

SATURDAY + SUNDAY, MARCH 17 & 18

ATLANTA

MARCH 15–18

2018

Science
on
My
Mind

**NSTA
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VOL.3

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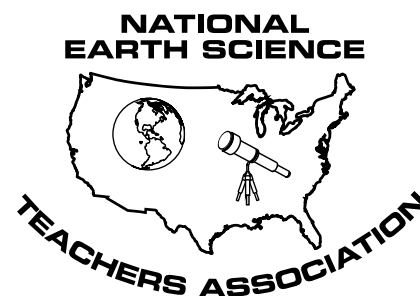
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National Earth Science Teachers Association Events at the 2018 NSTA National Conference in Atlanta



*We have a number of exciting sessions! To find our sessions, enter **NESTA** as the keyword when searching events online at NSTA's session browser for the conference. On Friday, March 16 and Saturday, March 17, we have a series of sessions all in **B103** of the Georgia World Congress Center. Don't miss out on our Share-a-Thons and the events below!*

www.nestanet.org

Friday, March 16

2:00 – 3:00 p.m. **American Geophysical Union (AGU) Lecture: Chasing Coral Bleaching: A Present and Growing Ecological Disaster: Dr. C. Mark Eakin**



Coral reefs are amazingly beautiful and complex ecosystems that support at least a quarter of all marine species. However, as ocean temperatures rise, corals have been expelling the algae that give them their color and their food, causing them to die around the world at a record rate. This talk describes this growing problem and its haunting future while attempting to leave you hopeful that we still can save coral reefs before they are all gone.

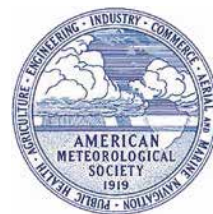
Sidney Marcus Auditorium, Georgia World Congress Center

Saturday, March 17

5:00 – 6:00 p.m. **NESTA's exciting Rock, Mineral, and Fossil Raffle!**
Georgia World Congress Center, B103

6:30 – 8:00 p.m. **NESTA Friends of Earth Science Reception**
International Ballroom F, Omni Atlanta at CNN Center

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**NSTA 66th National Conference
on Science Education**
Science on My Mind
Atlanta, Georgia • March 15–18, 2018

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National Science Teachers Association

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P L E A S E J O I N U S F O R O U R

2018

NSTA AREA CONFERENCES ON SCIENCE EDUCATION

**Elevating
Science**

Digging Deeper

RENO, NV
OCT. 11-13



**Science
Education**

A National Priority

NATIONAL HARBOR, MD
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**Energize
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Freedom to Become
Scientifically Literate

Cultivating Curiosity in the
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Through Science

Amp Up Science Instruction

High-Voltage Science Strategies
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For more information and to register, visit
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#NSTA18

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Photo courtesy of World of Coca-Cola



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.

Saturday, March 17

8:00–9:00 AM	Featured Presentation: Stephen Pruitt	14
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9:30–10:30 AM	NGSS@NSTA Share-a-Thon	29
9:30 AM–1:30 PM	The Horizon Educational Drone Competition (HEDC)	10
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12:30–2:30 PM	Community Connections Featured Forum: Learn How to Better Advocate for Science and Science Education.	57
2:00–3:00 PM	NSTA/ASE Honors Lecture: Linda Needham	58

The Atlanta 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.

Focusing On Evidence of 3-D Learning

States continue to develop and adopt standards that build on a three-dimensional approach, which calls on students to use disciplinary core ideas, science and engineering practices, and crosscutting concepts to explain real-world phenomena and solve authentic problems. Three-dimensional learning allows students to connect science to their everyday lives and helps prepare them for future careers. This approach is fully realized only when instruction leads to tangible evidence of three-dimensional learning through authentic student products. This strand will help teachers, whether they are 3-D novices or experts, expand their understanding of three-dimensional teaching, learning, and assessment. Sessions in this strand will target participants with a beginning, intermediate, or advanced level of familiarity with three-dimensional learning.



Imagining Science as the Foundation for STEM

STEM education has become a priority for many states as we seek to provide today's students with the real-world, innovative skills that they will need to be successful in tomorrow's world. STEM instruction that builds on the foundation of core science ideas provides students with opportunities that equip them to make sense of the world in which they live, hone their critical-thinking skills, and spark their sense of innovation. Sessions in this strand will allow participants to develop their understanding of how to plan and teach collaboratively within these integrated learning environments.



Reflecting On Access for All Students

Just as science encompasses diverse fields of learning from astronomy to zoology, science educators are called upon to equitably meet the needs of and engage ALL learners. Research has identified the unique challenges of a number of underserved groups, including students from urban areas, rural areas, English language learners, students with low socioeconomic status, those with special needs, gifted and talented students, and students from diverse cultural backgrounds. Cultivating a culture of equity and inclusion for all students not only aligns with the NSTA mission statement and the vision put forth by *A Framework for K–12 Science Education* but also prepares students for future career opportunities in a global society. This strand increases participants' understanding of the unique needs of various types of learners and helps them reduce barriers to full participation in science.



Comprehending the Role of Literacy in Science

A great number of personal and societal issues require citizens to draw upon a foundation of scientific knowledge, technological understanding of problem solving, and the ability to design scientific solutions to obtain, evaluate, and communicate information in order to make informed decisions. Engaging ALL students in science, beginning in the early years, is the way to develop students' skills in thinking creatively, expressing themselves, and investigating their world. As college- and career-ready students investigate natural phenomena, they should be able to communicate their argument-driven claims based on data-driven evidences. Science core ideas can be developed by using current technology and media to create, refine, and collaborate through reading, writing, listening, and speaking. This strand will allow educators to become advocates of literacy in preK–12 science and engineering, to see the connections between science and literacy, and to learn literacy strategies that encompass active student engagement.

Focusing On Evidence of 3-D Learning

Saturday, March 17

8:00–9:00 AM

Building 3-D, NGSS-Based Chemistry and Physics Courses from the Ground Up

Featured Presentation: 3-D Science Assessment: How Do You Still Make Construction a Priority?
(Speaker: Stephen Pruitt)

8:00–11:00 AM

Short Course: Using NGSS Storylines to Support Students in Meaningful Engagement in Science and Engineering Practices
(By Ticket: SC-11)

11:00 AM–12 Noon

Using NGSS Resources to Flip a Science Lesson on Evidence of Multidimensional Learning in Grades 3–5

12:30–1:30 PM

NGSS Physical Science Fun and Inquiry Across the Grade Bands

2:00–3:00 PM

Classroom-Embedded Assessments (CEAs): 3-D Assessments for Learning in Elementary and Middle School Classrooms

Build a Bug: Creating 3-D Insects, Supporting 3-D Learning

3:30–4:30 PM

The Environment in Three Dimensions: Connecting Students to Environmental Science Through Authentic Student Products

5:00–6:00 PM

Designing and Using Equitable 3-D Formative Assessments to Support Meaningful NGSS Investigations

Sunday, March 18

11:00 AM–12 Noon

Coaching Teachers Through Backward Planning for 3-D Lessons and Units

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Imagining Science as the Foundation for STEM

Saturday, March 17

8:00–9:00 AM

Active Learning and Student Data Collection in the Middle School Classroom

8:00–11:00 AM

Short Course: Integrating Engineering into K–8 Life Science Lessons
(By Ticket: SC-10)

9:30–10:30 AM

Social Studies (Put Some STEM in It!): Integrating Social Studies and STEM

11:00 AM–12 Noon

Beyond Earlobes and Tongue Rolling

12:30–1:30 PM

Innovation STEMs from Science...Engage in Engineering!

2:00–3:00 PM

Spaceward Bound: Exploring Life in Extreme Environments

3:30–4:30 PM

What Do You Get When You Cross a Scientist with a Teacher? A True Collaborative Journey!

5:00–6:00 PM

Data Collection in the Elementary Classroom Is...Fun!

Sunday, March 18

8:00–9:00 AM

Get NOS in Your Classroom...Without Starting Over

9:30–10:30 AM

STEMtastic Lessons for Elementary Students

11:00 AM–12 Noon

Snotty Plots and Toilet Splatter: Use the Fluid Dynamics of Disease Transmission to Teach Data Collection and Analysis

Comprehending the Role of Literacy in Science

Saturday, March 17

9:30–10:30 AM

Bringing STEM and Literacy “Out of the Dust”

11:00–11:30 AM

Giverny Award–Winning Science Storybooks: Engage Elementary Students in Science Concept Identification and Exploration!

11:30 AM–12 Noon

Pairing Children’s Literature and Science Field Trips to Create Authentic Learning Experiences

1:00–1:30 PM

Lessons in Literacy from *The Immortal Life of Henrietta Lacks* and Henrietta’s Amazing HeLa Cells

2:00–2:30 PM

You Turn Me On: Books to Teach Bioluminescence

2:30–3:00 PM

Cracking the Case II: Integrating Biology and Engineering in (More) Case Studies

3:30–4:30 PM

Accessing Secondary Data Sets Using Primary Devices

5:00–6:00 PM

Document-Based Questions: They’re Not Just for Social Studies Anymore!

Sunday, March 18

9:30–10:30 AM

Using Literacy and Culturally Responsive Pedagogy to Enhance Science Content

11:00 AM–12 Noon

Developing High School Peer-Reviewed Research Journals

Reflecting On Access for All Students

Saturday, March 17

8:00–9:00 AM

¡Anímate, Tú Puedes! Media-Infused and Culturally Responsive STEM Activities for Hispanic Girls

11:00 AM–12 Noon

Science and Language: Natural Partners

12:30–1:30 PM

Making Quality Science Instruction Accessible and Equitable to ALL K–6 Students

3:30–4:30 PM

Science Accessibility: Using Theater to Teach Science to Children on the Autism Spectrum

5:00–6:00 PM

Enhancing Transdisciplinary Learning for Students with Special Needs Through a Modified 3-E Approach

Community Connections Saturday Event

The Community Connections Forums and events build awareness of the abundance of existing high-quality out-of-school (informal) science education methods, resources, and opportunities available to enhance science teaching and learning. Both out-of-school and in-school science educators meet and interact to share best practices in informal science, learn about exciting collaborations happening among informal and formal science organizations, network with colleagues, and dialogue around ideas and innovations. Informal organizations participating in the Community Connections Forums include zoos, museums, media, after-school programs, universities outreach, and others that provide or support out-of-school science education.

12:30–2:30 PM Featured Forum: Learn How to Better Advocate for Science and Science Education

NGSS@NSTA STEM STARTS HERE

NGSS@NSTA Share-a-Thon

*Saturday, March 17, 9:30–10:30 AM
B102, Georgia World Congress Center*

At the NGSS@NSTA Share-a-Thon, get even more tips and tools to implement three-dimensional standards from NSTA's NGSS curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away! (p. 29)

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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 17

8:00–9:00 AM

Telling Earth Stories—Student-Led
Modeling with Real Data and Authentic
Experiments

9:30–10:30 AM

Outdoor Science...Literally!

11:00 AM–12 Noon

Need Money? Write a Grant!

Leveling the Playing Field: Unlocking
the Vision of the NGSS

2:00–3:00 PM

Argument-Driven Inquiry in the Life,
Physical, and Earth/Space Sciences: Lab
Investigations for Grades 6–8

3:30–4:30 PM

Solar Science: 3-D Learning Applied to
the Study of the Sun's Daily and Annual
Motion

5:00–6:00 PM

Bringing the S-T-E-M Together in
Early Childhood Using Science and
Engineering Practices



Sunday, March 18

8:00–9:00 AM

Next Time You See...

9:30–10:30 AM

Argument-Driven Inquiry in
Biology, Chemistry, and Physics:
Lab Investigations for Grades 9–12



Stop by Booth #2000 for The Horizon Educational Drone Competition (HEDC). The Horizon Educational Drone Competition (HEDC) is a STEM program in which students learn the history and current uses of drones in society and build, modify, and improve their own battery-powered drones to compete in three separate challenges: Drone Racing, Package Delivery, and FPV Surveillance Mission. Visit the competition area on Thursday and Friday to see the course layout and technology used in the challenge.

The live competition will start on Saturday at 9:30 AM. Stop by and cheer on the teams!

Three Dimensions of the Next Generation Science Standards (NGSS)

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

Disciplinary Core Ideas

Disciplinary Core Ideas in Physical Science	Disciplinary Core Ideas in Life Science	Disciplinary Core Ideas in Earth and Space Science	Disciplinary Core Ideas in Engineering, Technology, and the Application of Science
PS1: Matter and Its Interactions PS1.A: Structure and Properties of Matter PS1.B: Chemical Reactions PS1.C: Nuclear Processes PS2: Motion and Stability: Forces and Interactions PS2.A: Forces and Motion PS2.B: Types of Interactions PS2.C: Stability and Instability in Physical Systems PS3: Energy PS3.A: Definitions of Energy PS3.B: Conservation of Energy and Energy Transfer PS3.C: Relationship Between Energy and Forces PS3.D: Energy in Chemical Processes and Everyday Life PS4: Waves and Their Applications in Technologies for Information Transfer PS4.A: Wave Properties PS4.B: Electromagnetic Radiation PS4.C: Information Technologies and Instrumentation	LS1: From Molecules to Organisms: Structures and Processes LS1.A: Structure and Function LS1.B: Growth and Development of Organisms LS1.C: Organization for Matter and Energy Flow in Organisms LS1.D: Information Processing LS2: Ecosystems: Interactions, Energy, and Dynamics LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycles of Matter and Energy Transfer in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS2.D: Social Interactions and Group Behavior LS3: Heredity: Inheritance and Variation of Traits LS3.A: Inheritance of Traits LS3.B: Variation of Traits LS4: Biological Evolution: Unity and Diversity LS4.A: Evidence of Common Ancestry and Diversity LS4.B: Natural Selection LS4.C: Adaptation LS4.D: Biodiversity and Humans	ESS1: Earth's Place in the Universe ESS1.A: The Universe and Its Stars ESS1.B: Earth and the Solar System ESS1.C: The History of Planet Earth ESS2: Earth's Systems ESS2.A: Earth Materials and Systems ESS2.B: Plate Tectonics and Large-Scale System Interactions ESS2.C: The Roles of Water in Earth's Surface Processes ESS2.D: Weather and Climate ESS2.E: Biogeology ESS3: Earth and Human Activity ESS3.A: Natural Resources ESS3.B: Natural Hazards ESS3.C: Human Impacts on Earth Systems ESS3.D: Global Climate Change	ETS1: Engineering Design ETS1.A: Defining and Delimiting an Engineering Problem ETS1.B: Developing Possible Solutions ETS1.C: Optimizing the Design Solution ETS2: Links Among Engineering, Technology, Science, and Society ETS2.A: Interdependence of Science, Engineering, and Technology ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World



Based on the Arch of Titus, the Millennium Gate Museum celebrates peaceful accomplishment, with special emphasis on Georgia's history and people.

Saturday, March 17

	Featured Speakers	Special Sessions	Special Sessions/Events
7:00 AM			
8:00 AM	Featured Presentation 8:00–9:00 AM A411/412b, GWCC Speaker: Stephen Pruitt		
9:00 AM			
10:00 AM		NGSS@NSTA Share-a-Thon 9:30–10:30 AM B102, GWCC	The Horizon Educational Drone Competition (HEDC) 9:30 AM–1:30 PM Booth# 2000, Exhibit Hall B-2
11:00 AM	Paul F-Brandwein Lecture 11:00 AM–12 Noon A411/412b, GWCC Speaker: Caren Cooper		
12 Noon			
1:00 PM		Community Connections Forum: <i>Learn How to Better Advocate for Science and Science Education</i> 12:30–2:30 PM A312, GWCC	
2:00 PM	NSTA/ASE Honors Exchange Lecture 2:00–3:00 PM Grand Blrm. B, Omni Speaker: Linda Needham		GYSTC K–8 3-D Learning Share-a-Thon 2:00–3:00 PM B101, GWCC
3:00 PM			
4:00 PM			Yager Science Teaching Awardees Share-a-Thon 3:30–4:30 PM B102, GWCC
5:00 PM			
6:00 PM			
7:00 PM			
8:00 PM			
9:00 PM			
10:00 PM			

7:30–9:30 AM Meeting

Past Presidents Breakfast and Advisory Board Meeting

(By Invitation Only)

International Ballroom A/B, Omni

8:00–8:30 AM Presentations

3D Printing: Bringing Models to the STEM Classroom

(Grades 5–9)

A407, GWCC

Science Focus: ETS, CCC3, CCC4, SEP2, SEP5, SEP8

Nadene Klein (@nadeneklein11; naksmk@yahoo.com), Daniel C. Oakes High School, Castle Rock, CO

Using 3D printers is a great way to engage students in an authentic STEM project using modeling.

Ecological Considerations: Providing Access for All Students

(Grades 6–8)

C202, GWCC

Science Focus: LS2

Lacey Huffling (@GASouthernMAT; lhuffling@georgiasouthern.edu), **Heather Scott** (hscott@georgiasouthern.edu), **Hayway Johnson** (@mrjohnson_shs; hj00704@georgiasouthern.edu), **Nicole McIntyre**, and **Britt Gantt** (bg02081@georgiasouthern.edu), Georgia Southern University, Statesboro
Hear from teachers how to highlight research of diverse field ecologists, develop inquiry tasks with animal photographs, and create differentiated performance tasks.

PBS Builds the Next Generation of STEM Communicators

(Grades 6–12)

C205, GWCC

Science Focus: ETS, SEP8

Leah Clapman (@lclap; lclapman@newshour.org), PBS NewsHour, Arlington, VA

Jena Barchas-Lichtenstein (@neoyorquinaner; jblichtenstein@newknowledge.org), New Knowledge Organization Ltd., New York, NY

The STEM Student Reporting Labs program combines culturally responsive digital media training and STEM content to advance STEM and media literacy among youth.

Using Interactive Video Labs for Learning Science Practices

(Grades 9–College)

Dogwood A, Omni

Science Focus: LS, PS, SEP

Peter Bohacek (@bohacekp; peter.bohacek@isd197.org), Henry Sibley High School, Saint Paul, MN

Direct Measurement Videos provide opportunities for students to learn science practices such as experimental design, data analysis, and model making in biology, chemistry, and physics classrooms.

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 11 for a complete list of the *NGSS* codes used in this program.

Strands

The Atlanta 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.

Focusing On Evidence of 3-D Learning



Imagining Science as the Foundation for STEM



Comprehending the Role of Literacy in Science



Reflecting On Access for All Students

The following icons will be used throughout this program.



NSTA Press® Sessions



Sessions highlighting STEM learning experiences that occur in out-of-school environments.

8:00–9:00 AM Featured Presentation

3D 3-D Science Assessment: How Do You Still Make Construction a Priority?

(General)

A411/412b, GWCC

Science Focus: GEN, NGSS



Stephen Pruitt (@DrSPruitt),
Commissioner of Education, Ken-
tucky Dept. of Education, Frankfort

Presider: Brian Butler, Strand Leader,
NSTA Atlanta National Conference;
GSTA President; and Rutland High
School, Macon, GA

From the beginning of the develop-
ment of *A Framework for K–12 Science Education*, through the
development of the *Next Generation Science Standards*, Stephen
Pruitt has played key roles in reforming science education for
the 21st century. Join Commissioner Pruitt as he discusses
lessons learned during development and implementation of
new science assessment system in Kentucky. The new sys-
tem includes state level assessment, through course tasks,
and classroom-embedded assessments—all developed by
teachers. Come learn more about specific considerations of
three dimensional assessment from one of the more unique
and informed perspectives in science education.

*In September 2015, the Kentucky Board of Education unanimously
voted to hire Stephen L. Pruitt as Kentucky's sixth commissioner of
education. Commissioner Pruitt came to Kentucky with an extensive
background in education at the local, state, and national levels, and
he currently serves on the Board of Directors for the national Council
for Chief State School Officers.*

*Before coming to Kentucky, Stephen served as senior vice president
at Achieve, Inc. During his tenure with Achieve, he coordinated the
development of the Next Generation Science Standards. He began
his career as a high school chemistry teacher in Georgia, where he
taught for 12 years. In 2003, he joined the Georgia Department
of Education as program manager for Science. Until 2010, he held
various roles in the agency culminating with him being named chief
of staff to the state School Superintendent, coordinating the work
of the agency.*

*In addition to his state-level work, Stephen also served as presi-
dent of the Council of State Science Supervisors and a member of
the writing team for the College Board Standards for College
Success science standards. He also served on the National Academies
of Science's Committee on Conceptual Framework for New Science
Education Standards, which developed A Framework for K–12
Science Education.*

8:00–9:00 AM Presentations

Cosmic Collisions: Using Asteroid Impacts to Keep Earth Science Relevant in the Astronomy, Physics, Engineering, and Biology Classrooms

(General)

A302, GWCC

Science Focus: ESS1.B, ESS1.C, ESS2, ESS3.B, CCC4

Scott Harris (scott.harris@fernbank.edu), Fernbank Science
Center, Atlanta, GA

Asteroid and comet impacts can capture the imagination but
they also offer opportunities for cross-disciplinary teach-
ing that keeps Earth science relevant throughout the K–12
curricula.

Biomimicry: How Would Nature Solve This?

(Grades 6–8)

A303, GWCC

Science Focus: ETS, LS1.A, LS4.C, CCC6, SEP

Laura Kitagawa (lkitagawa@a-cs.org), Almaden Country
Day School, San Jose, CA

Inspire your students to design nature-inspired, sustainable
solutions for real-world problems...an engaging way to en-
hance STEM concepts through creativity, critical thinking,
and innovation.

Videotaped PBL and NGSS Units in My Classroom

(Grades K–9)

A304, GWCC

Science Focus: GEN, NGSS

Dominique Lark, Huegel Elementary School, Madison, WI
Last year, we had the opportunity to work with NSTA
experts to create an integrated Project-Based Learning
unit that meets the NGSS and CCSS. Then we taught the
unit with Disney videotaping our enactment. We will share
both our experiences and the units.

Aerial Exploration of Environmental Study Sites Using Kites, Cameras, and Other Sensors

(Grades 5–College)

A314, GWCC

Science Focus: ESS2, ESS3, ETS, CCC4, CCC6, SEP1,
SEP2, SEP3, SEP4, SEP5

David Bydlowski (davidbydlowski@me.com), Principal In-
vestigator, NASA's AREN Project, Wayne, MI

Paul Henry (henrya@resa.net), Wayne RESA, Wayne, MI
Take a look at your environmental study site from 150 meters
above ground level. Join us for this STEM presentation from
NASA's AREN Project and the GLOBE Program.

Develop a Chemical Hygiene Plan for Your School or District!

(Grades 6–12)

A402, GWCC

Science Focus: GEN, INF, SEP3

Crystal Caouette (*crystal@snet.net*), Safety Education & Consulting Services, LLC, Wolcott, CT

OSHA's Laboratory Standard requires a written Chemical Hygiene Plan (CHP), a framework for safer work environments. Obtain the resources to develop your own CHP!

Standards Make Strange Instructional Bedfellows: Science and Social Studies—Inquiry and Problem Solving

(Grades K–5)

A408, GWCC

Science Focus: GEN, NGSS

David Allen (@dallenbio; *david.r.allen@rps205.com*) and **Cory Nilsen** (@RPS205_SS; *cory.nilsen@rps205.com*), Rockford (IL) Public Schools

We will share how to use the NGSS as the backbone to a curriculum and instruction model that integrates science, social studies, and literacy in elementary classrooms.

Building a Strong Foundation: Elementary Science Lessons from Practitioners for STEM

(Grades K–5)

B212, GWCC

Science Focus: ESS, ETS, LS, PS

April Nelms (*anelms@ung.edu*), **Sanghee Choi** (*schoi@ung.edu*), and **Mark Spraker** (@mcspraker; *mcspraker@ung.edu*), University of North Georgia, Dahlonega

Cheryl Sundberg, Educational Consultant, Millbrook, AL
Karen Henman (*khenman@brenau.edu*), Brenau University, Gainesville, GA

Judi Souther (*judi.souther@hallco.org*) and **Alisha Buffington** (*alisha.buffington@hallco.org*), Chicopee Woods Elementary School, Gainesville, GA

Jennifer Poole (*jennifer.poole@hallco.org*) and **Heather Banks**, Hall County Schools, Oakwood, GA

Christy Morris (*christy.morris@hallco.org*), Oakwood Elementary School, Oakwood, GA

Brittney Patton, Sugar Hill Academy, Gainesville, GA

Maria Cristina Rodriguez, McEver Arts Academy, Gainesville, GA

Brian Johnston (*brian.johnston@hallco.org*), Friendship Elementary School, Buford, GA

Join us for roundtable discussions with inservice teachers who will share their classroom-vetted lessons that integrate STEM in each branch of science.

3D Building 3-D, NGSS-Based Chemistry and Physics Courses from the Ground Up

(Grades 6–12)

B401, GWCC

Science Focus: PS, CCC, SEP

Jonathan Frostad, Oak Harbor High School, Oak Harbor, WA

Hear how high school teachers developed and implemented NGSS-based chemistry and physics courses using engaging phenomena as the foundation for guided student inquiry projects.



Active Learning and Student Data Collection in the Middle School Classroom

(Grade 7)

B402, GWCC

Science Focus: PS2.A, SEP3, SEP4, SEP8

Jennifer Thompson, James Martin Middle School, Charlotte, NC

See how you can guide students in creating data-collection opportunities in order to take ownership of their own learning.

Designing Authentic Field Research Trips for Students

(Grades 9–12)

C213, GWCC

Science Focus: ESS3, ETS2.B, LS2.A, LS2.C, LS4.B, LS4.C, LS4.D, SEP

Drew Bueno-Potts (*gumbogarcon@gmail.com*), Ocean View High School, Huntington Beach, CA

Create authentic field research experiences for your students, including research protocols, data collection and analysis, and communication of results using local resources at minimal expense.

Equal Access to Science: Universal Design and Students with Disabilities

(General)

Chestnut, Omni

Science Focus: ESS1.B, CCC3, CCC4, SEP1, SEP2

Rachel Zimmerman Brachman (@RachelZBrachman; *rachel.zimmerman-brachman@jpl.nasa.gov*), NASA Jet Propulsion Laboratory, Pasadena, CA

Lyla Mae Crawford (*lylac@uw.edu*), DO-IT, University of Washington, Spokane

Full inclusion of students with disabilities in STEM involves both accommodation strategies for students and universal design of instruction that enhances learning for all students.

How Far Is the Moon? Measuring the Instantaneous Distance by Triangulation

(Grades 9–College)

International Ballroom F, Omni

Science Focus: ESS1

Tom Lough, Retired Educator, Round Rock, TX

Frederic Hessman (hessman@astro.physik.uni-goettingen.de), University of Göttingen, Germany

High school students measure angles to the Moon with paired observatory telescopes and calculate the Earth-Moon distance by triangulation. Your students can do this, too!

AMSE-Sponsored Session: Building Relationships with Students Across Lines of Difference

(General)

Juniper, Omni

Science Focus: GEN, SEP

Melissa Campanella (melissa.rae.campanella@gmail.com), Noel Community Arts School, Denver, CO

This session will serve as a “crash course” in critical race theory. Participants will examine their instructional practice through the lenses of identity, white privilege, and institutional racism, and make connections between critical pedagogy and the NGSS.

Empower ALL Students with Neuroscience

(General)

Magnolia, Omni

Science Focus: GEN, NGSS

Katrina Scherben, Harlem Children’s Zone Promise Academy Schools, New York, NY

Incorporating neuroscience can enrich the classroom culture, make differentiation easy, and increase student motivation. Walk away with resources and strategies for a diverse classroom.

What’s in Your Disciplinary Literacy Strategy Toolbox? (General)

Maple A/B, South Tower, Omni

Science Focus: GEN

Alice Gilchrist (agilchrist@s2temsc.org), S2TEM Centers SC, Greenwood, SC

Your toolbox will be filled with disciplinary literacy strategies that can be implemented easily in classrooms and that assist students in developing world-class skills.

Solar Cookers: Effective Tools for 3-D Learning

(Grades 4–12)

Maple C, South Tower, Omni

Science Focus: ETS, PS3, CCC, SEP

Susan Schleith (susan@fsec.ucf.edu) and **Penny Hall** (penny@fsec.ucf.edu), Florida Solar Energy Center, Cocoa

Mary Buchenic (rjbuch44@gmail.com), Global Development Solutions, Hubbard, OH

Incorporate solar cooking into your curriculum using an interdisciplinary, inquiry, and project-based approach. Leave with design plans and standards-focused activities.

Culturally Relevant STEAM Curriculum and Strategies for Culturally Linguistically Diverse Learners and Students with Disabilities

(General)

Walnut, Omni

Science Focus: GEN

Gerry Madrazo, Jr. (gerrymadrazo@hotmail.com), 1993–1994 NSTA President, and Madrazo Multicultural Science Consultancy, Elon, NC

Steve Showalter (steve.showalter@nau.edu) and **Patricia Peterson** (patricia.peterson@nau.edu), Northern Arizona University, Flagstaff

Experience culturally diverse STEAM curriculum for English language learners and students with disabilities. Learn to integrate STEAM within the context of American Indian and Latino cultures.



8:00–9:00 AM Hands-On Workshops

“Is This Good? Is This Right?” Empowering Girls to Overcome the Limitations of Their Self-Perceptions as Scientists/Engineers

(Grades 3–8) A301, GWCC

Science Focus: ETS, CCC2, CCC3, CCC6, SEP

Christine Nealy (christinenealy@gmail.com) and **Hyo Kim** (hyo.kim@trinityschoolnyc.org), Trinity School, New York, NY
Combining the research of Dweck’s *Mindset* and Steele’s *Whistling Vivaldi*, participants will receive a low-cost curriculum culminating in a unique twist on the ubiquitous egg drop.

April Showers Bring May Flowers AND a Means to Teach Many Fundamental Science Concepts

(Grades 6–12) A305, GWCC

Science Focus: ESS2.D, CCC1, CCC2, SEP

Martha Muir (mamuir@mindspring.com), Mill Springs Academy, Alpharetta, GA

Weather is an applied science based on the fundamental concepts in all science courses. Enliven the start of your school year with these natural phenomena.

Thinking Spatially About the Universe: WorldWide Telescope ThinkSpace Astronomy Labs

(Grades 6–8) A311, GWCC

Science Focus: ESS1.B, CCC1, CCC2, CCC3, CCC4, SEP2, SEP6, SEP7

Patricia Udomprasert (@WWTAmbassadors; pudompra@cfa.harvard.edu), Harvard University, Cambridge, MA

Abha Vaishampayan (abv5104@psu.edu) and **Kyungjin Cho** (kuc64@psu.edu), Penn State, University Park, PA

For middle school science teachers, ThinkSpace labs blend hands-on physical and virtual models to help students visualize spatially complex concepts like Moon phases, eclipses, seasons.

ASTC-Sponsored Session: Evolving Practice: An NGSS-Inspired Approach to Teaching with Fossils

(Grades 6–8) A312, GWCC

Science Focus: ESS, LS4

Jennifer Cross Peterson (jennifer_peterson@harvard.edu), Harvard Museum of Natural History, Cambridge, MA

Kris Grymonpre (kgrymonpre@bostonpublicschools.org), John W. McCormack Middle School, Boston, MA

Engage in a hands-on fossils activity as we delve into Earth science and evolution content, and science practices, as outlined in the NGSS.

Creative and Imaginative Ideas: STEM + Providing Real-World Application

(Grades 4–6)

A313, GWCC

Science Focus: ETS, PS

L. Octavia Tripp (tripplo@auburn.edu), **Megan Burton**, **Victoria Cardulo**, and **Stacie Finley**, Auburn University, Auburn University, AL

Create a robotic arm and a painted canvas. This activity shows how the robotic arm is beneficial to amputees in the real world.

Building Bridges Through the NGSS and CCSS

(Grades 4–8)

A315, GWCC

Science Focus: GEN, SEP

Lisa Ernst (@lae121; ernstl@sfsd.edu), Alice Fong Yu Alternative School, San Francisco, CA

This unit was developed through a summer fellowship at Yale, funded through numerous grants by DonorsChoose, and has been revised to meet the CCSS as well as NGSS.

I Am a Scientist, I Like What I Do, I Can Find Out What I Need to Know!

(General)

A316, GWCC

Science Focus: GEN, INF

Maryann Stimmer (mstimmer@fhi360.org) and **Ben Dworken** (bdworken@fhi360.org), Educational Equity at FHI 360, New York, NY

Let’s explore strategies for developing students’ STEM identities. Connections to informal learning environments maximize this critical piece of students’ college and career trajectories.

Using Wonder to Inspire Poets

(Grades 2–6)

A403, GWCC

Science Focus: GEN

Leticia Citizen (@citizensowls; jetaimky@aol.com), Highland Oaks Elementary School, Arcadia, CA

Find out how to use the Wonders provided by wonderopolis.org to spark the poet that lurks in every child. Also, how to use Wonder to infuse scientific expository writing and scientific nonfiction reading.

Integrating Crosscutting Concepts and Math Using NSTA Recommended Trade Books

(Grades 3–5)

A404, GWCC

Science Focus: GEN, CCC, SEP2, SEP3, SEP4, SEP5

Heidi Prouhet (heidiprouhet@wsdr4.org), Wentzville R-IV School District, Foristell, MO

Attention will be paid to integrating NGSS using hands-on activities and NSTA recommended books. Crosscutting concepts within the text will be addressed.

Using NGSS Resources to Flip a Science Lesson on Evidence of Multidimensional Learning in Grades K–2

(Grades K–2)

A405, GWCC

Science Focus: GEN, NGSS

Patti Works (@patti_works; patriciaeworks@gmail.com) and

Diane Johnson (@MDHJohnson; jdiane72@gmail.com),

EKU Partnership Institute for Math and Science Education Reform, Lexington, KY

Experience an elementary science lesson (K–2) “before and after” the NGSS, evaluating dimensionality using a structured process and NGSS resources.

Using the 5E Instructional Model to Develop a Conceptual Flow

(Grades 6–12)

A410, GWCC

Science Focus: GEN, NGSS

Cindy Gay, BSCS, Colorado Springs, CO

Dora Kastel (@Dora_Kastel; kastel.dora@gmail.com), New Visions for Public Schools, New York, NY

Compare classroom scenarios to learn the different phases of the BSCS 5E Instructional Model to plan for NGSS learning sequences.

NESTA and Soil Science Society of America (SSSA): Soils and NGSS—Perfect Together

(Grades 6–10)

B103, GWCC

Science Focus: ESS2.A, ESS3.A, ESS3.C, LS2.C

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

Let’s dig in! Join us to unearth why soil is more than the dirt under your feet, and why the nature of soil makes it the perfect NGSS topic.



¡Anímate, Tú Puedes! Media-Infused and Culturally Responsive STEM Activities for Hispanic Girls

(Grades 5–8)

B211, GWCC

Science Focus: GEN, SEP

Brenda Britsch (bbritsch@ngcproject.org), National Girls Collaborative Project, Saint Paul, MN

Rita Karl (@SciGirls; rkarl@tpt.org), **Alicia Santiago** (santimiller@mac.com), and **Sarah Carter** (scarter@tpt.org),

Twin Cities Public Television, Saint Paul, MN

Discover some of the best practices for engaging Hispanic middle school girls in STEM, including using role models, embracing cultural diversity, and engaging families.



NSTA Press® Session: Telling Earth Stories—Student-Led Modeling with Real Data and Authentic Experiments

(Grades 6–College)

B405, GWCC

Science Focus: ESS, SEP2, SEP4

Russell Colson (colson@mnstate.edu), Minnesota State University Moorhead

Mary Colson (@MnMColson; mcolson@moorheadschoools.org), Horizon Middle School, Moorhead, MN

How can you engage students in authentic modeling based on experimental investigation and data analysis rather than simply “learning the theories,” with examples from the NSTA Press® book, *Learning to Read the Earth and Sky*.

Shining a Light on the Deep Sea

(Grades 3–12)

C201, GWCC

Science Focus: ETS1, LS1.A, LS4.C, SEP1, SEP3, SEP4, SEP6

Rachel McDonald (rmcdonald@disl.org) and **Chris Flight** (@disealab; cflight@disl.org), Dauphin Island Sea Lab, Dauphin Island, AL

Bioluminescent organisms produce light in the deep ocean. Using simple circuits and creativity, your students can engineer their own bioluminescent deep sea arts.

Engaging Ways to Teach Cell Membrane Structure and Transport

(Grades 7–College)

C203, GWCC

Science Focus: LS

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

Learn how to teach your students about the structure of cell membranes and the types of cell transport with engaging and visual activities.

Framework and Tools to Help Students Analyze and Interpret Climate Data

(Grades 6–12) C206, GWCC

Science Focus: ESS2.D, ESS3.C, CCC1, SEP4

Mary (Margo) Murphy (@mmurphySTEM4ME), Camden Hills Regional High School, Rockport, ME

Molly Schauffler, University of Maine Climate Change Institute, Orono

Explore a framework and strategies for building data literacy using climate data and user-friendly online data visualization tools. Bring a device so you can explore these tools and climate data yourself.

Let's Get Critical: Literacy in the Science Classroom

(Grades 9–12) C209, GWCC

Science Focus: ESS3, ETS2, LS2.A, LS2.B, LS2.C, LS4.A, SEP7, SEP8

Lesley Shapiro (shapiro.l@husky.neu.edu) and **Briana Gustaitis** (gustaitisb@gmail.com), Classical High School, Providence, RI

Do your students believe everything they read? Discover strategies for helping students to become critical readers of scientific and pseudoscientific information.

Evolution: DNA and the Unity of Life

(Grades 9–12) C210, GWCC

Science Focus: LS4, CCC1, CCC2, SEP2, SEP4, SEP7

Louisa Stark, The Genetic Science Learning Center, Salt Lake City, UT

Explore a curriculum unit integrating three-dimensional learning with published scientific data to address core ideas in biochemistry, common ancestry, heredity, natural selection, and speciation. Visit learn.genetics.utah.edu for more information.

An NGSS Bonding Experience

(Grades 9–12) C211, GWCC

Science Focus: PS1.B, PS3.C, CCC2, CCC4, CCC5, SEP2, SEP3, SEP4

Joshua Rappuhn (jrappuhn@district100.com), Belvidere High School, Belvidere, IL

Dan Voss (@dcvoss1; daniel.voss@kstf.org), Boone High School, Boone, IA

Aliza Zivic (@alizazivic; alizazivic@u.northwestern.edu), Northwestern University, Evanston, IL

Receive an overview of a phenomena-driven storyline about chemical bonding. Then experience a lesson using magnets to model exothermic and endothermic reactions.

Using Differentiation in Phenomena-Based Inquiry

(Grades 9–11) C212, GWCC

Science Focus: PS, CCC2, SEP6, SEP7

Alexander Moran (morana@aaps.k12.mi.us) and **Avni Desai** (desaia@aaps.k12.mi.us), Skyline High School, Ann Arbor, MI

Integration of phenomenon-based inquiry and tiered differentiation allows for each and every student to engage and equitably grow toward mastery of concepts. Join us for a hands-on investigation of the relationship between a common chemical reaction and gas properties!

Modeling Energy in Physics with Multiple Representations

(Grades 9–12) C302, GWCC

Science Focus: PS3, CCC5, SEP2, SEP4, SEP5

Kimberlee Freudenberg (@KimFreudenberg; gatorfreud@gmail.com), **Kirstin Wehl**, and **Mariflor Medrano** (mmedrano@shcp.edu), Sacred Heart Cathedral Preparatory, San Francisco, CA

Yes, your students (even freshmen) can derive energy equations and solve complicated energy conservation problems! Find out how with our magic organizer using multiple representations!

Graphing—From the Concrete to the Abstract

(Grades 4–12) Dogwood B, Omni

Science Focus: GEN, SEP4

Susan Johnson (@stemsau; sjjohnson@saumag.edu) and **Stacy Allen** (snallen@saumag.edu), Southern Arkansas University, Magnolia

Are you tired of students not knowing which graph to use? So are they! Let's teach graphing in a way that makes sense!

Breaking Down the Silos: Using Microcircuit Technology and PBL to Promote STEM Learning Across Disciplines

(Grades 6–College) Grand Ballroom A, Omni

Science Focus: ETS

Steve Pauls (steve.pauls@fresno.edu), Fresno Pacific University, Fresno, CA

Use microsensor technology to collect your own data and then discuss the advantages and disadvantages of Problem-Based Learning in the science classroom.

Engineering for Sustainable Communities

(Grades 3–College) *International Ballroom D, Omni*

Science Focus: ETS1, SEP1, SEP4, SEP6, SEP8

Aerin Benavides (awbenavi@uncg.edu) and **Edna Tan**, The University of North Carolina at Greensboro

Engineer a hands-on technical solution and gain keys to bringing down barriers to access for all learners using stages of local community-inspired engineering design.

Transforming the Classroom: Where Blended Learning, PBL, and Differentiation Meet

(Grades 9–12) *International Ballroom E, Omni*

Science Focus: GEN, NGSS

Maria Thurmond and **Beth Feustel**, Discovery High School, Lawrenceville, GA

Learn how to transform instruction using multiple online tools and applications to create a blended learning environment that will increase available time to implement Project-Based Learning methods while differentiating instruction to meet the needs of a diverse learning community.

Spark Student Solutions with “Shark Tank” in the STEM Classroom

(Grades 3–12) *Pine (South Tower), Omni*

Science Focus: GEN, NGSS

Amanda Solarsh (@SolarshSTEM), Simon Baruch MS104, New York, NY

Gina Tesoriero (@Miss_STEM; ginateso@uw.edu), University of Washington, Seattle

Jeannie Gargiulo (jeanniegargiulo@gmail.com), Harrison High School, Harrison, NY

Engage in a Shark Tank Circuit Challenge to explore ways to incorporate science content in a design challenge that fosters innovative solutions and problem solving.

NARST-Sponsored Session: Investigating and Designing Paper Airplanes

(Grades 1–8) *Spruce, South Tower, Omni*

Science Focus: ETS1, PS, SEP

Augusto Macalalag, Jr. (macalalaga@arcadia.edu), Arcadia University, Glenside, PA

Joseph Johnson (@DrJohnson88; jjohnson@mercyhurst.edu), Mercyhurst University, Erie, PA

Let learning take wing! We will engage in the design of paper airplanes by using data from investigations to develop, test, evaluate, explain, and revise our engineering models.

8:00–9:30 AM Exhibitor Workshops

Flinn Favorite Biology Activities and Games

(Grades 7–College)

B203, GWCC

Science Focus: LS

Sponsor: Flinn Scientific, Inc.

Matt Anderson (manderson@flinnsci.com) and **Annemarie Duncan** (aduncan@flinnsci.com), Flinn Scientific, Inc., Batavia, IL

Students learn better and faster when they are actively involved in hands-on activities that are not only fun, but also create learning opportunities along the way. We'll share some inquiry-based labs, interactive demonstrations, and collaborative games you can use to motivate your students. Focusing on core topics like evolution, genetics, biochemistry, and more—you're sure to find a Flinn favorite that works for you! Handouts for all activities. Visit www.flinnsci.com for more information.

Biology with Vernier Using Chromebook

(Grades 7–College)

B207, GWCC

Science Focus: ETS2, LS1, LS2

Sponsor: Vernier Software & Technology

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

Participate in fun and engaging hands-on experiments using Vernier digital tools with Chromebooks to investigate cellular respiration, enzyme activity, and the spectral analysis of chlorophyll. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

Wind and Solar Energy Basics with Vernier

(Grades 3–8)

B208, GWCC

Science Focus: ESS3, ETS2, PS3

Sponsor: Vernier Software & Technology

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

Explore renewable energy using KidWind solar and wind experiment kits to design and test devices that convert energy from one form to another. In this hands-on workshop, you will use a Vernier Energy Sensor to collect and analyze data—practices that promote science inquiry, improve science literacy, and boost test scores.

Phenomena-Driven Units and Lessons for the Middle School Classroom

(Grades 6–8)

B209, GWCC

Science Focus: GEN

Sponsor: TCI

Christy Sanders, TCI, Mountain View, CA

We will conduct a Bring Science Alive! investigation that gets students engaged in explaining phenomena like real-world scientists. Join TCI and leave with everything you need to implement anchoring unit phenomena and investigative lesson phenomena in your classroom.

Shoot for the Stars: Freshmen Astronomy!

(Grades 9–10)

B215, GWCC

Science Focus: ESS

Sponsor: Perimeter Institute

Tonia Williams (outreach@perimeterinstitute.ca), Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada

Astronomy is one of the most fascinating topics in all of science. Discussion centers on a new classroom resource for introducing high school freshmen to a range of astronomical topics, including stars and stellar evolution, the Milky Way galaxy, exoplanets, and the big bang theory using hands-on activities!

Bring Citizen Science into Focus

(Grades 4–8)

B217, GWCC

Science Focus: LS

Sponsor: Celestron

Jennifer Fee, The Cornell Lab of Ornithology, Ithaca, NY
Binoculars bring nature closer and boost kids' observation skills. In any environment, you can support science learning through citizen science participation with the help of apps and free resources. We'll go on an urban bird walk to practice new skills and 20 lucky participants will receive high-quality Celestron binoculars!

STEM and Stewardship Series 1: Polar Popsicles

(Grades 3–12)

B303, GWCC

Science Focus: ESS3

Sponsor: NOAA Education

Louise Huffman, Thayer School of Engineering at Dartmouth, Hanover, NH

Today, climate change is arguably the most urgent global issue, and science educators are under siege by special interest groups intent on misinformation. An ice core scientist and a master polar educator will lead hands-on activities developed by scientists, engineers, and educators from the Ice Drilling Program Office (IDPO-NSF funded).

Calling All Carbons

(Grades 9–11)

B305, GWCC

Science Focus: ESS2, ESS3

Sponsor: Lab-Aids, Inc.

Eric Pyle, James Madison University, Harrisonburg, VA

The element of carbon is critical to life on Earth. All living organisms contain different and essential carbon-based molecules. Several Earth processes work together to cycle carbon from one carbon reservoir to another and to keep the amount in each reservoir stable. Participants will learn about and model different carbon transfer processes.

Top Biotech Stories of 2017

(Grades 7–College)

B306, GWCC

Science Focus: LS3

Sponsor: HudsonAlpha Institute for Biotechnology

Neil Lamb, HudsonAlpha Institute for Biotechnology, Huntsville, AL

Want to include cutting-edge genetic discoveries in your class? Join Neil Lamb as he explains the research discoveries of 2017 in genome architecture, human disease, pathogens, and agriculture in student-friendly language. Receive a free copy of HudsonAlpha's annual *Biotechnology Guidebook*.

Connecting Biological Concepts Through Phenomena: Sickle Cell and Malaria

(Grades 6–College)

B308, GWCC

Science Focus: LS1.A, LS3, LS4.B, LS4.C CCC1, CCC6, SEP4, SEP5, SEP6

Sponsor: HHMI BioInteractive

Timothy Guilfoyle (t.guilfoyle@cms.k12.nc.us), Phillip O. Berry Academy of Technology, Charlotte, NC

Jennifer Barnes (bioforsyth@gmail.com), Marietta High School, Marietta, GA

Explore the relationship between sickle cell anemia and malaria as an interconnected anchoring phenomenon for evolution, genetics, and protein folding using a variety of free research-based, classroom-ready resources from HHMI BioInteractive. A variety of instructional strategies will be demonstrated for activities that relate to the story of sickle cell anemia.

Mushroom Ecology and Why It Matters for Biofuel Production

(Grades 9–College)

B310, GWCC

Science Focus: LS

Sponsor: Bio-Rad Laboratories

Leigh Brown, Bio-Rad Laboratories, Hercules, CA

With rising greenhouse gases, bioengineers apply observations in mushroom ecology toward finding a biofuel solution. In this hands-on workshop, use an inquiry-based approach as you extract enzymes from mushrooms and optimize reaction rates for biofuel production.

How Engineering Can Make 3-D Assessments Sparkle

(Grades K–12)

B314, GWCC

Science Focus: ETS

Sponsor: Houghton Mifflin Harcourt

Cary Snider, Portland State University, Portland, OR

Engineering activities can provide tangible evidence of three-dimensional learning by challenging students to apply what they've learned about science to solving real-world engineering problems. Access free online examples from the latest NAEP assessment, see how middle school students respond to these "tests," and adapt this approach for your students.



Of All the Nerve: Exploring Neuronal Communication Through 3-D Learning

(Grades 9–College)

B403, GWCC

Science Focus: ETS, LS1, CCC1, CCC2, CCC4, CCC6, CCC7, SEP1, SEP2, SEP6

Sponsor: 3D Molecular Designs

Tim Herman (herman@msoe.edu), MSOE Center for Bio-Molecular Modeling, Milwaukee, WI

Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, WI

Engage students by incorporating three-dimensional learning and hands-on/minds-on models to explore response to neuronal stimuli. Construct a neuronal synapse model with a sodium-potassium pump and calcium, sodium, and potassium channels. Model resting and action potentials and neurotransmitter release. Develop explanations of ways drugs and toxins disturb neuronal communication. Handouts.

Famous Relationships—Science Is Full of Them: Engaging Middle School Students

(Grades 6–8)

B407, GWCC

Science Focus: ESS3.C, LS1.B, LS2.A, LS2.C, CCC1, CCC3, CCC4, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP7, SEP8

Sponsor: Vaccine Education Center at Children's Hospital of Philadelphia

Charlotte Moser (moser@email.chop.edu), Vaccine Education Center at Children's Hospital of Philadelphia, PA

Donald Mitchell (donald@medicalhistorypictures.com), Medical History Pictures, Inc., Haverford, PA

Middle school is full of relationship drama and so is science! We will introduce new, free modules that help students understand relationships between humans and germs in terms of relative size, interdependency in ecosystems, and the eternal struggle for survival, including consideration of relationships between scientists competing to beat diseases.

Integrating Robotics into Your Science Classroom (Grades 5+)

(Grades 5–12)

B409, GWCC

Science Focus: ETS, PS2

Sponsor: LEGO Education

Laura Jackson, Retired Science Teacher, Lee's Summit, MO

Want to prepare your students for STEM-related fields as you bring more engineering and Problem-Based Learning into the classroom? Attend this workshop and learn how to use robotics to teach science principles such as friction, acceleration, and velocity.

8:00–11:00 AM Short Courses



Integrating Engineering into K–8 Life Science Lessons (SC-10)

(Grades K–8) Tickets Required; \$45 Chastain E, Westin
Science Focus: ETS1, LS, SEP

Michelle Forsythe (mforsythe@txstate.edu), Texas State University, San Marcos

For description, see Volume 1, page 61.

3D Using NGSS Storylines to Support Students in Meaningful Engagement in Science and Engineering Practices (SC-11)

(Grades K–12) Tickets Required; \$69 Chastain H, Westin
Science Focus: GEN, NGSS

Brian Reiser (@reiserbrianj; reiser@northwestern.edu),

Michael Novak (@mnovakccl; mnovakccl@ccl.northwestern.edu), and

Tara McGill (@tarantulamarch; tara.mcgill@northwestern.edu), Northwestern University, Evanston, IL
For description, see Volume 1, page 61.

“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 Retiring: Suggestions and Help

Saturday, March 17

9:30–10:30 AM

Omni Atlanta Hotel at CNN Center
Chestnut

For more information on the Retired Members Advisory Board, contact Lloyd Barrow, Chair, at barrowl@missouri.edu.



8:30–9:00 AM Presentations

The Girls in STEM Project: Connecting Students to Mentors to Improve the Los Alamos National Laboratory Pipeline

(Grades 5–6)

A401, GWCC

Science Focus: GEN, NGSS

Elizabeth Coronado (ecoronado@lanl.gov), Los Alamos National Laboratory, Los Alamos, NM

Students from rural northern New Mexico work with mentors from Los Alamos National Lab in order to experience the application of learned STEM skills to real-life science careers.

Project-Based Learning Supports 3-D Learning; Projects Alone Do NOT!

(Grades K–8)

A407, GWCC

Science Focus: GEN, CCC1, CCC2, CCC4, SEP

April Sawey (@ASawey; asawey@fwacademy.org), Fort Worth Academy, Fort Worth, TX

Emphasis will be placed on the importance of teaching using Project-Based Learning as opposed to assigning projects as a support for three-dimensional learning. Discussion centers on challenges and solutions, best practices, and parent communication strategies to help transition your school culture.

Increasing Girls' Engagement in STEM: The Argument in Favor of Single-Gender Education

(Grades 6–12)

A412a, GWCC

Science Focus: GEN, SEP

Emilie Hill (@TchrEmilieHill; emilie.hill@lausd.net), Girls Academic Leadership Academy, Los Angeles, CA

Girls in a single-gender setting perform better in STEM courses than their co-ed counterparts, and are more likely to pursue STEM careers.

Alien Invasion! Using Invasive Species to Explore Ecosystems

(Grades 6–8)

C202, GWCC

Science Focus: LS2.A, LS2.B

Rebecca Paugh (paugh.rebecca@mail.fcboe.org), Rising Starr Middle School, Fayetteville, GA

Learn how to use invasive species to explore the various interactions in an ecosystem through argumentation, modeling, and data analysis.

Strategies for English Language Learners in Interactive Notebooks in Middle School Science Classrooms

(Grades 6–8)

Dogwood A, Omni

Science Focus: GEN

Edralin Pagarigan (edralin.pagarigan@pgcps.org), William Wirt Middle School, Riverdale, MD

Receive highlights of both ELL strategies in understanding science concepts and the use of interactive science notebooks as a tool for ELLs.

From STEM to Computer Science—Partnering for Quality Teaching and Learning

(Grades 9–College)

International Ballroom C, Omni

Science Focus: GEN, CCC, SEP

Dewayne Morgan (@USMAsker; dmorgan@usmd.edu), University System of Maryland, Adelphi

Hear about the best practices associated with a multi-year preK–20 STEM, inquiry-focused partnership that later expanded to include computer science and computing education.

9:00 AM–3:00 PM Exhibits

Hall B2, GWCC

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–5:00 PM Networking Opportunity NSTA International Lounge

Cypress, Omni

9:30–10:00 AM Presentations**It's Personal: The Scholar Responsive Learning Environment***(Grades 6–8)**A303, GWCC*

Science Focus: GEN, SEP4, SEP5, SEP8

Lakenna Booker, Nexus STEM Academy, Memphis, TN
 Founding STEM teachers from Memphis recount how to foster and create a scholar responsive environment. The team will examine the instructional model used to help respond to the needs of scholars using technology, interventions, and physical teacher instruction.

Take It Outside: Centering an Ecosystems Unit on a Local Open Space*(Grades 6–7)**A314, GWCC*

Science Focus: ESS3.C, LS2.B

Catherine Melton (@melton_science; catherinemelton@gmail.com), Lakeridge Junior High School, Lake Oswego, OR
 Discover how a field trip to a nearby open space can serve as a platform for a variety of NGSS-focused projects in a middle school science class.

PEEP-ing into PreKindergarten Science Instruction
*(Preschool)**A315, GWCC*

Science Focus: GEN

Gerrie Wiersberg (gwiersbe@wcboe.org), Wicomico County Public Schools, Salisbury, MD

Explore free resources from public television's *PEEP and the Big, Wide World*.™ Learn how to engage early learners in hands-on science using this STEM curriculum.

Creating Storylines to Localize Variability and Trends in Large Climate Data Sets*(Grades 5–6)**A401, GWCC*

Science Focus: ESS2.D, ESS3.D, CCC1, CCC7, SEP4

Meredyth Sullivan (msullivan@gmri.org), Gulf of Maine Research Institute, Portland

Follow the process of taking complex NASA data sets and designing experiences for middle school students to explore variability, trends, and patterns in climate-related data.

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

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NSTA National Science Teachers Association

Mapping for Student Success: Taking Notes with Concept Maps in Undergraduate Biology Courses

(Grades 6–College)

C202, GWCC

Science Focus: LS, SEP8

Erin Duckett (educkett@westga.edu) and **Danilo Baylen** (dbaylen1@yahoo.com), University of West Georgia, Carrollton
Review findings from a research project on demonstrating a relationship between note taking using concept maps and student performance as measured by recall and retention of science concepts, principles, and processes in undergraduate science courses.

9:30–10:30 AM Presentations

Implementing Culturally Responsive Pedagogy to Improve Access in Science

(Grades K–12)

A301, GWCC

Science Focus: GEN

Patricia Morgan (@MissDunac; morgan.patricia@mail.fcboe.org), Lafayette Educational Center, Fayetteville, GA
Leave with instructional strategies to enrich the curriculum by selecting meaningful learning materials, creating an inclusive learning environment, and making connections between school and home.

Partnering with State-Level Agencies to Broaden the Impact in STEM

(Grades 3–6)

A304, GWCC

Science Focus: GEN, NGSS

Timothy Laubach (@LaubachTim; laubach@ou.edu), The University of Oklahoma, Norman

Caitlin Trail (cmtrail@me.com), University of Oklahoma, and Whittier Middle School, Norman, OK

We will share our experiences of working with a statewide initiative in creating STEM instructional sequences related to environmental conservation and alternative energies that meet the NGSS.

STEM for All: Supporting Students in Special Education Within a STEM Environment

(Grades K–6)

A408, GWCC

Science Focus: GEN, NGSS

Tara Pitt (@TaraPitt1230; tpitt@dps61.org), French STEM Academy, Decatur, IL

We will explore how to adapt STEM curricula to meet the needs of students with learning disabilities.

Evaluate Your Sessions Online!

This year, we're giving away an Apple iPad mini 2 Wi-Fi tablet to two lucky attendees who complete a session evaluation! Remember, the more sessions you attend and evaluate, the more chances you have to win! (For details, see Volume 1, page 17.)

A Dozen Dandy Demonstrations

(Grades K–8)

A412a, GWCC

Science Focus: PS2.A, PS2.C, PS3.B, PS3.C, PS4.A, CCC

Fred Myers (@fredmyers27; fredmyers3p@gmail.com), Retired Science Educator, Bolivia, NC

Walk away with at least a dozen ideas for vivid physical science demonstrations that can be used as phenomena hooks for lessons or units, or as instructional tools to bolster student understanding. They can reveal misconceptions, engage students in discussions of their understandings, and improve student sense-making. Handouts.

NSTA Professional Development Committee's Share-a-Thon

(General)

B101, GWCC

Science Focus: GEN, NGSS

Eric Brunsell, NSTA Director, Professional Development in Science Education, and University of Wisconsin Oshkosh
NSTA's Professional Development Committee invites you to learn about a variety of grassroots professional learning strategies. Experienced PD facilitators will share effective approaches, including social media-based book studies, unconferences, PLC models, and more. Discover valuable resources and leave with a variety of "how-to" guides and practical examples.



Bringing STEM and Literacy "Out of the Dust"

(Grades 3–12)

B212, GWCC

Science Focus: GEN

Donald White (@dwhitesciguy; donald.white@cowetaschools.net), Coweta County School System, Newnan, GA

Laura Farmer (@laurarfarmer; laura.farmer@cowetaschools.net), Madras Middle School, Newnan, GA

STEM and literature may not seem like a likely combination, but when merged successfully can enlighten and engage the most reluctant student.

“Water, Water Everywhere, Not a Drop to Drink”...

(Grades 9–12) C204, GWCC

Science Focus: ETS1, LS1, LS2, CCC2, CCC7, SEP7

Dawnne LePretre (dlepretr@hawk.iit.edu), **Judith Lederman** (ledermanj@iit.edu), and **Norman Lederman** (ledermann@iit.edu), Illinois Institute of Technology, Chicago

Explore the water cycle as an ecosystem, learn about arguments in regards to the water crisis, and discuss if water is a commodity or a human right.

I Screen, You Screen, We All Screen...for Science Content!

(Grades K–5) C205, GWCC

Science Focus: GEN, NGSS

Rachel Fiore (rfiorel@gsu.edu) and **Kalil Garrett**, Georgia State University, Atlanta

Melinda Roberson (mroberson@rockdale.k12.ga.us), Rockdale City Public Schools, Conyers, GA

No longer will you worry about whether or not that lesson you found online has the correct science content. Become a tester for our app!

The Immortal Life of Henrietta Lacks and Her Contribution to Science

(Grades 7–12) C207, GWCC

Science Focus: LS3, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Veronica Costilla (costivr@nv.ccsd.net), Valley High School, Las Vegas, NV

Incorporate how cells are used to come up with cures for diseases and illness while discussing the ethical portion of research. You can incorporate this in class with your students.

Creating Empowerment and Agency for All Students in a Physics Classroom

(Grades 6–12) C301, GWCC

Science Focus: PS, CCC

Jennifer Keil (jenniferkeil11@gmail.com), American Chemical Society, Washington, DC

Nicole Schrode (schrode_nicole@svvsd.org), Longmont High School, Longmont, CO

The Physics and Everyday Thinking High School (PET-HS) curriculum engages students in science practices of generating and defending claims using evidence and argumentation as a means of developing and formalizing physics principles. Join us to learn more.

The A Is for ART! STEM to STEAM: How Science Shapes Art

(Grades 5–12)

Birch, Omni

Science Focus: GEN

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

Brenda Rentfro (brenren@comcast.net), Alan B. Shepard High School, Palos Heights, IL

Tiffany Albers-Lopez (tlopez@marianchs.com), Marian Catholic High School, Chicago Heights, IL

The true connections between art and science, application of science concepts to the creation of artwork and vice versa, are explored with middle level and high school students.

Before and After Retiring: Suggestions and Help

(Grades K–12)

Chestnut, Omni

Science Focus: GEN

Lloyd Barrow (barrowl@missouri.edu), Professor Emeritus, University of Missouri, Columbia

The NSTA Retiree Advisory Board invites you to this useful information-sharing session. Join colleagues and share your ideas about staying active after retiring.

A Model for Developing Coherent Sequences of 3-D Learning with Resources and Templates

(General)

Hickory, Omni

Science Focus: GEN, NGSS

Tyson Grover (@GroverScience; tgrover@dsdmail.net), Davis School District, Clearfield, UT

Matthew Patterson (@funguyscience; mpatterson@wsd.net), Weber School District, Ogden, UT

Come engage in a process with resources and templates for using phenomena to create clear storylines focused on student sense-making.

AMSE-Sponsored Session: George W. Carver Conversation Series on Diversity and Equity

(Grades 6–College)

Juniper, Omni

Science Focus: GEN, CCC

Sharon Delesbore (@amsek16; @DrSciMama; sjdelesbore@gmail.com), Fort Bend ISD, Rosharon, TX

Cherry Brewton (cbrewton@georgiasouthern.edu), Science Education Consultant, Statesboro, GA

The life of George Washington Carver exemplifies excellence in spite of circumstances. Dialogue and plan for equitable actions to create opportunities for ALL students.

Not Your Traditional Lab Report: Teaching Students to Communicate in Science So People Will Listen

(Grades 5–12) *Maple A/B, South Tower, Omni*

Science Focus: LS, SEP6, SEP8

Janet MacNeil (@curiouslearner8; janet_macneil@psbma.org), Public Schools of Brookline, MA

Mark Goldner (@sciencegold; mark_goldner@psbma.org), Heath School, Brookline, MA

Melissa London, Pierce School, Brookline, MA

How can you teach students to communicate explanations, information, and ideas about science in ways that are engaging, visually appealing, and fun? Come find out!

Digital Resources for Teaching Ecological Concepts

(Grades 6–College) *Maple C, South Tower, Omni*

Science Focus: LS2

Robert Steiner (rsteiner@amnh.org), American Museum of Natural History, New York, NY

Bridget Conneely (@Biointeractive; conneelyb@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, MD
We will share data-rich, interactive ecology resources and classroom activities from both the American Museum of Natural History and the Howard Hughes Medical Institute.



9:30–10:30 AM Hands-On Workshops

NASA Is with You When You Fly: Flight and the Four Forces

(Grades K–12)

A305, GWCC

Science Focus: ESS3.C, ETS1, ETS2.B, PS2.A, PS2.B, PS3.A, PS3.C, CCC1, CCC2, CCC4, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7

Barbara Buckner (@bbuckner; barbie.buckner@nasa.gov), NASA Armstrong Flight Research Center, Palmdale, CA

Wesley Kennedy (@wkennedy73, wesley.kennedy@acs-k12.org), Athens (AL) City Schools

Come explore aeronautics, parts of an airplane, and four forces as you engage in hands-on, standards-focused STEM activities. Make real-world connections with NASA research.

Using Robotics to Learn Programming—From the Simple to the More Complex

(Grades 3–8)

A311, GWCC

Science Focus: GEN, SEP5, SEP8

Tim Robinson (timothy@unr.edu) and **Catherine Pozarski Connolly**, University of Nevada, Reno

David Crowther (@Dtcrowther; crowther@unr.edu), NSTA President, and University of Nevada, Reno

Come learn how to program using paper and pencil, markers, and computers. Engage in hands-on activities showcasing free ideas for robotics, including cardboard, Ozobots, and EV3.

INF ASTC-Sponsored Session: Literacy and STEM: The Perfect Complement

(Grades P–2)

A312, GWCC

Science Focus: INF

Tara Henderson, Explora, Albuquerque, NM

Engage in a fun, thought-provoking workshop full of science activities integrated with literature and math that you can use in your classrooms. We will take an inquiry approach to learning, actively exploring physical materials. Explora educators will model engagement with materials and facilitation questions to assist teachers in developing skills for supporting science learning and literacy in their classrooms.

Rock Pocket Mice and Mendel's Peas: A Middle School 3-D Storyline

(Grades 6–8)

A313, GWCC

Science Focus: LS3, LS4.B, LS4.C, CCC2, CCC6, SEP2, SEP5, SEP6

Jeremy Peacock (@jeremy_peacock; peacock.jeremy@gmail.com), Program Coordinator, NSTA Atlanta National Conference; and Northeast Georgia RESA, Winterville

Anna Bahnson (agbahnson@gmail.com), Malcom Bridge Middle School, Bogart, GA

This storyline, adapted from resources from HHMI and others, engages middle school students in explaining genetic and evolutionary phenomena in rock pocket mouse populations.

CESI-Sponsored Session: Active Formative Assessment

(Grades K–6)

A402, GWCC

Science Focus: GEN, SEP

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

Jason Artero, Central Michigan University, Mount Pleasant

Learn how to use active formative assessment classroom strategies to set up a classroom environment where students can think critically.

Batology: An Integrated STEAM and ELA Unit on Bat Structure, Diversity, and Their Vital Role in the Ecosystem

(Grades 2–4)

A403, GWCC

Science Focus: LS

Wendy Wing (@Wingtweets; wwing@forsyth.k12.ga.us) and **Jennifer Magee** (@jmagee1; jmagee@forsyth.k12.ga.us), Sharon Elementary School, Suwanee, GA

Capture your students' attention with blood-loving vampires, giant flying foxes, and echolocation. Fly away with a STEAM/ELA unit full of engaging activities and resources.

Science and Literacy: Content Area Strategies for Nurturing Young Scientists

(Grades K–3)

A404, GWCC

Science Focus: GEN

Pam Goodner (pamela.goodner@greatminds.org), Great Minds Science, Washington, DC

Hear how to use developmentally appropriate, literacy-based strategies to reinforce key scientific habits of mind, including observation, inquiry, analysis, and the use of text evidence.

Tiny House for the Titans: Using Stories to Construct Tiny Houses

(Grades 3–5)

A405, GWCC

Science Focus: ETS1, SEP

Maggie Small (maggie.small@shs.org) and **Susanna Paterson** (susanna.paterson@shs.org), Shady Hill School, Cambridge, MA

Implement an interdisciplinary tiny house building project for upper elementary students that addresses the needs of a “client” in literature, mythology, folktales, or real-world context.

Assessing 3-D Learning with Instructionally Supportive Tasks and Rubrics

(Grades 6–8)

A410, GWCC

Science Focus: GEN, NGSS

Phyllis Haugabook Pennock (phyllishpennock@gmail.com), CREATE for STEM Institute, Michigan State University, East Lansing

Samuel Severance (@SamSeverance; severans@colorado.edu), University of Colorado Boulder

Christopher Harris (@chrsharris; christopher.harris@sri.com) and **Nonye Alozie** (nonye.alozie@gmail.com), SRI International, Menlo Park, CA

Consuelo Morales (cjmorale@umich.edu), Michigan State University, East Lansing

Support your science instruction with three-dimensional assessment tasks and rubrics designed to help teachers gain insight into their students' progress toward achieving NGSS performance expectations.

NGSS@NSTA Share-a-Thon

(Grades K–12)

B102, GWCC

Science Focus: GEN, NGSS

Ted Willard (@Ted_NSTA; twillard@nsta.org), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

Jennifer Horak, Assistant Executive Director, Program Integration, NSTA, Arlington, VA

At the NGSS@NSTA Share-a-Thon, get tips and tools to implement three-dimensional performance expectations from NSTA's NGSS Curators, NGSS writers, and other education experts. Leave with plenty of handouts and ideas you can use in your classroom right away!

NESTA and NOAA Share: Investigate Earth Processes Using NOAA Data Resources

(Grades 6–College)

B103, GWCC

Science Focus: ESS2.A, ESS3.C, LS2.A, SEP

Peggy Steffen (peg.steffen@gmail.com), NOAA National Ocean Service, Silver Spring, MD

Find out how you can access and use NOAA data in your classroom. Come learn about websites and resources that use data about weather, climate, drought, sea surface temperature, coastal water quality, coral bleaching, and ocean acidification...and try several activities that can be used in the classroom.



Social Studies (Put Some STEM in It!): Integrating Social Studies and STEM

(Grades 4–8)

B402, GWCC

Science Focus: ETS1

Cheri Jones (cheri_jones@gwinnett.k12.ga.us), Chattahoochee Elementary School, Duluth, GA

Amanda Meadows (@WES_STEM; ameadows@forsyth.k12.ga.us), Whitlow Elementary School, Cumming, GA

Forget stop and STEM! Integrate it in many subjects, including social studies. Make learning about history hands on with integrated STEM lessons. Find out how to support social studies standards through the engineering design process.



NSTA Press® Session: Outdoor Science...Literally!

(Grades K–8)

B405, GWCC

Science Focus: GEN, NGSS

Steve Rich (@bflyguy; bflywriter@comcast.net), University of West Georgia, Carrollton

Notebooks, journals, and children's books connect students to active learning in the school yard. This NSTA Press/NSTA Kids author will show you how. Free seeds.

Explaining the Phenomenon of Emerging Vector-Borne Disease: Modeling Ecosystem Biology, Human Interactions, and Disease

(Grades 9–12)

C201, GWCC

Science Focus: LS, CCC, SEP

Barbara Hug (bhug@illinois.edu), The University of Illinois at Urbana-Champaign, Champaign

Natasha Capell, Academy High School, Urbana, IL

Unravel a mystery using scientists' data of disease spreading through multiple ecosystems. Experience activities supporting model development explaining connections between ecosystem dynamics and vector-borne disease.

A Phenomenon-Based Life Science Unit: How and Why Would an Invasive Species Affect Our Ecosystem?

(Grades 6–8)

C203, GWCC

Science Focus: LS2, SEP2

Alissa Berg (@alissaberg; alissaberg@gmail.com), Academy for Urban School Leadership (AUSL), Chicago, IL

Robin Thompson (robinkthompson@gmail.com), Tarkington School of Excellence, Chicago, IL

Explore an NGSS-focused life science unit in which students engage in evidence-gathering and model-revision to explain a puzzling science phenomenon.

Teaching STEM in the Pop Culture Classroom

(Grades 6–12)

C206, GWCC

Science Focus: GEN, NGSS

Gioya Fennelly (gioyafennelly@aol.com), Teachers College, Columbia University, New York, NY

Marco Machado (@MarcoDMachado; marco.daniel.machado@gmail.com), The Brooklyn Latin School, Brooklyn, NY

Hyun Davidson (hjc248@gmail.com), Manhattan Early College School for Advertising, New York, NY

STEM instruction has seen graphic representations be used alongside text to improve student comprehension and retention for decades. With the rising popularity of comics, manga, and graphic novels in pop culture, an opportunity to further engage students by combining this pedagogical strategy with characters and themes students are familiar with has presented itself in the science classroom. Join us as we present specific strategies on how new media can be used to improve student interest and content literacy, as well as share some of the best comics and graphic novels for teaching STEM.

Exploring Sound and Music with Arduinos

(Grades 8–12)

C209, GWCC

Science Focus: ETS, CCC

Zoheyr Doctor (zdoctor@uchicago.edu), The University of Chicago, IL

Excite students with engineering activities that combine sound, music, coding, and electronics! Circuit diagrams, code, and classroom exercises are supplied for three musical devices.

You, Too, Can Drive a Mars Rover

(Grades 7–12)

C210, GWCC

Science Focus: PS2.A, PS3.C, PS4, CCC3

Martha Muir (mamuir@mindspring.com), Mill Springs Academy, Alpharetta, GA

Make fundamental measurements of angles and distances, enter them in a program, and then use radio waves to send them to a robotic rover.



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Dr. Ashok Gadgil, National Inventors Hall of Fame Inductee,
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How Do We Grade Students in a 3-D Classroom?

(Grades 6–12)

C211, GWCC

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

James Clark (jclark@slzusd.org), San Lorenzo (CA) Unified School District

Samantha Johnson (@SciInnovations; smjohnson@slzusd.org), Arroyo High School, San Lorenzo, CA

Assessing NGSS performance expectations will require that students have multiple assessment opportunities to demonstrate their understanding of these expectations. Come see how formative assessments and standards-based grading can be the perfect fit with NGSS.

Introducing Students to Data Science with Simulations and Interactive Graphing

(Grades 9–College)

Dogwood A, Omni

Science Focus: GEN, CCC1, SEP2, SEP4

Frieda Reichsman (freichsman@concord.org), The Concord Consortium, Concord, MA

Tim Erickson (@eeps; eepsmedia@gmail.com), eeps Media, Oakland, CA

What's data science? Can we teach it—without coding? Come learn about CODAP, a free online data analysis tool in various science contexts. Bring laptops!

Problem-Based Lessons for Teaching Biodiversity and Ecosystem Services

(Grades 5–12)

International Ballroom D, Omni

Science Focus: ESS3.A, ESS3.C, LS2.A, LS4.D, CCC1, CCC3, CCC7, SEP1, SEP3, SEP4, SEP7

John Greenler (@johngreenler; john.greenler@wisc.edu), Great Lakes Bioenergy Research Center, Madison, WI

Explore current science and engineering challenges by evaluating costs and benefits of growing different bioenergy crops through readings, discussions, data analysis, and investigations.

Hands-On STEM: K–12 NASA Aeronautics Activities for Each Subject of S.T.E.M.

(Grades K–12)

Pine (South Tower), Omni

Science Focus: PS2, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

April Lanotte (april.lanotte@gmail.com), Wings Over the Rockies Air and Space Museum, Denver, CO

Lisa Wininger (@LisaWininger; lisa.a.wininger@nasa.gov), Einstein Fellow, NASA Headquarters, Washington, DC
Explore new and existing hands-on NASA aeronautics activities that engage students in every subject of STEM. Aeronautics experience is not required.

Successful Strategies for Teaching Science Lab Safety Concepts

(Grades 1–12)

Spruce, South Tower, Omni

Science Focus: GEN, SEP2, SEP3

Kenneth Roy (@drroysafersci; royk@glastonburyus.org), Glastonbury (CT) Public Schools

Tyler Love (@UMES_Tech_Dept), University of Maryland Eastern Shore, Princess Anne

You need to have a safer science lab experience! Participants will be introduced to successful strategies, including activities fostering science lab safety concepts.



9:30–11:30 AM Presentation

Alliance of Affiliates—Sponsored Session: Professional Development and Resources for Science Teachers

(General)

Magnolia, Omni

Science Focus: GEN, NGSS

Lisa Martin-Hansen (@LMartinHansen; l.martinhansen@csulb.edu), California State University, Long Beach

Deborah Hanuscin (debi.hanuscin@wwwu.edu), Western Washington University, Bellingham

Mary Lou Lipscomb (mllscience@aol.com), NMLSTA Co-President, Naperville, IL

Sharon Delesbore, Fort Bend ISD, Rosharon, TX

Margaret Glass (mglass@astc.org), Association of Science-Technology Centers, Washington, DC

Need professional development for your teachers? Are you looking for a partner for a grant project or someone to help you write a grant for project funding? Join us to share your need for professional development for your teachers or a partner for a grant project. Consider NSTA's affiliates as potential partners.

10:00–10:30 AM Presentations

Hacking All of the Sciences

(Grades 4–8)

A303, GWCC

Science Focus: ETS, SEP

Melinda Huffman (melindajhs@mac.com), Riverbend School, Natick, MA

Explore how a middle school teacher created a grade 5 science curriculum based on physical, life, Earth, and computer sciences and used projects that infused making, the engineering and design process, computational thinking, and technology into that class.

Our Earth Awaits: Add Authentic Outdoor Earth Science Activities to Your Middle School Curriculum

(Grades 5–9)

A314, GWCC

Science Focus: ESS2.A, ESS2.D, CCC4, SEP1, SEP3, SEP4, SEP7, SEP8

Brian Gardiner (brian_gardiner@dekalbschoolsga.org), Peachtree Charter Middle School, Atlanta, GA

Use easy, low-cost authentic outdoor Earth science lessons to get your young scientists outside. Lessons include weather, erosion, scientific investigations, observations, and inferences.

Integrating Evolution Across the Syllabus in a Non-majors Biology Course

(Grades 8–College)

C202, GWCC

Science Focus: LS

Janet Ray (@JanetKRay; janet.ray@unt.edu), University of North Texas, Denton

Free evolution from its lonely isolated chapter in the text or syllabus. Seamlessly integrate evolution concepts and terminology across topics in an introductory biology course.

10:00–11:30 AM Exhibitor Workshops

New Standards: Project-Based STEM Engineering by WhiteBox Learning

(Grades 5–College)

B203, GWCC

Science Focus: ETS1

Sponsor: WhiteBox Learning, a Flinn Scientific Company

Graham Baughman (graham@whiteboxlearning.com), WhiteBox Learning, Louisville, KY

Engage your students in the complete engineering design process. Meet the new science standards with WhiteBox Learning's project-based STEM Learning System. Students can research, design, analyze, and simulate (iterate) their designs, and compete "virtually," all around the world, from any browser. An integrated learning management system (LMS) is included during this hands-on workshop. Visit www.whiteboxlearning.com for more information.



—Photo courtesy of Mike Weiss

Integrating Chromebook with Vernier Technology

(Grades 3–College)

B207, GWCC

Science Focus: ETS2, PS1, PS2

Sponsor: Vernier Software & Technology

Rick Rutland (info@vernier.com), Five Star Education Solutions, Stockdale, TX

Participate in fun and engaging experiments using Vernier digital tools with Chromebooks to compare grip strength, investigate pressure and volume relationships, and match position graphs. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

Physics with Vernier Using Chromebook

(Grades 3–6)

B208, GWCC

Science Focus: ETS2, PS2, PS3

Sponsor: Vernier Software & Technology

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

Participate in fun and engaging hands-on experiments using the new Go Direct Sensor Cart and other Vernier digital tools with Chromebooks. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

Beyond Building: Teaching Engineering Design

(Grades 6–8)

B209, GWCC

Science Focus: ETS1

Sponsor: TCI

Christy Sanders, TCI, Mountain View, CA

Come take on the role of students as you learn about the Engineering Design Process. Join us to participate in fun investigations where you learn about all aspects of being an engineer, including designing processes for solving problems, like algorithms.

Zombie Apocalypse!

(Grades 6–12)

B213, GWCC

Science Focus: GEN

Sponsor: Texas Instruments

Jeffrey Lukens, Sioux Falls (SD) School District

Be part of a zombie apocalypse! Learn about disease-spread modeling using simulations and fun storylines about a zombie outbreak. Applicable for middle school and high school, this workshop is sure to scare you and your little zombies with its exciting Hollywood themes used to engage students in learning science!

Hands-On with Google's Science Journal App

(Grades 4–10)

B214, GWCC

Science Focus: GEN, SEP

Sponsor: Google

Amit Deutsch (amitdeutsch@google.com), GOOGLE LLC, Mountain View, CA

Science Journal is a free app for Android and iOS that enables anyone to do fun hands-on science experiments using their phones and tablets. Come meet the Science Journal team as we demo the latest version of the app and showcase new educational activities developed by our partners.

Climate Change

(Grades 7–12)

B215, GWCC

Science Focus: ESS3

Sponsor: Perimeter Institute

Tonia Williams (outreach@perimeterinstitute.ca), Perimeter Institute for Theoretical Physics, Waterloo, ON, Canada

Climate change is a vitally important, yet challenging topic to teach. This session will get you engaging with hands-on activities you can use with your students on Monday! Together, critically think about key scientific data and the indicators that recognize our changing environment.

STEM and Stewardship Series 2: Planet Stewards Education Project

(General)

B303, GWCC

Science Focus: ESS

Sponsor: NOAA Education

Bruce Moravchik, NOAA National Ocean Service, Silver Spring, MD

Molly Harrison, NOAA Fisheries, Silver Spring, MD

Get funding to support hands-on learning! Find out how you can receive support for creating and carrying out a stewardship project with your students while learning from some of the most respected scientists in Earth science. Past funding recipients will discuss their experiences and share free hands-on activities to get you started.

A Music and Mind Melody

(General)

B304, GWCC

Science Focus: GEN

Sponsor: Society for Neuroscience

Nicole Baganz, Florida Atlantic University, Jupiter

Why does music help us learn our ABCs? Why do we have that one song that can bring us joy or make us weep? These are questions that researchers are currently investigating. Hear from a researcher on the current understanding of the connection between music and the mind.

Prospecting for Mineral Ore

(Grades 9–11)

B305, GWCC

Science Focus: ESS3, ETS1

Sponsor: Lab-Aids, Inc.

Eric Pyle, James Madison University, Harrisonburg, VA
How do geologists look for mineral ore? In this activity from *EDC Earth Science*, participants search for a layer of rock that contains a valuable mineral called molybdenum by testing sediments collected in strategic spots along river systems and gathering data to decide where the deposit is located. This is no cookie mining activity!

Sustainable and Safe Food and Water for Engaging STEM Students

(Grades 5–College)

B306, GWCC

Science Focus: ESS3.C, LS1.A, LS1.B

Sponsor: University of Delaware Food Science

Kali Kniel (kniel@udel.edu) and **Adrienne Shearer** (ashearer@udel.edu), University of Delaware, Newark
The University of Delaware Food Science Program offers science-based educational materials focused on food safety issues applicable across the curriculum. Multifaceted and adaptable resources feature case studies, videos, and web-based games designed for engaging students. Concepts addressed include foodborne illness outbreak investigation and prevention, sustainable agriculture, water conservation, and societal impacts.

Explore Our Changing Planet and Mass Extinctions with HHMI BioInteractive

(Grades 9–College)

B308, GWCC

Science Focus: ESS2.D, ESS2.E, LS4.A, LS4.C, CCC2, CCC7, SEP4, SEP6, SEP7

Sponsor: HHMI BioInteractive

Katherine Ward (kward@smuhsd.org), Aragon High School, San Mateo, CA

Dana Navarro (dgrooms@conejoussd.org), Thousand Oaks High School, Thousand Oaks, CA

Looking to incorporate more Earth science concepts into your biology course—or to combine these concepts for a more integrated approach? Join us to explore free, online, classroom-ready cross-curricular lessons that address how changes in Earth’s environmental conditions have caused changes in species over time.

That’s My Idea! Engineering in the Classroom Through Product Design

(Grades 9–College)

B310, GWCC

Science Focus: ETS

Sponsor: Bio-Rad Laboratories

Jeannie Spagnolo, Bio-Rad Laboratories, Hercules, CA
Low cost...helps with grading...works underwater? Designing a useful product requires creativity and critical thinking. In this interactive workshop, professional developers share their experience with the design process—a great way to practice defining problems, infusing all aspects of STEM into your class by designing solutions with students.

Advancing STEM Education Through Safety Science and Engineering

(Grades 5–8)

B311, GWCC

Science Focus: ETS1, PS3, CCC5, SEP

Sponsor: UL Xplorlabs

Ginger Sommer and **Dennis Avelar**, UL, Northbrook, IL
Kelly Keena, Blue Lotus Consulting & Evaluation, Louisville, CO

UL Xplorlabs bridges the gap between your classroom and real-world engineering. Developed as an NGSS-focused online learning platform, Xplorlabs is a flexible complement to middle school science, engineering, and technology curricula. This workshop lets educators test the features of Xplorlabs’ two interactive modules: “Portable Electrical Power” and “Fire Forensics: Claims & Evidence.”

Eliciting Evidence of What Students Really Think About Core Ideas in Science

(Grades K–12)

B312, GWCC

Science Focus: GEN

Sponsor: McGraw-Hill Education

Page Keeley, 2008–2009 NSTA President, and The Keeley Group, Fort Myers, FL

Joyce Tugel, Science Education Consultant, Barrington, NH

Learn how K–12 formative assessment probes are used throughout an instructional cycle to reveal what students are really thinking and how this information helps teachers make better instructional decisions.

Hear That? Exploring the Sound of Science

(Grades 5–12) B313, GWCC

Science Focus: PS4

Sponsor: Educational Innovations, Inc.

Jeremy Johnson, Educational Innovations, Inc., Terre Haute, IN

Join us for a hands-on exploration of sound that will keep you smiling AND learning! Frequency, amplitude, waves, and resonance never sounded so good. We will share our favorite phenomenon-based ways to teach your students about sound. Get ready to have a blast with our unique, vibrant demos. Giveaways and freebies!

Awesome Earth Systems Activities for the Science Classroom

(Grades 3–5) B314, GWCC

Science Focus: ESS2.A, ESS2.D

Sponsor: Houghton Mifflin Harcourt

Michael DiSpezio, HMH Author, Broadcast Host, and Global Educator, North Falmouth, MA

Participate in awesome grade band activities that profile NGSS in interpreting three-dimensional topographic maps, comparing star brightness, and constructing design solutions for weather-related hazards.

The Science and Ethics of Genomic Editing with CRISPR/Cas9

(Grades 9–College) B403, GWCC

Science Focus: ETS, LS1, LS3, LS4, CCC4, CCC6, CCC7, SEP1, SEP2, SEP3

Sponsor: MSOE Center for BioMolecular Modeling

Tim Herman (herman@msoe.edu), MSOE Center for BioMolecular Modeling, Milwaukee, WI

Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, WI

The development of CRISPR/Cas9 gene editing technology promises to revolutionize the biological sciences the same way that restriction endonucleases led to genetic engineering in the 1970s. Explore physical models of the Cas9 endonuclease and contrast the structure/function of this protein with restriction enzymes, zinc finger nucleases, and TALEN proteins.

BIOZONE's New NGSS Series for High School

(Grades 9–10) B406, GWCC

Science Focus: GEN, NGSS

Sponsor: BIOZONE International

Richard Allan, BIOZONE International Ltd., Hamilton, New Zealand

Successfully implement the high school biology, chemistry, physics, and Earth and space science core ideas of the NGSS with BIOZONE's newest award-winning series. Strongly focused on student inquiry and written from first principles to address the NGSS practices. Take home free review copies.

Crash Science Website Launched! Free STEM Activities, Videos, and More

(Grades 5–12) B407, GWCC

Science Focus: GEN

Sponsor: Insurance Institute for Highway Safety

Pini Kalnite (pkalnite@iihs.org), Insurance Institute for Highway Safety, Arlington, VA

Griff Jones (gjones@coe.ufl.edu), University of Florida, Gainesville

Discover how the new *IIHS in the Classroom* website helps students and teachers explore crash safety science in grades 5–12 classrooms with dramatic crash-testing videos, behind-the-scenes crash research facility tours, and complete inquiry-based, hands-on crash science lessons, demonstrations, teaching tips, and more. All resources are downloadable and free. Prizes and giveaways.

How to Teach Science with Minecraft

(Grades K–12) B408, GWCC

Science Focus: INF, GEN

Sponsor: Minecraft Education

Sara Cornish, Microsoft, Redmond, WA

Learn how science educators are using Minecraft: Education Edition to teach chemistry, biology, physics, and more. This hands-on workshop will teach you how to play Minecraft and provide sample science lessons for your classroom. Minecraft offers an immersive and engaging learning environment with over 300 free lessons across subject areas.

Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems

(Grades K–5)

B409, GWCC

Science Focus: ESS, ETS, LS

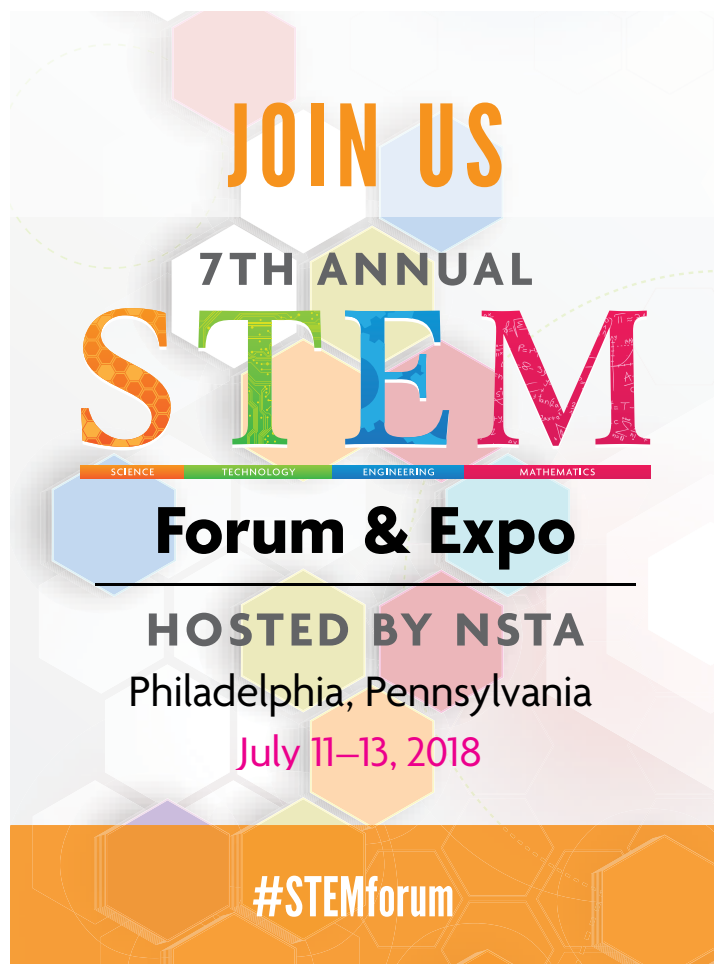
Sponsor: LEGO Education

Laura Jackson, Retired Science Teacher, Lee's Summit, MO

Build and code robotic models while exploring exciting Earth, space, and life science lessons. Learn the importance of teaching coding and computational thinking at the elementary level and leave with concrete activities that will empower your students to solve real-world problems.

NSTA Community Hub

Be sure to stop by the NSTA Community Hub today between 9:00 AM and 3:00 PM. It's located in the Exhibit Hall at Booth #1909. Meet up with your peers in our Networking Lounge and exchange teaching ideas or session notes. Come see what NSTA has to offer! See Vol. 1, page 15 for more details.



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7TH ANNUAL

STEM

SCIENCE TECHNOLOGY ENGINEERING MATHEMATICS

Forum & Expo

HOSTED BY NSTA

Philadelphia, Pennsylvania

July 11–13, 2018

#STEMforum

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

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

For information and to register, visit
www.nsta.org/stemforum

NSTA National Science Teachers Association

11:00–11:30 AM Presentations

Using Authentic STEM Career Experiences in Science Instruction to Improve Mathematical Thinking

(Grades 4–8)

A303, GWCC

Science Focus: ETS, CCC3, SEP5

Min Jung Lee (moondae87@gmail.com) and **Xiaoxin Lyu** (x12502@tc.columbia.edu), Teachers College, Columbia University, New York, NY

We will describe how to use STEM career-related experiences to improve students' mathematical thinking.

Scaffolding Novice Teachers' Responsiveness to Equitable Sense-Making

(Grades K–5)

A401, GWCC

Science Focus: GEN

Christa Haverly (@haverlycm; haverlyc@msu.edu), Michigan State University, East Lansing

Brittani Havenaar (havenaa2@gmail.com), French Elementary School, Colorado Springs, CO

Leave with tools and strategies from an elementary teacher and science education researcher for mentoring novice teachers in being responsive to students' sense-making.

Using Smithsonian Digital Products to Engage Students to Solve Real-World Problems

(Grades 1–8)

A407, GWCC

Science Focus: GEN, NGSS

Ashley Deese (@AshleyDeese; Smithsonian Science Education Center, Washington, DC

How do we provide freshwater to those in need? How can we engineer solutions to mitigate the effects of natural disasters? Learn about the Smithsonian's free NGSS-focused digital tools that introduce complex problems and offers students ways to solve them.



INF How to Develop an Amazing After-School Science Enrichment Program

(Grades P–5)

A408, GWCC

Science Focus: INF

Martha Bjorklund (@mrsmcbac; mbjorklund@allendale-columbia.org), Allendale Columbia School, Rochester, NY

Leave with great ideas to develop an exciting after-school science program for elementary-age students. CSI, DNA, and hands-on experiments.



Giverny Award–Winning Science Storybooks: Engage Elementary Students in Science Concept Identification and Exploration!

(Grades P–2)

B212, GWCC

Science Focus: ESS2, ESS3, LS2, LS4

Renee Clary (rclary@geosci.msstate.edu), Mississippi State University, Mississippi State, MS

Since 1998, the annual Giverny Award identifies outstanding children's science storybooks. Use the winning books in your classroom within the 5E (Engage, Explore, Explain, Elaborate, and Evaluate) learning cycle! Resources provided.

Using a Role-Playing Game in the Teaching of Chemistry

(Grades 10–11)

C301, GWCC

Science Focus: PS

Paul Orbe (porbe@ucboe.us), Academy for Enrichment and Advancement, Union City, NJ

Measure student engagement and academic performance through a role-playing activity. Join me for an overview of the activity and some interesting results.

How to Write the Evidence Part of a C-E-R

(Grades 6–College)

Birch, Omni

Science Focus: GEN, SEP

Elise Burns (@efb68; eburns@pascack.org), Pascack Hills High School, Montvale, NJ

How can students distinguish scientific evidence from other facts they may encounter? I will demonstrate simple techniques to guide writing lab reports and developing arguments.

11:00 AM–12 Noon Paul F-Brandwein Lecture
INF Citizen Science: How Ordinary People Are Changing the Face of Discovery

(General)

A411/412b, GWCC

Science Focus: LS, INF

Sponsored by Brandwein Institute



Caren Cooper (@CoopSciScoop), Associate Professor, Forestry and Environmental Resources, Chancellor's Faculty Excellence Program in Leadership in Public Science, North Carolina State University, Raleigh; and Assistant Head, Biodiversity Research Lab, North Carolina Museum of Natural Sciences, Raleigh

Around the world, in fields ranging from astronomy to zoology, millions of people are choosing to participate in the scientific process through citizen science. In schools, citizen science can help prepare young people for future STEM career paths, and, as important, to become well-rounded adults in which science is a lifelong hobby and a form of civic engagement. Citizen science challenges old notions about who can conduct research, where knowledge is acquired, and even how solutions to some of our biggest societal problems might emerge.

Caren Cooper is dedicated to training and mentoring students to become public scientists so they can pursue careers that weave science into the fabric of society. An ecologist with broad interest in conservation and natural resource management, she has helped design citizen science projects at the Cornell Lab of Ornithology, including YardMap, NestWatch, and Celebrate Urban Birds.

Currently, Caren is an associate professor at North Carolina State University and jointly appointed as assistant head of the Biodiversity Research Lab where her research lab is on display at the North Carolina Museum of Natural Sciences. At NCSU, she is part of an interdisciplinary team of faculty in the Chancellor's Faculty Excellence Program in Leadership in Public Science and mentors conservation biology graduate students within the Department of Forestry and Environmental Resources in Fish, Wildlife, and Conservation Biology. She has authored the book Citizen Science: How Ordinary People Are Changing the Face of Discovery.

Caren's current citizen science projects include Sparrow Swap, which has birders monitoring nest boxes aid in the collection of house sparrow eggs for mapping biocontaminants, and Sound Around Town, which investigates ecology and human well-being associated with soundscapes in suburban and urban areas.

11:00 AM–12 Noon Presentation

2017 Solar Eclipse in the Near Space Environment

(Grades 5–College)

A314, GWCC

Science Focus: ESS, ETS1, SEP3

Edward Roberts (ed.roberts@pottsvilleschools.org), Pottsville High School, Pottsville, AR

Tillman Kennon (jkennon@astate.edu), **Brent Carroll** (bcarroll@astate.edu), and **Benjamin Rougeau** (brougeau@astate.edu), Arkansas State University, State University, AR
 Relive how a team of educators and students observed the eclipse during totality using a high-altitude weather balloon, micro-controllers, and satellites.

WIDA Session: Doing and Talking Science with ELLs

(Grades 3–8)

A412a, GWCC

Science Focus: GEN, NGSS

Rita MacDonald (rkmacdonald@wisc.edu), Wisconsin Center for Education Research, Madison

Join in for video examples and discussion on how to implement discourse facilitation moves to strengthen students' reasoning and complex language, in ways fully inclusive of English language learners.



NSTA Press® Session: Leveling the Playing Field: Unlocking the Vision of the NGSS

(General)

B206, GWCC

Science Focus: GEN, NGSS

Rodger Bybee (rodgerwbybee@gmail.com), Retired Executive Director, BSCS, Golden, CO

Jack Rhoton (rhotonj@etsu.edu), East Tennessee State University, Johnson City

Stephen Pruitt, Kentucky Dept. of Education, Frankfort
Jay Labov (jlabov@nas.edu), The National Academies of Sciences, Engineering, and Medicine, Washington, DC

Join recognized thought leaders in STEM education as they share and discuss a range of components of the K–12 system that need integration to support full implementation of the NGSS, including—but not limited to—curricula, instruction, professional learning, higher education, and state and district policy.

Update on the Every Student Succeeds Act

(General)

B309, GWCC

Science Focus: GEN

Jodi Peterson (jpeterston@nsta.org), Assistant Executive Director, Legislative & Public Affairs, NSTA, Arlington, VA
The new federal education law is now being implemented in schools and districts nationwide. This session will examine changes under the new law, how the law is being implemented by the Trump Administration, what we can expect to change for science and STEM education, and what is ahead for science and STEM education.



Beyond Earlobes and Tongue Rolling

(Grades 8–College)

B402, GWCC

Science Focus: LS1.A, LS3, CCC2, SEP4, SEP8

John Gensic (@bioonthego; john.gensic@gmail.com) and **Robert Berkheiser** (@MrCoachBerk; berkheiserrob@gmail.com), Penn High School, Mishawaka, IN

Has your DNA been analyzed? Come see how two teachers allowed their students to interpret their DNA and play the role of genetic counselor.



NSTA Press® Session: Need Money? Write a Grant!

(Grades P–12)

B405, GWCC

Science Focus: GEN

Patty McGinnis (@patty_mcginnis; pattymcginnis1@gmail.com), Arcola Intermediate School, Eagleville, PA

Kitchka Petrova (dr.k.petrova@gmail.com), Florida State University, Tallahassee

Get tips and tricks for writing a successful grant proposal from the authors of *Be a Winner! A Science Teacher's Guide to Writing Successful Grant Proposals*.

Aquaponics: A Sustainable System

(Grades 6–10)

C202, GWCC

Science Focus: LS2

Robert Vandel, Cherokee Charter Academy, Roswell, GA
Hear about the importance of aquaponics as an alternative to normal food production and fisheries. Discussion includes building classroom-size systems that are STEM based, as well as possibilities for hands-on active learning and establishing critical foundations of STEM needed for lifelong scientific exploration.

Middle School STEM Courses for Building Science Practices

(Grades 6–8)

C213, GWCC

Science Focus: ETS, SEP1, SEP3, SEP4, SEP5, SEP6, SEP8

Roxanne Moore (roxanne.moore@gatech.edu), Georgia Institute of Technology, Atlanta

I'll share STEM-Innovation & Design curricula for middle school. Specific examples will illustrate how engineering experiences build core science competencies.

Incorporating Literacy Standards in the Science Classroom

(Grades 9–12)

Grand Ballroom C, Omni

Science Focus: GEN, SEP2, SEP7

Stephanie Harmon (@StephHarmon41; sharmon8564@earthlink.net), Rockcastle County High School, Mount Vernon, KY

Join us as we explore a variety of strategies to integrate literacy standards into the high school science classroom.

Establishing Roots for STEM Across K–12 Science Classroom Collaboration in the NGSS Era

(Grades K–12)

Hickory, Omni

Science Focus: ETS, SEP3, SEP8

Michael Nocella (micnoc@d219.org), Niles West High School, Skokie, IL

Jim O'Malley (@MrOScience; omalleyj@skokie69.net), Thomas Edison Elementary School, Morton Grove, IL

Hear two teachers' evolving journey on establishing a collaborative relationship between secondary and elementary students to expand a futuristic vision for STEM and service-based learning.

Populations Are Poppin'

(Grades 9–12)

International Ballroom F, Omni

Science Focus: ESS3.C, LS2.D, SEP1, SEP4, SEP6, SEP7, SEP8

Claudia Hagan (claudiaehagan@gmail.com), Rockdale Career Academy, Conyers, GA

Patrick Enderle (penderle@gsu.edu) and **Renee Schwartz** (rschwartz@gsu.edu), Georgia State University, Atlanta

We will share an engaging way to have students research and communicate information about population dynamics for several countries around the world.

AMSE-Sponsored Session: Science for a Rapid Action Planning Session

(Grades 6–College)

Juniper, Omni

Science Focus: GEN

Pamela Gilchrist (@pamelagilchrist; pogilchr@ncsu.edu), The Science House at North Carolina State University, Raleigh

Come reflect and share research-based practices used to make science significant to all students. We will assess practices, brainstorm, and create an action plan.

How Do We Know? Searching for Evidence in Lessons Integrating Science and Literacy

(General)

Maple A/B, South Tower, Omni

Science Focus: GEN, SEP

Susan Cooper (@sjcooper809; sjcooper@fgcu.edu), Florida Gulf Coast University, Fort Myers

Inquiry-based science lessons integrated with literature help students search for evidence to support claims as they learn about the nature of science.

Three-Dimensional Learning for All Grades K–16

(General)

Maple C, South Tower, Omni

Science Focus: GEN, NGSS

Mary Loesing (@mloesing; mloesing@ccsdl.org), NSTA Director, District IV, and Connetquot Central School District, Bohemia, NY

Jen Gutierrez (@jengutierrez18; jengutierrez63@gmail.com), NSTA Director, District XIV, and integratedSTEMk12, LLC, Chandler, AZ

Shannon Hudson (shudson@cville.k12.in.us), Crawfordsville Middle School, Crawfordsville, IN

Jeanelle Day (dayj@easternct.edu), Eastern Connecticut State University, Willimantic

Teachers/Leaders at all levels K–16 (elementary, middle school, high school, and college) will discuss the pedagogical changes necessary to implement three-dimensional learning with fidelity. This session is applicable whether your state has adopted or adapted the NGSS or whether you are just focusing on changing the way science is taught in your classroom. Examples will be shared from all levels.

Unpacking Race in a Science Classroom

(Grades K–12)

Walnut, Omni

Science Focus: GEN, NGSS

Jason Foster, Niles West High School, Skokie, IL

How does racial identity correspond to or counter that of the dominant narrative that is commonly shared in our science classrooms? What are the implications?

11:00 AM–12 Noon Hands-On Workshops Decomposition or Fossilization? Claims, Evidence, and Reasoning Required!

(Grades 4–8)

A301, GWCC

Science Focus: ESS1.C, LS, SEP6, SEP7

Marta Toran (@mtoran; martatoran@gmail.com), Appalachian State University, New York, NY

Get a hands-on look into the science of taphonomy to encourage critical-thinking skills and use of evidence to create scientific explanations. *Note:* Hands-on activities available to the first 30 participants.

A 3-D Approach to Engaging Students in Global Climate Change Literacy

(Grades 6–12)

A302, GWCC

Science Focus: ESS3

MaryMargaret Welch (mmwelch@seattleschools.org), Seattle (WA) Public Schools

Come learn about a fully developed NGSS-focused three-week unit to help your students make sense of the evidence around global climate change

Yes, Humans Really Do Cause Earthquakes: Hydraulic Fracturing, Wastewater Injection, and Earthquakes

(Grades 7–College)

A305, GWCC

Science Focus: ESS2.A, ESS2.B, ESS3.A, ESS3.C, CCC1, CCC2, CCC4, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Michael Hubenthal (michael.hubenthal@iris.edu), IRIS, Washington, DC

Mike Gallagher (michael.gallagher@oakland.k12.mi.us), Oakland Schools, Waterford, MI

Explore the “hot topic” of induced earthquakes with your students through an activity built on the Argument Driven Inquiry framework that supports three-dimensional learning.

How High Did It Go? Using Math to Compute Rocket Apogee

(Grades 4–8)

A311, GWCC

Science Focus: ESS, PS, SEP5

Tim Robinson (timothy@unr.edu), and **Catherine Pozarski Connolly** (cpozarski@gmail.com), University of Nevada, Reno

David Crowther (@Dtcrowther; crowther@unr.edu), NSTA President, and University of Nevada, Reno

Take learning to new heights. Join us and discover how to build, launch, and test paper rockets and then calculate apogee (the highest point of the flight) using a homemade altitude detection device. Mathematics learned can be applied to student-built model rockets.

INF ASTC-Sponsored Session: Citizen Science Investigations: Data-Rich Learning at Your Doorstep

(Grades 6–8)

A312, GWCC

Science Focus: LS2.A, LS2.C, LS4, INF, CCC1, CCC3, SEP4, SEP7

Christine Voyer (@cev4; christine@gmri.org) and **Rebecca Harvey** (@VitalSignsME; mharvey@gmri.org), Gulf of Maine Research Institute, Portland

Citizen science investigations provide a rich context for math practices and statistical thinking. Experience how you can develop students' mathematical understanding of data and variability along with science skills and concepts through real-world ecosystem investigations.

Stepping into STEM Success: Exploring Teacher Leadership Through Best Practices in 3-D Learning

(Grades K–8)

A315, GWCC

Science Focus: GEN, NGSS

Ella Bowling (@ellabowling; bowlinge6@nku.edu) and **Amber Carter** (@CarterNKUCinsam; cartera20@nku.edu), Northern Kentucky University, Highland Heights

Come learn how we are building teacher leaders across our region through our Next Generation STEM Fellows program and see examples of their exemplary work.

Astronomy Activities to Increase Both Your and Your Students' Knowledge

(Grades 1–8)

A316, GWCC

Science Focus: ESS1.A, CCC1, CCC4, CCC7, SEP2, SEP4, SEP8

Donald Powers (dt-powers@wiu.edu), Western Illinois University, Macomb

Presider: Lee Wells (lee@themuseknoxville.org), The Muse Knoxville, TN

Probe some astronomy activities that will increase your knowledge and are appropriate for your elementary and middle school classroom.

Starting STEM at an Early Age

(Grades P–3)

A402, GWCC

Science Focus: INF, NGSS

Kendra McCoy (kmintz@lsc.org), Liberty Science Center, Jersey City, NJ

STEM starts at an early age. Come learn how to engage early learners in an NGSS early childhood curriculum.

From the Sky to the Sea:—Integrating Science in Upper Elementary Classrooms

(Grades 3–6)

A403, GWCC

Science Focus: ESS1.A, ESS1.B, LS2.A, LS2.C, CCC3, CCC4, SEP1, SEP2, SEP3, SEP4, SEP8

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

Using space and marine ecology, we will share lessons that you can incorporate into an interdisciplinary curriculum and use to build process and critical-thinking skills.

What Does 3-D Learning Look Like in Elementary?

(Grades K–5)

A404, GWCC

Science Focus: GEN, NGSS

Denise Webb (dewebb@forsyth.k12.ga.us), Coal Mountain Elementary School, Cumming, GA

Amber Hoke (@ahokiefan; ahoke@forsyth.k12.ga.us), Chattahoochee Elementary School, Cumming, GA

Participate in hands-on activities you can use right away that connect three-dimensional learning with the NGSS or the new Georgia State Science Standards.

Building on Science: A Pathway for Integrating Science and Literacy

(Grades 1–5)

A405, GWCC

Science Focus: GEN, NGSS

Jennifer Craddock (jenny_craddock@newton.k12.ma.us), Newton (MA) Public Schools

Learn how one district's ELA and Science Technology Environment (STE) leadership and teachers developed literacy units that build from the science units to extend student science learning through reading, writing, speaking, and listening.

NESTA, NREL, and CLEAN: Understanding the Grid: Using Evidence to Argue for Ways That Engineering Can Improve How We Live

(Grades 9–11)

B103, GWCC

Science Focus: ESS3.A, ESS3.C, ETS1.C, ETS2.B, PS3.B, CCC4, CCC5, SEP4, SEP7, SEP8

Cheryl Manning (@clbmanning; clbmanning@mac.com), Evergreen High School, Evergreen, CO

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

The electrical grid is the oldest and largest network in America. In this problem-based activity, students research and identify most suitable solutions for upgrading it.

“This online master’s in biology program was perfect for me.
It opened up opportunities and also moved me on the pay scale.”



Curtis Reese, MS in Biology, Graduate

Online Biology, MS

► University of Nebraska at Kearney

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Science and Language: Natural Partners

(Grades P–1)

B211, GWCC

Science Focus: GEN

Cindy Hoisington (@CAHoisy; choisington@edc.org), Education Development Center, Inc., Waltham, MA
Science is a natural vehicle for supporting language development for all children. A brief hands-on exploration and video will be used to promote discussion about approaches and strategies that support language development while keeping the focus on children's science experiences, observations, and ideas.

3D Using NGSS Resources to Flip a Science Lesson on Evidence of Multidimensional Learning in Grades 3–5

(Grades 3–5)

B401, GWCC

Science Focus: GEN, NGSS

Diane Johnson (@MDHJohnson; jdiane72@gmail.com) and **Patti Works** (@patti_works; patriciaeworks@gmail.com), ECU Partnership Institute for Math and Science Education Reform, Lexington, KY

Experience an elementary science lesson “before and after” the NGSS, evaluating dimensionality using a structured process and NGSS resources.

TEAM Science: Population Genetics, Biodiversity, and Interdependence in the 21st-Century Classroom

(Grades 5–12)

C201, GWCC

Science Focus: LS

Megan Stitt (@wcsPHSmc; megan.stitt@wcs.edu), Fred J. Page High School, Franklin, TN

Wendy Comer (wendyc@wcs.edu), Crockett Elementary School, Brentwood, TN

Get fantastic ideas on scaffolding, literacy, and STEM in the classroom. Perfect for grades 5–12!

Using Mitotic Division to Introduce Statistics in AP and IB Biology

(Grades 9–College)

C203, GWCC

Science Focus: LS1.B, LS1.D, SEP

Kristen Dotti (kristen.dotti@catalystlearningcurricula.com), Verde Valley School, Sedona, AZ

Turn the root tip mitosis lab into an opportunity to teach the test of correlation and chi-squared so students are prepared to analyze more complex data.

3-D Teaching of Weather Through the Use of American Meteorological Society's Resources

(Grades 5–10)

C205, GWCC

Science Focus: ESS2.D

Fran Hess (franhess@gmail.com), Catskill Regional Teacher Center, Oneonta, NY

Join in for an introduction of AMS Project Atmosphere as the basis for engaging participants in hands-on weather-related activities geared toward an NGSS three-dimensional teaching format.

Big Pumpkins: Using Computer Models to Investigate Inheritance and Variation in the Garden

(Grades K–5)

C206, GWCC

Science Focus: LS3, CCC1, CCC2, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7

Lin Xiang (linxiang@weber.edu), Weber State University, Ogden, UT

April Mitchell (april.mitchell@slcschools.org), Salt Lake City (UT) School District

Young children explore the phenomenon of a giant pumpkin, observing variation of traits in the school garden and using an interactive computer model to compare the effects of nurture and nature on pumpkin growth. Students engage in the process of selection to grow the biggest virtual pumpkin, collecting and analyzing data on the size and weight of pumpkins over many generations. Students use evidence to explain that traits can be influenced by the environment or inherited from parents. Targets NGSS heredity standards in grades 1 and 3 (1-LS3-1, 3-LS3-1, 3-LS3-2). *Note:* Please bring a tablet/laptop to access the NetLogo computer model.

Modeling Nanotechnology Using Smart Robots

(Grades 9–12)

C209, GWCC

Science Focus: ETS, SEP

Raena Cota (raenac@nmsu.edu) and **Caitlin Ard**, New Mexico State University, Las Cruces

Engage in a Project-Based Learning nanotechnology module where participants will practice computational thinking and programming with smart robots.

Hands-On Comparison of Homo Species Using 3D-Printed Fossils Such as Teeth and Skulls

(Grades 9–10) C210, GWCC

Science Focus: LS4.B, LS4.C, CCC2, SEP6

Rudy Simpson (rsimpson@pky.ufl.edu), P.K. Yonge Developmental Research School, Gainesville, FL

Michael Ziegler (@paleoteach; michael.ziegler@bobcats.gcsu.edu), **Claudia Grant** (@paleoteach; @claugrant; cgrant@flmnh.ufl.edu), and **Pavlo “Pasha” Antonenko** (p.antonenko@coe.ufl.edu), University of Florida, Gainesville
Immerse yourself in authentic NGSS-focused science experiences to determine how geographic location impacted anatomy and physiology features in Homo species by analyzing 3D-printed specimens.

A Framework for Engaging Students in “Lab Group Meeting” Discussions

(Grades 8–12) C211, GWCC

Science Focus: PS, SEP3, SEP4, SEP6, SEP7, SEP8

Amanda Whaley (amandakristenwhaley@gmail.com), KIPP Academy Middle School, Houston, TX

Get the tools to implement a framework for student-led discussions in advanced physics that mirrors how career scientists present their work to peers. Instructional materials and rubrics provided.

Mix It Up! Activities and Assessments

(Grades 6–12) C212, GWCC

Science Focus: GEN

Heather Cowart (hcameron@dodge.k12.ga.us), **Dana Niblett** (dniblett@dodge.k12.ga.us), **Miranda Simmons** (msimmons@dodge.k12.ga.us), and **Michelle Wahl** (wahl_dogs@yahoo.com), Dodge County High School, Eastman, GA
We will actively engage in learning how to mix up traditional assignments, engage students in meaningful activities, and get all students interacting.

AMP UP Your Physical Science Curriculum with Integrated Practices

(Grades 5–9) C302, GWCC

Science Focus: ESS2.D, ESS3.C, PS3, CCC1, CCC4, CCC5, SEP4, SEP8

Jayma Koval (jayma.koval@ceismc.gatech.edu) and **Mike Ryan**, CEISMC, Georgia Institute of Technology, Atlanta
Barbara King (barbara.king@gscs.org), Griffin-Spalding County School System, Griffin, GA

Experience a STEM-based curriculum that integrates NGSS practices with physical science content. Bring an internet-ready device to engage in the curriculum.

Integrating Engineering Design and 3D Printers into Your Current Lessons and Activities

(Grades K–12) Dogwood A, Omni

Science Focus: ETS1

Beth ByersSmall, The Maine Center for Research in STEM Education (RiSE Center), Orono

Marina Van der Eb, University of Maine, Orono

Patsy Adams (padams@msad11.org), Pittston Consolidated School, Gardiner, ME

Explore our protocol for enhancing lessons within your current science program by adding opportunities for students to use the engineering design process and 3D printing.

ABC: Activity Before Content

(Grades 3–10) Dogwood B, Omni

Science Focus: LS1.A, PS1.A, CCC6, SEP2

Susan Johnson (@stemsau; sjohnson@saumag.edu) and

Stacy Allen (snallen@saumag.edu), Southern Arkansas University, Magnolia

Moving labs to the beginning of lessons is a simple first step toward NGSS integration. Use familiar labs in a new way.

Argument for All: Engaging English Language Learners in Scientific Argumentation and Explanation

(Grades 4–12) Grand Ballroom A, Omni

Science Focus: GEN, CCC, SEP6, SEP7

Kevin Fleming (kevin.james.fleming@gmail.com) and **Dina Secchiaroli** (@DinaSecchiaroli; Area Cooperative Educational Services (ACES), Hamden, CT

Correspondences between NGSS and ELL practices will be explored through featured strategies that build language skills through argumentation, providing equitable access for English language learners.

Underrepresented Groups in Educational Science Comics

(Grades P–12) International Ballroom A/B, Omni

Science Focus: GEN, SEP1, SEP3, SEP4, SEP8

Christopher Bowen (@ProfChrisBowen; bowenc@jc-schools.org), Liberty Bell Middle School, Johnson City, TN

Review findings from a study examining representations of minorities in the text and illustrations of educational science comics adopted for use by K–12 educators.

You Don't Need to Reinvent the Wheel! Build on Your Foundation!

(Grades K–12) *International Ballroom E, Omni*
Science Focus: ETS1, PS2, PS3.A, PS3.B, PS3.C, CCC2, CCC4, CCC5, SEP

Brian Butler (brian.butler@bcsdk12.net), Rutland High School, Macon, GA

Lynn Larsen, Chattahoochee-Flint GYSTC, Americus, GA
Many existing lessons are ripe for beefing up to meet the demands of a three-dimensional lesson. Learn how to “3-D” your teaching with existing materials!

Exploring Practices, Nature of Science, and Science in Society: Analyzing Historical Primary Sources from the Library of Congress

(Grades K–12) *Pine (South Tower), Omni*
Science Focus: GEN, SEP

Cheryl Lederle (@TeachingLC; cled@loc.gov) and **Michael Apfeldorf** (@TeachingLC; mapf@loc.gov), Library of Congress, Washington, DC

Encounter hands-on strategies to engage students with scientific notebooks, letters, photos, and drawings, highlighting scientific practices, nature of science, and connections between science and society.

Providing Equitable Learning Experiences for ELLs in Science

(Grades 6–12) *Spruce, South Tower, Omni*
Science Focus: GEN, SEP

Jaclyn Austin (@jaclyn_austin; jaclyn_austin@hcpss.org), **Deborah Puhak** (@HCPSS_ESOL; deborah_puhak@hcpss.org), and **Jessica Mulhern** (@JMulhernBiology; jessica_mulhern@hcpss.org), Howard County Public School System, Ellicott City, MD

Mary Weller, NSTA Director, District III, and Howard County Public School System, Ellicott City, MD

Explore three-dimensional learning focusing on equitable access for English language learners. Personalized supports within the same learning experience will be modeled and shared.

11:00 AM–12:30 PM Presentation

High School Share-a-Thon: Set Your Sights Higher!

(Grades 9–12) *B101, GWCC*
Science Focus: GEN

Carrie Jones (ncscienceteacher@yahoo.com), Middle Creek High School, Apex, NC

Do you need new lessons for your high school classroom? If so, please join us for networking, great ideas, and activities. Enter to win door prizes! Handouts.

11:30 AM–12 Noon Presentations

Scientists Are Friends: Building Science Identity and Literacy with Scientists in the Classroom

(Grades K–12) *A303, GWCC*
Science Focus: GEN

Janet Clarke (jclarke@sitkascience.org) and **Kristina Tina** (ktirman@sitkascience.org), Sitka Sound Science Center, Sitka, AK

Make the most of inviting scientists into the classroom with effective strategies from a highly successful “Scientists in the Schools” program in Sitka, Alaska.

Designing a Regional Elementary Curriculum Materials Program: Learning from Initial Adoption

(Grades K–6) *A401, GWCC*
Science Focus: GEN, NGSS

Jessica Whisher-Hehl (@jwhehl; jhehl@ocmboces.org) and **Jennifer Spong** (@spong_learns; jspong@ocmboces.org), Onondaga-Cortland-Madison BOCES, Syracuse, NY

Sharon Dotger (@sdotger; sdotger@syr.edu), Syracuse University, Syracuse, NY

We will describe the initial transition from locally developed elementary curriculum materials that meet previous state standards to new nationally developed materials to support the NGSS.

3-D Learning to Support Student Connections to Their Lives and Communities Through Aquatic Food Webs

(Grades 3–7) *A407, GWCC*
Science Focus: LS2, CCC, SEP

John Pecore (jpecore@uwf.edu), University of West Florida, Pensacola

Lee Morris (lobsterlady@gmail.com), University of South Carolina Union

Melissa Demetrikopoulos (mdemetr@BioPhi.org), Institute for Biomedical Philosophy, Dunedin, FL

Engage in providing upper elementary and middle grades students in virtual and field-based scientific discovery related to aquatic food webs.

The Music of Science: Creative Cross-Curricular Connections for Kiddos

(Grades P–5)

A408, GWCC

Science Focus: ESS1, ESS2, LS1, LS2

Jenny Dees (jenny.dees@ttu.edu), Texas Tech University, Lubbock

Experience creative cross-curricular (STEAM) lessons using multiple modalities of world, classical, and traditional children's music with science! Heighten engagement/achievement/enrichment for all learners through organic differentiation.



Pairing Children's Literature and Science Field Trips to Create Authentic Learning Experiences

(Grades P–5)

B212, GWCC

Science Focus: GEN

Melissa Parks (mparks@stetson.edu), Stetson University, Deland, FL

Geared toward new elementary educators, this presentation will share the process of having children's literature (fiction and nonfiction) meet the NGSS and field trip locations.

Types of Chemical Reactions Performance Assessment

(Grades 9–12)

C301, GWCC

Science Focus: PS1.B

Stacie Sanders (ssanders@rjuhsd.us) and **Concettina Sutliff** (csutliff@rjuhsd.us), Woodcreek High School, Rocklin, CA

How can we assess students' understanding of chemical reactions using a three-dimensional approach? We will use a lab-based assessment in which students identify and explain chemical reaction types using a claim-evidence-reasoning formatted response. Grading rubrics will be included.

How to Write the Reasoning Part of a C-E-R

(Grades 6–College)

Birch, Omni

Science Focus: GEN, SEP

Elise Burns (@efb68; eburns@pascack.org), Pascack Hills High School, Montvale, NJ

Students have difficulty constructing the reasoning section of lab reports and arguments. I will present lessons, examples, and student work.

12 Noon–1:30 PM Exhibitor Workshops

Award-Winning STEM Enrichment Program for Grades 4–8 from Flinn Scientific

(Grades 4–8)

B203, GWCC

Science Focus: GEN

Sponsor: Flinn Scientific, Inc.

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

Join us as we present FlinnSTEM powered by IMSA Fusion! Created by leading educators from the Illinois Math and Science Academy®, IMSA Fusion blends inquiry-based student content and in-depth teacher professional development. Ignite student interest in science and math with interactive activities that connect concepts to the students' lives. Twelve different problem-centered curriculum modules easily integrate with STEM courses in the classroom or after-school STEM programs. Visit www.flinnsci.com and www.flinnstem.com for more information.

Chemistry with Vernier Using Chromebook

(Grades 9–College)

B207, GWCC

Science Focus: ETS, PS1, PS3, PS4

Sponsor: Vernier Software & Technology

Nüsret Hisim (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Participate in fun and engaging hands-on experiments using Vernier digital tools with Chromebooks to measure intermolecular attractions, investigate pressure and volume relationships, and explore spectroscopy. See how sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

Middle School with Vernier

(Grades 9–College)

B208, GWCC

Science Focus: ETS2, PS2, PS3, PS4

Sponsor: Vernier Software & Technology

Verle Walters (info@vernier.com), Vernier Software & Technology, Beaverton, OR

Participate in fun and engaging hands-on STEM activities using Vernier digital tools to study temperature, light, friction, and grip strength. See how age-appropriate, sensor-based experiments teach students about data collection and analysis—practices that promote science inquiry, improve science literacy, and boost test scores.

There's More than One Way to Assess for the Three Dimensions

(Grades K–8)

B209, GWCC

Science Focus: GEN, NGSS

Sponsor: TCI

Christy Sanders, TCI, Mountain View, CA

What does a three-dimensional (3-D) assessment look like? Join us as we explore a variety of ways TCI helps teachers assess the three-dimensions throughout the entire unit. Walk away with a better understanding of the different assessments that have been created around 3-D and ways to implement them throughout the lessons.

STEM and Stewardship Series 3: Chasing Coral Bleaching

(General)

B303, GWCC

Science Focus: ESS2, ESS3

Sponsor: NOAA

C. Mark Eakin, National Oceanic and Atmospheric Administration, Silver Spring, MD

Join Mark Eakin, oceanographer and coordinator of the NOAA Coral Reef Watch Program, as he discusses coral bleaching and clips from the film, *Chasing Coral*, for which he was a chief scientist. NOAA educators will share related science and hands-on education resources for your classroom.

Using Climate Proxies to Learn About Earth's Climate History

(Grades 9–11)

B305, GWCC

Science Focus: ESS2, ESS3, ETS1

Sponsor: Lab-Aids, Inc.

Eric Pyle, James Madison University, Harrisonburg, VA

How can scientists tell what Earth's climate was like thousands of years before human measurements? This activity simulates the use of fossil ocean foraminifera, tiny organisms whose growth patterns are different in warm or cold water. Analyze and graph samples of replicas of these organisms and then determine relative warm and cold periods in the past 200,000 years. This activity is from *EDC Earth Science*, a new NSF-supported high school Earth science program from Lab-Aids.

Personalized Virtual Labs that Grade Themselves

(Grades 4–10)

B306, GWCC

Science Focus: GEN, NGSS

Sponsor: Inq-ITS

Janice Gobert, Rutgers University, New Brunswick, NJ
BYOD! Learn to use virtual labs, three-dimensional assessment tools to monitor student growth, real-time alerts to help struggling students, tutoring to provide equity in the

classroom, and virtual science practices that transfer to hands-on labs. Join Janice Gobert, professor at Rutgers University, as we explore how educators can inform their instruction.

No Pressure: Teaching About Air Is a Breeze!

(Grades 3–8)

B313, GWCC

Science Focus: ESS2, ESS3, PS1.A, PS2.A

Sponsor: Educational Innovations, Inc.

Tami O'Connor, Educational Innovations, Inc., Bethel, CT

Come to this workshop filled with discrepant events and science phenomena to learn some jaw-dropping, hands-on activities that will prove to your students that air is much, much more than “just” the stuff we breathe! Lessons, give-aways, and FUN!

All Standards All Students Case Study: Looking at the Intersections Between Social Emotional Learning (SEL) and NGSS

(Grades 6–12)

B314, GWCC

Science Focus: GEN, NGSS

Sponsor: Houghton Mifflin Harcourt

Bernadine Okoro, Consultant, Washington, DC

As one of the writers of the NGSS Appendix D and Case Studies, Bernadine Okoro will illustrate how teachers can provide a practical and tangible route toward effective science instruction with diverse student groups. Discussion centers on understanding the utility of the case study, as well as Social Emotional Learning, thinking routines, and brain-based learning in teaching diverse student groups about science.

Using Models to Uncover Student Misconceptions in Chemistry

(Grades 9–College)

B403, GWCC

Science Focus: PS

Sponsor: 3D Molecular Designs

Gina Vogt (gina.vogt@3dmoleculardesigns.com), 3D Molecular Designs, Milwaukee, WI

Tim Herman (herman@msoe.edu), MSOE Center for Bio-Molecular Modeling, Milwaukee, WI

Uncover students' conceptual understanding of atoms, molecules, compounds, and elements using NGSS modeling practices. Explore chemistry topics in polarity, pH, density, solubility, bonding, and more with hands-on/minds-on manipulatives! Make learning-thinking visible through student-centered simulations of neutralization, water dissociation, and dehydration synthesis reactions. Great formative assessment probes provided!

12:30–1:00 PM Presentations

Creating a Coding Culture in the Classroom

(Grades P–4)

A408, GWCC

Science Focus: GEN, NGSS

Byron Gilliland (@byron_gilliland; byron.gilliland@winona.k12.mn.us), Jefferson Elementary STEM School, Winona, MN

Discover ways to create a culture inclusive to coding in the classroom. Explore methods to create excitement and engage preK–6 students in coding/programming activities.

Adapting Curriculum Through UDL Principles: Herpetological Fieldwork with Students Who Are Deaf/Hard of Hearing

(Grades 9–12)

C204, GWCC

Science Focus: LS

Lacey Huffling (lhuffling@georgiasouthern.edu), Georgia Southern University, Statesboro

Aerin Benavides (awbenavi@uncg.edu), The University of North Carolina at Greensboro

Learn how to use Universal Design for Learning principles to adapt curricula. We share our experiences with adapting fieldwork for high school students with hearing loss.

12:30–1:30 PM Meeting

NSTA Standing Committee, Advisory Board, and Panel Chairs Meeting

(By Invitation Only)

International Ballroom A/B, Omni

12:30–1:30 PM Presentations

NASA Apps for Classroom Implementation

(General)

A301, GWCC

Science Focus: ESS

Lester Morales (@NASAKSCEPDC; lester.morales@nasa.gov), NASA Kennedy Space Center, Kennedy Space Center, FL

NASA has over 50 free apps for educational use. Find out how to use and integrate some of the applications' functionality in the classroom setting. Virtual reality, 3-D exploration, and NASA missions come alive with the use of these apps. Earth science, solar system, robotics, and International Space Station research are covered—engaging students through the usage of technology apps as “only NASA can.”

Magnetics

(Grades K–8)

A303, GWCC

Science Focus: PS2, SEP3, SEP7

Carlos Villa (villa@magnet.fsu.edu), National High Magnetic Field Laboratory, Tallahassee, FL

Hear how National High Magnetic Field Laboratory educators are using inquiry activities to teach the topics of magnets and magnetism. You're guaranteed one new idea using magnets for your classroom!



—Photo courtesy of Mike Weiss

NSTA District Support

(Grades K–12)

A304, GWCC

Science Focus: GEN, NGSS

Jennifer Horak, Assistant Executive Director, Program Integration, NSTA, Arlington, VA

Find out how NSTA can support your district with science PD opportunities that combine access to national thought leaders with high-quality NSTA products.

Milkweed in the Classroom

(Grades P–5)

A401, GWCC

Science Focus: LS2, INF, SEP

Jackie Sherry (jackie@dunwoodynature.org), Dunwoody Nature Center, Dunwoody, GA

The Milkweed Project is a curriculum spanning the entire school year that starts with a milkweed seed and ends with a monarch butterfly.

Oceans of Fun

(Grades 2–8)

A407, GWCC

Science Focus: GEN

Bill Brooks (billbrookssurf@gmail.com), Irvine (CA) Unified School District

Come learn how to bring the ocean into your classroom. Ocean phenomena can be used as a springboard for NGSS science teaching.

The Zombie Autopsies: Novel Science

(Grades 8–12)

A412a, GWCC

Science Focus: GEN, NGSS

Nicole Kessler-Snook (@SnookScience; for6frog@msn.com), Changemaker High School, Tucson, AZ

Learn how to use the pop culture of zombie-ism to teach teens about brain science, empathy, teamwork, and problem solving.



Making Quality Science Instruction Accessible and Equitable to ALL K–6 Students

(Grades K–6)

B211, GWCC

Science Focus: GEN, NGSS

Donna Knoell (dknoell@sbcglobal.net), Educational Consultant, Overland Park, KS

Find out how to utilize differentiation strategies and resources to advance achievement and engagement, and meet the unique needs of All learners. Leave with ways to increase participation, engagement, and advance learning. Handouts.

Harry Potter Episodes as Stimulators for Motivation, Creative Thinking, and Concept Development

(Grades 2–9/College)

B309, GWCC

Science Focus: GEN

Alan McCormack (amccorma@mail.sdsu.edu), 2010–2011 NSTA President, and Professor Emeritus, San Diego State University, San Diego, CA

The fictional events highlighting adventures of Harry Potter in J.K. Rowling's children's literature series can serve as enticing entrees into science and engineering activities.

EXENTHUNCO: What Is That?

(Grades 6–8)

C202, GWCC

Science Focus: LS4

Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca (IL) Nature Center

Roy “Jack” Tison (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, IL

We will share a new method to clearly explain the ideas of extinction and endangered, threatened, uncommon, and common species.

AMP UP Your Life Science Curriculum with Integrated Practice

(Grades 5–9)

C207, GWCC

Science Focus: LS2.A, LS2.C, CCC1, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Sabrina Grossman (sabrina.grossman@ceismc.gatech.edu), CEISMC, Georgia Institute of Technology, Atlanta

Barbara King (barbara.king@gscs.org), Griffin-Spalding County School System, Griffin, GA

Find out about a STEM-based curriculum that integrates NGSS practices with life science content. Engage in sample inquiry activities and receive access to Georgia Tech developed curriculum.

Modeling as a Science Practice: Developing Model-Based Units

(Grades 6–12)

C213, GWCC

Science Focus: GEN, SEP2

Darrin Collins (d.a.collins1831@gmail.com), Kenwood Academy High School, Chicago, IL

Emphasis will be placed on the science and engineering practice of modeling as we develop units based on this NGSS principle.

It Takes a Village to Raise a Scientist

(Grades 6–8)

C301, GWCC

Science Focus: ESS3, ETS1, PS3, CCC5

Cori Nelson (@nelsonch5; cnelson@winfield34.org), Winfield (IL) School District #34

Entice your middle school interdisciplinary team to join forces and allow students to explore energy through research, debates, and hands-on investigations in all subject areas.

NGSS and 3-D Implementation: Tools for K–12 Teachers

(Grades K–12)

Birch, Omni

Science Focus: GEN, NGSS

Martha Inouye (mcinouye@gmail.com) and **Ana Houseal** (ahouseal@uwyo.edu), University of Wyoming, Laramie

Explore three-dimensional learning using tools developed to help elementary and secondary teachers integrate their curricula and teaching strategies. Handouts.

Core Values: Students Study Arctic Sediment Cores to Learn About Climate in the Past

(Grades 7–College)

Chestnut, Omni

Science Focus: ESS2.A, ESS2.D, ESS2.E, ESS3.C, ESS3.D, ETS1, CCC4, CCC7, SEP1, SEP3, SEP4, SEP5, SEP7

Tim Martin (tmartin@greensboroday.org), Greensboro Day School, Greensboro, NC

Using Arctic sediment core data, students investigate climate change through inquiry activities that model paleoclimatology research. Then they go into the field to study local core samples.

PD to Practice: Evidence of 3-D Transformation in the Middle School Classroom

(Grades 6–8)

Dogwood A, Omni

Science Focus: GEN, NGSS

Annette Brown (annetteb@dawsonesc.com), Dawson Education Cooperative, Arkadelphia, AR

Tabitha Horton (tabby.horton@jsdlions.net), Jessieville Middle School, Jessieville, AR

Greg Wertenberger (@ARTransformED; gwertenberger@bryantschools.org), Bryant (AR) School District

We will highlight how professional development and ongoing educator support using NSTA's powerful resources is translating into evidence of authentic three-dimensional student engagement.

Interactive Note-Taking in Science

(Grades 9–12)

Grand Ballroom C, Omni

Science Focus: GEN

Tamara Slowiak (@tslowiak; slowiatj@chipfalls.org) and **Kari Skaar** (skaarke@chipfalls.org), Chippewa Falls High School, Chippewa Falls, WI

Use the process of interactive note-taking in your high school science classes. Get away from “sit and get.” Allow students to play a role in the notes given. Interactive notebooks are a great tool for organizing notes and formative assessments, enhancing student involvement, and developing a study tool in the process.

Rain to Drain Water Tour

(Grades K–12)

Hickory, Omni

Science Focus: ESS2.A, ESS2.C, ESS2.D, ESS3.A, ESS3.C, ETS, LS1.C, LS1.D, LS2.B, LS2.C, PS1.A, PS1.B, PS2, PS3, CCC1, CCC2, CCC4, CCC5, CCC6, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

Jennifer Burton (jennifer.burton@henry.k12.ga.us) and **Heather Toliver** (@MrsTolly; heather.toliver@henry.k12.ga.us), Henry County Schools, McDonough, GA

Build a partnership with your local water authority to incorporate citizen science and STEM in your science lessons. Ideas from our workshop will be shared.

IB Science Meets the NGSS

(Grades 11–12)

International Ballroom F, Omni

Science Focus: GEN, CCC, SEP1, SEP2, SEP3, SEP4, SEP5, SEP8

Michelle Mason, **Kathy Mirakovits** (@kmirakovits; kmirakovits@gmail.com), **Donna Hertel** (dhertel@portageps.org), and **Colin Killmer** (@ckillmer; ckillmer@portageps.org), Portage Northern High School, Portage, MI

Join us as we discuss the impact of the NGSS on International Baccalaureate Diploma Program science courses and some of the things we have done to integrate science and engineering practices with that curriculum. We'd also love to hear what you do!

NARST-Sponsored Session: The INSPIRES Curriculum for Connecting Engineering to a STEM Curriculum

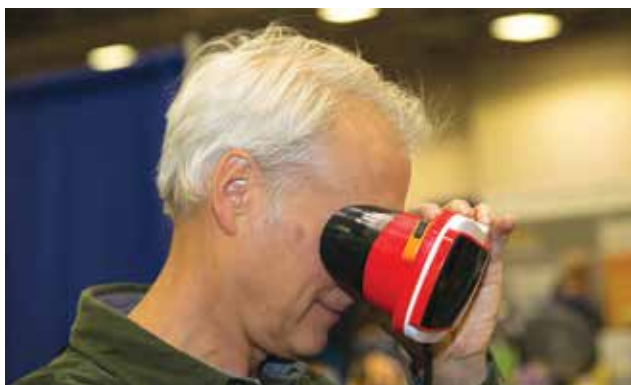
(Grades 9–12)

Juniper, Omni

Science Focus: ETS, SEP

Jonathan Singer, University of Maryland, Baltimore County, Baltimore

Attention will be paid to a set of high school curricula that integrates engineering practices within a biomedical context.



—Photo courtesy of Mike Weiss

Fostering Strong Student Relationships Using the 10 Socio-Emotional Learning Core Competencies

(General)

Magnolia, Omni

Science Focus: GEN, SEP1, SEP7, SEP8

Sofiya Eрман (sserman1@gmail.com), STRIVE Prep—SMART, Denver, CO

Come learn about the 10 core competencies of Socio-Emotional Learning and how they can be used to build/repair relationships with students and to help meet the needs of all students academically.

More Than a Research Paper: Secondary Literacy Strategies That Increase Content Knowledge and Literacy Skills

(Grades 6–College)

Maple A/B, South Tower, Omni

Science Focus: GEN, SEP1, SEP4, SEP6, SEP8

April Lanotte, Wings Over the Rockies Air and Space Museum, Denver, CO

Learn easy-to-implement literacy strategies for your secondary classroom that will improve both content understanding and student literacy skills, without becoming the English teacher.

Solving Pieces of the Autism Puzzle for Science Teachers

(Grades 5–12)

Walnut, Omni

Science Focus: GEN, NGSS

Jennifer Pontello (scienceteacherjen@yahoo.com), Puzzle Pieces Consulting, Ballwin, MO

John Bruno (jbruno0802@gmail.com), Special School District of St. Louis County, Saint Louis, MO

Encounter strategies for increasing success of the growing number of students on the autism spectrum in general education science classrooms.

12:30–1:30 PM Hands-On Workshops

Productive and Collaborative Science Talk: Strategies for Facilitating Group Work Through Science Talk

(Grades 6–8)

A302, GWCC

Science Focus: GEN

Nonye Alozie (nonye.alozie@gmail.com), SRI International, Menlo Park, CA

Explore dimensions of student collaboration within groups and develop instructional tools that promote collaboration through effective and productive science talk.

Earthquakes, Earth's Structure, and Plate Tectonics Animations: Powerful Learning Tools for Earth Science Educators and Their Students

(Grades 6–College)

A305, GWCC

Science Focus: ESS2.B, ESS3.B, SEP2, SEP8

Michael Hubenthal (michael.hubenthal@iris.edu), IRIS, Washington, DC

Jenda Johnson (jendaj@gmail.com), Earth Sciences Animated, Portland, OR

Use IRIS's more than 100 free animations of Earth processes to explore how students process visual/auditory information, and learn strategies to effectively employ animations to enable learning.

Assessing 3-D Learning

(Grades K–12)

A311, GWCC

Science Focus: GEN, NGSS

Aneesha Badrinarayan (abadrinarayan@achieve.org), Achieve, Inc., Washington, DC

President: Ted Willard (twillard@nsta.org), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

How do you know if students are making progress toward three-dimensional (3-D) learning goals? Assessments are challenging, and 3-D assessments are even more so. In this session, we will feature strategies you can use to engage in formative assessment of your students' achievement of the 3-D performance expectations. We will focus on features of high-quality 3-D assessments, and you will leave with strategies for using the three dimensions in learning experiences as assessment opportunities.

Systems Thinking, Modeling, and Climate Change

(Grades 7–12) *A313, GWCC*

Science Focus: ESS2.D, ESS3.C, ESS3.D, CCC2, CCC4, CCC5, SEP2, SEP4, SEP5, SEP6, SEP7

Daniel Damelin (@dandamelin; *ddamelin@concord.org*), The Concord Consortium, Concord, MA

Pendred Noyce (@TumblehomeLearn; *pnoyce@noycefdn.org*), Tumblehome Learning, Inc., Boston, MA

Climate science thrives on systems thinking and understanding feedback. Explore a free open-source modeling tool for engaging with climate change. Bring computers! Free e-book.

Integrating CCSS English Language Arts with NGSS in the Elementary Classroom

(Grades 4–8) *A315, GWCC*

Science Focus: PS2.A, PS3.B, CCC2, CCC5, SEP

Sabine Jeske (*sabine.jeske@ucsf.edu*) and **Jessica Allen** (*jessica.allen@ucsf.edu*), UCSF Science & Health Education Partnership, San Francisco, CA

Engage in an exciting phenomenon-based activity to experience how NGSS-focused instruction can motivate students to listen, speak, read, and write to deepen their scientific understanding.

CESI-Sponsored Session: Integrating Science and Literacy: Proven Strategies Developed from Evidence-Based Practices

(Grades K–6) *A402, GWCC*

Science Focus: GEN

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

Katie Kalajian (*kalajian.katie@gmail.com*), Manning Oaks Elementary School, Alpharetta, GA

Find out how to integrate science with literacy and walk away with 33 proven instructional strategies to use in your classroom right away.

City on the Delta: Engaging Students in Science Learning with River Investigations and Flood Protection Engineering Projects

(Grades 2–6) *A403, GWCC*

Science Focus: LS2, SEP

Jennifer Williams (@ScienceJennifer; *jenniferwilliams@newmanschool.org*), Isidore Newman School, New Orleans, LA
River investigation and the creation of model flood protection projects offer unique experiential opportunities to engage young students in science learning experiences that

are relevant to the communities that live in and promote environmental stewardship. Learn how one school created multifaceted STEM partnerships to teach their students about their city, their wetlands, and their river.

Where Does Our Food Come From? It's Not a Public Supermarket!

(Grades P–5) *A404, GWCC*

Science Focus: GEN, NGSS

Tanna Nicely (@TannaNicely; *tanna.nicely@knoxschools.org*), South Knoxville Elementary School, Knoxville, TN

Have you ever asked a student where their food comes from? Seven out of ten students believe their milk comes from a local supermarket instead of a cow. Tennessee Foundation for Ag in the Classroom equips teachers with the tools needed to ignite students' curiosity about the origin of their food.

Using the Science Writing Heuristic as a Method for Implementing 3-D Learning

(Grades 6–12) *A405, GWCC*

Science Focus: GEN, NGSS

Jennifer Panczszyn (@jpscigirl; *panczjl@nv.ccsd.net*), Clark County School District, Las Vegas, NV

Heather Witt (@tortugahiker), Arbor View High School, Las Vegas, NV

Incorporate three-dimensional learning using the Science Writing Heuristic, a research-based method of teaching science through inquiry. SWH lessons allow students to develop their initial thoughts, build on them through lab experiences, and challenge them through expert readings. Engage in an SWH lesson, view student work, and begin to develop your own SWH.

NESTA Integrating Earth Science into Other Disciplines Share-a-Thon

(Grades K–12) *B103, GWCC*

Science Focus: ESS2, LS2, LS4, PS1, PS3, CCC1, CCC4, SEP

Cheryl Manning (@clbmanning; *clbmanning@mac.com*), Evergreen High School, Evergreen, CO

Belinda Jacobs (@NESTA_US; *bjrockgirl11@gmail.com*), Cedar Ridge High School, Round Rock, TX

Join more than 20 NESTA members and other education specialists as they share their favorite NGSS-congruent classroom activities. Lots of free resources!

3D NGSS Physical Science Fun and Inquiry Across the Grade Bands

(Grades K–12)

B401, GWCC

Science Focus: PS

Wayne Snyder (wsnyder@caltech.edu), Cal Poly Pomona, CA

Karen Ostlund (klostlund@utexas.edu), 2012–2012 NSTA President, and The University of Texas at Austin

Join the fun and inquiry as we apply a variety of hands-on activities to core concepts across grade levels, from elementary to middle school to high school.

Innovation STEMs from Science...Engage in Engineering!

(Grades P–5)

B402, GWCC

Science Focus: GEN, SEP

Kelly Shea (@kellyshea18; kellyshea@uri.edu), **Sara Sweetman** (@gemsnet10; sara_sweetman@uri.edu), and **Caroline Stabile** (@gemsnet10; stokbridge@uri.edu), The University of Rhode Island, Kingston

Engage in an engineering challenge that STEMs from science. Feel confident promoting critical-thinking skills and NGSS science and engineering practices in your classroom!

Teaching Personalized Medicine in the Biology Classroom

(Grades 9–College)

C203, GWCC

Science Focus: LS3.B, SEP2, SEP4, SEP6

Tanya Buxton (tbuxton@menloschool.org), Menlo School, Atherton, CA

Come learn about gene chips, CRISPR gene editing, and 23andMe DNA profiling. Understanding which genes someone has and how genes are expressed is the future of diagnosis and treatment of disease. Simulations and laboratory exercises in these techniques will be presented.

Building a Periodic Table Unit Plan Using American Association of Chemistry Teachers (AAPT) Resources

(Grades 10–12)

C205, GWCC

Science Focus: PS

Kimberly Duncan (@AAPTconnect; @chemduncan; kimberly.z.duncan@gmail.com), American Association of Chemistry Teachers, Washington, DC

Discover how to put together a successful unit plan using the wide variety of classroom resources available on AAPT's website.

Investigating Bark Beetle Outbreaks in Forest Ecosystems Using Computer Models

(Grades 6–8)

C206, GWCC

Science Focus: LS2.A, LS2.C, CCC1, CCC2, CCC3, CCC4, CCC7, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

April Mitchell (april.mitchell@slcschools.org), Salt Lake City (UT) School District

Lin Xiang (linxiang@weber.edu), Weber State University, Ogden, UT

Recent bark beetle outbreaks have devastated forest ecosystems across Western North America. We will gather evidence to explain this phenomenon and use a computer simulation to collect and analyze data on variables that affect bark beetle populations, including temperature, drought, and tree diversity. Targets NGSS ecosystem MS-LS2-4. Bring a tablet/laptop to access the NetLogo computer model.

Investigating Adaptation Using 3D-Printed Fossils from the Great American Biotic Interchange

(Grades 9–12)

C210, GWCC

Science Focus: LS4.C, CCC2, SEP6, SEP7

Sabrina Sahlstrom (@paleoteach; ssahlstrom@deltaschool.org), Delta Charter High School at Cabrillo College, Gainesville, FL

Sean Moran (@paleoteach; smmoran.wm@gmail.com),

Pavlo “Pasha” Antonenko (@paleoteach; p.antonenko@coe.ufl.edu), and **Claudia Grant** (@paleoteach; @claugrant; cgrant@flmnh.ufl.edu), University of Florida, Gainesville

Bruce MacFadden (bmacfadd@flmnh.ufl.edu), Florida Museum of Natural History, Gainesville

Immerse yourself in authentic NGSS-focused science experiences. Using 3D-printed fossils, explore adaptation of various animals that crossed the Isthmus of Panama over the past.

Beams to Bridges: Graphing Stress-Strain Curves

(Grades 9–12)

C211, GWCC

Science Focus: ETS1.C, ETS2.A, CCC6,

Scott Spohler (sspohler@gisaoh.org), Global Impact STEM Academy, Springfield, OH

A hands-on beam lab produces graphs critical to understanding beam properties for engineering. Emphasis will be placed on making, interpreting, and teaching the graphs in a classroom.

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Registration Hall B

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Sunday, March 18	8:00 AM–NOON

NSTA National
Science
Teachers
Association

Science Vocabulary: It's About Concepts Not Definitions

(Grades 6–10)

C212, GWCC

Science Focus: GEN, SEP2, SEP8

Tammy Barnes (tamara.barnes@browardschools.com), Broward County Public Schools, Fort Lauderdale, FL

Attention will be paid to student-centered strategies that promote student understanding of the concepts represented by science vocabulary instead of copying and memorizing definitions.

Board Meetings: Analyzing Lab Results Using Student-Led Discussion

(Grades 9–12)

C302, GWCC

Science Focus: PS, CCC4, SEP1, SEP2, SEP3, SEP4

Kristen One (kone@d125.org), **Lauren Albert** (@MissLAlbert;lalbert@d125.org), **Andy Fitz** (afitz@d125.org), **Nathan Gustin** (ngustin@d125.org), and **Josh Bozeday** (jbozeday@d125.org), Adlai E. Stevenson High School, Lincolnshire, IL

We will share a method and practical tips that will get students arguing and collaborating with one another over the meaning of their lab data.

Building Bridges to Science: Using Inquiry Pedagogy to Enable Crosstalk Between Subjects

(Grades K–12)

Cottonwood A/B, Omni

Science Focus: GEN

Nicholas Balisciano (@STEMNick;nbalisciano@alumni.upenn.edu), Connecticut Science Center, Hartford

Learn about and receive a common framework for inquiry-based lessons that can foster connections between science and other subjects.

Science and the Congressional Record: “Sewing the Seeds of Discontent”

(Grades 4–10)

Grand Ballroom A, Omni

Science Focus: ETS1.A, ETS2.B, LS1.A, LS1.B, CCC6, SEP

Sue Kezios (kezios@uncw.edu) and **Kathy Ibbotson** (ibbotsonk@uncw.edu), University of North Carolina Wilmington

Reading from the congressional record can inspire students to engineer solutions to significant problems, and sometimes all it takes is a sewing machine.

Geotech: Using Digital Resources to Support Hands-On Earth Science Instruction

(Grades 3–10)

International Ballroom D, Omni

Science Focus: ESS2, ESS3, ETS2, SEP2, SEP3, SEP4, SEP6, SEP7, SEP8

Beverly Owens (@owensscience; @CleveCoSchools;bsowens@clevelandcountyschools.org), Kings Mountain Middle School, Kings Mountain, NC

President: Chinita Allen (chinitayallen@gmail.com), Chalker Elementary School, Kennesaw, GA

How can 21st-century technologies be used to support geoscience education? Examine 3D printing, Augmented Reality, apps, and other tools that can enhance hands-on labs and activities. Participate in several activities that can be used in the classroom.

Transition Toolkit for Planning and Implementing 3-D Lessons

(Grades 9–12)

International Ballroom E, Omni

Science Focus: GEN, NGSS

Jennifer Ward (ward.jenn.c@gmail.com) and **Jennifer Duell** (jduell.science@gmail.com), Francis T. Maloney High School, Meriden, CT

President: Cindy Kern (cindy.kern@quinnipiac.edu), Quinnipiac University, Hamden, CT

Are you a teacher transitioning to NGSS? The Transition Toolkit provides an intentional planning guide to help teachers think three-dimensionally for units and lesson development.

Experience Question Formulation!

(Grades 7–College)

Pine (South Tower), Omni

Science Focus: GEN, INF, CCC2, SEP1, SEP3, SEP7, SEP8

Chris Willems (@WillemsChris;willemscience@gmail.com), Metropolitan Business Academy, New Haven, CT

Asking questions and defining problems is a core NGSS practice. I'll share and use an engaging, classroom-proven question-generating strategy.

12:30–2:30 PM Presentations

INF Community Connections Forum: Learn How to Better Advocate for Science and Science Education

(General) A312, GWCC

Science Focus: GEN, INF, NGSS

Steven Walvig (@SteveWalvig; steven.walvig@gmail.com), SciMathMN, Saint Paul, MN

Ed Barker, Kennesaw State University,, Kennesaw, GA

Margaret Glass, Association of Science-Technology Centers, Washington, DC

Bob Hirshon, AAAS, Washington, DC

Bradley Hoge, National Center for Science Education,, Oakland, CA

Katie Kross-Landes, Georgia Statewide Afterschool Network, Atlanta

Mary (Margo) Murphy, Camden Hills Regional High School, Rockport, ME

Jodi Peterson, Assistant Executive Director, Legislative & Public Affairs, NSTA, Arlington, VA

Science matters! Learn how to better advocate for science and science education from experts in the field.

INF Multicultural and Equity Ignite Presentations

(General) B102, GWCC

Science Focus: GEN, INF, NGSS

Deb Morrison (@educatordeb; educator.deb@gmail.com), University of Washington, Seattle

Lisa Ernst (@lae121; ernstl@sfusd.edu), Alice Fong Yu Alternative School, San Francisco, CA

Natacia Campbell (ncampbell@joliet86.org), NSTA Director, Multicultural/Equity in Science Education; and Joliet (IL) Public Schools District 86

Juliana Texley (texlej@cmich.edu), 2014–2015 NSTA President, and Central Michigan University, Mount Pleasant

Marion Reeves, Science Education Consultant, Avondale Estates, GA

Meg Delgato (delgato.meg@spcollege.edu), St. Petersburg College, Redington Shores, FL

Julio Mendez (@MrMendezTeach; julio.cesar.mendez2@gmail.com), Perspectives Charter School, Joslin Campus, Chicago, IL

Come to the Multicultural and Equity in Science Education Ignite Presentations. We will have four presentations that will be 20 minutes each with five minutes for questions after each session. Attend one session or all four! We will address effective strategies, exemplary programs, and successful practices. You'll leave re-energized and renewed!

12:30–2:30 PM Hands-On Workshops

CSSS-Sponsored Session: Three-Dimensional Instructional Lessons

(General)

Dogwood B, Omni

Science Focus: GEN, NGSS

Juan-Carlos Aguilar (jaguilar@doe.k12.ga.us), Georgia Dept. of Education, Atlanta

We will provide examples of three-dimensional instructional lessons developed by Georgia teachers. Organized around the Gathering, Reasoning, and Communicating framework, the lessons integrate components of the 5E model throughout each section. Participants will experience one of the lessons to form an idea of the classroom practices necessary to implement this type of instruction.

College Science Teaching as the Foundation for STEM: Best Practices

(College)

Spruce, South Tower, Omni

Science Focus: GEN

Elizabeth Allan (eallan@uco.edu), NSTA Director, College Science Teaching, and University of Central Oklahoma, Edmond

This session is for those who teach at the college level and those who are interested in an opportunity to share strategies that promote student success.

1:00–1:30 PM Presentations

Use Appealing and Accessible Literature to Deepen STEM Aptitude

(Grades K–6)

A408, GWCC

Science Focus: PS, SEP

Nicholas Bourke (nbourke@aum.edu), Auburn University at Montgomery, AL

Explore creative research-based ways to use trade books to enhance your STEM curriculum as we share ideas incorporating our favorite trade books.



Lessons in Literacy from *The Immortal Life of Henrietta Lacks* and Henrietta's Amazing HeLa Cells

(Grades 6–12)

B212, GWCC

Science Focus: LS

Dana Compton McCullough (dmccullough@ccboe.net), Columbia County School District, Evans, GA

Hear how excerpts from *The Immortal Life of Henrietta Lacks* during science instruction concerning cells creates opportunities for students to engage in reading, writing, and discourse.

Aquaculture and Workforce Development—Engaging All Students in Science Learning

(Grades 8–12)

C204, GWCC

Science Focus: LS, CCC

Linda Chilton (lchilton@usc.edu), USC Sea Grant, Los Angeles, CA

Aquaponics and aquaculture provide the foundation for engaging high school students with three-dimensional learning both through career technical training and in higher education.

2:00–2:30 PM Presentations

Building Middle School Students' Experience with Science Practices Using Gene-Environment Interactions to Make Sense of Type 2 Diabetes

(Grades 6–8)

A412a, GWCC

Science Focus: GEN, NGSS

Idit Adler (adleridit@msu.edu), **Jane Lee** (leejanej@msu.edu), and **Renee Bayer** (rbayer@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing

Experience this free NGSS-focused curriculum and examine Project-Based Learning environments that engage students in three-dimensional learning investigating gene-environment interactions to make sense of Type-2 diabetes.



You Turn Me On: Books to Teach Bioluminescence

(Grades 5–11)

B212, GWCC

Science Focus: LS4

Laura Robertson (robertle@etsu.edu) and **Renee Lyons** (lyonsrc@etsu.edu), East Tennessee State University, Johnson City

Explore fun nonfiction texts and resources for teaching bioluminescence and how animals use the light they produce to find prey, communicate, and defend themselves.

Printer Guts: Reverse Engineering Printers to Make a “Hugo” Drawing Automaton

(Grades 7–11)

C213, GWCC

Science Focus: ETS1.A, ETS1.B, PS3.C, CCC1, CCC2, CCC6, SEP1, SEP3, SEP6, SEP8

Mark Bell (mbell@country-school.org), The Country School, Valley Village, CA

High student engagement. Very low cost. Full STEAM! Surprisingly rich in engineering content. Students take apart free printers to make their own machine that draws.

2:00–3:00 PM NSTA/ASE Honors Exchange Lecture

Literacy and Success in Science

(General)

Grand Ballroom B, Omni

Science Focus: GEN

Sponsored by The Association for Science Education



Linda Needham (@NeedhamL56; linda@vicia.co.uk), 2017–2018 Chair, The Association for Science Education, Hatfield, Herts., UK

President: Shaun Reason, Chief Executive, The Association for Science Education, Hatfield, Herts., UK

Science teachers are often faced with such content-laden schemes of work (lesson plans) that it is difficult to fit everything into the time available for science lessons. Added to this, they are expected to develop mathematical and literacy skills to ensure student success in science examinations. These wider skills are often sidelined in order to get through the science content. Linda will address this dilemma and the challenges facing science teachers regarding literacy development. Reflecting on current approaches, she will share ideas to strengthen students' use of literacy to make them better scientists.

A native of Leeds, West Yorkshire, Linda Needham found it a humbling experience to be elected by the membership as chair-elect in 2016 and now to be representing The Association for Science Education as chair. She is a long serving member of the ASE Yorkshire region, a member of the Education Group, and a regular host on #ASEchat. She is currently an independent education consultant. Her teaching roles are too numerous to list fully, but she taught in middle schools and at a Sixth Form College, as well as mentored preservice teachers. Linda also held a three-year post as a northwest region science adviser on The National Strategies, professional programs aimed at improving the quality of learning and teaching in schools in England.

Linda holds a degree in biological sciences from The University of Lancaster and a post-graduate certificate in education from Loughborough University. She also is a Chartered Science Teacher (CSciTeach), a professional recognition for excellence in science teaching and learning.

2:00–3:00 PM Presentations

INF Animal Behavior Field Studies at Zoos and Aquariums (Grades 5–9) A301, GWCC

Science Focus: INF, NGSS

Daniel O'Shoney (*doshoney@wcs.org*), Wildlife Conservation Society, Bronx, NY

Catherine Calogero (*ccalogero@gmail.com*), The High-bridge Green School, Bronx, NY

Join us as Urban Advantage NYC and Wildlife Conservation Society present the ways teachers can use zoos and aquariums to engage students in authentic science investigations.

INF Connecting Creatively: Engaging Diverse Learners in STEM Through Creativity and Informal Science Learning Approaches

(Grades 6–12) A302, GWCC

Science Focus: INF, NGSS

Jennifer Adams (*jennifer.adams1@ucalgary.ca*), University of Calgary, AB, Canada

Theila Smith (*theila.smith@baruchmail.cuny.edu*), The Math & Science Exploratory School, Brooklyn, NY

Terrona Gaynor (*@TGaynor11*) and **Christopher Vasquez** (*chrisleev Vasquez@aol.com*), Brooklyn College, Brooklyn, NY

Pablo Garcia (*@Garcia20*), Urban Assembly New York Harbor School, New York, NY

Learn how to connect informal science learning with approaches that foster creativity in the science classroom.

Digital Natives Use 3-D Learning to Collaborate on Climate Change

(Grades 3–8) A303, GWCC

Science Focus: ESS2.D, ESS3.C, ESS3.D, CCC1, CCC2, CCC4, SEP2, SEP7, SEP8

Kathleen Christie-Blick (*@KottieCB*; *kottie@verizon.net*) and **Jacob Tanenbaum** (*jtanenbaum@socsd.org*), South Orangetown Central School District, Blauvelt, NY

Get students learning, collaborating, creating, and playing on the internet to learn about climate change. NOAA Climate Stewards Educators share their successful classroom practices. Leave ready to launch a cloud-infused curriculum that meets NGSS to engage and empower your students.

Authors Wanted! Publish Your Teaching Idea in an NSTA Journal

(General) A304, GWCC

Science Focus: GEN, INF

Ken Roberts (*ken_r@nsta.org*), Assistant Executive Director, Journals, NSTA, Arlington, VA

Patty McGinnis (*@patty_mcginnis*; *pattymcginnis1@gmail.com*), Field Editor, *Science Scope*, and Arcola Intermediate School, Eagleville, PA

Linda Froschauer (*fro2@me.com*), 2006–2007 NSTA President, and Field Editor, *Science & Children*, Pasadena, CA

Dennis Schatz (*@DinoManSchatz*; *dschatz@pacsci.org*), NSTA President-Elect Elect; Editor, *Connected Science Learning*; NSTA Director, Informal Education; and Pacific Science Center, Seattle, WA

Steve Metz (*smetz@nsta.org*), Field Editor, *The Science Teacher*, and The Governor's Academy, Byfield, MA

Meet with NSTA journal editors to learn how to successfully prepare and submit an article for publication.

3D Build a Bug: Creating 3-D Insects, Supporting 3-D Learning

(Grades 3–6) A316, GWCC

Science Focus: ETS1, LS1.A, LS1.B, LS4.C, CCC1, CCC4, CCC6, SEP1, SEP2, SEP3, SEP4

Rebecca Blumenthal (*@BBSciTeach*; *bblumenthal@berkeleycarroll.org*), Berkeley Carroll School, Brooklyn, NY

Insects are ideal for three-dimensional learning in elementary classrooms. Adding a creative “bioengineering” project gives students an imagination outlet and gives teachers an authentic assessment.

Cultivating a Community of Scientists: Moving Students Toward Co-Constructing Scientific Understanding Beginning in the Outdoor Classroom

(Grades P–5) A401, GWCC

Science Focus: ESS2, ESS3, LS2, CCC1, CCC5, CCC7, SEP1, SEP3, SEP6, SEP7

Holly Rosa (*@BPSSciHolly*; *hrosa@bostonpublicschools.org*), Boston (MA) Public Schools

Kristin Metz (*kristinmetz@outlook.com*), Education Consultant, Roslindale, MA

Angela Palo (*apalo@bostonpublicschools.org*), Horace Mann School for the Deaf and Hard of Hearing, Boston, MA

Elizabeth Hadly (*eely@bostonpublicschools.org*), Ellis Mendell School, Roxbury, MA

Use a new tool to foster a culture of science among your students. This tool includes a continuum for gauging student progress, planning materials, and teaching moves.

Measuring Proficiency and Growth in the Science and Engineering Practices

(Grades 6–12)

A407, GWCC

Science Focus: GEN, SEP

Steve Wood (swood@d125.org) and **Sara Cahill** (scahill@d125.org), Adlai E. Stevenson High School, Lincolnshire, IL
Leave with resources to measure student proficiency and growth in science and engineering practices. Practical examples for lessons, rubrics, and resources will be shared.

NSTA's Online Resources and Communities

(Grades K–12)

A408, GWCC

Science Focus: GEN, NGSS

Flavio Mendez (@fljmenendez; flavio_m@nsta.org), Assistant Executive Director, NSTA Learning Center, NSTA, Arlington, VA

Ted Willard (@Ted_NSTA; twillard@nsta.org), Assistant Executive Director, Science Standards, NSTA, Arlington, VA

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

GYSTC K–8 3-D Learning Share-a-Thon

(Grades K–8)

B101, GWCC

Science Focus: GEN, NGSS

Aubrey Crook and **Tom Brown** (tbrown2056@gmail.com), Georgia Youth Science and Technology Centers, Inc., Kennesaw

Cathy Fontenot (@westgystc; cfonteno@westga.edu), West GYSTC, Carrollton, GA

Jolaine Whitehead, Oconee River GYSTC, Winterville, GA

Tammy Nowell (@tammy_nowell; tammy.nowell@bainbridge.edu), Southwest GYSTC, Bainbridge, GA

Erin Youmans, Magnolia Midlands GYSTC, Swainsboro, GA

Regional coordinators from the Georgia Youth Science and Technology Centers will share grade-level examples of three-dimensional learning experiences. Example lessons from multiple grade levels will be provided.

Phenomena: The Missing Link to Lesson Planning Using Student Questions

(Grades K–5)

B211, GWCC

Science Focus: GEN, NGSS

Rachel Fiore (rfiore1@gsu.edu), **David Wojnowski** (wojnowskidavid@gmail.com), and **Brian Williams** (@bawilli; bawilli@gsu.edu), Georgia State University, Atlanta
Struggling with writing elementary lessons using student questions? Struggling with understanding how to use phenomena? We can help!

3D Classroom-Embedded Assessments (CEAs): 3-D Assessments for Learning in Elementary and Middle School Classrooms

(Grades K–8)

B401, GWCC

Science Focus: GEN, NGSS

Diane Johnson (@MDHJohnson; jdiane72@gmail.com), **Patti Works** (@patti_works; patriciaeworks@gmail.com), and **Kimberly Zeidler-Watters** (@KimWatters5; @EKU-PIMSER; kim.zeidler@eku.edu), ECU Partnership Institute
Justin McFadden, University of Minnesota, Minneapolis
for Math and Science Education Reform, Lexington, KY
We will detail a process for developing robust formative assessments at key “hinge-points” during instruction that in turn inform next instructional steps for learning.



Spaceward Bound: Exploring Life in Extreme Environments

(General)

B402, GWCC

Science Focus: LS4, INF

Amelia Gulling (@DRIScienceAlive; amelia.gulling@dri.edu) and **Craig Rosen** (@DRIScienceAlive; craig.rosen@dri.edu), Desert Research Institute, Las Vegas, NV

Leah Madison (@DRIScienceAlive; leah.madison@dri.edu) and **Mackenzie Peterson** (@DRIScienceAlive; mackenzie.peterson@dri.edu), Desert Research Institute, Reno, NV

Bring cutting-edge science and real-world experience to the classroom. Follow the weeklong journey of eight teachers and a team of planetary scientists in the Mojave Desert.



NSTA Press® Session: Argument-Driven Inquiry in the Life, Physical, and Earth/Space Sciences: Lab Investigations for Grades 6–8

(Grades 6–8)

B405, GWCC

Science Focus: ESS, LS, PS, CCC, SEP

Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin

Patrick Enderle (penderle@gsu.edu), Georgia State University, Atlanta

Learn about Argument-Driven Inquiry and how it can help

students learn how to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

Food Chains: Using Field Surveys That Give Real Results

(Grades 6–8)

C202, GWCC

Science Focus: LS

Frederick Maier (fredmaier@sbcglobal.net), Village of Itasca (IL) Nature Center

Roy “Jack” Tison (globes@comcast.net), Lincoln Marsh Natural Area, Wheaton, IL

See a demonstration of three hands-on survey techniques that allow students to calculate actual numbers of plants, herbivores, and carnivores in creating a food chain.

Liven Up Your Labs with Free 3-D Learning Tools and Resources

(Grades 9–12)

C206, GWCC

Science Focus: LS, PS, CCC1, CCC2, CCC3, CCC5, SEP

Chad Dorsey (@chaddorsey; cdorsey@concord.org), **Tom Farmer** (@tomofarmer; tfarmer@concord.org), and **Daniel Damelin** (@dandamelin; ddamelin@concord.org), The Concord Consortium, Concord, MA

Students should learn science by “doing” science, but how can you find rich, open three-dimensional learning approaches to support them? Come get access to free research-based tools and curricular supports that meet the NGSS approach to STEM. Through open-ended tools and approaches, you can adapt to all your favorite labs!

Digging Deep into Science Literacy

(Grades K–12)

Birch, Omni

Science Focus: GEN, NGSS

Leslie Suters (lsuters@tntech.edu), Roane State Community College, Oak Ridge, TN

Kristen Trent (kpennycuff@tntech.edu), **Kelly Moore** (kellyramey; kellymoore@tntech.edu), **Stephanie Wendt** (swendt@tntech.edu), and **Queen Ogbomo** (qogbomo@tntech.edu), Tennessee Tech University, Cookeville

We will share technical reading and writing strategies for K–12 science classrooms that we have developed as part of a Math Science Partnership grant.

Who’s in Your STEM Ecosystem? Engaging Local STEM Professionals as the Foundation for NGSS-Focused Units

(Grades K–12)

Chestnut, Omni

Science Focus: ESS3, ETS, LS2, PS2

Stacy Meyer (stacy.meyer@esd112.org) and **Vickei Hrdina** (@STEMesd112; vickei.hrdina@esd112.org), Educational Service District 112, Vancouver, WA

We will outline a strategy for building sustainable partnerships with your local STEM community and translating authentic local problems into phenomena-based units.

Active Differentiated Instruction: Teaching to Meet Diverse Needs

(Grades K–10)

Dogwood A, Omni

Science Focus: GEN, SEP3

LaTonya Waller (lwaller2@rvaschools.net), Thomas C. Boushall Middle School, Richmond, VA

Helena Easter (@helena260; heaster@rvaschools.net), **Renee Simpkins**, and **Vickey Drew** (vickydrew@verizon.net), Richmond (VA) Public Schools

Differentiated instruction authorization will avail you implement practical strategies to create positive classroom environments that appeal to students with different abilities of readiness and learning styles. Learn how to differentiate science labs and activities by providing multiple windows into your curriculum! Many resources will be given to attendees.

Slow Down to Go Fast? How Modeling Can Increase Student Engagement Through Storytelling

(Grades 9–12)

Grand Ballroom C, Omni

Science Focus: PS1, PS3

Mason Converse (conversem@apps.harpercreek.net) and **Sandra Erwin** (@science_serwin; erwins@harpercreek.net), Harper Creek High School, Battle Creek, MI

Explore how using student-generated models increases depth of content understanding and student engagement through storytelling in high school science classes.

Lights, Camera, Literacy! Engaging Students Through Filmmaking

(Grades 4–College)

Hickory, Omni

Science Focus: GEN, NGSS

Susan Tate (@SusanTate22; susantate@whitehallschools.net), Whitehall Middle School, Whitehall, MI

Conni Crittenden (crittec@gmail.com), Williamston (MI) Community Schools

Loris Chen (@tworiversnj; lchen@wyckoffschools.org), Dwight D. Eisenhower Middle School, Wyckoff, NJ

Hear how four award-winning science teachers use interdisciplinary filmmaking projects to create authentic literacy experiences for their students. Sample films, tips, and troubleshooting provided.

INF An Interdisciplinary Approach to Sustainability: Promoting Equity Through Project-Based Learning and Informal Learning Experiences

(Grades 9–12)

International Ballroom F, Omni

Science Focus: GEN, INF, NGSS

Joshua Modeste (JoshModeste; joshua.modeste@gmail.com), The Urban Assembly School for Global Commerce, New York, NY

Steven Azeka (sazeka@gmail.com), Teachers College, Columbia University, New York, NY

Discover how an inclusive group of grade 9 students were exposed to sustainability through an interdisciplinary project-based environmental science and career technical education course.

Understanding Real Research: Incorporating Primary Literature into the Classroom

(Grades 11–College)

Magnolia, Omni

Science Focus: GEN, CCC, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

Beth Ruedi (@SciClassroom; bruedi@aaas.org), AAAS, Washington, DC

Science in the Classroom (SitC) is an expanding collection of research articles, carefully annotated for teaching. Learn how to use SitC to enhance science literacy in the classroom!

Interactive Word Walls: Training Trainers and Coaching Coaches

(Grades K–12)

Maple A/B, South Tower, Omni

Science Focus: GEN, NGSS

Julie Jackson (@ScienceToolkit; jj32@txstate.edu), Texas State University, San Marcos

Interactive word walls help develop students' ability to read and produce the genres of texts that are intrinsic to science at every grade level.

2:00–3:00 PM Hands-On Workshops

NASA's Scale of Discovery: Applications from Our Universe

(Grades 3–12)

A305, GWCC

Science Focus: ESS1.A, ESS1.B, ESS2.A, ESS3.C, ETS1.B, ETS2, PS2.A, PS2.C, CCC1, CCC2, CCC3, CCC4, CCC6, SEP

Barbara Buckner (@bbuckner; barbie.buckner@nasa.gov), NASA Armstrong Flight Research Center, Palmdale, CA

Jennifer Kennedy (@jekennedy421; jekennedy421@gmail.com), SPARK Academy at Cowart, Athens, AL

Explore applications of scale and conversions with hands-on standards-focused STEM activities. Engage our universe as you apply distance, time, and size scales to models.

Ice Core Records—From Volcanoes to Solar Proton Events to Supernovas

(Grades 9–12)

A311, GWCC

Science Focus: ESS1.A, ESS1.B, ESS2.A, ESS2.B, PS1.B, PS2.B, PS2.C, PS3.B, PS4.B, SEP4, SEP7

Pamela Perry (pperry@lewistonpublicschools.org), Lewiston High School, Lewiston, ME

Donna Young (dlyoung.nso@gmail.com), NASA NSO STEM Coordinator, Bullhead City, AZ

Connect the three dimensions of NGSS with STEM using absolute and relative dating, ice core data, volcanic eruptions, solar flares, nitrate anomalies, and supernova events.

East Meets West: Pathways to Understanding How Young Children of Different Cultures Engage in Physics (Force and Motion) and Engineering

(Grades P–3)

A313, GWCC

Science Focus: ETS, PS2, SEP

Akiko (Sonia) Yoshizawa (@SoniaYoshizawa), East Tennessee State University, Johnson City

Beth Van Meeteren (beth.vanmeeteren@uni.edu), University of Northern Iowa, Cedar Falls

Winnie Wong (winnie@dr-play.com.hk), Dr. PLAY, Kwun Tong Kowloon, IA

How do children in the United States and Asia develop science practices and engineering? Join us to hear stories, view videos, actively engage in materials yourself, and participate in discussions.

Integrating Science and Literacy...Take It to the Next Level!

(Grades K–8)

A315, GWCC

Science Focus: GEN, NGSS

Kelly Shea (@gemsnet10; kellyshea@uri.edu), **Caroline Stabile** (@gemsnet10; stokbridge@uri.edu), and **Sara Sweetman** (@gemsnet10; sara_sweetman@uri.edu), The University of Rhode Island, Kingston

Engage in rigorous discourse around phenomena-driven instruction. Learn a practical research strategy for informational texts and view student writing that will inspire you.

Blown Away by Engineering

(Grades K–5)

A402, GWCC

Science Focus: ESS2.D, ESS3.B, ETS1, CCC1, CCC2, SEP7

Ella Bowling (@ellabowling; bowlinge6@nku.edu) and **Amber Carter** (@CarterNKUCinsam; cartera20@nku.edu), Northern Kentucky University, Highland Heights

Come explore NGSS-focused 5E (Engage, Explore, Explain, Elaborate, and Evaluate) lessons for elementary grades that use the engineering design process to develop a house that can reduce wind damage in this lesson that is the basis for learning about weather.

From Wolf to Woof—Engage Students in a 3-D Active Learning Unit on Natural Selection

(Grades 7–12)

A403, GWCC

Science Focus: LS4, CCC, SEP

Sandra Lampley (sandra.lampley@uah.edu), The University of Alabama in Huntsville

Presider: Catherine Brand (cbrand@atljewishacademy.org), Atlanta Jewish Academy, Atlanta, GA

Transform your natural selection unit by using active learning strategies that engage students in the three dimensions of science learning.

Preschool Educators: How to Teach STEAM Through Experiences and Literacy!

(Preschool)

A404, GWCC

Science Focus: GEN

Shawn Lord (kinscikids@gmail.com), Kinsci, Fort Walton Beach, FL

This interactive hands-on workshop will focus on the interpretation of STEAM for early childhood educators, and emphasize its use through literacy with engaging experiences!

Advancing Children's Science Literacy and Knowledge Through Traditional Texts and Digital Media

(Grades K–2)

A405, GWCC

Science Focus: PS2, PS3

Jean Crawford, PBS, Arlington, VA

Jeanne Paratore (jparator@bu.edu), Boston University, Boston, MA

Alicia Poulin (alicia.rmello@gmail.com), Devotion School, Brookline, MA

Discover how to create engaging science lessons using informational texts and digital media from PBS Kids, including the free creative coding app PBS KIDS ScratchJr.

There's an APP for That: Free and Useful Apps for Education

(Grades 9–12)

A410, GWCC

Science Focus: ETS, CCC

Borislav Bilash (@borislavbilash; bbilash@pascack.org), Pascack Valley High School, Hillsdale, NJ

Learn about free apps and extensions you may find useful in your science classroom. Bring your smartphone, iPad, or computer for a hands-on experience.

NESTA and AAPT: Developing the Strategies and Content Knowledge to Integrate Earth and Space Science Concepts into High School Physics and Physical Science Courses

(Grades 9–12)

B103, GWCC

Science Focus: ESS, PS

Rebecca Vieyra (@AAPTHQ; @RVieyraAEF; rvieyra@aapt.org), American Association of Physics Teachers, College Park, MD

David Thesenga (@DCThesenga; dthesenga@dawsonschool.org), Alexander Dawson School, Lafayette, CO

We will connect content, pedagogy, and NGSS to effectively integrate Earth and space science performance expectations and disciplinary core ideas into physics and physical science courses.

School Gardens as a Place to Cultivate STEM Learning

(Grades K–12)

C201, GWCC

Science Focus: LS2

Carmen Carrion (ccarrion1@student.gsu.edu), Georgia State University, Atlanta

Kyla Van Deusen (@Kyla_Van_Deusen; kyla_van-deusen@dekalbschoolsga.org), Fernbank Science Center, Atlanta, GA

Assess student STEM learning with a project-based garden unit developed from NGSS by the Captain Planet Foundation.

Hands-On Simulations of Bacterial Cell Transformation

(Grades 9–College)

C203, GWCC

Science Focus: LS

Danielle Alcena (danielle_alcena@urmc.rochester.edu) and **Dina Markowitz** (dina_markowitz@urmc.rochester.edu), University of Rochester, NY

Use a wet-lab simulation for bacterial transformation, in a fraction of the time! Receive full lesson guides from University of Rochester's Life Sciences Learning Center.

Butterfly Gardening Using Native Plants

(General)

C205, GWCC

Science Focus: LS

Nancy Sale (butterflybonanza@yahoo.com), Lillie C. Evans K–8 Center, Miami, FL

Butterfly Bonanza provides a roadmap to success for implementing a native butterfly habitat. Take home a starter kit that will enable you to immediately set up a habitat at your school. Door prizes and a wealth of digital data.

Proportional Reasoning: The Missing Piece of Your Calculations

(Grades 9–12)

C209, GWCC

Science Focus: PS, CCC1, CCC2, CCC3, SEP5

Kimberlee Freudenberg (@KimFreudenberg; gatorfreud@gmail.com), **Mariflor Medrano** (mmedrano@shcp.edu), and **Kirstin Wehl** (kwehl@shcp.edu), Sacred Heart Cathedral Preparatory, San Francisco, CA

But do they REALLY understand how each variable interacts with the others? We will show you how to incorporate real understanding into your physics problem-solving.

I Win! Using Game Design as a Starting Point for 3-D Learning

(Grades 9–12)

C210, GWCC

Science Focus: ESS1, CCC2, CCC4, CCC7, SEP2, SEP6

Abe Cohen-Garcia (@mrcohen754; mrcohen754@gmail.com), Bronx Arena High School, Bronx, NY

Play, deconstruct, and design games using an 3-D learning lens. Investigate interdisciplinary systems thinking as a way to access science content and the design process.

Teaching Science with a Murder Mystery

(Grades 9–12)

C211, GWCC

Science Focus: PS2.A, CCC1, CCC4, CCC5, SEP1, SEP2, SEP4, SEP5, SEP6, SEP7, SEP8

Joe Cossette (@cossettej; cossettej@gmail.com), Minnetonka High School, Minnetonka, MN

In this hands-on session, participants will take a learner stance and work in groups to solve a mystery from the student's perspective. While the topic of this lesson will focus on physics and kinematics, this session is intended for all STEM teachers.

3-D Science and Engineering for the Middle Level

(Grades 5–8)

C212, GWCC

Science Focus: ETS1, PS2.A, CCC2, CCC4, CCC6, SEP2

Sharon McKinney (@scischaron; mrssharonmckinney@gmail.com), Arch Ford Education Service Cooperative, Plumerville, AR

Engage in a classroom-ready three-dimensional science and engineering lesson on balloon rockets for those with beginning and intermediate-level familiarity with three-dimensional learning.

Using the 5E Instructional Model to Design Learning Sequences

(Grades 6–12)

C302, GWCC

Science Focus: GEN, NGSS

Dora Kastel (@Dora_Kastel; kastel.dora@gmail.com), New Visions for Public Schools, New York, NY

Cindy Gay (@CindyGay; cindyjgay@gmail.com), BSCS, Colorado Springs, CO

Using the BSCS 5E Instructional Model, participants will design an NGSS learning sequence that integrates the three dimensions: disciplinary core ideas, practices, and crosscutting concepts.

Carrying a Phenomenon Through a Unit: Day One to Day Done

(Grades K–12)

Cottonwood A/B, Omni

Science Focus: GEN, NGSS

Heather Toothaker (@htoothaker13; heather.toothaker@new-haven.k12.ct.us), Engineering and Science University Magnet School, West Haven, CT

Cindy Kern (@cindylkern; cindy.kern@quinnipiac.edu), Quinnipiac University, Hamden, CT

Explore a framework for developing units and three-dimensional lessons grounded in a phenomena. Focus lessons to build skills, content knowledge, and culminate in the scientific explanation of a phenomena.



Supporting Early STEM Inquiry Through Learning Partnerships

(Grades P–K)

Grand Ballroom A, Omni

Science Focus: GEN, SEP

Lauren Allen (@AllnSTEM; lauren.allen@dc.gov), District of Columbia Office of the State Superintendent of Education, Washington

Sarah Massie (@Massie387; semassie0@gmail.com), Plummer Elementary School, Washington, DC

Supported by 100kin10—the District of Columbia Office of the State Superintendent of Education, DC Public Schools, and the National Air and Space Museum have partnered to improve active STEM learning in the early grades by providing rich professional development for teachers and connecting young learners to STEM in their community. We will share the program’s progress and will lead participants through a hands-on inquiry STEM experience focused on preK learners.

NARST-Sponsored Session: Understanding Conceptual Effects: How Teachers’ Conceptual Models of Integrated STEM Education Influence Curriculum Writing

(Grades K–12)

International Ballroom C, Omni

Science Focus: ETS

Elizabeth Ring-Whalen (@DrWhalen_STEM; eawhalen245@stkate.edu), St. Catherine University, Saint Paul, MN

Gillian Roehrig (@ghroehrig; roehr013@umn.edu), **Elizabeth Crotty**, and **Preethi Titu** (titux002@umn.edu), STEM Education Center, Saint Paul, MN

Emily Dare (@thedoctordare; eadare@mtu.edu), Michigan Technological University, Houghton

This two-part session will include a brief overview of a research study and an interactive discussion surrounding teachers’ conceptions of STEM and curriculum writing.

Learning to Fail: Building Confidence with Data Collection

(Grades 9–12)

International Ballroom E, Omni

Science Focus: GEN, NGSS

Jessica Kohout (@MrsKohout; jessica_kohout@hcpss.org), Reservoir High School, Fulton, MD

Do your students have trouble taking risks for fear of failure? Give them a science “toolbox” to overcome any challenge in the lab.

Teaching Strategies for Integrating the Three Dimensions into a Fluid Instructional Process

(Grades 3–12)

Pine (South Tower), Omni

Science Focus: PS4, CCC, SEP

Tyson Grover (@GroverScience; tgrover@dsdmail.net), Davis School District, Clearfield, UT

Matthew Patterson (@funguyscience; mpatterson@wsd.net), Weber School District, Ogden, UT

Experience teaching strategies developed to allow for core idea focus, while engaging in practice, and framing student thinking through explicit crosscutting concepts MS-PS4-3.

2:00–3:30 PM Exhibitor Workshops

Building or Renovating a Laboratory? Get Your Questions Answered

(Grades 4–College)

B203, GWCC

Science Focus: GEN

Sponsor: Flinn Scientific, Inc.

Greg Chyson (gchyson@flinnsci.com), Flinn Scientific, Inc., Batavia, IL

Get answers to all your laboratory design questions! We will share design priority tips and safety information gathered from years of experience helping science teachers plan their laboratory construction and remodeling projects! You'll learn what features to include in your laboratories and what common mistakes to avoid. Visit www.flinnsci.com for more information.

Human Physiology with Vernier

(Grades 9–College)

B207, GWCC

Science Focus: ETS2, LS1

Sponsor: Vernier Software & Technology

Colleen McDaniel (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 7–College)

B208, GWCC

Science Focus: ETS

Sponsor: Vernier Software & Technology

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

Learn from David Vernier in this engaging hands-on workshop. Explore ways to extend your science experiments with engineering challenges. Using our Digital Control Unit with LabQuest 2 and Logger Pro, you will learn how to apply logic statements to control inexpensive electronic devices (fans, buzzers, and LEDs) based on sensor inputs.

Teaching Strategies for Cells and Genetics in Middle School Science Classes

(Grades 6–8)

B209, GWCC

Science Focus: LS

Sponsor: TCI

Christy Sanders, TCI, Mountain View, CA

Standards have shifted from learning about each body system to focusing on how body systems interact together. Join us as we discuss strategies for teaching the new focuses for NGSS. TCI's Cells and Genetics uses evidence to explore traits, survival, and reproduction; the structure and functions of body systems and cells; genes and inheritance of traits, mutations; and engineering and genetics.

NGSS Biomedical Engineering: Get a Grip!

(Grades 6–8)

B305, GWCC

Science Focus: ETS1, LS

Sponsor: Lab-Aids, Inc.

Lisa Kelp, Lab-Aids, Inc., Ronkonkoma, NY

Use the approach of biomimicry to design, test, evaluate, and redesign a mechanical gripping device to meet criteria. An iterative process is used to optimize the device by investigating the relationship between structure and function and applicable technology.

So You Are Teaching Earth Science Now—What You Need to Know to Be Prepared

(Grades 6–12)

B314, GWCC

Science Focus: ESS

Sponsor: Houghton Mifflin Harcourt

Michael Passow, Retired Teacher, Englewood, NJ

Learn more about what you should include in an NGSS-focused Earth science class. Discussion centers on content guidelines, hands-on activity suggestions, field experiences, locating web resources, and other ideas.

2:30–3:00 PM Presentations

Learning Together: Constructing Scientific Arguments About Virology Through Gameplay

(Grades 6–9)

A412a, GWCC

Science Focus: LS, INF, SEP1, SEP3, SEP4, SEP6, SEP7, SEP8

Jennifer Dalsen (*jdalsen@wisc.edu*), University of Wisconsin–Madison

Discussion centers on how gameplay supports the construction of scientific arguments among middle school students investigating virology within an informal learning environment.



Cracking the Case II: Integrating Biology and Engineering in (More) Case Studies

(Grades 6–12)

B212, GWCC

Science Focus: ETS, LS, SEP

Rebecca Hite (*@Sciencebecca*; *rebecca.hite@ttu.edu*), Texas Tech University, Lubbock

M. Gail Jones, **Megan Ennes** (*@AFishNamedMeg*; *meennes@ncsu.edu*), and **Emily Cayton** (*@CaytonScience*; *emcayton@ncsu.edu*), North Carolina State University, Raleigh
Gina Childers, University of North Georgia, Dahlonega
Looking for more ways to contextualize biology concepts integrating engineering and literacy? Join us to explore hands-on discovery engineering case studies for grades 6–12 life science.

Using 3D Printers to Support Deeper Content Knowledge

(Grades 6–12)

C213, GWCC

Science Focus: ETS1, ETS2.A, CCC3, CCC4, SEP2, SEP6

Jessica Guccione (*@msguccione*; *jessguccione@gmail.com*), Venado Middle School, Irvine, CA

Discover the ways in which a 3D printer can support your students in understanding science concepts and maintaining a growth mind-set. Resources will be shared!

3:30–4:00 PM Presentations

Revealing the Hidden Brain: Using Writing Strategies to Make Thinking Visible in the Science Classroom

(Grades K–8)

A303, GWCC

Science Focus: GEN, SEP7, SEP8

Lori Nelson (*lori.nelson@hsv-k12.org*), Chaffee Elementary School, Huntsville, AL

April Sport, Graduate Student, Birmingham, AL

This presentation will equip teachers with writing strategies to help students express their ideas in science.

Innovating STEM Practices in the Preschool Classroom

(Preschool)

A401, GWCC

Science Focus: GEN

Lauren Gonzalez, Stephen F. Austin State University, Nacogdoches, TX

Innovate STEM in the preschool classroom. I'll provide early childhood teachers with examples of research-based activities for integrating STEM in the everyday classroom.

Inquiry-Based Science as a Vehicle to Develop Language and Literacy Skills to Support English Language Learners

(Grades K–6)

A408, GWCC

Science Focus: GEN, NGSS

Jennifer Cody (*jlc479@psu.edu*), Park Forest Elementary School, Port Matilda, PA

May Lee (*mhl11@psu.edu*), Penn State, University Park, PA
Explore innovative ways to meet the literacy needs of English language learners via K–5 inquiry-based science investigations in a culturally responsive way.

Supporting Students with Disabilities in the 5E Learning Cycle

(Grades 6–8)

C301, GWCC

Science Focus: PS

Gregory Taylor, Dayton (OH) Public Schools

We analyzed over 70 middle school physics lessons that use the 5Es (Engage, Explore, Explain, Elaborate, and Evaluate) and will share our findings for students with learning disabilities.

Teaching Nanotechnology Using Project-Based Learning

(Grades 9–12)

Chestnut, Omni

Science Focus: GEN

Corbin Feldhaus, Charlestown High School, Charlestown, IN

Review research results from an NSF grant that was used to train high school teachers to incorporate nanotechnology concepts into high school science courses using PBL.

What Can STEM Project-Based Learning Do for You?

(Grades 9–12)

Grand Ballroom C, Omni

Science Focus: ETS2.A

Adriana Da Silva (dasilva.adriana27@gmail.com) and **Peter Perez** (pperez@ilsroyals.com), Immaculata-La Salle High School, Miami, FL

Tired of hearing of Project-Based Learning and the benefits? We can provide you with examples and ways to develop effective cross-curricular STEM PBLs in your classroom to ensure your students are becoming 21st-century learners!

STEAM Gardening

(Grades P–12)

Hickory, Omni

Science Focus: GEN, NGSS

Charles Harper (@harp76; harper.charles@mail.fcboe.org), Lafayette Educational Center, Fayetteville, GA

Jeff Eller (@jellerlearning; eller.jeff@mail.fcboe.org), Spring Hill Elementary School, Fayetteville, GA

Gardens are ideal for implementing STEAM and three-dimensional science. Cultivate new learning with this interactive presentation offering insights, instructional resources, and practical guidance for anyone interested in STEAM gardening.

3:30–4:00 PM Hands-On Workshop

NESTA and NABT: Developing the Strategies and Content Knowledge to Integrate Earth and Space Science Concepts into High School Biology Courses

(Grades 9–12)

B103, GWCC

Science Focus: ESS2, ESS3, LS4, CCC1, CCC4, SEP

Carla McAuliffe (carla_mcauliffe@terc.edu), TERC, Cambridge, MA

We connect content, pedagogy, and NGSS to effectively integrate Earth and space science performance expectations and disciplinary core ideas into biology courses.

3:30–4:30 PM Meeting

Development Advisory Board Meeting

(By Invitation Only)

Willow Boardroom, Omni

3:30–4:30 PM Presentations

Powering Potential: Alleviating Barriers and Providing Access for All Students Through Online Learning

(Grades 4–12)

A301, GWCC

Science Focus: ETS2.B, SEP

Deana Triemer (@gwinnettonline), Gwinnett County Public Schools, Suwanee, GA

Debora Hogan (@gwinnettonline), **Robin Tillotson** (@gwinnettonline), and **Erin Springthorpe** (@gwinnettonline), Gwinnett Online Campus, Lawrenceville, GA

Breaking barriers: A look into ways in which the online environment can power the potential for any student, anytime, anywhere in grades 4–12.

Creating Teacher Leaders to Build Grade-Level STEM Curricula and Mentor New Teachers

(Grades K–8)

A304, GWCC

Science Focus: GEN

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

Deborah Vannatter, University of Evansville, IN

We will share how our communities supported K–8 STEM teachers to develop best-practice lessons, provide guidance for professional development, and mentor new teachers online.

Reaching All Children with PBS KIDS and NGSS

(Grades P–3)

A313, GWCC

Science Focus: GEN, NGSS

Sara Sweetman (sara_sweetman@uri.edu), The University of Rhode Island, Kingston

Amy Mainzer (@AmyMainzer), NASA Jet Propulsion Laboratory, Pasadena, CA

Lawrence Mirkin (lawrence@mirkincreative.com), Mirkin Creative, Toronto, ON, Canada

Craig Bartlett (smwilcox@pbs.org), Wind Dancer Films, Glendale, CA

Presider: Anne Lund (annlnd2@aol.com), PBS, Arlington, VA
Engage with free, evidence-based PBS KIDS content to advance young children's understanding of age-appropriate science practices, core ideas, and crosscutting concepts.



Incorporate **STEM** into your classroom with **eCYBERMISSION!**



eCYBERMISSION is a national web-based
STEM competition, free to students in grades 6–9.

Teams compete for awards up to **\$9,000** per student in
U.S. Savings Bonds.

Teachers can **APPLY** for **MINI-GRANTS**
to support implementation of student projects.

Visit booth #1815 for more information on
eCYBERMISSION and mini-grant applications.



PolarTREC Lessons from NASA's Operation Ice-Bridge

(Grades 6–12)

A314, GWCC

Science Focus: ESS3.D, CCC1, CCC4, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Mark Buesing (mark.buesing@d128.org), Libertyville High School, Libertyville, IL

Maggie Kane (maggielane0@gmail.com), Prescott (AZ) Unified School District #1

Adeena Teres (@A_Ter8; adeenateres@yahoo.com), Stoneman Douglas High School, Pompano Beach, FL

Explore lessons, activities, and labs for your classroom from PolarTREC and NASA. Lessons include using a sonic ranger to map topography, using a Hall-effect probe to map magnetic fields, estimating the size of Greenland, exploring terrain features without being able to “see” them, simulating the formation of glacial ice with basic materials, and more.

Modeling and the NGSS: Think Out Loud the Scientific Way!

(Grades K–8)

A407, GWCC

Science Focus: GEN, SEP2

Randy Bell (randy.bell@oregonstate.edu), Oregon State University, Corvallis

Participate in engaging activities designed to clarify and teach scientific modeling while encouraging elementary/middle school students to think and learn. Receive free resources!

Yager Science Teaching Awardees Share-a-Thon

(Grades K–12)

B102, GWCC

Science Focus: GEN, NGSS

James Brown, Sand Creek Middle School, Albany, NY

Brian McDowell, Mason County Schools, Maysville, KY

Kristen Poindexter, Spring Mill Elementary School, Indianapolis, IN

Deepa Iyer, Knox Gifted Academy, Chandler, AZ

Jose Rivas, Lennox Academy, Lennox, CA

Amanda Upton, Senior Manager, Award and Nomination Program and Competitions NSTA, Arlington, VA

Hear from 2017 Robert E. Yager Exemplary Teaching Award recipients as they share their best practices during this share-a-thon.

3D The Environment in Three Dimensions: Connecting Students to Environmental Science Through Authentic Student Products

(Grades 10–College)

B401, GWCC

Science Focus: LS1, LS2, LS4

Ben Smith (ben.smith@alumni.duke.edu), Palos Verdes Peninsula High School, Rolling Hills, CA

Explore a cohesive application of three-dimensional learning, engaging students to explain real-world phenomena and to connect environmental science to their daily lives.

High-Paying STEM Careers in the Medical Field That Use the NGSS Life Science Performance Expectations

(Grades 9–12)

C201, GWCC

Science Focus: LS

Alejandro Melendez (amelendez@lsc.org), Liberty Science Center, Jersey City, NJ

President: Patrick McQuillan (pmcquillan@lsc.org), Liberty Science Center, Jersey City, NJ

Experience the opportunity to speak with a surgical team, discuss careers pathways, and watch a surgical procedure!

Using PBL to Build an Interactive Biology Museum

(Grades 9–12)

C202, GWCC

Science Focus: LS, SEP2

Christine Payne (payne_cm@yahoo.com) and **Kayce Prince-Harvey** (kprince@richland2.org), Westwood High School, Blythewood, SC

Jeremi Madden (jmadden@richland2.org), Westwood High School, Blythewood, SC

Students in a cross-curricular PBL program built a permanent interactive museum illustrating key biological concepts. We will discuss constructing large-scale PBL projects along with differentiation.

Fostering Watershed Stewardship Through a Collaboration Between Schools and Local Watershed Agencies

(Grades 3–12)

C203, GWCC

Science Focus: LS2, CCC1, CCC2, CCC3, CCC5, CCC7, SEP1, SEP2, SEP3, SEP4, SEP5, SEP7, SEP8

Annette Simpson (annette.simpson@cobbk12.org), McCleskey Middle School, Marietta, GA

Michael Kahle (michael.kahle@cobbcounty.org), Cobb County Watershed Stewardship Program, Marietta, GA

Experiential investigations and activities help students to develop a deeper understanding of how to interpret chemical and bio indicator data and determine river health.

Transforming Cool Class Projects into Excellent Engineering Design Practice

(General)

Birch, Omni

Science Focus: ETS1, SEP2, SEP6

Elise Burns (@efb68; eburns@pascack.org), Pascack Hills High School, Montvale, NJ

Transform your favorite projects by integrating engineering design strategies and assessing the three dimensions of learning. I will share student work, lesson materials, and assessment techniques.

Supporting All Students in 3-D Learning Using Free Technology Tools

(Grades 9–12)

Dogwood A, Omni

Science Focus: GEN, NGSS

Michael Lim (@courageousgiver; michaellim@iusd.org), Woodbridge High School, Irvine, CA

Angela Kolonich (@akolonich; gerberan@msu.edu), CREATE for STEM Institute, Michigan State University, East Lansing

Engage in three-dimensional learning using technology, and discuss effective strategies for supporting all students—with a focus on English language learners.

Using Partnerships with Your Local College to Bring STEM to High-Need Schools

(Grades 4–10)

International Ballroom F, Omni

Science Focus: LS, SEP

Lisa Pike (@pikelisa; lpikem@fmarion.edu) and **Corbin Witt** (@corbinw96; cwitt4839@g.fmarion.edu), Francis Marion University, Florence, SC

Junior and senior science and education majors were recruited to bring STEM to a local elementary school in the form of a family science night.

AMSE-Sponsored Session: Science Teachers Promoting Culturally Relevant Education: A Panel Discussion

(Grades 6–College)

Juniper, Omni

Science Focus: GEN

Robert Ferguson, Cleveland State University, Cleveland, OH

A panel of teachers will share their journeys of growth and provide examples as they strive to enact a culturally relevant education.

High-Tech and Low-Tech Strategies for Science and Literacy

(Grades 4–12)

Maple A/B, South Tower, Omni

Science Focus: GEN

Michelle Joyce (@awesomescience; AwesomeSTEM@gmail.com), Palmetto Ridge High School, Naples, FL

Scaffold instruction to have your ELL, ESE, SPED, or low-achieving students successfully navigate scientific vocabulary, formal language in reporting, as well as reading complex nonfiction text. Good teaching practices for ALL students—opportunities for gifted differentiation, too.

How Do YOU Know They Know It? Using Student-Generated Artifacts as Evidence of Student Learning

(Grades K–12)

Maple C, South Tower, Omni

Science Focus: GEN, NGSS

Lori Henrickson (@MsLorisStory; henrile@nv.ccsd.net) and **Jennifer Panczszyn** (@jpscigirl; panczjl@nv.ccsd.net), Clark County School District, Las Vegas, NV

Heather Witt (@tortugahiker), Arbor View High School, Las Vegas, NV

Learn how to use a claim, evidence, reasoning framework as a method for developing clear descriptions of what you want your students to know, how they will show you they know it, and why the student-generated artifacts indicate three-dimensional learning.

Equity-Based NGSS Implementation Through Research Practice Partnerships: Experiences with Leveraging Cross-Institutional Resources

(General)

Walnut, Omni

Science Focus: GEN, NGSS

MaryMargaret Welch (mmwelch@seattleschools.org), Seattle (WA) Public Schools

We will explore ways that equitable Research Practice Partnerships allow researchers, administrators, teacher educators, and teachers to effectively engage in NGSS implementation work.

3:30–4:30 PM Hands-On Workshops

Keep the Shell in Shellfish!

(Grades 7–9)

A302, GWCC

Science Focus: ESS3, LS

Victoria Obenchain (@vickieliynn74; vobenchain@saklan.org), Saklan Valley School, Moraga, CA

Find out how atmospheric carbon dioxide is weakening our shelled ocean organisms and coral reef environments.

Planetary Storytelling and Citizen Science Using Postcards from Space and Google Mercury

(Grades 4–12)

A305, GWCC

Science Focus: ESS, INF, SEP4

Larry Lebofsky (lebofsky@lpl.arizona.edu), Planetary Science Institute, Tucson, AZ

Brian Kruse (bkruse@astrosociety.org), Astronomical Society of the Pacific, San Francisco, CA

Nancy Tashima (tashima@aloha.net), Onizuka Space Science Program, Captain Cook, HI

Investigate and map phenomena on the Sun-scorched surface of Mercury and contribute to NASA exploration as a citizen scientist.

Starting a School Garden with a Shoestring Budget

(Grades P–5)

A311, GWCC

Science Focus: LS

Rebecca Kurson (rkurson@golddaacademy.org), Golda Och Academy, West Orange, NJ

Discover simple, easy, and inexpensive methods for starting a school garden by using upcycled and free materials.

Mars Mission Specialist: Payload Design

(Grades 3–8)

A315, GWCC

Science Focus: ESS1.B, ETS, LS1.C, PS2.A, CCC3, SEP

Bill Burton (@effelgorp; bburton@thelamplighterschool.org) and **Leslie Bledsoe** (lbledsoe@thelamplighterschool.org), The Lamplighter School, Dallas, TX

Working within size and mass constraints, determine which sustainable food crops will be sent to a Mars colony. Tinker-Cad, 3D printing, and rocketry will be discussed.

STEMifying Storybooks: A Planning Guide Using Storybooks to Integrate Science and Engineering into Elementary Classrooms

(Grades P–5)

A404, GWCC

Science Focus: GEN, SEP

Brian Raygor (@ScienceWCBOE; braygor@wcboe.org) and **Kevin Hill** (khill@wcboe.org), Wicomico County Public Schools, Salisbury, MD

Science time getting squeezed by CCSS? In this interactive workshop, you will use our tool to find STEM in any storybook and get your students excited about reading AND science. Receive a CD packed with classroom resources.

Science and Literacy Are Phenomenal!

(Grades K–5)

A405, GWCC

Science Focus: GEN, NGSS

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

Phenomena drives science learning, and literacy strategies drive understanding of phenomena. Engage in literacy examples and strategies that support engagement with phenomena in science instruction.

KSU MSP Elementary Share-a-Thon

(Grades 1–5)

B101, GWCC

Science Focus: GEN, NGSS

Charlease Kelly-Jackson (ckellyja@kennesaw.edu), Kennesaw State University, Kennesaw, GA

Sally Creel (@STEMSally; #KSUMSP; sally.creel@cobbk12.org), Cobb County School District, Marietta, GA

Looking for best practice science lessons that meet your standards? Come learn with us! We'll be sharing our favorite lessons we've learned during our time with the Kennesaw State Math Science Partnership. Resources, links, and sample lessons will be shared.



Science Accessibility: Using Theater to Teach Science to Children on the Autism Spectrum

(Grades K–7)

B211, GWCC

Science Focus: ESS1, LS1, PS4

Anna Voelker (@AnnaAstropub; voelker.30@osu.edu), The Ohio State University, Columbus

Explore ways in which science education can be more accessible for children with autism through the use of theater and playfulness.



Accessing Secondary Data Sets Using Primary Devices

(Grades 6–12) B212, GWCC

Science Focus: ESS, LS, PS

Timothy Laubach (@LaubachTim; laubach@ou.edu), The University of Oklahoma, Norman

BYOD to explore large secondary data sets integrated with physical, life, and Earth science performance expectations and underlying dimensions of the NGSS. Resources will be shared.



What Do You Get When You Cross a Scientist with a Teacher? A True Collaborative Journey!

(Grades P–12) B402, GWCC

INF

Science Focus: LS1, INF

Amelia Gulling (@DRIScienceAlive; amelia.gulling@dri.edu) and **Craig Rosen** (@DRIScienceAlive; craig.rosen@dri.edu), Desert Research Institute, Las Vegas, NV

Mackenzie Peterson (@DRIScienceAlive; mackenzie.peterson@dri.edu) and **Leah Madison** (@DRIScienceAlive; leah.madison@dri.edu), Desert Research Institute, Reno, NV
Explore how the Desert Research Institute's preK–12 education program pairs seasoned educators with scientists to design high-quality STEM resources. Walk away with free lessons!



NSTA Press® Session: Solar Science: 3-D Learning Applied to the Study of the Sun's Daily and Annual Motion

(Grades 5–8) B405, GWCC

Science Focus: ESS

Dennis Schatz (@DinoManSchatz; dschatz@pacsci.org), NSTA President-Elect Elect; NSTA Director, Informal Science; and Pacific Science Center, Seattle, WA

Solar Science provides various examples of using three-dimensional learning. Come explore activities associated with the daily and annual motion of the Sun.

Using Technology to Provide Positive Constructive Feedback

(Grades 4–8) C205, GWCC

Science Focus: GEN

Jennifer Joiner, Whitewater Middle School, Fayetteville, GA

Discover how technology can be used to create a student-centered classroom where students receive immediate feedback and learn progressively within a designed framework.

Thinking Machines: How to Build an Artificial Neural Network in Your Classroom

(Grades 6–College) C206, GWCC

Science Focus: ETS, LS1.A, LS1.D, PS3.A, PS3.B, CCC2, CCC4, CCC6, SEP2, SEP5, SEP6

Lawrence Bencivengo (larry.bencivengo@mercerisland-schools.org), Mercer Island High School, Mercer Island, WA

Benjamin Hart (bhart@lwsd.org), Redmond High School, Redmond, WA

Learn how to implement a project in which students build a functional Artificial Neural Network. Includes hands-on activities that can be conducted in the classroom.

Conceptual Storylines: Scaffolding Student Engagement Through Deliberate Planning and Assessment

(Grades 9–12) C209, GWCC

Science Focus: GEN, NGSS

Jennifer Duell (jduell.science@gmail.com) and **Jennifer Ward** (jennifer.ward@meridenk12.org), Francis T. Maloney High School, Meriden, CT

Cindy Kern (@cindylkern; @QUEST-LC; cindy.kern@quinnipiac.edu), Quinnipiac University, Hamden, CT

Explore tools and resources to use learning performances to develop student conceptual storylines in phenomenon-driven units and targeted three-dimensional formative assessments.

LEGO® Stoichiometry: Addressing Student Misconceptions with Manipulatives

(Grades 9–12) C211, GWCC

Science Focus: PS1.B, CCC1, CCC4, SEP2, SEP5

Michelle Trimble (trimblem@sfsd.edu), Lowell High School, San Francisco, CA

Explore activities to engage students in challenging chemistry concepts. Leave with ideas for classroom activities that can be used throughout the year.

Justification of Evidence

(Grades 5–8) C212, GWCC

Science Focus: GEN, CCC

Ann Robinson (@AMR496; arobinso@westga.edu), University of West Georgia, Carrollton

Using the Ball Bounce Investigation, participants will learn how to change and design any lab into argument-driven inquiry by crosscutting concepts.

Build an Ultra Powerful Ping-Pong Ball Vacuum Cannon!

(Grades 7–College)

C302, GWCC

Science Focus: ETS, PS2

James Fong (waterdogg8@gmail.com), Saint Joseph Notre Dame High School, Alameda, CA

Build and take home a vacuum cannon that will shoot a ping-pong ball completely through an aluminum soda can at 400 miles per hour.

Research Skills and Activities for Teachers and Students

(Grades K–12)

Cottonwood A/B, Omni

Science Focus: GEN, SEP1, SEP3, SEP4

Scott Watson (swatson@liberty.edu), Liberty University, Lynchburg, VA

We will focus on science research skills as a basis for research in STEM disciplines along with applications for teaching K–12 students.

Cultural Competence: Equity Success Using Culturally Relevant Pedagogy

(Grades 6–College)

Dogwood B, Omni

Science Focus: GEN, NGSS

Natalie Holliman (@N_Holliman; natalie.holliman@ttu.edu), Little Rock (AR) School District

Hear how research reflects the necessity to bridge the gap between students by making education culturally relevant and using knowledge of students' cultural backgrounds in instruction. This practice is proven to improve academic achievement, narrow the gap between students of all backgrounds, and provide success via equity.

How to Invent the Wheel: Designing a STEM Program from Scratch

(Grades 8–12)

International Ballroom E, Omni

Science Focus: ESS2, ESS3, ETS, CCC4, CCC6, SEP1, SEP2, SEP3, SEP4, SEP5

David Brock (brockda@rpcs.org), Roland Park Country School, Baltimore, MD

Join faculty of The STEM Institute at Roland Park to learn how to identify and develop your STEM needs into a working curriculum for your students. Engage in guided planning to build a model framework for constructing your own STEM program.

Beyond Access: Social Justice in Science

(General)

Pine (South Tower), Omni

Science Focus: ETS2.B, CCC1, CCC2, CCC7, SEP1, SEP3, SEP4, SEP5, SEP6, SEP7, SEP8

Moses Rifkin (mrifkin@universityprep.org), University Prep, Seattle, WA

Access for all is crucial, but is it enough? We will discuss how social justice enables equity and also extends beyond, and how to bring it into our classrooms.

NARST-Sponsored Session: Making Time for Science Reading: The News Is Good

(Grades 6–9)

Spruce, South Tower, Omni

Science Focus: GEN, SEP7

Billy McClune (w.mcclune@qub.ac.uk), Queen's University Belfast, Belfast, UK

This “Newswise” challenge aims to develop secondary students' critical reading/literacy skills using science-based media reports. Join in to gain access to resources and assessments from a multi-school classroom study.



—Photo courtesy of Mike Weiss

4:00–4:30 PM Presentations**Vocabulary Instruction for English Language Learners!***(Grades 3–9)**A303, GWCC*

Science Focus: GEN

Karen Ziminski (*karen.ziminski@gmail.com*), Washington Irving Middle School, Boston, MA

How do we teach Tier 3 science vocabulary to students with limited English (or no English) and encourage success? We will share multiple strategies for teaching Tier 3 Academic Science vocabulary, as well as modalities that incorporate visual aids, manipulatives, and kinesthetic activities to engage all students, regardless of their English level.

Family Learning Opportunities and Research in Engineering and Science (FLORES) Education*(Grades P–4)**A401, GWCC*

Science Focus: ETS

Amanda Gunning and **Meghan Marrero** (*@megmarrero; mmarrero3@mercy.edu*), Mercy College, Dobbs Ferry Campus, Dobbs Ferry, NY

Karla Purcell (*kpurcell@portchesterschools.org*), John F. Kennedy Magnet School, Port Chester, NY

Marcia Manzueta (*mmanzueta@portchesterschools.org*), Thomas A. Edison School, Portchester, NY

We will illustrate the success of the FLORES model and how to conduct such a program at your own school district.

Literacy Activities for Young Scientists*(Grades K–5)**A408, GWCC*

Science Focus: GEN, SEP6, SEP7, SEP8

Kathryn Hall, McMurry University, Abilene, TX

Join me in a science sandbox for interactive investigations of literature-based activities that encourage elementary students to read, write, and think science.

Architects of STEM Engagement: Bridging the Opportunity Gap*(Grades 10–12)**Grand Ballroom C, Omni*

Science Focus: GEN, SEP

Doug Baltz (*@baltzyworld; dbaltz@birmingham.k12.mi.us*), Seaholm High School, Birmingham, MI

Architects of STEM research and design develop a conduit for all students to be successful. Embedding authentic research experiences for teachers and students is the three-dimensional learning foundation.

**3-D Learning in 3D Space***(Grades 5–12)**Hickory, Omni*

Science Focus: ETS, SEP

Diane Ripollone (*@rippie77; rippie77@nc.rr.com*), Cardinal Gibbons High School, Raleigh, NC

Kathy Biernat (*@ScientistMaker; kathybiernat@gmail.com*), St. Mary's Visitation School, Elm Grove, WI

How can you take a student to Jupiter? Inside a volcano? To walk in a rain forest? Or solve their problems with printed solutions? All of these include VR or 3D printing. Both use the three-dimensional (3-D) approach using the NGSS. Through real-world phenomena, science, engineering, and solving problems, students can connect their 3-D learning to real-life learning.

Greenway Case Study Puts Students in the Decision-Making Role: Using Technology and Maps to Inform Development Decisions*(Grades 8–College)**International Ballroom A/B, Omni*

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

Jenna Hartley (*@JHartleySTEM; hartley.jenna@epa.gov*), ASPPH, Hillsborough, NC

Students generate an opinion and justification for whether they support a proposed greenway route using maps and web-based interactive tools from EnviroAtlas.

4:00–4:30 PM Hands-On Workshop

NESTA and AACT: Developing the Strategies and Content Knowledge to Integrate Earth and Space Science Concepts into High School Chemistry Courses

(Grades 9–12)

B103, GWCC

Science Focus: ESS1.A, ESS2.A, ESS2.C, ESS3.A, ESS3.C, ESS3.D, ETS1.B, ETS2, PS1, PS3.D, PS4.B, CCC1, CCC2, CCC5, CCC7, SEP

Cheryl Manning (@clbmanning; clbmanning@mac.com), Evergreen High School, Evergreen, CO

Discover how to connect content, pedagogy, and NGSS to effectively integrate Earth and space science performance expectations and disciplinary core ideas into chemistry courses.

4:00–5:30 PM Exhibitor Workshops

Teaching Strategies for Matter in Middle School Science

(Grades 6–8)

B209, GWCC

Science Focus: PS1

Sponsor: TCI

Christy Sanders, TCI, Mountain View, CA

Jump into the world of TCI where you will see how TCI takes a unique approach to the typical chemistry class. Using modeling and other strategies, we will apply the concepts of conservation of matter and energy transfer to model atoms, molecules, particle motion, state changes, and chemical reactions; and explore engineering solutions involving chemical reactions.

NGSS—Follow the Energy

(Grades 6–8)

B305, GWCC

Science Focus: PS3.A, PS3.B, SEP7

Sponsor: Lab-Aids, Inc.

Lisa Kelp, Lab-Aids, Inc., Ronkonkoma, NY

Most of the energy we use every day needs to be “changed” before it is useful, i.e., batteries (chemical energy to electrical energy) and coffee makers (electrical energy to thermal energy). Explore new tools focused on the conservation of energy by analyzing common, and uncommon, energy transfers. Supports MS-PS3.A and MS-PS3.B, Engaging in Argument from Evidence, and CCSS ELA. From the SEPUP Middle School Energy unit, redesigned for NGSS.

5:00–5:30 PM Presentation

Integrating Robotics for All Middle School Students

(Grades 5–8)

C207, GWCC

Science Focus: ETS, SEP

Geeta Verma (@gverma116; geeta.verma@ucdenver.edu) and **Helen Douglass** (douglass_helen@svvsd.org), University of Colorado Denver

Anton Puvirajah (@AntonPuvirajah; apuvira@uwo.ca), Western University, London, ON, Canada

We will present ideas for integrating robotics (coding/programming) and tying key disciplinary core ideas and science and engineering practices.

5:00–6:00 PM Presentation

INF ASTC-Sponsored Session: Sowing Creativity: “Investigating Perception”

(General)

A304, GWCC

Science Focus: INF

Greg Brown (gregbrownsj@gmail.com), Consultant, San Jose, CA

Alysia Caryl (acaryl@sjmusart.org), San Jose Museum of Art, San Jose, CA

Find out about Sowing Creativity, a STEAM-integrated visual arts residency program developed by San Jose Museum of Art to address NGSS and CCSS.

5:00–6:00 PM Hands-On Workshops

National Earth Science Teachers Association (NESTA) Rock, Mineral, and Fossil Raffle

(General)

B103, GWCC

Science Focus: ESS2, CCC1, SEP1

Parker Pennington IV (p.o.pennington@gmail.com), National Earth Science Teachers Association, Ann Arbor, MI

Howard Dimmick, Consultant, Fort Collins, CO

Michael Passow (michael@earth2class.org), Retired Teacher, Englewood, NJ

NESTA offers a chance to win one or more display- and classroom-quality rock, mineral, and fossil specimens, as well as other Earth science-related materials.



Enhancing Transdisciplinary Learning for Students with Special Needs Through a Modified 3-E Approach

(Grades P–5)

B211, GWCC

Science Focus: ESS3

Gregory Borman (gborman@schools.nyc.gov), New York City (NY) Dept. of Education

Derek Ramdass (dramdas@schools.nyc.gov), P.S. K004, Brooklyn, NY

Deborah Charles (dcharles2@schools.nyc.gov), P4K@P843K, Brooklyn, NY

Experience an NGSS-focused STEM unit that unfolds through engaging activities using a modified 3-E Model that enhances transdisciplinary learning for students with special needs.



Document-Based Questions: They're Not Just for Social Studies Anymore!

(Grades 4–12)

B212, GWCC

Science Focus: ESS3.C, ESS3.D, ETS2.B, LS2.A, LS2.B, PS3.B, CCC1, CCC4, CCC5, CCC7, SEP1, SEP4, SEP7

Heather Toliver (heather.toliver@henry.k12.ga.us) and **Heidi Pickett** (@hlpickett), Henry County Schools, McDonough, GA

Join us for an in-depth experience on how primary and secondary resources can be used to promote argumentation in the science classroom.

3D Designing and Using Equitable 3-D Formative Assessments to Support Meaningful NGSS Investigations

(General)

B401, GWCC

Science Focus: GEN, NGSS

Philip Bell, University of Washington, Seattle

Come examine samples of student responses and explore how to design cognitive assessments of three-dimensional learning and engage in sense-making to interpret student responses.



Data Collection in the Elementary Classroom Is... Fun!

(Grades K–5)

B402, GWCC

Science Focus: GEN, CCC1, CCC2, SEP4, SEP5, SEP8

Ariel Zych (@arieloquent; azych@sciencefriday.com) and **Xochitl Garcia** (@msxgarcia; garcia.xochitl@gmail.com), Science Friday, New York, NY

Stacy George (@stacyag; whatevasbbs@gmail.com), Mauka Lani Elementary School, New York, NY

Beth Topinka (@BTopink; topinkb@millstone.k12.nj.us), Millstone Township Elementary School, Millstone Township, NJ

Come experience four data-driven elementary investigations that are fun, visual, and hands on! Leave with tested lesson plans, multimedia, and planning tools from elementary teacher leaders.



NSTA Press® Session: Bringing the S-T-E-M Together in Early Childhood Using Science and Engineering Practices

(Grades P–2)

B405, GWCC

Science Focus: GEN, SEP

Peggy Ashbrook (@PeggyAshbrook; scienceissimple@yahoo.com), Author/NSTA Early Years Columnist, Alexandria, VA

Increase your understanding of science and engineering practices while seeing how young children use them in STEM explorations. Discuss examples and NSTA's early childhood position statement.

6:30–8:00 PM Networking Opportunity

NESTA Friends of Earth Science Reception

International Ballroom F, Omni



—Photo courtesy of Georgia Aquarium

A type of jellyfish, the sea nettle has stinging tentacles that it uses to hunt tiny drifting animals.

7:30–8:30 AM Networking Opportunity

NSTA Life Members Morning Social

(By Invitation Only)

Cottonwood A/B, Omni

8:00–9:00 AM Presentations

PD to Practice: Evidence of 3-D Transformation in the Elementary Classroom

(Grades K–5)

A301, GWCC

Science Focus: GEN, NGSS

Greg Wertenberger (@ARTransformED; gwertenberger@bryantschools.org), Bryant (AR) School District

Annette Brown (@GPSgo3D; annetteb@dawsonesc.com), Dawson Education Cooperative, Arkadelphia, AR

Jessica Wright (jessica.wright@arkadelphiaschools.org), Peake Elementary School, Arkadelphia, AR

We will highlight how professional development and ongoing educator support using NSTA's powerful resources are translating into evidence of authentic three-dimensional student engagement.

Science and Engineering Lab Renovations: Working Collaboratively with Architects to Create 21st-Century Labs

(Grades 6–12)

A303, GWCC

Science Focus: GEN

Steve Wood (swood@d125.org) and **Wendy Custable** (wcustable@d125.org), Adlai E. Stevenson High School, Lincolnshire, IL

Thoughtful lab renovations require collaboration between teachers, administrators, and architects. We will highlight specific design elements, lessons we learned, and ways to maximize stakeholders' expertise.

Start STEM Young: Fostering Success for All K–2 Scientists

(Grades K–2)

A401, GWCC

Science Focus: GEN, SEP1, SEP3, SEP7, SEP8

Taina Montalvo-Teller (@MissTVotes; tmontalvoteller@gmail.com), P.S. 075 Emily Dickinson, New York, NY

"Start STEM Young" covers practical tips and tools in ensuring engagement, curiosity, and success for your wide range of K–2 learners.

**Don't Forget to Evaluate
Your Sessions Online!**

INF STEM Buddies and Family STEM Nights: Two High-Impact Ways to Build Your School's STEM Culture

(Grades P–8)

A407, GWCC

Science Focus: INF, NGSS

Kathleen Bailey, Tarkington School of Excellence, Chicago, IL

Alissa Berg (@alissaberg; alissaberg@gmail.com), Academy for Urban School Leadership (AUSL), Chicago, IL

Learn about our programs, our engaging STEM activities and their impact, and tips for launching such programs to provide all students with quality STEM learning.

Science and Literacy Messages from Michigan: How the KLEWS Chart Supports Students in Using Evidence in K–5 Science

(Grades K–5)

A408, GWCC

Science Focus: GEN, SEP

Richard Bacolor (@richbacolor; bacolor@resa.net), Wayne RESA, Wayne, MI

Mary Starr (@starrscience; mary@starrscience.com), Michigan Mathematics and Science Centers Network, Plymouth
The KLEWS Chart will be shared as a tool to scaffold the development of scientific explanation, argumentation, and literacy skills in the elementary classroom.

Global STEM Implementation with African and Asian Nations

(Grades 5–8)

B204, GWCC

Science Focus: ESS3.D, CCC4, CCC5, CCC6, SEP3

Florentia Spires (@STEMgineer; florentia.spires@gmail.com), William Beanes Elementary School, Suitland, MD

Global collaboration connects teachers and students to Africa and Asia using real-world science strengthening NGSS and enhancing 21st-century skills that help promote global science citizens.

High, Low, Do-Re-Neap/All These Tides Are Flooding Our Streets

(Grades 6–College)

B209, GWCC

Science Focus: ESS2.C, ESS2.D, ESS2.E, ETS, LS2.A, LS2.C, LS2.D, CCC, SEP

Merrie Koester, University of South Carolina, Columbia
Why is my school community flooding? Learn how students in a low-income school used STEM and digital media arts skills to become community knowledge resources.

3D Scanning and Printing with iDigFossils: A Citizen Science Student Program

(Grades 5–12)

B213, GWCC

Science Focus: ETS2, LS4, CCC6

Bradford Davey (brad@techforlearning.org) and **Hilarie Davis** (hilarie@techforlearning.org), Technology for Learning Consortium, Inc., Stuart, FL

Have a 3D scanner or printer? If so, you might be able to participate in a national citizen science program to digitize museum fossil collections.

The Innovator Next Door: Establishing and Optimizing Collaborative Relationships with Colleagues to Improve Student Achievement

(Grades 6–12)

B217, GWCC

Science Focus: GEN

Emilie Hill (@TchrEmilieHill; emilie.hill@lausd.net), Girls Academic Leadership Academy, Los Angeles, CA

Steven Taylor Wichmanowski (stw7278@lausd.net), Los Angeles (CA) Unified School District

Technology offers endless possibilities for collaboration with teachers around the world, but sometimes the best resources are still the colleagues at your own school site.



Get NOS in Your Classroom...Without Starting Over

(Grades 3–8)

B402, GWCC

Science Focus: GEN, CCC1, CCC2, CCC3, CCC4, CCC6, SEP1, SEP2, SEP3, SEP7, SEP8

Sophia Shrand (@sciencewithsoph; sophia.shrand@msichicago.org), Museum of Science and Industry, Chicago, IL

Hear how the Museum of Science and Industry Chicago, the largest science center in the Western Hemisphere, took a risk to develop a lab designed around Nature of Science (NOS). Explore what NOS means, why it's important, and how it can be fun rather than frightening. Examine strategies to bring NOS into your own lessons and reflect on ways you may already use it in lessons you have. Get creative, imaginative, and innovative—voilà, you're doing NOS in action!

8:00–9:00 AM Hands-On Workshops

Classroom Planetarium Projector: Everything You Need to Construct and Operate One

(Grades 3–College)

A312, GWCC

Science Focus: ESS1, CCC1, CCC2, CCC3, SEP2, SEP6, SEP8

Mark Malone (mmalone@uccs.edu), University of Colorado at Colorado Springs

The first 100 participants will receive everything needed to construct a working self-contained planetarium projector. Project stars on the walls and ceiling of any small dark room.

Authentic Engineering Problems to Engage Learners in Scientific Concepts

(Grades 6–12)

A314, GWCC

Science Focus: ESS, ETS, PS, CCC2, CCC3, CCC5, SEP1, SEP2, SEP3, SEP4, SEP5, SEP6, SEP8

Megan Beckam and **Marissa Tsugawa**, University of Nevada, Reno

Experience an authentic problem-solving project and learn of others created from a partnership between a classroom teacher and an engineering graduate student.

Evidence-Based Argumentation: Writing in Science to Create a Schoolwide Vision of Science

(Grades K–8)

A316, GWCC

Science Focus: GEN, SEP7

Holly Katz (hkatz@naturemuseum.org) and **Alexandra Campbell** (acampbell@naturemuseum.org), Chicago Academy of Sciences/Peggy Notebaert Nature Museum, Chicago, IL

Integrate writing and science to promote student discourse and ownership through Claim Evidence Reasoning, science journaling, and peer critiques.

Supporting Elementary Students in Thinking Visually

(Grades P–5)

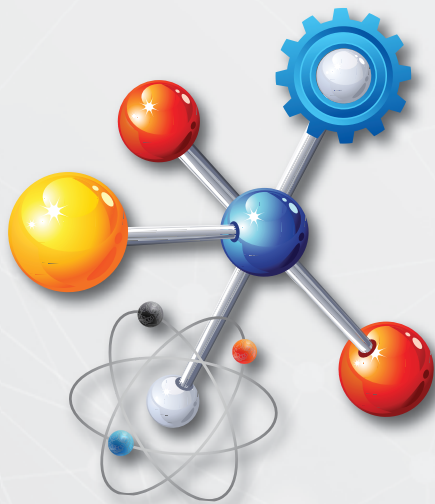
A402, GWCC

Science Focus: GEN, SEP6

Jenny Flowers (jflowers@fieldmuseum.org) and **Kyla Cook** (kcook@fieldmuseum.org), The Field Museum, Chicago, IL

Sarah Wehlage (swehlage@naturemuseum.org), Peggy Notebaert Nature Museum, Chicago, IL

Experience how to adapt and use Visual Thinking Strategies (VTS) in an elementary science classroom in order to support students in their authentic engagement in the NGSS practices.



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partnerships
for students
and teachers.*

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students and teachers focused
on increasing STEM awareness,
interest, & engagement

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Rube Goldberg: Understanding Principles of Physical Science Through Design and Construction of a Complicated, Comical Machine

(Grades 3–12)

A404, GWCC

Science Focus: PS2, PS3.A, PS3.B, PS3.C, CCC2, CCC3, SEP1, SEP2, SEP3, SEP5, SEP8

Nathan Dolenc (nathan.dolenc@louisiana.edu), University of Louisiana at Lafayette

Jonathan Cohen (jcohen@gsu.edu), Georgia State University, Atlanta

Experience how students can integrate physical science, various technologies, backward engineering, artistic themes, and ratio mathematics as they build a comically construed Rube Goldberg machine.

Teaching a Variety of Science to a Variety of Learners in a Variety of Settings

(Grades P–5)

A405, GWCC

Science Focus: GEN

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

Come learn what type of activities have been taught in different informal and formal educational settings to all types of learners from the experience of a college science outreach program.

Learning Design Through Cellular Construction: Modeling Cells as Biological Machines

(Grades 9–12)

B215, GWCC

Science Focus: ETS1, LS1.A, LS3.A, CCC2, CCC6, SEP2, SEP4

Jessica Allen (jessica.allen@ucsf.edu) and **Sabine Jeske** (sabine.jeske@ucsf.edu), UCSF Science & Health Education Partnership, San Francisco, CA

Bring engineering design into the biology classroom with lessons based on cellular engineering that encourage students to tinker with cells as biological machines.

Improving Scientific Literacy in a STEM Lesson

(Grades 6–12)

B216, GWCC

Science Focus: GEN, NGSS

Heather Wygant (geofaultline@gmail.com), Santa Clara District Resource Center, Sunnyvale, CA

Susan Paulsen (@susanpaulsen; susanpaulsen@yahoo.com), Live Oak High School, Morgan Hill, CA

Incorporate literacy skills into a STEM lesson by adding reading and writing activities to enhance student understanding, using science content articles and annotation strategies.



Using Augmented and Virtual Reality in the Classroom

(Grades P–12)

B301, GWCC

Science Focus: ETS

Denise Wright (@DeniseCWright; dwright@horrycountyschools.net), Horry County Schools, Conway, SC

Do you want to make your science classroom more engaging? Do you want your students to become creators instead of consumers of content? Let's explore the possibilities of augmented and virtual reality in the science classroom.

Using Evidence of Learning Specifications to Develop Performance Tasks

(Grades 6–12)

B401, GWCC

Science Focus: GEN, NGSS

David Randle, American Museum of Natural History, New York, NY

Use a tool to engage in a process to create assessments that meet performance expectations based on task specifications.



NSTA Press® Session: Next Time You See...

(Grades P–6)

B405, GWCC

Science Focus: GEN

Emily Morgan (@EmilyMorganNTYS; emily@pictureperfectscience.com), Picture-Perfect Science, West Chester, OH

Join the author of the *Next Time You See* picture book series as she shows how ordinary natural objects can be seen in a new and extraordinary way.

9:30–10:30 AM Presentations

Infiniscope: Breaking Down Content Silos in High School Science Courses

(Grades 9–12)

A304, GWCC

Science Focus: ESS2, LS4, PS1, CCC3, SEP4, SEP6, SEP7

Jessica Swann (@etx_infiniscope; jlswann@asu.edu) and **Diana Hunsley** (@etx_infiniscope; diana.hunsley@cox.net), Arizona State University, Tempe

Explore how NASA data and virtual field trips (VFTs) from compelling geologic locations are used to teach Earth science disciplinary core ideas in life and physical sciences.

BIG Data/BIG Skills: Improve Student Data Literacy Using Free Web Tools from NOAA

(Grades 7–12)

A407, GWCC

Science Focus: ESS2, ESS3

Dan Pisut (@NOAAEducation; dan.pisut@noaa.gov), NOAA Environmental Visualization Laboratory, Silver Spring, MD

“Data in the Classroom” is a free online learning platform from the National Oceanic and Atmospheric Administration. Find out how to access these digital lessons and data exploration tools, and learn more about the curriculum’s unique scaffolding that will help your middle school students navigate BIG data about dynamic Earth processes and the impact of environmental events on regional and global scales.

Project-Based Learning in an Early Elementary and Early Childhood Classroom

(Grades P–4)

A408, GWCC

Science Focus: GEN, NGSS

Byron Gilliland (@byron_gilliland; byron.gilliland@winona.k12.mn.us), Jefferson Elementary STEM School, Winona, MN

Discover strategies to successfully meet standards and integrate STEM educational experiences with Project-Based Learning in an early elementary and early childhood classroom.



Using Literacy and Culturally Responsive Pedagogy to Enhance Science Content

(Grades 6–8)

B212, GWCC

Science Focus: ESS2, ESS3, LS2

Lacey Huffling (lhuffling@georgiasouthern.edu) and **Alma Stevenson** (@astevensongda; almastevenson@georgiasouthern.edu), Georgia Southern University, Statesboro

Come experience NGSS-focused lessons developed to incorporate literacy and culturally responsive pedagogies into middle grades science classrooms. Leave with resources to use in your classroom.

Thinking and Reading Between the Lines

(Grades 7–11)

B217, GWCC

Science Focus: LS, CCC2, SEP4, SEP7

Ellie Williamson (@Eleanor28762890; ellie.williamson@uasdc.org), Urban Assembly School of Design and Construction, New York, NY

Arlene Ramos (@arlenramos04), High School for Health Professionals and Human Services, New York, NY

Suzette Nelson (@sumarnel; suzettenelson12@gmail.com), Clara Barton High School, Brooklyn, NY

Are your students struggling to understand science texts? Encounter engaging literacy strategies that students can use to interpret challenging text.



NSTA Press® Session: Argument-Driven Inquiry in Biology, Chemistry, and Physics: Lab Investigations for Grades 9–12

(Grades 9–12)

B405, GWCC

Science Focus: LS, PS, CCC, SEP

Victor Sampson (@drvictorsampson; victor.sampson@gmail.com), The University of Texas at Austin

Patrick Enderle (penderle@gsu.edu), Georgia State University, Atlanta

Learn about Argument-Driven Inquiry and how it can help students learn how to use disciplinary core ideas, crosscutting concepts, and science and engineering practices to explain natural phenomena.

9:30–10:30 AM Hands-On Workshops

Analyzing and Interpreting Ice Sheet Data to Determine the Effects of Human Activities on Climate

(Grades 5–College) *A301, GWCC*
Science Focus: ESS2.D, ESS3.C, ESS3.D, CCC7

David Randle (*drandle@amnh.org*), American Museum of Natural History, New York, NY

Use GRACE satellite ice sheet data with resources that incorporate data analysis and literacy strategies to teach about the causes and effects of climate change. GRACE stands for NASA's Gravity Recovery and Climate Experiment.

Astrobiology: Using Storylines to Plan and Assess Learning

(Grades 1–12) *A311, GWCC*
Science Focus: ESS

Hilarie Davis (*hilarie@techforlearning.org*) and **Bradford Davey** (*brad@techforlearning.org*), Technology for Learning Consortium, Inc., Stuart, FL

Astrobiology integrates Earth, life, and physical sciences. Learn how to use astrobiology storylines at different grade bands to plan engaging learning experiences for your students.

Students Working as Scientists Through GLOBE Mission EARTH

(Grades 5–12) *A312, GWCC*
Science Focus: ESS2.D, SEP

Janet Struble (*janet.struble2@utoledo.edu*) and **Kevin Czajkowski** (*kevin.czajkowski@utoledo.edu*), The University of Toledo, OH

David Padgett (*@TSUGIScLab*; *dpadgett@tnstate.edu*), Tennessee State University, Nashville

Jessica Taylor (*jessica.e.taylor@nasa.gov*), NASA Langley Research Center, Hampton, VA

Learn how your students can be scientists using GLOBE (Atmosphere protocols) and MY NASA DATA that meets the NGSS/Weather and Climate. Handouts.

A Case of Unintentional Overdose

(Grades 7–12) *A314, GWCC*

Science Focus: LS, SEP

Dina Markowitz (*dina_markowitz@urmc.rochester.edu*) and **Danielle Alcena** (*danielle_alcena@urmc.rochester.edu*), University of Rochester, NY

Lisa Brosnick (*lbrosnick@gmail.com*), North Collins Central School, North Collins, NY

Follow the case of a teen who has taken an unintentional overdose of over-the-counter (OTC) medicine. Conduct simulated lab tests, interpret drug facts labels, and learn how improper use of OTC medicines may cause serious health problems. Learn about free online resources from University of Rochester's "Medicines and Me" project.

"Making" Meaning Within the Science Classroom: How a Maker Mind-Set Fuels Learning

(Grades P–8) *A315, GWCC*
Science Focus: ETS, LS2, PS1, PS2, PS3, CCC1, CCC2, CCC5, CCC6, SEP

Margaret Koenig (*@PeggyKoenig*; *margaret.s.koenig@gmail.com*), Hillcrest Elementary School, Catonsville, MD

Learn how integrating making into daily science instruction marries the rigor of the NGSS with the inherent fascination of tinkering and constructing.

Primary Grade Engineers: Integrating STEM and Literacy in K–2 Classrooms

(Grades K–3) *A402, GWCC*
Science Focus: ETS, SEP

Patricia Bricker (*@patricialynnb*; *bricker@email.wcu.edu*) and **Melissa Faetz** (*@smemelissa*; *mkfaetz@email.wcu.edu*), Western Carolina University, Cullowhee, NC

Delaney Smith, Hayesville Elementary School, Hayesville, NC

Kimberly Sanders (*kimberly.sanders@macon.k12.nc.us*), South Macon Elementary School, Franklin, NC

Learn about methods, activities, and resources to engage primary grade students in engineering while meaningfully integrating reading, vocabulary, writing, and digital literacy.

The Benefits of Applying Spatial Learning Within a STEM Classroom

(Grades P–5) *A403, GWCC*
Science Focus: GEN, CCC1, CCC3

Steve Pauls (*steve.pauls@fresno.edu*), Fresno Pacific University, Fresno, CA

Spatial ability is an important aspect of STEM education. Join in to engage in different spatial activities to promote awareness of spatial learning in the classroom.

Elementary Storybooks and Hands-On Activities

(Grades K–4)

A405, GWCC

Science Focus: ESS2, ESS3, SEP

Becca Hatheway (hatheway@ucar.edu) and **Lisa Gardiner** (@lisagardiner), UCAR Center for Science Education, Boulder, CO

Tina Harte (tina.r.harte@nasa.gov), NASA Langley Research Center, Surry, VA

Join us to explore free Elementary GLOBE storybooks and hands-on activities that help students gain experience as scientists as they learn Earth system science.

INF Out-of-School-Time STEM Is Out of This World!

(Grades 5–8)

B202, GWCC

Science Focus: INF, SEP6

Joelle Clark (@PlanetSTEM; joelle.clark@nau.edu), Northern Arizona University, Flagstaff

Presider: Elizabeth Weissman (weissmane@ramaz.org), The Ramaz School, New York, NY

Explore innovative approaches that integrate science and engineering in out-of-school-time settings for grades 6–8 students.

Using Games to Teach Models

(Grades 9–12)

B204, GWCC

Science Focus: LS, CCC4, SEP2

Rudolf Kraus (rkraus@ric.edu), Rhode Island College, Providence

Lesley Shapiro (shapiro.l@husky.neu.edu), Classical High School, Providence, RI

Find out how to adapt common games to help your students become more scientifically literate.

Sand from Georgia and Around the World: Integrated Activities for Elementary and Middle School

(General)

B209, GWCC

Science Focus: GEN

Olga Jarrett (ojarrett@mindspring.com) and **Brian Williams** (@bawilli; bawilli@gsu.edu), Georgia State University, Atlanta

Mary Gurney, Level Creek Elementary School, Suwanee, GA

Mizrap Bulunuz (mbulunuz@gmail.com), Uludag University, Bursa, Turkey

Robert Jarrett, Retired Engineer, Decatur, GA

This workshop, focusing on sands of Georgia and around the world, includes eight hands-on learning stations. Make sand viewers and receive handouts of classroom ideas.

Differentiation Through Notebooks: Using Interactive Notebooks to Reach All Students

(Grades 4–12)

B210, GWCC

Science Focus: GEN, SEP

Tanya Flynn (tanya.flynn@douglas.k12.ga.us), Douglas County High School, Douglasville, GA

We will use a variety of graphic organizers and Interactive Notebooks to bring the curriculum to all students. Participants will create several types of organizers to use the first day back from the conference. Learn organization techniques to document student progress and have students analyzing their own data in less than a month.

Chemistry 3-D Lessons Encourage Thinking

(Grades 9–12)

B214, GWCC

Science Focus: PS

Donna Ahlswede (donna_ahlswede@gwinnett.k12.ga.us) and

Laura Herbig (laura_herbig@gwinnett.k12.ga.us), Collins Hill High School, Suwanee, GA

Experience chemistry lessons and assessments shared with hands-on activities and results of a year of three-dimensional lessons. Find out how we used phenomena to get students engaged.

Using a River Ecology Teaching Case to Engage Students in Developing and Using Models, and Constructing Explanations from Evidence

(Grades 6–12)

B215, GWCC

Science Focus: LS2.A, LS2.B, LS2.C, CCC7, SEP2, SEP6

Jay Holmes (jholmes@amnh.org), American Museum of Natural History, New York, NY

Jon Franks (jcfranks@gmail.com), OWNCS Middle School, Astoria, NY

Lauren DeFino (definoscience@gmail.com), Eagle Academy for Young Men, Bronx, NY

Engage your students in the science practices of developing models and constructing explanations using a teaching case with readings, videos, and online datasets.

Global Collaboration in STEM Projects

(Grades 7–12)

B216, GWCC

Science Focus: GEN, NGSS

Heather Wygant (geofaultline@gmail.com), Santa Clara District Resource Center, Sunnyvale, CA

Susan Paulsen (@susanpaulsen; susanpaulsen@yahoo.com), Live Oak High School, Morgan Hill, CA

Increase global collaboration in your classrooms using STEM lessons. One STEM lesson example will be shared with extensions for cultural awareness.

Constructing Explanations and Engaging in Arguments from Evidence in Life Science

(Grades 6–12)

B218, GWCC

Science Focus: LS, SEP

Lisa Carnes (@lisasmithcarnes; lisa_carnes@gwinnett.k12.ga.us) and **Tracy Evans** (tracy_evans@gwinnett.12.ga.us), Gwinnett County Public Schools, Suwanee, GA

Experience how document-based questions combined with literacy mini-tasks encourage reading, writing, speaking, and listening through the lens of the science and engineering practices.

21st-Century Classroom: Unlimited Realities

(Grades K–12)

B301, GWCC

Science Focus: GEN

Allison Mignardi (a.music@att.net) and **Christine Parsons**, Seminole High School, Seminole, FL

Take your classroom to places no classroom has gone before. This workshop will provide information on using virtual and augmented reality in the K–12 classroom.



STEMtastic Lessons for Elementary Students

(Grades 1–5)

B402, GWCC

Science Focus: GEN, NGSS

Selina Bartels (selina.bartels@cuchicago.edu), Concordia University Chicago, River Forest, IL

STEM is all the rage but how to teach it? This workshop will provide ideas for teaching elementary students STEM without breaking the bank.



11:00 AM–12 Noon Presentations

Building Young Scientists: Using Authentic Earth Science Curriculum in Your Classroom

(Grades 6–9)

A304, GWCC

Science Focus: ESS, CCC4, SEP2

Brian Gardiner (brian_gardiner@dekalbschoolsga.org), Peachtree Charter Middle School, Atlanta, GA

Build your core Earth science lessons around free computer-based models, simulations, and data collection. Turn your Earth science students into Earth scientists.

Equity, Science, and Universal Design for Learning: Ensuring that ALL Students Are Ready to Learn

(Grades K–2)

A401, GWCC

Science Focus: GEN

Beth Daniels, Twin Cities Public Television, Saint Paul, MN

How can Universal Design for Learning promote equity in K–2 science activities? Come explore and leave with new ideas you can use!

Increasing Scientific Literacy Through an Issues-Based Curriculum

(Grades 3–8)

A407, GWCC

Science Focus: GEN, SEP

Rhoda Goldberg (@rhodagoldberg; rhodagoldberg@sbcglobal.net), Assistant Director of STEM, Sugar Land, TX
Use community issues to increase interest and engagement in science content while at the same time increasing scientific literacy using science and engineering practices.

Engineering EXPO

(Grades K–4)

A408, GWCC

Science Focus: ETS

Arthur Williams (@PrincipalArthur; arthur.williams@winona.k12.mn.us), Jefferson Elementary STEM School, Winona, MN

Learn tips and strategies to put on an engineering expo that families will not forget!

Ghost (net) Busters! 3-D Learning as a Solution to Derelict Fishing Nets

(Grades 5–9)

B201, GWCC

Science Focus: ESS3.C, ETS1.B, ETS2.B, SEP

Sue Kezios (kezios@uncw.edu) and **Laura Sirak-Schaeffer** (sirakschaefferl@uncw.edu), University of North Carolina Wilmington

Hear about a STEAM curriculum focused on the history, materials science, and impacts of fishing nets using three-

dimensional learning to inspire students to engineer alternative harvesting devices.

Driving Student Growth in Science with Standards-Based Grading

(Grades 3–12)

B210, GWCC

Science Focus: GEN

Michael Kelly (michael_a_kelly@gwinnett.k12.ga.us) and **Lindsey Heffley** (lindsey_heffley@gwinnett.k12.ga.us), Snellville Middle School, Snellville, GA

Hear how communicating student progress with standards-based grading can improve achievement for all types of learners in science.



Developing High School Peer-Reviewed Research Journals

(Grades 9–12)

B212, GWCC

Science Focus: GEN, SEP8

Christina Curtis (ccurtis@jcss.us), Jackson County Comprehensive High School, Jefferson, GA

Want to take research projects a step further? Join a panel of students as they present their collaborative statewide peer-reviewed journal.

Crafting Your Physical Science and Chemistry Curriculum to the Culture of Your Students

(Grades 7–11)

B213, GWCC

Science Focus: PS

Joel Truesdell (jotruesd@ksbe.edu), Kamehameha Schools, Honolulu, HI

Engagement, exploration, and assessment are maximized by crafting your assessments, activities, and labs to the culture of your students. Templates will be used to help you craft a pre-assessment, a hands-on activity, and a lab geared toward the culture of your students. Examples are from Hawaiian culture.

3D Coaching Teachers Through Backward Planning for 3-D Lessons and Units

(Grades K–12)

B401, GWCC

Science Focus: GEN, NGSS

Hillary Paul Metcalf (hillarymetcalf@gmail.com), Chelsea High School, Chelsea, MA

Holly Rosa (@BPSSciHolly; hrosa@bostonpublicschools.org), Boston (MA) Public Schools

Join us as we share best practices for coaching backward planning in order to develop three-dimensional lessons and units, including resources to use with teachers!

11:00 AM–12 Noon Hands-On Workshops

Exploring Our Changing Planet in Humanities Classrooms: Helping All Students Become Active and Engaged Citizens Through Effective Literacy Practices

(Grades 7–12)

A301, GWCC

Science Focus: GEN, NGSS

Caitlin MacLeod-Bluver (cmacleodbluver@gmail.com), Boston (MA) Public Schools

Experience a model unit where students engage in scientific argumentation and share their innovative solutions with an authentic audience. Then, create your own action plan.

Riding the Waves of Three-Dimensional Learning

(Grades 6–8)

A303, GWCC

Science Focus: PS4

Nicole Ross (nross@imsa.edu), Illinois Mathematics and Science Academy, Aurora

We will explore characteristics of ocean waves and technology associated with their capture and conversion to electricity. A focus on three-dimensional learning is included.

Space Science After the Eclipse, Anchoring Phenomena to Keep the Excitement about the Universe Alive

(Grades 4–12)

A311, GWCC

Science Focus: ESS1.A, ESS1.B, CCC1, CCC3, CCC4, CCC5, SEP1, SEP2, SEP4, SEP7

Brian Kruse (bkruse@astrosociety.org) and **Linda Shore** (lshore@astrosociety.org), Astronomical Society of the Pacific, San Francisco, CA

As the excitement surrounding the 2017 solar eclipse fades, explore some astronomical anchoring phenomena to keep your students engaged.

Assessing the Development of Student-Created Models

(Grades 6–12)

A313, GWCC

Science Focus: GEN, CCC1, CCC2, CCC4, SEP2, SEP4, SEP6, SEP8

Brianna Reilly (@MsB_Reilly; breilly39@gmail.com), Hightstown High School, Hightstown, NJ

The transition from assessing product to process is challenging. Assessing changes in student-created models that explain phenomena provides the opportunity to see growth of understanding.

Man Versus Wild: Lessons on Earth and Human Impacts

(Grades 6–12)

A314, GWCC

Science Focus: ESS3.A, ESS3.C, ESS3.D, LS2.A, LS4.D, CCC1, CCC2, CCC3, CCC4, CCC7, SEP

Terri Clark, Population Education, Washington, DC

Engage in thought-provoking, multidisciplinary activities to trace human population changes and impacts on Earth and ecosystems over the past two centuries.

Modeling Using STEM

(Grades 3–9)

A315, GWCC

Science Focus: GEN, SEP2

Judith Lucas-Odom (@Judith_Odom; judyps23@yahoo.com), Chester High School, Chester, PA

Make STEM come alive through the use of models! Experience how to incorporate quick and easy STEM activities into your everyday classroom routine!

Bite into 3-D Learning: Shark Teeth and Science Integration

(Grades 3–6)

A402, GWCC

Science Focus: GEN, CCC

David Wojnowski (dwojnowski@gsu.edu) and **Christy Visaggi** (cvisaggi@gsu.edu), Georgia State University, Atlanta
Using fossilized shark teeth, participants will be introduced to a three-dimensional learning unit that integrates geosciences, history, language arts, and marine biology/ecology. Crosscutting concepts of form and function will also be explored.

Using 3-D Science Experiences to Foster Task Perseverance, Critical-Thinking Skills, and Innovation

(Grades K–5)

A404, GWCC

Science Focus: GEN, NGSS

Tracy Ingram (@tracycoleying; tingham@tiftschools.com), Len Lastinger Primary, Tifton, GA

No matter what DCI, CCC, or SEP you are addressing—learn how to design innovative learning experiences that foster creativity and critical thinking.

Integrating Science and Literacy in K–3: Hands-On Scientific Investigations and Literacy Strategies for Teachers

(Grades K–3)

A405, GWCC

Science Focus: GEN, SEP

Rosemary Geiken and **Kathryn Sharp** (sharpk@etsu.edu), East Tennessee State University, Johnson City

The eight NGSS science and engineering practices will be

highlighted as participants engage in hands-on activities that integrate science and literacy in K–3.

Cultivating Creativity: Using HyperDocs to Facilitate 3-D Learning Experiences

(Grades 6–8)

B202, GWCC

Science Focus: GEN, NGSS

Paul Williams (@mrwilliamssteam; pwilliams@beaumontusd.k12.ca.us), San Geronio Middle School, Beaumont, CA
Learn how to incorporate HyperDocs, collaborative groups, and Interactive Notebooks to produce authentic three-dimensional learning experiences that will transform your classroom's pedagogical and cultural practices.

Using FRQ Notebooks in AP Sciences to Decrease Stress and Increase Scores

(Grades 9–12)

B204, GWCC

Science Focus: GEN, SEP4, SEP6, SEP8

Chelsea Sexton (@chelseamsexton; chelsea.sexton@cobbk12.org), Cobb County School District, Kennesaw, GA

Maria Avitia-Freeman (@mafreemankmhs; maria.avitia-freeman@cobbk12.org), Kennesaw Mountain High School, Kennesaw, GA

Learn how implementing student notebooks and “Free Response Fridays” can reduce student stress while raising scores and confidence on constructed response on the AP exam.

Making Sense of the World: Sinkholes and Beyond

(Grades K–12)

B209, GWCC

Science Focus: GEN, SEP

Donna Ahlswede (donna_ahlswede@gwinnett.k12.ga.us), Collins Hill High School, Suwanee, GA

Our elementary, middle school, and high schools teamed together to provide three-dimensional lessons and supporting materials for our teachers. Sinkholes, sample lessons, and what we learned!

STEM's Not What We Teach; It's What We Do

(Grades K–12)

B301, GWCC

Science Focus: GEN, SEP

Jodi Zeis (mrszteachesme@yahoo.com), S2TEM Centers SC, Orangeburg, SC

Alice Gilchrist (agilchrist@s2temsc.org), S2TEM Centers SC, Greenwood, SC

How do you STEM? We will examine community partnerships and instructional leadership experiences in STEM to become better prepared for implementing STEM-mindedness communitywide.



Snotty Plots and Toilet Splatter: Use the Fluid Dynamics of Disease Transmission to Teach Data Collection and Analysis

(Grades 5–10)

B402, GWCC

Science Focus: ETS, CCC2, SEP4, SEP5, SEP6

Ariel Zych (@arieloquent; azych@sciencefriday.com), Science Friday, New York, NY

What happens to a sneeze as it travels? These are the questions at the center of this hands-on workshop where participants will engage in NGSS-focused activities that explore the fluid dynamics of disease transmission.

11:30 AM–12 Noon Presentation

Engaging Community Partners in a High School Bioscience Course to Increase Student Interest in STEM Careers

(Grades 9–College)

B218, GWCC

Science Focus: LS

Ron Gray (@grayron; gray.ron@gmail.com), and **Robert Woodruff** (rdw62@nau.edu), Northern Arizona University, Flagstaff

We will describe the integration of local community partners into a high school bioscience course designed to find solutions to a community-based problem: tracking infectious disease.

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NSTA National
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Saturday, March 17

Past Presidents Breakfast and Advisory Board Meeting

By Invitation Only

Int'l Ballroom A/B, Omni CNN..... 7:30–9:30 AM

NSTA International Lounge

Cypress Room, Omni CNN.....9:00 AM–5:00 PM

NSTA Standing Committee, Advisory Board, and Panel Chairs Meeting

By Invitation Only

International Blrm. A/B, Omni CNN 12:30–1:30 PM

Development Advisory Board Meeting

By Invitation Only

Willow Brdrm., Omni CNN 3:30–4:30 PM

NESTA Friends of Earth Science Reception

Int'l Blrm. F, Omni CNN 6:30–8:00 PM

Sunday, March 18

NSTA Life Members Morning Social

By Invitation Only

Cottonwood A/B, Omni CNN..... 7:30–8:30 AM

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3D Molecular Designs LLC (Booth #731)

Saturday, Mar 17	8:00–9:30 AM	B403, GWCC	Of All the Nerve: Exploring Neuronal Communication through 3-D Learning (p. 22)
Saturday, Mar 17	12 Noon–1:30 PM	B403, GWCC	Using Models to Uncover Student Misconceptions in Chemistry (p. 48)

Bio-Rad Laboratories, Inc. (Booth #434)

Saturday, Mar 17	8:00–9:30 AM	B310, GWCC	Mushroom Ecology and Why It Matters for Biofuel Production (p. 22)
Saturday, Mar 17	10:00–11:30 AM	B310, GWCC	That's My Idea! Engineering in the Classroom Through Product Design (p. 35)

BIOZONE International, Ltd. (Booth #1427)

Saturday, Mar 17	10:00–11:30 AM	B406, GWCC	BIOZONE's New NGSS Series for High School (p. 36)
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Celeston (Booth #903)

Saturday, Mar 17	8:00–9:30 AM	B217, GWCC	Bring Citizen Science into Focus (p. 21)
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Educational Innovations (Booth #1213)

Saturday, Mar 17	10:00–11:30 AM	B313, GWCC	Hear That? Exploring the Sound of Science (p. 36)
Saturday, Mar 17	12 Noon–1:30 PM	B313, GWCC	No Pressure: Teaching About Air Is a Breeze! (p. 48)

Flinn Scientific, Inc. (Booth #1022)

Saturday, Mar 17	8:00–9:30 AM	B203, GWCC	Flinn Favorite Biology Activities and Games (p. 20)
Saturday, Mar 17	12 Noon–1:30 PM	B203, GWCC	Award-Winning STEM Enrichment Program for Grades 4–8 from Flinn Scientific (p. 47)
Saturday, Mar 17	2:00–3:30 PM	B203, GWCC	Building or Renovating a Laboratory? Get Your Questions Answered (p. 66)

Google (Booth #1151)

Saturday, Mar 17	10:00–11:30 AM	B214, GWCC	Hands-On with Google's Science Journal App (p. 34)
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HHMI BioInteractive (Booth #323)

Saturday, Mar 17	8:00–9:30 AM	B308, GWCC	Connecting Biological Concepts Through Phenomena: Sickle Cell and Malaria (p. 21)
Saturday, Mar 17	10:00–11:30 AM	B308, GWCC	Explore Our Changing Planet and Mass Extinctions with HHMI BioInteractive (p. 35)

Houghton Mifflin Harcourt (Booth #1110)

Saturday, Mar 17	8:00–9:30 AM	B314, GWCC	How Engineering Can Make 3-D Assessments Sparkle (p. 22)
Saturday, Mar 17	10:00–11:30 AM	B314, GWCC	Awesome Earth Systems Activities for the Science Classroom (p. 36)
Saturday, Mar 17	12 Noon–1:30 PM	B314, GWCC	All Standards All Students Case Study: Looking at the Intersections Between Social Emotional Learning (SEL) and NGSS (p. 48)
Saturday, Mar 17	2:00–3:30 PM	B314, GWCC	So You Are Teaching Earth Science Now—What You Need to Know to Be Prepared (p. 66)

HudsonAlpha Institute for Biotechnology (Booth #1104)

Saturday, Mar 17	8:00–9:30 AM	B306, GWCC	Top Biotech Stories of 2017 (p. 21)
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Inq-ITS (Booth #1837)

Saturday, Mar 17	12 Noon–1:30 PM	B306, GWCC	Personalized Virtual Labs that Grade Themselves (p. 48)
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Insurance Institute for Highway Safety (Booth #1307)

Saturday, Mar 17	10:00–11:30 AM	B407, GWCC	Crash Science Website Launched! Free STEM Activities, Videos, and More (p. 36)
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Lab-Aids, Inc. (Booth #723)

Saturday, Mar 17	8:00–9:30 AM	B305, GWCC	Calling All Carbons (p. 21)
Saturday, Mar 17	10:00–11:30 AM	B305, GWCC	Prospecting for Mineral Ore (p. 35)
Saturday, Mar 17	12 Noon–1:30 PM	B305, GWCC	Using Climate Proxies to Learn about Earth's Climate History (p. 48)
Saturday, Mar 17	2:00–3:30 PM	B305, GWCC	NGSS Biomedical Engineering: Get a Grip! (p. 66)
Saturday, Mar 17	4:00–5:30 PM	B305, GWCC	NGSS—Follow the Energy (p. 76)

LEGO Education (Booth #1122)

Saturday, Mar 17	8:00–9:30 AM	B409, GWCC	Integrating Robotics into Your Science Classroom (Grades 5+) (p. 22)
Saturday, Mar 17	10:00–11:30 AM	B409, GWCC	Use Science, Coding, and Robotics in the Elementary Classroom to Solve Real-World Problems (p. 36)

McGraw-Hill Education (Booth #635)

Saturday, Mar 17	10:00–11:30 AM	B312, GWCC	Eliciting Evidence of What Students Really Think About Core Ideas in Science (p. 35)
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Minecraft Education (Booth #1516)

Saturday, Mar 17	10:00–11:30 AM	B408, GWCC	How to Teach Science with Minecraft (p. 36)
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MSOE Center for BioMolecular Modeling (Booth #729)

Saturday, Mar 17	10:00–11:30 AM	B403, GWCC	The Science and Ethics of Genomic Editing with CRISPR/Cas9 (p. 36)
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NOAA Education (Booth #142)

Saturday, Mar 17	8:00–9:30 AM	B303, GWCC	STEM and Stewardship Series 1: Polar Popsicles (p. 21)
Saturday, Mar 17	10:00–11:30 AM	B303, GWCC	STEM and Stewardship Series 2: Planet Stewards Education Project (p. 34)
Saturday, Mar 17	12 Noon–1:30 PM	B303, GWCC	STEM and Stewardship Series 3: Chasing Coral Bleaching (p. 48)

Perimeter Institute for Theoretical Physics (Booth #1050)

Saturday, Mar 17	8:00–9:30 AM	B215, GWCC	Shoot for the Stars: Freshmen Astronomy! (p. 21)
Saturday, Mar 17	10:00–11:30 AM	B215, GWCC	Climate Change (p. 34)

Society for Neuroscience (Booth #442)

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TCI (Booth #1343)

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Saturday, Mar 17	10:00–11:30 AM	B209, GWCC	Beyond Building: Teaching Engineering Design (p. 34)
Saturday, Mar 17	12 Noon–1:30 PM	B209, GWCC	There's More than One Way to Assess for the Three Dimensions (p. 48)
Saturday, Mar 17	2:00–3:30 PM	B209, GWCC	Teaching Strategies for Cells and Genetics in Middle School Science Classes (p. 66)
Saturday, Mar 17	4:00–5:30 PM	B209, GWCC	Teaching Strategies for Matter in Middle School Science (p. 76)

Texas Instruments (Booth #223)

Saturday, Mar 17	10:00–11:30 AM	B213, GWCC	Zombie Apocalypse! (p. 34)
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UL XplorLabs (Booth #851)

Saturday, Mar 17	10:00–11:30 AM	B311, GWCC	Advancing STEM Education Through Safety Science and Engineering (p. 35)
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University of Delaware Food Science (Booth #1536)

Saturday, Mar 17	10:00–11:30 AM	B306, GWCC	Sustainable and Safe Food and Water for Engaging STEM Students (p. 35)
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Vaccine Education Center at Children's Hospital of Philadelphia (Booth #343)

Saturday, Mar 17	8:00–9:30 AM	B407, GWCC	Famous Relationships: Science Is Full of Them: Engaging MS Students (p. 22)
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Vernier Software & Technology (Booth #523)

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Saturday, Mar 17	8:00–9:30 AM	B207, GWCC	Biology with Vernier Using Chromebook (p. 20)
Saturday, Mar 17	10:00–11:30 AM	B207, GWCC	Integrating Chromebook with Vernier Technology (p. 34)
Saturday, Mar 17	10:00–11:30 AM	B208, GWCC	Physics with Vernier Using Chromebook (p. 34)
Saturday, Mar 17	12 Noon–1:30 PM	B208, GWCC	Middle School with Vernier (p. 47)
Saturday, Mar 17	12 Noon–1:30 PM	B207, GWCC	Chemistry with Vernier Using Chromebook (p. 47)
Saturday, Mar 17	2:00–3:30 PM	B208, GWCC	Introductory Engineering Design Projects with Vernier (p. 66)
Saturday, Mar 17	2:00–3:30 PM	B207, GWCC	Human Physiology with Vernier (p. 66)

WhiteBox Learning, a Flinn Scientific company (Booth #1622)

Saturday, Mar 17	10:00–11:30 AM	B203, GWCC	New Standards: Project-Based STEM Engineering by WhiteBox Learning (p. 33)
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