A, Wisconsin Center Science Focus: LS, CCC, SEP Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin Learn about Argument-Driven Inquiry and how it can help students learn to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.
9:30–10:30 AM  Hands-On Workshops

Easy Middle School Engineering Projects
(Grades 6–12)  Regency C, Hyatt
Science Focus: ETS, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8
Brian Knox (brian.knox@bvsd.org), Peak to Peak Charter School, Lafayette, Colo.
Learn some easy-to-implement middle school–level engineering projects that meet the NGSS. Walk away with four low-cost inquiry-based engineering projects and build one on your own!

Teachers Helping Teachers: Teaching Socially Controversial Topics
(Grades 7–College)  Regency D, Hyatt
Science Focus: ESS, LS4
Brian Pinney (@NCSEteach; pinney@ncse.com), National Center for Science Education, Oakland, Calif.
The National Center for Science Education (NCSE) has spent decades defending the teaching of scientifically settled but socially controversial topics. Discussion centers on teaching these topics.

A Picture-Perfect Approach to Connecting Literacy and Science
(Grades P–5)  101B, Wisconsin Center
Science Focus: GEN, NGSS
Kim Stilwell (@kimstilwellNSTA; kstilwell@nsta.org), Manager, NSTA Business Development, NSTA, Arlington, Va.
Need ideas to connect literacy and science? Never before has it been so easy to interest students in reading and science. Picture-Perfect Science Lessons combine the appeal of children’s picture books with standards-based science content. Leave with ideas on how to begin the integration in your classroom.

ACS Middle Level Session Two: The Water Molecule and Dissolving
(Grades 6–8)  102A, Wisconsin Center
Science Focus: PS
James Kessler, American Chemical Society, Washington, D.C.
Explore the polarity of the water molecule and identify substances based on their solubility using hands-on activities and molecular animations from the free website middleschool-chemistry.com.

ASEE Session: K–5 Engineering: Integrating Engineering and Design into the Curriculum
(Grades 3–5)  102E, Wisconsin Center
Science Focus: ETS
Jay Garvey Shah (jgshah@sunprairieschools.org), Creekside Elementary School, Sun Prairie, Wis.
Attention will be paid to the importance and authentic implementation of engineering in the upper elementary school setting. Engage in hands-on engineering design processes and gain experience designing and testing possible solutions.

CESI-Sponsored Session: Integrating Science and Literacy: Proven Strategies Developed from Evidence-Based Practices
(Grades K–5)  103D, Wisconsin Center
Science Focus: GEN
Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), CESI President, and Central Michigan University, Mount Pleasant
Find out how to integrate science with literacy and walk away with 33 proven instructional strategies to use in your classroom right away.

9:30–10:30 AM  Exhibitor Workshops

Implementing Argumentation: Evidence, Claims, Reasoning, and Science Seminars in Grades 6–8
(Grades 6–8)  201A, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Amplify
Sophia Lambertsen and Rebecca Abbott, The Lawrence Hall of Science, University of California, Berkeley
Participate in The Lawrence Hall of Science’s argumentation-rich curricular approach that supports students as they gain expertise using evidence and reasoning to support claims. Engage in a science seminar, getting a glimpse of what the authentic and robust use of argumentation can look like in your classroom.

What Is a Species?
(Grades 9–12)  201B, Wisconsin Center
Science Focus: LS4.A, CCC1, CCC2, SEP6, SEP7, SEP8
Sponsor: Lab-Aids, Inc.
Dawn Posekany, Solon High School, Solon, Iowa
In this activity from the SEPU high school biology program, learn about conditions that lead to speciation, including isolation due to temporal, geographical, and behavioral factors, and more. Then determine whether selected animal or plant pairs are in the early, mid, or late stages of speciation.
Shifting to the Five Innovations: How Do We Transform Instruction?
(Grades 6–8) 201 C/D, Wisconsin Center
Science Focus: PS1, CCC, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the five innovations with the Smithsonian’s new STC-Middle School “Matter and Its Interactions” module. This thought-provoking hands-on workshop will demonstrate three-dimensional learning using phenomena. Leave with a better understanding of how the five innovations enhance science instruction.

Understanding Photosynthesis: A Lab-Based Approach
(Grades 6–12) 202A, Wisconsin Center
Sponsor: PASCO scientific
Ronn Fieldhouse, PASCO scientific, Roseville, Calif.
How can you clear up student misconceptions about respiration only occurring in the dark, or that only green light is used for photosynthesis? With data! Collect data on plant pigments, light reactions, and carbon cycling to create a better conceptual model that students can synthesize for a complete understanding of photosynthesis.

INF STEMrangers: Making Science Night Meaningful
(Grades 3–8) 202B, Wisconsin Center
Science Focus: LS2.C, INF
Sponsor: STEMscopes
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning, Inc., Houston, Tex.
STEMscopes has partnered with EarthEcho International to develop Science Nights for schools that turn learning into action. Come see how you can both learn new science content and help save Earth’s most valuable resource. Leave with the tools to make your campus science night an unforgettable event for students and families.

3-2-1 Blast Off!
(Grades 2–8) 202C, Wisconsin Center
Science Focus: PS2, PS3
Sponsor: Educational Innovations, Inc.
What student doesn’t like a burst of energy?! Elementary and middle school teachers join us for this fast-paced hands-on workshop that covers energy, forces, motion, and Newton’s laws. Make your own stomp rockets as you explore elastic, potential, and kinetic energy, and more! Lesson ideas, giveaways, and door prizes!

Incorporating the NGSS Crosscutting Concepts into Your Teaching
(Grades K–12) 202D, Wisconsin Center
Science Focus: GEN, CCC
Sponsor: Pearson Learning Services
Michael Wyssession, Washington University in St. Louis, Mo.
Join professor and NGSS writing team leader Michael Wyssession as he discusses ways that teaching can meet best practices concerning the NGSS crosscutting concepts. Often seen as the most challenging of the three dimensions of the NGSS, the crosscutting concepts, if implemented well, can provide students with a deep and intuitive understanding of science.

Chemistry with Vernier
(Grades 9–12) 202E, Wisconsin Center
Science Focus: ETS, PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, learn how Vernier supports chemistry teachers who want their students to use probe-ware. A variety of experiments from our popular chemistry lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Explore Data Points with HHMI BioInteractive
(Grades 9–College) 203 D/E, Wisconsin Center
Sponsor: HHMI BioInteractive
Kathy Van Hoeck (kathyvanhoeck@gmail.com), York Community High School, Emhurst, Ill.
Are you looking for scientific research and data that are accessible to your students? Come learn about HHMI BioInteractive’s Data Points. These free classroom-ready resources can help your students unpack complex data and include associated materials—such as short films, interactives, and classroom activities—that encourage data literacy.
Hands-On Anatomy: Body Building with Clay
(Grades 5—College) 203A, Wisconsin Center
Science Focus: LS
Sponsor: ANATOMY IN CLAY® Learning System
Debbi Warren, Medford (Ore.) School District 549C
Join us for this hands-on approach to teaching anatomy and body systems. This is a proven method used from middle schools to medical schools that allows for learning, not memorizing, how the human body systems work together. Participants will be involved in building and discussing how the system works in the classroom.

DNA Structure and Function with a Twist of Dynamic DNA
(Grades 8—College) 203B, Wisconsin Center
Science Focus: ETS, LS, CCC1, CCC2, CCC6, CCC7, SEP3, SEP6
Sponsor: 3D Molecular Designs
Tim Herman (herman@msoe.edu), MSOE Center for Bio-Molecular Modeling, Milwaukee, Wis.
Support three-dimensional learning with engaging instructional materials that introduce DNA as a double-stranded helical molecule and as information that encodes proteins. Physical models allow students to explore DNA structure and function. A paper bioinformatics exercise focuses on the beta subunit of hemoglobin and the sickle cell disease mutation.

Get That Grant Money!
(Grades 9—College) 203C, Wisconsin Center
Science Focus: GEN
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Successful grant writing isn’t rocket science, but it can take your teaching to new heights. We will show you how to get organized and find resources. Experienced grant writers will share their powerful tips to get you to the next level.

10:00–10:30 AM Presentations
Station Rotations to Chunk Material in Freshman Biology
(Grade 9) Lakeshore A/B, Hyatt
Science Focus: LS, SEP1, SEP7, SEP8
Bridget Meyers, Glenbard (Ill.) District 87
Eric Day (eric_day@glenbard.org), Glenbard North High School, Carol Stream, Ill.
Take an activity and chunk it, allowing for a “timed” amount for students to read, react, and respond. Students refine as closure to the activity.

NGSS and Climate Change for Middle School
(Grades 5—10) Regency A, Hyatt
Science Focus: ESS3.C, ESS3.D, CCC2, SEP1, SEP2, SEP7
Jenna Totz (@climategenorg; jenna@climategen.org), Climate Generation: A Will Steger Legacy, Minneapolis, Minn.
Is your district adopting NGSS? Are you looking for free curricular resources? Let Climate Generation help you incorporate climate change performance standards with interdisciplinary real-world lessons.

10:30 AM–12 Noon Hands-On Workshop
ACS High School Session Two: Relating Structure and Properties: Constructing Science Ideas Through Exploring Data
(Grades 9–12) 102B, Wisconsin Center
Science Focus: PS, CCC, SEP
Chad Bridle (cbridle1@gpsbulldogs.org), Grandville High School, Grandville, Mich.
Jennifer Keil (jenniferkeil11@gmail.com) and Marta Gmurczyk (m_gmurczyk@acs.org), American Chemical Society, Washington, D.C.
Rebecca Stober (beckystober@gmail.com), Mapleton Expeditionary School of the Arts, Denver, Colo.
Saul Trevino (srt0589@gmail.com), Houston Baptist University, Houston, Tex.
Experience strategies for engaging students in analyzing and interpreting data to discover the structural factors that affect the solubility of ionic compounds. Explore how to help students use their findings to revise their original models and create solutions to relevant problems in the surrounding world.
Doing and Talking Science with English Learners  
(General) 102C, Wisconsin Center
Science Focus: GEN, NGSS

Rita MacDonald (@rmacdonald@wisc.edu), Applied Linguist and Researcher, WIDA Consortium, Wisconsin Center for Education Research, Madison

Presider: John Whitsett, Strand Leader, NSTA Milwaukee Area Conference; 2007–2008 NSTA President; and Retired Teacher/Curriculum Director, Oshkosh, Wis.

English learners—the most rapidly growing segment of our student population—are often excluded from the vibrant classroom discourse that is part of the science and engineering practices of the NGSS, due to the mistaken belief that they need proficiency in complex academic English to participate effectively. But ELs can and do engage meaningfully with their peers in critical science discussions when properly supported. By learning about resources developed during a three-year NSF grant, viewing a classroom video, and listening to teachers talk about their implementation of this new approach, attendees will learn ways to simultaneously strengthen all students’ science-based reasoning and their effectiveness with language.

Rita MacDonald is an applied linguist and researcher at the 39-state WIDA Consortium at the Wisconsin Center for Education Research, University of Wisconsin—Madison. Since completing a master’s degree in Teaching English to Speakers of Other Languages (TESOL) at Saint Michael’s College in Vermont in 2002, she has worked in educational linguistics, first as an ESL teacher, then as a teacher educator for both ESL and content teachers, and now as a member of WIDA’s research team.

Her work and research has focused on supporting content teachers in building students’ academic discourse, particularly as lead developer on an NSF grant to support ELL engagement in the disciplinary practices of math and science. She also serves as the applied linguist on a team supporting the development of a Yup’ik language assessment system with the indigenous Yup’ik people of Alaska, and as part of the support team for language revitalization efforts for a Wisconsin tribe. Additional areas of focus include formative language assessment, mentoring of co-teaching teams, and the development of resources to support equitable, cross-state identification and reclassification of English learners.
NSELASponsored Session: Tools for Leaders Session 2
(Grades K–12) Milwaukee, Hyatt
Science Focus: GEN
Larry Plank (@nselascience; larry.plank@sdhc.k12.fl.us), Hillsborough County Public Schools, Tampa, Fla.
Bob Sotak (@nselascience; bobosotak@gmail.com), NSELA President, and Science/STEM Education Consultant, Edmonds, Wash.
The National Science Education Leadership Association welcomes you to join science leaders from around the nation who will share successful tools and best practices for leaders in science education. These tools can be curricular, instructional, or managerial in nature.

AAPT Session: Teach Science with IceCube Neutrino Observatory
(Grades 7–College) 102D, Wisconsin Center
Jeff Paradis (jparadis@whitnall.com) and Amanda Nothem (anothem@whitnall.com), Whitnall High School, Milwaukee, Wis.
It can be done! Discover great ways to introduce science concepts using examples connected to the South Pole IceCube Neutrino Observatory.

How to Implement STEM and NGSS into Your Classroom Through the Use of NSTA Competitions
(Grades K–12) 103A, Wisconsin Center
Science Focus: GEN, NGSS
Sue Whitsett (swhitsett@nsta.org), AEOP Project Director, NSTA, Arlington, Va.
Erin Lester (elester@nsta.org), eCYBERMISSION Project Manager, NSTA, Arlington, Va.
Hear about various NSTA competitions and how they can bring STEM and the NGSS into the classroom, as well as give students and teachers a chance to earn recognition and prizes. Free food and a gift bag will be distributed to each participant.

Collaborative Groundwater Research You Can Do!
(Grades 9–College) 103B, Wisconsin Center
Science Focus: ESS3.A
Dennis Rohr (drohr@seymour.k12.wi.us), Seymour Community High School, Seymour, Wis.
John Luczaj (luczajj@uwgb.edu), University of Wisconsin–Green Bay
Combine student real-world research, a community-service project, and collaboration with university scientists as students discover and research local groundwater issues that may impact their personal lives.

Meet the Standards and Enhance Your Chemistry Classroom with Other People’s Money
(Grades 9–12) 103E, Wisconsin Center
Science Focus: PS, CCC, SEP
Kenetia Thompson and Karen Kaleuati (k_kaleuati@acs.org), American Chemical Society, Washington, D.C.
Learn about grant opportunities available to high school chemistry teachers (including those from the American Chemical Society) and the process for writing a fundable proposal.

NGSS@NSTA Forum Session: Designing and Using Classroom Assessments to Support Meaningful NGSS Investigations
(Grades K–12) Ballroom B, Wisconsin Center
Science Focus: GEN, NGSS
Philip Bell (@philiplbell; pbell@uw.edu) and Deb Morrison (@educatordeb; educator.deb@gmail.com), University of Washington, Seattle
Embedding formative assessment sequences into instruction helps gauge progress in student understanding and reveals learning assets that students bring to the classroom. Through an examination of assessment examples and sample student responses, we’ll explore how to design and interpret cognitive assessments of three-dimensional learning, as well as cultural formative assessments of student and community interests and funds of knowledge. STEM teaching tools will also be shared.
**11:00 AM–12 Noon  Hands-On Workshops**

**DNA Sequence Evolution Simulation**  
(Grades 8–College) Regency A, Hyatt  
Science Focus: LS3, LS4, SEP4, SEP5  
Nicole Perna (nperna@wisc.edu), University of Wisconsin–Madison  
Members of the UW–Madison Crow Institute will demonstrate a fun and informative pen-and-paper DNA sequence evolution and phylogenetic analysis lesson.

**Connected Educators Connect Learning**  
(General) Regency C, Hyatt  
Science Focus: GEN, INF  
Sandra Leiterman (@saleiterman; saleiterman@gmail.com), University of Arkansas at Little Rock  
Trouble with the digital world? Learn how to become a connected educator by building a digital Professional Learning Network.

**Inventing Is Just Plain Fun (for All)!**  
(Grades 4–College) Regency D, Hyatt  
Science Focus: ETS, SEP6  
Anthony Perry (@tonyperry; aperry@mit.edu), The Lemelson-MIT Program, Cambridge, Mass.  
Steve Meyer (stevenblakemeyer@gmail.com), STEMy Stuff, Brillion, Wis  
Gain experience leading design challenges and incorporating invention into your curriculum to provide authentic three-dimensional units that integrate STEM disciplines.

**Innovative and Integrated: STEM Activities from Chinese Classrooms**  
(Grades 6–12) 101 C/D, Wisconsin Center  
Science Focus: GEN, SEP  
Judith Lederman (ledermanj@iit.edu) and Norman Lederman (ledermann@iit.edu), Illinois Institute of Technology, Chicago  
Teachers from Beijing middle schools and secondary STEM high schools will demonstrate unique integrated projects and activities. Participants will be actively engaged in model lessons that authentically include all STEM components.

**SciGirls Strategies: Gender-Equitable Teaching Practices in Career and Technical Education Pathways for High School Girls**  
(Grades 6–12) 101A, Wisconsin Center  
Science Focus: ETS2.A  
Alex Dexheimer (@SciGirls; adexheimer@tpt.org) and Leah Defenbaugh (@leahdeeda; ldefenbaugh@tpt.org), Twin Cities Public Television, Saint Paul, Minn.  
Learn how to employ SciGirls’ researched-based gender equitable teaching strategies through classroom discussion, activities, and multimedia resources.

**ACS Middle Level Session Three: Chemical Reactions—Breaking and Making Bonds**  
(Grades 6–8) 102A, Wisconsin Center  
Science Focus: PS  
James Kessler, American Chemical Society, Washington, D.C.  
Explore the production of a gas, a precipitate, and changes in temperature through hands-on activities and molecular model animations from the free online resource middleschool-chemistry.com. Attendees will receive a handout of the lessons.

**ASEE Session: Engineering Education: Simple Electronics and Microcontrollers for the Classroom**  
(Grades K–12) 102E, Wisconsin Center  
Science Focus: ETS, PS3, PS4, SEP  
Andrea Burrows (@SciEdBurrows; aburrow1@uwyo.edu) and Mike Borowczak (@mborowczak; mike.borowczak@uwyo.edu), University of Wyoming, Laramie  
We introduce basic electronics for the classroom and then build a circuit with LEDs, light sensor, and a microcontroller (e.g. Arduino and Raspberry Pi).

**Selecting Phenomena to Motivate Student Sense-making**  
(Grades K–12) 103C, Wisconsin Center  
Science Focus: GEN, NGSS  
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va  
The right phenomena are a key ingredient in successful three-dimensional teaching and learning. Emphasis will be placed on what makes some phenomena better than others and how to use them successfully in the classroom.
Harnessing a Powerful Synergy: Engaging All Students with Science-Based Literacy Experiences  
(Grades K–8) 103D, Wisconsin Center  
Science Focus: GEN, SEP8  
Carolyn DeCristofano (@STEMCarolyn; carolyn@bhstemed.us), Blue Heron STEM Education, Inc., Plympton, Mass.  
Patricia Newman (@PatriciaNewman; newmanbooks@live.com), Author, Sacramento, Calif.  
Jennifer Swanson (@JenSwanBooks; jennifer@jesswansonbooks.com), Author, Jacksonville, Fla  
With a trio of lively activities, acclaimed science nonfiction authors demonstrate the synergistic power of literacy and science to engage a diverse classroom. Follow-up resources provided.

Friday, 11:00 AM–12 Noon

11:00 AM–12 Noon  Exhibitor Workshops  
Disappearing Jaguars and Sloths: Phenomena and 3-D Instruction for Grades 2–5  
(Grades 2–5) 201A, Wisconsin Center  
Science Focus: LS  
Sponsor: Amplify  
Rebecca Abbott and Sophia Lambertsen, The Lawrence Hall of Science, University of California, Berkeley  
Experience how students investigate declining jaguar and sloth populations while figuring out principles of ecosystems and engaging in three-dimensional learning. Get a hands-on dive into Amplify Science for grades 2–5, engaging with this new NGSS-designed program from The Lawrence Hall of Science.

Cell Differentiation and Gene Expression  
(Grades 9–12) 201B, Wisconsin Center  
Sponsor: Lab-Aids, Inc.  
Dawn Posekany, Solon High School, Solon, Iowa  
Students often have trouble conceptualizing how selective gene expression works. We will use manipulatives to teach this concept and explain how it is connected to genetic engineering. Innovative activities are selected from the new Science and Global Issues: Biology program from SEPUP and Lab-Aids. Activities focus on ways to integrate selective gene expression as a relevant and engaging sustainability issue.

Comparative Mammalian Organ Dissection with Carolina's Perfect Solution® Specimens  
(Grades 9–12) 201 C/D, Wisconsin Center  
Science Focus: LS  
Sponsor: Carolina Biological Supply Co.  
Carolina Teaching Partner  
Come show us your surgical skills while you experience the superior quality of Carolina’s Perfect Solution specimens. Dissect a cow eye and then your choice of a sheep brain, pig heart, or pig kidney. Use this excellent comparative dissection to gain a better understanding of these mammalian organs.

Evaporative Cooling: Visualizing Matter so It Makes Sense!  
(Grades 6–12) 202A, Wisconsin Center  
Science Focus: PS1  
Sponsor: PASCO scientific  
Ronn Fieldhouse, PASCO scientific, Roseville, Calif.  
Why does perspiration make you feel cooler? How is cooling related to molecular properties? Help your students understand the process of evaporation by measuring the temperature difference when a substance changes from liquid to gas. Look at the process from a molecular perspective to understand how bonding and shape affect cooling.
Using Argumentation for Discussing Phenomena and Increasing Student Voice About STEM  
(Grades K–12) 202B, Wisconsin Center  
Science Focus: GEN, SEP7  
Sponsor: STEMscopes  
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning, Inc., Houston, Tex.  
Reduce teacher talk and increase purposeful student talk as we model consensus building through argumentation around intriguing science phenomena that matter. ELA skills and the 21st-century skills of communication and collaboration are a must in the STEM classroom!

STEM in Agriculture: Middle School/High School  
(Grades 6–12) 202C, Wisconsin Center  
Sponsor: GrowNextGen  
Brian Badenhop, Ohio Hi-Point Career Center, Bellefontaine  
Jeff Jostpille, Fort Jennings High School, Fort Jennings, Ohio  
Jane Hunt (jane@educationprojects.org) and Heather Bryan (heather@educationprojects.org), Education Projects, LLC, Columbus, Ohio  
Engage in hands-on activities related to engineering, biotechnology, and food science that teach STEM skills, inspired by agriculture.

The Best Test Prep Book Ever for AP Chemistry  
(Grades 9–12) 202D, Wisconsin Center  
Science Focus: PS  
Sponsor: Pearson Learning Services  
Ed Waterman, Retired Educator, Fort Collins, Colo.  
Learn how to give students control of the required content with ample practice to master the material. This book includes thorough content summaries and hundreds of updated multiple choice and free-response questions focusing on graphical and tabular data analysis and atomic-molecular particle representations.

Biology with Vernier  
(Grades 9–12) 202E, Wisconsin Center  
Science Focus: ETS, LS, SEP  
Sponsor: Vernier Software & Technology  
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.  
In this hands-on workshop, learn how Vernier supports biology teachers who want their students to use probeware. A variety of experiments from our popular biology lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Death Finds the Mesozoic: Analyzing Real Data with HHMI BioInteractive  
(Grades 6–College) 203 D/E, Wisconsin Center  
Sponsor: HHMI BioInteractive  
Nicoline Chambers (chambers.nikki@tusd.org), West High School, Torrance, Calif.  
Bring Earth and physical science into your biology classes—or biology into your other sciences classes—with these rich, robust, free BioInteractive resources. Take part in a 5E lesson experience centered around the K-T mass extinction. Engage your students in science practices, including analyzing data and constructing explanations.

Bringing the World into Your Classroom with National Geographic Explorers  
(Grades K–5) 203A, Wisconsin Center  
Science Focus: GEN  
Sponsor: National Geographic Learning | Cengage  
Pam Caffery (pam.caffery@cengage.com), National Geographic Learning | Cengage, Boston, Mass.  
Your students will be inspired when they connect with National Geographic Explorers and National Geographic Learning! Discover great ideas for using National Geographic Learning’s program and the Explorers to bring real-world exploration to the classroom.

Of All the Nerve: Exploring Neuronal Communication Through Three-Dimensional Learning  
(Grades 9–College) 203B, Wisconsin Center  
Science Focus: ETS, LS1, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6  
Sponsor: MSOE Center for BioMolecular Modeling  
Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, Wis.  
Engage students by exploring response to neuronal stimuli by incorporating three-dimensional learning and hands-on/minds-on models. Construct a neuronal synapse model with sodium-potassium pump, calcium, sodium, and potassium channels. Model resting and action potentials and neurotransmitter release. Develop explanations of ways drugs and toxins disturb neuronal communication. Handouts!
Become a GMO Investigator
(Grades 9–College) 203C, Wisconsin Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Regardless of where you stand in the GM debate, wouldn’t it be interesting to know which foods you eat are GM foods? This hands-on workshop teaches the basics of DNA extraction, PCR, and electrophoresis and how they are used to test grocery store food products for the presence of GM foods.

12:30–1:30 PM Presentations

INF Beyond the Field Trip: Creating Community Partnerships to Enhance Science Learning Outside the Classroom
(General) Executive A/B, Hyatt
Science Focus: GEN, INF
Lisa Martin and Rochelle Sandrin (sandrirr@milwaukee.k12.wi.us), Milwaukee (Wis.) Public Schools
While field trips come and go, partnerships can last forever. Learn how to create community partnerships that promote equitable access to science for all students.

INF Digital Storytelling—Not Just for Language Arts Classes
(Grades K–12) 101 C/D, Wisconsin Center
Science Focus: GEN, SEP1, SEP6, SEP7, SEP8
Sandra Leiterman (@saleiterman; saleiterman@gmail.com), University of Arkansas at Little Rock
Learn the seven elements of digital storytelling. See examples of digital stories in the science classroom, and get links to free web 2.0 tools you can use next week!

INF Data Is Not a Four-Letter Word: Use NOAA Resources to Build Student Proficiency in Data Analysis
(Grades 5–12) 101A, Wisconsin Center
Science Focus: GEN
June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.
Scientists at the National Oceanic and Atmospheric Administration collect a stunning array of data in their work. Learn how to access this treasure trove of archived and real-time data, and explore NOAA’s data-rich resources, lesson plans, and visualization tools to help you build student proficiency in scientific data analysis.

AAPT Session: Integrating Engineering into Physics
(Grades 9–College) 102D, Wisconsin Center
Science Focus: ETS, PS, SEP
Katherine Shirey (@kateyshirey; katey.shirey@knowlesteachers.org), Knowles Science Teaching Foundation, Moorestown, N.J.
Thinking about how to bring engineering to your physics classes? Learn about possible tensions and productive solutions to overcome them from real experiences.

NSTA District Support
(Grades K–12) 103A, Wisconsin Center
Science Focus: GEN
Kim Stilwell (@kimstilwellNSTA; kstilwell@nsta.org), Manager, New Business Development, NSTA, Arlington, Va.
Find out how NSTA can support your district with science PD opportunities that combine access to national thought leaders with high-quality NSTA products.

Modeling the World Around Us: Applying the NGSS Practice in the K–6 Classroom
(Grades P–6) 103B, Wisconsin Center
Science Focus: GEN, SEP2, SEP3, SEP6, SEP8
Sarah Kendrick (skendrick@madisoncountryday.org) and Shelley Petzold (spetzold@madisoncountryday.org), Madison Country Day School, Waunakee, Wis.
Help students build a better understanding of the world around them through the use of models. Example models from K–6 classrooms will be shared.
NMLSTA-Sponsored Session: Science Fairs: Relevant in 2017 or Is It Time for a Change?  
(Grades 4–9)  
103E, Wisconsin Center  
Science Focus: GEN, NGSS  
Kathy Biernat (@ScientistMaker; kbiernat@stmaryeg.org), St. Mary’s Visitation School, Franklin, Wis.  
Heather Gayton-Grabarski (@HeatherGayton; grabarski_h@afasd.net), Adams-Friendship Elementary School, Adams, Wis.  
Does the traditional science fair with its trifold display board meet the NGSS goals of authentic learning and assessment?

NSTA Press® Session: Uncovering Student Ideas About Science with Formative Assessment Probes and Literacy Capacities  
(Grades K–5)  
Ballroom A, Wisconsin Center  
Science Focus: GEN, NGSS  
Page Keeley (@CTSKeley; pagekeley@gmail.com), 2008–2009 NSTA President, and The Keeley Group, Fort Myers, Fla.  
Experience examples of how K–5 formative assessment probes in the Uncovering Student Ideas series elicit evidence of student understanding through the use of the literacy capacities of writing, speaking, and listening.

12:30–1:30 PM Hands-On Workshops  
Using the Science of Flight to Teach NGSS and Free Student Flights  
(Grades 3–6)  
Lakeshore A/B, Hyatt  
Science Focus: ETS, PS, INF  
Lee Siudzinski (lee@blueskyfoundation.org), Blue Sky Educational Foundation, Three Lakes, Wis.  
Erron Sagen (erron.sagen@gmail.com), Oakwood Elementary School, Oshkosh, Wis.  
Let us introduce you to an aviation curriculum that we’ve used 15 years. It was evaluated by an independent researcher and demonstrated significant achievement in science and mathematics.

INF Connecting Families Through STEM Events  
(Grades P–8)  
Regency C, Hyatt  
Science Focus: ETS, INF, CCC2, CCC4, CCC6, SEP1, SEP2, SEP4, SEP6  
Rebecca McDowell (@BeTheChnge; @STEM220; beckymcdowell@gmail.com) and Elizabeth Nelson (@STEM220; enelson@barrington220.org), Barrington (Ill.) 220 School District  
Partner with families by hosting fun yet educational family STEM events. Navigate through the logistics and then team up to complete one or more STEM challenges.

Bringing the “Bookends” of STEM Together  
(Grades 7–12)  
Regency D, Hyatt  
Science Focus: GEN, SEP3, SEP4, SEP5  
Jeffrey Lukens (jeffreylukens0613@gmail.com), Sioux Falls (S.Dak.) School District  
The “bookends” of STEM are science and math, and integrating them should be seamless, natural, and painless. Come join the fun as we collect and analyze data!

ACS Middle Level Session Four: ACS Chemical Reactions—Ocean Acidification  
(Grades 6–8)  
102A, Wisconsin Center  
Science Focus: PS  
James Kessler, American Chemical Society, Washington, D.C.  
Explore how excess carbon dioxide in the atmosphere makes water more acidic through hands-on activities from the free website middleschoolchemistry.com. Simple and inexpensive experiments show how excess carbon dioxide can contribute to ocean acidification. Attendees will receive a handout of the lesson.
ASEE Session: NGSS, 3-D Learning, and the Design and Use of Classroom Assessment
(Grades 6–12) 102E, Wisconsin Center
Science Focus: ETS, LS, PS, CCC, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8
Brian Gane (bgane@uic.edu) and Sania Zaidi (@sania-zaidi; sania@uic.edu), The University of Illinois at Chicago
Join us as we go into detail about how to conceptualize and design classroom assessments that meet the NGSS.

Climate Science in the Classroom
(Grades 3–12) 103C, Wisconsin Center
Science Focus: ESS3.C, ESS3.D, CCC2, CCC6, CCC7, SEP1, SEP2, SEP7, SEP8
Jenna Totz (@climategenorg; jenna@climategen.org), Climate Generation: A Will Steger Legacy, Minneapolis, Minn.
Join Climate Generation for free climate science activities, lessons, and resources. We will spend this workshop engaging in these activities so you are ready to implement on Monday.

CESI-Sponsored Session: Using Toys to Teach Physics
(Grades K–8) 103D, Wisconsin Center
Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), CESI President, and Central Michigan University, Mount Pleasant
Karen Ostlund (@karen_ostlund; klostlund@utexas.edu), 2012–2013 NSTA President, and The University of Texas at Austin
Betty Crocker (betty.crocker@unt.edu), Retired Educator, Denton, Tex.
Tinker with how toys can be used to teach physics to increase student motivation, excitement, and interest. Handouts.

NGSS@NSTA Forum Session: Better Science for All
(Grades K–12) Ballroom B, Wisconsin Center
Science Focus: GEN, NGSS
Michael Lach (mikelach@me.com), Achieve, Inc., Washington, D.C.
Implementation of the NGSS should focus on advancing science education for all students and doing this successfully means catalyzing strategic change within your school and district. Explore how to leverage existing Achieve tools to address concrete needs (selecting instructional materials, evaluating assessments, etc.) while simultaneously building long-term capacity to advance science instruction. This session is designed for leaders who are (or want to be) thinking strategically about NGSS implementation and are looking for ideas of how to move forward.

12:30–1:30 PM   Exhibitor Workshops
Are You Moody?
(Grades 6–12) 201A, Wisconsin Center
Science Focus: ETS, PS, CCC2, SEP5, SEP6
Sponsor: Texas Instruments
Stacy Thibodeaux, David Thibodaux STEM Magnet Academy, Youngsville, La.
Fred Fotsch, Texas Instruments, Dallas
We will bring science and coding together as participants learn to do some basic coding (no experience necessary) while developing their own mood ring! The science of color mixing is explored while determining the right body temperature thresholds. Is fuchsia flirty? Should green be groovy? It’s up to you!

pH Scale
(Grades 9–12) 201B, Wisconsin Center
Science Focus: PS, SEP4, SEP5
Sponsor: Lab-Aids, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
What does pH actually measure? In this investigation, you will measure pH indirectly using indicators and absorption using the Lab-Master. Using their data, participants generate a graph of absorbance versus pH. This graph can be used to determine the pH of solutions, within the measured pH range. Join us for this activity from A Natural Approach to Chemistry program.

Introduction to Wisconsin Fast Plants®
(Grades K–12) 201C/D, Wisconsin Center
Science Focus: LS
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner
Experience the versatility of Wisconsin Fast Plants. These small, quick-growing plants engage students, suit all learning levels, and let you integrate plant development, life cycle, environmental effects, genetics, and evolution into your instruction. Learn the basics for successful planting, flower dissection, and pollination.

Exploring Misconceptions: What Is pH?
(Grades 6–12) 202A, Wisconsin Center
Science Focus: PS1.A, CCC1, CCC3, SEP2, SEP5
Sponsor: PASCO scientific
Ronn Fieldhouse, PASCO scientific, Roseville, Calif.
What is pH and why is the scale 0–14? Help students understand the logarithmic pH scale by creating serial dilutions in
In this hands-on workshop. Using the Wireless pH sensor and universal indicator, your students will be able to analyze and visualize what pH actually means and measures!

Demystifying STEM: Earthquake-Proof Towers and Engineering Design
(Grades 3–8)  202B, Wisconsin Center
Science Focus: ESS2, ETS1, PS4
Sponsor: STEMscopes
Michele Cozza (mcozza@acceleratelearning.com), Accelerate Learning, Inc., Houston, Tex.
While investigating the phenomenon of waves through the three dimensions of the NGSS, we will design and build earthquake-proof towers that can withstand the devastating horizontal S waves. Using models, simulations, and tower engineering, we will demystify the standards for waves, the practices of engineering design, and how best to teach them through STEM.

STEM in Agriculture: Elementary
(Grades K–5)  202C, Wisconsin Center
Sponsor: GrowNextGen
Jeff Jostpille, Fort Jennings High School, Fort Jennings, Ohio
Brian Badenhop, Ohio Hi-Point Career Center, Bellefontaine
Heather Bryan (heather@educationprojects.org) and Jane Hunt (jane@educationprojects.org), Education Projects, LLC, Columbus, Ohio
Engage in hands-on activities appropriate for elementary students that develop STEM skills while helping students understand what agriculture products they use in their daily lives.

STEM and NGSS Inquiry in Chemistry—Effective, Efficient, Economical
(Grades 9–12)  202D, Wisconsin Center
Science Focus: PS
Sponsor: Pearson Learning Services
Ed Waterman, Retired Educator, Fort Collins, Colo.
Learn how to transition to a STEM and NGSS student-centered chemistry classroom by implementing safe, simple, easy-to-use, material-conserving, time-efficient, and effective inquiry activities in chemistry.

Integrating Chromebook with Vernier Data-Collection Technology
(Grades 3–College)  202E, Wisconsin Center
Science Focus: ETS, PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, learn how Vernier supports teachers who use Chromebook devices in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.

Some Animals Are More Equal than Others: Exploring Trophic Cascades
(Grades 8–College)  203 D/E, Wisconsin Center
Science Focus: LS2.A, LS2.C, CCC1, CCC2, CCC4, CCC5, CCC6, CCC7, SEP1, SEP2, SEP4, SEP7, SEP8
Sponsor: HHMI BioInteractive
Amy Fassler (fasslera@marshfieldschools.org), Marshfield High School, Marshfield, Wis.
What controls species’ populations in a food web? From Robert Paine’s pioneering studies to current research on river ecology, your students will gain a deeper understanding of the importance of top-down regulation of ecological communities by predators using HHMI BioInteractive’s free resources. Get ready for a trophic cascade throwdown!

Take a Walk Through the Molecular World with Watercolor Landscapes
(Grades 9–College)  203B, Wisconsin Center
Science Focus: LS1, LS3, PS1, CCC3, CCC4, CCC6, SEP1, SEP2
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman (herman@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
Use vibrant watercolor landscapes to explore the molecular world in the cellular context within which proteins function. David Goodsell’s Tour of the Human Cell Panorama traces the production and secretion of antibodies. His new Flu Fight: Immunity & Infection Panorama illustrates how antibodies work to block the influenza infection cycle.
12:30–2:30 PM Hands-On Workshops
AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity
(General) Executive C/D, Hyatt
Science Focus: GEN
Deb Morrison (@educatordeb; educator.deb@gmail.com), University of Washington, Seattle
Preston Robinson III (preston.robinson.iii@gmail.com), Tuskegee University, Tuskegee Institute, Ala.
The life of George Washington Carver exemplifies excellence in spite of circumstances. Dialogue and plan for equitable actions to create opportunities for ALL students.

ACS High School Session Three: Relating Structure and Properties: Demonstrating Understanding Through Integration and Application of Knowledge
(Grades 9–12) 102B, Wisconsin Center
Science Focus: PS, CCC, SEP
Chad Bridle (cbridle1@gpsbulldogs.org), Grandville High School, Grandville, Mich.
Jennifer Keil (jenniferkeill11@gmail.com) and Marta Gmurczyk, American Chemical Society, Washington, D.C.
Rebecca Stober (beckystober@gmail.com), Mapleton Expeditionary School of the Arts, Denver, Colo.
Saul Trevino (srt0589@gmail.com), Houston Baptist University, Houston, Tex.
Learn how to help students integrate results and ideas from multiple explorations to build explanations and construct arguments based on structure-property relationships of covalent compounds. Learn how students can demonstrate a rich understanding of core chemical concepts and ideas by proposing solutions to complex problems.

1:00–1:30 PM Presentation
Authentic Assessment: Hierarchy and Structure/Function of Gene Expression
(Grades 9–12) Regency A, Hyatt
Science Focus: LS3
Jeffrey McMahon, Barrington High School, Barrington, Ill.
Find out how our assessment creates differentiates to reach students of low and gifted abilities. The assessment hits several NGSS performance expectations, and gives students a very hands-on assessment, assessing hierarchy and structure/function in gene expression.

2:00–2:30 PM Presentation
The Learning Ecosystem: Consider the Wisconsin Science Festival to Make Connections to Your Classroom
(General) Executive A/B, Hyatt
Science Focus: INF, GEN
Travis Tangen (@WiSciFest; ttangen@warf.org), Wisconsin Alumni Research Foundation, Madison
Find ways for your classroom to connect to the Wisconsin Science Festival. Students, teachers, and researchers can be involved as presenters or visitors at your own site or make connections to event hosts across the state of Wisconsin.

2:00–3:00 PM Presentations
EXENTHUNCO: What Is That?
(Grades 6–8) Lakeshore C, Hyatt
Science Focus: LS4.B
Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.
Roy “Jack” Tison (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, Ill.
Discover a new method to clearly explain the ideas of extinction and endangered, threatened, uncommon, and common species.

Teach Engineering Practices on the Cheap with Concrete
(Grades 6–12) Regency C, Hyatt
Science Focus: ETS1, SEP
Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, Mo.
Solidify new learning by teaching engineering using concrete and other composite materials. Discover inexpensive STEM projects that engage students using the #1 building material in the world. NGSS correlations will be shared.
Badging as a Vehicle for Engaging All Learners  
(Grades K–9) 101A, Wisconsin Center

Science Focus: GEN, INF
Matthew Vick (mevick@wi.rr.com), University of Wisconsin—Whitewater
Ken King (kking@roosevelt.edu), Roosevelt University, Schaumburg, Ill.

Learn strategies to implement your own digital or traditional badging program in or out of school to engage all learners.

AAPT Session: Video-Based Experiments  
(Grades 7–College) 102D, Wisconsin Center

Science Focus: PS, SEP2, SEP3, SEP4, SEP5, SEP7
Matthew Vonk (matthew.vonk@uwrf.edu), University of Wisconsin—River Falls

Learn how to teach science as a process and hone students’ science skills by efficiently designing and performing experiments using direct measurement videos.

NSTA’s Online Resources and Communities  
(General) 103A, Wisconsin Center

Science Focus: GEN, NGSS
Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, NGSS@NSTA, NSTA, Arlington, Va.
Wendy Binder (wbinder@nsta.org), SPIR Project Director, NSTA, Arlington, Va.

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

Advancing Science Literacy While Meeting CCSS  
(Grades K–6) 103B, Wisconsin Center

Science Focus: GEN, NGSS
Donna Knoll (dtknoell@nbglobal.net), Educational Consultant, Overland Park, Kans.

I’ll share strategies to enable elementary students to read and comprehend informational science text, communicate science concepts orally and in writing, develop their science vocabularies, and meet the CCSS. Handouts.

Literacy in the Chemistry Classroom  
(Grades 9–12) 103C, Wisconsin Center

Science Focus: PS, SEP
Michelle Anderson (manderson@barrington220.org), Sara Calhoun (scalhoun@barrington220.org), and Jessica Royal (jroyal@barrington220.org), Barrington High School, Barrington, Ill.

Learn how a creative, more student-centered, real-world approach can increase engagement and add more literacy to your chemistry classroom experience.

How to Construct 3-D Learning Lessons for Early Childhood Learners  
(Grades P–2) 103D, Wisconsin Center

Abha Singh (a-singh@wiu.edu), Western Illinois University, Macomb

Join me for an example of how the NGSS is implemented with three-dimensional learning for the K–2 learner.

Blending Science and Language Arts  
(Grades P–5) 103E, Wisconsin Center

Science Focus: LS
Kelly Schaeffer (@BirdSleuth; kms448@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.

Children’s books can be powerful tools for science learning. Explore book-related activities that connect STEM, art, and ELA while inspiring outdoor observation.

NSTA Press® Session: Creating Classroom Narrative: Fitting Science Reasoning Problems and Open-Ended Investigation into a Curriculum  
(Grades 8–12) Ballroom A, Wisconsin Center

Science Focus: ESS2
Russell Colson (colson@mnstate.edu), Minnesota State University Moorhead
Mary Colson (@MnMColson; mcolson@moorheadschools.org), Horizon Middle School, Moorhead, Minn.

We will discuss weaving sample experimental investigations and modeling of surface and groundwater movement into a curriculum, with examples from the NSTA Press book Learning to Read the Earth and Sky.
2:00–3:00 PM  Hands-On Workshops

Uncovering the Awesomeness of Our Science Students
(Grades 5–9) Lakeshore A/B, Hyatt
Science Focus: GEN, SEP1, SEP3, SEP4, SEP6
Sarah Renish-Ratelis (sarenish@yahoo.com) and Callie Mikolajczyk (mikolajczyk@gmail.com), Mary Lou Mahone Middle School, Kenosha, Wis.
Most students do inquiry-based investigations but have difficulty in constructing scientific explanations. Join us as we explore ways to strengthen communication skills through the use of scaffolding and workshop models, as well as building learner confidence.

Organelle Elections: Using the Political Candidate Analogy to Engage Biology Students
(Grades 9–College) Regency A, Hyatt
Science Focus: LS, SEP2, SEP8
Michelle Frack (@NutmegSomething; mfrack@hawk.iit.edu), Illinois Institute of Technology, Chicago
Integrate political analogy into lectures as students write and present “stump speeches” to construct models to represent, explain, and communicate cell and organelle function to peers.

STEM-Related Activities for K–8 Science
(Grades K–8) Regency D, Hyatt
Science Focus: ETS, PS2, PS3, CCC2, SEP2, SEP4
Donald Powers (DT-Powers@wiu.edu), Western Illinois University, Macomb
Emphasis will be placed on activities that integrate engineering and technology activities appropriate for elementary and middle school classrooms. NGSS connections included.

Using Models to Teach Shapes and Kinds of Land and Bodies of Water
(Grades 2–4) 101B, Wisconsin Center
Science Focus: ESS2.B, CCC1, SEP2, SEP4
Stephen Mattox (mattoxs@gvsu.edu), Adea Davis (davisade@mail.gvsu.edu), and Meghan Cleveland (clevelme@mail.gvsu.edu), Grand Valley State University, Allendale, Mich.
We will explore 3-D models and images and national, regional, state, and county maps to describe the shapes and kinds of water and land features.

Sing, Dance, and Celebrate Science
(General) 102A, Wisconsin Center
Science Focus: GEN, NGSS
Juliana Texley (@JulianaTexley; texle1j@cmich.edu), 2014–2015 NSTA President, and Science Writer/Instructor, New Baltimore, Mich.
Sing with Pete Seeger, dance, enjoy poetry, and celebrate with the Innovation Collaborative. Join in for some effective practices research and free lessons for all ages.

ASEE Session: ASEE’s K–12 Outreach: Engineering, Go For It (eGFI); Teach Engineering; Link Engineering; and the National Science Digital Library
(Grades P–12) 102E, Wisconsin Center
Jay Garvey Shah (jgshah@sunprairieschools.org), Creekside Elementary School, Sun Prairie, Wis.
Join the American Society for Engineering Education (ASEE) and its K–12 division for innovative ways to introduce engineering into the K–12 classroom.

NGSS@NSTA Forum Session: Developing Coherent Storylines of NGSS Lessons
(Grades K–12) Ballroom B, Wisconsin Center
Science Focus: GEN, NGSS
Brian Reiser (@reiserbrian; reiser@northwestern.edu) and Michael Novak (@mnovakccl; mnovakccl@gmail.com), Northwestern University, Evanston, Ill.
We will explore how to develop a coherent storyline for a unit where instead of students learning about science ideas, they are motivated by questions arising from phenomena to figure out these ideas and, in the process, incrementally build explanatory models.

Science Square Dancing: Lessons That Move to the Music!
(General) Ballroom D, Wisconsin Center
Science Focus: GEN, CCC1, CCC6
Lewis Maday-Travis (@fishyteaching; ltravis@seattleacademy.org), Seattle Academy, Upper School, Seattle, Wash.
Engage all students with lessons combining social dance with concept-rich content. Participants will dance the Periodic Table, cell structures, and more! No dancing experience needed.
2:00–3:00 PM Exhibitor Workshops

When Zombies Attack!

(Grades 6–12) 201A, Wisconsin Center
Science Focus: ETS, LS, PS, SEP5, SEP6
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Fred Fotsch, Texas Instruments, Dallas

After the apocalypse, you must use any resources available to survive. In this session, survivors will use a little coding (no experience necessary), a simple speaker, and a flashlight to construct a zombie repulsion device. Using the science of sound and hearing, you may just find a way to stop the ZOMBIE ATTACK!

Chemical Formula and Amino Acids

(Grades 9–12) 201B, Wisconsin Center
Science Focus: ETS1, PS2
Sponsor: Lab-Aids, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
What is the difference between subscripts and coefficients? What does “balancing” a chemical equation mean? Many students have trouble with these fundamental concepts in chemistry. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for some elegant, intuitive, and well-differentiated lessons that allow students of all levels to master the chemical formula and thereby move confidently into a deeper understanding of chemistry.

Engineer Physical Science Excitement in Your Classroom with a Carolina STEM Challenge®

(Grades 6–12) 201 C/D, Wisconsin Center
Science Focus: PS, SEP
Sponsor: Carolina Biological Supply Co.
Carolina Teaching Partner

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

STEM Challenge: Keeping Students Engaged with Problem Solving

(Grades 6–9) 202C, Wisconsin Center
Science Focus: GEN, SEP1
Sponsor: AEOP
The practices included in the NGSS are all based on solving problems. Come work on and solve some problems that you can take back to the classroom, as well as develop your own problem-solving activities. We will also share how the online STEM competition, eCYBERMISSION, gives students a chance to solve problems using science and engineering and how you and your students can participate at no cost.

Make Any Classroom a Makerspace

(Grades K–12) 202D, Wisconsin Center
Science Focus: ETS
Sponsor: Pearson Learning Services
Obie Martin, Pearson Education, Logansport, Ind.
Makerspaces are everywhere, from television to your public library. You can make your classroom into a makerspace without a lot of equipment or cost. All you need is the right attitude and the willingness to promote innovative thinking in your students. Come try it out for yourself in this fun hands-on workshop.

Integrating iPad with Vernier Data-Collection Technology

(Grades 3–College) 202E, Wisconsin Center
Science Focus: ETS, PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
Collecting and analyzing data help students learn critical science concepts that increase test scores and promote science inquiry. In this hands-on workshop, you will learn how Vernier supports teachers who use iPads in their classrooms. Experiments such as “Boyle’s Law,” “Grip Strength Comparison,” and “Ball Toss” will be conducted.
Exploring Inheritance and Gene Regulation in Sticklebacks
(Grades 9–College) 203 D/E, Wisconsin Center
Sponsor: HHMI BioInteractive
Kathy Van Hoeck (kathyvanhoeck@gmail.com), York Community High School, Emhurst, Ill.
Help your students understand gene regulation and inheritance with free HHMI BioInteractive materials. Explore a short film, lab activity, and data analysis that center around stickleback fish evolution, and emphasize collecting and analyzing data to determine a pattern of inheritance.

The Science and Ethics of Genome Editing with CRISPR/Cas9
(Grades 9–College) 203B, Wisconsin Center
Science Focus: ETS, LS1, LS3, LS4, CCC4, CCC6, CCC7, SEP1, SEP2, SEP3
Sponsor: MSOE Center for BioMolecular Modeling
Tim Herman (herman@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.
The development of CRISPR/Cas9 gene editing technology promises to revolutionize the biological sciences the same way that restriction endonucleases led to genetic engineering in the 1970s. Explore physical models of the Cas9 endonuclease and contrast the structure/function of this protein with restriction enzymes, zinc finger nucleases, and TALEN proteins.

Conserving Panda Population…One Hormone Test Design at a Time!
(Grades 9–College) 203C, Wisconsin Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Come put your immunology and reproductive endocrinology systems knowledge basics to the test as you engineer a hormone detection system that can be used for giant panda population conservation efforts.

2:00–4:00 PM Hands-On Workshop
Wisconsin Society of Science Teachers Preservice Exploratorium
(General) Hall B Lobby, Wisconsin Center
Science Focus: GEN, NGSS
Ray Scolavino (rscol13@yahoo.com), Program Coordinator, NSTA Milwaukee Area Conference, and University of Wisconsin–Milwaukee
Abbey Beine (desmond2@uw.edu), Kelsey Clark (clark227@uw.edu), Trevor Derksen (trev2892@gmail.com), Mark Jarchow (mjarchow@uw.edu), Kaitlin Kapitan (kapitan@uw.edu), Anthony Garcia (garciaap@uw.edu), Jennifer Hawes (jihawes@uw.edu), Kylie Vanchena (vanchena@uw.edu), Juliana Montero (jmontero@uw.edu), Matt Sanders (sande259@uw.edu), Amanda Schreiber (schrei78@uw.edu), and Matt Sostock (@msostock; msostock@uw.edu), University of Wisconsin–Milwaukee
Preservice teachers present discrepant events. Move from table to table and gather lesson plans to take with you so you can spice up your lessons with discrepant events.

2:45–3:30 PM Special Session
Meet the Presidents and Board/Council
(General) NSTA Exhibit Hall Entrance, Wisconsin Center
Science Focus: GEN
Be sure to stop by for this special session. Come “meet and greet” with your elected NSTA officers on your way to the exhibits. The President, President-Elect, and Retiring President along with your Board and Council members are looking forward to talking with you at the conference! One lucky person who attends this event will be eligible to win a $100 gift certificate to the NSTA Science Store. Must be present to win. Drawing will take place at 3:20 PM.

—Photo courtesy of Jacob Slaton

82 NSTA Milwaukee Area Conference on Science Education
3:30–4:30 PM  Exhibitor Workshops
Drought in Africa Inspires Students to Invent a Smart Irrigation System
(Grades 6–12)  201A, Wisconsin Center
Science Focus: ESS, ETS, CCC1, CCC2, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6
Sponsor: Texas Instruments
Jeffrey Lukens, Sioux Falls (S.Dak.) School District
Fred Fotsch, Texas Instruments, Dallas
Come learn how to create a project-based camp or classroom lesson that enables students to apply concepts, such as photosynthesis and the water cycle, to design a smart irrigation system. Inspired by real-world events, students are motivated to apply problem-solving skills and learn some basic programming to come up with innovative solutions to the drought situation in southern Africa.

Distilling Aromatic Hydrocarbons
(Grades 9–12)  201B, Wisconsin Center
Science Focus: PS2
Sponsor: Lab-Aids, Inc.
Brandon Watters, Vernon Hills High School, Vernon Hills, Ill.
We distill water to purify it, or so we think. So why does the clear distillate from apple cider smell like apples? Join us and find out! Using a clever test-tube distillation apparatus, distill the essence of vanilla and the scent of mint… and even show you how to make brandy from wine! Distillation is a crucial process in chemical engineering and technology, yet few students ever get to explore the process.

Take Your Students on a Quest! A Real-World Problem-Based Learning Project That Incorporates All Three Dimensions of NGSS
(Grades K–8)  202D, Wisconsin Center
Science Focus: GEN, NGSS
Sponsor: Pearson Learning Services
Take your students on a Quest! These real-world Problem-Based Learning projects incorporate all three dimensions of NGSS. A Quest! brings classroom concepts to life as students are immersed in a world of discovery to help solve real-world problems through a combination of hands-on digital simulations.

Physics and Physical Science with Vernier
(Grades 9–12)  202E, Wisconsin Center
Science Focus: ETS, PS, SEP
Sponsor: Vernier Software & Technology
David Carter (info@vernier.com), Vernier Software & Technology, Beaverton, Ore.
In this hands-on workshop, learn how Vernier supports physics and physical science teachers who want their students to use probeware. A variety of experiments from our popular lab books will be conducted. Learn how our innovative data-collection technology works across multiple platforms such as LabQuest 2, computer, Chromebook, and iPad.

Investigate Photosynthesis and Cellular Respiration with Algae Beads
(Grades 9–College)  203C, Wisconsin Center
Science Focus: LS
Sponsor: Bio-Rad Laboratories
Damon Tighe (damon_tighe@bio-rad.com), Bio-Rad Laboratories, Hercules, Calif.
Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration through authentic inquiry investigations in formats to support both AP and NGSS biology. Learn how to extend this lab to study the effects of light intensity, light color, temperature, and other organisms on these processes.

5:00–7:00 PM  Networking Opportunity
Wisconsin Society of Science Teachers (WSST) Member Reception
Vue East (21st Floor), Hyatt
This reception is for all WSST members and Wisconsin teachers to meet with their professional organization and socialize.
8:00–8:30 AM Presentations

Using Local Citizen Science to Teach the Engineering Design Process
(Grades 6–12) Lakeshore A/B, Hyatt
Karen Olson (@karenurbenolson; kloson@baraboschools.net), Spencer Rohlinger (srohlinger@baraboschools.net), and Claire Gillick, Baraboo High School, Baraboo, Wis.
Hear how we worked with community partners to mitigate the effects of climate change, all while developing science and engineering practices, scientific argumentation, literacy skills, and making science relevant to our students.

Step by Step: Rube Goldberg in the Physics Classroom
(Grades 6–12) 103B, Wisconsin Center
Science Focus: PS, SEP
Howard Citron (hcitron@dist113.org) and William Stafford (wstafford@dist113.org), Deerfield High School, Deerfield, Ill.
Engineering and physics collide in this exploration of mechanics and energy transfer through the use of Rube Goldberg machines.

8:00–9:00 AM Presentations

NOAA in Your Backyard: Free Professional Development and Local Educator Resources Are Closer Than You Think
(Grades K–12) 103A, Wisconsin Center
Science Focus: GEN, SEP
June Teisan (june.teisan@noaa.gov), NOAA Office of Education, Washington, D.C.
The National Oceanic and Atmospheric Administration (NOAA) has hundreds of facilities and professional communicators across the nation. Get connected to guest speakers, field trips, and local and national professional development opportunities.

Food Chains: Using Field Surveys That Give Real Results
(Grades 6–8) 103E, Wisconsin Center
Science Focus: LS2.B
Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca Nature Center, Itasca, Ill.
Roy “Jack” Tison (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, Ill.
Join us for three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

8:00–9:00 AM Hands-On Workshops

Building Background Knowledge
(Grades 5–9) 101 C/D, Wisconsin Center
Science Focus: GEN, SEP8
Sarah Renish-Ratelas (sarenish@yahoo.com), Mary Lou Mahone Middle School, Kenosha, Wis.
The Building Background Workshop helps students synthesize multiple sources of nonfiction text to provide common background knowledge for all learners.

Connecting Chemistry to Your World Through ChemClub
(Grades 9–12) 102A, Wisconsin Center
Science Focus: PS, INF
Karen Kaleuati (@ACSChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, D.C.
The ACS ChemClub program provides fun and educational resources—all for FREE! Learn about the program, try out some of the activities, and take home a copy of the resources.

Making Sense of Science: A System for Systems Thinking
(Grades 3–10) 102B, Wisconsin Center
Kathy Huncosky (khuncos@wested.org), Making Sense of SCIENCE at WestEd, Madison, Wis.
Christopher Thompson (christopher.thompson@rusd.org), Racine (Wis.) Unified School District
Jonathon Ticha (jonathan.ticha@rusd.org), West Ridge Elementary School, Racine, Wis.
Make systems accessible—explore a variety of system boundaries, components, interactions, and inputs/outputs. Then make sense of the world through systems thinking.

Seamless Integration: Maximize Student Learning in Science and Literacy
(Grades P–6) 102D, Wisconsin Center
Science Focus: GEN
Sara Nelson (@SaraDNelson1; sara.d.nelson@gmail.com), Iowa State University, Ames
Join me as I share integrated lesson plans and practices that engage and enhance learning for elementary-age children in both science and literacy. Lessons and practices can be used for both formal and informal educational settings.
Principles of Electrophoresis: Which Way Did the DNA Go?  
(Grades 6–College)  102E, Wisconsin Center  
Science Focus: LS, PS2.B, INF  
**Barbara Bielec** (barbara.bielec@btci.org), BioPharmaceutical Technology Center Institute, Madison, Wis.  
Designed for teachers in grades 6–12, this presentation will emphasize fundamental biotechnology concepts about electrophoresis in a hands-on way! Also, biotechnology teacher courses and stipends will be shared.

8:00–9:00 AM  **Exhibitor Workshop**  
**Calling All Carbons**  
(Grades 9–12)  201B, Wisconsin Center  
**Sponsor:** Lab-Aids, Inc.  
**Jenny Boldt,** Solon High School, Solon, Iowa  
The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. Join in to learn about and model different carbon transfer processes.

8:00 AM–5:00 PM  **Meeting**  
**Discover the NGSS Train-the-Trainer Workshop**  
(By Preregistration Only)  Regency B, Hyatt  
This workshop gives teacher leaders a solid understanding of the NGSS, tools for conducting teacher training, and the confidence they need to be leaders.

8:30–9:00 AM  **Presentations**  
**Augmented Reality Makes Science Come to Life!**  
(Grades P–12)  Lakeshore A/B, Hyatt  
Science Focus: GEN, INF  
**Joan Biese** ([@gr1teacher; jbiese@seymour.k12.wi.us]), Rock Ledge Primary Center, Seymour, Wis.  
iOS and Android apps—such as Aurasma, Elements 4D, and more—can enhance science exploration in the K–12 classroom and integrate with other content areas.

**From Earth to Sky—Using Drones to Map 3-D Surfaces**  
(Grades 7–College)  101B, Wisconsin Center  
**Carl Wozniak** (cwozniak@nmu.edu) and **Catherine Boileau** (choileau@nmu.edu), Northern Michigan University, Marquette  
Drones and 3D printers—it doesn’t get more exciting for students! Join an exploration of modeling geologic features in digital and physical three dimensions.

**Freshman Physics for All**  
(Grades 9–12)  103B, Wisconsin Center  
Science Focus: PS  
**Judi Luepke,** Deerfield High School, Deerfield, Ill.  
Discover how one high school developed a freshman physics program using NGSS to provide nearly 100% of graduates with a physics experience for STEM careers.

9:00 AM–12 Noon  **Exhibits**  
**Hall A, Convention Center**  
The NSTA Exhibit Hall is a must-see! NSTA brings you the leading science education companies and organizations to showcase products, services, curricula, and much more. You’ll discover something new and exciting in the world of science teaching. Some exhibitors will offer materials for sale.

9:30–10:00 AM  **Presentation**  
**Spark Students’ Curiosity with Chemistry!**  
(Grades K–12)  103B, Wisconsin Center  
Science Focus: PS1, PS3  
**Karen Kaleuati** (k_kaleuati@acs.org), American Chemical Society, Washington, D.C.  
Learn about the various free resources—games, lesson plans, grants, and more—available from the American Chemical Society (ACS) without being a member. Attendees will walk away with copies of the resources.
9:30–10:30 AM  Presentations

**Differentiated Voyage: Technology Integration and Differentiating Science Assessments**  
(Grades 6–8)  
*Lakeshore A/B, Hyatt*

Science Focus: LS3, PS2  
**Josh Ariel Almoite** (@sirbiolojosh; ariel.almoite@asfm.edu.mx), American School Foundation of Monterrey, Santa Catarina, N.L., Mexico  
Learn how to integrate technology through formative response tools. The differentiated authentic assessment by Robert Marzano will also be integrated in the Branch-Loop Differentiated Model (my original model). Attendees should bring a laptop or mobile device to maximize participation.

**Standards Make Strange Instructional Bedfellows: Science and Social Studies—Inquiry and Problem Solving**  
(Grades K–5)  
*101 C/D, Wisconsin Center*

Science Focus: GEN, NGSS  
**David Allen** (@dallenbio; david.r.allen@rps205.com) and **Cory Nilsen** (@rps205_ss; cory.nilsen@rps205.com), Rockford (Ill.) Public Schools  
We will share how to use NGSS as the backbone to a curriculum and instruction model that integrates science, social studies, and literacy in elementary classrooms.

**Diffusion, the Cell Membrane, and Ourselves: Biology Comes Alive Through the Aesthetic Realism Method**  
(Grades 7–11)  
*103E, Wisconsin Center*

Science Focus: LS1.A, LS1.C  
**Rosemary Plumstead** (aldersgate@msn.com), Retired Educator, Waretown, N.J.  
**Sarah Ross** (sross3@gmail.com), Retired Biology Teacher, New York, N.Y.  
Demos on diffusion vividly show its logical, beautiful structure of opposites, enabling students to eagerly learn and feel that science is exciting and related to themselves!

9:30–10:30 AM  Hands-On Workshops

**Animal Multimedia Inspires Learning and Engagement**  
(Grades 6–12)  
*101B, Wisconsin Center*

Science Focus: LS  
**Kelly Schaeffer** (@BirdSleuth; kms448@cornell.edu), The Cornell Lab of Ornithology, Ithaca, N.Y.  
Come see how easy it is to support STEM learning through animal multimedia using the free sound analysis program Raven.

**The Law of Conservation of Mass…and Literacy**  
(Grades 9–12)  
*102A, Wisconsin Center*

Science Focus: PS  
**Dawne LePretre** (lepretre@hawk.iit.edu), **Judith Lederman** (ledermanj@iit.edu), and **Norman Lederman** (ledermann@iit.edu), Illinois Institute of Technology, Chicago  
**Selina Bartels** (selina.bartels@cuchicago.edu), Concordia University Chicago, River Forest, Ill.  
We will share a tested chemistry lesson linking conservation of mass to nature of science, a key component of scientific literacy via claims, reasoning, argumentation, and reflective writing.

**Teaching Science and Engineering with Historical Primary Sources: Opportunities for Cross-Disciplinary Learning**  
(Grades 3–12)  
*102B, Wisconsin Center*

Science Focus: ESS, ETS, CCC, SEP  
**John Smith** (@jftrey; jf.trey.smith@gmail.com), Northwestern University, Evanston, Ill.  
Engage students in cross-disciplinary literacy learning using maps, notebooks, photos, and newspapers that make visible science practices and links among science, technology, engineering, and society.

**Testing Look-Alike Liquids**  
(Grades 3–6)  
*102D, Wisconsin Center*

Science Focus: PS1.A, CCC1, CCC6, SEP2, SEP4, SEP6  
**Patricia Galvan** (p_galvan@acs.org), American Chemical Society, Washington, D.C.  
Conduct simple tests on four identical-looking clear colorless household liquids. Testing reveals interesting differences elementary students will discover! Complete instructions will be provided and are available at www.inquiryinaction.org.
Taking the Right Step  
(Grades 4–7)  
102E, Wisconsin Center  
Science Focus: LS, PS, SEP1, SEP2, SEP5, SEP7  
Vernon Gentele (vern@treesfortomorrow.com), Trees for Tomorrow, Eagle River, Wis.  
In this hands-on session, participants will look at the NGSS to see how students learn by making models. Elements of STEM will assist in learning.

Outside Your Door: Exploring the Arts in Nature  
(Grades P–K)  
103D, Wisconsin Center  
Science Focus: GEN, INF, CCC  
Discover how the arts can enhance your children’s understanding of weather and seasonal changes, life needs, and the natural world outside your door.

9:30–10:30 AM Exhibitor Workshops  
Prospecting for Mineral Ore  
(Grades 9–12)  
201B, Wisconsin Center  
Science Focus: ESS3, ETS1  
Sponsor: Lab-Aids, Inc.  
Jenny Boldt, Solon High School, Solon, Iowa  
How do geologists look for mineral ore? In this activity from EDC Earth Science, participants search for a layer of rock containing a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems—gathering data to decide where the deposit is located. This is no cookie mining activity!

Cells as Protein Engineers  
(Grades 8–College)  
203B, Wisconsin Center  
Science Focus: ETS1, LS1, LS3, CCC1, CCC2, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6  
Sponsor: MSOE Center for BioMolecular Modeling  
Tim Herman (herman@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, Wis.  
Explore the cellular processes of DNA replication, transcription, and translation using hands-on instructional materials that support the three dimensions of NGSS, most notably the science and engineering practice of developing and using models. Handouts and information on borrowing instructional materials from a university model lending library program will be provided.

10:00–10:30 AM Presentation  
Learning Chemistry Like Physics  
(Grades 9–12)  
103B, Wisconsin Center  
Science Focus: PS1.B, PS3.C, CCC2, CCC4, CCC5, SEP2, SEP3, SEP4  
Dan Voss (@dcvoss1; daniel.voss@kstf.org), Boone High School, Boone, Iowa  
Joshua Rappuhn (jrappuhn@district100.com), Belvidere High School, Belvidere, Ill.  
Aliza Zivic (@alizazivic; alizazivic@u.northwestern.edu), Northwestern University, Evanston, Ill.  
See how a chemistry unit on energetics uses magnets and other hands-on tools to help students build an understanding of bonds and bond energy.

11:00 AM–12 Noon Presentations  
Advancing Science Learning Through Interactive Science Notebooks  
(Grades K–12)  
101 C/D, Wisconsin Center  
Science Focus: GEN, NGSS  
Kevin Mason (masonk@uwstout.edu), University of Wisconsin–Stout, Menomonie  
Discover how teachers are using interactive science notebooks to engage students in science and engineering, activate prior knowledge, check for understanding, and reflect on learning.

Super STEM Apps and Trade Books for PreK–6 Classrooms  
(Grades P–6)  
103A, Wisconsin Center  
Science Focus: GEN, NGSS  
Janet Jordan (janetjordan37@gmail.com), Retired Educator, Fort Wayne, Ind.  
Discover many excellent, engaging, and challenging STEM iPad apps and trade books. Practical tips for integrating them into the curriculum will be presented.

Cars: A Fundamental Look at How Cars Work and the Science Involved  
(Grades 7–12)  
103B, Wisconsin Center  
Science Focus: ETS, PS1, PS2, PS3, CCC2, CCC4, SEP2, SEP4  
Andrew Nydam (andrewnydam@hotmail.com), Polymer Ambassador, Olympia, WA  
Students love cars and tolerate school. Complex science concepts can be introduced and explored using the automobile as the focus (energy transformations, chemical reactions, gas laws, solutions).
Using Inquiry-Based Modules to Study Biological Processes in Relation to Environmental Health Science  
(Grades 7–12) 103E, Wisconsin Center  
Renee Hesselbach (hesselba@uwm.edu), Craig Berg (caberg@uwm.edu), Dave Petering (petering@uwm.edu), Henry Tomasiewicz (henryt@uwm.edu), and Michael Carvan (carvanmj@uwm.edu), University of Wisconsin–Milwaukee  
Learn about four unique modules that teach students about the toxic effects of environmental agents on the developmental and behavioral health of fish and earthworms.

11:00 AM–12 Noon  Hands-On Workshops  
Not Just Flowers...STEM, Too: Reaching All Students Through Plants and Nature  
(Grades 7–12) 101A, Wisconsin Center  
Science Focus: ETS, LS, CCC, SEP  
Rebecca Ammann (rlammann@gmail.com), Chicago Botanic Garden, Glencoe, Ill.  
Plants offer a natural entryway to STEM for students from diverse backgrounds and abilities. We will unearth a fun hands-on workshop covering science, engineering, and technology.

11:00 AM–12 Noon  Hands-On Workshops  
Let’s Get Wet: Water and Weather  
(Grades P–3) 102A, Wisconsin Center  
Science Focus: ESS  
Ruth Ruud (ruudru61@gmail.com), Cleveland State University, Cleveland, Ohio  
Juliana Texley (texle1j@cmich.edu), 2014–2015 NSTA President, and Science Writer/Instructor, New Baltimore, Mich.  
Don’t look now, but the CCSS asks that you teach Earth sciences as early as kindergarten, and the NGSS have specific goals for early primary. No more procrastinating! The good news is that you have your equipment. Come get easy activities, lit basics, and basic teacher background so that you can start right away!

11:00 AM–12 Noon  Hands-On Workshops  
Investigating Clean Energy Systems: Connecting Classrooms to University Research  
(Grades 7–College) 101B, Wisconsin Center  
John Greenler (@johngreenler; john.greenler@wisc.edu), Great Lakes Bioenergy Research Center, Madison, Wis.  
Through research stories, data dives, and hands-on investigations, students learn how to apply science and engineering practices in the current quest for alternative fuels.

11:00 AM–12 Noon  Hands-On Workshops  
Digital Observation Tech Skills: Student-Led Inquiry to Transects of Change  
(Grades 4–12) 102B, Wisconsin Center  
Science Focus: ETS2, LS2  
Sarah Oszuscik (sarahbgo@gmail.com), La Escuela Fratney, Milwaukee, Wis.  
Justin Hougham (@uphamwoods1941; justin.hougham@ces.uwex.edu), University of Wisconsin–Extension, Wisconsin Dells  
Daniel Graves (gravesdt@milwaukee.12.wi.us), Maryland Avenue Montessori School, Milwaukee, Wis.  
Use technology to engage our “technology-native” students in careful observation and student-led inquiries. Teachers highlight projects and participants engage in a mini-inquiry of their own.
Bring the Science of Energy to Your Elementary School Classroom!
(Grades 2–6) 102D, Wisconsin Center
Science Focus: PS3
Amy Truemper (@NEED_Project; @ms_truemper; atruemper@sd308.org), Bednarcik Junior High School, Aurora, Ill.
Confidently teach energy forms and transformations in your elementary classroom using six center-based, hands-on stations. Motion, sound, and thermal, radiant, electrical, and chemical energy are fun to teach!

Rates in Earth Science: Can You Outrun a Glacier? A Lava Flow? A Landslide?
(Grades 7–12) 102E, Wisconsin Center
Science Focus: ESS2.A, CCC3
Stephen Mattox (mattoxs@gvsu.edu) and Emily Siriano (@EmilySiriano; sirianoe@mail.gvsu.edu), Grand Valley State University, Grand Rapids, Mich.
Earth science processes move as fast as comets and as slow as plates. We’ll demonstrate rates of numerous phenomena to be used across your curriculum.

Memory, Attention, and Distraction
(Grades 9–12) 103D, Wisconsin Center
Science Focus: LS1.D, CCC4, SEP2
Molly Malone (molly.malone@utah.edu), The University of Utah, Salt Lake City
What can games, a murder mystery, and a driving test demonstrate about neurophysiology? Explore brain anatomy, memory, and attention for free at learn.genetics.utah.edu.

11:00 AM–12 Noon Exhibitor Workshop
Using Climate Proxies to Learn About Earth’s Climate History
(Grades 9–12) 201B, Wisconsin Center
Science Focus: ESS2, ESS3, ETS1
Sponsor: Lab-Aids, Inc.
Jenny Boldt, Solon High School, Solon, Iowa
How can scientists tell what Earth’s climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. Analyze and graph samples of replicas of these organisms to determine relative warm and cold periods in the past 200,000 years. This activity is from EDC Earth Science, a new NSF-supported high school program from Lab-Aids.
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Hall A

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Thursday, Nov. 9  7:30 AM – 5:30 PM
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Some exhibitors have classified their products by grade level and subject area. Subject areas are abbreviated here as follows:

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Milwaukee, WI 53202  EN, G, PD  
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E-mail: info@activatelearning.com  
Website: www.activatelearning.com

Activate Learning is a leader in research-based K–12 STEM curricula, including IQWST® and Project-Based Inquiry Science: PBIS™ for middle school science and several leading high school math, science, and engineering curricula. Our project-based, investigation-centered, and literacy-rich programs immerse students in rigorous learning environments, in which their original questions and everyday experiences are central to standards-based 3-D learning.

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Phone: 703-312-9360  
E-mails: swhitsett@nsta.org  
Website: www.usaep.org

The National Science Teachers Association administers and provides support to U.S. Army Educational Outreach Programs that engage students in real-world STEM experiences. Learn about eCYBERMISSION, an online competition free to grades 6–9 students, as well as GEMS and Camp Invention, summer STEM enrichment programs for grades K–12 teachers and students.

American Chemical Society #615  
1155 16th St. NW  C, PD  
Washington, DC 20036  PreK–12  
Phone: 800-333-9511  
E-mail: education@acs.org  
Website: www.acs.org/education

The ACS Education Division serves learners and educators by building communities and providing effective chemistry education resources, grants, communities, professional development opportunities, standards, and guidelines. Stop by our booth to find information that can support your efforts to provide innovative, relevant, and effective chemistry education from kindergarten through professional education.

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The Cereal City Science program (by BCAMSC) supports kindergarten through middle school educators and students with curricula and professional development that meets the NGSS and CCSS. This research-based program provides STEM instruction where students are engaged in phenomena and problem solving in an integrated curriculum of physical science, life science, Earth science, engineering, and technology.
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The Minerals Education Coalition is dedicated to education that promotes the importance of minerals in our daily lives. To reach K–12 educators, free rock and minerals kits are given to attendees, as well as classroom posters. MEC’s website is a tool for all teachers with its searchable database of free lesson plans, demonstrations, and resources for mineral education.

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STEMCON’s mission is to provide a practical professional development conference for K–12 STEM educators. STEMCON is a platform for STEM educators and administrators from all around the nation to connect, collaborate, and share their best practices. Join us for the 5th Annual STEMCON at the Hyatt Regency O’Hare on April 20, 2018.

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Phone: 847-272-8800
E-mail: ULxpolorlabs@ul.com
Website: www.ulxpolorlabs.org

With UL XpolorLabs, we push, pull, smash, and set fire to every limit in order to solve real-world safety science problems and set safety standards that will change tomorrow. All while adhering to the standards of today. Every research-based, teacher-tested UL XpolorLabs element supports key Next Generation Science Standards.

Vernier Software & Technology #400
13979 SW Millikan Way B, C, EN, G, PH, Beaverton, OR 97005 PD, T Phone: 888-837-6437 3–12, College
E-mail: info@vernier.com
Website: www.vernier.com

Vernier Software & Technology is a leading innovator of scientific data-collection technology. Focused on STEM, Vernier is dedicated to developing creative ways to teach and learn using hands-on science. Vernier creates easy-to-use science interfaces, sensors, and graphing/analysis software. Vernier’s technology-based solutions enhance STEM education, increase learning, and build students’ critical-thinking skills.

World Wildlife Fund #619
1250 24th St. NW B, EA, EN, G, T Washington, DC 20037 2–6
Phone: 202-495-4405
E-mail: wildclassroom@wwfus.org
Website: www.worldwildlife.org/wildclassroom

World Wildlife Fund connects educators and parents with the materials they need to help kids understand the natural world around them with a new educational resource, Wild Classroom. Available for free download, Wild Classroom is a growing library of species-focused toolkits that can be used to enhance children’s learning experience.
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**NSTA Milwaukee Area Conference on Science Education**

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<tr>
<td>8:00–9:00 AM</td>
<td>101A, Wisc. Center</td>
<td>Igniting Creativity for STEM Innovation: Focus On Gifted/Advanced Learners (p. 59)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>101 C/D, Wisc. Center</td>
<td>Riding the Wave of Integration: Science and Children’s Literature (p. 60)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>101A, Wisc. Center</td>
<td>Using National Science Olympiad STEM Events to Address NGSS Crosscutting Concepts and Content (p. 65)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>202E, Wisc. Center</td>
<td>Chemistry with Vernier (p. 67)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>102E, Wisc. Center</td>
<td>ASEE Session: K–5 Engineering: Integrating Engineering and Design into the Curriculum (p. 66)</td>
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**Engineering, Technology, and the Application of Science**

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<td>Regency C, Hyatt</td>
<td>Easy Middle School Engineering Projects</td>
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<td>203B, Wisc. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
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<td>202C, Wisc. Center</td>
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<td>Of All the Nerve: Exploring Neuronal Communication Through Three-Dimensional Learning</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>4–C</td>
<td>Regency D, Hyatt</td>
<td>Inventing Is Just Plain Fun (for All)!</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>P–8</td>
<td>Regency C, Hyatt</td>
<td>Connecting Families Through STEM Events</td>
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<tr>
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<td>K–5</td>
<td>202C, Wisc. Center</td>
<td>STEM in Agriculture: Elementary</td>
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<td>12:30–1:30 PM</td>
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<td>AAPT Session: Integrating Engineering into Physics</td>
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<td>102E, Wisc. Center</td>
<td>ASEE Session: NGSS, 3-D Learning, and the Design and Use of Classroom Assessment</td>
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<td>12:30–1:30 PM</td>
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<td>Using the Science of Flight to Teach NGSS and Free Student Flights</td>
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<td>Integrating Chromebook with Vernier Data-Collection Technology</td>
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<td>201A, Wisc. Center</td>
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<td>Teach Engineering Practices on the Cheap with Concrete</td>
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<td>How to Construct 3-D Learning Lessons for Early Childhood Learners</td>
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<td>The Science and Ethics of Genome Editing with CRISPR/Cas9</td>
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<td>201A, Wisc. Center</td>
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<td>202D, Wisc. Center</td>
<td>Make Any Classroom a Makerspace</td>
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<td>202E, Wisc. Center</td>
<td>Integrating iPad with Vernier Data-Collection Technology</td>
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<td>2:00–3:00 PM</td>
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<td>201B, Wisc. Center</td>
<td>Chemical Formula and Amino Acids</td>
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<td>ASEE Session: ASEE’s K–12 Outreach: Engineering, Go For It (eGFI), Teach Engineering, Link Engineering, and the National Science Digital Library</td>
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<td>201A, Wisc. Center</td>
<td>Drought in Africa Inspires Students to Invent a Smart Irrigation System</td>
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<td>6–12</td>
<td>Lakeshore A/B, Hyatt</td>
<td>Using Local Citizen Science to Teach the Engineering Design Process</td>
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<tr>
<td>8:30–9:00 AM</td>
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<td>101B, Wisc. Center</td>
<td>From Earth to Sky—Using Drones to Map 3-D Surfaces</td>
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<td>9:30–10:30 AM</td>
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<td>Teaching Science and Engineering with Historical Primary Sources: Opportunities for Cross-Disciplinary Learning</td>
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<td>9:30–10:30 AM</td>
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<td>Cells as Protein Engineers</td>
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<td>11:00 AM–12 Noon</td>
<td>9–12</td>
<td>201B, Wisc. Center</td>
<td>Using Climate Proxies to Learn About Earth’s Climate History</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>7–C</td>
<td>101B, Wisc. Center</td>
<td>Investigating Clean Energy Systems: Connecting Classrooms to University Research</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12</td>
<td>101A, Wisc. Center</td>
<td>Not Just Flowers...STEM, Too: Reaching All Students Through Plants and Nature</td>
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<td>102B, Wisc. Center</td>
<td>Digital Observation Tech Skills: Student-Led Inquiry to Transects of Change</td>
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<td>Cars: A Fundamental Look at How Cars Work and the Science Involved</td>
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NSSTA Milwaukee Area Conference on Science Education 110
## Schedule at a Glance  Life Science

### Thursday

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<tr>
<td>8:00–9:00 AM</td>
<td>6–C</td>
<td>203 D/E, Wisc. Center</td>
<td>Martian Genetics: An Electrophoresis Exploration (p. 37)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>5–12</td>
<td>202D, Wisc. Center</td>
<td>CPO Science Biology Energy QUEST: Teaching Cell Energy Pathways (p. 36)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>7–12</td>
<td>Regency A, Hyatt</td>
<td>Traveling Through a Worm Hole: What Red Worm Burrowing Behavior Can Tell Us About the Effects of Environmental Contaminants (p. 34)</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>4–C</td>
<td>203B, Wisc. Center</td>
<td>Keep Your Head Above Water with Magnetic Water Molecule Models (p. 39)</td>
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<tr>
<td>10:00 AM–11:00 AM</td>
<td>8–C</td>
<td>203D, Wisc. Center</td>
<td>NGSS Reproduction: Breeding Critters—More Traits (p. 39)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>12</td>
<td>Milwaukee, Hyatt</td>
<td>PTC Taster Lab: From Genotype to Phenotype (p. 62)</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>3–6</td>
<td>Executive C/D, Hyatt</td>
<td>From Exploring Ecosystems to Writing Reports and Explanations—ELLs Focus on Language (p. 46)</td>
</tr>
<tr>
<td>2:00–3:00 PM</td>
<td>9–12</td>
<td>Regency A, Hyatt</td>
<td>Evolution: DNA and the Unity of Life (p. 48)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>9–C</td>
<td>203 D/E, Wisc. Center</td>
<td>Detecting the Silent Killer: Clinical Detection of Diabetes (p. 50)</td>
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<td>2:00–3:00 PM</td>
<td>9–C</td>
<td>201 C/D, Wisc. Center</td>
<td>Solids: The Neglected “State” of Chemistry (p. 43)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>203B, Wisc. Center</td>
<td>Cancer Investigators: Medical Diagnostics in Your Classroom (p. 45)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–C</td>
<td>103C, Wisc. Center</td>
<td>Hands-On Science with Classroom Critters (p. 44)</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–12</td>
<td>Lakeshore C, Hyatt</td>
<td>ASTE-Sponsored Session: Simplifying the Planning of Lessons, Units, and Courses for NGSS Using “Phenomena First” Approaches for the Life Sciences (p. 42)</td>
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<tr>
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<td>6–8</td>
<td>203B, Wisc. Center</td>
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<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>203 D/E, Wisc. Center</td>
<td>Environmental Toxicology Using Edvotek’s New EZ-elegans (p. 54)</td>
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<td>3:30–4:30 PM</td>
<td>9–C</td>
<td>203C, Wisc. Center</td>
<td>Enzymes: Technology Inspired by Nature (p. 54)</td>
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<td>3:30–4:30 PM</td>
<td>6–12</td>
<td>Regency A, Hyatt</td>
<td>Teach Evolution with the World’s Most Extravagant Birds (p. 52)</td>
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<td>5:00–6:00 PM</td>
<td>6–12</td>
<td>102B, Wisc. Center</td>
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<td>5:00–6:00 PM</td>
<td>P–1</td>
<td>Lakeshore A/B, Hyatt</td>
<td>Fusing Science and English Language Arts (p. 56)</td>
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<tr>
<td>5:00–6:00 PM</td>
<td>7–12</td>
<td>Milwaukee, Hyatt</td>
<td>A Simple Classroom Test to Assess the Effects of Chemicals on Learning and Memory in Fishes (p. 56)</td>
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<td>K–8</td>
<td>Regency A, Hyatt</td>
<td>Forest Ecosystems: Trees of Life (p. 60)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>8–C</td>
<td>203 D/E, Wisc. Center</td>
<td>Elephant Biology and Conservation with HHMI BioInteractive (p. 62)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>9–12</td>
<td>201B, Wisc. Center</td>
<td>Photosynthesis and Respiration Shuffle (p. 61)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>K–12</td>
<td>101A, Wisc. Center</td>
<td>Igniting Creativity for STEM Innovation: Focus On Gifted/Advanced Learners (p. 59)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>9–C</td>
<td>203C, Wisc. Center</td>
<td>How to Use Pop Culture in Your Life Science Class (p. 63)</td>
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<td>201 C/D, Wisc. Center</td>
<td>Hands-On Activities to Model Habitat Preference and Population Sampling (p. 61)</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–C</td>
<td>203B, Wisc. Center</td>
<td>PTC Taster Lab: From Genotype to Phenotype (p. 62)</td>
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<td>8:00–9:00 AM</td>
<td>7–C</td>
<td>202C, Wisc. Center</td>
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<td>9:30–10:00 AM</td>
<td>9–12</td>
<td>Lakeshore A/B, Hyatt</td>
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<tr>
<td>9:30–10:00 AM</td>
<td>9–C</td>
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<td>9:30–10:30 AM</td>
<td>8–C 203B, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–12 202A, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>3–12 101A, Wisc. Center</td>
</tr>
<tr>
<td>10:00–10:30 AM</td>
<td>9 Lakeshore A/B, Hyatt</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–C 203 D/E, Wisc. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>8–C Regency A, Hyatt</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 202C, Wisc. Center</td>
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<td>9–12 201C/D, Wisc. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>9–C 203B, Wisc. Center</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>2–5 201A, Wisc. Center</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>9–C 203B, Wisc. Center</td>
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<td>8–C 203 D/E, Wisc. Center</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>K–12 201 C/D, Wisc. Center</td>
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<td>6–12 102E, Wisc. Center</td>
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<tr>
<td>12:30–1:30 PM</td>
<td>K–5 202 C, Wisc. Center</td>
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<tr>
<td>1:00–1:30 PM</td>
<td>9–12 Regency A, Hyatt</td>
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<td>2:00–3:00 PM</td>
<td>9–C 203 D/E, Wisc. Center</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>103D, Wisc. Center</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>6–8 Lakeshore C, Hyatt</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>P–5 103E, Wisc. Center</td>
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<tr>
<td>2:00–3:00 PM</td>
<td>9–C Regency A, Hyatt</td>
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<td>2:00–3:00 PM</td>
<td>9–C 203C, Wisc. Center</td>
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<td>2:00–3:00 PM</td>
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<tr>
<td>3:30–4:30 PM</td>
<td>9–C 203C, Wisc. Center</td>
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<td>6–12 Lakeshore A/B, Hyatt</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>3–10 102B, Wisc. Center</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–8 103E, Wisc. Center</td>
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<tr>
<td>8:00–9:00 AM</td>
<td>6–C 102E, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>7–11 103E, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>8–C 203B, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–12 101B, Wisc. Center</td>
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<td>9:30–10:30 AM</td>
<td>4–7 102E, Wisc. Center</td>
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<tr>
<td>9:30–10:30 AM</td>
<td>6–8 Lakeshore A/B, Hyatt</td>
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<td>Memory, Attention, and Distraction (p. 90)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>7–12 103E, Wisc. Center</td>
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<td>Using Inquiry-Based Modules to Study Biological Processes in Relation to Environmental Health Science (p. 89)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>7–C 101B, Wisc. Center</td>
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<td>Investigating Clean Energy Systems: Connecting Classrooms to University Research (p. 89)</td>
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<tr>
<td>11:00 AM–12 Noon</td>
<td>6–12 101A, Wisc. Center</td>
<td></td>
<td>Not Just Flowers…STEM, Too: Reaching All Students Through Plants and Nature (p. 89)</td>
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<tr>
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### Physical Science

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#### Friday

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2:00–3:00 PM  6–12  201 C/D, Wisc. Center  Engineer Physical Science Excitement in Your Classroom with a Carolina STEM Challenge® (p. 81)
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General Science Education

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