

SATURDAY & SUNDAY, MARCH 14 & 15

NATIONAL CONFERENCE
on **SCIENCE EDUCATION**

CHICAGO

MARCH 12-15, 2015

#NSTA15



VOL. 3

NSTA National
Science
Teachers
Association

DISCOVER

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|-----------|-----------------|
| Wednesday | 5:00 PM–8:00 PM |
| Thursday | 7:00 AM–6:00 PM |
| Friday | 7:00 AM–5:00 PM |
| Saturday | 7:00 AM–5:00 PM |
| Sunday | 7:30 AM–12 Noon |

NSTA National
Science
Teachers
Association



NSTA 63rd National Conference on Science Education

Chicago: Great Lakes/Great Ideas

Chicago, Illinois • March 12–15, 2015

Volume 3 Saturday and Sunday, March 14–15

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National Science Teachers Association

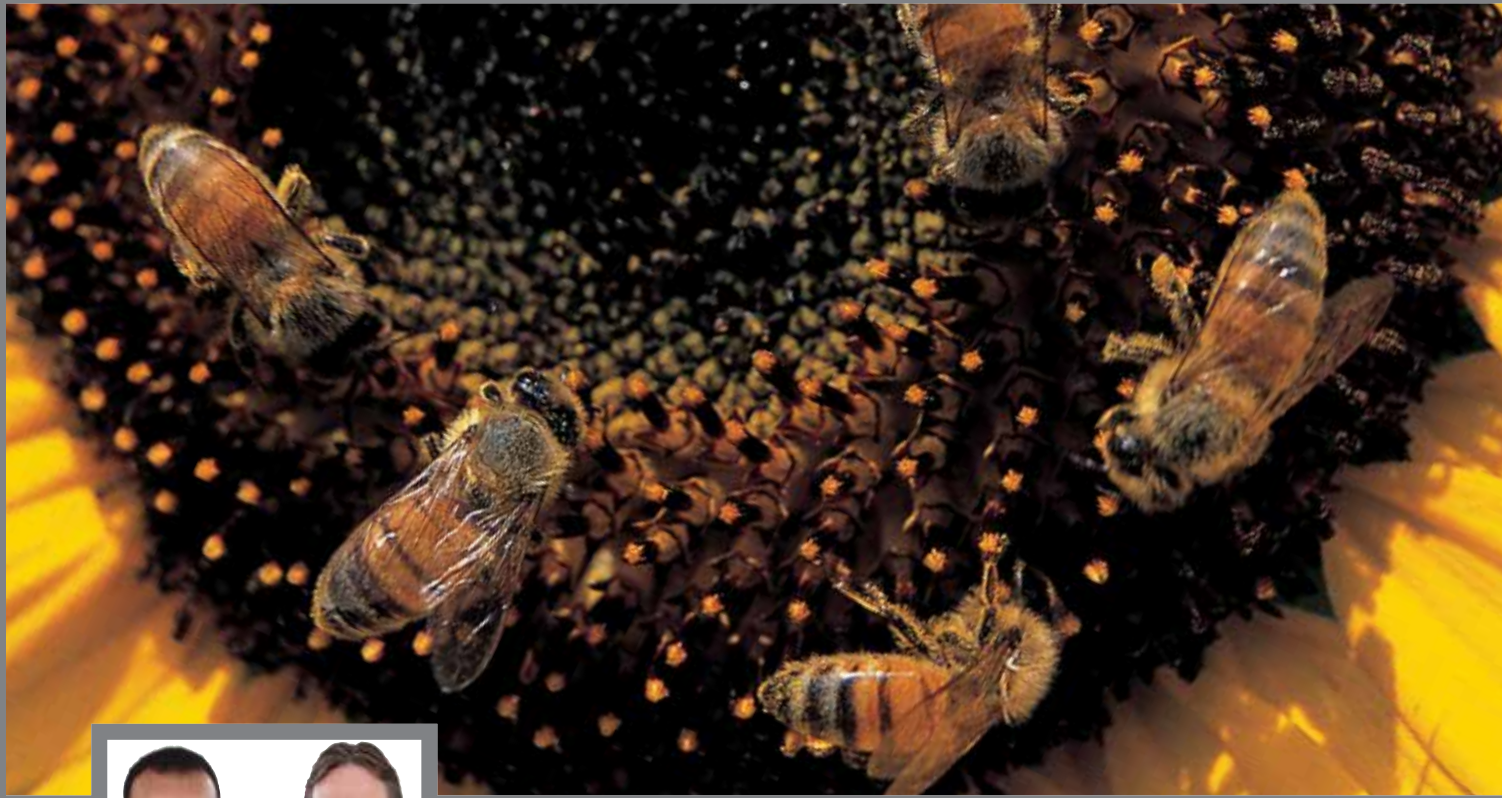
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- Workshops available all day Thursday, Friday and Saturday in our booth and in McCormick Place Room #W192B



For complete workshop schedule and details, visit wardsci.com/conference

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Courtesy of Michael Weiss



Saturday, March 14

| | | |
|------------------|--|----|
| 8:30 AM–4:30 PM | Teacher Researcher Day | 9 |
| 9:00 AM–3:00 PM | Exhibits | 30 |
| 11:00 AM–12 Noon | Paul F-Brandwein Lecture: Curt Meine | 50 |
| | <i>sponsored by Brandwein Institute</i> | |
| 12 Noon–1:30 PM | NSTA/SCST College Luncheon (M-4): Marcy Towns | 59 |
| 12 Noon–2:00 PM | CESI/NSTA Elementary Science Luncheon | 63 |
| | (M-5): Traci Wierman and Rebecca Abbott | |
| 2:00–3:00 PM | NSTA/ASE Honors Exchange Lecture: Chris Harrison | 74 |
| 3:30–4:30 PM | Featured Presentation: Samuel Dyson | 84 |
| | <i>sponsored by Shell</i> | |
| 4:00–6:00 PM | Pi Day Celebration for Preservice/New Teachers and | 90 |
| | First-Time Conference Attendees (M-6) | |
| | <i>sponsored in part by Texas Instruments</i> | |
| 8:00–10:00 PM | Celebrate Einstein’s Birthday...with a Salute to the | 96 |
| | Blues Brothers! | |

Mission Statement

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

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.

The Chicago Conference Committee has planned the conference around these four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program.

See the following pages for a list of sessions and events for each strand.

Teaching Every Child by Embracing Diversity

All classrooms are diverse. Learners bring a variety of cultures, backgrounds, and experiences to the study of science. Educators must provide opportunities to meet the needs of all students, including English language learners, students with special needs, and those with diverse learning styles and abilities. Successful instructional approaches must address methods, materials, facilities, and partnerships. These sessions will confirm the belief that every student can excel in science.

The Science of Design: Structure and Function

Architecture and engineering provide the infrastructure for human-made systems. Designing for the future requires imagination and a commitment to sustainability. It also involves the crosscutting concepts of structure and function and the practices of science and engineering. Communities like Chicago provide examples of great design and great science.

Student Learning—How Do We Know What They Know?

The goal of every teacher is to maximize student learning. Monitoring learning is the responsibility of both the teacher and the student. To successfully monitor learning requires authentic assessment, including formative and summative strategies. The progressions embedded in the *NGSS* provide opportunities for students to engage in the practices of science and engineering; these should be assessed through a variety of modalities.

Natural Resources, Natural Partnerships

Sustaining natural resources requires collaborative partnerships among many stakeholders, and science is the key to making smart decisions about resources. Educators and students can engage with environmental groups, agencies, and businesses to build and support a sustainable future. This strand will help teachers identify possibilities and potential partnerships.

Student Learning—How Do We Know What They Know?

Saturday, March 14

8:00–9:00 AM

Formative Assessment with Developing and Using Models

8:30–9:30 AM

Teacher Researcher Day Session: Poster Session for Teachers and Teacher Educators Inquiring into Science Learning and Teaching

9:30–10:30 AM

Power Learning: Success Strategies for Meaningful Understanding in the Middle School Science Classroom

11:00 AM–12 Noon

Using Technology to Prepare for the Next Generation of Science Assessments

12:30–1:30 PM

Authentic Assessment and the NGSS

1:30–4:30 PM

Short Course: Using Science Phenomena to Assess Student Understanding of NGSS Performance Expectations (By Ticket: SC-14)

2:00–3:00 PM

Using a Graphic Organizer for Formative Assessment Opportunities in the Preschool Classroom

3:30–4:30 PM

Astronomical Assessments

ABCs with DEs: Addressing Basic Concepts with Discrepant Events

5:00–6:00 PM

What Do I Do with My LOVE Lessons?

Sunday, March 15

8:30–9:00 AM

Classroom-ready Inquiry Labs for Biology and Chemistry

9:30–10:30 AM

Interactive Science Notebooks as Integrative Assessment Tools

Visit our booth to Think **Big**. Think **Science**.

Big News.
Be among the first to see our newest products including the 550 Universal Interface, Smart Gate, and Wireless Spectrometer.

Big Ideas.
Join hands-on demos taking place every hour covering NGSS, biology, chemistry and physics, and walk away with ideas on how to tackle tough topics in your class.

Big Winners.
Enter our booth drawing for a chance to win a free classroom set of science technology.

Booth #1522

Think **Big**. Think **Science**.

PASCO

Teaching Every Child by Embracing Diversity

Saturday, March 14

8:00–9:00 AM

Which Plants Make Good Acid/Base Indicators?

8:00 AM–12 Noon

Short Course: STEM for ALL: Practices and Methods that Promote Equal Access to STEM (By Ticket: SC-10)

9:30–10:30 AM

A New Movement: Thinking on Your Feet

11:00 AM–12 Noon

Mixed Media Journaling in the Diverse Science Classroom

12:30–1:30 PM

Implementing the 3-E Instructional Model to Enhance Science Learning Experiences for Students with Special Needs

2:00–3:00 PM

Using Universal Design for Learning (UDL) Principles to Enhance Science Learning Experiences for Students with Special Needs

3:30–4:30 PM

Any Time, Any Place, Any Pace Lab Science

Sunday, March 15

8:00–9:00 AM

Your Kids Can, Too! Scientific Argumentation for All Students

9:30–10:00 AM

Analysis of a Speed and Velocity Lesson: Implications for Students with Learning Disabilities

The Science of Design: Structure and Function

Saturday, March 14

8:00–9:00 AM

Operation Rescue: A Project Approach to STEM Education

9:30–10:30 AM

Integrating Art, STEM, and ELA by Creating a Mechanism that Animates a Story

11:00 AM–12 Noon

Color Your World: Learn How LEDs Can Mix and Match Colors, and Use Them to Design a Scene

12:30–1:30 PM

Novel Engineering: Integrating Engineering and Literacy to Engage Students in Engineering Design Challenges

2:00–3:00 PM

Science by Design: Addressing Science Concepts Through Engineering

3:30–4:30 PM

Children's Innovation Project

5:00–6:00 PM

Advancing Science Learning: Teaching Elementary Physical Science Concepts Through Engineering Problems

Sunday, March 15

8:00–8:30 AM

Think Tank to Shark Tank: Engineering to Entrepreneurship

8:30–9:00 AM

Designing a Bioretention Basin

9:30–10:30 AM

Discovery Box Engineers: Growing a STEM Classroom

Natural Resources, Natural Partnerships

Saturday, March 14

8:00–9:00 AM

Watering the Grassroots of Change: Integrated Outdoor Science and Community-based Water Resource Education

8:00 AM–12 Noon

Short Course: Explore Local Biodiversity with Encyclopedia of Life and OBIS (By Ticket: SC-12)

11:00 AM–12 Noon

DataStreme: Earth's Climate System

12:30–1:30 PM

Birds and Buds: Citizen Science in Your School Yard

2:00–3:00 PM

On-the-Ground Stewardship + Great Lakes Science = A Five Star Place-based Education Program

3:30–4:30 PM

(Scientific) Inquiry Minds Want to Know: Creating a School-University-Park Partnership

5:00–6:00 PM

No Child Left Inside

Sunday, March 15

8:00–9:00 AM

Green Proposals to Meet NGSS and CCSS ELA

9:30–10:00 AM

The Science of Sustainable Energy

10:00–10:30 AM

NOAA Science On a Sphere®: Earth and Space Science Data Visualizations in the Classroom

11:00–11:30 AM

HAWK: Honoring Urban Resources and Acting with Knowledge

11:30 AM–12 Noon

Bringing the NGSS Outdoors

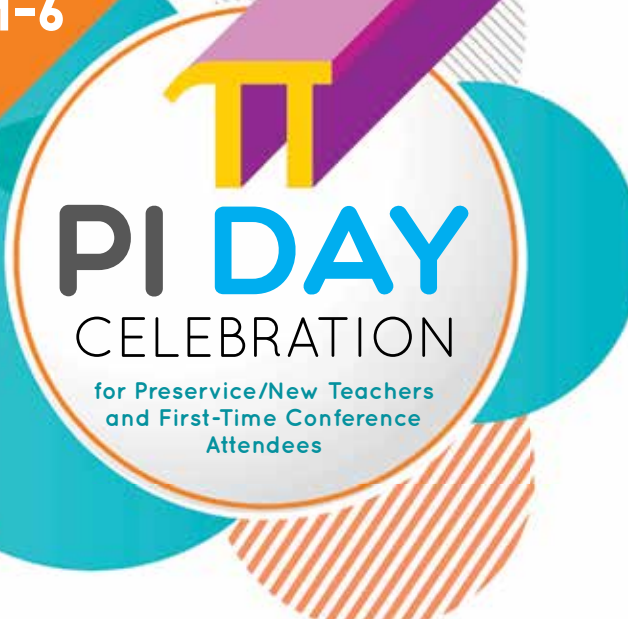
Teacher Researcher Day

Saturday, March 14, 8:30 AM–5:00 PM

Regency A/B, Hyatt Regency McCormick Place

Teacher researchers are curious about their students’ learning and ask questions to try to better understand what is happening in their classrooms. They collect data such as videotapes of instruction, copies of student work, and their own written reflections. Then they try to make sense out of what they see in the data and use this knowledge to improve their teaching. Teacher Researcher Day is for both new and experienced teacher researchers. The full day of activities includes a poster session and presentations on topical issues. These sessions provide opportunities to meet teacher researchers and learn about their studies in a wide variety of contexts.

| | | | |
|------------------|--|------------------|---|
| 8:30–9:30 AM | Poster Session for Teachers and Teacher Educators Inquiring into Science Learning and Teaching | 12 Noon–12:30 PM | Brown Bag Lunch Conversation with Teacher Researchers |
| 9:30–11:00 AM | Panel Discussion: <i>Embracing Diversity in Science: Benefits and Challenges of Equitable Science Education from Multiple Perspectives</i> | 12:30–1:30 PM | Concurrent Sessions |
| 11:00 AM–12 Noon | Concurrent Sessions | 1:30–2:00 PM | Concurrent Sessions |
| | | 2:00–3:00 PM | Concurrent Sessions |
| | | 3:00–4:00 PM | Concurrent Sessions |
| | | 4:00–5:00 PM | Next Year Planning and Summary |



Ticket # M-6

Saturday, March 14, 4:00-6:00 PM
McCormick Place, W196b


Ticketed Event: \$15 Advance; \$20 on-site


NSTA President Juliana Texley is extending a special invitation to Preservice/New Teachers and/or First-Time Conference attendees to join her and other members of NSTA in a special pizza and beverage reception in honor of Pi Day. To highlight the festivities, Jeffrey Lukens, a high school science educator with over 30 years of experience and 20 years of professional development leadership, will share some humorous stories and sage advice for educators new to the science classroom.

Ticket includes pizza and beverages (beer, soda, or water).

Attendance is limited to the first 200 registrants.

Sponsored by





NSTA Press Sessions

NSTA Press® books offer new classroom ideas and standards-based strategies.

Join NSTA Press authors for these sessions linked to the topics of their books.

Saturday, March 14 (Volume 3)

8:00–9:00 AM

Doing Good Science in Middle School

Using Predict, Observe, Explain
Sequences in Your Classroom

9:30–10:30 AM

Bringing Outdoor Science In

An Introduction to Scientific
Argumentation in the Classroom

11:00 AM–12 Noon

What Are They Thinking? Supporting
Elementary Learning Through Formative
Assessment Probes and Strategies

11:00 AM–12:30 PM

Planning for Hard-to-Teach Biology
Concepts Included in the NGSS

12:30–1:30 PM

Teaching Science for Conceptual
Understanding—Building a Bridge
Between Students' Ideas and Scientific
Concepts

2:00–3:00 PM

*Teaching Science Through Trade Books—
Exemplars from the Book and Featured
Columns*

*Argument-Driven Inquiry in Biology: Lab
Investigations for Grades 9–12*

3:30–4:30 PM

Phenomenon-based Learning: Fun,
Hands-On, Cooperative Learning

Teaching Science Through Integrating
Children's Literature and Outdoor
Investigations

Out in the Field. Showcasing Elementary
Preservice Interns Teaching *Inside-Out*

5:00–6:00 PM

Everyday Engineering

Sunday, March 15 (Volume 3)

8:00–9:00 AM

Inquiry and Literacy for Grades 3–5
*Science: A Perfect Pair for Making
Meaning of the Natural World*

The Basics of Data Literacy: Helping
Your Students (and You!) Make Sense of
Data

9:30–10:30 AM

Activating Adolescent Science Identity:
Research and Practice

The Method—A Systematic Approach to
Problem Solving

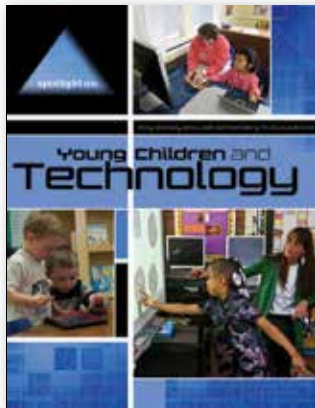
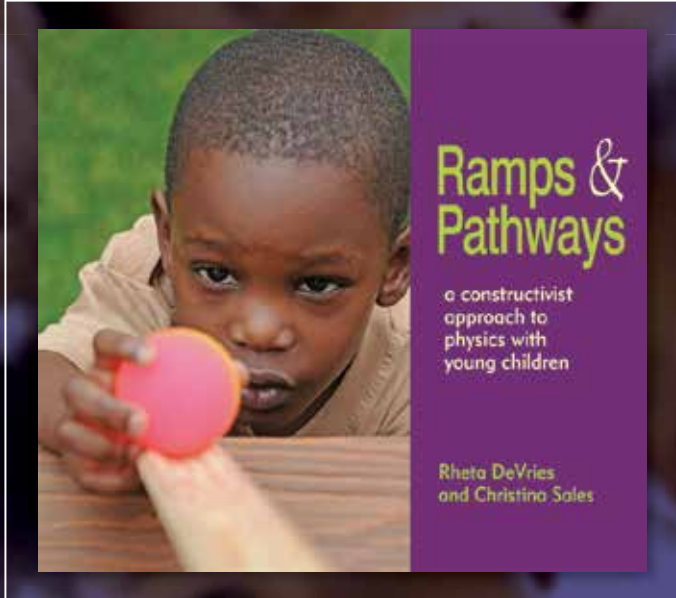
11:00 AM–12 Noon

Forensics in Chemistry

CCSS, ELA and Literacy + the NGSS =
Even More Brain-powered Science



Join us every day for demonstrations of physics and young children based on our book *Ramps and Pathways*.



Join us at the Elementary Extravaganza

Friday, March 13, 8-10AM

We'll be in Skyline W375c, McCormick Place.



—Photo courtesy of Jim Schulz, Chicago Zoological Society

Saturday, March 14

| | Featured Speakers | Special Events | Special Events |
|----------|--|--|---|
| 8:00 AM | | | Teacher Researcher Day 8:30 AM–3:30 PM Regency A/B, Hyatt Regency McCormick Place |
| 9:00 AM | | | |
| 10:00 AM | | | |
| 11:00 AM | Paul F-Brandwein Lecture 11:00 AM–12 Noon W190a, McCormick Place Speaker: Curt Meine <i>sponsored by Brandwein Institute</i> | | |
| 12 Noon | | | |
| 1:00 PM | | | |
| 2:00 PM | NSTA/ASE Honors Lecture 2:00–3:00 PM W192a, McCormick Place Speaker: Chris Harrison | | |
| 3:00 PM | | | |
| 4:00 PM | Featured Presentation 3:30–4:30 PM W190a, McCormick Place Speaker: Samuel Dyson <i>sponsored by Shell</i> | Pi Day Celebration for Preservice/New Teachers and First-Time Conference Attendees 4:00–6:00 PM W196b, McCormick Place Ticket Required (M-6) | |
| 5:00 PM | | | |
| 6:00 PM | | | |
| 7:00 PM | | | |
| 8:00 PM | | | |
| 9:00 PM | | Celebrate Einstein's Birthday ...with a Salute to the Blues Brothers 8:00–10:00 PM Regency Ballroom, Hyatt Regency McCormick Place | |
| 10:00 PM | | | |

7:00–9:00 AM Meeting

APAST Breakfast Meeting

(By Invitation Only)

Adler A/B, Hyatt

Catch up with those friends with whom you shared your PA experience. Stop by and see the exciting things happening at APAST! Current PA's only.

7:30–8:15 AM Meeting

NSTA Past Presidents' Breakfast

(By Invitation Only)

Regency C, Hyatt

8:00–8:30 AM Presentations

Using Blue Mussels to Measure Contamination in a New England Harbor

(Grades 9–College)

Grant Park A, Hyatt

Science Focus: ESS

Mari Butler, Endicott College, Beverly, MA

This session should not be shucked. Join us and hear how we collected mussels from a dirty harbor to use as a bioindicator of harbor contaminants in this student-driven project.

NGSS and Research-based STEM Lesson for the High School Biology Classroom

(Grades 9–12)

S402a, McCormick Place

Science Focus: LS1.A, LS3.A, LS3.B

Rachel Beattie, Lincoln-Way East High School, Frankfort, IL

Join us as we share an NGSS- and research-based lesson designed to confront high school student misconceptions about the relationships among heritable phenotypes, protein, DNA, and chromosomes.

Using an Intertextual Approach for Teaching Disciplinary Core Ideas in Science

(Grades 5–8)

W175c, McCormick Place

Science Focus: GEN, SEP1, SEP2, SEP4, SEP7, SEP8

Carol Manocchi-Verrino (manocchi@fordham.edu) and **John Craven** (jcraven@fordham.edu), Fordham University, Bronx, NY

Attention will be paid to examining the practices of upper elementary/middle school teachers using an intertextual approach to teaching disciplinary core ideas in science.

Most conference sessions are scheduled in McCormick Place and Hyatt (listed as “Hyatt” in this program), with short courses and a few other events scheduled at the Palmer House Hotel.

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

Science Area

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

The science areas and their abbreviations are:

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

NGSS

See page 87 in Volume 1 for a complete list of the NGSS codes used in this program.

Strands

The Chicago Conference Committee has planned the conference around the following four strands, enabling you to focus on a specific area of interest or need. Strand events are identified by icons throughout the daily program. For strand descriptions, see page 6.

 **Teaching Every Child by Embracing Diversity**



The Science of Design: Structure and Function



Student Learning—How Do We Know What They Know?



Natural Resources, Natural Partnerships

The following icons will be used throughout this program.

INF Informal Education Sessions



NSTA Press® Sessions



PDI Professional Development Institutes

8:00–9:00 AM Presentations

Bang for Your Buck! Cover New Material and Assess with Accuracy in 50 Minutes!

(Grades 9–12)

Adler C, Hyatt

Science Focus: GEN, NGSS

Nora Ugalde, The School District of Palm Beach County, West Palm Beach, FL

Speed dating, peer review, and QR code scavenger hunts are fantastic, easy ways of engaging and assessing students. Join our fun session, make life easier!

Goodbye Research Paper! Self-publishing Projects for Creative Students

(Grades 6–12)

Burnham C, Hyatt

Science Focus: GEN, SEP8

David Black (*elementsunearthed@gmail.com*), Walden School of Liberal Arts, Provo, UT

By self-publishing using Web 2.0 tools, students can communicate their STEM knowledge while creating educational content for others to use. We'll explore various student-created projects and how to assess them for student learning.

Differentiating Assessments in the Science Classroom

(Grades P–12)

Field A/B, Hyatt

Science Focus: GEN, INF, NGSS

Sara Aronin (*sara.aronin@Mail.wvu.edu*), West Virginia University, Morgantown

Kyle Greenleaf (*kgreenlewvu@gmail.com*), West Preston Middle School, Masontown, WV

Jennifer George (*@MsGeorgeWVU2014; jgeorge3@wcpss.net*), Wendell Middle School, Wendell, NC

Join us for a demonstration on the development and use of choice boards to differentiate assessments by content, process, and product in the science classroom.

Information Literacy in Biology Education Through Authentic Assessment

(Grade 12–College)

Grant Park B, Hyatt

Science Focus: LS, SEP8

Tricia Gray (*tgray5@uwo.ca*) and **Linda Dunn** (*@lkdunnatwestern; ldunn@uwo.ca*), University of Western Ontario, London, Canada

Experience a blended research tutorial for undergraduate biology students that helps them learn at their own pace, addresses basic search skill variability, and teaches skills that are immediately applicable.

Ready, Set, Go: Optimizing Community and University Resources to Improve Science Communication

(College)

Grant Park C, Hyatt

Science Focus: GEN, SEP6, SEP7, SEP8

Michelle Paulsen (*@mlpaulsen; @NU_RSG; m-paulsen@northwestern.edu*), Northwestern University, Evanston, IL

Effective communication is a key component to successful science. We need to make a specific effort to train our scientists to communicate—especially their research to nontechnical audiences. Hear how we are using the expertise found on our university campus to begin this process.

Connecting to the Community Through Authentic Learning

(Grades K–12)

Hyde Park B, Hyatt

Science Focus: ESS, ETS, LS, INF, CCC2, CCC4, CCC7, SEP

Beth Guzzetta (*@bethguzzetta; bguzzetta@allendalecolumbia.org*) and **Martha Bjorklund** (*@mrsmcbac; mbjorklund@allendalecolumbia.org*), Allendale Columbia School, Rochester, NY

Julie Thompson (*@drjctompson; juliecthompson@gmail.com*), Western Governors University, Salt Lake City, UT

Find out how our K–12 classes have built partnerships with local and distant museums and scientists through authentic learning projects including citizen science.

Science Lab Renovations: Working Strategically with Architects to Create 21st-Century Labs

(Grades 6–College)

Jackson Park D, Hyatt

Science Focus: GEN

Steve Wood (*@stevewood1968; swood@d125.org*), Adlai E. Stevenson High School, Lincolnshire, IL

Thoughtful lab renovations require collaboration among teachers, administrators, and architects. Join us as we highlight ways to maximize all stakeholders' expertise and lessons learned.



NSTA Press® Session: Doing Good Science in Middle School

(Grades 5–9)

S401bc, McCormick Place

Science Focus: GEN, NGSS

Vicki Massey (*vickimassey@cox.net*), NSTA Director, District XIV, Mesa, AZ

Find out what is in this comprehensive, easy-to-use, must-have resource for middle school teachers. Hints for keeping kids engaged will be shared.

Going Beyond Data Collection: Sharing in a Science Classroom

(Grades 3–College)

S401d, McCormick Place

Science Focus: ETS, SEP

Ben Smith, Red Lion Area Senior High School, Red Lion, PA

Find how students can collect and share data and produce a digital report. Bring your own device to participate as a student or come observe all the action.

Managing Your Chemical Inventory

(Grades 6–12)

S403a, McCormick Place

Science Focus: PS

Brian Wazlaw (briwazlaw@aol.com), Laboratory Safety Consultant, Portsmouth, NH

Proper chemical management is an essential component for promoting safer science classrooms. We'll cover purchasing, using, storing, and disposing of chemicals and inventory control.

Vertical Alignment in the STEM Classroom: Implementing NGSS with Diversity in Mind

(Grades K–12)

S501a, McCormick Place

Science Focus: PS2.A, PS2.B, PS3.B, PS4.A, PS4.B, CCC1, CCC3, CCC4, SEP1, SEP2, SEP4, SEP5

Rabieh Hafza ([@jamalhafza](https://twitter.com/jamalhafza) ; jamalhafza@att.net), Westlake High School, Atlanta, GA

Attention will be paid to the implementation of the NGSS physical science core ideas as students progress from elementary through high school, focusing on diversity.

Primary STEM Research for High School Students

(Grades 9–12)

S503b, McCormick Place

Science Focus: LS, PS, SEP

JulieAnn Villa (julvil@d219.org) and **Ruth Gleicher** (rutgle@d219.org), Niles West High School, Skokie, IL

Join us as we share our experiences developing a yearlong primary high school STEM research course. Receive access to curriculum resources for guiding students in experimental design and research projects. Learn from our six years of experience with developing this primary STEM research course.

CONFERENCE APP

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Download our conference app for the NSTA Chicago National Conference on Science Education—a social experience you don't want to miss.

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Please note that your conference app scheduler will not sync with the Personal Conference Scheduler found on NSTA's website.

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Station Teaching for Diverse Learners

(Grades 5–8) *S504bc, McCormick Place*

Science Focus: GEN

Lucie Davis, St. HOPE Leadership Academy Charter School, New York, NY

Reach all of your students with different learning needs in a one hour block through station teaching. Handouts and prizes!

INF Using Your Local Natural Resource Partners

(Grades K–8) *S504d, McCormick Place*

Science Focus: ESS, INF

Susan Disch, ETHOS Science Center, Elkhart, IN

Liz Hincks, Little River Wetlands Project, Fort Wayne, IN
Connecting with local natural resource partners is a win-win for everyone! Discover some of your community's best treasures and how they can benefit your students.

Student Movie-Making Projects—From Planning to the Premiere

(Grades 1–8) *S505a, McCormick Place*

Science Focus: GEN

Nicholas Bourke (*nbourke@aum.edu*) and **Russ McKinney** (*@russmac; rmckinn1@aum.edu*), Auburn University at Montgomery, AL

We will share examples of our students' movie-making projects and our lessons learned to help you use videos as a creative and engaging assessment tool.

Energy 101: Bringing STEM to Life with Real-World Projects

(Grades 7–College) *W176b, McCormick Place*

Science Focus: PS

Dan Whisler (*@DanWhisler; whislerd@usd376.com*), Sterling High School, Sterling, KS

Making real-world connections with wind energy and an electric car? Come join us to hear two high school students share what they have learned through this highly integrated project!

Using Remote Online Labs in Your Science Classroom

(Grades 9–12) *W187c, McCormick Place*

Science Focus: GEN, SEP3, SEP4, SEP7

Ashley Walter (*@NU_OSEP; ashley.walter@northwestern.edu*), Northwestern University, Evanston, IL

Discover how to incorporate more inquiry-driven science labs into your curriculum using remote online labs! Students analyze real data from experiments they design themselves.

Blue Man Physics

(Grades 7–12) *W190a, McCormick Place*

Science Focus: PS

Rob White (*@MrWhiteBBCHS; rwhite@bbchs.org*), Bradley-Bourbonnais Community High School, Bradley, IL
Engage your students in the science of the sound and engineering behind the awe-inspiring music of the Blue Man Group experience. Help your students make the connection between music theory and the science of sound.

Effective Professional Development for Beginning STEM Teachers: Three Noyce Project Exemplars

(Grades 7–College) *W196c, McCormick Place*

Science Focus: GEN

John Tillotson (*jtillot@syr.edu*), Syracuse University, Syracuse, NY

Peter Veronesi (*pverones@brockport.edu*), The College at Brockport, NY

Join us as we highlight three research-based approaches to exemplary professional development for beginning STEM teachers developed for the NSF Noyce Scholars Project at each institution.



8:00–9:00 AM Hands-On Workshops

ASTC Session: Bridging the Gap—Successful Formal/ Informal Partnerships for Advancing STEM Education

(Grades 3–12) Clark A/B, Hyatt
 Science Focus: ESS, ETS, LS, PS, INF, CCC2, CCC3, CCC4, CCC6, SEP1, SEP2, SEP3, SEP4, SEP6

Sandra Ryack-Bell (*sryackbell@mits.org*), MITS, Inc. (Museum Institute for Teaching Science), Quincy, MA

Jason Welch (*jasonswelch@yahoo.com*), Holbrook Junior and Senior High School, Holbrook, MA

Rachel Stronach (*rstronach@lloydcenter.org*), Lloyd Center for the Environment, Dartmouth, MA

David Unger (*dunger@athm.org*), American Textile History Museum, Lowell, MA

Engage in inquiry activities developed by teachers and educators from museums and science education centers during the Museum Institute for Teaching Science (MITS) graduate collaborative professional development institutes. The activities combine science content with science and engineering practices.

ASTE Session: Experiencing Communication Barriers: Building Teacher Empathy for English Language Learners

(Grades 3–8, College) Grant Park D, Hyatt
 Science Focus: GEN

Katie Brkich, Georgia Southern University, Statesboro
 We will share a lesson developed for use with preservice teachers teaching the importance of ELL accommodations through affective experience and empathy development.



First-timers, Preservice Teachers and New Teacher Lounge

This lounge is for first-time attendees, preservice and new teachers to connect with colleagues, learn about relevant NSTA resources, enjoy a refreshment or just take a moment between sessions to relax. NSTA leaders and experience educators will be on-hand periodically to answer questions about the conference and NSTA resources in general

Lounge Hours:
Thursday, March 12—11:00AM–6:00PM
Friday, March 13 – 9:00AM–5:00PM
Saturday, March 14 – 9:00AM–3:00PM
 McCormick Place West
 (adjacent to NSTA Registration Area)

Lounge generously supported by



Water Down Your Lawn, Not Your Lessons for English Language Learners

(General)

Hyde Park A, Hyatt

Science Focus: GEN

Troy Dassler, Wisconsin Center for Education Research, Madison

Join us as we share how to ensure that students are still getting high levels of science content and not watering down the curriculum, but scaffolding the academic language needs of the students. In this interactive workshop, we will do experiments that blend NGSS and English language development standards so that you may keep the cognitive demand high.

Performing Pedagogical Alchemy: Transforming Leaden Labs into Golden Opportunities for Student Learning

(Grades 6–College)

Jackson Park A, Hyatt

Science Focus: GEN, SEP3

Chuck Downing (@CRDowningAuthor; chuckdowning4@gmail.com), Retired Science Teacher, San Diego, CA

Find out how to change leaden labs—heavy with cookbook procedures—into golden opportunities for student learning through inquiry and writing. Specific examples and handouts provided.

Picture This!

(Grades K–12)

Jackson Park B, Hyatt

Science Focus: GEN, NGSS

Natalie Macke (nmacke12@yahoo.com), Pascack Hills High School, Montvale, NJ

Using pictures as scientific models can be worth more than a thousand words! Learn how you can use picture models as formative and summative assessment tools.

DuPont Presents: Global Food Security—Can We Sustain?

(Grades 9–12)

Regency E, Hyatt

Science Focus: LS

David Black (@davidablack77; dblack3@murraystate.edu), Murray State University, Murray, KY

Let us introduce you to an inquiry activity to get students excited about sustainability and their role to feed the nine billion people that will need nourishment by 2050. Experience a fun activity to understand the difference between food insecure and food secure that can keep your students active and thinking. A wonderful activity to include in any level of science class!

NSTA Press® Session: Using Predict, Observe, Explain Sequences in Your Classroom

(Grades 6–12)

S401a, McCormick Place

Science Focus: GEN, SEP3, SEP4, SEP7

Michael Bowen (gmbowen@yahoo.com), Mount Saint Vincent University, Halifax, N.S., Canada

Using examples from the NSTA Press book *Predict, Observe, Explain: Activities Enhancing Scientific Understanding*, we will demonstrate how to engage middle school and high school students in POE activities to develop their understanding of science concepts. Resources provided.

Scale the Universe

(Grades 6–10)

S404 b/c, McCormick Place

Science Focus: ESS, CCC3

Christine Royce (@caroyce; caroyce@aol.com), Shippensburg University/PSTA, Shippensburg, PA

How big is big? How small is small? Let us “Scale the Universe” as we investigate a variety of different scaling activities.

Explore Earthquakes!

(Grades K–12)

S404a, McCormick Place

Science Focus: ESS, CCC2, SEP2, SEP3, SEP4, SEP8

David Buehler (dbuehler@geosociety.org), The Geological Society of America, Boulder, CO

Using several inquiry-based activities, we will explore earthquakes in a way that will allow students to become actively engaged in the learning process. Free resources!

An Inquiry Approach to the Introduction of Minerals and Rocks

(Grades 6–8)

S404d, McCormick Place

Science Focus: ESS2.A, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Laura Tinigin (laura.tinigin@wmich.edu) and **Laura Robinson** (@lrbios; lrobinson@gmail.com), Western Michigan University, Kalamazoo

Renee Schwartz (rschwartz@gsu.edu), Georgia State University, Atlanta

Join us for an inquiry approach that introduces a minerals and rock unit with an emphasis on incorporating nature of science objectives and literacy strategies.

TCi™

Booth 1552



Session 1

Date: Friday, Mar 13
Time: 10:00-11:30 AM

Room: W194a

Ignite the NGSS with Today's Cutting-edge Technology

Session 2

Date: Saturday, Mar 14
Time: 8:00-9:30 AM

Room: W194a

Ride the Wave with *Bring Science Alive!*



Session 3

Date: Saturday, Mar 14
Time: 10:00-11:30 AM

Room: W194a

Modeling the Earth, Sun, and Other Stars with *Bring Science Alive!*

teachtci.com

Skepticism in the Classroom

(Grades 7–College)

S501bc, McCormick Place

Science Focus: PS

Matthew Lowry, Lake Forest High School, Lake Forest, IL

We will share a variety of lessons appropriate for the physics/science classroom that focus on the skeptical and critical-thinking nature of science.

Rigor and Relevance: Keeping It Real

(Grades 6–12)

S501d, McCormick Place

Science Focus: ESS, ETS, LS, PS, CCC2, CCC3, CCC4, CCC5, SEP

Sarah Radencic (spr67@msstate.edu), and **Darrel Schmitz** (schmitz@geosci.msstate.edu), Mississippi State University, Mississippi State, MS

Deborah Pounders (debponders@hotmail.com), Columbus (MS) Municipal School District

Presider: Sarah Radencic

Engage diverse learners by connecting STEM concepts to their personal experiences through activities focused on exploration and investigations linking current research to subject-specific standards.

Taking Engineering Design All the Way

(Grades 4–9)

S502a, McCormick Place

Science Focus: ETS, INF, SEP1, SEP3, SEP6, SEP8

Cathy Barthelemy (cbarthelemy@fwmsk.org), Fort Worth Museum of Science and History, Fort Worth, TX

Karen Matsler (@eatincorg; kmatsler@uta.edu), The University of Texas at Arlington

Don't stop students short! Allow them to model engineering practices through authentic scenarios that demonstrate their understanding of core ideas in science.

Circular Reasoning: Integrating Math, Science, and Engineering by Studying a Wind-up Toy

(Grades 4–8)

S502b, McCormick Place

Science Focus: ETS1, PS2, PS3, CCC1, CCC2, CCC3, CCC6, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7

Gary Benenson (benenson@ccny.cuny.edu), The City College of New York, NY

Emmy Matias-Leonard (emmym68@yahoo.com), The Earth School, New York, NY

Develop physical science core ideas of force, motion, mass, energy, and friction in your classroom via a wind-up toy. Using simple materials, make a wind-up toy that goes in circles and records its own path. Investigate how the design of the toy affects the size of the circle.

STEAMING Along with Da Vinci: Integrating Science and Engineering with the Arts in an Early Childhood Classroom

(Grades P–4)

S503a, McCormick Place

Science Focus: ETS, CCC, SEP

Fred Estes (@FredSci; festes@nuevaschool.org), The Nueva School, Hillsborough, CA

Come experience an elementary science and engineering unit integrated with the visual arts and creativity, inspired by the life and work of Leonardo da Vinci.

NESTA Session: Multimedia Tools and Classroom Resources for Teaching Earth System Science

(Grades 6–College)

Skyline W375e, McCormick Place

Science Focus: ESS2.A, ESS2.B, ESS2.E, ESS3.C, LS2.B, LS2.C, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7

Roberta Johnson Killeen (rmjohnsn@nestanet.org), National Earth Science Teachers Association, Boulder, CO

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, NJ

Earth is a dynamic planet that has undergone vast changes over geologic history. This NESTA-HHMI workshop investigates our changing Earth while modeling Earth system science classroom resources.

The Dead Zone

(Grades 4–7)

W175 a/b, McCormick Place

Science Focus: ESS3.C, SEP2, SEP4, SEP6, SEP8

Liz Martinez (@lizrmartinez; emartinez@imsa.edu), Illinois Mathematics and Science Academy, Aurora

Use stream tables, maps, and ocean data to investigate the relationships among erosion, run-off, and dead zones in the Gulf of Mexico.

Engaging Youth (and Partners) Through Engineering: Strategies to Secure Partnerships to Enrich Curriculum

(Grades 6–8)

W176a, McCormick Place

Science Focus: ETS, CCC, SEP

Melissa Dean (@MAEF8020; @DoinThisFrSchl; mdean@maef.net) and **Suzan Morris** (smorris@maef.net), Mobile Area Education Foundation, Mobile, AL

Learn about successful strategies that were used to engage business and community partners in order to develop integrated STEM lessons.

Engineering Design Journals: Documenting Learning
(Grades 4–8) *W178b, McCormick Place*

Science Focus: ETS, SEP

Tina Harris (*taharris79@yahoo.com*), Marion High School, Marion, IN

Engage in STEM projects we have used in our classes and find out how students document their projects and thoughts over time to show learning progression.



Operation Rescue: A Project Approach to STEM Education

(Grades 5–9)

W186c, McCormick Place

Science Focus: GEN, INF, NGSS

Greg Vogt, Baylor College of Medicine, Houston, TX
Student teams organize and conduct a simulated emergency relief supplies rescue mission to the Philippines following the destruction caused by Typhoon Haiyan. The project incorporates science, medicine, payload model construction, mathematics, geography, social studies, and current world events.



Watering the Grassroots of Change: Integrated Outdoor Science and Community-based Water Resource Education

(Grades 8–College)

W187a, McCormick Place

Science Focus: ESS, INF, CCC5, SEP1, SEP4, SEP6, SEP7

Jamie Esler (*jesler@cdaschools.org*), Lake City High School, Coeur d’Alene, ID

Rusti Kreider (*rkreider@sd41.org*), St. Maries High School, St. Maries, ID

Cindy Rust (*crust@sd273.com*), Post Falls High School, Post Falls, ID

Through partnerships between environmental nonprofits, universities, government/professional agencies, and local high schools, The Confluence Project immerses students in freshwater resource issues facing their community.

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Which Plants Make Good Acid/Base Indicators?

(Grades 2–8, College)

W187b, McCormick Place

Science Focus: PS

Rebecca Dyasi, Long Island University, Brooklyn, NY

Learn how prospective teachers engage in and use experiences with plant-based indicators to enable urban children to develop science practices and understandings, along with communication and self-assessment skills.



Formative Assessment with Developing and Using Models

(Grades K–5)

W190b, McCormick Place

Science Focus: PS, SEP

Rita Januszyk (ritajanuszyk@gmail.com), Retired Educator, Hinsdale, IL

Join a member of the NGSS writing team as she guides elementary teachers through the power of the science and engineering practice: “Developing and Using Models” for assessment. Participants will engage in the practice of developing a conceptual model using a light box to explain illumination. Formative assessment opportunities in developing and using models will be explored.

Nanotechnology in the Classroom: Synthesis of Graphene

(Grades 7–College)

W192a, McCormick Place

Science Focus: PS, INF, CCC, SEP

Benjamin Taylor (@UWWRSEC; bltaylor2@wisc.edu) and

Anne Lynn Gillian-Daniel (@UWWRSEC; agillian@wisc.edu), University of Wisconsin–Madison

In this hands-on workshop, learn about nanotechnology and synthesize graphene (called a “21st-century wonder discovery” by *Scientific American*), which can be used to create the next generation of solar cells.

CESI Session: Family Science Events: Logistics, Engaging Science, and Parent Involvement

(Grades P–8)

W192c, McCormick Place

Science Focus: GEN

Jim McDonald (@jimscienceguy; jim.mcdonald@cmich.edu), Central Michigan University, Mount Pleasant

Find out how to set up Family Science events at your school or site. We’ll cover the process and logistics, parental involvement, and demonstrate activities.

Family Science for the Whole Family

(Grades 5–10)

W196a, McCormick Place

Science Focus: INF

Jake Noel-Storr (@noelstoj; drjakens@gmail.com), Insight-STEM, Inc., Tucson, AZ

Learn strategies to engage the WHOLE family in STEM activities—obliterate parents sitting at the back of the room drinking coffee!

Mudslides: Connecting Science and Engineering Practices in Classrooms

(Grades 5–12)

W475b, McCormick Place

Science Focus: ETS, SEP

Yaozhen Pan and **Norman Lederman** (ledermann@iit.edu), Illinois Institute of Technology, Chicago

Join us for a simulation of mudslides for students to connect real-life events with science and engineering content! Lesson plans and activities provided.



8:00–9:00 AM Exhibitor Workshop

Off to the Races with K’NEX Education’s Forces, Energy, and Motion Set!

(Grades 5–9)

W471b, McCormick Place

Science Focus: PS

Sponsor: K’NEX Education

Robert Jesberg, Science Consultant, Hatfield, PA

Start your engines! Join the K’NEX® building experience as you build gravity, rubber band, and spring power racers to test physical science concepts. Build models just like your students and investigate, experiment, collect data, graph, and analyze results. We will explore potential and kinetic energy, average speed, and much more.

8:00–9:30 AM Exhibitor Workshops

Implementing Inquiry: Strategies and Tools for Elementary Students

(Grades P–3)

W179b, McCormick Place

Science Focus: GEN, SEP1

Sponsor: Zula International

Laurie Michnal (laurie@zula.com), Zula International, Burbank, CA

Join us for a fun hands-on workshop that can help you integrate STEM for elementary students. Learn to implement engaging, inquiry-based, cross-curricular science activities that stimulate critical thinking and support the NGSS. Take away hands-on activities that you can use in the classroom

Marine Science Education—Awareness, Understanding, and Action

(Grades K–12)

W184a, McCormick Place

Science Focus: ESS3

Sponsor: Ocean Classrooms

Cynthia Long (cyndi@oceanclassrooms.com) and **Caine Delacy** (caine@oceanclassrooms.com), Ocean Classrooms, Boulder, CO

Awareness begins with understanding the ocean, its inhabitants, and how we are connected. Human activity across the globe has altered ocean ecosystems. Learn how to develop ocean advocates in your classroom by incorporating marine science content understanding, identifying human impact on the ocean, and designing actions we can take.

“Don’t simply retire from something; have something to retire to.” —Harry Emerson Fosdick

The NSTA Retired Advisory Board invites you to a vibrant and useful information sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

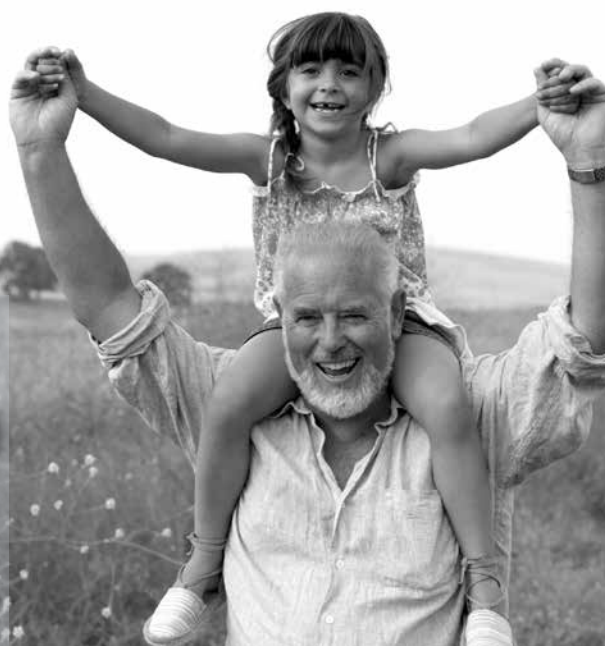
Before and After Retirement—Practicalities and Possibilities

**Saturday, March 14
9:30–10:30 AM**

McCormick Place, W176b

For more information on the Retired Members Advisory Board, contact Joyce Gleason, chair, at joycegle@earthlink.net.

NSTA National Science Teachers Association



Climate Change Series 1: Climate Stewards Roundtable Presentations

(Grades 3–College)

W184bc, McCormick Place

Science Focus: ESS

Sponsor: NOAA's National Ocean Service

Bruce Moravchik, Molly Harrison, and Peg Steffen, NOAA National Ocean Service, Silver Spring, MD

Bringing climate science into education settings can be challenging. Come learn from educators in NOAA's Climate Stewards who will showcase strategies, activities, and resources to use with your audiences. Information about NOAA Climate Stewards Education Program will also be presented.

Leading Students to Exciting Careers in Emerging Technology Fields

(Grades 8–College)

W184d, McCormick Place

Science Focus: GEN

Sponsor: Nano-Link: Center for Nanotechnology Education

Deb Newberry, Dakota County Technical College, Rosemount, MN

Educators are gaining the ability to include emerging technology concepts in their classes. They may, however, lack the knowledge of how these technologies can lead to a diverse set of career pathways. Participants will walk away with a set of career possibilities (and handouts) for the fields of nanoscience, biotechnology, and photonics.

Biology with Vernier

(Grades 9–College)

W185a, McCormick Place

Science Focus: LS, SEP3, SEP4

Sponsor: Vernier Software & Technology

Colleen McDaniel (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Use Vernier sensors to conduct a variety of biology experiments from our popular lab books in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger Pro computer software, and mobile devices. See how Vernier has been incorporating principles of the NGSS science and engineering practices for 34 years!

Integrate Chromebook and BYOD with Vernier Technology

(Grades 3–College)

W185d, McCormick Place

Science Focus: GEN, SEP4

Sponsor: Vernier Software & Technology

Matthew Anthes-Washburn (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Use Vernier sensors in this hands-on workshop to conduct a variety of experiments using Chromebooks and BYOD tech-

nology. Experience data collection using Graphical Analysis for Chrome and Vernier Data Share for BYOD environments. See how Vernier has been incorporating principles of the NGSS science and engineering practices for 34 years!

Go Virtual! Enhancing Instruction with Technology in Geography, Physical Geology, and Environmental Science

(Grades 9–12)

W186a, McCormick Place

Science Focus: ESS

Sponsor: National Geographic Learning

Tom Hinojosa, National Geographic Learning, Littleton, CO

Enhance learning with virtual resources available for teaching environmental science, physical geology, and geography. We'll access an interactive map tool to investigate multiple environmental parameters for anywhere in the world. See virtual field trips featuring national parks as stunning examples of geologic processes and concepts for physical geology and environmental science.

MINDSTORMS® EV3 Robotics in the Middle School Classroom—Getting Started

(Grades 6–9)

W186b, McCormick Place

Science Focus: ETS

Sponsor: LEGO Education

Laura Jackson, Retired Teacher/LEGO Education Trainer, Greenwood, MO

Cindy Howard, Retired Teacher/LEGO Education Trainer, Kansas City, MO

Learn firsthand how LEGO Education MINDSTORMS EV3 can get your students excited as they model real-life mechanisms and solve real-world challenges, all while building the critical-thinking and creative problem-solving skills that will serve them well for a lifetime.

Who's Killing Crystal Creek? Solve an Environmental Science Mystery

(Grades 9–12)

W192b, McCormick Place

Science Focus: ESS

Sponsor: Ward's Science

Liam Casey, VWR Education, Rochester, NY

Uncover the source of pollution affecting a local creek using our hands-on materials and newly updated NGSS-aligned activity guides. Connect real-world environmental issues and science practices. After solving the case, head to the Ward's Science booth to track down the pollution offender and collect your bounty!

Physics and Open-Source Robotics: The Opera of Math and Science

(Grades 9–College)

W193a, McCormick Place

Science Focus: PS2, PS3.B, INF, CCC1, CCC2, CCC3, CCC4, CCC5, CCC6, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

Sponsor: SparkFun Electronics

Jeff Branson (jeff.branson@sparkfun.com), **Derek Runberg** (derek.runberg@sparkfun.com), and **Brian Huang** (brian.huang@sparkfun.com), Sparkfun Electronics, Longmont, CO Position, velocity, acceleration, torque, and rotation—these are all key concepts in both physics and robotics. Why not integrate these things together? We use arduino, a simple robotics platform, and a little math to introduce students to kinematics concepts in physics. Integrate STEM and engineering into your physics class!

Going Viral—From Proteins to Pandemics

(Grades 9–College)

W193b, McCormick Place

Science Focus: LS

Sponsor: MSOE Center for BioMolecular Modeling

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

This workshop will review the molecular structure of viruses and the mechanisms they use to infect our cells. We will then consider how the approaches we have developed to protect ourselves from influenza virus and HIV are now being applied to develop vaccines and treatments for the Ebola virus.



THE AWARD-WINNING PLANETARIUM SHOW GOES FLAT SCREEN!

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Ride the Wave with Bring Science Alive!

(Grades K–8)

W194a, McCormick Place

Science Focus: PS

Sponsor: TCI

Nathan Wellborne (nwellborne@teachtci.com), TCI, Rancho Cordova, CA

Unveiling the NGSS has left K–5 teachers wondering how their lessons should change. In this workshop, we'll use a powerful online learning system to develop a model of waves to describe patterns in terms of amplitude and wavelength. Participants will experience learning from a student's perspective.

Investigating Chemical Changes

(Grades 9–12)

W195, McCormick Place

Science Focus: PS1.B

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, NY

How can we write a chemical reaction that explains what happens during a chemical change? During this workshop, explore three different types of chemical reactions. After completing the experiments, we will practice writing chemical reactions using one or two examples of each reaction type. Join us for this activity from The Natural Approach to Chemistry program.

Woodles! Vocabulary Development for Scientific Literacy!

(General)

W470a, McCormick Place

Science Focus: GEN

Sponsor: Accelerate Learning

Sharry Whitney (swhitney@acceleratelearning.com), Accelerate Learning, Houston, TX

Scientific literacy is grounded in understanding the specific scientific terms that are at the heart of a strong STEM program. Experience the exhilaration of successfully passing an assessment about Woodles by just having the experience of interacting with them. Build the capacity in your students for literacy success.

Genes in Space: Design a DNA Analysis Experiment for the International Space Station

(Grades 7–12)

W470b, McCormick Place

Science Focus: ETS1.A, ETS1.B, ETS2, LS1, LS3, LS4, PS1.A, PS1.B, PS2, PS3.C, PS3.D, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Sponsor: miniPCR

Sebastian Kraves (seb@minipcr.com) and **Ezequiel Alvarez Saavedra** (zeke@minipcr.com), miniPCR, Cambridge, MA

Space exploration poses intriguing questions about life beyond Earth. To answer them, the first student-designed DNA amplification experiment will soon be conducted aboard the International Space Station using a miniPCR machine. This national competition is the first to invite students to propose a PCR experiment to occur in space orbit.

Hands-On Wave-Particle Duality

(Grades 9–College)

W471a, McCormick Place

Science Focus: PS, CCC, SEP

Sponsor: Perimeter Institute

Damian Pope and **Kevin Donkers**, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada

The wave-particle duality is one of the deepest mysteries of quantum mechanics. Come explore hands-on activities that introduce students to this vitally important concept in the quantum world. The Challenge of Quantum Reality multimedia educational resource was designed by experienced educators in collaboration with Perimeter Institute researchers.

Science, Fashion, and Fun! Genes in a Bottle™ Kit

(Grades 6–College)

W474a, McCormick Place

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, CA

Isolate your own DNA and capture your unique essence in our stylish new helix-shaped necklaces! From cell structure to genetics to the chemistry of life, this workshop is perfect for all education levels, integrating multiple life science standards in a single lesson.

Share My Lesson: Free Classroom Resources Developed by Teachers for Teachers

(Grades P–12) *W474b, McCormick Place*

Science Focus: GEN

Sponsor: Share My Lesson

Elena Balint, Share My Lesson, Washington, DC

Share My Lesson is a free website with more than 300,000 resources on all subjects and grades. Learn about professional development opportunities where educators, parents, and school-support staff from across the country come together to develop or identify resources to share around topics, such as state standards, early childhood education (toddler to preK), and formative assessment techniques.

Getting the Most from Your Low-Cost Water Monitoring Kit

(Grades 5–9) *W475a, McCormick Place*

Science Focus: ESS

Sponsor: LaMotte Co.

Kurt Moser, Earth Force, Denver, CO

Learn how to use water quality testing kits to measure critical factors that indicate the health of a water resource. Data

collected will be used to illustrate use of the Earth Force Process, a service-learning instructional model that combines action civics and STEM concepts as a pedagogical strategy.

Implementing the NGSS Eight Practices with Research-based Curriculum

(Grades 6–8) *W476, McCormick Place*

Science Focus: GEN, SEP

Sponsor: Activate Learning

Joseph Krajcik, CREATE for STEM Institute, Michigan State University, East Lansing

Learn more about integrating the NGSS into the middle school science classroom using IQWST, the latest research-based curriculum developed for grades 6–8. Take back information to implement pedagogy and strategies that will increase student achievement.

**8:00–10:00 AM Networking Opportunity
AMSE/NSTA Minority Caucus: George Washington Carver Breakfast**

(By Invitation Only) *Prairie B, Hyatt*

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8:00–10:00 AM Hands-On Workshop

CSSS Session: Aligning Classroom Instruction and Formative Assessment to Support the NGSS Performance Expectations

(Grades K–12)

Regency D, Hyatt

Science Focus: GEN, INF, CCC, SEP

Brett Moulding (mouldingb@ogdensd.org), and **Nicole Paulson** (nicole.paulson@nebo.edu), Partnership for Effective Science Teaching and Learning, Ogden, UT

Engage in modifying and aligning existing instructional activities and embedded formative assessment items to support the NGSS performance expectations. Specific attention will be placed on how to use the crosscutting concepts to scaffold student reasoning about science phenomena.

8:00 AM–12 Noon Short Courses

Authentic Performance Assessments: Creating a Common Lab Report Rubric (SC-11)

(Grades 9–12)

Salon 2, Palmer House

Science Focus: GEN, SEP

Tickets Required; \$42

Paul Fraser (pfraser1011@gmail.com) and **Lee Ann Haralambakis** (leeannie1680@gmail.com), Rolling Meadows High School, Rolling Meadows, IL

For description, see Volume 1, page 60.



Explore Local Biodiversity with Encyclopedia of Life and OBIS (SC-12)

(Grades 4–10)

Salon 3, Palmer House

Science Focus: LS, INF, SEP

Tickets Required; \$27

Joanna Snyder (joanna_snyder@berkeley.edu), and **Erica Beck Spencer** (ebspencer@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

For description, see Volume 1, page 61.



STEM for ALL: Practices and Methods That Promote Equal Access to STEM (SC-10)

(Grades 5–College)

Salon 7, Palmer House

Science Focus: GEN, INF, SEP

Tickets Required; \$42

Mia Dubosarsky (mdubosarsky@wpi.edu), The STEM Education Center at WPI, Worcester, MA

For description, see Volume 1, page 60.

8:00 AM–5:00 PM Short Course

Modeling Key Mechanisms of Evolution and Population Biology (SC-13)

(Grades 9–12)

Salon 1, Palmer House

Science Focus: LS

Tickets Required; \$94

Michael Novak (mnovak@gmail.com) and **Corey Brady** (cbrady@northwestern.edu), Northwestern University, Evanston, IL

Katahdin Cook Whitt (kate.cook@wright.edu), The Dayton Regional STEM School, Kettering, OH

For description, see Volume 1, page 61.

8:15–9:15 AM Meeting

Past Presidents Advisory Board Meeting

Regency C, Hyatt

8:30–9:00 AM Presentations

Argumentation? When They Think They Can't, But You Know THEY CAN!

(Grades 9–12)

Dusable C, Hyatt

Science Focus: GEN, SEP6, SEP7, SEP8

Jai David-Valentine (jai.david@aspirepublicschools.org), Aspire California College Preparatory Academy, Berkeley
Leave with multiple strategies to that will ensure articulate, intelligent, and evidence-based responses as students share their argument/opinion.

Original Laboratory Research in a High School STEM Curriculum

(Grades 9–12)

S402a, McCormick Place

Science Focus: LS, SEP

Katrina Brandis, Mary Institute and Saint Louis Country Day School, St. Louis, Mo.

Hear about our first year conducting molecular and cellular biology experiments in our high school's research lab for students interested in pursuing original laboratory research projects.

The Impact of an Inquiry-based Science Instructional Method on Student Achievement and Teacher Instruction

(Grades 1–8)

W175c, McCormick Place

Science Focus: GEN, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Todd Zoblotsky (t.zoblotsky@memphis.edu), The University of Memphis, TN

Review third-year outcomes from a five-year Investing in Innovation study of a kit-based inquiry science instructional method and its impact on student learning and attitudes toward science.

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- Combining Science with Agriculture
- Achieving Success with the *NGSS*



For more information and to register, visit:
www.nsta.org/conferences

NSTA National
Science
Teachers
Association

8:30–9:30 AM Presentation

Teacher Researcher Day Session: Poster Session for Teachers and Teacher Educators Inquiring into Science Learning and Teaching

(General)

Regency A/B, Hyatt

Science Focus: GEN

Deborah Roberts-Harris, The University of New Mexico, Albuquerque

Find out what questions teachers and teacher educators are asking and how they are exploring these in their own classrooms.

8:30 AM–10:00 AM Meeting

Shell Award Judging Panel Meeting

(By Invitation Only)

Huron, Hyatt

9:00 AM–3:00 PM Exhibits

Hall F2, McCormick Place

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.

9:00 AM–3:00 PM Networking Opportunity First-Timers, Preservice Teachers, and New Teachers Lounge

Hall F2, adjacent to Exhibit Hall Entrance, McCormick Place

This lounge is for first-time attendees, preservice teachers, and new teachers to connect with colleagues, learn about relevant NSTA resources, enjoy a refreshment, or just take a moment between sessions to relax. NSTA leaders and experienced educators will be on hand periodically to answer questions about the conference and NSTA resources in general.

9:00 AM–5:00 PM Networking Opportunity NSTA International Lounge

Michigan, Hyatt

Please stop by the NSTA International Lounge to relax or meet colleagues while you're at the conference. The lounge is open Thursday through Saturday, 9:00 AM–5:00 PM.

9:30–10:00 AM Presentations

Infusing Literacy into High School Science

(Grades 9–12)

Dusable C, Hyatt

Science Focus: GEN, SEP

Susan Gleason (sglea@udel.edu) and **Kathryn Scantlebury** (kscantle@udel.edu), University of Delaware, Newark
Recent standards emphasize the need for students to read and interpret informational text. Discussion centers on how high school science teachers can incorporate literacy strategies into their science teaching.

Engaging Biology Students with Interactive Case Studies to Address the NGSS Science Practices

(Grades 9–12)

S402a, McCormick Place

Science Focus: LS, SEP

Georgia Hodges, The University of Georgia, Athens

Experience a novel use of technology that enables you to formatively assess students in real time during an interactive case study experience. Leave with the tools needed to deploy the software.

Interactive Science Notebooks, Formative Assessment, and the NGSS: A Match Made in Heaven

(Grades 6–8)

S404d, McCormick Place

Science Focus: GEN, NGSS

Jennifer White (whiteje@champaignschools.org) and **Jackie Baxter** (baxterja@champaignschools.org), Jefferson Middle School, Champaign, IL

Make interactive science notebooks an integral part of your classroom routine. Join us as we identify ways to use science notebooks for teachers and students to monitor growth in terms of mastering content and scientific practices.

Meta-Sticks: A Novel Way to Promote Negotiation in the Classroom

(Grades K–8)

S505b, McCormick Place

Science Focus: GEN, INF, NGSS

Mason Kuhn, Shell Rock Elementary School, Shell Rock, IA

Students engaging in negotiation is considered a central motivation for recent policy recommendations. In this session, we will discuss how Meta-Sticks encourage classroom negotiation. What's a Meta-Stick? Come find out.

Engaging in Oral and Written Argumentation Through Technology

(Grades 4–College)

W196c, McCormick Place

Science Focus: GEN, SEP

Fatemeh HossainMardi, University of Missouri–St. Louis

Join us for a four-step cycle for argumentation based on evidence using Google tools to deepen content understanding. We will explore collaborative/individual and oral/written aspects for learners of different abilities.



9:30–10:30 AM Presentations

Show Us the Answer!

(Grades 5–12)

Adler C, Hyatt

Science Focus: GEN, CCC, SEP

Natalie Macke (@nmacke12), Pascack Hills High School, Montvale, NJ

Aarti Mallya, Pascack Valley Regional High School District, Montvale, NJ

Team up and come work with your colleagues to develop a performance assessment that supports the performance expectations in the NGSS.

ASTC Session: Science Center Partnerships That Support Science Learning

(Grades P–8, College)

Burnham A/B, Hyatt

Science Focus: GEN

Traci Wierman (twierman@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Explore how one public science center's regional and national partnership models with formal and informal educators to highlight the NGSS and support the needs of local communities.

Features and Models of Quality Performance Assessment for the NGSS/Three-Dimensional Learning

(Grades K–12)

Field A/B, Hyatt

Science Focus: GEN, NGSS

Karen Whisler, Measured Progress, Dover, NH

Learn how to develop models of performance tasks that integrate the NGSS practices, core ideas, and crosscutting concepts to evaluate student learning.

Evaluating and Designing Local Sustainable Solutions

(Grades 9–12)

Field C, Hyatt

Science Focus: ESS, SEP6

Erin Layde (elayde@ecasd.k12.wi.us), Memorial High School, Eau Claire, WI

Discover how to help your students use the framework of sustainable development to evaluate local issues and proposals, design sustainable solutions, and work with community members to affect change!

Exemplar Inclusive STEM High Schools: How Do They Work?

(Grades 9–College)

Grant Park A, Hyatt

Science Focus: GEN

Erin Peters-Burton (epeters1@gmu.edu), George Mason University, Fairfax, VA

Nancy Spillane (@nks1300; nks1300@gmail.com), The George Washington University, Washington, DC

Are you interested in building a STEM school? Join us in exploring the critical components of schools successfully increasing the STEM participation of underrepresented students.

Concise Lab Reports to Demonstrate Conceptual Understanding

(Grades 9–College)

Grant Park C, Hyatt

Science Focus: GEN, SEP

Don Dosch (ddosch@imsa.edu), Illinois Mathematics and Science Academy, Aurora

Join us as we share examples of a concise lab report format with instructions to students so that they communicate understanding of major concepts.

Exploring Global Regions and Resources with National Geographic

(Grades K–12)

Hyde Park B, Hyatt

Science Focus: GEN, INF

Jessica Metz-Bugg (*jessicametz-bugg@partner.nps.gov*), Seeking Paths in Nature, Cherokee, NC

Thomas Szymanski (*tszymanski@cps.edu*), Walt Disney Magnet School, Chicago, IL

Cristina Veresan (*@cveresan*; *cveresan@gmail.com*), Star of the Sea School, Honolulu, HI

Want to explore the Arctic, Antarctic, or beyond with National Geographic/Lindblad Expeditions as a Grosvenor Teacher Fellow? Current fellows share experiences, insight, and curriculum resources.

They've Inquired: How Do I Know What They Know?

(Grades 6–College)

Jackson Park A, Hyatt

Science Focus: GEN

Chuck Downing (*@CRDowningAuthor*; *chuckdowning4@gmail.com*), Retired Science Teacher, San Diego, CA

Assessment in an inquiry classroom is a tricky subject. Engage in strategies that assess students after inquiry and other activities. Rubrics will be the focus. Handouts and weblinks provided.

Reaching and Teaching Every Student: A Unique Physics and Chemistry Course for Students of All Abilities

(Grades 9–12)

Jackson Park D, Hyatt

Science Focus: ETS, PS, SEP

Kevin Fleming, Old Saybrook Senior High School, Old Saybrook, CT

We will share a unique course designed for diverse learners with a wide range of learning challenges that provides a foundation in physics and chemistry. Leave with instructional strategies and sample activities that show how to meet the needs of all learners.



NSTA Press® Session: Bringing Outdoor Science In

(Grades K–8)

S401bc, McCormick Place

Science Focus: GEN, INF, SEP

Steve Rich (*@bflyguy*; *bflywriter@comcast.net*), West GYSTC, Carrollton, GA

Taking it outside or *Bringing Outdoor Science In*, explore school yard resources for crosscutting concepts, and how sticks and stems bring in STEM. Free seeds.

Adventures in Standards-Based Grading

(Grades 10–12)

S401d, McCormick Place

Science Focus: GEN

Kameron Pence (*kpence73@yahoo.com*), Collins Hill High School, Suwanee, GA

Standards-Based Grading is a very “outside of the box” approach to assessment in the science classroom. Hear how SBGs changed the way I grade. Learn how to create unit objectives and turn those objectives into assessments that can determine mastery level. By using your feedback, students can determine the areas of concentration needed to demonstrate that they have truly mastered the content.

Water Sustainability: Chemistry, Engineering, and Video PSA Projects

(Grades 6–12)

S403a, McCormick Place

Science Focus: ESS2.C, ESS3.A, ESS3.C, ESS3.D, ETS, PS1.A, PS1.B, PS3.A, PS3.D, CCC2, CCC3, CCC4, CCC5, SEP

Andrea Swenson and **Joseph Vincente** (*joseph.vincente@gmail.com*), East Side Community High School, New York, NY

Hear how an old “Unique Properties of Water” essay evolved into a meaningful water sustainability unit! Resources shared include water treatment lab, wastewater engineering challenge, and water sustainability video PSA projects.

INF After-School Science: What's Possible with Partnerships

(Grades K–12)

S404 b/c, McCormick Place

Science Focus: INF

Bryan Wunar (*bryan.wunar@msichicago.org*), Museum of Science and Industry, Chicago, IL

Michael Kennedy (*m-kennedy@northwestern.edu*), Northwestern University, Evanston, IL

Melissa Ballard (*@afterschool4all*; *mjballard@afterschoolalliance.org*), Afterschool Alliance, Washington, DC
Innovative after-school programs share how they provide engaging STEM learning experiences for youth. Join us for an overview of after-school programs and potential partnership opportunities around the NGSS.

Cars: A Fun and Relevant Way to Teach Physical Science

(Grades 9–12) *S504bc, McCormick Place*
 Science Focus: PS

Debbie Goodwin (nywin@hotmail.com), Retired High School Science Teacher, Chillicothe, MO

Generate student interest and understanding of STEM with labs and demonstrations that relate automobiles to physical science (chemistry) concepts. Correlations to the CCSS included. Take home CD with materials.

Model-Eliciting Activities in the Elementary Classroom

(Grades 1–5) *S504d, McCormick Place*
 Science Focus: ETS, SEP

Melissa Parks, Stetson University, Deland, FL
 Model-Eliciting Activities (MEAs) are simulated real-world problems that integrate engineering, mathematical, and scientific thinking as students find solutions for specific real-world scenarios. Join me as I share the good, the bad, and the ugly with using them in your elementary classroom as a STEM teaching tool.

Meeting the Needs of All Science Students

(Grades 2–5) *S505a, McCormick Place*
 Science Focus: GEN

Brenda Turgeon, Purdue University Calumet, Hammond, IN

Hear how a well-designed 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle differentiates instruction. Discussion centers on how to strategically plan lessons and embed effective strategies to meet the needs of all learners.

High School Science and Engineering Share-a-Thon

(Grades 9–12) *Vista/S406a, McCormick Place*
 Science Focus: GEN, SEP

Bev DeVore-Wedding ([@bdevore; bdevorewedding@gmail.com](mailto:bdevore; bdevorewedding@gmail.com)), Meeker High School, Meeker, CO

Sample a variety of lessons, activities, and content demonstrating the science and engineering practices that can easily and immediately be incorporated into your classroom.



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Join our workshops, all day Thursday, Friday and Saturday in our booth and in McCormick Place Room #W192B

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Middle School Motivation and Meaning at the Active Intersection of the NGSS and CCSS Mathematics

(Grades 6–9) *W175c, McCormick Place*

Science Focus: GEN, CCC1, CCC2, SEP3, SEP4, SEP5

Mark Roddy (*mrodny@seattleu.edu*), Seattle University, Seattle, WA

Middle school students can find meaning and motivation when they see science and mathematics as tools to make sense of music, coffee, sunshine, and more. Handouts.

Before and After Retirement: Practicalities and Possibilities

(General) *W176b, McCormick Place*

Science Focus: GEN

Joyce Gleason (*joycegle@earthlink.net*), Educational Consultant, Punta Gorda, FL

Teshia Birts, Senior Director of Membership Development and Chapter Relations, NSTA, Arlington, VA

The NSTA Retired Advisory Board invites you to a vibrant and useful information sharing session. Join your fellow colleagues and share your ideas about staying active both in and out of the profession.

NGSS@NSTA Share-a-Thon

(Grades K–12) *W183a/b, McCormick Place*

Science Focus: GEN, NGSS

Presenters to be announced

Do you wonder how other teachers are grappling with three-dimensional instruction in their classrooms? Would you like some tips and tools to help you implement the NGSS in your school? Join 30 presenters—including NSTA’s NGSS Curators, the National Academies, NGSS writers, and other education experts—as they share resources to help teachers implement the *Next Generation Science Standards*.

From the News to the Classroom

(Grades 9–12) *W187c, McCormick Place*

Science Focus: GEN, SEP4, SEP8

Kristin Hennessy-McDonald, St. Benedict at Auburn-dale High School, Cordova, TN

When a scientific finding is in a news report, the science tends to get lost. Discussion centers on using flawed news reports to assess understanding.

Raspberry Pi and Arduino for Enhanced Science and Engineering

(Grades 5–College) *W475b, McCormick Place*

Science Focus: ETS, SEP

Michael Davis, Wilbur Wright College, Chicago, IL

Join the maker movement. Low-cost electronics like the Raspberry Pi and Arduino make it possible for classes to build their own instruments for use in experiments.

9:30–10:30 AM Hands-On Workshops

On the EdGE of Science and Play

(Grades 7–12) *Grant Park B, Hyatt*

Science Focus: GEN

Erin Bardar (*@Edge_at_TERC*), EdGE at TERC, Cambridge, MA

Teon Edwards (*@EDGE_at_TERC*), TERC, Cambridge, MA

George Papayannis (*george@doyouaskwhy.com*), Boston Arts Academy, Boston, MA

EdGE stands for the Educational Gaming Environments group at TERC. Come play with us! Bring a laptop, smartphone, or tablet and join us for gameplay and discussion of how games can support your STEM teaching.

ASTE Session: Let’s Hear It for Sound!

(Grades 2–4) *Grant Park D, Hyatt*

Science Focus: PS4.A, CCC2, SEP

Jill Shambach (*jrshambach@tsc.k12.in.us*), Woodland Elementary School, Lafayette, IN

By observing, planning, constructing, and analyzing results, participants actively investigate the science of sound using the engineering design process.

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Integrated Literacy Strategies to Enhance Higher Order Thinking for All Learners in Your Science Classroom

(Grades 6–College) *Jackson Park B, Hyatt*
Science Focus: GEN, NGSS

Leslie Gregory (lgregory@rsu20.org), and **Dawn Staples-Knox** (dstaplesknox@gmail.com), Searsport District Middle School and High School, Searsport, ME

Are you frustrated that your students can't articulate what they're learning in your classroom? Join us as we introduce integrated literacy strategies that can help them develop critical thinking and writing skills while having some fun, too!

Inquiring Minds Want to Know

(Grades 6–12) *Jackson Park C, Hyatt*
Science Focus: ESS, LS, PS

Cathy Northcutt (cathy.k.northcutt@wmich.edu), Western Michigan University, Kalamazoo, MI

Create inquiry investigations from the everyday recipe-like labs. Practice strategies and take home inquiry labs for biology, chemistry, physics, and geosciences.

DuPont Presents: Photosynthesis and Respiration—It's a Plant's Life!

(Grades 7–12) *Regency E, Hyatt*
Science Focus: LS

Anita Boggs, Milan High School, Milan, IN

John Hadenfedlt (@hadie121), Centura High School, Cairo, NE

Help your students sprout and grow with a different approach to teaching photosynthesis and cellular respiration. Learn how to captivate students through inquiry activities that can challenge and excite them. Easily implement activities into your current biology or plant science class.

NSTA Press® Session: An Introduction to Scientific Argumentation in the Classroom

(Grades 6–College) *S401a, McCormick Place*
Science Focus: GEN, NGSS

Ellen Granger, Florida State University, Tallahassee
Teachers will need to develop science-proficient students while meeting the demands of the NGSS. Argumentation activities provide an instructional model that incorporates the practices of science from the NGSS. Experience a model for scientific argumentation activities that are supported by a new book series from NSTA Press.

Genetic “Face Lab” Variations

(Grades 3–College) *S402b, McCormick Place*
Science Focus: LS

Candace Smithson (csmithson@cowan.k12.in.us), Cowan Junior/Senior High School, Muncie, IN

Mary Gobbett (mgobbett@uindy.edu), University of Indianapolis, Indianapolis, IN

Engage in a “face lab” activity and discover variations to teaching genetic concepts to a variety of age groups.

Expedition Earth and Beyond: Using Earth for Planetary Comparisons

(Grades 4–12) *S403b, McCormick Place*
Science Focus: ESS1.B, ESS1.C, ESS2.B, ESS2.C, CCC1, SEP1, SEP3, SEP4, SEP7, SEP8

Timothy McCollum (tmccollum@eiu.edu), Eastern Illinois University, Charleston, IL

Work with images of Earth and other planets to learn about and understand geologic processes that have sculpted the surface of Earth and other worlds.

Understanding Plate Tectonics Using Actual Earthquake Data in NGSS-based Lessons

(Grades 5–College) *S404a, McCormick Place*
Science Focus: ESS2.B, INF, CCC1, CCC4, SEP4, SEP7

Patrick McQuillan (mcquillan@iris.edu), IRIS, Washington, DC

IRIS stands for Incorporated Research Institutions for Seismology. Explore the IRIS earthquake database using software, lessons, 3-D views, and live map displays.

But I Teach High School Science...Not English Language

(Grades 7–12) *S501d, McCormick Place*
Science Focus: GEN, SEP1, SEP3, SEP6, SEP7, SEP8

Susan Hartley (susan.mumford.hartley@hotmail.com), Hinkley High School, Aurora, CO

President: Laurie Hayes (lhayes@cart.org), The Center for Advanced Research and Technology, Clovis, CA

Engage in a “cool” lesson and learn easy ways to incorporate writing and speaking practice into your science content lessons—painlessly—so that your English language learners become more proficient in English and science.

Climate Is Elementary

(Grades 3–6)

S502a, McCormick Place

Science Focus: ESS2.D

Lisa Gardiner (@lisagard2; @UCARSciEd), UCAR Center for Science Education, Boulder, CO

Try activities that help upper elementary learners explore the difference between weather and climate. Understanding climate is the first step toward understanding the science of climate change.

Using 3-D Graphic Organizers to Develop Writing and Increase Science Literacy

(Grades 3–6)

S502b, McCormick Place

Science Focus: GEN

Jennifer Trochez, Gates Street Elementary School, Los Angeles, CA

Paper, scissors, and glue transform into 3-D graphic organizers that facilitate student creativity, increase learning, develop writing, and provide an alternate form of assessment.

Conservation of Matter—What Happens to All Our STUFF?

(Grades 4–5)

S503b, McCormick Place

Science Focus: PS

Kristin Camp (campkr@champaignschools.org), Jefferson Middle School, Champaign, IL

Designed around a grade 5 unit, participants will create and dig up a “mini-landfill,” collect data, make a claim about which items are biodegradable using evidence from their data, and provide an explanation based on evidence and their knowledge of conservation of matter.

Girls and STEM—a Natural Match!

(Grades 4–8)

S504a, McCormick Place

Science Focus: GEN, INF, NGSS

Susan Evens (susan.evens@heartland.edu), Challenger Learning Center at Heartland Community College, Normal, IL

Do a hands-on project and walk away with ideas and handouts for engineering and science-based activities that will engage girls in STEM/STEAM!



*Celebrate Einstein's Birthday ...
with a Tribute to the Blues Brothers!*

Saturday, March 14, 8:00–10:00 PM

Regency Ballroom, Hyatt Regency McCormick Place

President Juliana Texley is inviting you to join her for an evening of dancing and celebration on Saturday, March 14, from 8:00 to 10:00 PM.

Professor Einstein will be joining us in celebration of his birthday. Additional evening entertainment will include a tribute to the Blues Brothers!

Cash bar. No registration or cost required.

www.nsta.org/chicago



NESTA Session: Using Data in the Earth and Space Science Classroom to Engage Students as Real Scientists

(Grades 6–12) Skyline W375e, McCormick Place
Science Focus: ESS, CCC, SEP

Roberta Johnson Killeen (rmjohnsn@nestanet.org), National Earth Science Teachers Association, Boulder, CO

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, NJ

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, NJ

This NESTA-ESIP hands-on workshop highlights freely available lessons and strategies integrating data acquisition, analysis, and interpretation into the classroom, engaging students in the scientific process.

Cloudy with a Chance of Science: Teaching STEM Through a Classic Children’s Tale

(Grades 2–6) W175 a/b, McCormick Place
Science Focus: GEN, SEP1, SEP5

Laura Saxton (lsaxton@jhu.edu), The Johns Hopkins Center for Talented Youth, Baltimore, MD

Getting elementary students engaged in STEM is often as easy as helping them to see connections to things they already know and love. Bring STEM to life using *Cloudy with a Chance of Meatballs* as the text.

Under Pressure? Join Us!

(Grades 6–8) W176a, McCormick Place
Science Focus: PS

Modesto Tamez, Exploratorium, San Francisco, CA

We will share guided inquiry-based activities leading you to understand the fundamentals of air pressure. Fun, cheap, and profound!

Neon Art and the Atom

(Grades 10–12) W178b, McCormick Place
Science Focus: PS1, PS4, CCC5, SEP2, SEP6, SEP7

Amber Szymczyk, Rice University, Houston, TX

Incorporate art into your chemistry or physics classroom! Come see how Bruce Nauman’s neon artwork reveals the hidden mysteries of light and atomic structure. Using spectrometers, gas emission tubes, and a plasma ball, participants will look closer and investigate neon questions.



Integrating Art, STEM, and ELA by Creating a Mechanism that Animates a Story

(Grades 1–4) W186c, McCormick Place
Science Focus: ETS1, PS2, CCC1, CCC2, CCC3, CCC6, SEP1, SEP6, SEP7

Lesia Wilder (lesiasings@gmail.com), New York City (NY) Dept. of Education

Travis Sloane (tsloane@schools.nyc.gov), East Side Elementary PS267, Bronx, NY

Angula Bumbury Camacho (angula99@hotmail.com), P.S. 5, Brooklyn, NY

Create a MechAnimation, a cardboard mechanism that makes a story come to life!



A New Movement: Thinking on Your Feet

(Grades K–8) W187b, McCormick Place
Science Focus: GEN

Carolyn Mohr, Dominican University, River Forest, IL

Ann Kennedy, Robert Crown School, Wauconda, IL

Don’t just sit there—use your body to activate your mind! Through movements, transform science concepts into memorable connections that will engage and inspire all.



Power Learning: Success Strategies for Meaningful Understanding in the Middle School Science Classroom

(Grades 6–9) W190b, McCormick Place
Science Focus: GEN, SEP

Janel Reed (jreed@culver.k12.or.us), Culver (OR) School District #4

Empower your students to take charge of their learning through learning targets, self-reflection, and formative assessments that are easily integrated into science classrooms while keeping students actively engaged in learning.

Teaching the Properties of Waves Through Real-World Application

(Grades 7–12) W192a, McCormick Place
Science Focus: PS, INF, CCC, SEP

Benjamin Taylor (@UWMRSEC; bltaylor2@wisc.edu) and **Anne Lynn Gillian-Daniel** (@UWMRSEC; agillian@wisc.edu), University of Wisconsin–Madison

Calculate wave velocity and direction with this activity that is ideal for middle and high school classrooms. Join us and measure the properties of waves using water, mirrors, and lasers in order to build a better antenna.

CESI Session: Integrating Elementary Science and Social Studies

(Grades K–8) *W192c, McCormick Place*
 Science Focus: GEN

Jim McDonald (@jimscienceguy; *jim.mcdonald@cmich.edu*), Central Michigan University, Mount Pleasant, MI

We will examine opportunities to integrate science and social studies together by proposing a format for an integrated unit and providing examples.

Out of the Classroom and into the Sky with Civil Air Patrol

(Grades K–12) *W196a, McCormick Place*
 Science Focus: PS2.A, CCC, SEP3, SEP4

Kathy Biernat (*kbiernat@stmaryeq.org*), St. Mary's Visitation School, Franklin, WI

Build and fly foam rockets, demonstrate Bernoulli's principle, and send some airplanes flying. Join us for a sampling of some of CAP's free STEM materials and programs.

9:30–10:30 AM Exhibitor Workshop**Forensic DNA Activities and More with K'NEX Education's DNA, Replication, and Transcription Set**

(Grades 7–12) *W471b, McCormick Place*
 Science Focus: GEN

Sponsor: K'NEX Education

Robert Jesberg, Science Consultant, Hatfield, PA
CSI has heightened students' interest in forensics and DNA fingerprinting. Let's build on that interest to strengthen their understanding of DNA concepts and processes. You will build actual K'NEX Education DNA models to examine a DNA ladder, structure, the double helix, and more. Also, explore mRNA, replication, transcription, and translation.

9:30–11:00 AM Presentation**Teacher Researcher Day Session: Embracing Diversity in Science: Benefits and Challenges of Equitable Science Education from Multiple Perspectives**

(General) *Regency A/B, Hyatt*
 Science Focus: GEN, INF, NGSS

Deborah Roberts-Harris, The University of New Mexico, Albuquerque

Discussion centers on the benefits and challenges of providing equitable science education from multiple perspectives. Come with an open mind and possible questions for the panel.

9:30–11:15 AM Exhibitor Workshop**Climate Change Series 2: Antarctic Team Showcases Ice Cores**

(Grades 6–12) *W184bc, McCormick Place*
 Science Focus: ESS

Sponsor: NOAA's National Ocean Service

Linda M. Morris, T. J. Fudge, and **Kristina Slawny**, Ice Drilling Program Office, Thayer School of Engineering at Dartmouth, Hanover, NH

How do scientists know what they know about climate? What clues are hidden in the ice? Meet a scientist and an engineer engaged in research at the South Pole. Get up close with an ancient ice core! Hands-on activities and a movie will bring this home to your classroom.

10:00–10:30 AM Presentations**What Are You Reading?**

(Grades 9–12) *Dusable C, Hyatt*
 Science Focus: GEN

Colleen Buzby (@buzbyrocks; *colleen.buzby@gmail.com*) and **Elizabeth Potter-Nelson** (@mrspotternelson; *epotter@gmail.com*), Antioch Community High School, Antioch, IL

You're probably already reading in class, but what can you do to make it more meaningful for all students? This is one department's look at how reading was used throughout their curriculum.

The American Astronomical Society and You: How the AAS Supports Educators, Students, and Families

(Grades 6–College) *Hyde Park A, Hyatt*
 Science Focus: ESS, INF

Gina Brissenden (@AstroGinaB), American Astronomical Society, Washington, DC

Join the American Astronomical Society as they share events they offer for local educators, students, and their families in conjunction with AAS national meetings.

21st-Century Hands-On Biology for ALL Students

(Grades 9–12) *S402a, McCormick Place*

Science Focus: LS, SEP

Emily Ferrin (@BCoE_LMSA; *emily.ferrin@northwestern.edu*), Northwestern University, Evanston, IL

Mirror the advances of the real world with advanced hands-on labs developed for biology students at all levels and modeled after the research laboratory of 2015.

A Culture of Science Discourse to Uncover Student Thinking

(Grades P–8)

S505b, McCormick Place

Science Focus: GEN, SEP6, SEP7, SEP8

Erika Allison (@RISECtr; *erika.allison@maine.edu*), Center for Research in STEM Education, Orono, ME

Lauree Gott (*lgott@veaziecs.org*), Veazie Community School, Veazie, ME

Come discover how a culture of rich classroom discussion helps elementary students share their ideas and helps teachers develop a better understanding of what students know.

INF Hands-Off Instruction: Allowing Students to Guide Instructional Outcomes Through Formative Assessment

(Grades 6–8)

S404d, McCormick Place

Science Focus: GEN, INF, SEP

Candyce Johnson, Brooklyn Botanic Garden, Brooklyn, NY

Explore a variety of effective informal assessment strategies that help put students in the driver's seat while learning about the science practices.

Illinois Smart Grid for Schools Program

(Grades K–12)

W196c, McCormick Place

Science Focus: ETS, PS3, CCC4, CCC5, CCC6, SEP4, SEP6

Matt Aldeman and **Brad Christensen** (*bachris@ilstu.edu*), Illinois State University, Normal

The Smart Grid for Schools program provides educators with knowledge about the Smart Grid, plus lesson plans, activities, and Smart Grid simulators for classroom use.

10:00–11:30 AM Hands-On Workshop

NSTA Aerospace Share-a-Thon

(General)

Vista/S406b, McCormick Place

Science Focus: ESS, INF

Coordinated by members of the NSTA Aerospace Programs Advisory Board

From airplanes to asteroids—join teachers and representatives from industry and organizations to discover innovative ways to connect students to STEM through aerospace! Drawing for two one-year NSTA memberships (must be present to win).



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10:00–11:30 AM Exhibitor Workshops

3-2-1 Blast Off!!

(Grades 2–8)

W178a, McCormick Place

Science Focus: PS1.A, PS1.B

Sponsor: Educational Innovations, Inc.

Tami O'Connor, Educational Innovations, Inc., Bethel, CT
What student doesn't like a burst of energy?! Join us for things that go bump in the day! Perfect for elementary or middle school educators teaching energy or Newton's laws. Make your own rockets; explore elastic, potential, and kinetic energy; and more! Lesson ideas, giveaways, and door prizes!

Use Science to Teach Reading; Use Reading to Teach Science

(Grades K–6)

W179b, McCormick Place

Science Focus: GEN, NGSS

Sponsor: Learning A–Z

Jane King and **Lori Smith**, Learning A–Z, Tucson, AZ
Many elementary teachers are reluctant to teach science, or feel there's never enough time. Join us to experience fun, easy, and affordable ways to teach science and reading simultaneously. Use informational texts to foster reading comprehension and develop vocabulary, while also having students write, think, and behave like scientists.

Dynamic Demonstrations from Flinn Scientific

(Grades 9–College)

W180, McCormick Place

Science Focus: PS

Sponsor: Flinn Scientific, Inc.

Irene Cesa (irene.cesa@flinnsci.com) and **Mike Frazier** (mfrazier@flinnsci.com), Flinn Scientific, Inc., Batavia, IL
Seeing is believing! Flinn Scientific presents a variety of easy-to-perform and exciting chemistry and physical science demonstrations. Come see Flinn's new demonstrations and some of your old favorites—all guaranteed to make your science classroom come alive. Handouts for all demonstrations.

Hands-On Activities to Model Habitat Preference and Population Sampling

(Grades K–12)

W181a, McCormick Place

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Watch and learn! Create a terrestrial model to observe how pill bugs respond to habitat change. Use inquiry to develop experiments to observe the habitat preference of bess beetles and millipedes. Then investigate the advantages and disadvantages of different sampling methods to estimate population size in habitats. Door prizes provided.

Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher

(Grades 9–12)

W181c, McCormick Place

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 are sure to produce a reaction from your students. Whether you're new to chemistry or feeling out of your element, you'll learn new ways to create excitement. Free materials and giveaways.

Marine Science Education—Awareness, Understanding, and Action

(Grades K–12)

W184a, McCormick Place

Science Focus: ESS3

Sponsor: Ocean Classrooms

Cynthia Long (cyndi@oceanclassrooms.com) and **Caine Delacy** (caine@oceanclassrooms.com), Ocean Classrooms, Boulder, CO

Awareness begins with understanding the ocean, its inhabitants, and how we are connected. Human activity across the globe has altered ocean ecosystems. Learn how to develop ocean advocates in your classroom by incorporating marine science content understanding, identifying human impact on the ocean, and designing actions we can take.

Using Science Magazines to Connect the NGSS with CCSS, ELA

(Grades 3–10)

W184d, McCormick Place

Science Focus: GEN, NGSS

Sponsor: Scholastic Inc.

Patricia Janes and **Mara Grunbaum**, Scholastic Inc., New York, NY

Science magazines are a fun and engaging way to connect the NGSS with the CCSS, ELA. Join *Scholastic* classroom magazine editors and teachers as they show how to meet reading and writing standards while teaching science and engineering principles—and introducing exciting discoveries too new for textbooks. Find out how to tailor them to meet your classroom's needs.

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Chemistry with Vernier

(Grades 9–College)

W185a, McCormick Place

Science Focus: PS, SEP3, SEP4

Sponsor: Vernier Software & Technology

Elaine Nam (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Use Vernier sensors to conduct a variety of chemistry experiments from our popular lab books in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger Pro computer software, and mobile devices. See how Vernier has been incorporating principles of the NGSS science and engineering practices for 34 years!

Renewable Energy with KidWind and Vernier

(Grades 7–College)

W185d, McCormick Place

Science Focus: PS3.A, PS3.B, PS3.C, SEP3, SEP4

Sponsor: Vernier Software & Technology

Fran Poodry (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Learn how you can incorporate the principles of the NGSS science and engineering practices into lessons focusing on renewable energy using KidWind Wind Experiment Kits and Vernier data-collection technology. These hands-on activities, appropriate for middle school and high school students, embody the spirit of STEM education through this highly relevant topic.

Free Chemistry Resources and Tools to Support BYOD, from the Royal Society of Chemistry

(Grades 7–College)

W186a, McCormick Place

Science Focus: PS, SEP1, SEP3, SEP4

Sponsor: Royal Society of Chemistry

Jenny O'Hare and **Stephanie Musson**, Royal Society of Chemistry, Cambridge, U.K.

Bring your laptop or tablet to a demonstration of the newest chemistry education tools and online resources from the Royal Society of Chemistry. Try out our problem-solving tutor, aspirin screen experiment, assessment tool, Periodic Table app, magazine e-reader, and more—all designed to be BYOD friendly.

Multiple Subjects, One Platform: Tackle STEM Learning with LEGO Education WeDo!

(Grades 1–5)

W186b, McCormick Place

Science Focus: ETS

Sponsor: LEGO Education

Laura Jackson, Retired Teacher/LEGO Education Trainer, Greenwood, MO

Cindy Howard, Retired Teacher/LEGO Education Trainer, Kansas City, MO

Discover how elementary students can practice STEM learning through digital technology! LEGO® Education WeDo consists of LEGO bricks, a simple age-appropriate software, and a variety of activity packs correlated to the CCSS. Experience how to create engaging cross-curricular lessons that develop 21st-century skills while inspiring students to become lifelong learners.

Teaching with Technology in the Elementary Classroom

(Grades K–5)

W192b, McCormick Place

Science Focus: ETS

Sponsor: Ward's Science

Patty Muscatello, VWR Education, Rochester, NY

Introduce elementary students to the world of science and technology using Ward's Single Probes elementary probe-aware system. Incorporate technology, math, and engineering principles into your standards-aligned science activities. Bring your lesson ideas and we'll help you incorporate technology into those, too! Participants will be entered to win a Ward's Single Probes unit.

Seeing the Sky with High-Altitude Weather Balloons and Data Collection

(Grades 7–College)

W193a, McCormick Place

Science Focus: ESS2.D, PS, CCC2, CCC3, SEP2, SEP4, SEP8

Sponsor: SparkFun Electronics

Jeff Branson (jeff.branson@sparkfun.com), **Derek Runberg** (derek.runberg@sparkfun.com), and **Brian Huang** (brian.huang@sparkfun.com), Sparkfun Electronics, Longmont, CO

Design and build a high-altitude balloon with SparkFun Electronics. This engaging project introduces tools for real-world science and data collection. We will build a balloon, add instrumentation, and launch it (tethered for safety, of course) in Chicago to characterize temperature, humidity, and barometric pressure as a function of altitude.

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New Modeling Kits: Flow of Genetic Information and Phospholipid and Membrane Transport Kits

(Grades 8–College)

W193b, McCormick Place

Science Focus: LS1.A, LS1.D, LS3, CCC, SEP1, SEP2, SEP6
Sponsor: 3D Molecular Designs

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

3D Molecular Designs is releasing two new kits and the Center for BioMolecular Modeling continues to develop new materials such as the Synapse Construction Kit, new gene maps, and molecular stories. Test new kits and learn about Modeling the Molecular World and other professional development opportunities for next year.

Modeling Earth, Sun, and Other Stars with Bring Science Alive!

(Grades K–8)

W194a, McCormick Place

Science Focus: ESS

Sponsor: TCI

Nathan Wellborne (nwellborne@teachtci.com), TCI, Rancho Cordova, CA

In this workshop, we'll use a powerful online learning system to demonstrate a lesson that meets the NGSS—"How Do Stars Seem to Move During the Night and Year?" Participants will experience learning from a student's perspective.

Chemical Formula and Amino Acids

(Grades 9–12)

W195, McCormick Place

Science Focus: PS, SEP2

Sponsor: LAB-AIDS®, Inc.

Mark Koker, LAB-AIDS, Inc., Ronkonkoma, NY

What is the difference between subscripts and coefficients? What does "balancing" a chemical equation mean? Many students have trouble with these concepts. If a student does not fully understand the chemical formula, then moles, reactions, and stoichiometry are hopelessly confusing. Join us for intuitive lessons for all students to master the formula, gaining a deeper understanding of chemistry.

Bringing Real Neuroscience (Spiking Neurons!) into Your Classroom

(Grades 4–College)

W470a, McCormick Place

Science Focus: LS

Sponsor: Backyard Brains

Timothy Marzullo (tim@backyardbrains.com), Backyard Brains, Inc., Ann Arbor, MI

Want to show your students the real electrical activity of neurons and muscles? Curious how remote control cockroaches work and the physiology of muscles during arm wrestling?

Now you can! During our workshop, you will learn via live demos how to bring neuroscience into your classroom.

Biology for NGSS: A New Approach for a New Program

(Grades 9–12)

W470b, McCormick Place

Science Focus: LS

Sponsor: BIOZONE International

Richard Allan (richard@biozone.co.nz), BIOZONE International Ltd., Hamilton, New Zealand

Find the tools you need to successfully implement the high school life science component of the NGSS program in BIOZONE's newest student workbook. This carefully constructed new resource is strongly focused on student inquiry and written from first principles to address all aspects of the NGSS system architecture. Attendees receive free books that support the NGSS.

The Mystery of Dark Matter

(Grades 8–College)

W471a, McCormick Place

Science Focus: PS

Sponsor: Perimeter Institute

Damian Pope and **Kevin Donkers**, Perimeter Institute for Theoretical Physics, Waterloo, Ont., Canada

Are you looking for ways to connect your students with current physics research? Join us as we explore how uniform circular motion and universal gravitation can be used to Dark Matter. The Mystery of Dark Matter multimedia resource is the product of collaboration between experienced educators and Perimeter Institute researchers.

Living by Chemistry: What Shape Is That Smell?

(Grades 9–12)

W474b, McCormick Place

Science Focus: PS

Sponsor: Bedford, Freeman, & Worth Publishing Group

Angelica Stacy, University of California, Berkeley

Jeffrey Dowling (science@bfpwpub.com), Bedford, Freeman & Worth Publishing Group, San Francisco, CA

Teach rigorous chemistry with guided inquiry! Let's explore activities that help students understand molecular structure and other core chemistry concepts using the context of smell. Take home free sample materials from the *Living by Chemistry* curriculum.

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Modeling and Engineering Design—From Ideas to Reality

(Grades 6–9)

W475a, McCormick Place

Science Focus: ETS, SEP2

Sponsor: eCYBERMISSION

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

Do you struggle with integrating engineering design into your middle school classroom or relaying the importance of models? We will discuss the use of models/prototypes and share ways to implement these ideas and engineering design into your science class. Hear about the free STEM competition, eCYBERMISSION, and how it can help integrate engineering design and models into your classroom.

Biotechnologies: Restriction Digestion in STEM Education

(Grades 9–College)

W476, McCormick Place

Science Focus: LS, SEP

Sponsor: G-Biosciences

Ellyn Daugherty (ellyn@biotech.com), Biotechnology Educator/Author, San Mateo, CA

Simon Holdaway (simonholdaway@vmaxbiotechnology.com), Educator, Windsor, CT

New advances make it possible to do restriction enzyme digestions and gel runs in half to a third of the time. In this workshop, participants use new G-Biosciences lab kits to perform super-fast restriction digestions, run 15-minute DNA/agarose gels, and analyze the restriction fragments to confirm the presence of a new plasmid.

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10:30 AM–12 Noon Exhibitor Workshop**NGSS in the High School Biology Classroom***(Grades 9–College)**W474a, McCormick Place*

Science Focus: LS, SEP

Sponsor: Bio-Rad Laboratories

Leigh Brown (leigh_brown@bio-rad.com), Bio-Rad Laboratories, Hercules, CA

Engage with Kirk Brown, master teacher, curriculum expert, California regional science county office lead, as well as lead writer of the revised California science framework, to better understand how you can apply the three dimensions from the NGSS in your high school biology classroom. This interactive learning opportunity includes modeling, explanation and argumentation, and engineering practices.

**11:00–11:30 AM Presentations****Flipped Classrooms and Diverse Learners: How to Meet the Needs of All Students***(Grades 6–8)**Dusable C, Hyatt*

Science Focus: GEN, NGSS

Jennifer White (whiteje@champaignschools.org), Jefferson Middle School, Champaign, IL**Heidi Bjerke** (hbjerke; hbjerke@gmail.com), Champaign Unit 4 Schools, Champaign, IL

Attention will be paid to strategies that teachers can use to ensure that by flipping their classroom they are not marginalizing any of their students.

A Clear Argument: How to Address Literacy Standards in the Science Classroom*(Grades 5–12)**Field A/B, Hyatt*

Science Focus: GEN, SEP7

Gary Holliday (gh30@uakron.edu), The University of Akron, OH

Discover how to integrate the language of argumentation across the content areas. Take away rigorous and creative ideas for teaching writing in the science classroom.

Developing Partnerships: A Model of Outdoor Education*(Grades K–12)**Hyde Park B, Hyatt*

Science Focus: GEN, INF, NGSS

Pamela Christol, Northeastern State University, Broken Arrow Campus, Broken Arrow, OK

Join us as we highlight the activities and resources used at a weeklong outdoor education day camp. We will share students' perceptions. Connections to the NGSS included.

Teacher Researcher Day Session: You Need to Look Really Close*(Grades 8–12)**Regency A/B, Group 1, Hyatt*

Science Focus: ESS

Michael Jabot, SUNY Fredonia, NY

Join us as we share a triangulated approach looking at the intersection of water, climate, and energy on forest resources. We will present a place-based strategy for addressing climate change and its impact on natural resources.

Teacher Researcher Day Session: Paving a Path to Conceptual Understanding of the Climate System*(Grades 7–College)**Regency A/B, Group 3, Hyatt*

Science Focus: ESS2.D, CCC1, CCC2, CCC3, CCC4, CCC5

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, NJ

Modeling, explorations, and reflection can all scaffold students as they grapple with the complexities of our climate system. A conceptual model will be shared.

Understanding Student Learning by Having Students Write Scientific Explanations and Scientific Arguments in Chemistry*(Grade 11)**S501a, McCormick Place*

Science Focus: PS1, CCC2, SEP2, SEP6, SEP7

Thomas Shiland (tshi@nycap.rr.com), Saratoga Springs High School, Saratoga Springs, NY

Discussion centers on students' scientific explanations and arguments using NGSS chemistry performances. We will share templates and rubrics for both arguments and explanations along with lessons learned.

How to Effectively Conduct a Science Curriculum Review that Meets the NGSS

(Grades P–8) S504d, McCormick Place

Science Focus: GEN, NGSS

Rita Weiss (rweiss@schoolofstmary.org), School of St. Mary, Lake Forest, IL

Hear how a preK–8 school effectively conducts a curriculum review for science so that their curriculum, resources, and instruction support the NGSS.

Grades 4–6 Students’ Reasoning About Competing Tradeoffs and Efficiency When Optimizing Design Solutions

(Grades 4–8) S505a, McCormick Place

Science Focus: ETS, CCC6, SEP6

David Crismond, The City College of New York, NY

Review findings from a mixed methods developmental study involving grades 4–6 students in New York City doing ratio-based optimization thinking when designing model “energy trees.”

Hollywood Game Night and Science

(Grades 5–9) S505b, McCormick Place

Science Focus: GEN, NGSS

Ann Wallenmeyer (awallenmeyer@spsmail.org), Springfield (MO) Public Schools

Students will learn topics in science using games similar to the TV show *Hollywood Game Night*. Put a new spin on your lessons and encourage collaboration, communication, and critical thinking.



11:00 AM–12 Noon Paul F-Brandwein Lecture Teaching Tomorrow’s Conservation Leaders: Lessons from Aldo Leopold

(General)

W190a, McCormick Place

Science Focus: ESS

Speaker sponsored by Brandwein Institute.



Curt Meine (curtmeine@gmail.com), Senior Fellow, The Aldo Leopold Foundation, Baraboo, WI

President: Jack Padalino, The Paul F-Brandwein Institute, Port Jervis, NY

Introduction: Daniel J. Bisaccio, Brown University, Providence, RI

As a Senior Fellow at The Aldo Leopold Foundation, Curt Meine is dedicated to promoting the global legacy of Aldo Leopold, considered by many as the father of wildlife management and of the United States’ wilderness system. Curt has written extensively about Aldo Leopold and will share the timelessness of Leopold’s work and how it may be used to cultivate environmental leadership for students of the 21st century as we build a land ethic in this new century.

Curt Meine believes we all have a stake and a role in building a healthier relationship between people and land. Noted conservation biologist, historian, and writer, Curt serves as Senior Fellow with the Aldo Leopold Foundation in Baraboo, Wisconsin, and with the Chicago-based Center for Humans and Nature. He is also a research associate with the International Crane Foundation and an adjunct associate professor in the Department of Forest and Wildlife Ecology at the University of Wisconsin–Madison.

Curt has authored several books, including the biography Aldo Leopold: His Life and Work and Correction Lines: Essays on Land, Leopold, and Conservation (2004). He also served as the narrator and on-screen guide of the Emmy Award–winning documentary film Green Fire: Aldo Leopold and a Land Ethic for Our Time (2011). In 2013, the Library of America published his edited collection of Leopold’s writings, Aldo Leopold: A Sand County Almanac and Other Writings on Conservation and Ecology.

11:00 AM–12 Noon Presentations**Picture, Post, and Shoot!***(Grades 7–12)**Adler C, Hyatt*

Science Focus: GEN

Stacey Balbach (@StaceyBalbach; *stacey.balbach@cubacity.k12.WI.US*), Cuba City (WI) School District

Would you like a new method to make vocabulary more applicable to your students? Aurasma is an augmented reality app for iOS and Android devices that is flexible, interchangeable, engaging, and free. Try Aurasma!

ASTC Session: Successes and Challenges of Documenting Design with Elementary Students*(General)**Burnham A/B, Hyatt*

Science Focus: GEN, SEP3, SEP8

Tara Chudoba (*tchudoba@nysci.org*) and **Peggy Monahan** (*pmonahan@nysci.org*), New York Hall of Science, Queens

Thoughtful documentation is required for students participating in design projects. Hear what the New York Hall of Science (NYSCI) has developed to reinforce the NGSS and CCSS.

Four Pics, One Word?: Vocabulary Games and Activities to Enhance Academic Language Usage*(Grades 6–12)**Burnham C, Hyatt*

Science Focus: GEN

Lauren Rentfro (*rentfrrla@lewisu.edu*), Lewis University, Romeoville, IL

Leave with more than 25 vocabulary strategies and games to practice the use of academic language.

AMSE Session: Problems and Solutions Facing Teachers with the NGSS*(Grades K–12)**Clark A/B, Hyatt*

Science Focus: GEN, NGSS

Preston Robinson, Jackson (MS) Public Schools

Ebonie Butler-Cheeks (*ebbutler@jackson.k12.ms.us*), Wingfield High School, Jackson, MS

Expectations for the NGSS are high, however, some administrators are hesitant about adopting the new standards. See how one district approaches problem solving on implementing them.

AMSE Session: Preparing Preservice Teachers for STEM Project-based Instruction Classrooms*(Grades 6–College)**Field C, Hyatt*

Science Focus: GEN, NGSS

Robert Ferguson and **Debbie Jackson** (@debbiekjackson; *d.jackson1@csuohio.edu*), Cleveland State University, Cleveland, OH

Discussion centers on how we are preparing the next generation of teachers to work in STEM project-based and problem-based environments.

Preparing Teacher Candidates for the edTPA*(College)**Grant Park C, Hyatt*

Science Focus: GEN, SEP

Jessica Krim (@drjkrim; *jkrim@siue.edu*), Southern Illinois University Edwardsville

Join us as we contribute to the collaborative network of teacher educators currently facing curriculum-based questions as they prepare teacher candidates for the edTPA, formerly the Teacher Performance Assessment.

Science Connections Using Fiction Books*(Grades 4–12)**Hyde Park A, Hyatt*

Science Focus: GEN, SEP8

Kyla Gentry (*kgentry@searcyschools.org*) and **Cristina Farley** (*cfarley@searcyschools.org*), Ahlf Junior High School, Searcy, AR

Challenge students to discover science while reading fiction novels. Incorporate the CCSS by comparing the science in a fiction text to nonfiction texts.

Empowering Students Toward Independence*(General)**Jackson Park A, Hyatt*

Science Focus: GEN, INF, SEP

Lara Arch, Accelerate Learning, Houston, TX

Explore some simple and immediately implementable ways that educators can facilitate the growth of 21st-century skills in all learners.

Teacher Researcher Day Session: Sharing Insights and Experiences in Teaching About Climate Change*(General)**Regency A/B, Group 2, Hyatt*

Science Focus: ESS3.D, ESS2.D

Emily Van Zee (*emily.vanzee@science.oregonstate.edu*), Oregon State University, Corvallis

Interested in engaging students in learning about climate change? Join a conversation about insights, concerns, and experiences incorporating aspects of climate change into one's curriculum.

Teacher Researcher Day Session: Life Science Understanding in the Young Learner

(Grades P–1) *Regency A/B, Group 4, Hyatt*

Science Focus: GEN, NGSS

Mary Hobbs (*maryhobbs@utexas.edu*), The University of Texas at Austin

Discussion centers on the outcomes and implications of NSF-funded research looking into what four-year-olds know and can do in the life sciences.



NSTA Press® Session: What Are They Thinking? Supporting Elementary Learning Through Formative Assessment Probes and Strategies

(Grades K–5, College) *S401bc, McCormick Place*

Science Focus: GEN, NGSS

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

Gather strategies that link instruction, assessment, and children’s science ideas and build teachers’ knowledge of effective K–5 science teaching. See how teachers and schools have been using formative assessment probes and techniques to support science learning while simultaneously strengthening literacy capacities.

Student-managed Portfolios: Performance-based Alternatives to Standardized Tests for the NGSS

(Grades 9–12) *S401d, McCormick Place*

Science Focus: SEP

Chris Ludwig (*@chrisludwig; cludwig@lajunta.k12.co.us*), La Junta High School, La Junta, CO

Discussion centers on how standards-based portfolios of students’ science and engineering performances can be used to create a robust assessment system for the NGSS.

Fostering Student Creativity while Teaching Renewable Energy

(Grades 6–12) *S403a, McCormick Place*

Science Focus: PS

Kenneth Harasty, Clarksville, PA

Your students will have a blast as they learn to build a basic wind turbine to generate an electrical current. This unit teaches important concepts about green renewable energy while fostering student creativity within the structure of an engineering team.

Promoting Success for All Learners in STEM!

(General) *S404 b/c, McCormick Place*

Science Focus: GEN, SEP

Megan Garner, East Carolina University, Greenville, NC

Explore how the NGSS science and engineering practices support diverse classrooms, while increasing interest and confidence in STEM. Discussion includes constructing and using NGSS-based performance tasks.

STEM, NGSS, and Technology: Implementation for Middle School Classrooms

(Grades 6–8) *S404d, McCormick Place*

Science Focus: ESS2.B, ESS3.A, ETS1, ETS2.B, LS3, LS4, CCC1, CCC2, SEP

Beth Newton (*@TrekkingNewt; bnewton@cpsk12.org*), Oakland Middle School, Columbia, MO

Jennifer Szydlowski (*jszydlow@columbia.k12.mo.us*), Jefferson Middle School, Columbia, MO

Designing solutions, integrating iPads, and implementing the NGSS. Discover engaging classroom strategies, apps, and ideas for STEM integration that support Earth and space science as well as the process of natural selection.

Working Together to Create a Woodland Ecosystem Experience

(Grades 4–6) *S504bc, McCormick Place*

Science Focus: ESS, INF

Kristin Camp (*campkr@champaignschools.org*), Jefferson Middle School, Champaign, IL

Stacey Clementz (*sclementz@ccfpd.org*), Champaign County Forest Preserve District, Homer, IL

Hear how Champaign School District designed a woodland/forest ecosystem unit with the assistance of the Champaign County Forest Preserve District. Join us as we share the unit design process, classroom and field trip learning activities, and the benefits for teachers, students, and nonformal educators.

Award-winning Share-a-Thon: Featuring NSTA Distinguished Teachers

(Grades 1-College) *Vista/S406a, McCormick Place*
Science Focus: GEN

Tom Lough (*tom.lough@gmail.com*), Retired Educator, Round Rock, TX

James Brown (*jmbrown@nycap.rr.com*), Forest Park Elementary School, Albany, NY

Tricia Shelton (*@tdishelton; tdishelton@gmail.com*), Boone County High School, Florence, KY

Past winners of the NSTA Distinguished Teaching Award share their reflections, describe their science teaching approaches and experiences, and discuss their favorite projects. Handouts! Demonstrations!

Mastery: Learning for All

(Grades 6–8) *W175c, McCormick Place*
Science Focus: GEN

Rebecca Litherland, Parkway School District, St. Louis, MO

Julia Orr (*jorrl@pkwy.k12.mo.us*) and **Diane Coffey** (*dcoffey@pkwy.k12.mo.us*), Parkway Central Middle School, Chesterfield, MO

See what happens when learning is the constant and time is the variable. Learn how we transformed our classrooms and increased student achievement using a flipped/mastery model.

Talking Science with the Hosts of Lab Out Loud

(Grades 6–12) *W176b, McCormick Place*
Science Focus: GEN

Dale Basler (*@basler*) and **Brian Bartel** (*@bbartel*), Johnston Elementary School, Appleton, WI

Join the hosts of the *Lab Out Loud* podcast to explore the benefits of using digital media in science education—helping to engage students and improve teaching practice.

INF Mobile Science: Using iPads as Field Notebooks

(Grades P–12) *W187c, McCormick Place*
Science Focus: GEN

Katy Scott, Monterey Bay Aquarium, Monterey, CA

If you're keeping your iPads inside the walls of your classroom, you're missing the most powerful benefit of these devices. Come see how the Monterey Bay Aquarium is using iPads in the field to help K–12 students access and create a wealth of information.

Molecular-Level Computational Modeling for High School Chemistry: Emergent Properties Methodology

(Grades 9–12) *W192a, McCormick Place*
Science Focus: PS, CCC, SEP

JulieAnn Villa, Niles West High School, Skokie, IL

Find out about current computer programs available for molecular level modeling in chemistry. Use emergent properties (computational modeling, macroscopic lab experiences, and symbolic representations) to deepen understanding.

CESI Session: Outstanding Web Tools and Children's Literature to Support Science Lessons in the Elementary Classroom

(Grades K–5) *W192c, McCormick Place*
Science Focus: GEN

Jeff Thomas (*jathomas@usi.edu*), University of Southern Indiana, Evansville

We will present recent award-winning children's literature selections on elementary learning as well as Web 2.0 tools and their connections to science.

Teacher-friendly Tracking of Student Success on Science and Engineering Practices

(Grades K–12) *W475b, McCormick Place*
Science Focus: SEP

Doug Damery (*@rddamery; ddamery@gmail.com*), Madison High School, Adrian, MI

Hear how one Michigan county used rubrics and the NGSS science and engineering practices to transform how teachers collaborate to ensure student understanding of science practices.



11:00 AM–12 Noon Hands-On Workshops

Engineering in Action: How Our Students Learn to Develop Sustainable Products and Processes

(Grades 9–College) Grant Park A, Hyatt
Science Focus: GEN, INF, CCC, SEP

Theodore Hogan, Northern Illinois University, DeKalb
Paul Kelter, North Dakota State University, Fargo
Students can learn to make truly environmentally effective decisions. The key: Learning to evaluate all phases of product development from raw source to reuse.

Talking Cells: Using Inquiry and Modeling to Teach Cellular Communication

(Grades 9–College) Grant Park B, Hyatt
Science Focus: NGSS

Tamica Stubbs, Phillip O. Berry Academy of Technology, Charlotte, NC
Join us as we develop and use an interactive model to explore how cells send, receive, and respond to signals in the human body.

The Science and Engineering of Flight and Aircraft!

(Grades 3–6) Grant Park D, Hyatt
Science Focus: PS, SEP

Kazi Shahidullah (kazishahidullah@unr.edu), University of Nevada, Reno, Reno, NV
Presider: David Crowther, University of Nevada, Reno
Take learning to new heights as we explore the four basic forces involved in making an airplane fly. Participants will create and compete for the best airplane design.

Writing to Learn Together: Formative Assessment as a Process of Scientific Writing and Peer Review

(Grades 5–College) Jackson Park B, Hyatt
Science Focus: GEN, SEP1, SEP3, SEP4, SEP7, SEP8

Deb Morrison (@educatordeb; educator.deb@gmail.com), TREE Educational Services, Boulder, CO
Discover formative assessment practices that support students in refining their scientific ideas through writing and peer review throughout inquiry activities. We'll cover short constructed response, quick writes, and journaling.

Argumentation in the Science Classroom

(Grades 7–12) Jackson Park C, Hyatt
Science Focus: GEN, SEP

Matt Edstrom, dlai E. Stevenson High School, Lincolnshire, IL
Learn the basics of teaching students about engaging in argument from evidence, including introducing students to argumentation and methods of scaffolding.

DuPont Presents: The Wicked Web They Weave

(Grades 6–12) Regency E, Hyatt
Science Focus: ESS

Jessica Grundy, Wayne High School, Bicknell, UT
Understanding the complex web of relationships within ecosystems is essential to understanding their sustainability. Come experience an inquiry activity that can reinforce your students' understanding of food webs and how they contribute to sustainability.

Genes, the Environment, and Me: Glucose Balance and Type 2 Diabetes

(Grades 7–12) S402b, McCormick Place
Science Focus: LS1.A, LS3.A, CCC2, CCC4, CCC6, SEP2, SEP4, SEP6

Joan Griswold (jcgriz@uw.edu), and **Maureen Munn** (mmunn@uw.edu), University of Washington, Seattle
Type 2 diabetes provides a context for learning concepts like homeostasis and gene/environment interactions. Explore physiological, behavioral, and social factors that affect glucose balance and diabetes risk.

Using Neighborhood Models to Explore an Electrical System

(Grades 5–12) S404a, McCormick Place
Science Focus: PS

Samantha Lindgren, University of Illinois at Urbana–Champaign
Plug into learning about the power grid by lighting a model neighborhood using renewable and conventional power sources. Vary electrical loads and design circuits in classroom-ready, NGSS-based activities.

National Earth Science Teachers Association Events at 2015 NSTA National Conference in Chicago



All NESTA sessions are in the Hyatt Regency McCormick Place, Skyline W375e unless otherwise indicated

Friday, March 13

- 8:00 – 9:00 am **Earth Science Rocks! Using Earth Science Activities to Engage Students as Scientists**
- 9:30 – 10:30 am **NESTA Geology Share-a-Thon**
- 11:00 am – noon **NESTA Climate, Ocean and Atmosphere Share-a-Thon**
- 12:30 – 1:30 pm **NESTA Earth System Science Share-a-Thon**
- 2:00 – 3:00 pm **Harnessing the Power of Earth System Science for Developing Science Practices and Crosscutting Concepts**
- 2:00 – 3:00 pm **American Geophysical Union Lecture, “Abrupt Climate Change: Past, Present and Future” by Dr. Jim White, University of Colorado, McCormick Place, Skyline W375b**
- 6:30 – 8:00 pm **Friends of Earth Science Reception (see www.nestanet.org for more info)**

Saturday, March 14

- 8:00 – 9:00 am **Multimedia Tools and Classroom Resources for Teaching Earth System Science**
- 9:30 – 10:30 am **Using Data in the Earth and Space Science Classroom to Engage Students as Real Scientists**
- 12:30 – 1:30 pm **NESTA Space Science Share-a-Thon**
- 2:00 – 3:00 pm **How Weird Can it Get? Developing Weather and Climate Literacy**
- 3:30 – 4:30 pm **NESTA Rock and Mineral Raffle**
- 5:00 – 6:00 pm **NESTA Annual Membership Meeting**

NESTA gratefully acknowledges co-sponsorship of our events by the following organizations:



Science Explorations with Deaf and Hard-of-Hearing Students

(Grades 6–12) *S501d, McCormick Place*
Science Focus: GEN

Jake Noel-Storr, InsightSTEM, Inc., Tucson, AZ
Explore ways to engage deaf and hard of hearing students in science explorations, and engage all students using American Sign Language.

May the Magnetic Force Be with You

(Grades K–4) *S502a, McCormick Place*
Science Focus: PS2.B

Jesse Wilcox (jwilcox.23@gmail.com), Iowa State University, Polk City

Jerrid Kruse (@jerridkruse; jerridkruse@gmail.com), Drake University, Des Moines, IA

Experience how to use concrete activities to confront students' misconceptions on magnetism in the primary grades. We will demonstrate how numerous activities can be used to scaffold students from their previous ideas to accurate understandings of magnetism. Handouts.

Language Demands and Opportunities of the Science and Engineering Practices for ELLs

(Grades 4–8) *S502b, McCormick Place*
Science Focus: ESS2.C, PS1.A, CCC2, CCC4, SEP2, SEP4, SEP6, SEP7, SEP8

Diana Velez (dvelez@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Claudio Vargas (claudio.vargas@ousd.k12.ca.us), Oakland (CA) Unified School District

Join us as we model an approach to accelerate learning with a heated debate on temperature and density. Explore best practices that include all students in academic discussions, support meaning-making, and promote reasoning.

Integrating Science, Engineering, and Mathematics Through Sailboat Design

(Grades 3–6) *S503a, McCormick Place*
Science Focus: ETS1, CC1, CCC2, CCC3, CCC4, CCC6, SEP

Heidi Wiebke, Indiana University Bloomington
Embark on a journey integrating science, engineering, and mathematical practices. We challenge you to build the swiftest and most stable sailboat in the fleet.

Teacher, How Do the Birds Know Where the Worms Are? K–2 Argument-based Inquiry

(Grades Preschool–2) *S503b, McCormick Place*
Science Focus: GEN, SEP

Jay Staker (@iastatejay; jstaker@iastate.edu), Iowa State University, Ames

Lori Norton-Meier (@LoriNortonMiller; lanort02@louisville.edu), University of Louisville, KY

Harness the wonder of children to explore by linking science to literacy. The Science Writing Heuristic approach brings science, literacy, and math together with argument-based inquiry.

Get Energized: Science + Engineering + Problem-Based Learning = Success

(Grades 3–8) *S504a, McCormick Place*
Science Focus: ETS, CCC5, CCC6

Elizabeth Edmondson (ewedmondson@vcu.edu) and **Suzanne Kirk** (svkirk@vcu.edu), Virginia Commonwealth University, Richmond

Anne Mannarino (amannarino@wm.edu), College of William & Mary, Williamsburg, VA

Plug into science and engineering tasks focusing on energy use and conservation embedded within a Problem-Based Learning (PBL) unit.

What Constitutes High-quality Discussion in a Science Classroom?

(Grades 2–6) *W175 a/b, McCormick Place*
Science Focus: GEN, SEP6, SEP7

Emily Weiss (weisse@berkeley.edu) and **Craig Strang** (@CraigStrang2; cstrang@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Watch and analyze several video examples to understand what constitutes high-quality discussion in the science classroom for students in grades 3–5. Appropriate for teacher leaders, administrators, and PD designers/providers.

Exciting Engineering Endeavors

(Grades K–5) *W176a, McCormick Place*
Science Focus: ETS, CCC, SEP

Terri George (terrigeorgel@gmail.com), Metro RESA, Smyrna, GA

Come explore easy and exciting engineering experiences for the elementary level. In this hands-on workshop, participants will be engaged in engineering designs that support the science and engineering practices of the NGSS.

Making the Invisible Visible*(Grades 4–9)**W178b, McCormick Place*

Science Focus: ESS, SEP

Melissa Sleeper (onewhosleeps3@aol.com), Sebastian River Middle School, Sebastian, FL**Cris DeWolf** (dewolf.cris@gmail.com), Chippewa Hills High School, Remus, MI**Cara Germann**, Munster High School, Munster, IN**Beverly Pierson** (bpierston@ecasd.k12.wi.us), Memorial High School, Eau Claire, WI

Add an out-of-this-world twist to your classroom learning. Join us for activities focused on projects relating to the exploration and analysis of Mars and its atmosphere.

**Color Your World: Learn How LEDs Can Mix and Match Colors, and Use Them to Design a Scene***(Grades 4–8)**W186c, McCormick Place*

Science Focus: ETS, PS, CCC1, CCC2, CCC6, SEP1, SEP2, SEP6

Cherubim Cannon, P.S. 005 Dr. Ronald McNair, Brooklyn, NY

Mix colors with LEDs and create colored shadows. Then use these techniques to design a miniature stage set that conveys an idea.

**Mixed Media Journaling in the Diverse Science Classroom***(Grades K–6)**W187b, McCormick Place*

Science Focus: PS1, CCC6, SEP3, SEP4

Andrea Guillaume (aguillaume@fullerton.edu) and **Ruth Yopp** (ryopp@fullerton.edu), California State University, Fullerton

Experience mixed media journaling that honors what each student brings to the science classroom. See how journaling assists all students in making and communicating meaning.

**Using Technology to Prepare for the Next Generation of Science Assessments***(Grades 4–12)**W190b, McCormick Place*

Science Focus: GEN, CCC, SEP

Jennifer Arnsward (@jenarnswald; jenniferarnswald@kentisd.org), Kent ISD, Grand Rapids, MI

Add online assessments incorporating 21st-century skills related to the NGSS to your educational toolkit. Bring an internet ready device to session.

Eco-Tech: Tools and Resources for Integrating Technology in Outdoor Learning*(Grades K–12)**W196a, McCormick Place*

Science Focus: GEN, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Tom Brown, Cobb County Schools, Marietta, GA**Karan Wood** (karan@captainplanetfdn.org), Captain Planet Foundation, Atlanta, GA

Explore exciting opportunities at the intersection of the “Maker” movement, STEM, and environmental education. Discover how student enthusiasm for technology can be channeled into engaging standards-based learning.



11:00 AM–12 Noon Exhibitor Workshop

Introduction to Simple Machines with K’NEX Education Models and Lessons for the Elementary Classroom

(Grades 3–6)

W471b, McCormick Place

Science Focus: PS

Sponsor: K’NEX Education

Robert Jesberg, Science Consultant, Hatfield, PA

Let’s excite elementary students about physical science. Build, explore, and redesign K’NEX® simple machine models to investigate the concept “simple machines make work easier.” Discover how simple machines multiply force, multiply distance, or change direction by working hands on with fully functioning models—standards-based STEM at its best in the classroom.

11:00 AM–12:30 PM Hands-On Workshop



NSTA Press® Session: Planning for Hard-to-Teach Biology Concepts Included in the NGSS

(Grades 9–College)

S401a, McCormick Place

Science Focus: LS1, CCC4, SEP2

Susan Koba (skoba@cox.net), Science Education Consultant, Omaha, NE

Anne Tweed (atweed@mcrel.org), 2004–2005 NSTA President, and McREL International, Denver, CO

Participate with the authors in a model lesson that exemplifies the framework and tools in *Hard-to-Teach Biology Concepts: A Framework to Deepen Student Understanding*.

11:20 AM–12:20 PM Exhibitor Workshop

Climate Change Series 3: Teaching Climate? Learn How to Use the *Climate.gov* 2014 National Climate Assessment Resources for Educators

(Grades 3–12)

W184bc, McCormick Place

Science Focus: ESS

Sponsor: NOAA’s National Ocean Service

Frank Niepold, NOAA Climate Program Office, Silver Spring, MD

Explore a series of guides for educators focusing on the regional chapters of the National Climate Assessment Report and high-quality online educational resources. This session will provide examples of how and where climate concepts can be integrated with the NGSS and provide resources for the classroom.

11:30 AM–12 Noon Presentations

First and Foremost: Engage!

(Grades 6–12)

Dusable C, Hyatt

Science Focus: GEN

Mary Eskridge-Lincoln (mary.eskridge@jefferson.kyschools.us), Jefferson County Public School, Louisville, KY

When time is crunched or running out, how do teachers keep the engagement piece in their lessons—and why should they?

Inquiry Labs for High School Chemistry

(Grades 9–12)

S501a, McCormick Place

Science Focus: PS, SEP

Mark Prosis, Vernon Hills High School, Vernon Hills, IL
Empower your lessons with problem-based and inquiry-driven labs and projects for the high school chemistry classroom.

Teaming Up to Teach NGSS: A Learning Team and Administration Perspective

(Grades K–9)

S504d, McCormick Place

Science Focus: GEN, NGSS

Micheline Cosentino (mcosentino@northbrook28.net) and **Kathy Horvath** (khovath@northbrook28.net), Northbrook School District 28, Mundelein, IL

Shannon Zajac (@ShannonZajac; szajac@northbrook28.net), Northbrook Junior High School, Northbrook, IL

Two teachers and administrators share their process of unpacking the NGSS, developing learning targets, and incorporating rigorous and interactive student-centered activities.

Using GLOBE Activities for Threading the NGSS Vertically Through Grades K–8

(Grades K–8)

S505a, McCormick Place

Science Focus: ESS2.C, ESS2.D, ESS3, ETS1.A, ETS1.B, LS2.B, PS2.A, PS2.B, PS3.A, PS3.C, CCC1, CCC2, CCC3, CCC4, CCC5, CCC7, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

Peter Garik (garik@bu.edu), Boston University, Boston, MA

Join us as we present materials that demonstrate using GLOBE as a mainstay component of a curriculum designed to maximize the vertical integration of science concepts.

Game-themed Instruction on a Budget*(Grades 4–9)**S505b, McCormick Place*

Science Focus: GEN, INF

Leslie Philipot (*leslie.phipot@sidneycityschools.org*), Sidney Middle School, Sidney, OH

Join us for interactive hands-on games that are quick formative assessments. Inexpensive and requiring little technology, the games encourage students to be responsible for their own learning.

Developing STEM Education in Your District*(Grades 6–12)**W196c, McCormick Place*

Science Focus: INF, SEP1, SEP2, SEP3, SEP4, SEP6, SEP8

Terry Stroh (*@terrystrohhjr*; *terry.stroh@d300.org*), Jacobs High School, Algonquin, IL

Emphasis will be placed on developing and implementing NGSS-focused STEM classes within school districts. Leave with guidelines for designing, implementing, and assessing STEM education programs for grades 6–12 within your district.

12 Noon–12:30 PM Presentation**Teacher Researcher Day Session: Brown Bag Lunch Conversation with Teacher Researchers***(General)**Regency A/B, Hyatt*

Science Focus: GEN

Emily Van Zee (*emily.vanzee@science.oregonstate.edu*), Oregon State University, Corvallis

Are you curious about what a teacher research is? Interested in some mentoring? Have data you would like to share and discuss? Come join the conversation!

12 Noon–1:30 PM NSTA/SCST College Luncheon Active Learning in Large Lecture Courses*(Ticket Required: \$65)***M-4***Prairie A, Hyatt*

Science Focus: PS



Marcy Towns, Professor of Chemistry, Purdue University, West Lafayette, IN

At Purdue, the Chemistry Department has been in the process of reforming their large lecture general chemistry courses, including both lecture and laboratory components.

The general chemistry program has moved forward through implementation of learning objectives which all professors “buy into” as well as jointly developed curriculum and assessments aligned with learning objectives. Dr. Marcy Towns will discuss this pedagogical approach that uses scaffolded problem-solving facilitated by graduate teaching assistants and how laboratories have been reformed to be more relevant and include opportunities for authentic assessment of student laboratory techniques.

Trained as a physical chemist, Marcy Towns has had a long-standing interest in physical chemistry. Her research includes developing methods for analyzing online group work in physical chemistry, evaluating the efficacy of physical chemistry modules, and engaging in collaborative projects with mathematics education researchers to document student understanding of physical chemistry (especially the mathematics associated with physical chemistry).

From 1995 to 2006, Dr. Towns was on the faculty of Ball State University, and then joined the faculty at Purdue University in 2006 as part of the largest division of chemistry education in the U.S. In 2013, she received Purdue’s most prestigious honor for teaching, the Murphy Award, as well as the chemistry department’s the Arthur B. Kelly Award. She has taught general chemistry, physical chemistry, and instrumental analysis. In addition to being a professor of Chemistry, she is associate department head and director of General Chemistry at Purdue University. She is also a Fellow of the American Association for the Advancement (AAAS) 2009 and a Fellow of the American Chemical Society (ACS) 2012. In 2015, she will be awarded the Society for College Science Teachers Outstanding Undergraduate Science Teacher Award.

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Friday.

12 Noon–1:30 PM Exhibitor Workshops

Monitor, Guide, and Control Student Activity While Delivering STEM/STEAM Applications with the Intelligent Laptop Cart

(Grades K–12)

W179b, McCormick Place

Science Focus: GEN, INF

Sponsor: A+ Mobile Solutions, Inc.

Bill Waibel (bwaibel@aplusmobilesolutions.com), A+ Mobile Solutions, Inc., Bay Shore, NY

With configurations ranging from 10 to 35 devices, the A+ Mobile Intelligent Laptop Cart is ready to roll into any classroom with technology you would find in any state-of-the-art interactive classroom; proprietary tools to distribute and collect data; as well as classroom management software to monitor, guide, and control student activity.

Flinn Activities to Integrate STEM Education

(Grades 7–12)

W180, McCormick Place

Science Focus: GEN

Sponsor: Flinn Scientific, Inc.

Janet Hoekenga (jhoekenga@flinnsci.com), Flinn Scientific, Inc., Batavia, IL

This hands-on workshop will help you integrate STEM inquiry and design principles into your science curriculum. Join Flinn Scientific in a “build-it-yourself” lab project that can actively engage your students and increase their understanding of concepts that cut across scientific disciplines. Interactive demonstrations highlight inquiry skills and reasoning based on the evidence. Handouts for all activities!

Strawberry Milkshakes: DNA and Lactose

(Grades 5–8)

W181a, McCormick Place

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Introduce middle school students to the fascinating world of molecular biology through age-appropriate hands-on activities. These activities are designed to make challenging abstract concepts (including DNA, genes, and enzymes) more concrete—and to make biology fun. Presented in partnership with the DNA Learning Center. Free materials and door prizes.

Picking Apart the Owl Pellet

(Grades K–6)

W181b, McCormick Place

Science Focus: LS

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

“Whoop” isn’t fascinated by owl pellets? Use this simple product to teach students about food chains, mammalian

anatomy, ecology, and more! Join us for this engaging hands-on workshop as we dissect owl pellets, explore Carolina’s Owl Pellet app, and share ways to incorporate this extremely popular product into your lessons.

Bring Visual Science into Grades 6–8 Classrooms—It’s a Game Changer!

(Grades 6–8)

W181c, McCormick Place

Science Focus: GEN

Sponsor: Carolina Biological Supply Co.

Carolina Teaching Partner

Spark student interest by combining visual, auditory, and hands-on learning techniques. Harvey Bagshaw discusses and models how he teaches science with videos and activities to support blended learning. Learn how to integrate compelling visuals and video and receive a one-year subscription to Carolina’s Twig online video-based learning program!

Interesting Demonstrations for the Chemistry Classroom

(Grades 6–College)

W184a, McCormick Place

Science Focus: PS, SEP7, SEP6, NGSS

Sponsor: South Dakota State University

Matthew Miller (matt.miller@sdstate.edu), South Dakota State University, Brookings

The Department of Chemistry and Biochemistry at South Dakota State University offers an online MS in Chemistry for teachers. We will show and discuss a variety of safe demonstrations that engage students in the classroom. These discussions will demonstrate similar activities that occur in the MS program.

HOWTOONS! Engaging Kids with DIY STEM Projects via Comic Books

(Grades 4–8)

W184d, McCormick Place

Science Focus: PS2.A, PS2.B, PS3.A, PS3.B, PS3.C, CCC2, CCC5, CCC6, SEP3, SEP4, SEP6, SEP7

Sponsor: Publisher Spotlight

Saul Griffith and **Nick Dragotta** (info@howtoons.com), Otherlab, San Francisco, CA

Join Howtoons creators Dr. Saul Griffith and artist Nick Dragotta of the award-winning STEM comic that teaches kids how to make things using everyday household goods, like origami robots, marshmallow shooters, stomp rockets, zoetropes, and more. STEM topics covered include robotics to force, gravity, air resistance, persistence of vision, and more in this fun merging of art and science.

Inquiry-based Chemistry with Vernier*(Grades 9–College)**W185a, McCormick Place*

Science Focus: PS, SEP1, SEP3, SEP4

Sponsor: Vernier Software & Technology

Jack Randall (*info@vernier.com*), Vernier Software & Technology, Beaverton, OR

Involving your students in inquiry-based chemistry can be easy and fun. Many investigations have already been designed and tested in our lab book, *Investigating Chemistry through Inquiry*. In this engaging hands-on workshop, you will conduct an inquiry-based chemistry investigation using Vernier sensors with a LabQuest 2 and Logger Pro software.

Middle School Science with Vernier*(Grades 3–8)**W185d, McCormick Place*

Science Focus: GEN, SEP4

Sponsor: Vernier Software & Technology

David Carter (*info@vernier.com*), Vernier Software & Technology, Beaverton, OR

Use Vernier sensors, including our Go Wireless sensors, to conduct a variety of age-appropriate experiments in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger *Pro* computer software, and mobile devices. See how Vernier has been incorporating principles of the NGSS science and engineering practices for 34 years!

Exploring How Machines Work with the LEGO® Education Simple and Motorized Mechanisms Set*(Grades 5–8)**W186b, McCormick Place*

Science Focus: ETS

Sponsor: LEGO Education

Laura Jackson, Retired Teacher/LEGO Education Trainer, Greenwood, MO**Cindy Howard**, Retired Teacher/LEGO Education Trainer, Kansas City, MO

With the LEGO Education Simple and Motorized Mechanisms Set, your upper elementary students gain an in-depth understanding of the mechanical principles built into everyday machines. Through building, designing, and testing solutions, learners work as scientists and engineers, all while honing design technology, science, and math skills.

AP Biology Investigation 4: The Ins and Outs of Diffusion and Osmosis*(Grades 9–12)**W192b, McCormick Place*

Science Focus: LS

Sponsor: Ward's Science

Michelle Pagani, VWR Education, Rochester, NY

Learn how to save time in AP Biology labs and meet science practices with Ward's AP Biology Investigation 4. Get hands on with state-of-the-art prepared agar cubes and all items needed to demonstrate movement of materials across a semi-permeable membrane by diffusion and osmosis. Take home activity guide and agar cube.

Circuit Scribe: Joining Art and Science with Conductive Gel Pens*(Grades 1–12)**W193a, McCormick Place*

Science Focus: PS

Sponsor: SparkFun Electronics

Jeff Branson (*jeff.branson@sparkfun.com*), **Brian Huang** (*brian.huang@sparkfun.com*), and **Angela Sheehan** (*angela.sheehan@sparkfun.com*), Sparkfun Electronics, Longmont, CO

Circuit Scribe is a conductive gel pen that saw a huge reception on Kickstarter. We see Circuit Scribe as an easy way to integrate electronics and art into the science classroom. With a pen, paper, and some basic components, students can start exploring the magic of electricity and, at the same time, create beautifully creative pieces of art.

Leadership Pathways for Exemplary K–12 STEM Teachers*(Grades K–12)**W193b, McCormick Place*

Science Focus: GEN

Sponsor: PAEMST

Marilyn Suiter, National Science Foundation, Arlington, VA

K–12 teachers are invited to join us as we discuss and explore the National Science Foundation (NSF)'s teacher leadership programs, which include the Presidential Awards for Excellence in Science and Mathematics Teaching (PAEMST), Master Teaching Fellowships Track of the Robert Noyce Teacher Scholarship Program, and STEM-C Partnerships Program.

Gliding Flight and the Engineering Design Experience

(Grades 6–8) *W194a, McCormick Place*

Science Focus: PS, SEP

Sponsor: SAE International—A World In Motion

Claudia Lee (*clee@sae.org*), SAE International, Warrendale, PA

Engage in the science behind gliding flight through SAE International's A World In Motion program. Explore the relationship between force and motion and the effects of weight and lift on a glider. Join us and build a glider as you manipulate variables to optimize flight.

Evolving Curiosity in the Animal Kingdom

(Grades 5–10) *W470b, McCormick Place*

Science Focus: LS

Sponsor: Shape of Life

Denise Ryan, Ryan+forest Hayes, Soquel, CA

Natasha Fraley, Sea Studios Foundation, Monterey, CA

Kevin Goff, Virginia Institute of Marine Science, Gloucester Point

Join Nancy Burnett, Shape of Life and Monterey Bay Aquarium founder, on an exploration of how the animal kingdom evolved on planet Earth through exquisite FREE classroom media. Nancy will feature real classroom applications and lesson plans that adapt to your teaching environment.

Telling the Story of Neuroscience

(Grades 5–College) *W471a, McCormick Place*

Science Focus: INF, SEP8

Sponsor: Society for Neuroscience

Jennifer Yates (*jryates@owu.edu*), Ohio Wesleyan University, Delaware

Engage your students in science with storytelling! Learn the neuroscience behind spinal cord injury and repair in the context of a story, and participate in a hands-on storytelling workshop. Having students visualize, simplify, and re-state scientific concepts as stories increases their understanding, enjoyment, and retention of the material.

Electrophoresis in a Flash: Complete a Lab in a Single Class Period

(Grades 7–College) *W474b, McCormick Place*

Science Focus: LS, INF

Sponsor: The MiniOne Electrophoresis

Pauline Cheng (*info@theminione.com*), Embi Tec, San Diego, CA

Richard Chan (*info@theminione.com*), The MiniOne Electrophoresis, San Diego, CA

Engage students in a fully interactive lab environment. They will love the opportunity to make their own gels, load them, and watch their DNA samples migrate in through gel. Students receive instant results for a better understanding of the lecture. Encourage students to develop hypotheses, test their results, and draw a conclusion based on their discoveries.

Finding Your Way to a Curriculum That Supports NGSS and CCSS

(Grades K–8) *W475a, McCormick Place*

Science Focus: GEN, NGSS

Sponsor: Battle Creek Area Mathematics and Science Center

Nancy Karre (*nancy@bcamsc.org*) and **Mary Lindow**,

Battle Creek Area Math and Science Center, Battle Creek, MI

Meet a team of curricula developers, teachers, and writers and investigate how the Cereal City Science units (K–MS) address NGSS and CCSS. Explore activities, inquiry, reading, writing, and engineering, and evaluate the experience using the EQuIP rubric.

Biotechnology...the New Field of Converged Science

(Grades 9–College) *W476, McCormick Place*

Science Focus: ESS3, ETS, LS, PS1.A, PS1.B, PS2, INF, CCC, SEP

Sponsor: Energy Concepts Inc.

Merrill Rudes, Energy Concepts, Inc., Mundelein, IL

Thomas Chinske, Vernon Hills High School, Vernon Hills, IL

Explore the field of biotechnology through demonstrations that pull in the integration of biology and microbiology, chemistry, bioprocessing, genetic engineering, biochemistry, and investigating forensics. Enjoy experiments that captivate students at all levels of scientific understanding while expanding their critical-thinking skills and providing exposure to new career opportunities.

12 Noon–2:00 PM CESI/NSTA Elementary Science Luncheon

Integrating Argumentation in Support of Science and Literacy Development

(Ticket Required: \$65)

M-5

Regency C, Hyatt

Science Focus: INF, GEN



Traci Wierman (@seeds-roots), Curriculum Implementation Network Director, The Learning Design Group, The Lawrence Hall of Science, University of California, Berkeley

Rebecca Abbott (@seeds-roots), Professional Development Specialist, The Learning Design Group, The Lawrence Hall of Science, University of California, Berkeley

The Learning Design Group at The Lawrence Hall of Science has developed a broadly applicable instructional sequence that supports students' skills with scientific argumentation by providing explicit instruction in aspects of argumentation. Join Traci and Rebecca as they offer new ideas and strategies designed for supporting students in constructing new understanding of science content through argumentation experiences, providing the deep thinking and engagement that are essential for meaningful content learning.

Traci Wierman is the Curriculum Implementation Network Director for the Learning Design Group at The Lawrence Hall of Science, supporting more than 100 partner organizations across the country and around the world in their effective delivery of Hall curricular programs. Previously, Traci worked for 17 years in the Enterprise School District in California, serving in a variety of capacities including self-contained elementary, middle school, and charter school math and science coordination and delivery of the districtwide gifted and talented program, as well as leadership for the district Title I math programs. She also spent nine years working to create and deliver interdisciplinary programs for Turtle Bay Exploration Park, an interdisciplinary 200-acre park and museum complex.

Rebecca Abbott is a literacy specialist on the Learning Design Group professional development team. She taught in elementary schools in the San Francisco Bay Area for 12 years and was an English language learner and literacy instructional coach for five years before joining the team at The Lawrence Hall of Science.

Tickets, if still available, must be purchased at the Registration Area before 3:00 PM on Friday.

12:30 PM–1:00 PM Presentations

ELL + Science: Barriers to Success and Strategies to Improve Performance

(Grades 5–12)

Hyde Park A, Hyatt

Science Focus: GEN

James Kedvesh (jkedvesh@dupage88.net), Willowbrook High School, Villa Park, IL

Review findings on significant barriers to English language learners' academic success in science classrooms and learn about instructional methods that can improve their performance.

Teacher Researcher Day Session: Putting All the Pieces Together

(Grades 5–12)

Regency A/B, Group 1, Hyatt

Science Focus: GEN, NGSS

Michael Jabot, SUNY Fredonia, NY

Join us as we share initial findings of a districtwide model of integration of the NGSS, CCSS, and C3 (College, Career, and Civic Life) framework. The focus of this integration is around a place-based framework in which students address critical issues at the intersection of science and society.

Teacher Researcher Day Session: TeachMeet Session on Finding Meaning in Your Teaching Practice Through Inquiry

(General)

Regency A/B, Group 3, Hyatt

Science Focus: GEN, CCC1

Jeremy Ervin (jervin62@gmail.com), Cedarville University, Cedarville, OH

Come ready to discuss topics focused on making sense of your science teaching through reflective practice.

Stellar Science Girls: Nurturing Middle School Girls to Become Scientists

(Grades 6–8)

S404d, McCormick Place

Science Focus: GEN

Beatrise Revelins, Caruso Middle School, Deerfield, IL

We will emphasize the practices of scientists and engineers and how integrating the CCSS into science curriculum nurtures girls' interest in science as well as their self-esteem.



Making Physics Labs Fun with EPICS

(Grades 10–11)

S501a, McCormick Place

Science Focus: PS

Jianlan Wang, Indiana University Bloomington
EPICS stands for Engineering Projects in Community Service. Join us for a demonstration of this problem-based sequence for designing physics labs with two successful examples of simple machines and specific heat.

Making Time for Science

(Grades K–5)

S504bc, McCormick Place

Science Focus: GEN, NGSS

Erin Eckholt (@eck200; eekholt@cbscd.org), College View Elementary School, Council Bluffs, IA

In the current push for CCSS, many teachers are finding that they are left with less time to teach content. We will provide ways to integrate the NGSS with CCSS in the areas of literacy and mathematics.

Science Buddies: Genius at Work

(Grades 1–6)

W192c, McCormick Place

Science Focus: GEN, SEP1, SEP3, SEP6, SEP8

Kimber Hershberger (khl12@scasd.org) and **Melissa Gleason** (mag28@scasd.org), Radio Park Elementary School, State College, PA

Hear how grade 3 and grade 5 students share “Genius Hour” sessions around student-chosen science topics to increase passion and as authentic assessment of the NGSS science and engineering practices.

12:30–1:30 PM Presentations

Facilitating Long-Term Student Inquiry: Integrating PBL, NGSS, and Real-World Applications

(Grades 8–12)

Adler C, Hyatt

Science Focus: LS2, LS4, PS1.A, PS1.B, SEP

Tracy Schloemer (@tracyhle; tracyhle@umich.edu), STEM School and Academy, Highlands Ranch, CO

Nikki Dobos (nikki.dobos@stemhigh.org), STEM High School, Highlands Ranch, CO

Have an idea for a real-world, Problem-Based Learning application your students could do, but not sure how to do it? Analyze samples with a STEM focus for biology/chemistry high school students, experience part of a project from a student perspective, and gather ideas to get students from point A to point B.

ASTC Session: Energize NM: How Informal Learning Institutions Are Supporting the Crosscutting Concepts

(Grades 3–5)

Burnham A/B, Hyatt

Science Focus: GEN, CCC

Deb Novak (debra.novak@state.nm.us), New Mexico Museum of Natural History and Science, Albuquerque

Selena Connealy (selena.connealy93@gmail.com), New Mexico EPSCoR, Albuquerque

Marcia Barton (marcia.barton@state.nm.us), New Mexico Public Education Department, Santa Fe

Join us for lessons learned from the New Mexico Informal Science Education Network’s implementation of weeklong Energy Institutes for teachers of grades 3–5.

Teaching Middle School and High School Science Content Using CCSS, ELA

(Grades 6–12)

Burnham C, Hyatt

Science Focus: GEN, INF, SEP

Dora Kravitz (dkravitz@amnh.org), American Museum of Natural History, New York, NY

Join us as we explore how reading and writing strategies can be differentiated for teaching science content to middle school and high school students that supports the CCSS and NGSS.

Three Dimensional Planning, Learning, and Assessment: NGSS in Action

(Grades 9–12)

Dusable C, Hyatt

Science Focus: GEN, NGSS

Chad Janowski (@21stSciEd; janowsc@shawanoschools.com), **Wendy Esch** (wendye@shawanoschools.com), and **Matt Brunette** (brunetm@shawanoschools.com), Shawano High School, Shawano, WI

From curriculum design to implementation, discover how we are implementing three-dimensional NGSS planning, learning, and assessment for life, physical, and Earth/space science.

Formative Assessment Using Manipulatives

(Grades 8–College)

Field A/B, Hyatt

Science Focus: PS1, CCC2, CCC5, CCC6, SEP2, SEP4, SEP6, SEP7, SEP8

Umadevi Garimella, University of Central Arkansas, Conway

Manipulatives are a powerful tool for supporting classroom assessment. In this module, students will use manipulatives to demonstrate their understanding of physical and chemical changes.

Teaching Scientific Modeling and Physics Content Using Sources of Alternative Energy

(Grades 9–College)

Grant Park A, Hyatt

Science Focus: PS

Rachael Lancor, Edgewood College, Madison, WI

Teach fundamental physics concepts using real-world examples—learn about gravitational potential energy from hydro-power and the electromagnetic spectrum from solar panels.

Flipping the Classroom in Advanced Science 2.0: Reaching ALL Learners by Extending the Classroom

(Grades 8–12)

Grant Park B, Hyatt

Science Focus: GEN

Traci Lowes (@LowesChemClass; tlowes@neisd.net), Lee High School, San Antonio, TX

Whether you're a first-time “flipper” or an expert, come experience new tools and strategies for “Flipping” that can help you reach learners of all abilities.

From College to Classroom—Building Mentor and Student Teacher Partnerships

(Grades 6–8, College)

Grant Park C, Hyatt

Science Focus: GEN, NGSS

Laura Wang (laura.cragin.wang@gmail.com), KAPPA International High School, Bronx, NY

Sephali Thakkar (@SephaliRay; sephali@gmail.com), Columbia Secondary School for Math, Science and Engineering, New York, NY

Jennifer Micceri (miccerij@ursulinenewrochelle.org), The Ursuline School, New Rochelle, NY

Build your own Professional Learning Community by using reflective dialogue to co-plan and deliver instruction in a six-week cycle that builds autonomy in aspiring teachers.

The NGSS@NSTA Hub

(General)

Jackson Park A, Hyatt

Science Focus: GEN, NGSS

Ted Willard (@Ted_NSTA; twillard@nsta.org), Program Director, COMPASS, NSTA, Arlington, VA

This session will feature a tour of the NGSS@NSTA Hub, a digital destination to support teaching and learning of the *Next Generation Science Standards*. Hear about the work of 55 NGSS@NSTA curators—a group of educators from all across the U.S. working to identify resources that support the standards.

Research Worth Reading: NSTA Affiliates Selected Research for 2014

(Grades K–12)

Jackson Park D, Hyatt

Science Focus: GEN

John Tillotson (@johnwtillotson), jwtillot@syr.edu, Syracuse University, Syracuse, NY

Deborah Hanuscin (hanuscind@missouri.edu), University of Missouri, Columbia

Each year, the NSTA Research Committee works with NSTA affiliates to identify research that teachers should read. This session will share the identified research of 2014.

Teacher Researcher Day Session: Scientific Explanation Skills Among Nonscience Majors at a Community College

(Grades 9–College)

Regency A/B, Group 2, Hyatt

Science Focus: GEN, SEP6

Steve Bennett (benne455@msu.edu), Michigan State University, East Lansing

Discussion centers on the challenges students encounter when constructing scientific explanations and providing examples of scaffolds that help students overcome these challenges.

Teacher Researcher Day Session: Relevant Chemistry in Chicago

(Grades 9–12) *Regency A/B, Group 4, Hyatt*
Science Focus: PS1.A, SEP3, SEP4, SEP7

Daniel Morales-Doyle (*dmoralesdoyle@gmail.com*), University of Illinois at Chicago

Learn from my efforts to engage urban students in chemistry curriculum that is both relevant to their lives and to the NGSS.

NSTA Press® Session: Teaching Science for Conceptual Understanding—Building a Bridge Between Students' Ideas and Scientific Concepts

(General) *S401bc, McCormick Place*
Science Focus: GEN

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

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

What does it really mean to teach for conceptual understanding? How do students (and teachers) experience conceptual change? Learn how you can use the author's new book to transform and guide teaching and foster deeper, conceptual learning of science.

Collaborating with Math: Using Statistics to Learn About How We Learn

(Grades 9–12) *S402a, McCormick Place*
Science Focus: LS, CCC2, SEP3, SEP4, SEP5, SEP8

Julie Smith (*@smitly74; jsmith@greenhillsschool.org*), **Ruth Miller** (*@RM11235813; rmiller@greenhillsschool.org*), and **Amy Ward** (*@Award315; award@greenhillsschool.org*), Greenhills School, Ann Arbor, MI

Discussion centers on how biology and math classes can collaborate to teach students how we learn by introducing scientific inquiry, experimental design, graphing, and statistical analysis.

Partnering to Improve Chemical Management and Laboratory Safety in the Era of NGSS

(Grades 6–12) *S403a, McCormick Place*
Science Focus: PS

Maryann Suero (*suero.maryann@epa.gov*), U.S. EPA Region 5, Chicago, IL

Karen Frank (*kfrank@wps60.org*), Waukegan High School, Waukegan, IL

Learn how to safely manage chemicals and redesign existing investigations in an effort to reduce disposal costs, pollution, and safety hazards in the classroom.

Reinforce STEM with Medical Mysteries Web Adventures

(Grades 6–College) *S404 b/c, McCormick Place*
Science Focus: GEN, INF, NGSS

Lynn Lauterbach (*lynnlauterbach@gmail.com*), Retired Teacher, Loveland, CO

Kristi Bowling (*@RiceCTTL*), Rice University Center for Technology in Teaching and Learning, Houston, TX
Promote scientific inquiry, STEM careers, and science literacy in the context of infectious diseases with this free online adventure game. Handouts.

Soil and The Three Little Pigs

(Grades 3–6) *S504d, McCormick Place*
Science Focus: ESS, SEP

Stephanie Nowak, Rice Elementary School, Mentor, OH
Huff, Puff, but it still stands. Using inquiry skills, students will design a house out of soil that the wolf can't blow down. Integrating e-Readers, QR codes, google forms, and apps like Haiku Deck—join us as we dig into soil properties and purposes.

Great Adaptations: Teaching Practices That Support Diverse Learners

(Grades K–8) *S505a, McCormick Place*
Science Focus: GEN

Cheryl Czarnik and **Julia Maceri**, Davis Junior High School, Sterling Heights, MI

Kathleen Heikkinen (*daleheikkinen@att.net*), Lincoln Middle School, Warren, MI

Jennifer Wickersham (*jkwick1848@gmail.com*), Peck Elementary School, Warren, MI

Michelle Kirkland (*shellkirkland@comcast.net*), Mount Clemons Middle School, Mount Clemens, MI

The power of a learning community builds strong relationships, resulting in adaptations of teaching practices. The outcome is highly engaging science for students with diverse needs.

How Does Vocabulary Fit into PBL for English Language Learners?

(Grades K–5) *S505b, McCormick Place*
Science Focus: GEN

Sara Holm (*sholm@washoeschools.net*) and **Jean Donley** (*jdonley@washoeschools.net*), Smithridge STEM Academy, Reno, NV

Hear how teachers from an elementary STEM academy integrate focused vocabulary instruction into Project Based Learning.

STEM Share-a-Thon*(Grades 6–12) Vista/S406a, McCormick Place*

Science Focus: GEN, SEP

Brandy Whitney (*whitneybrandy@yahoo.com*), Ottoson Middle School, Arlington, MA**Doug Baltz** (*db06bps@birmingham.k12.mi.us*), Seaholm High School, Birmingham, MI**Ian Fogarty** (*@ifoggs; ifoggs@gmail.com*), Riverview High School, Riverview, NB, Canada

Come learn about the latest STEM classroom initiatives by the PASCO STEM Educator award-winners! Teachers will present their winning ideas at the elementary, middle school, and high school levels.

INF Size Matters: Analyzing Experimental Data with Large Variation: How Sample Size Can Actually Change “Conclusions”*(Grades 6–8) W175c, McCormick Place*

Science Focus: ESS2.D, ESS3.C, ESS3.D, LS2.A, LS2.C, PS2.A, CCC1, CCC2, CCC3, CCC4, SEP

Mona McNamara (*mmcnamara@nybg.org*), The New York Botanical Garden, Bronx**Matthew Mirabello** (*mmirabello@amnh.org*), American Museum of Natural History, New York, NY“Are three trials enough?” Explore how sample size affects conclusions and learn to estimate appropriate numbers of repeated trials. Connections to NGSS and CCSS *Mathematics*.**Edible Lunar Vehicle: Making the World Smaller Through Technology That Supports Student Learning of Engineering Design***(Grades K–6, College) W176b, McCormick Place*

Science Focus: ETS1, INF

Kate Baird (*@7350goldendreams; kabaird@iupuc.edu*), Indiana University–Purdue University Columbus**Stephanie Coy** (*sscoy@iupuc.edu*), Discovery School of Tulsa, OK

Join us as we share how elementary children across the world can practice engineering design and crosscutting concepts through the design of an ELV: a working model for space flight made from common food.

Make Thinking More Visible with Free Web-based Technology*(Grades 5–College) W187c, McCormick Place*

Science Focus: GEN

Kathryn Lubker, The Penn-Harris-Madison School Corp., Osceola, IN

Explore a variety of free web technologies, revealing how to assess a student’s level of understanding of a given concept.

Flipped Class 201: Implementation and Beyond*(Grades K–12) W190a, McCormick Place*

Science Focus: GEN

Rob White (*@MrWhiteBBCHS; rwhite@bbchs.org*) and **Bill Sadler** (*@MrSadlerBBCHS; bsadler@bbchs.org*), Bradley-Bourbonnais Community High School, Bradley, IL

So, you want to flip your classroom? After you film a podcast, what’s next? Come to our session and learn from our experiences.

The Memphis Virtual STEM Academy (VSA) at East High School*(Grades 7–College) W196c, McCormick Place*

Science Focus: GEN, SEP

Alfred Hall II (*alhall11@memphis.edu*), The University of Memphis, TN

The Memphis VSA implements a pre-engineering STEM curriculum with virtual self-paced modules, face-to-face laboratory projects, and field experiences designed to help students understand and apply engineering concepts and principles.

12:30 PM–1:30 PM Hands-On Workshops

Designing, Making, and Marketing Shower Gel: A Cross-curricular Activity

(Grades 3–8)

Grant Park D, Hyatt

Science Focus: ETS, PS, CCC3, SEP1, SEP3, SEP4, SEP5, SEP8

Joe Muskin (jmuskin@illinois.edu), University of Illinois at Urbana–Champaign

Integrate math, language arts, science, and art in this activity in which students are chemical engineers making shower gel to sell for the holidays.

Fields of Fuel: A Video Game to Support Student Reasoning About Sustainability

(Grades 5–College)

Hyde Park B, Hyatt

Science Focus: ESS3.A, ESS3.C, ESS3.D, ETS1, ETS2.B, LS2.B, LS2.C, LS4.D, PS3.B, PS3.D, INF, CCC1, CCC2, CCC4, CCC5, SEP2, SEP4, SEP6, SEP7

Leith Nye (lnye@glbrc.wisc.edu), University of Wisconsin–Madison

Play a free online game designed by university scientists and classroom educators to engage students in reasoning about sustainability, resource management, and biofuel production.

Adding the R's to Increase the Rigor in Claims, Evidence, and Reasoning

(Grades 3–College)

Jackson Park B, Hyatt

Science Focus: GEN, SEP4, SEP7

Susanne Hokkanen (susanne.hokkanen@gmail.com), Colin Powell Middle School, Matteson, IL

Caryn Meirs (caryn.meirs@gmail.com), Half Hollow Hills Central School District, Dix Hills, NY

Add Rebuttal and Revisions to increase the rigor of Claims, Evidence, and Reasoning technique of scientific writing. We'll cover the gallery walk strategy of formative assessment.

Integrating Science and Math Practice Standards

(Grades 6–12)

Jackson Park C, Hyatt

Science Focus: GEN, SEP1, SEP2, SEP3, SEP4, SEP5, SEP8

Cory Cloud, Florida High School, Tallahassee

Engage in hands-on science and mathematical modeling activities and discuss how to best implement these practices into your classroom.

Separating Academic Content Knowledge from 21st-Century Skills

(Grades 7–12)

S401d, McCormick Place

Science Focus: GEN

Sarah Sallade (@mrssallade), Sanborn Regional High School, Kingston, NH

What does competency/standard-based grading look like in a science classroom? As teachers, we must communicate to students, parents, other teachers, colleges, and employers what each student knows and is able to do. Discussion centers on how to measure and provide feedback on science content separately from 21st-century skills.

Engaging Astronomy

(Grades 5–12)

S403b, McCormick Place

Science Focus: ESS1.A, CCC3, CCC4

Daniell Poulsen (dpoulsen@portageps.org), Portage Northern High School, Portage, MI

Presider: Charles Fulco (saros61@gmail.com), Port Chester (NY) Public Schools

Make the abstract realm of astronomy EASY for your students to understand by having THEM become part of the demo! Engaging activities, labs, and demos included! Think-Act-Draw!

Connecting Students and Nature, in the Classroom and Garden

(Grades 4–12)

S404a, McCormick Place

Science Focus: ESS

Angela Brisson and **Britta Culbertson**, The Nature Conservancy, Washington Field Office, Arlington, VA

Get your hands dirty in this interactive workshop! The Nature Works Everywhere Gardens program teaches conservation science with project-based, NGSS-based lesson plans.

Captivate Students' Interests Beyond the Classroom with Chemistry

(Grades 8–12)

S501bc, McCormick Place

Science Focus: PS, INF

Karen Kaleuati (@ACSCChemClubs; k_kaleuati@acs.org), American Chemical Society, Washington, DC

The American Chemical Society ChemClub is a high school chemistry club that provides students with a unique opportunity to experience chemistry beyond the classroom. Join us to learn about the free, fun resources as well as experience a meeting. Handouts.



ELL Success in an AP Classroom

(Grades 7–12) *S501d, McCormick Place*
 Science Focus: GEN, SEP1, SEP3, SEP4, SEP7, SEP8

Drew Bueno-Potts, Ocean View High School, Huntington Beach, CA

Come participate in this interactive workshop focusing on strategies, activities, techniques, projects, and methods that promote success for English language learners in an AP Science classroom.

Scientists for Tomorrow: A STEM Out-of-School-Time Program in Community Centers

(Grades 5–9) *S502a, McCormick Place*
 Science Focus: ETS, INF, CCC4, CCC5, CCC6, SEP

Marcelo Caplan (@sftinitiative; mcaplan@colum.edu), Columbia College Chicago, IL

Join us for an introduction to the National Science Foundation–Informal Science Education (NSF-ISE) Scientists for Tomorrow program. Engage in hands-on activities from the module “Physics of Sound and Mathematics of Music.”

Forward or Backward? Making a Mechanism That Controls a Motor

(Grades 4–8) *S502b, McCormick Place*
 Science Focus: ETS1, PS2, PS3, CCC2, CCC4, CCC5, CCC6

Gary Benenson (benenson@ccny.cuny.edu), The City College of New York, NY

Cherubim Cannon, P.S. 005 Dr. Ronald McNair, Brooklyn, NY

Switch up learning in your classroom by creating a mechanical linkage that reverses the direction of a motor from a single input. Join us for this rich introduction to integrating mechanisms and circuits.

Assessing Three-Dimensional Learning in the Next Generation Science Standards

(Grades 5–9) *S503a, McCormick Place*
 Science Focus: LS2.A, CCC2, SEP4

John Howarth (john_howarth@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Engage in a fun activity that models the effects of competition on a population of clams and assesses the three NGSS dimensions in the context of a middle school life science performance expectation.

Energy in Action: Students Impacting Energy Issues

(Grades 4–7) *S503b, McCormick Place*
 Science Focus: GEN, NGSS

Joyce Tugel (jtugel@gmail.com), Maine Mathematics and Science Alliance, Augusta

How can “STEM Service-Learning” integrate core ideas and practices of science while developing authentic youth voice? Come see an example and receive a step-by-step guide!

Integrating STEM into the Multi-Age Classroom

(Grades K–4) *S504a, McCormick Place*
 Science Focus: ETS, LS

Kelly Smith and **Christine Jeffery** (cjeffery@pccharter-school.org), Prairie Crossing Charter School, Grayslake, IL

Explore ways to integrate STEM into the elementary multi-age classroom through the use of hands-on materials and Problem-Based Learning techniques.

NESTA Session: NESTA Space Science Share-a-Thon
(Grades 3–12) Skyline W375e, McCormick Place

Science Focus: ESS

Roberta Johnson Killeen (*rmjohnsn@nestanet.org*), National Earth Science Teachers Association, Boulder, CO

Margaret Holzer (*mholzer@monmouth.com*), Chatham High School, Chatham, NJ

Michael Passow (*michael@earth2class.org*), Dwight Morrow High School, Englewood, NJ

Carla McAuliffe (*Carla_McAuliffe@terc.edu*), TERC, Cambridge, MA

Tom Ervin (*tombervin@gmail.com*), NESTA Appointed Director, Le Claire, IA

Rachel Zimmerman Brachman (*rachel.zimmerman-brachman@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, CA

Cris DeWolf (*dewolf.cris@gmail.com*), Chippewa Hills High School, Remus, MI

Ardis Herrold, Grosse Pointe North High School, Grosse Pointe Woods, MI

Brian Kruse, Astronomical Society of the Pacific, San Francisco, CA

Ruth Paglierani (*ruthp@ssl.berkeley.edu*), University of California, Berkeley, Berkeley, CA

Cassie Soeffing (*cassie_soeffing@strategies.org*), Institute for Global Environmental Strategies/NASA Earth Science Forum, Arlington, Va.

Joy Sinclair, Ida Middle School, Ida, Mich.

Nancy Tashima (*tashima@aloha.net*), Onizuka Space Center, Kailua Kona, HI

Christie Thomas and **Donald York** (*don@odjob.uchicago.edu*), The University of Chicago, IL

Join more than 20 NESTA members and other education specialists as they share their favorite classroom activities. Lots of free handouts!

Synergizing Math and Reading Scientifically

(Grades 2–6) W175 a/b, McCormick Place

Science Focus: GEN, SEP

Carol Annette Huett (*@huett_annette; annettehuett@mooreschools.com*), Kelley Elementary School, Moore, OK

Catapult new learning in your classroom by building one. Merge your reading and math into a science lesson through this STEM activity. Show your students how cause and effect, inferring, and sequencing can be applied in your science lessons. Engage your students in math by showing them how graphs, division, measurement, and estimating are used in science class. This session may also convince your administration why teaching science at an elementary level is important.

Ready, Set, Read...Integrating Reading into Your Science Classroom

(Grades 6–8)

W176a, McCormick Place

Science Focus: GEN, SEP7, SEP8

Veronica Betancourt (*veronica.betancourt@harlandale.net*), Harlandale ISD, San Antonio, TX

Julie Dyess Archer (*juliesdyess@gmail.com*), League City Intermediate School, League City, TX

Gina Gattavara Peterson (*ggatta@neisd.net*), Nimitz Middle School, San Antonio, TX

Engage in a variety of activities designed for deeper contextual understanding in non-textbook science reading.

Stimulate Student Learning with Food!

(Grades 7–12)

W178b, McCormick Place

Science Focus: GEN

Susan Hartley, Hinkley High School, Aurora, CO

Laurie Hayes (*lhayes@cart.org*), The Center for Advanced Research and Technology, Clovis, CA

Join us in a hands-on learning experience, using food to teach science standards and integrate the CCSS. Handouts and door prizes included!



Novel Engineering: Integrating Engineering and Literacy to Engage Students in Engineering Design Challenges

(Grades 1–8)

W186c, McCormick Place

Science Focus: ETS

Elissa Milto, Tufts University, Medford, MA

Engage in a hands-on engineering challenge based on a children's book. Join presenters as they also share examples of literacy-based engineering challenges and leave with approaches to integrate engineering into classroom literacy tasks.



Birds and Buds: Citizen Science in Your School Yard

(Grades 5–College)

W187a, McCormick Place

Science Focus: ESS

Sandra Henderson (*@plantwatcher*), NEON, Boulder, CO

Have your students engage in authentic ecological research as citizen scientists in two nationally acclaimed citizen science programs—BirdSleuth and Project BudBurst.

**Implementing the 3-E Instructional Model to Enhance Science Learning Experiences for Students with Special Needs***(Grades P–5) W187b, McCormick Place*

Science Focus: GEN, SEP

Gregory Borman, The City College of New York, NY**Derek Ramdass**, P.S. K004, Brooklyn, NY

Utilizing the Engagement, Exploration, and Evaluation phases of the 5-E model has enhanced the learning of science among children with autism and other developmental issues.

**Authentic Assessment and the NGSS***(Grades 4–10) W190b, McCormick Place*

Science Focus: GEN, CCC, SEP4, SEP7, SEP8

Carla Magoon (*cmagoon@rsu20.org*), RSU 20, Belfast, ME**Elizabeth Haynes** (*bhaynes@rsu20.org*), Troy Howard Middle School, Belfast, ME

Engage in authentic assessments and examine how they can be used to see if students are meeting the NGSS.

Digging Deep with Climate Proxies*(Grades 7–12) W192a, McCormick Place*

Science Focus: ESS

Mark Goldner, Heath School, Brookline, MA

By partnering with climate scientists and creating audio podcasts, grade 8 students learned and taught others about current climate science research. Literacy skills (reading, summarizing, listening, and talking) were strengthened throughout.

Working with Students' Ideas about the Nature of STEM*(Grades 6–12) W196a, McCormick Place*

Science Focus: GEN, NGSS

Jerrid Kruse (*@jerridkruse; jerridkruse@gmail.com*), Drake University, Des Moines, IA

We researched students' ideas about the nature of STEM. Come experience instructional strategies to confront misconceptions and help students' make connections.

Linking Engineering and Scientific Models in an NGSS Context*(Grades 4–10) W475b, McCormick Place*

Science Focus: ETS1.B, EST1.C, LS1.A, PS4.A, CCC2, CCC6, SEP2, SEP3, SEP4, SEP7

Kevin Anderson (*@WisDPIscience; mrkja@yahoo.com*), CESA #2, Middleton, WI

Explore and learn about the NGSS modeling practice by collaboratively developing an engineering model and then connecting it to a scientific model through a hands-on activity.

12:30–2:00 PM Hands-On Workshop Multicultural/Equity in Science Education Share-a-Thon*(General) Vista/S406b, McCormick Place*

Science Focus: GEN

Jerry Valadez (*@samacademymaker; jdvsience@yahoo.com*)and **Jean Pennycook** (*jean.pennycook@gmail.com*), SAM Academy, Sanger, CA**Cherry Brewton** (*cbrewton@georgiasouthern.edu*), Science Education Consultant, Statesboro, GA**Lyla Mae Crawford** (*lylac@uw.edu*), DO-IT, Spokane, WA**Deena Gould** (*DNAMartin@cox.net*), **Sara Tolbert**, **Edward Lyon**, **Jorge Solis**, and **Trish Stoddart**, Arizona State University, Tempe**S. Maxwell Hines** (*hinessm@wssu.edu*), Winston-Salem State University, Winston Salem, NC**Sami Kahn** (*skahn@collegiateschool.org*), Collegiate School, New York, NY**Deb Morrison** (*educator.deb@gmail.com*), TREE Educational Services, Boulder, CO**Antoinette “Toni” Schlobohm** (*toni@schlobohms.org*), Ardenwood School, Fremont, CA**Vanessa Tucker**, Hanford West High School, Hanford, CA**Laura Walls** (*laura.walls@fresnounified.org*), Duncan Polytechnical High School, Fresno, CA

Come to the Multicultural/Equity in Science Education Share-a-Thon! Visit our numerous exhibits of effective strategies, exemplary programs, and successful practices get re-energized and renewed.

12:45–1:45 PM Exhibitor Workshop**Climate Change Series 4: Bring Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources***(Grades 3–12) W184bc, McCormick Place*

Science Focus: ESS, INF

Sponsor: NOAA's National Ocean Service

Victoria Arthur, U.S. Forest Service, Washington, DC

Explore Forest Service climate change education resources.

Collect and enter tree data to quantify and value services trees provide. Learn about computer modeling and potential effects of different emissions scenarios on birds and trees.

Bring climate change closer to home; helping to answer, “What does climate change mean to me?”

1:00–1:30 PM Presentation

Science for Everyone! Engaging Science Instruction for Students with Profound Disabilities

(Grades K–12) *Hyde Park A, Hyatt*
Science Focus: INF, NGSS

Michele Hodson (*Vvmhodson@mdeca.org*), Valley View Junior High School, Farmersville, OH

Discuss the unique science needs of students with profound disabilities. Leave with materials that can be used as soon as you return to your school!

Sister Schools: Breaking Racial and Socioeconomic Barriers Using Authentic Science Fieldwork

(Grades 6–8) *S404d, McCormick Place*
Science Focus: ESS2.C, ESS2.D, LS2.B

Rebekah Fuerst (*@FuerstScience; rebekah.fuerst@ucps.k12.nc.us*), Parkwood Middle School, Monroe, NC

Ashley Lagas (*@MissLagas; lagasa@holliston.k12.ma.us*), Robert H. Adams Middle School, Holliston, MA

In a yearlong project, students from two different states and vastly different backgrounds connect through science. We will share the students' science fieldwork, friendships through letters, and their joint website.

Elementary Teachers' and Students' Understandings of Science Explanations

(Grades K–5) *S504bc, McCormick Place*
Science Focus: GEN, SEP4, SEP6, SEP7, SEP8

Presenters to be announced

Join us as we share how we introduced claims, evidence, and reasoning across our school and how we scaffolded thinking and writing of scientific explanations.

1:00–2:00 PM Exhibitor Workshop

Off to the Races with K'NEX Education's Forces, Energy, and Motion Set!

(Grades 5–9) *W471b, McCormick Place*
Science Focus: PS

Sponsor: K'NEX Education

Robert Jesberg, Science Consultant, Hatfield, PA

Start your engines! Join the K'NEX® building experience as you build gravity, rubber band, and spring power racers to test physical science concepts. Build models just like your students and investigate, experiment, collect data, graph, and analyze results. We will explore potential and kinetic energy, average speed, and much more.



1:30–4:30 PM Short Course

Using Science Phenomena to Assess Student Understanding of NGSS Performance Expectations (SC-14)

(Grades K–8) *Salon 3, Palmer House*
Science Focus: GEN, CCC, SEP

Tickets Required; \$62

Brett Moulding (*mouldingb@ogdensd.org*), Partnership for Effective Science Teaching and Learning, Ogden, UT
For description, see Volume 1, page 61.

1:50–2:50 PM Exhibitor Workshop

Climate Change Series 5: Climate Science in Action

(Grades 3–College) *W184bc, McCormick Place*
Science Focus: ESS

Sponsor: NOAA's National Ocean Service

Peg Steffen, NOAA National Ocean Service, Silver Spring, MD

Get up-to-date information about the current state of climate science and research from a nationally recognized climate expert. Learn about climate impacts, adaptation, and mitigation on large and local scales and take home resources for your classroom.



2:00–2:30 PM Presentations**Place-based Climate Change Education***(Grades 3–College)**Hyde Park B, Hyatt*

Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2, LS4.D, INF, CCC4, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Kristen Poppleton (@willstegerfound; kristen@willstegerfoundation.org), WILL Steger Foundation, Minneapolis, MN

Climate change is a relatively abstract concept to understand and making a concept local and relevant is an important tool for STEM educators. We will highlight successful place-based collaborative partnerships in climate change education, lessons learned, and resources for implementing climate change education in your place.

Teacher Researcher Day Session: It's Pretty Simple... Yeah Right!!*(Grades 8–12)**Regency A/B, Group 3, Hyatt*

Science Focus: PS

Michael Jabot, SUNY Fredonia, NY

Join us as we share the implementation of a design-based unit investigating energy and energy conservation. The premise of this unit is to challenge student understanding of energy and energy use and the impact that efficiency and energy conservation could play in the total energy picture. Handouts.

Teacher Researcher Day Session: Elementary School Science Specialist Collaboration for Excellence in Science Within a University-School Partnership*(Grades P–5)**Regency A/B, Group 4, Hyatt*

Science Focus: GEN

Janell Catlin, Teachers College, Columbia University, Somerset, NY

Explore ideas for improving science teaching and learning within the school culture as well as best practices for collaborating with university and community partners.

Illinois Renewable Energy for Schools (REFS) Program*(Grades 6–12)**S403a, McCormick Place*

Science Focus: ETS, PS2, PS3, CCC5, CCC6, SEP4, SEP6

Matt Aldeman, Illinois State University, Normal

Jolene Willis (@willis_jolene; js-willis@wiu.edu), Western Illinois University, Macomb

The Illinois Renewable Energy for Schools (REFS) program covers a broad spectrum of renewable technologies, including wind, solar, biomass/biofuels, energy storage, and energy efficiency/Smart Grid. Handouts.

Understanding Computer Programming with Latina and Latino Middle School Students*(Grades 6–8)**S404d, McCormick Place*

Science Focus: GEN, SEP1, SEP3, SEP5

Carlos LopezLeiva, The University of New Mexico, Albuquerque

Join us as we describe our experiences and results obtained through the facilitation of a computer-programming curriculum with Latina and Latino middle school students.

3-D Printing Engineering Design in SMART STEM Classrooms*(Grades 6–9)**W176b, McCormick Place*

Science Focus: ETS, SEP

David Efron, Starling STEM PreK-8, Columbus, OH

We will show student solutions to design challenges using a SMARTBoard™, SMART Notebook™, 3-D software, and 3-D printers in a student-centered STEM classroom.



2:00–3:00 PM NSTA/ASE Honors Exchange Lecture

Exploring Classroom Assessment in Science—From Research to Classroom Practice

(General)

W192a, McCormick Place

Science Focus: GEN



Chris Harrison (@ASEChairChris; christine.harrison@kcl.ac.uk), Senior Lecturer in Science Education, Dept. of Education and Professional Studies, King's College London, U.K.

Prsident: Shaun Reason, Chief Executive, The Association for Science Education, London, U.K.

Balancing the need to assess to inform learning against assessment to measure performance at key points in a child's life is a tricky problem for science teachers. Join Dr. Chris Harrison for an exploration on the dilemmas that teachers face on a daily basis and how many British teachers have responded to this challenge. Emphasis will be placed on the research principles and how these play out in classroom practice.

Chris Harrison has worked in secondary schools for 13 years before joining King's College London to run the Biology Education section. Her teaching and research have centered on assessment, science education, cognitive acceleration, and the use of text and TV in classrooms.

In 1998 following her PhD, she began work on the King's-Medway-Oxfordshire-Formative Assessment Project (KMOFAP), where she developed action research work with science and mathematics teachers to help them focus on and improve their formative practice. This work has led to numerous other assessment projects in a variety of countries and a range of publications for researchers, teachers, and advisors.

Chris is known for the way she blends research ideas with classroom practice. Much of her work focuses on the role and beliefs that teachers have in classrooms as they undertake assessment practices.

2:00–3:00 PM Presentations

ASTC Session: STEM Pathways: Informal Science Institutions and a School District United to Improve STEM Engagement and Learning

(Grades 1–8)

Burnham A/B, Hyatt

Science Focus: GEN, INF, SEP

Beth Murphy (murphy@thebakken.org) and **Steven Walvig** (walvig@thebakken.org), The Bakken Museum, Minneapolis, MN

Abby Moore (abby.moore@state.mn.us), Minnesota Zoo, Apple Valley

Kevin Williams (willi002@umn.edu), Bell Museum of Natural History, Minneapolis, MN

Melanie Peters (mpeters@starbasemn.org), STARBASE Minnesota, Saint Paul

Learn about an innovative community partnership to create, implement, and evaluate a coherent and connected STEM pathway for students that supports standards-based learning and inspires interest and engagement.

Collaboration Instead of Compliance: How to Effectively Manage an Interactive Classroom Through Student Decision-making

(Grades 6–12)

Burnham C, Hyatt

Science Focus: GEN, SEP4, SEP7

Jesse Wilcox (jwilcox.23@gmail.com), Iowa State University, Polk City

Garrett Hall (@chemichall; hallgt@gmail.com), Southeast Polk High School, Pleasant Hill, IA

In this hands-on presentation, we will model how teachers can create a classroom atmosphere with a great deal of student decision-making while reducing classroom management issues.

Using Literature to Jump-Start Science Education

(Grades 9–12)

Dusable C, Hyatt

Science Focus: GEN, NGSS

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

Discover ways to incorporate fiction and nonfiction literature into your science curriculum to improve science literacy and help students make connections to careers and apply the science learned in the classroom.

Authentic Summative and Formative Assessments with a Greater Purpose

(Grades 6–College)

Field A/B, Hyatt

Science Focus: GEN, NGSS

Roslynn Stewart (roslynn_stewart@fc.dekalb.k12.ga.us), Salem Middle School, Lithonia, GA

Johni Cruse-Craig (dr.cruse.craig@gmail.com), Delta Research and Educational Foundation, Washington, DC Empower, inspire, engage, and assess your students through creative writing, comics, and board games with a greater purpose using authentic formative and summative assessment strategies. Come with expectations and leave with inspirations!

Engaging Students in Authentic Science Research

(Grades 9–College)

Grant Park B, Hyatt

Science Focus: LS4.B, LS4.C

Chuck McWilliams (chuck.mcwilliams@mrhschools.net), Maplewood Richmond Heights High School, Saint Louis, MO Find out how your students can participate in authentic science research involving the cyanogenesis of clover plants growing in their own backyards. Free materials!

edTPA and Methods for Teaching Science Courses: Ideas for Increasing Teacher Candidate Success: Part 2: Updates and Data

(College)

Grant Park C, Hyatt

Science Focus: GEN

Lauren Rentfro (rentfrla@lewisu.edu), Lewis University, Romeoville, IL

Revisions to science courses can better prepare preservice teachers for their future classrooms, as well as state licensure assessments. We'll cover analysis of student learning, critical pedagogy, interdisciplinary teaching and learning, Problem-Based Learning, and the use of academic language.

Five Common Myths of the NGSS—and How to Address Them

(General)

Jackson Park A, Hyatt

Science Focus: GEN, NGSS

Kenneth Huff (kenneth.huff@roadrunner.com), Williamsville Central School District, Blasdell, NY

Do you find fellow teachers or administrators still have misconceptions about the NGSS? Join Achieve staff and a member of the NGSS writing team to learn how you can help colleagues better understand the NGSS.

Incorporating Bioethical Case Studies into the Science Curriculum

(Grades 6–College)

Jackson Park D, Hyatt

Science Focus: GEN, NGSS

Terry Maksymowych (tmaksymowych@ndapa.org), Academy of Notre Dame de Namur, Villanova, PA

Practice effective strategies for incorporating bioethics into your curriculum. Examples of case studies will range from relatively non-controversial issues, such as physical enhancement or ecological ethics to the most contentious, such as cloning or stem cell research. When students are actively engaged in real-world problems, they develop an appreciation for the relevance of science in society.

Teacher Researcher Day Session: Learning in Motion About Motion

(General)

Regency A/B, Group 1, Hyatt

Science Focus: GEN, SEP

Deborah Roberts-Harris, The University of New Mexico, Albuquerque

University faculty, teachers, and students participated in a STEM adventure. Integrating STEM areas led students to new learning through the eight practices of science and engineering.

Teacher Researcher Day Session: Formative Assessment: Lessons from Teachers to Improve Participation in Classroom Conversations for All Students

(General)

Regency A/B, Group 2, Hyatt

Science Focus: GEN, CCC2, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Deb Morrison (@educatordeb; educator.deb@gmail.com), TREE Educational Services, Boulder, CO

Join us as we explore recent research on ways to improve classroom conversations with respect to formative assessment and classroom equity.

Science Olympiad Urban Schools Initiative Kick Starter

(Grades 6–12)

S401bc, McCormick Place

Science Focus: ESS, ETS, LS, PS, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP3, SEP4, SEP6

Jennifer Kopach (@SOALumniNetwork; jrkopach@soinc.org), Science Olympiad, Oakbrook Terrace, IL

Kelly Price (@KPriceGA; kellyrprice@comcast.net), Forsyth County Schools, Cumming, GA

Do you wonder how to engage underserved populations/districts with K–12 STEM outreach? Science Olympiad has a solution for you. Attend this session to learn more about the success of the Science Olympiad Urban Schools Initiative.

How Do I Learn: The Adolescent Brain and Learning

(Grades 3–College) *S402a, McCormick Place*

Science Focus: GEN, INF, NGSS

Timothy O’Mahony (*tko2@uw.edu*), University of Washington, Seattle

We use an iterative challenge cycle to explore and enhance adolescents’ learning. Discussion focuses on brain-based strategies for engaging learners by uncovering neuroscience areas such as attention, memory, multitasking, and more.

HS Engineering 4.0: Going from One Engineering Class to an Articulated Four-Year Science/CVTE Engineering Program

(Grades 9–12) *S404 b/c, McCormick Place*

Science Focus: ETS

Amy Winston (*amy_winston@newton.k12.ma.us*), Newton North High School, Newton, MA

Find out about our homegrown curriculum, program expansion/articulation, and engineering-infused science classes. Develop your own “next steps” for expanding (or starting) engineering offerings at home.

Shell Science Teaching Award: Fueling Success with Students

(Grades K–12) *S501a, McCormick Place*

Science Focus: GEN

Presenters to be announced

Share your passion and practice by applying for this \$10,000 award. Learn from Shell awardees, finalists, and judging panel members. Door prizes—Visa gift cards!

Save Time in the Classroom: Combining Reading and Science Through Picture Books

(Grades P–3) *S504bc, McCormick Place*

Science Focus: GEN

Donna German, Arbordale Publishing, Mount Pleasant, SC

Save time in the elementary classroom. Get step-by-step ideas for using picture books to supplement science concepts by combining the CCSS and NGSS (or state-specific science standards).

Science Integration at Its Finest!

(Grades K–8) *S504d, McCormick Place*

Science Focus: GEN

Douglas Hunnings (*@ETHOS_Douglas; dhunnings@elkhart.k12.in.us*), Riverview Elementary School, Elkhart, IN
Find out how to successfully integrate science within your literacy lessons and use the integration as a way to assess student learning of science.

STEM Buds

(Grades 1–8) *S505a, McCormick Place*

Science Focus: GEN, NGSS

Dawn Owen and **Jason Carroll** (*jcarroll@stmes.org*), St. Mark’s Episcopal School, Houston, TX

Join us as we share how to organize cross-grade-level teams to help your students’ STEM skills “blossom.” We’ll show you how grades 1–8 students “buddy up” to solve STEM challenges and interactively scaffold the NGSS.

Chicks, Man!

(Grades P–2) *S505b, McCormick Place*

Science Focus: GEN

Jennifer Labash (*jlbash@goshenschools.org*), Goshen College/Goshen Schools, Goshen, IN

I will share how I built vocabulary and background experiences for my low-income and English language learners through hatching chicks in a kindergarten classroom.

INF Real Science with NASA Scientists

(Grades 4–12) *W175 a/b, McCormick Place*

Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS3.B, ESS3.C, ESS3.D, ETS2, PS1.A, PS1.B, PS2.A, PS2.C, PS3.A, PS3.B, PS3.C, PS4.B, PS4.C, CCC, SEP

Emily Schaller (*@nasa_airborne; emily.schaller@nasa.gov*), National Suborbital Education and Research Center, Palmdale, CA

Michael Wilkinson (*@mwilkinson3; mwilkinson@ecfs.org*), Ethical Culture Fieldston School, Bronx, NY

Hear how your students can engage in authentic dialogue with NASA Airborne Science Program missions to motivate, validate, and collaborate in experimental design and research.

NGSS and Backward Design: Our District’s Journey

(Grades 6–8) *W175c, McCormick Place*

Science Focus: GEN, NGSS

Rebecca Litherland (*rlith5000@gmail.com*), Parkway School District, St. Louis, MO

Hear how we have moved forward in development of a district curriculum that meets the NGSS using Understanding by Design®. We will share our process, a sample unit, and lessons.

Use Fun, Interactive Online Games to Teach STEM in the Context of Substance Abuse

(Grades 6–8) *W187c, McCormick Place*
Science Focus: GEN, INF, NGSS

Lynn Lauterbach (lynnlauterbach@gmail.com), Retired Teacher, Loveland, CO

Kristi Bowling (@RiceCTTL), Rice University Center for Technology in Teaching and Learning, Houston, TX
Learn about free online games that provide simulations and visualizations to teach standards-based science in a problem-based scenario involving the science behind substance abuse and body system.



Using a Graphic Organizer for Formative Assessment Opportunities in the Preschool Classroom

(Grades P–K, College) *W190b, McCormick Place*
Science Focus: GEN

Christine Knaggs (cknaggs@lourdes.edu), Lourdes University, Sylvania, OH

Through multiple seasonal science examples and demonstrations, participants will use a graphic organizer to both plan and formatively assess STEM lessons in the preschool classroom.

2:00–3:00 PM Hands-On Workshops

Printing 3-D Objects to Teach Chemistry or Physics

(Grades 6–College) *Grant Park D, Hyatt*
Science Focus: ETS1, PS1.B, PS4.A, CCC5, CCC6, SEP6

Joe Muskin (jmuskin@illinois.edu), University of Illinois at Urbana–Champaign

Rapid prototyping is an important step in engineering design. This hands-on activity prints real 3-D objects using a simple to build 3-D printer.

The Connected Science Teacher

(Grades 5–College) *Jackson Park C, Hyatt*
Science Focus: GEN, INF

Heidi Bjerke (@jbkerle'hbjerke@gmail.com), Champaign (IL) Unit 4 Schools

Keep current in your field of science and on current science teaching practices. Please BYOD to fully participate.



NSTA Press® Session: Teaching Science Through Trade Books—Exemplars from the Book and Featured Columns

(Grades 2–6) *S401a, McCormick Place*
Science Focus: GEN

Christine Royce (@caroyce; caroyce@aol.com), Shippensburg University/PSTA, Shippensburg, PA

Emily Morgan (@EmilyMorganNTYS; emily@pictureperfect-science.com) and **Karen Ansberry** (karen@pictureperfectscience.com), Picture-Perfect Science, West Chester, OH

NSTA Press authors will share exemplar activities from the book *Teaching Science Through Trade Books* as well as featured columns from *Science and Children*. This session will engage participants with highlighted activities that feature the integration of quality trade books and content enriching science lessons.



NSTA Press® Session: Argument-Driven Inquiry in Biology: Lab Investigations for Grades 9–12

(Grades 9–12) *S401d, McCormick Place*
Science Focus: LS, CCC, SEP

Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin

Jonathon Grooms (@drjongrooms; jgrooms@fsu.edu), Florida State University, Tallahassee

Argument-driven inquiry gives students an opportunity to learn how to participate in the practices of science and use the core ideas and crosscutting concepts of science to make sense of natural phenomena. Receive a brief overview of this innovative approach to laboratory instruction.

Making Hands-On/Minds-On Games and Activities for Elementary

(Grades 1–5) *S402b, McCormick Place*
Science Focus: GEN

Rodelio Abuan, Sam Houston Math, Science & Technology Center, Houston, TX

Engage elementary students in learning by playing. Learn how to make and use 10 fun games and activities that can be tailor-made to your grade level and subject area, adjusted to fit any class size, and used as practice activities, review stations for state tests, warm-up exercises, and more.

Using Data for Climate Change

(Grades 6–12) *S403b, McCormick Place*
Science Focus: ESS, SEP4, SEP7, SEP8

Melanie Mudarth (mudarth@gmail.com), Evanston/Skokie School District 65, Evanston, IL

Explore climate change through data sets developed from firsthand experiences, data from both poles, and International Polar Year resources.

Family Science Night Partnerships in a Culture of Science

(Grades 1–12) *S404a, McCormick Place*

Science Focus: INF

Karen Saur (@Karen_Saur; *ksaur@nysci.org*), New York Hall of Science, Queens

Jay Holmes (*jholmes@amnh.org*), American Museum of Natural History, New York, NY

Student success is improved when parents participate in the learning process. Family science nights allow teachers, students, families, and the whole community to learn together.

Using Stickers and Tape to Prototype and Explore Electrical Circuits

(Grades 6–12) *S501bc, McCormick Place*

Science Focus: PS

Samantha Lindgren, University of Illinois at Urbana–Champaign

Forget the alligator clips! Investigate concepts in electricity, including voltage, current, series and parallel circuits, using stickers and copper tape and these classroom-ready NGSS-based activities.

STEM for ALL! Integrated STEM Projects for Diverse Learners

(Grades 6–12) *S501d, McCormick Place*

Science Focus: GEN

Shari Weaver, Massachusetts Academy of Math & Science at WPI, Worcester

Take part in hands-on STEM activities that can be used for students with a range of learning disabilities in an inclusion or substantially separate environment. Handouts.

Implementing Inquiry and Engineering Design Using NASA’s Materials on Newton’s Laws

(Grades P–8) *S502a, McCormick Place*

Science Focus: ETS

Linda Smith (*elementary.science.teacher@gmail.com*), Retired Educator, Elmer, NJ

Students use readily available materials to perform inquiry-based activities to develop evidence to complete an engineering design problem. Free NASA poster set to all participants.

Connecting the Practices of Science and Mathematics to Enhance Integrated STEM Instruction

(Grades 3–8) *S502b, McCormick Place*

Science Focus: GEN, NGSS

Jane Metty, Mercer University, McDonough, GA

Engage in integrated math and science activities. Analyze of these activities in light of the NGSS science and engineering practices and *CCSS Mathematics*.

Engineering for Middle-Schoolers After the Bell Rings

(Grades 5–8) *S503a, McCormick Place*

Science Focus: GEN, SEP

Melissa Higgins (@EiE_org; *mhiggins@mos.org*), Museum of Science, Boston, MA

Experience how engaging middle-schoolers in engineering activities after school can bolster their engineering skills and pique their interest in STEM subjects.

Linking Science to Informed Citizenship Through Integrated Environmental Health Curriculum

(Grades 6–9) *S503b, McCormick Place*

Science Focus: ESS3.A, ESS3.C, ETS1, ETS2.B, LS2.B, INF, CCC2, CCC3, CCC4, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Alla Keselman, U.S. National Library of Medicine, Bethesda, MD

Review an integrated environmental health curriculum and accompanying electronic resources from the National Library of Medicine; engage in some curricular activities. Laptop helpful.

Writing to Learn vs. Learning to Write in Science with Connections to the NGSS Science and Engineering Practices

(Grades 3–9) *S504a, McCormick Place*

Science Focus: GEN, SEP

Roxane Dupuis (*radupuis@comcast.net*), Loyola University Chicago, IL

Frank Panion (*fapanion@cps.edu*), Inter-American Magnet School, Chicago, IL

Engage in writing-to-learn activities illustrating how writing is used to initiate discussion, reinforce content, and model the method of inquiry.

NESTA Session: How Weird Can It Get? Developing Weather and Climate Literacy

(Grades 1–12) Skyline W375e, McCormick Place
Science Focus: ESS, CCC, SEP

Roberta Johnson Killeen (rmjohnsn@nestanet.org), National Earth Science Teachers Association, Boulder, CO

Margaret Holzer (mholzer@monmouth.com), Chatham High School, Chatham, NJ

Michael Passow (michael@earth2class.org), Dwight Morrow High School, Englewood, NJ

Explore the scientific foundations of what we know about weather, climate, and climate change through effective hands-on and data-rich classroom activities from NESTA.

Teaching Refraction for Conceptual Understanding

(Grades 6–9) W176a, McCormick Place
Science Focus: PS4.B

Scott Ashmann (ashmanns@uwgb.edu), University of Wisconsin–Green Bay

Using real-world examples, ray diagrams, and a learning cycle, join us as we focus on developing students' conceptual (not mathematical) understanding of refraction.

Stellar Girls: NGSS-based Innovative Hands-On STEM Program

(Grades 4–8) W178b, McCormick Place
Science Focus: GEN, NGSS

Karen Lindebrekke (karen.lindebrekke@ibioinstitute.org) and **Ann Reed** (@ibioeducate; ann.reed@ibioinstitute.org), iBIO Institute, Chicago, IL

Stellar Girls inspires young women to pursue STEM careers by offering them engaging hands-on activities that relate to global challenges requiring 21st-century skills to solve.

**Science by Design: Addressing Science Concepts Through Engineering**

(Grades 4–9) W186c, McCormick Place
Science Focus: ETS

Julie Alexander (jalexander@cpsk12.org), Columbia (MO) Public Schools

Want to incorporate engineering? Worried about promoting an activity-mania classroom void of scientific content? Come learn ways to meaningfully incorporate engineering in your classroom. Samples of student work and handouts.

**On-the-Ground Stewardship + Great Lakes Science = A Five Star Place-based Education Program**

(Grades 6–12) W187a, McCormick Place
Science Focus: ETS, LS2.A, LS2.B, INF, SEP1, SEP3, SEP4

Katie Larson (klarson@greatlakes.org), Alliance for the Great Lakes, Chicago, IL

Enhance your teaching repertoire with the Great Lakes in My World curriculum, Adopt-a-Beach citizen science, place-based habitat restoration, and the NGSS.

**Using Universal Design for Learning (UDL) Principles to Enhance Science Learning Experiences for Students with Special Needs**

(Grades 6–12) W187b, McCormick Place
Science Focus: GEN, SEP

Gregory Borman, The City College of New York, NY

Experience how incorporating the principles of Universal Design for Learning into teaching and learning leads to deeper understanding of science concepts and processes for students with disabilities.

Data Sets for Climate Education

(Grades 6–12) W192c, McCormick Place
Science Focus: ESS2, PS1, PS3, CCC1, CCC4, CCC5, CCC7, SEP

Patricia Harcourt (@HarcourtMC; pharcourt@gmail.com), MADE CLEAR, Annapolis, MD

Climate science provides a great context for introducing data interpretation to students. We will work with several data sets to introduce important climate concepts.

Introduction to the Nanoscale: An Integrated Interactive STEM Curriculum for NGSS Classrooms

(Grades 6–12) W196a, McCormick Place
Science Focus: ETS, LS, PS, INF, CCC1, CCC2, CCC3, CCC4, CCC5, CCC6, SEP

Matthew Hsu (mhsu.northwestern@gmail.com), Northwestern University, Evanston, IL

Join us for hands-on activities and interactive content demonstrations that illustrate some of the core nanoscience concepts at the heart of a new NGSS-based STEM curriculum.

2:00–3:30 PM Exhibitor Workshops

Creating a Science Class for the 21st Century

(Grades 7–12)

W184d, McCormick Place

Science Focus: GEN, INF

Sponsor: Intelitek

Elizabeth Klingseisen and **Shannon Richmond** (*srichmond@intelitek.com*), Intelitek, Inc., Manchester, NH

Turn your classroom into a productive environment in which students develop the skills they will need in the workplace and teachers facilitate their learning. Find out ways to integrate technology to promote success in PBL and student projects. Gain practical research-based ideas centered on technology, instruction strategies (like flipped instruction), and classroom management. Leave with great ideas!

Human Physiology with Vernier

(Grades 9–College)

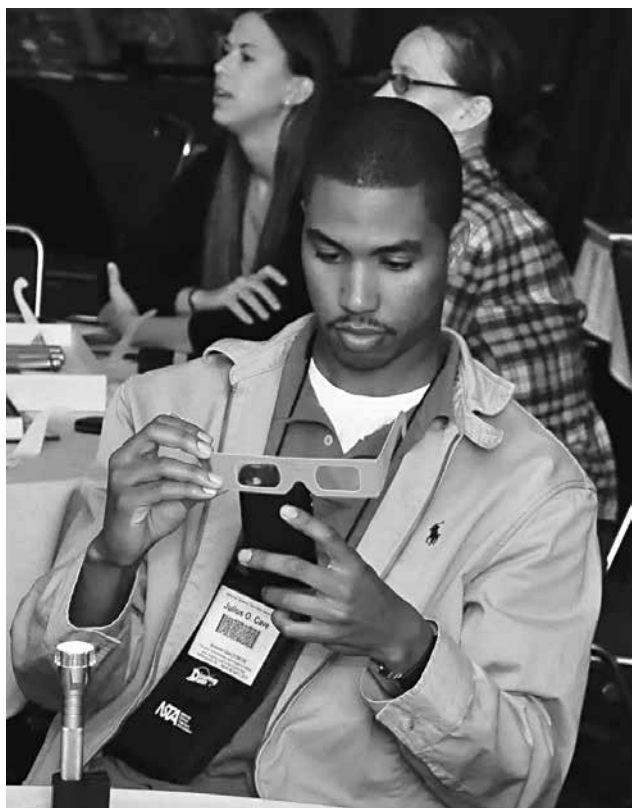
W185a, McCormick Place

Science Focus: LS, SEP4

Sponsor: Vernier Software & Technology

John Melville (*info@vernier.com*), Vernier Software & Technology, Beaverton, OR

Use Vernier sensors to conduct a variety of human physiology experiments from our popular *Human Physiology with Vernier* lab book in this engaging hands-on workshop. Experience data collection using LabQuest 2, Logger Pro computer software, and mobile devices.



Introductory Engineering Design Projects with Vernier

(Grades 6–12)

W185d, McCormick Place

Science Focus: ETS, SEP3, SEP4

Sponsor: Vernier Software & Technology

David Vernier (*info@vernier.com*), Vernier Software & Technology, Beaverton, OR

This engaging hands-on workshop explores ways to use Vernier sensors for introductory engineering design projects. Using our Digital Control Unit and Logger Pro computer software, participants will learn how to apply logic statements to set alarms and to control simple electronic devices based on sensor input values.

Exploring Forces, Motion, and Engineering Design with LEGO® Education Simple Machines

(Grades 1–3)

W186b, McCormick Place

Science Focus: ETS

Sponsor: LEGO Education

Laura Jackson, Retired Teacher/LEGO Education Trainer, Greenwood, MO

Cindy Howard, Retired Teacher/LEGO Education Trainer, Kansas City, MO

Develop first- through third-graders' understanding of science, engineering, and mathematics concepts, using the LEGO Education Simple Machines Set. In this hands-on workshop, you will learn how to meet elementary engineering design standards with LEGO-based activities that encourage exploration of forces and motion, development of 21st-century skills, and more.

Dissection Connections: Using Preserved Specimens to Explore Human Biology, Disease, and Development

(Grades 6–12)

W192b, McCormick Place

Science Focus: LS

Sponsor: Ward's Science

Jim Collins, VWR Education, Rochester, NY

Everything you need for safer, more accurate dissections. Work with Ward's fetal pig specimens, odor-neutralizing pads, and newly illustrated dissection guides. Walk through case-based dissection highlighting connections to the NGSS and other state standards. Receive a color copy of our dissection guide and an exclusive discount toward your next preserved materials purchase.

ECO Classroom: Field-based Professional Development for STEM Teachers

(Grades 7–12) *W474b, McCormick Place*
 Science Focus: LS2.A, LS2.C, LS4.D, INF, SEP1, SEP3, SEP4, SEP5, SEP8

Sponsor: Conservation International

Danielle Belmont, Miller Middle School, Durango, CO
Peggy Lubchenco, University of California, Santa Barbara and Conservation International, Goleta

Ngoc Hoang, Yerba Buena High School, San Jose, CA

James MacCarthy, Conservation International, Arlington, VA

ECO-Classroom secondary science teachers who participated in a free Northrop Grumman professional development opportunity in Costa Rica will recount how they incorporate newly acquired field skills with teaching NGSS topics like climate change, land use, and ecology. Information about participating in future two-week Costa Rica trips will be available.

Stretch Your Legs for Science!

(Grades K–12) *W475a, McCormick Place*
 Science Focus: LS2

Sponsor: Celestron

Jennifer Fee and **Lindsay Glasner**, The Cornell Lab of Ornithology, Ithaca, NY

Join us for some post-lunch exercise; explore Chicago via a bird walk! After a tutorial on bird identification, we'll head outside with Celestron binoculars to experience firsthand how you can meet standards and engage students through bird watching! After the walk, Celestron will raffle binoculars to a few lucky attendees.

2:00–4:00 PM Meeting

NSTA Council Roundtable

(By Invitation Only)

Regency D, Hyatt

2:00–4:00 PM Presentation

Alliance of Affiliates Session: The 3Rs: Research, Resources, and Relationships

(General)

Regency E, Hyatt

Science Focus: GEN, NGSS

Elizabeth Allan, University of Central Oklahoma, Edmond
Deborah Hanuscin (@DHanuscin; *hanuscind@missouri.edu*), University of Missouri, Columbia

Come connect with NSTA affiliates to learn about research and resources and form relationships to support your work in science education.

2:00–4:00 PM Hands-On Workshop

Retiring? Tricks and Tips for the Next Phase of Your Life

(General)

Jackson Park B, Hyatt

Science Focus: GEN

Joyce Gleason (*joycegle@earthlink.net*), Educational Consultant, Punta Gorda, FL

Susan Clay (*sclay1@ashland.edu*), Ashland University, Ashland, OH

In this session sponsored by the Retired Members Advisory Board, experts will explore topics like finances, volunteering, travel, consulting, liability, writing, care-giving, elderly driving, NSTA benefits, and other topics that can add spark to the retirement years.

2:30–3:00 PM Presentations

If You Build It—They Will Come!

(General) *Hyde Park A, Hyatt*

Science Focus: LS, INF

Taryn Page, Charlotte Country Day School, Charlotte, NC
 Raising monarch butterflies is an authentic opportunity for stewardship learning. Learn about the plight of the Monarch butterflies, and why it is important to act now to preserve this incredible natural phenomenon.

Climate Change MADE CLEAR

(Grades 5–10, College)

Hyde Park B, Hyatt

Science Focus: ESS, INF, CCC, SEP

Christopher Petrone (@seaPetrone; *petrone@udel.edu*), Delaware Sea Grant Marine Advisory Service, Lewes

Melissa Rogers (*mrogers@umces.edu*), University of Maryland Center for Environmental Science, Cambridge

Hear about MADE-CLEAR, an NSF-funded, collaborative partnership seeking to identify effective and sustainable ways to embed meaningful climate change instruction in Maryland and Delaware schools and informal education institutions.

Renewable Energy Science Workshop with STEM Career Focus

(Grades 7–12) *S403a, McCormick Place*
Science Focus: ESS2.C, ETS2.B, LS2.A, LS2.B, LS2.C, PS3, INF, SEP1, SEP8

Kathryn Orvis and **Matthew Kararo** (*mkararo@purdue.edu*), Purdue University, West Lafayette, IN
Discussion centers on how agricultural concepts around renewable energy can help meet the NGSS and inspire students to choose STEM careers.

Technology and Inclusivity: How Social Network Learning Technology and Environments Shape Student Science Identities

(Grades 6–8) *S404d, McCormick Place*
Science Focus: GEN, NGSS

Vanessa Lujan (*vlujan@berkeley.edu*), The Lawrence Hall of Science, University of California, Berkeley
Come hear how teachers can foster development of student science identity by engaging students in classroom discourse via social network learning technology environments.

Applications of Engineering/Applications of Physics

(Grades 9–12) *W176b, McCormick Place*
Science Focus: ETS1, ETS2.A, PS1.A, PS3, PS4.A, PS4.B, PS4.C, CCC2, CCC4, CCC6, SEP1, SEP2, SEP3, SEP6

Jason English (*jenglish@d211.org*), William Fremd High School, Palatine, IL
Fermilab’s physics research stretches the limits of modern engineering. We challenge our students to apply the physics they’re learning to projects in the classroom.

2:30–3:30 PM Exhibitor Workshop

Forensic DNA Activities and More with K’NEX Education’s DNA, Replication, and Transcription Set

(Grades 7–12) *W471b, McCormick Place*
Science Focus: LS

Sponsor: K’NEX Education

Robert Jesberg, Science Consultant, Hatfield, PA
CSI has heightened students’ interest in forensics and DNA fingerprinting. Let’s build on that interest to strengthen their understanding of DNA concepts and processes. You will build actual K’NEX Education DNA models to examine a DNA ladder, structure, the double helix, and more. Also, explore mRNA, replication, transcription, and translation.

2:55–3:55 PM Exhibitor Workshop

Climate Change Series 6: ClimateChangeLIVE Distance Learning Project—Engage Your Students in Climate Change Learning and Being Part of the Solution!

(Grades 5–12) *W184bc, McCormick Place*
Science Focus: ESS

Sponsor: NOAA’s National Ocean Service

Victoria Arthur, U.S. Forest Service, Washington, DC
Discover a treasure chest of climate change education resources to help you educate, inspire, and engage your students! Online resources from 27 federal agency and NGO partners include lesson plans, videos, webinars, and more. Youth from across the country provide ideas about how your class can be part of the climate solution!



3:00–3:30 PM Presentation**Teacher Researcher Day Session: Becoming a Teacher Researcher Through an Online Graduate Course**

(General) *Regency A/B, Group 3, Hyatt*
Science Focus: GEN, CCC1

Jeremy Ervin (@dr_jeremy_ervin; jervin62@gmail.com), Cedarville University, Cedarville, OH

Learn how an online graduate course educates students to systematically implement research in daily practice to improve pedagogy.

3:00–4:00 PM Presentations**Teacher Researcher Day Session: An In-depth Look at Our Students Learning and Teacher Evaluation**

(General) *Regency A/B, Group 1, Hyatt*
Science Focus: GEN

Deborah Roberts-Harris, The University of New Mexico, Albuquerque

Providing teachers with opportunities to reflect on learning/teaching in their own classrooms enriches evaluation. Come find out how teacher research and teacher evaluation are linked.

Teacher Researcher Day Session: Woodrow Wilson Fellows—Shaping Teaching Practice Through Field-based Action Research

(Grades 6–12) *Regency A/B, Group 2, Hyatt*
Science Focus: GEN, NGSS

Gary Holliday (@GaryMHoliday; gh30@uakron.edu) and **Nidaa Makki** (nmakki@uakron.edu), The University of Akron, OH

The University of Akron's Woodrow Wilson Fellows will share action research projects conducted during their first year of teaching and will discuss the impact on teaching practice.

Teacher Researcher Day Session: Using Historical Stories to Support Development of Authentic Investigations

(Grades 4–7) *Regency A/B, Group 4, Hyatt*
Science Focus: GEN

Deb McGregor, Oxford Brookes University, Oxford, U.K. Hear how stories from scientist's past lives can be used to inspire and support children developing their own unique investigations.

3:00–5:00 PM Meeting**Association for Multicultural Science Education (AMSE) Town Hall Meeting**

Clark A/B, Hyatt

Robert Ferguson (r.l.ferguson1@csuohio.edu), Cleveland State University, Cleveland, OH

Cherry Brewton (cbrewton@georgiasouthern.edu), Science Education Consultant, Statesboro, GA

Melissa Campanella (melissa.rae.campanella@gmail.com), Noel Community Arts School, Denver, CO

Participate in NGSS 3D lessons and learn how to make NGSS accessible to all students.

3:30–4:00 PM Presentations**Implementing Connections to the CCSS for Literacy Through Collaborative Writing**

(Grades 5–12) *Field C, Hyatt*

Science Focus: GEN, SEP1, SEP7, SEP8

Jason Artero, Central Michigan University, Mount Pleasant

Explore implementing connections to NGSS Appendix M by using collaborative writing with students to allow them to challenge other students' ideas about science through writing and discussion.

Involving Preservice Teachers at Your State Conference: Exploratorium Time

(College) *Grant Park C, Hyatt*

Science Focus: INF

Ray Scolavino (rscali3@yahoo.com), University of Wisconsin–Milwaukee

Leave with an outline on how you can implement an Exploratorium for your next state conference and let your preservice teachers strut their stuff.

Science Futures: Developing Teacher Leaders for Instructional and School Reform

(General) *Jackson Park D, Hyatt*

Science Focus: GEN

Chad Janowski (@21stSciEd; janowsc@shawanoschools.com), Shawano High School, Shawano, WI

Hear how Science Futures, a leadership development program for science teachers, has teachers actively involved in reforming their science teaching and their school's science programs.

Differentiation and Formative Assessment in the Secondary Science Classroom—It Can Be Done!

(Grades 6–12)

W475b, McCormick Place

Science Focus: GEN

Amy Alexander (alexandera@trine.edu), Trine University, Angola, IN

Emphasis will be placed on a tiered instruction format that allows for active inquiry, continuous assessment, and promotion of a positive classroom community. The model allows students to choose activities based on learning style, ability level, and interest.



3:30–4:30 PM Featured Presentation

Connected Learning: Emerging Contexts for Deeper Engagement

(General)

W190a, McCormick Place

Science Focus: ETS, INF

Speaker sponsored by Shell



Samuel Dyson ([@samueledyson](https://twitter.com/samueledyson); sam@mozillafoundation.org), Hive Chicago Learning Network, Chicago, IL

President: Krishna Millsapp-Palmore, Mount Carmel High School, Chicago, IL

A learner's ability to make connections remains the hallmark of understanding. Digital technology continues to open new possibilities for empowering teachers and learners alike, but how has the increasingly connected context in which we live created a context for more connected learning? Let's explore the potential of digital media to enable the connections that give more kids an irreplaceable desire to keep growing.

A 2007 recipient of the Golden Apple award for excellence in teaching, Samuel Dyson has 10 years of physics teaching experience. His background includes educational administration in both community-based and Chicago Public Schools contexts.

Currently, he is director of the Hive Chicago Learning Network, a MacArthur-supported initiative operated by the Mozilla Foundation to enact connected learning among teens and educators through a community of youth-serving organizations. Hive Chicago engages youth around their personal interests, peer culture, and civic participation focusing on production-centered, hands-on making and skill building. His work explores the power of networks to solve complex challenges inherent in the work of teaching and learning. Samuel has led development of connected learning programs and resources for teens and adults, including Hive Fashion in Chicago and New York City Networks; STEAM Studio, a pop-up makerspace at the Chicago Cultural Center; and Maker Party and showcase events supporting the Chicago City of Learning.

3:30–4:30 PM Presentations**ASTC Session: STEM Learning Through Partnerships***(Grades K–8)**Burnham A/B, Hyatt*

Science Focus: GEN, INF

Becky Wolfe (*beckyw@childrensmuseum.org*), The Children's Museum of Indianapolis, IN

Coordinated partnerships between schools, museums, and scientists are a strategy for increasing engagement with STEM. Museum staff will discuss ways to develop and maintain partnerships.

Transforming the High School Classroom into an NGSS Classroom*(Grades 6–12)**Burnham C, Hyatt*

Science Focus: NGSS, GEN

Chris Embry Mohr (*chrismohr@olympia.org*), Olympia High School, Stanford, IL

Hear from the NGSS writing team about how they are transforming their classrooms into ones that support the NGSS by building professional learning communities, adjusting curriculum, analyzing resources, and developing lessons and assessments.

Teaching Science from a Global Perspective*(Grades 9–12)**Dusable C, Hyatt*

Science Focus: GEN, NGSS

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

Emphasis will be placed on practical ways to incorporate global data into every science lesson. Learn about hands-on lessons that promote global learning and understanding using data bases, technology, and professional development opportunities.

Turning the Performance Expectations of the NGSS into a Working Curriculum*(Grades 9–12)**Hyde Park A, Hyatt*

Science Focus: GEN, SEP

Angela Codron (*codrona@unit5.org*), Normal West High School, Normal, IL

Classroom teachers and curriculum leaders will gain practical ideas for district and classroom level implementation of the NGSS, including target writing, formative assessment processes, performance-based assessments, and use of rubrics.

Encouraging Student Thinking and Engagement Through Effective Questioning*(General)**Jackson Park A, Hyatt*

Science Focus: GEN

Deborah Sachs (*dsachs@uindy.edu*), University of Indianapolis, IN

Do your questioning strategies need a boost? Learn principles for designing effective questions. Explore strategies and structures that lead to increased student thinking and engagement.

Addressing Misconceptions About Evolution*(Grades 9–12)**S402a, McCormick Place*

Science Focus: LS4.A, LS4.B, LS4.C, CCC1, CCC2, SEP7

Sarah O'Leary-Driscoll and **Don Dosch** (*ddosch@imsa.edu*), Illinois Mathematics and Science Academy, Aurora

Leave with effective ways to identify and address misconceptions about evolution, with a particular focus on supporting explanations with evidence.

Why Does the Earth Shake in the Central U.S.?*(Grades 6–12)**S403a, McCormick Place*

Science Focus: ESS, CCC1, SEP2

John Taber, IRIS, Washington, DC

Join us for an investigation of intraplate earthquakes for the Earth science classroom. Explore where and why the earth shakes far from plate margins through simple, illustrative, physical models, and the analysis of earthquakes from IRIS's online data-portal.

Engaging Students in Data-Informed Engineering Design Decisions in Chemistry and Physics*(Grades 9–12)**S404 b/c, McCormick Place*

Science Focus: ETS, PS, SEP

Bradford Hill (*@sciencebradford; bradfordhill@gmail.com*), Southridge High School, Beaverton, OR**Heather Haines**, Community Charter School of Cambridge, MA

Engage students in both engineering and science practices through embedding physics- or chemistry-driven inquiry to generate data to inform relevant engineering design decisions.

Building an Integrated K–8 Curriculum Based on the NGSS

(Grades K–8) *S504bc, McCormick Place*
Science Focus: ESS, ETS, LS, PS, SEP6

Janet MacNeil (@curiouslearner8; *janet_macneil@brookline.k12.ma.us*), Brookline (MA) Public Schools

Come learn about the K–8 science curriculum that we are creating to meet the NGSS—integrating science and engineering practices, disciplinary core ideas, crosscutting concepts, and literacy.

Family Science Day: Do’s and Don’t’s for a Successful STEAM Event

(Grades P–8) *S504d, McCormick Place*
Science Focus: ETS1.A, ETS1.B, INF, SEP1, SEP3, SEP6

Sara McCubbins (*samccub@ilstu.edu*), Illinois State University, Normal

Hear how a local university, museum, and other informal science groups combined resources and expertise often not available in K–12 schools to create a one-day STEAM event. Leave with strategies to create your own event in your community.

Teaching Science Writing: Reports to Explanations

(Grades 3–5) *S505a, McCormick Place*
Science Focus: LS, CCC5, SEP2, SEP6

Tracy Hodgson-Drysdale (*thodgso2@uottawa.ca*), University of Ottawa, Ont., Canada

Holly Rosa (*hrosa@bostonpublicschools.org*), Boston (MA) Public Schools

Learn to teach science writing that supports content knowledge and language development while enriching the experiences of all students in multicultural classrooms.

PAEMST Award-Winners: How Do They Get Their Mojo?

(Grades K–6) *S505b, McCormick Place*
Science Focus: GEN

Jim O’Malley (@MrOScience; *omalleyj@skokie69.net*), Skokie District 69, Morton Grove, IL

We NEED to develop and nurture great elementary science teachers with “mojo” and my presentation will share my dissertation findings. PAEMST stands for Presidential Awards for Excellence in Mathematics and Science Teaching—find out what sets the award-winners apart.

Deep-Brain Stimulation

(Grades 7–College) *W175 a/b, McCormick Place*
Science Focus: LS1.A, LS1.B, PS3.D, CCC2, CCC4, CCC7, SEP1, SEP2, SEP6, SEP8

Kevin Fleming (*kfleming@oldsaybrook.k12.ct.us*), Old Saybrook Senior High School, Old Saybrook, CT

Learn about an event-based science linking biomedical engineering and neuroscience to teach the nervous system. We will share an innovative unit on the nervous system focusing on deep-brain stimulation, a modern technology used to treat movement disorders.

Math Standards in Data Analysis: Going Beyond “Average”

(Grades 6–8) *W175c, McCormick Place*
Science Focus: GEN, SEP5

Mona McNamara (*mcmnamara@nybg.org*), The New York Botanical Garden, Bronx

Matthew Mirabello (*mmirabello@amnh.org*), American Museum of Natural History, New York, NY

Graph and interpret data using measures of center and spread. Join us as we focus on methods that students can use to represent and analyze experimental data, including mean, median, mode, and box and whisker plots.

STEM Summer Scholars Program

(Grades 6–8) *W176b, McCormick Place*
Science Focus: GEN, SEP1, SEP3, SEP6

Edward McGrath (*edward.mcgrath@redclay.k12.de.us*), Red Clay Consolidated School District, Wilmington, DE

Each summer, the Red Clay Consolidated School District holds a three-week camp for rising grades 6–8 students focused entirely on a STEM topic. Join us as we share details about the STEM Summer Scholars program, a middle school summer enrichment program providing a rich STEM experience to all middle school students in a public K–12 school district in Delaware.

INF Dazzling Deceptions: Discrepant Events That Delight and Mystify!

(Grades 3–College) *W185 b/c, McCormick Place*
Science Focus: GEN, INF, NGSS

Alan McCormack (*amccorma@mail.sdsu.edu*), 2010–2011 NSTA President, and San Diego State University, San Diego, CA

Science experiences that seem contrary to “common sense” are great motivators and gateways to science inquiry and concept development.

**(Scientific) Inquiry Minds Want to Know: Creating a School-University-Park Partnership***(Grades 7–College)**W187a, McCormick Place*

Science Focus: INF, SEP

Susan B. Kelly, University of Illinois at Urbana–Champaign
Join us to learn more about a new partnership recently developed between University of Illinois Urbana–Champaign scientists and educators, Park staff from Wildlife Prairie Park near Peoria, Illinois, and science teachers from three school districts.

Meeting Individualized Instructional Needs in the Secondary Science Inclusion Classroom: A Web-based Approach*(Grades 6–College)**W187c, McCormick Place*

Science Focus: GEN, INF, NGSS

Laura Barden–Gabbei (*lm-barden@wiu.edu*), Western Illinois University, Macomb

Get introduced to web-based science resources that can help teachers meet student IEP, 504, and RTI accommodations in science classrooms.

**Astronomical Assessments***(Grades 6–8)**W190b, McCormick Place*

Science Focus: ESS

Charles Juister (*cjuister@gmail.com*) and **Rachel Letizia**, Heritage Middle School, Berwyn, IL

President: Jen Gutierrez (*jen Gutierrez@cox.net*), Arizona Dept. of Education, Phoenix

Explore authentic assessments for demonstrating student understanding of Earth-Moon-Sun patterns and models in the context of the NGSS.

CESI Session: Get Real! STEM Career Awareness Strategies to Enhance Science Learning*(Grades K–5)**W192c, McCormick Place*

Science Focus: GEN, SEP

Julie Thomas, University of Nebraska–Lincoln

Ramp up elementary science lessons with simple strategies that connect concepts and practices to the real world as well as inspire STEM career interests.

3:30–4:30 PM Hands-On Workshop**Incorporating Engineering Design Principles into High School Science Experiments***(Grades 9–College)**Grant Park A, Hyatt*

Science Focus: ETS, SEP1, SEP3, SEP4

Andrea Van Duzor (*andrea.vanduzor@csu.edu*) and **Rita Koziarski** (*rkoziars@csu.edu*), Chicago State University, Chicago, IL

We will compare scientific experimentation and engineering investigation and discuss rubrics and methods for developing engineering projects from inquiry-based science projects.

Science in Action Share-a-Thon—Research from the CPS Student Science Fair*(Grades 6–12)**Grant Park B, Hyatt*

Science Focus: GEN, SEP

Paul Dolan, Northeastern Illinois University, Chicago
Students from the 2015 Chicago Public Schools Student Science Fair will present their research posters, showing how NGSS is in action in Chicago.

ABCs with DEs: Addressing Basic Concepts with Discrepant Events*(Grades Preschool–10)**Grant Park D, Hyatt*

Science Focus: GEN, NGSS

Ruth Hutson, Blue Valley High School, Randolph, KS
Carolyn Mohr, Dominican University, River Forest, IL
A discrepant event (DE) activity is a teaching strategy that identifies students' misconceptions and provides ways to determine whether students understand concepts. Come play/practice magical science with everyday items! Make-and-take home our favorites.

Designed to Handle a Chicago Winter!*(Grades 4–12)**Hyde Park B, Hyatt*

Science Focus: GEN, CCC5, CCC6, CCC7


Jeffrey Lukens, Sioux Falls (SD) School District

People living in (or visiting!) Chicago in the winter are a hardy lot! Join us to find out how to stay warm (or cool) while you're here!

Formative Assessments You Can Use on Monday*(General)**Jackson Park C, Hyatt*

Science Focus: GEN, INF

Jennifer Hooper, The University of Texas at San Antonio
Encounter formal assessments that are easy to use, fun to do, and still let you know how students are performing. Find out where the gaps are and who needs the most help in your classroom.

 **NSTA Press® Session: Teaching Science Through Integrating Children’s Literature and Outdoor Investigations**

(Grades 3–5) *S401a, McCormick Place*

Science Focus: LS2.A, LS2.B, INF

Christine Royce (@caroyce; *caroyce@aol.com*), Shippensburg University/PSTA, Shippensburg, PA

Steve Rich (@bflyguy; *bflywriter@comcast.net*), West GYSTC, Carrollton, GA

Engage in lessons that combine investigations in outdoor science topics with paired children’s literature that will enhance the topic and integrate other discipline areas.

 **NSTA Press® Session: Phenomenon-based Learning: Fun, Hands-On, Cooperative Learning**

(Grades 3–College) *S401d, McCormick Place*

Science Focus: PS1.A, PS2, PS3.B, PS3.C, PS3.D, PS4.A, PS4.B, CCC2, CCC3, CCC4, CCC5, CCC6, CCC7, SEP

Matt Bobrowsky, Delaware State University, Dover
Experience the kind of learning that propelled Finland to international leadership in science education—learning not by memorizing facts but by exploration and discovery.

Drama of the Immune System

(Grades 5–12) *S402b, McCormick Place*

Science Focus: LS

Tory Brady, Exploratorium, San Francisco, CA

Meet the cellular players and explore their roles as first- and second-line defenders against myriad pathogen enemies.

Don’t Tell, Let Them Inquire: Teaching Climate Science Through Data

(General) *S403b, McCormick Place*

Science Focus: ESS, INF, SEP4, SEP7, SEP8

Anne Gold (*anne.u.gold@colorado.edu*), University of Colorado Boulder

Hilary Peddicord (@NOAA_SOS; *hilped@mac.com*), NOAA/Earth System Research Laboratory, Boulder, CO

Deb Morrison (@educatordeb; *educator.deb@gmail.com*), TREE Educational Services, Boulder, CO

Examining data is a fundamental science practice. Engage in climate science data inquiry activities that can be used in your classroom.

Seed Dispersal: Model Design and Redesign

(Grades 6–10) *S404a, McCormick Place*

Science Focus: GEN, SEP

Nikelle Miller (*nikelle73@yahoo.com*), and **Lynn Wiedelman** (*lwiedel2@gmail.com*), Centennial High School, Champaign, IL

Germinate new learning in your classroom by building your own model seed/fruit to be dispersed by wind. Join us and collect data, analyze the performance of your model, and redesign/retest the model. Handouts and resources.

Using a Web-based Graphing Tool to Analyze and Interpret Weather Data, Climate Change, and Patterns in Weather and Climate

(Grades 6–8) *S404d, McCormick Place*

Science Focus: ESS2.D, ESS3.D CCC1, CCC4, CCC5, SEP4, SEP5

Matthew Mirabello (*mmirabello@amnh.org*), **Hudson Roditi** (*hroditi@amnh.org*), and **Jay Holmes** (*jholmes@amnh.org*), American Museum of Natural History, New York, NY

Explore weather and climate data through a free online graphing tool that simplifies data visualization so students can focus on data analysis and interpretation.

Newton’s Laws Across the Science Curriculum

(Grades 4–College) *S501bc, McCormick Place*

Science Focus: PS, CCC

Daryl Taylor (@DarylScience; *daryl261@gmail.com*), AP Fizzix & Astro Guy, Naugatuck, CT

Get “retro.” Join us for a fast-paced inquiry-based blast of more than 20 participation demos you can use tomorrow with no special equipment! Resources for many more. Freebies to all.

Dynamic Life Science

(Grades 7–12) *S501d, McCormick Place*

Science Focus: LS

John Fedors (*jfedors@wavecable.com*), Science Activities, Lincoln, CA

Experience hands-on WOW demos. Join us and engage in activities using readily available materials to stimulate critical thinking and bridge science disciplines. Use Glo Germ™, Petrifilm plates, magic bubble/wire, various polymers, and more.

Hands-On Science Demos for Elementary and Middle School Teachers

(Grades K–8)

S502a, McCormick Place

Science Focus: GEN, SEP

Carrie Wilson Herndon, Maryville Christian School, Maryville, IL

Ever wonder how to incorporate science and engineering practices into your elementary or middle school classroom? Experience hands-on activities that use common household items to get your students engaged and excited about science!



NSTA Press® Session: Out in the Field. Showcasing Elementary Preservice Interns Teaching Inside-Out

(Grades 2–6)

S502b, McCormick Place

Science Focus: GEN, INF, CCC5, SEP1, SEP3

Robert Blake, Jr. and **Sarah Haines** (*shaines@towson.edu*), Towson University, Towson, MD

Join us as we showcase how activities from the NSTA Press book *Inside-Out: Environmental Science in the Classroom and the Field*, Grades 3–8 are actually applied in teaching by preservice elementary interns.

Seeding STEM in Early Childhood: How Language Skills Grow STEM Thinking

(Grades P–K)

S503a, McCormick Place

Science Focus: ETS1, PS2.A, PS2.B, CCC1, CCC2, SEP

Diana Dumetz Carry, Consultant, Chicago, IL

Explore developmentally appropriate hands-on STEM opportunities for children to grow their capacity for language. As children grow language, they grow their capacity for thinking.

Full STEAM Ahead: A Summer Learning Challenge

(Grades K–8)

S503b, McCormick Place

Science Focus: INF, GEN

Bryan Wunar (*bryan.wunar@msichicago.org*), Museum of Science and Industry, Chicago, IL

Chicago Public Library and the Museum of Science and Industry partnered to create a STEM-based summer learning program for more than 70,000 children in Chicago. Learn strategies for how summer reading and STEM can be paired to address the summer learning loss and to meet the learning needs of all children.

STEMLandia: A STEM-infused Geocaching Adventure

(Grades 6–12)

S504a, McCormick Place

Science Focus: ESS, INF, CCC

Barbara Fortier (*@bfortier*; *bfortier1@une.edu*), University of New England, Biddeford, ME

Erin Bardar (*@Edge_at_TEREC*), **James Larsen** (*jamie_larsen@terc.edu*), and **Barbara MacEachern** (*@edge_at_terc*; *barbara_maceachern@terc.edu*), EdGE at TERC, Cambridge, MA

Teon Edwards, TERC, Cambridge, MA

Open the door and use geocaching to connect STEM learning with location-based adventures. Find out how to navigate your own adventures in STEMLandia.

NESTA Session: National Earth Science Teachers Association Rock and Mineral Raffle

(General)

Skyline W375e, McCormick Place

Science Focus: ESS

Roberta Johnson Killeen (*rmjohnsn@nestanet.org*), National Earth Science Teachers Association, Boulder, CO

Margaret Holzer (*mholzer@monmouth.com*), Chatham High School, Chatham, NJ

NESTA offers more than 50 specimens to choose from for a chance to win display-quality specimens of rocks, minerals, and fossils as well as other Earth science-related materials.

Making the NGSS Come Alive in Your District!

(Grades 6–8)

W176a, McCormick Place

Science Focus: GEN, NGSS

Susan Agger (*sagger@cpsd.us*), Dr. Martin Luther King, Jr. School, Cambridge, MA

Daniel Monahan (*dmonahan@cpsd.us*) and **Marianne Dunne** (*mdunne@cpsd.us*), Cambridge (MA) Public Schools Experience how teachers and coaches in our urban district unpacked the NGSS using an Understanding by Design approach to create a cohesive experience for grades 6–8 students.

Smiling Faces

(Grades 5–9)

W178b, McCormick Place

Science Focus: LS

Suzanne Cunningham (*scunning@purdue.edu*), Purdue University, West Lafayette, IN

Do plants and animals eat the same food? A simple assay for the presence of starch teaches students about the similarity between plants and animals.



Children's Innovation Project

(Grades P–5, College)

W186c, McCormick Place

Science Focus: GEN, CCC, SEP

Melissa Butler, Pittsburgh Allegheny K–5, Pittsburgh, PA
Join us for an interdisciplinary approach to learning about learning, both for children and teachers. We will share the content progressions of our work, including hands-on engagement with circuit blocks.



Any Time, Any Place, Any Pace Lab Science

(Grades 5–12)

W187b, McCormick Place

Science Focus: GEN, NGSS

Christine Gregory and **Arlyliss Lisner** (*alisner@ivirtual.org*), Illinois Virtual School, Edwards

Remove the barriers of schedule and facility and provide student-centered digital blended learning that supports the NGSS and CCSS through Illinois Virtual School.

Strategies for Integrating Disciplinary Literacy and Science: Where the NGSS Meets the CCSS

(Grades 4–8)

W192a, McCormick Place

Science Focus: ESS2, LS1, SEP4, SEP6, SEP7, SEP8

Rebecca Abbott and **Traci Wierman** (*twierman@berkeley.edu*), The Lawrence Hall of Science, University of California, Berkeley

Leverage the NGSS and CCSS ELA to increase disciplinary literacy skills and science understanding for all students—with an emphasis on argumentation. Free materials.

Science and Engineering Practices: Models and Modeling with Real-World Application

(Grades 6–12)

W196a, McCormick Place

Science Focus: GEN, CCC2, CCC3, CCC4, CCC6, SEP

Renee Schwartz (*rschwartz@gsu.edu*), Georgia State University, Atlanta

Model science and engineering practices to understand a system and develop a graphical model to make predictions and evidence-based recommendations to solve an authentic problem.

4:00–4:30 PM Presentation

Minute to Win It! Science Edition

(Grades 7–12)

W475b, McCormick Place

Science Focus: ETS, LS, PS, CCC2, SEP3, SEP6, SEP8

Stephanie Townsend, Memphis (TN) City Schools

Leave with ideas for challenging multisensory assessments based on the popular game show. We will share interactive biology and physical science challenges that assess your students' ability to think quickly and offer definitive explanations.

4:00–5:00 PM Exhibitor Workshop

Climate Change Series 7: Use NGSS as a Pathway to Climate Literacy

(Grades 3–12)

W184bc, McCormick Place

Science Focus: ESS, CCC, SEP

Sponsor: NOAA's National Ocean Service

Frank Niepold, NOAA Climate Program Office, Silver Spring, MD

Kristen Poppleton, WILL Steger Foundation, Minneapolis, MN

The NGSS are the first science standards to include human-caused climate change as a core idea for students. This session will provide examples of how and where climate concepts can be integrated with the NGSS, review climate relevant performance expectations, and discuss NSTA's efforts to identify NGSS-aligned resources.

4:00–5:30 PM Exhibitor Workshop

Grant Writing: Pipelines, Partnerships, and Finding Funding

(Grades K–12)

W192b, McCormick Place

Science Focus: GEN

Sponsor: Ward's Science

Rusti Berent, Ward's Science, West Henrietta, NY

Explore proven strategies for finding science funding at the local, regional, state, and national levels. Learn how to implement in your planning process to secure the materials your students need to succeed. Leave this workshop armed with easy-to-implement tools, techniques, and resources to win funding.

4:00–6:00 PM Networking Opportunity

Pi Day Celebration for Preservice/New Teachers and First-Time Conference Attendees

(Ticket Required: \$20)

M-6

W196b, McCormick Place

Sponsored in part by Texas Instruments

President Juliana Texley is extending a special invitation to Preservice/New Teachers and/or First-Time Conference attendees to join her and other members of NSTA in a special pizza pie and beverage reception in honor of Pi Day. Special guests, door prizes, entertainment, and more! Ticket includes pizza and beverage (beer, soda, or water). Attendance is limited to the first 200 registrants.

Tickets, if still available, must be purchased at the Registration Area before 12 Noon on Friday.

5:00–5:30 PM Presentations**Using Online Labs to Enhance Science Curriculum***(Grades 6–12) Burnham C, Hyatt*

Science Focus: GEN, SEP3, SEP4, SEP6

Kathleen Fritsch, Waukegan High School, Brookside Campus, Waukegan, IL

Learn how to use remote online labs to deliver science experiments using mobile devices that support the NGSS practices.

Leveraging Teacher Leadership to Support the Next Generation Science Standards*(Grades 6–12) W192c, McCormick Place*

Science Focus: GEN, NGSS

Jeremy Peacock, Northeast Georgia RESA, Winterville, GA**Zoe Evans** (@zoe_evans; zoevans@charter.net), Central Middle School, Carrollton, GA

Learn about a research-based model of science instructional leadership to provide practical guidance for teacher leaders to leverage support for reform.

Using the Frameworks of Performance Tasks and Claim, Evidence, and Reasoning to Assess Student Learning*(Grades 6–12) W475b, McCormick Place*

Science Focus: GEN, CCC5, SEP

Rachel Ruggirello, Washington University in St. Louis, MO
Encounter an approach for upgrading current assessment practices to make visible the learning promoted by the NGSS. Model assessments will be provided.**5:00–6:00 PM Meeting****National Earth Science Teachers Association Annual Meeting***Skyline W375e, McCormick Place*Find out what NESTA has been up to. Help plan for the future, and share your thoughts on directions for NESTA. Attendance is open! For further information, visit www.nestanet.org.**5:00–6:00 PM Presentations****Assessing Students' Skills in Using Technology to Conduct Inquiry Activities***(Grades 6–10) Adler C, Hyatt*

Science Focus: GEN, SEP4, SEP7, SEP8

Hui-Yin Hsu (hhsu02@nyit.edu), New York Institute of Technology, Old Westbury

Join us as we share an electronic lab report template developed to guide students' use of technology to conduct inquiry activities. Also, receive rubrics used to assess their new literacy and scientific literacy skills.

Bringing Service Learning into the Biology and Chemistry Classrooms*(Grades 9–12) Dusable C, Hyatt*

Science Focus: LS2.A, LS2.B, PS1.A

Cheryl Dudeck (cldudeck@cps.edu), and **Melanie Yau**, King College Prep High School, Chicago, IL

Delve into how to integrate a local aquatic ecosystem service-learning project with NGSS disciplinary core ideas in biology and chemistry curricula using technology.

Interactive Virtual Field Trips for Science Students*(Grades 5–College) Field A/B, Hyatt*

Science Focus: GEN, SEP4, SEP6

Brett Samantha Dooley (bdooley@patrickhenry.edu), Patrick Henry Community College, Martinsville, VA

Learn to produce easily interactive virtual field trips that foster the observational and critical thinking skills of place-based field trips!

Advancing Scientific Literacy with Inquiry Lesson Plans Using Science Reading Materials*(Grades 9–12) Hyde Park A, Hyatt*

Science Focus: PS, CCC, SEP

Patrice Pages (@ACSCChemMatters; p_pages@acs.org), American Chemical Society, Washington, DC**Susan Cooper** (sjcooper@fgcu.edu), Florida Gulf Coast University, Fort MyersHear how we have developed inquiry lesson plans that support the NGSS and CCSS and are based on successful past *ChemMatters* articles.

The Tree Room: A New Tool for Teaching Evolutionary Relationships

(Grades 6–College) *Hyde Park B, Hyatt*
Science Focus: GEN, INF, CCC1, CCC7, LS3.B, LS4, SEP2, SEP6, SEP8

David Heiser (*david.heiser@yale.edu*), Yale Peabody Museum of Natural History, New Haven, CT
Berkeley’s landmark Understanding Evolution website just got even better with The Tree Room. This companion site brings evolutionary relationships to life for students and teachers.

International Baccalaureate Biology, Chemistry, and Physics Field Trip to Patagonia

(Grades 10–12) *Jackson Park D, Hyatt*
Science Focus: LS, PS1.B, PS3, SEP4

Paula Daurat, Patricia Benmergui (*patricia.benmergui@sanandres.esc.edu.ar*), and **Ana Varela**, St. Andrew’s Scots School, Olivos, Argentina
Come as we share the amazing scientific experience we live every year with our students in Patagonia, Argentina. We develop collaborative hands-on activities within the Group 4 Project framework, an IB curriculum component.

Engineering Project Slices: How to Use Class Period-Length Physics-based Engineering Tasks

(Grades 9–12) *S404 b/c, McCormick Place*
Science Focus: ETS, PS, SEP

Katherine Shirey (*katherineshirey@gmail.com*), Grad Student at University of Maryland, College Park
Jordan Pasqualin (*@jpasqualin; jpasqualin@gmail.com*), Jones College Prep, Chicago, NJ
Use short-duration engineering tasks to introduce engineering, provide multiple opportunities for students to practice the processes, and assess student growth in engineering and physics.

Teaching Inquiry and the Nature of Science, K–8

(Grades K–8) *S504d, McCormick Place*
Science Focus: GEN, SEP

Randy Bell (*randy.bell@oregonstate.edu*), Oregon State University, Corvallis
Kathy Cabe Trundle (*kcetrundl@ncsu.edu*), North Carolina State University, Raleigh
Engage in activities designed to make learning about the nature of science fun for your elementary students. Take home free resources and lessons.

Modeling and Professional Development in a NSF Mathematics and Science Partnership Project: Insights and Lessons Learned

(Grades 3–8) *S505a, McCormick Place*
Science Focus: GEN, SEP

Arthur Camins (*@arthurcamins; arthurcamins@gmail.com*) and **Katheryn Kennedy** (*katheryn.kennedy@stevens.edu*), Stevens Institute of Technology, Hoboken, NJ
What professional development strategies support teachers as they enact NGSS science and engineering practices in their classrooms? Join us as we share insights from our work creating evidence-based, explanation-focused PD.

Go with the Flow! Changing Your F2F Professional Development to Online Sessions

(Grades K–8) *S505b, McCormick Place*
Science Focus: GEN

Ellen Thompson (*ellen.thompson@uah.edu*), AMSTI-UAH, Huntsville, AL
Maria Young (*maria.young@uah.edu*), The University of Alabama in Huntsville
Calling all professional development facilitators! Come hear how we changed our face-to-face kit-based training to quality online professional learning for our K–8 science teachers.

INF Finding Our Way: Making Connections with Students’ Culture and STEM

(Grades 6–8) *W176b, McCormick Place*
Science Focus: ESS1, ESS2, ETS, PS2, PS4, CCC1, CCC2, CCC3, SEP

Toni Kauai (*@kumukauai; kumukauai@gmail.com*), Virginia Tech, Blacksburg
Presented by a Native Hawaiian teacher, this session will explore how to use the engineering design process to connect physical science and Earth and space science and the geometry and trigonometry of angles with *Ho’okele*, the Polynesian cultural practice of navigation.



Advancing Science Learning: Teaching Elementary Physical Science Concepts Through Engineering Problems

(Grades K–6) *W186c, McCormick Place*
Science Focus: PS, SEP

Kevin Mason (*masonk@uwstout.edu*), and **Brian McAlister** (*mcalisterb@uwstout.edu*), University of Wisconsin–Stout, Menomonie
Discover how elementary teachers are using engineering problems to deepen their students’ understanding of physical science concepts and science and engineering practices.

**No Child Left Inside***(Grades 8–12)**W187a, McCormick Place*

Science Focus: GEN, SEP

Scott McCreary (*smccreary@lw210.org*), Lincoln-Way North High School, Frankfort, IL

Discover how natural areas became a large part of our school's biology curriculum and how our community pulled together to build our school's outdoor classrooms.

**What Do I Do with My LOVE Lessons?***(Grades K–5)**W190b, McCormick Place*

Science Focus: GEN, SEP

Jaymee Herrington, Katy (Tex.) ISD

Transform some of your favorite lessons with new designs based on the NGSS—showing how progressions and modeling are crucial components in your new lesson.

Play Your GAMES: Generating Academic Meaning from Entertainment Systems*(Grades 5–12)**W196c, McCormick Place*

Science Focus: GEN, SEP

Tim Kubinak, John Yeates Middle School, Suffolk, VA
PYG is a game play program designed to exploit the interests of diverse groups of students within the context of reinforcing STEM methodology and problem-solving acuity.**5:00–6:00 PM Hands-On Workshops****Promoting a Science-Talk Learning Community***(Grades 6–12)**Grant Park A, Hyatt*

Science Focus: GEN

Rebecca Stanley (*rls0320; rstanley@ncnewschools.org*), North Carolina New Schools, Raleigh

Explore a rubric to measure the current level of science talk within your classes, as well as tools and strategies to shift responsibility to your students.

Finding Your Way: Adapting to Argument and the Practices*(Grades 7–11)**Grant Park B, Hyatt*

Science Focus: GEN, SEP

Jay Staker (*@iastatejay; jstaker@iastate.edu*), Iowa State University, Ames**Leah McDowell-Spink** (*mcdowell.leah@gmail.com*), Haine Elementary School, Cranberry Township, PA

Shifting to the practices is intimidating. Explore an argument-based inquiry approach using converted traditional activities to explore their learner questions using the Science Writing Heuristic approach.

Engaging Elementary Students with Earth's Systems*(Grades 3–5)**Grant Park D, Hyatt*

Science Focus: ESS2.A, ESS2.C

Sean Musselman (*@MrMusselman; musselman@bpsk12.org*), Burlington (MA) Public Schools

Put yourself in your students' shoes and engage in lessons designed to teach elementary level students about Earth's systems and their interactions with one another. The NGSS Earth Systems core ideas for grades 4–5 will be the primary focus.

The Power of Stories to Promote Deeper Conceptual Understanding*(Grades 2–12)**Jackson Park B, Hyatt*

Science Focus: GEN, SEP

Hethyr Tregerman (*@HethyrTregerman; hander3@luc.edu*), Loyola University Chicago, IL**Rebecca Fligelman**, Chicago (IL) Public Schools**Emily Mathews** (*emilylippert@sbcglobal.net*), Patrick Henry Elementary, Chicago, IL

Encounter strategies such as concept mapping to explore the power of story and its impact on student learning.

Easy Methods to Incorporate Nature of Science and Scientific Inquiry in Everyday Lessons

(Grades 6–12) Jackson Park C, Hyatt

Science Focus: GEN, CCC1, CCC2, CCC4, SEP

Laura Tinigin and **Laura Robinson** (@lrbios; lrobinson@gmail.com), Western Michigan University, Kalamazoo

Renee Schwartz (rschwartz@gsu.edu), Georgia State University, Atlanta

Receive a comprehensive overview of nature of science and nature of scientific inquiry objectives and leave with ways to easily incorporate them into existing lessons.



NSTA Press® Session: Everyday Engineering

(Grades 4–9) S401d, McCormick Place

Science Focus: ETS

Richard Moyer (rhmoyer@umich.edu) and **Susan Everett** (everetts@umd.umich.edu), University of Michigan–Dearborn

Use simple activities to integrate NGSS engineering content and practices into your curriculum. Workshop will focus on activities found in *Science Scope*'s regular column, “Everyday Engineering.”

Empower All Students with Neuroscience!

(Grades 3–College) S402b, McCormick Place

Science Focus: LS

Kelsey Voller (@missvoller; kelsey_voller@icloud.com), Cheney Middle School, West Fargo, ND

Find out how to incorporate neuroscience concepts—such as multiple intelligences and brain plasticity—to enrich classroom culture, simplify differentiation, and motivate students.

Learning Gardens: Transforming Your School Yard into an Outdoor STEM Lab

(Grades K–12) S403b, McCormick Place

Science Focus: GEN, INF, SEP

Karan Wood (karan@captainplanetfdn.org), Captain Planet Foundation, Atlanta, GA

Discover designs for one-day garden installations. Explore free standards-based activities that turn school gardens into outdoor STEM labs, and learn how students can protect the Earth through garden-based learning.

Microalgae to Biofuel: A Pipeline for Integrating and Teaching Crosscutting STEM Concepts

(Grades 7–12) S404a, McCormick Place

Science Focus: LS, CCC, SEP

Shawn Kenaley (bti_edu_1s@cornell.edu), Boyce Thompson Institute for Plant Research, Ithaca, NY

An integrated, interdisciplinary approach will be required to realize the full potential of oil-producing microalgae as biofuels—a future industry created and sustained by a skilled STEM workforce! Join us and construct a simple classroom photobioreactor, permitting students to design and execute experiments to determine optimal methods for growing algae.

Assessing Three Dimensions of the NGSS in Middle School Genetics

(Grades 6–9) S404d, McCormick Place

Science Focus: LS, CCC, SEP

Barbara Nagle (bnagle@berkeley.edu), and **Maia Willcox** (mwillcox@berkeley.edu), The Lawrence Hall of Science, University of California, Berkeley

Engage in hands-on activities and explore assessments related to the three dimensions of the NGSS for heredity: modeling, inheritance and variation of traits, and cause and effect.

Using Electronic Devices to Develop Geospatial Skills and Enhance Analysis of Citizen Science Data

(General) S501bc, McCormick Place

Science Focus: GEN, NGSS

Mary Haskins, Rockhurst University, Kansas City, MO
Smartphones, iPads, and tablets provide a unique and easy method to collect data for geospatial analysis. Find out how to use your electronic devices to collect geospatial data for analysis and leave equipped to implement this process in your classroom.

Hands-On Science: Innovative Activities for Applying Science and Engineering Practices in the Classroom

(Grades P–8) S502a, McCormick Place

Science Focus: GEN, SEP

Eric Welker (eric@raft.net), RAFT San Jose, CA

Experience how to conduct a few simple yet powerful activities that emphasize the use of the science and engineering practices in the NGSS.

Addressing Student Misconceptions in K–2 Science with Children’s Literature

(Grades P–3) *S502b, McCormick Place*
Science Focus: PS

Lisa Felske, Harris County Dept. of Education, Houston, TX

Are you identifying and addressing student misconceptions? Topics covered include observation/inference, buoyancy/density, heat/temperature, time scale in geologic events, and misconceptions about plant and animal adaptations.

Warming Up to Engineering: How Can I Keep My Snowman from Melting?

(Grades 2) *S503a, McCormick Place*
Science Focus: PS, SEP

Michele Lee (*scienceedchica@gmail.com*), Temple University, Philadelphia, PA

Marlene Hilkwitz (*mah465@drexel.edu*), Drexel University, Philadelphia, PA

Frosty vs. puddle—come examine how assessment can be embedded throughout an inquiry-based lesson in which elementary students (grade 2) use a design process to learn about properties of materials and heat transfer.

Building on Inquiry Through STEM

(Grades 3–8) *S503b, McCormick Place*
Science Focus: GEN

John Zenchak (*jjzenchak@noctrl.edu*) and **Mary Jean Lynch** (*mlynch@noctrl.edu*), North Central College, Naperville, IL

Engage in an inquiry-based activity and a STEM activity to better understand the relationship between these two effective learning approaches.

Science Seminars: How Argumentation Helps You Meet the NGSS and CCSS at the Same Time

(Grades 4–8) *S504a, McCormick Place*
Science Focus: GEN, SEP

Traci Wierman, The Lawrence Hall of Science, University of California, Berkeley

Experience then learn how to create your own Science Seminar, an instructional sequence that engages students in argumentation in a lively, rigorous way.

Science Teacher as Designer: Making the Tacit Designer in You Explicit

(Grades K–12) *W175 a/b, McCormick Place*
Science Focus: ETS1, SEP1, SEP3, SEP4, SEP6, SEP7

David Crismond, The City College of New York, NY

The challenge of the NGSS to place engineering design on equal footing with scientific inquiry may seem less daunting when the idea that “teachers are designers” is explored and experienced.

Math with a “Porpoise”: Explore Data Analysis Tools for the Middle School Classroom, Modeled with Animal Behavior Data

(Grades 6–8) *W175c, McCormick Place*
Science Focus: LS, INF, SEP4

Christine DeMauro (*@WCSEducation; cdemauro@wcs.org*), New York Aquarium, Brooklyn

Daniel Golub (*golub.dan@gmail.com*), P.S. 089 Cypress Hills, Brooklyn, NY

Aquariums inspire stronger data analysis! Learn how analyzing animal behavior data elevates math skills in science classrooms via graphing and measures of center. Connections to the CCSS and NGSS shared.

The Power of Questioning

(Grades K–5) *W192a, McCormick Place*
Science Focus: GEN, CCC, SEP

Julie McGough, Valley Oak Elementary School, Fresno, CA

Learn how to utilize engaging questioning strategies to foster inquiry, depth of knowledge, and communication of science concepts that also teach ELA standards!

The Rube Goldberg Machine Contest: Invention in the Classroom

(Grades 6–College) *W196a, McCormick Place*
Science Focus: ETS1, PS1.B, PS2.A, PS2.B, PS3.A, PS3.B, PS3.C, PS4.A, INF, CCC, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Shawn Jordan (*shawn.s.jordan@asu.edu*), Arizona State University at the Polytechnic Campus, Mesa

Rube Goldberg Machine Contests challenge middle school, high school, and college students to build complex inventions that complete simple tasks while linking STEM and the arts. Join us as we share examples.

5:30–6:00 PM Presentations

Innovative Instructional Technology to Engage and Assess the Science Classroom

(Grades 6–12)

Burnham C, Hyatt

Science Focus: GEN

Mark Prosis (mark.prosis@d128.org) and **Chris Wolf** (wolfbioedu@; chris.wolf@d128.org), Vernon Hills High School, Vernon Hills, IL

Instruction for the 21st century requires that students develop critical life skills by accessing information, collaborating, communicating, and demonstrating creativity and entrepreneurship through these instructional technologies.

Free Mobile Device Apps for Data Collection and Analysis

(Grades 6–College)

W192c, McCormick Place

Science Focus: GEN, NGSS

Rebecca Vieyra (@RVieyraAEF; rebecca.e.vieyra@nasa.gov), Einstein Fellow, NASA Headquarters, Washington, DC Find out about free mobile device apps for Android and how they can be used to collect and analyze data in and outside of the classroom. Example lesson ideas and engineering projects associated with the NGSS will be presented.

Using the Lab Report as Assessment and Evidence of Achievement of NGSS Science Learning Progressions for Grades 6–12

(Grades 6–12)

W475b, McCormick Place

Science Focus: GEN, SEP1, SEP3, SEP4, SEP8

Laura Cottongim (laura_sheehan@universitylaboratoryschool.org) and **Betty Skiles** (betty_skiles@universitylaboratoryschool.org), University Laboratory School, Honolulu, HI

The laboratory investigation is a learning tool and assessment piece within the science curriculum that inherently meets the NGSS. The lab report can be designed to become progressively more advanced and offer opportunities for formative and summative assessment through an authentic disciplinary experience.

5:30–7:30 PM Networking Opportunity

Equity in Science Reception, Sponsored by National Geographic Society

Prairie B, Hyatt

Equity in Science Education is an idea nationwide that must look at a more targeted and comprehensive approach to improve educational achievement and growth as well as closing the STEM achievement and opportunity gap throughout the nation. Join us for a conversation about how to better serve communities of color and underserved students in STEM.

8:00–10:00 PM Networking Opportunity

Celebrate Einstein's Birthday...with a Tribute to the Blues Brothers!

Regency Ballroom, Hyatt

Professor Einstein will be joining us in celebration of his birthday. Additional evening entertainment will include a tribute to the Blues Brothers!

Cash bar. No registration or cost required.

8:00–8:30 AM Presentations

Crosscutting Educators: Exploring Effective Collaboration Between Formal and Informal Science Sectors

(Grades K–12) *S402a, McCormick Place*
Science Focus: INF, NGSS

Jameela Jafri (jameela.jafri@afterschoolmatters.org), After School Matters, Chicago, IL

Julianne Kanter (jkanter@expandedschools.org), The After-School Corp., New York, NY

Using results from the Frontiers in Urban Science Exploration study, we will share the impact of collaboration between informal and formal science educators on the NGSS.

STEM-Inspired Physics!

(Grades 9–12) *S501a, McCormick Place*
Science Focus: PS, CCC, SEP

Mimi Kallwitz (mkallwitz@d155.org), **Amanda Senese** (asenese@d155.org), **Jenny Morris** (jmorris@d155.org), and

Kristin Glover (Kgllover@d155.org), Prairie Ridge High School, Crystal Lake, IL

Leave with a complete description of how to implement two NGSS- and STEM-inspired projects for your high school physics class! Student examples and takeaways provided.

Building Literacy Back into Science

(Grades 6–12) *S501d, McCormick Place*
Science Focus: GEN

Jason Forbrook (jason.forbrook@yahoo.com), Waukegan High School, Washington Campus, Waukegan, IL

Stop sacrificing content for skills! Improve science instruction by addressing both content and *CCSS ELA* at the same time.

Think Tank to Shark Tank: Engineering to Entrepreneurship

(Grades 5–9) *W186c, McCormick Place*
Science Focus: ETS, INF

Karen Plaster, The University of Akron, OH

Hear about an interdisciplinary Problem-Based Learning workshop where grades 6–10 students were challenged to brainstorm, develop, and perfect a solution to a problem with the final presentation to a “Shark Tank.”

8:00–9:00 AM Presentations



NSTA Press® Session: Inquiry and Literacy for Grades 3–5 Science: A Perfect Pair for Making Meaning of the Natural World

(Grades 3–5) *S401bc, McCormick Place*
Science Focus: GEN, SEP8

Jessica Fries-Gaither, Columbus School for Girls, Columbus, OH

The authors of *Inquiring Scientists*, *Inquiring Readers* share literacy strategies that support grades 3–5 science instruction. Strategies are integrated into learning cycle lessons. Engage in a literacy-infused inquiry activity from the book.

Addressing Diverse Learning Needs at Both Ends of the STEM Spectrum

(Grades 5–8) *S504bc, McCormick Place*
Science Focus: GEN

Gina Tesoriero (@STEMSUCCESEDU; ginatezoriero@gmail.com) and **Amanda Solarsh** (@stemsuccesedu; amandasolarsh@gmail.com), Simon Baruch MS104, New York, NY

Encounter strategies to engage lower level students in content while providing higher level students with support for communication and collaboration in the STEM classroom.

Building Buoyant Boats: A Cross-curricular Case Study in Teaching Science to Children with Learning Disabilities

(Grades 1–6) *S504d, McCormick Place*
Science Focus: GEN

Greg Hill-Ries (greggh@mmfnsync.org), **Stacy Miller** (stacym@mmfnsync.org), and **Rebecca Barnett** (rebeccab@mmfnsync.org), Mary McDowell Friends School, Brooklyn, NY

Applying language to science is challenging for students with language-based learning disabilities. Join us as we examine the design and implementation of a unit on buoyancy.

A Way with Words: Integrating Science and Engineering in Reading

(Grades K–5) *S505a, McCormick Place*
Science Focus: ETS, CCC, SEP

Brian Raygor (braygor@wcboe.org), Wicomico Board of Education, Salisbury, MD

Discover how to construct lessons integrating science and engineering into your reading time. Take home a CD with classroom resources.

Claim, Evidence, and Reasoning: Using Science Probes to Develop Scientific Literacy

(Grades 1–5) *S505b, McCormick Place*

Science Focus: GEN

Luis Arroyo (*larroyo2@bostonpublicschools.org*), Nathan Hale Elementary School, Boston, MA

Holly Rosa (*hrosa@bostonpublicschools.org*), Boston (MA) Public Schools

Hear how Boston Public Schools science specialists implement the Claim-Evidence-and Reasoning framework using science probes.

The Intersection of NGSS and CCSS: Promoting Content Knowledge and Literacy in the Science Classroom

(Grades 6–12) *W178b, McCormick Place*

Science Focus: GEN

Terry McHugh (*tmchugh@wps60.org*), Waukegan (IL) Public Schools

Karen Frank (*kfrank@wps60.org*), Waukegan High School, Waukegan, IL

Explore a range of vocabulary-based literacy strategies that build content knowledge across science disciplines. Join us as we model instructional strategies through interactive activities.

Using Flipped Classrooms to Assess the Mastery of Objectives in Middle School

(Grades 6–8) *W181a, McCormick Place*

Science Focus: GEN

John Pappas (*@CWScience36; johnpappas@winnetka36.org*), Carleton Washburne School, Winnetka, IL

Encounter how to effectively use a mastery model to assess student performance on objectives in a flipped classroom framework.



Green Proposals to Meet NGSS and CCSS, ELA

(Grades 9–12) *W187a, McCormick Place*

Science Focus: CCC, DCI, SEP

Lisa McKenna (*lismck@d219.org*) and **Susan Trzaskus** (*sustrz@d219.org*), Niles North High School, Skokie, IL

Students solve real school sustainability problems by writing grant proposals to the district to fund improvement projects. Allows teachers to incorporate NGSS and CCSS ELA with engineering practices at all levels and core topics.

Building Biomedical Curricula Through Scientist Teacher Partnerships

(Grades 11–College)

W191, McCormick Place

Science Focus: LS, INF

Berri Jacque (*berri.jacque@tufts.edu*), Tufts University School of Medicine, Boston, MA

Come learn about the advantages of using partnerships between teachers and scientists to build curricula that emphasize the three dimensions of the NGSS.

Infusing Practices into Lesson Sequences

(Grades K–12)

W193a, McCormick Place

Science Focus: GEN, NGSS

Diane Johnson, Lewis County Board of Education, Lexington, KY

How can we assess current lessons to determine how they might meet the NGSS and where they might fall short? How can we systematically infuse practices to support student learning of science content, while deepening understanding of the practices? Join us and experience a process that can be applied to a range of resources.

Science Fair and the NGSS: Bringing Student Research to Your Institution

(Grades P–12)

W193b, McCormick Place

Science Focus: GEN, INF, NGSS

Michael Lowry (*mlowry@mccallie.org*), **Karah Nazor** (*knazor@mccallie.org*), and **Nancy Olencheck** (*nolencheck@mccallie.org*), The McCallie School, Chattanooga, TN

See how the blueprint of the NGSS is linked to the structure of the science fair. Join us as we offer models for how to implement both in your classroom.

Connecting Physical Science, Design, and Engineering Through Underwater Robotics

(Grades 6–12)

W196c, McCormick Place

Science Focus: ETS, PS2.A, PS2.B, PS2.C, INF, CCC2, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Arthur Camins (*@arthurcamins; arthurcamins@gmail.com*), Stevens Institute of Technology, Hoboken, NJ

Join us as we delve into underwater robotics projects as vehicles for teaching and connecting physical science and engineering design principles, along with the unique challenges involved.

8:00–9:00 AM Hands-On Workshops



NSTA Press® Session: The Basics of Data Literacy: Helping Your Students (and You!) Make Sense of Data

(Grades 6–College) *S401a, McCormick Place*
 Science Focus: GEN, SEP3, SEP4, SEP5

Tony Bartley (*abartley@lakeheadu.ca*), Lakehead University, Thunder Bay, Ont., Canada

Michael Bowen (*gmbowen@yahoo.com*), Mount Saint Vincent University, Halifax, N.S., Canada

Join the authors of this groundbreaking book on data literacy in science as they present their strategies to help students produce, analyze, and interpret data.

Playing a Jenga-based Game to Learn About Ecosystem Dynamics

(Grades 4–College) *S401d, McCormick Place*
 Science Focus: LS2, CCC4, CCC7

Greg Bartus (*gregory.bartus@stevens.edu*), Stevens Institute of Technology, Hoboken, NJ

President: Kathy Kennedy (*kkenned3@stevens.edu*), Stevens Institute of Technology, Hoboken, NJ

This Jenga-based game aims to teach the importance of biodiversity (species richness and biological interactions or linkages) during ecological disruption. Other variations to the game are possible as well.

Shattering the Gender Binary Misconceptions in Life Science

(Grades 6–College) *S402b, McCormick Place*
 Science Focus: LS

Andrew Milbauer (*amilbauer@greeleyschools.org*), Northridge High School, Greeley, CO

Find ways to explore the biological basis gender in science using STEM and *Common Core*. Gender is far more diverse than Mendelian inheritance.

Record and Analyze Seismic Data in the Classroom with Free IRIS Software!

(Grades 6–College) *S404a, McCormick Place*
 Science Focus: ESS, SEP4

Alan Kafka (*kafka@bc.edu*), Boston College, Chestnut Hill, MA

Tammy Bravo (*tkb@iris.edu*), IRIS, Washington, DC
 Monitor the Earth from your classroom! Display real-time data from school seismographs or nearby professional seismometers. Students can determine earthquake locations, magnitudes, and more.

STEM Integration for Learning in Grades 4–8: The EngrTEAMS Project

(Grades 4–8) *S502a, McCormick Place*
 Science Focus: ETS, SEP5, SEP7

Tamara Moore (*tamara@purdue.edu*) and **Siddika Guzey** (*sguzey@purdue.edu*), Purdue University, West Lafayette, IN
 EngrTEAMS stands for Engineering to Transform the Education of Analysis, Measurement, and Science. Join us and learn guidelines to develop STEM integration units that use engineering design to learn science content and meaningfully integrating data analysis and measurement in grades 4–8.

Don't Throw the Baby Out with the Bathwater! How to Modify Elementary Science to Optimize Learning

(Grades P–6) *S502b, McCormick Place*
 Science Focus: GEN, SEP

Lori Ihrig (*@drlmihrig; lori-ihrig@uiowa.edu*), The Belin-Blank Center, Iowa City, IA

Find out how to modify your elementary science curriculum for optimized student learning without throwing it out. Learn key ways to change existing curriculum to create fruitful inquiries for your students.

Creating a Collaborative Culture: Success Stories and Strategies

(Grades 4–8) *S503b, McCormick Place*
 Science Focus: GEN, SEP

Liz Martinez (*emartinez@imsa.edu*), Illinois Mathematics and Science Academy, Aurora

Engage in inquiry-based activities that focus on practices, techniques, and strategies required to establish and foster a collaborative culture for students in the classroom.

Model Building as a Prerequisite to Mass Production: The Importance of Engineering Design in Relation to Cost and Safety

(Grades 4–8) *S504a, McCormick Place*
 Science Focus: ETS

William Sumrall (*sumrall@olemiss.edu*), The University of Mississippi, University, MS

This activity-based presentation focuses on model building prior to building prototypes and eventual mass production. We'll cover cost, safety, and other factors. Handouts.

All the Water

(Grades 2–8, College)

W178a, McCormick Place

Science Focus: ESS2, ETS2, CCC2, CCC4, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Vicki Ardisana (vicki.ardisana@nau.edu), Northern Arizona University–Yuma

Wade into water concepts and issues through this inquiry/problem/question/research/solution cycle as taught to fourth-graders.

Developing Models that Have Explanatory and Predictive Power

(Grades K–12)

W179a, McCormick Place

Science Focus: GEN, SEP2

David Brothers (davidbrothers@wentzville.k12.mo.us), Wentzville (MO) R-IV School District

Developing and using models is an unfamiliar science practice for many teachers. Participants, in groups, will construct a model for water evaporating and condensing in an open and a closed container as well as discuss how to engage students in modeling at different grade levels and abilities.

Creating Meaning Through the Crosscutting Concepts

(Grades K–12)

W180, McCormick Place

Science Focus: GEN, CCC

Jennifer Gottlieb (jgottlieb@mysd.net), Macomb Intermediate School District, Clinton Township, MI

The crosscutting concepts are thinking tools that allow students to connect ideas and make sense of phenomena. Come explore ways to embed them into instruction.

Uncovering the Awesomeness of Our Science Students

(Grades 6–8)

W181c, McCormick Place

Science Focus: GEN, NGSS

Sarah Renish-Ratelis (sarenish@yahoo.com), Kenosha (WI) Unified School District

Most students will do inquiry-based investigations but will have difficulty in constructing scientific explanations. Join us as we explore ways to strengthen communication skills through the use of scaffolding, workshop models, and building learner confidence.



Your Kids Can, Too! Scientific Argumentation for All Students

(Grades 5–10)

W187b, McCormick Place

Science Focus: LS1, CCC1, CCC2, SEP4, SEP7

Deena Gould (DNAMartin@cox.net), Arizona State University, Tempe

Engage in exploration, meaning-making, and argumentation about core concepts in life sciences. Experience strategies, resources, and real examples for success with all learners, including English language learners.

Biodiesel: Making Alternative Energy in the Classroom

(Grades 7–12)

W192a, McCormick Place

Science Focus: ESS3.A, ESS3.C, LS2.B

David Zeiger (dzeiger@trinitychristian.org) and **Curtis Blagburn** (cblagburn@trinitychristian.org), Trinity Christian Academy, Addison, TX

Fuel new learning in your classroom. We will cover conservation, lab skills, and alternative fuels. Join us as we share our students' experiences creating biodiesel in the classroom. Go from used oil to bulk quantities of fuel!

Writing Engaging Scientific Case Studies

(Grades 9–12)

W192c, McCormick Place

Science Focus: GEN, INF, CCC

Timothy Gay, Boston Latin School, Boston, MA

Learn simple ways to write engaging scientific case studies. Use your original research data (or someone else's) to cultivate higher order thinking in your students.

Ready? Set? Fire Up a Design Challenge

(Grades 6–12)

W194a, McCormick Place

Science Focus: ETS

Jennifer Cheesman (@azspacecampgirl; jcheesman@peoriaud.k12.az.us), Zuri Hills Elementary, Sun City, AZ

Test your students' engineering skills with a series of design challenges that will incorporate STEM plus cooperative learning—geared toward grades 6–12 classrooms.

8:30–9:00 AM Presentations

The Illinois State Geological Survey: Public Field Trip Guidebooks as a Resource for Earth Science Instruction

(General) *S402a, McCormick Place*
 Science Focus: ESS, INF

Lisa Anderson (@ILGeoSurvey; *lisander@illinois.edu*), University of Illinois at Urbana-Champaign

The Illinois State Geological Survey discusses how public field trip guidebooks can be used in Earth science instruction. Learn how to find similar resources in your state.

Engaging Students with Literacy Strategies

(Grades 6–12) *S501d, McCormick Place*
 Science Focus: GEN, NGSS

Kellie Dean (*kdean@d125.org*), Adlai E. Stevenson High School, Lincolnshire, IL

Science literacy can be a challenge for students. Learn how to create engaging literacy activities that support the NGSS and CCSS.



Designing a Bioretention Basin

(Grades 7–12) *W186c, McCormick Place*
 Science Focus: ETS, SEP1, SEP2, SEP4, SEP6

Nidaa Makki (*nmakki@uakron.edu*), The University of Akron, OH

Laura Pancoe-Wilhite, Copley High School, Akron, OH
 Storm water runoff is a problem in many communities. Hear about an activity in which students learn about how engineers solve real-world problems. Students engage in designing, building, and testing bioretention models to address a problem in their community.



Classroom-ready Inquiry Labs for Biology and Chemistry

(Grades 6–12) *W190b, McCormick Place*
 Science Focus: LS, PS, INF

Julie Widinski (*jwidinski@lw210.org*) and **Ross Widinski** (*rwidinski@lw210.org*), Lincoln-Way East High School, Frankfort, IL

Inquiry is an essential process for science students, and this session will provide methods for converting teachers' current laboratories into NGSS-supported inquiry labs.

9:30–10:00 AM Presentations

“But How Did They Know?” Teaching Chemistry “Data First”

(Grades 10–12) *S501a, McCormick Place*
 Science Focus: PS, SEP4

Amber Szymczyk, Rice University, Houston, TX

Build scientific thinkers by reordering your chemistry instruction to put the “Data-First”! See examples and receive complete lesson plans to implement in your own classroom.



The Science of Sustainable Energy

(Grades 9–12) *W187a, McCormick Place*
 Science Focus: ETS2, LS1, LS2, PS1, PS3, PS4.A, CCC2, CCC4, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5

Andrew Bowersox, Greenfield High School, Greenfield, MA

Curriculum plans for five sustainable energy classroom projects will be shared, including solar concentrators, solar photovoltaics, anaerobic digesters, cellulosic biofuels, and energy auditing of buildings. Handouts.



Analysis of a Speed and Velocity Lesson: Implications for Students with Learning Disabilities

(Grades 6–8) *W187b, McCormick Place*
 Science Focus: PS2.A

Gregory Taylor (*gregory_taylor@mail.harvard.edu*), Harvard Graduate School of Education, Cambridge, MA

Join us as we review a speed and velocity lesson that supports NGSS middle school core ideas and its implications for students with learning disabilities. Come away with general, research-validated, instructional supports that help students with learning disabilities succeed.

Scientific Practice: Data Analysis by Middle School and High School Students

(Grades 6–12) *W195, McCormick Place*
 Science Focus: GEN, SEP

Laura Robertson and **Mahua Chakraborty**, East Tennessee State University, Johnson City

Examine data analysis for middle school and high school students. Numerous strategies, activities, and methods of assessment will be provided in the context of the NGSS.

9:30–10:30 AM Presentations



NSTA Press® Session: Activating Adolescent Science Identity: Research and Practice

(Grades 6–11) *S401bc, McCormick Place*
Science Focus: INF

Julia McQuillan (*jmcquillan2@unl.edu*), University of Nebraska, Lincoln

Review findings from a study of grades 9–10 students on the relative influences of science-themed comics on youth engagement in science and science identity. Funded by the NIH, the Biology of Human Project develops innovative deliverables and conducts learning research on science identities.

Playing Against Nature: Natural Hazards Mitigation as a Relevant (and NGSS-focused) Topic for Scientific Argumentation

(Grades 7–12) *S403a, McCormick Place*
Science Focus: ESS, CCC1, SEP4

Seth Stein, Northwestern University, Evanston, IL

Combine geoscience data with simple ideas from economics, policy, and risk analysis to explore mitigation options for hazards affecting society into a very uncertain future.

I Introduced the Claim-Evidence-Reasoning Framework...Now What?

(Grades 5–8) *S504bc, McCormick Place*
Science Focus: GEN, SEP6, SEP7

María González-Howard, Boston College, Chestnut Hill, MA

For teachers already focusing on argumentation, we will discuss examples of student work and strategies for supporting greater student proficiency with the CER framework.

Making Space for Meaningful Connections with Science: Merging Science and Literacy Through Inquiry

(Grades P–8) *S505a, McCormick Place*
Science Focus: GEN, INF, CCC, SEP

Lara Smetana and **Katie Gnau**, Loyola University Chicago, IL

Sarah Anderson, Peggy Notebaert Nature Museum, Chicago, IL

Samantha Ashbaker, Chicago Academy of Sciences, Chicago, IL

Heidi Rouleau, The Field Museum, Chicago, IL

Collaborate with informal institutions to engage students in standards-based inquiries that foster building skills in science, social studies, and literacy and are relevant to students' local communities.

Next Generation Science Standards Stations

(Grades 2–8) *S505b, McCormick Place*
Science Focus: GEN, NGSS

Halle Quezada, Eugene Field Elementary School, Chicago, IL

Discover planning and implementation of NGSS stations. Emphasis will be placed on assessment, portfolios, room organization, mini-lessons, and student routines. Resources will build confidence in using stations while transitioning to the NGSS.

Multicultural STS: Teacher Preparation Model Integrating Science, Technology, and Society (STS) with Multicultural Community Resources

(Grades 1–6, College) *W176b, McCormick Place*
Science Focus: GEN, NGSS

Jiyeon Yoon, The University of Texas at Arlington

Review findings from a study on elementary science educator preparation for teaching culturally and linguistically diverse (CLD) learners by integrating science-technology-society (STS) with multiculturalism.

Modeling in Science, It's Not Just One Practice!

(Grades 6–12) *W178b, McCormick Place*
Science Focus: GEN, SEP2, SEP6, SEP7

Eric Boehm, International Magnet School for Global Citizenship, Hartford, CT

Receive an overview of a research-based protocol on modeling in science and its foundational role in other practices.

NGSS Practices and the Reason for the Seasons

(Grades 6–8) *W181a, McCormick Place*
Science Focus: ESS, SEP

Kathy Kennedy, Stevens Institute of Technology, Hoboken, NJ

Hear how we have modified a “reason for the seasons” lesson to highlight the NGSS practices while scaffolding for varied student math levels.

Media and Middle School Making: Partners in Inspiring Engineering and Design

(Grades 6–9) *W181b, McCormick Place*
Science Focus: ETS, CCC6, SEP6

Rachel Connolly, WGBH, Boston, MA

Discover strategies and tools for teaching engineering practices through stories of innovation and hands-on projects from Design Squad, NOVA, and PBS LearningMedia.



Discovery Box Engineers: Growing a STEM Classroom

(Grades 4–7) *W186c, McCormick Place*

Science Focus: ETS, SEP

Sherri Cianca (*scianca@niagara.edu*), Niagara University, Niagara University, NY

Explore a transdisciplinary integration approach to designing STEM discovery boxes—an approach that organizes curriculum around real-life problems, questions, or concerns and that calls for a holistic interconnection and interdependence of science, technology, engineering, and mathematics.



Interactive Science Notebooks as Integrative Assessment Tools

(Grades P–12) *W190b, McCormick Place*

Science Focus: PS, SEP

Michelle Fleming (*michelle.fleming@wright.edu*) and **Lisa Kenyon** (*lisa.kenyon@wright.edu*), Wright State University, Dayton, OH

Interactive Science Notebooks integrate content and practices while building literacy skills. This equitable formative assessment provides unique measures of student understanding and engagement.

Interactive Word Walls: Visual Scaffolds that Transform Content Vocabulary Instruction

(Grades K–12) *W191, McCormick Place*

Science Focus: GEN

Julie Jackson (*jj32@txstate.edu*), Texas State University, San Marcos

Hear about an effective research-based teaching strategy that supports academic vocabulary development and instruction in classrooms with English language learners.

New Science Standards! Where Do I Begin?

(Grades K–12) *W193a, McCormick Place*

Science Focus: GEN, NGSS

Chris Embry Mohr (*chrisembry.mohr@olympia.org*), Olympia High School, Stanford, IL

Find out how teams of cross-curricular teachers are striving to implement the NRC *Framework* and NGSS by cohesively analyzing resources, adjusting curriculum, and developing lessons and assessments.

INF Partnerships for World Class STEM Education: Using the Resources Outside Our Doors

(Grades 1–12) *W196c, McCormick Place*

Science Focus: ESS, INF, SEP

Ruth McDonald (*wesmc@charter.net*), Lincoln County School District, Newport, OR

Using ocean science and coastal natural resources, students address authentic local issues and partner with researchers, government agencies, and informal science educators in place-based, Project Based Learning.

Creating Partnerships That Work

(Grades 4–12) *W476, McCormick Place*

Science Focus: GEN

Liz Martinez (*emartinez@imsa.edu*) and **Brian Grublesky** (*bgrublesky@imsa.edu*), Illinois Mathematics and Science Academy, Aurora

Identify needs, goals, responsibilities, and potential partnerships as well as develop a plan of action and network during this interactive session. Leave with a list of potential partnerships.



9:30–10:30 AM Hands-On Workshops



NSTA Press® Session: The Method—A Systematic Approach to Problem Solving

(Grades 10–College)

S401a, McCormick Place

Science Focus: GEN

Norman LaFave (@nlafave0; nlafave0@yahoo.com), Northland Christian School, Houston, TX

The Method is a systematic and general approach to improving student problem solving. Join us as we present examples and engage in a practice problem.

Using Your Local Zoo to Enhance Genetics Instruction

(Grades 4–12)

S401d, McCormick Place

Science Focus: LS3.A, LS3.B, INF, CCC1, CCC4, CCC6, CCC7, SEP1, SEP2, SEP3, SEP4, SEP8

Kathy McKee, Blank Park Zoo, Des Moines, IA

Kacia Cain (kacia.cain@dmschools.org), Des Moines Central Campus, Des Moines, IA

Jodi Morgan-Peters (morgan-petersj@newton.k12.ia.us), Newton High School, Newton, IA

Explore how to connect classroom learning with a local non-formal science resource and experience investigations focusing on concept development in genetics. We'll cover individual traits; genomes, chromosomes, and genes; mutation and adaptation; simple dominance; and human effects on organisms.

Taste Blind

(Grades 8–College)

S402b, McCormick Place

Science Focus: LS, INF, SEP

Presenter to be announced

Why can some people taste PTC (a bitter substance) while others can't? Match diagrams with a reading about the parts of the nervous system involved in tasting. Interpret a pedigree and a simulated electrophoresis gel to determine the genotypes of 10 family members. These and other neurobiology activities are available online from the University of Rochester's Life Sciences Learning Center.

Dream Green Model Homes and Communities in Your Classroom

(Grades 3–12)

S404a, McCormick Place

Science Focus: ETS, ESS3.A, ESS3.C, ESS3.D, LS2.A, LS2.B, LS2.C, PS3.B, INF, SEP2

Catherine Wilkins (catwill@gpsk12.org), Greenfield High School, Greenfield, MA

Susan Reyes (sreyes7@mac.com), UMass Amherst, MA

Explore energy concepts, ecology, and sustainability with your students as you design, construct, and manipulate model green “dollhouses,” landscapes, and communities.

The Bottle Racer Project: Physics in Motion

(Grades 5–12)

S501bc, McCormick Place

Science Focus: PS

Gregory Reiva, Streamwood High School, Streamwood, IL
Rev up learning in your classroom with this Bottle Racer Project that showcases an engineering-based approach to learning science by constructing and testing air pressure-driven vehicles.

Engineering a Story: Following the Engineering Design Process to Solve Problems in Books

(Grades P–8)

S502a, McCormick Place

Science Focus: ETS, INF, SEP

Mia Dubosarsky (mdubosarsky@wpi.edu), The STEM Education Center at WPI, Worcester, MA

We will provide preK–8 teachers with practical methods to turn any book or classroom text into an engaging engineering design project.

Building a Classroom Culture of Questioning

(Grades K–8)

S502b, McCormick Place

Science Focus: GEN, SEP

Jennifer Hope, McKendree University, Lebanon, IL

Glenda McCarty (@Glenda_Plexus; mccargl@quincy.edu), Quincy University, Quincy, IL

Science begins with questions! But what makes a question “good”? Find out, plus how student questions show us their abilities relative to the science practices.

STEM Activities for the Elementary and Middle School Classroom

(Grades K–8)

S503a, McCormick Place

Science Focus: ETS, PS, CCC, SEP

Donald Powers (Dt-Powers@wiu.edu), Western Illinois University, Macomb

Join us and design and build a cart, bridge, or tower and/or modify a previously built device. Basic data from these devices will be collected and analyzed. NGSS connections included.

Engineering with Young Learners

(Grades P–2)

S504a, McCormick Place

Science Focus: ETS, SEP

Melissa Higgins (@EiE_org; mhiggins@mos.org), Museum of Science, Boston, MA

Engage in engineering activities appropriate for our youngest learners and discuss what successful engineering activities look like in early education classrooms.

How Did I Get This? A Series of Hypothetical Case Studies of Sexually Transmitted Infections

(Grades 9–College) *W178a, McCormick Place*
 Science Focus: LS, SEP

Rita Wakefield, Brownstown Junior/Senior High School, Brownstown, IL

Laura Barden-Gabbei (*lm-barden@wiu.edu*), Western Illinois University, Macomb

Use case studies to develop a better understanding of the NGSS relating to group behavior, natural selection, and population dynamics. The hypothetical case studies of sexually transmitted infections are interconnected with one another and designed for high school and college level students.

Integrating Issues

(Grades 4–12) *W180, McCormick Place*
 Science Focus: GEN

Rhoda Goldberg (*rhoda.goldberg@cfisd.net*), Cypress-Fairbanks ISD, Houston, TX

Laura Schisler, Crowder College, Neosho, MO

Use socio-scientific issues for increasing engagement and understanding! Write an evidenced-based perspective, participate in learning strategies, and leave with classroom-ready activities and rubrics.

Poetry in Motion

(Grades 6–8) *W181c, McCormick Place*
 Science Focus: GEN

Mildred Wigfall, University of Missouri-St. Louis

If you've got the time, join us for science inquiry rhyme. Explore how the arts (intertwined with science inquiry investigations) can be used to build a foundation for science literacy skills recommended by STEM initiatives. Science poetry music productions could be that spark toward developing science literacy skills in young budding scientists.

Sick!

(Grades 6–9) *W192a, McCormick Place*
 Science Focus: ETS2.B, LS1.B, INF, CCC3, SEP

Laura Robinson, Western Michigan University, Kalamazoo
 How effective are the cleaners we use in our homes and schools? How do we know? Examine how you can use microbiology techniques to get students to engage in inquiry to answer their questions about the bacteria they find and grow in class. Sick!

Writing NGSS Student-centered Learning Targets

(Grades 6–12) *W194a, McCormick Place*
 Science Focus: GEN, NGSS

Beverly Pierson (*bpierson@ecasd.k12.wi.us*), **Niki Anderson** (*nanderson@ecasd.k12.wi.us*), and **Joel Robaidek** (*jrobaidek@ecasd.k12.wi.us*), Memorial High School, Eau Claire, WI

We will create student-centered learning targets, based on the NGSS performance expectations, which provide students with a clear understanding of what they need to know and do.



10:00–10:30 AM Presentations

Mastery Learning in the Chemistry Classroom

(Grades 9–12) *S501a, McCormick Place*

Science Focus: PS

Sarah Eales (*sarah_eales@gwinnett.k12.ga.us*), Peachtree Ridge High School, Suwanee, GA

Come see how a group of chemistry teachers have increased content knowledge and engagement through the use of mastery learning in their classrooms.



NOAA Science On a Sphere®: Earth and Space Science Data Visualizations in the Classroom

(Grades 6–12) *W187a, McCormick Place*

Science Focus: ESS, SEP4, SEP7

Hilary Peddicord (*@NOAA_SOS; hilped@mac.com*), NOAA/Earth System Research Laboratory, Boulder, CO

NOAA Science On a Sphere® (SOS) has partnered with government labs, museums, universities, science organizations, and teachers to bring hundreds of scientific data visualizations and movies to the classroom with SOS Explorer. Previously only seen in museums—it can now be manipulated and viewed in your classroom!

Day-to-Day Data Analysis: Strategies for Scaffolding Student Data Analysis

(Grades 6–12) *W195, McCormick Place*

Science Focus: GEN, SEP

Presenter to be announced

Join us as we introduce three strategies for scaffolding data analysis in the classroom: (1) partially completed data tables, (2) spot the outliers, and (3) claim-evidence-analysis graphic organizers for collecting lab data.



11:00–11:30 AM Presentations

Bring Relativity to Everyday Life

(Grades 10–11)

S501a, McCormick Place

Science Focus: PS

Jianlan Wang, Indiana University Bloomington

Find out about an activity that contextualizes the abstract theory of special relativity in a scenario with Global Positioning System (GPS).

Can I Grow Enough Trees to Offset My Carbon Footprint?

(Grades 4–8)

S504bc, McCormick Place

Science Focus: ESS3.C, SEP4, SEP5

Barbara Wheeler (*wheeleba@mail.gvsu.edu*), Grand Valley State University, Allendale, MI

Calculate your annual carbon footprint and convert usage into various amounts/types of trees. Then determine if forest storage can mitigate the climate change.

NGSS: The Enterprise Going Where No Model Has Gone Before!

(Grades 6–8)

W181b, McCormick Place

Science Focus: GEN, SEP2, SEP6, SEP8

Lisa Kenyon (*lisa.kenyon@wright.edu*) and **Michelle Fleming** (*michelle.fleming@wright.edu*), Wright State University, Dayton, OH

Hear how we changed Family Science Night to engage students in building model-based explanations to explain a physical science phenomenon to an audience.



HAWK: Honoring Urban Resources and Acting with Knowledge

(Grades 9–12)

W187a, McCormick Place

Science Focus: LS2

Ann Wallenmeyer (*awallenmeyer@spsmail.org*), Springfield (MO) Public Schools

Join us for lessons learned during the development and implementation of an integrated biology/English course taught through the lens of conservation of urban resources.

Using Physics Dialogues to Motivate Students and Assess Student Learning

(Grades 6–College)

W476, McCormick Place

Science Focus: GEN

Marian Schraufnagel, Washburn High School, Washburn, WI

Dialogues are two-person mini-plays that students participate in, or construct, to demonstrate their understanding. Examples provided—learn how to write your own.

11:00 AM–12 Noon Presentations



NSTA Press® Session: Forensics in Chemistry

(Grades 10–12) *S401bc, McCormick Place*

Science Focus: PS, SEP

Sara McCubbins (*samccub@ilstu.edu*), Illinois State University, Normal

Forensics is the foundation in this yearlong lab series. As students solve the case, the narrative shows the relevance of chemistry. Rubrics that support the NGSS will be provided.

Visualizing the Unviewable: Simple Models to Activate Your Earthquake/Plate Tectonics Unit

(Grades 7–12) *S403a, McCormick Place*

Science Focus: ESS, SEP2

Michael Hubenthal, IRIS Consortium, Washington, DC

Explore a collection of simple and inexpensive physical models designed to aid in developing students' understanding of abstract earthquake/plate tectonics-related concepts.

INF The Reflective Assessment Practice: 15 Minutes to Improved Instruction and Learning

(Grades 3–8) *W475b, McCormick Place*

Science Focus: GEN

Helen Weber, Science Education Consultant, Trenton, NJ

Kathy Long (*klong@berkeley.ca.gov*), The Lawrence Hall of Science, University of California, Berkeley

Michele Francis (*francim@mhs-pa.org*), Milton Hershey School, Hershey, PA

Explore a quick assessment practice that pinpoints what students need to learn next—without giving a quiz. See how it improved student performance in individual classrooms and a national study.

Using STEM to Meet the CCSS

(Grades 3–5) *S505a, McCormick Place*

Science Focus: SEP

Nancy Johnson (*@jcjvb; jcjvb@sbcglobal.net*), Curriculum Consultant, Waukegan, IL

Get tales from the classroom front. Learn about a classroom teacher's experiences using STEM projects to integrate academic subjects and meet the CCSS.

Driving with Data in a Title I STEM Academy

(Grades K–5) *S505b, McCormick Place*

Science Focus: GEN

Sara Holm (*sholm@washoeschools.net*) and **Tom Wortman** (*twortman@washoeschools.net*), Smithridge STEM Academy, Reno, NV

Leave with practical ideas for how to start or continue your own journey to a Project Learning Based STEM academy with a collaborative data-driven culture.

Formative Assessment in the Physics Classroom

(Grades 9–College) *W176b, McCormick Place*

Science Focus: PS, SEP4, SEP7, SEP8

Ryan Fedewa (*rfedewa@d125.org*) and **Sheila Edstrom** (*sedstrom@district125.k12.il.us*), Adlai E. Stevenson High School, Lincolnshire, IL

Discover the value, uses, and best practices for formative assessments in the AP or NGSS-based physics classroom.

Project-based Inquiry Science Promotes Reading, Writing, and Presenting in the Science Classroom

(Grades 6–8) *W181a, McCormick Place*

Science Focus: GEN, SEP

Elizabeth Gorak and **Mary Fassbender** (*@maryfazz; mary.fassbender@franklin.k12.wi.us*), Forest Park Middle School, Franklin, WI

Discover how the structure of a project-based science curriculum provides opportunities to target the CCSS ELA, including students working collaboratively, writing explanations from evidence, and participating in small- and large-group discussions.

The Science Behind Advanced Coursework in High School

(Grades 10–College) *W191, McCormick Place*

Science Focus: GEN

Philip Sadler (*psadler@cfa.harvard.edu*), Harvard-Smithsonian Center for Astrophysics, Cambridge, MA

Join us as we review findings from our national studies measuring the impact of AP, IB, and other advanced coursework on STEM career interest and later performance in college science.

Read Their Minds with TALS

(Grades 5–College) *W193b, McCormick Place*

Science Focus: GEN, NGSS

Nancy Foote (@carbon; tinkerbello611@gmail.com), Sossaman Middle School, Queen Creek, AZ

If we could only see inside our students' minds and see exactly what they are thinking! I've come up with a great solution—TALs (Tasks to Advance Learning) for science. I will share ones already designed and show you how to design them, too.

11:00 AM–12 Noon Hands-On Workshops

NSTA Press® Session: CCSS ELA and Literacy + NGSS = Even More Brain-Powered Science

(Grades 5–College) *S401a, McCormick Place*

Science Focus: GEN, NGSS

Thomas O'Brien (tobrien@binghamton.edu), Binghamton University, Binghamton, NY

Discrepant event activities and cartoons model how to integrate English language arts and science literacy standards to show “the whole is greater than the sum of the parts.”

The Green and Growing Classroom

(Grades P–12) *S401d, McCormick Place*

Science Focus: LS, SEP

Rebecca Ammann (rammann@chicagobotanic.org), Chicago Botanic Garden, Glencoe, IL

Nurture budding scientists in your classroom with a variety of techniques for easy indoor gardening and ideas for using those plants across the curriculum and to support the NGSS.

Disease Detectives: Meningitis

(Grades 8–College) *S402b, McCormick Place*

Science Focus: LS, INF, SEP

Presenter to be announced

Conduct simulated lab tests to determine that a teen patient has bacterial meningitis. Use a prewriting grid to organize information for writing a letter to inform parents about the importance of the meningitis vaccine. This activity and other neurobiology activities are available online from the University of Rochester's Life Sciences Learning Center.



Analyzing and Interpreting GRACE Satellite Data Using Visualizations and Scientific Data Sets

(Grades 6–College) *S403b, McCormick Place*

Science Focus: ESS, INF, CCC, SEP

David Randle (drandle@amnh.org) and **Jay Holmes** (jholmes@amnh.org), American Museum of Natural History, New York, NY

Using NASA's Gravity Recovery and Climate Experiment (GRACE) satellite data on ice sheets, explore how climate change is affecting these regions.

Your Ecological Footprint: NGSS Practices at Work on the Pathway to a Sustainable Planet

(Grades 4–College) *S404a, McCormick Place*

Science Focus: ESS, SEP1, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

Laurel Kohl (kohll@easternct.edu), Eastern Connecticut State University, Willimantic

How much of our world resources do you (and your students) use? This lesson from *ctenergyeducation.com* brings global issues to a personal level, fosters use of NGSS science practices, and encourages student action.

A Suite of Sweet Sound Activities

(Grades 5–12) *S501bc, McCormick Place*

Science Focus: PS4.A, INF, CCC2, SEP1, SEP2, SEP3, SEP6, SEP7, SEP8

Presenter to be announced

Come do hands-on, ears-on investigations that reveal the science of sound. Use NGSS practices to develop your understanding of resonance, waves, and our auditory system.

Integrating Science and Art: A New Strategy to Teach Central Dogma

(Grades 9–College) *S501d, McCormick Place*
 Science Focus: LS1.A, LS3.A, LS3.B, INF, CCC1, CCC6, SEP2, SEP6, SEP8

Pamela Snyder (*psnyder5396@gmail.com*), Columbus City Schools, Columbus, OH

Kerry Dixon (*kerrydixon001@gmail.com*), Hodos Education Consulting, Granville, OH

Experience how inquiry unites art and science by promoting student thinking in biology. Create a representative work of art that models transcription and translation. Developed through a grant from the Ohio Soybean Council, this activity is one of several free curriculum materials. Handouts.

Engaging Preschool Students in STEM

(Preschool) *S502a, McCormick Place*
 Science Focus: ETS1, LS2.C, PS2.A, CCC1, SEP

Elizabeth Gajdzik, INSPIRE, West Lafayette, IN

Discover how to engage preschool students in STEM through hands-on, developmentally appropriate, problem-based tasks that build understanding of foundational science and math content.

Let’s Talk about Early Learners

(Grades P–2) *S502b, McCormick Place*
 Science Focus: GEN, INF

Patty Born Selly (*@StKateSTEM; pebornselly@stkate.edu*), National Center for STEM Elementary Education, St. Paul, MN

Young children (grade 2 and younger) have unique needs in the classroom. Effective teachers need to understand developmentally appropriate practices and approaches to teaching very young children. Learn how best to support the needs of early learners to maximize learning and engagement while reducing “challenging” classroom behavior.

An Integrated Science and Literacy 5E Learning Cycle About Electricity

(Grades 3–5) *S503a, McCormick Place*
 Science Focus: PS

Brenda Turgeon, Purdue University Calumet, Hammond, IN

Spark new learning in your grades 3–5 classroom. Teach electricity and circuits as well as integrate science and literacy with a 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle that uses inexpensive and readily available materials. Correlations to the *CCSS ELA* included.

Simple Machines Made Simple

(Grades 3–6) *S504a, McCormick Place*
 Science Focus: PS2.A, INF, CCC1, CCC2, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5

Dustin Axe (*dustin.axe@msichicago.org*), **Jason Dupuis** (*jason.dupuis@msichicago.org*), and **Jessica Dietzel**, Museum of Science and Industry, Chicago, IL

Discover how to teach simple machines using everyday classroom objects and materials. Free lesson plans, videos, and prizes!

Cooperative Learning in the Science Classroom: Get Your Kids Talking and Helping Each Other Learn

(Grades 9–12) *W178a, McCormick Place*
 Science Focus: LS, PS

Denise Sanders (*denise.sanders@austinisd.org*), James Bowie High School, Austin, TX

Get your students talking, learning, and working together every day using easily integrated, low-prep strategies you can implement Monday. Receive biology and chemistry examples—on-level to AP.

Flipping the Classroom 2.0: Let’s Get to Work! BYOD (Bring Your Own Device)

(Grades 8–12) *W178b, McCormick Place*
 Science Focus: GEN

Traci Lowes (*@LoweChemClass; tlowes@neisd.net*), Lee High School, San Antonio, TX

Bring your laptop/iPad or other device and create flipped lessons in a collaborative, supportive learning environment. You’ll leave this workshop with a fully flipped lesson!

Reading to Learn Science and Learning to Read Science

(Grades 3–12) *W179a, McCormick Place*
 Science Focus: GEN, SEP4, SEP7, SEP8

Jonathan Osborne, Stanford Graduate School of Education, Stanford, CA

Brian Donovan (*briand79@stanford.edu*), Stanford University, Stanford, CA

Reading is key to obtaining, evaluating, and communicating information—practice 8 in the *NGSS*. Join us as we explore ways of supporting students’ reading for learning in science.

Assessing Argument: Rubric Creation for Grading Science Arguments

(General) *W180, McCormick Place*

Science Focus: GEN, SEP7

Sherry Geesaman (*sgeesaman@msd.k12.de.us*), Milford Central Academy, Milford, DE

Victoria Deschere (*victoria.deschere@appo.k12.de.us*), Louis L. Redding Middle School, Middletown, DE

Now that your students are writing arguments, how do you assess them? Learn how to create rubrics to suit the specific needs of a science argument—clear, direct claims, qualitative and quantitative evidence, and implications of findings.

Kernels of Knowledge

(Grades 6–8) *W181c, McCormick Place*

Science Focus: LS, SEP2

Kristin Camp (*campkr@champaignschools.org*) and **Jackie Baxter** (*jackiebaxter1@gmail.com*), Jefferson Middle School, Champaign, IL

Join us and gain “kernels of knowledge” as you study how cells carry out the essential processes needed to sustain and perpetuate life by connecting these processes with a healthy snack—popcorn!

Constructing Scientific Explanations: Enhancing High School Students’ Reasoning Skills

(Grades 9–12) *W192c, McCormick Place*

Science Focus: GEN, SEP6, SEP7

Mary Clark (*mfclark2@cps.edu*) and **Kristel Hsiao** (*kristel.keegan@gmail.com*), Solorio Academy High School, Chicago, IL

Kevin Tam (*ktam@auslctr.org*), AUSL Chicago Teacher Residency Program, Chicago, IL

Alissa Berg (*alissaberg@gmail.com*), Academy for Urban School Leadership (AUSL), Chicago, IL

Miguel Garcia, Alejandra Valencia, Diana Reyes, Jaqueline Navarro, and Nancy Contreras, Students, Solorio Academy High School, Chicago, IL

Explore ways to support students to construct logically reasoned explanations for science phenomena. Analyze student work samples and walk away with formative assessment tools!

Organizing Effective Feedback Processes for Students Learning with Infographics

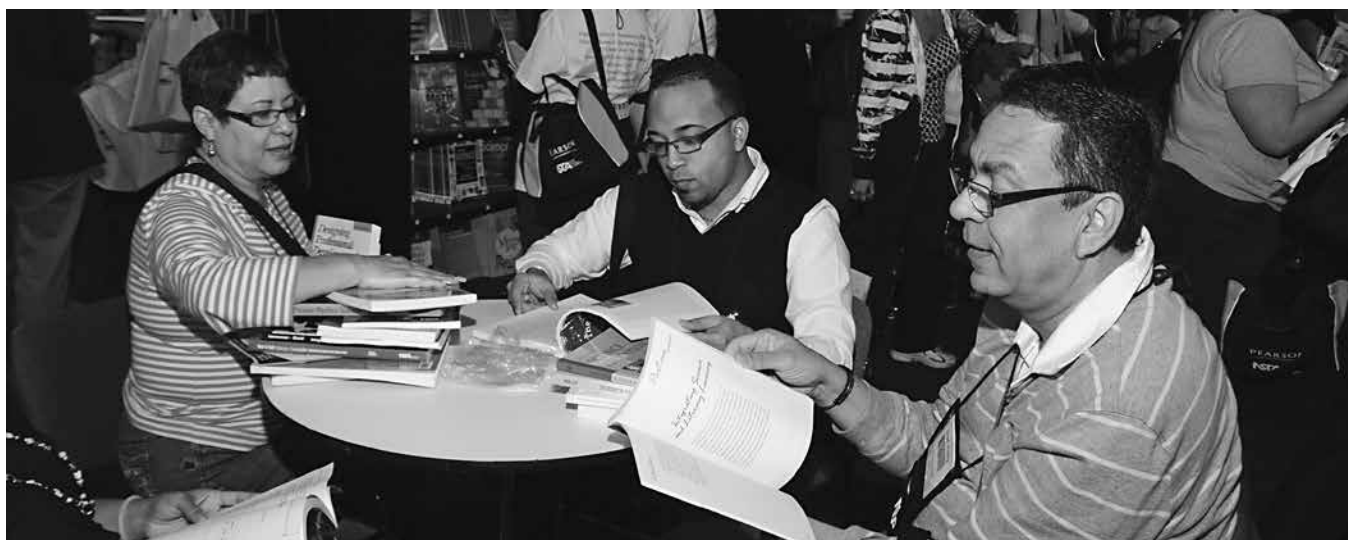
(Grades 9–12) *W194a, McCormick Place*

Science Focus: GEN, CCC, SEP4, SEP5, SEP8

Joseph Polman (*@joepolman; joseph.polman@colorado.edu*), University of Colorado Boulder

Rob Lamb (*@lambchop1998; rlamb@psdr3.org*), Pattonville School District, Maryland Heights, MO

Find out how organizing technology-supported peer and expert feedback for students who create infographics enhances learners’ collaborative and constructive engagement in key STEM and NGSS practices.



11:30 AM - 12 Noon Presentation



Bringing the NGSS Outdoors

(Grades 9–12) *W187a, McCormick Place*

Science Focus: INF, SEP

Samantha Ozik (@ChiPubSchools; *scmatton@cps.edu*), Chicago (IL) Public Schools

Mark Hauser (@chicagoriver; *mhauser@chicagoriver.org*), Friends of the Chicago River, Chicago, IL

Hear how Chicago Public Schools partner with local environmental organizations to support place-based science teaching tied to high school service-learning projects.

A Culture of Learners: Using “Self-service” Tools, Reflection, Remediation, and Collaborative Problem-solving to Cultivate Growth Mind-sets

(Grades 6–12) *W195, McCormick Place*

Science Focus: GEN, NGSS

Brett Erdmann (*berdmann@d125.org*), Adlai E. Stevenson High School, Lincolnshire, IL

How do students “know what they know”? Learn how to build a culture in which learning is an iterative process involving student self-reflection, remediation, and extension.

Using Chemistry and Physical Science Dialogues to Engage Students and Assess Student Learning

(Grades 6–College) *W476, McCormick Place*

Science Focus: PS

Nancy Smith (*nsmith@waterforduhs.k12.wi.us*), Waterford High School, Waterford, WI

Learn how to elevate student engagement by using dialogues in the classroom and incorporate a new assessment strategy by having students write dialogues. Examples provided.

Meetings and Social Functions Index

Please note that the Hyatt referenced below is the Hyatt Regency McCormick Place.

Saturday, March 14

APAST Breakfast Meeting

By Invitation Only

Adler A/B, Hyatt..... 7:00–9:00 AM

NSTA Past Presidents' Breakfast

By Invitation Only

Regency C, Hyatt Regency McCormick Place .. 7:30–8:15 AM

AMSE/NSTA Minority Caucus George Washington Carver Breakfast

By Invitation Only

Prairie B, Hyatt..... 8:00–10:00 AM

Past Presidents Advisory Board Meeting

Boardrm. 2, Hyatt..... 8:15–9:15 AM

Shell Award Judging Panel Meeting

By Invitation Only

Huron, Hyatt..... 8:30–10:00 AM

First-Timers, Preservice Teachers, and New Teachers Lounge

Hall F2, McCormick Place 9:00 AM–3:00 PM

NSTA International Lounge

Michigan, Hyatt 9:00 AM–5:00 PM

NSTA/SCST College Luncheon (M–4)

(Tickets Required: \$65)

Prairie A, Hyatt..... 12 Noon–1:30 PM

CESI/NSTA Elementary Science Luncheon (M–5)

(Tickets Required: \$65)

Regency C, Hyatt..... 12 Noon–2:00 PM

NSTA Council Roundtable

By Invitation Only

Regency D, Hyatt..... 2:00–4:00 PM

Association for Multicultural Science Education (AMSE) Town Hall Meeting

Clark A&B, Hyatt 3:00–5:00 PM

Pi Day Celebration for Preservice/New Teachers and First-Time Conference Attendees (M–6)

(Tickets Required: \$20)

W196b, McCormick Place 4:00–6:00 PM

National Earth Science Teachers Association Annual Meeting

Skyline W375e, McCormick Place..... 5:00–6:00 PM

Equity in Science Reception, Sponsored by National Geographic Society

Prairie B, Hyatt 5:30–7:30 PM

Celebrate Einstein's Birthday...with a Tribute to the Blues Brothers!

Regency Blroom, Hyatt 8:00–10:00 PM

Index of Exhibitor Workshops

3D Molecular Designs (Booth #1833)

| | | | |
|--------------------|----------------|------------------------|---|
| Saturday, March 14 | 10:00–11:30 AM | W193b, McCormick Place | New Modeling Kits: Flow of Genetic Information and Phospholipid and Membrane Transport Kits (p. 46) |
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A+ Mobile Solutions (Booth #1750)

| | | | |
|--------------------|-----------------|------------------------|--|
| Saturday, March 14 | 12 Noon–1:30 PM | W179b, McCormick Place | Monitor, Guide, and Control Student Activity While Delivering STEM/STEAM Applications with the Intelligent Laptop Cart (p. 60) |
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Accelerate Learning (Booth #1056)

| | | | |
|--------------------|--------------|------------------------|--|
| Saturday, March 14 | 8:00–9:30 AM | W470a, McCormick Place | Woodles! Vocabulary Development for Scientific Literacy! (p. 26) |
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Activate Learning (Booth #1353)

| | | | |
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| Saturday, March 14 | 8:00–9:30 AM | W476, McCormick Place | Implementing the NGSS Eight Practices with Research-based Curriculum (p. 27) |
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Backyard Brains (Booth #471)

| | | | |
|--------------------|----------------|------------------------|---|
| Saturday, March 14 | 10:00–11:30 AM | W470a, McCormick Place | Bringing Real Neuroscience (Spiking Neurons!) into Your Classroom (p. 46) |
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Battle Creek Area Mathematics and Science Center (Booth #877)

| | | | |
|--------------------|-----------------|------------------------|--|
| Saturday, March 14 | 12 Noon–1:30 PM | W475a, McCormick Place | Finding Your Way to Curriculum that Supports NGSS and CCSS (p. 62) |
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Bedford, Freeman, & Worth Publishing Group (Booth #752)

| | | | |
|--------------------|----------------|------------------------|--|
| Saturday, March 14 | 10:00–11:30 AM | W474b, McCormick Place | Living by Chemistry: What Shape Is That Smell? (p. 46) |
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Bio-Rad Laboratories (Booth #847)

| | | | |
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| Saturday, March 14 | 8:00–9:30 AM | W474a, McCormick Place | Science, Fashion, and Fun! Genes in a Bottle™ Kit (p. 26) |
| Saturday, March 14 | 10:30 AM–12 Noon | W474a, McCormick Place | NGSS in the High School Biology Classroom (p. 49) |

BIOZONE International (Booth #876)

| | | | |
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| Saturday, March 14 | 10:00–11:30 AM | W470b, McCormick Place | Biology for NGSS: A New Approach for a New Program (Grades 9–12) (p. 46) |
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Carolina Biological Supply (Booth #1131)

| | | | |
|--------------------|-----------------|------------------------|---|
| Saturday, March 14 | 10:00–11:30 AM | W181a, McCormick Place | Hands-On Activities to Model Habitat Preference and Population Sampling (p. 42) |
| Saturday, March 14 | 10:00–11:30 AM | W181c, McCormick Place | Keep Calm and Chemistry On: Successful Lab Activities for the New Chemistry Teacher (p. 42) |
| Saturday, March 14 | 12 Noon–1:30 PM | W181b, McCormick Place | Picking Apart the Owl Pellet (p. 60) |
| Saturday, March 14 | 12 Noon–1:30 PM | W181a, McCormick Place | Strawberry Milkshakes: DNA and Lactose (p. 60) |
| Saturday, March 14 | 12 Noon–1:30 PM | W181c, McCormick Place | Bring Visual Science into Grades 6–8 Classrooms—It’s a Game Changer! (p. 60) |

Celestron (Booth #1656)

| | | | |
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| Saturday, March 14 | 2:00–3:30 PM | W475a, McCormick Place | Stretch Your Legs for Science! (p. 81) |
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Conservation International (Booth #1092)

Saturday, March 14 2:00–3:30 PM W474b, McCormick Place ECO Classroom: Field-based Professional Development for STEM Teachers (p. 81)

eCYBERMISSION (Booth #1181)

Saturday, March 14 10:00–11:30 AM W475a, McCormick Place Modeling and Engineering Design: From Ideas to Reality (p. 48)

Educational Innovations, Inc. (Booths #1067/#1167)

Saturday, March 14 10:00–11:30 AM W178a, McCormick Place 3–2–1 Blast Off!! (p. 42)

Energy Concepts Inc. (ECI) (Booth #577)

Saturday, March 14 12 Noon–1:30 PM W476, McCormick Place Biotechnology...the New Field of Converged Science (p. 62)

Flinn Scientific, Inc. (Booth #631)

Saturday, March 14 10:00–11:30 AM W180, McCormick Place Dynamic Demonstrations from Flinn Scientific (p. 42)

Saturday, March 14 12 Noon–1:30 PM W180, McCormick Place Flinn Activities to Integrate STEM Education (p. 60)

G–Biosciences (Booth #456)

Saturday, March 14 10:00–11:30 AM W476, McCormick Place Biotechnologies: Restriction Digestion in STEM Education (p. 48)

Intelitek (Booth #989)

Saturday, March 14 2:00–3:30 PM W184d, McCormick Place Creating a Science Class for the 21st Century (p. 80)

K’NEX Education (Booth #789)

Saturday, March 14 8:00–9:00 AM W471b, McCormick Place Off to the Races with K’NEX Education’s Forces, Energy, and Motion Set! (p. 22)

Saturday, March 14 9:30–10:30 AM W471b, McCormick Place Forensic DNA Activities and More with K’NEX Education’s DNA, Replication, and Transcription Set (p. 39)

Saturday, March 14 11:00 AM–12 Noon W471b, McCormick Place Introduction to Simple Machines with K’NEX Education Models and Lessons for the Elementary Classroom (p. 58)

Saturday, March 14 1:00–2:00 PM W471b, McCormick Place Off to the Races with K’NEX Education’s Forces, Energy, and Motion Set! (p. 72)

Saturday, March 14 2:30–3:30 PM W471b, McCormick Place Forensic DNA Activities and More with K’NEX Education’s DNA, Replication, and Transcription Set (p. 82)

LAB–AIDS®, Inc., cont.

Saturday, March 14 8:00–9:30 AM W195, McCormick Place Investigating Chemical Changes (p. 26)

Saturday, March 14 10:00–11:30 AM W195, McCormick Place Chemical Formula and Amino Acids (p. 46)

LaMotte Co. (Booth #1650)

Saturday, March 14 8:00–9:30 AM W475a, McCormick Place Getting the Most from Your Low-Cost Water Monitoring Kit (p. 27)

Learning A–Z (Booth #1461)

Saturday, March 14 10:00–11:30 AM W179b, McCormick Place Use Science to Teach Reading—Use Reading to Teach Science (p. 42)

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LEGO Education (Booth #956)

| | | | |
|--------------------|-----------------|------------------------|--|
| Saturday, March 14 | 8:00–9:30 AM | W186b, McCormick Place | MINDSTORMS® EV3 Robotics in the Middle School Classroom: Getting Started (p. 24) |
| Saturday, March 14 | 10:00–11:30 AM | W186b, McCormick Place | Multiple Subjects, One Platform: Tackle STEM Learning with LEGO Education WeDo! (p. 44) |
| Saturday, March 14 | 12 Noon–1:30 PM | W186b, McCormick Place | Exploring How Machines Work with the LEGO® Education Simple and Motorized Mechanisms Set (p. 61) |
| Saturday, March 14 | 2:00–3:30 PM | W186b, McCormick Place | Exploring Forces, Motion, and Engineering Design with LEGO® Education Simple Machines (p. 80) |

The MiniOne Electrophoresis (Booth #984)

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| Saturday, March 14 | 12 Noon–1:30 PM | W474b, McCormick Place | Electrophoresis in a Flash—Complete a Lab in a Single Class Period (p. 62) |
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miniPCR (Booth #1828)

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| Saturday, March 14 | 8:00–9:30 AM | W470b, McCormick Place | Genes in Space: Design a DNA Analysis Experiment for the International Space Station (p. 26) |
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MSOE Center for BioMolecular Modeling (Booth #1835)

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| Saturday, March 14 | 8:00–9:30 AM | W193b, McCormick Place | Going Viral: From Proteins to Pandemics (p. 25) |
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Nano-Link: Center for Nanotechnology Education (Booth #888)

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| Saturday, March 14 | 8:00–9:30 AM | W184d, McCormick Place | Leading Students to Exciting Careers in Emerging Technology Fields (p. 24) |
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National Geographic Learning (Booth #1546)

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| Saturday, March 14 | 8:00–9:30 AM | W186a, McCormick Place | Go Virtual! Enhancing Instruction with Technology in Geography, Physical Geology, and Environmental Science (p. 24) |
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NOAA's National Ocean Service (Booth #1358)

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| Saturday, March 14 | 8:00–9:30 AM | W184bc, McCormick Place | Climate Change Series 1: Climate Stewards Roundtable Presentations (p. 24) |
| Saturday, March 14 | 9:30–11:15 AM | W184bc, McCormick Place | Climate Change Series 2: Antarctic Team Showcases Ice Cores (p. 39) |
| Saturday, March 14 | 11:20 AM–12:20 PM | W184bc, McCormick Place | Climate Change Series 3: Teaching Climate? Learn How to Use the <i>Climate.gov</i> 2014 National Climate Assessment Resources for Educators (p. 58) |
| Saturday, March 14 | 12:45–1:45 PM | W184bc, McCormick Place | Climate Change Series 4: Bring Climate Change Closer to Home: U.S. Forest Service Climate Change Education Resources (p. 71) |
| Saturday, March 14 | 1:50–2:50 PM | W184bc, McCormick Place | Climate Change Series 5: Climate Science in Action (p. 72) |
| Saturday, March 14 | 2:55–3:55 PM | W184bc, McCormick Place | Climate Change Series 6: ClimateChangeLIVE Distance Learning Project—Engage Your Students in Climate Change Learning and Being Part of the Solution! (p. 82) |
| Saturday, March 14 | 4:00–5:00 PM | W184bc, McCormick Place | Climate Change Series 7: Use NGSS as a Pathway to Climate Literacy (p. 90) |

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Ocean Classrooms (Booth #1625)

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| Saturday, March 14 | 8:00–9:30 AM | W184a, McCormick Place | Marine Science Education: Awareness, Understanding, and Action (p. 23) |
| Saturday, March 14 | 10:00–11:30 AM | W184a, McCormick Place | Marine Science Education: Awareness, Understanding, and Action (p. 42) |

PAEMST (Booth #1281)

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| Saturday, March 14 | 12 Noon–1:30 PM | W193b, McCormick Place | Leadership Pathways for Exemplary K–12 STEM Teachers (p. 61) |
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Perimeter Institute (Booth #767)

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| Saturday, March 14 | 8:00–9:30 AM | W471a, McCormick Place | Hands-On Wave-Particle Duality (p. 26) |
| Saturday, March 14 | 10:00–11:30 AM | W471a, McCormick Place | The Mystery of Dark Matter (p. 46) |

Publisher Spotlight (Booth #1544)

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| Saturday, March 14 | 12 Noon–1:30 PM | W184d, McCormick Place | HOWTOONS! Engaging Kids with DIY STEM Projects via Comic Books (p. 60) |
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Royal Society of Chemistry (Booth #548)

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| Saturday, March 14 | 10:00–11:30 AM | W186a, McCormick Place | Free Chemistry Resources and Tools to Support BYOD, from the Royal Society of Chemistry (p. 44) |
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SAE International—A World In Motion (Booth #891)

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| Saturday, March 14 | 10:00–11:30 AM | W185a, McCormick Place | Chemistry with Vernier (p. 44) |
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| Saturday, March 14 | 12 Noon–1:30 PM | W185d, McCormick Place | Middle School Science with Vernier (p. 61) |
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