# May 17–19, 2012

with May 16 Expo Preview Atlantic City, N.J.

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HISTORY

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LANGUAGES





Visit us at booth #301 and room #309

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# Membership in NSTA delivers all the best professional development and resources a science educator needs.

- Members select one or more of the idea-packed, peer-reviewed journals designed for all grade levels. *Science and Children* (grades K–6); *Science Scope* (grades 6–9); *The Science Teacher* (grades 9–12), or *Journal of College Science Teaching*.
- NSTA National and Area Conferences are the world's largest gathering of science educators—an unparalleled professional development opportunity.
- The NSTA Learning Center offers year-round, face-to-face and online-learning opportunities with leading education providers.
- NSTA Listserver Email Subscriptions allow members to join any of 13 electronic lists to gain knowledge from industry professionals who gather online to share valuable information.
- Members save with discounts on insurance, Learning Center products, books, digital content and conference registration.
- And stay informed with our publications; *NSTA Reports, NSTA Book Beat, SciLinks* web content and our E-newsletters.



For more information or to become a member, visit *www.nsta.org/membership* or call 1.800.722.6782







# **STEM For All.**

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More than any other middle school program, the PBIS *Project-Driven Inquiry* approach exemplifies the use of **STEM** in the classroom. Throughout PBIS, students use the *Engineering Design Cycle* to problem-solve real-world projects and build the skills they will need to be successful in the 21st century:

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- observing and interpreting,
- using evidence to support claims,

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Empowering Us All with STEM www.its-about-time.com



#### NSTA 2012 STEM Forum & Expo

Atlantic City, New Jersey • May 17–19, 2012 with Expo Preview and Welcome Reception, Wednesday, May 16

Donors and Advocates
President and Committee Welcome
STEM Forum & Expo Steering Committee
NSTA Conferences Go Green!

#### **Registration, Travel, and Hotels**

Meeting Location and Times 8
Registration
Ground Transportation to/from Airport 8
Amtrak/NJ Transit
Getting Around Town 8
Parking
Discounted Rental Cars 8
Airlines/Rail Discounts 8
Forum Hotels
Atlantic City Map 9

#### **STEM Forum & Expo Resources**

Exhibits 10
NSTA Science Bookstore
Housing Questions
Presenters and Presiders Check-In 10
Wi-Fi in Convention Center
Forum Evaluation
Lost and Found
Graduate Credit
NSTA Mobile Website
Audiovisual Needs
Message Center
First Aid Services
Business Services
Online Session Evaluations/
Tracking Professional Development11

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

#### STEM Forum & Expo Resources, cont.

Floor Plans 1	2
NSTA Headquarters Staff 1	6
NSTA Officers, Board of Directors, Council, and	
Alliance of Affiliates	7
Future NSTA Conferences 1	8
Professional Development Documentation	
Form	32

#### **STEM Forum & Expo Program**

STEM Forum & Expo Highlights
STEM Forum & Expo Strands
'Family" STEM Night
Roundtable Task Force 22
Poster Session
Wednesday Daily Program
Thursday Daily Program
Friday Daily Program
Saturday Daily Program 41
PreK–2 (Early Childhood) Strand Sessions
Grades 3–5 Strand Sessions
Grades 6–9 Strand Sessions
Administrators Strand Sessions
Community/After-School/Outreach Programs Strand Sessions 81

#### Indexes

Exhibit	Hall Floor F	lan .												88
Exhibit	or List													89
Index of	f Exhibitor V	Norks	hop	s.										98
Index of	f Participant	s											.1	101
Index of	f Advertisers									•			1	04

#### **NSTA Affiliates**

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

Cover Design

Christina Dierssen

NSTA and the STEM Forum Steering Committee are extremely grateful to the following companies and associations for their generous support and contributions to the STEM Forum & Expo.

#### Donors to the STEM Forum & Expo

Carolina Biological Supply Co. Foundation for Family Science & Engineering NBC Learn New Jersey Science Teachers Association Ohaus Corp. Vernier Software & Technology







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#### **Advocates to the STEM Forum & Expo**

Aldebaran Robotics
ASCD (formerly the Association for Supervision and Curriculum Development)
Association of Mathematics Teachers of New Jersey (AMTNJ)
Center for Integrative STEM Education at the National Institute of Aerospace
Council of State Science Supervisors (CSSS)
International Society for Technology in Education (ISTE)
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National Center for Earth and Space Science Education (NCESSE) National Science Foundation (NSF) New Jersey Dept. of Education New Jersey Science Teachers Association (NJSTA) NIMBioS: National Institute for Mathematical and Biological Synthesis Secondary and Education Programs/NASA The STEM Academy® Tennessee Science Teachers Association (TSTA) Vernier Software & Technology



The environment is important to science educators. These programs are recyclable and were printed on recycled paper.

#### Welcome to the STEM Forum & Expo





Margie Gifford-Hawkins

Patricia Simmons

e welcome you to the first-ever NSTA STEM Forum & Expo. We're glad you could join us for this incredible resource for teachers, administrators, and those involved with after-school and outreach programs—in other words, for anyone interested in developing better STEM opportunities for our youth and professional development for STEM educators!

The Steering Committee has been working with NSTA since spring of 2011 in an effort to design a STEM Forum that is engaging, innovative, fun, enlightening, and as useful as possible for the development of STEM education in this country. We think we have scored a win here!

We have organized the strand sessions by grade levels—PreK-2 (Early Childhood), Grades 3–5, Grades 6–9, Community/After-School/Outreach programs, and Administrators—we are hoping it will be really easy to find exactly which session will meet your needs.

Exciting keynote speakers, including

- Kenneth Wesson, a world-renowned educational consultant in neuroscience, will speak about "The STEM Hologram: Several Disciplines; One Interdependent Picture."
- Mary Ellen Weber, two-time Space Shuttle astronaut, executive, engineer, scientist, and pilot, will focus on encouraging students "To Boldly Go: The Unbounded Opportunities in Science and Math."

We encourage you to take part in "Family" STEM Night on Friday evening from 7:30 to 9:00 PM. "Families" will be comprised of four teachers who will be your "family" members. Take home a flash drive with all documents needed to run a "Family" STEM Night of your own. Join us and see how much fun "families" can have discovering the excitement of STEM teaching and learning.

The STEM Forum is also highlighting a roundtable task force of high school and higher education teachers, along with STEM-related business leaders. They will be meeting throughout the Forum and the scope of their work will be to identify practices, big concept understandings, habits, and dispositions that can be better developed in our students at a younger age to help them become more successful in STEM activities at higher levels.

We all know the value of STEM education. Wonderful pockets of STEM expertise are developing all around our country. We've now brought STEM experience and knowledge together here in Atlantic City.

We look forward to meeting you during the STEM Forum & Expo!

Margie Gifford-Hawkins, NSTA 2012 STEM Forum Steering Committee Chairperson Patricia Simmons, 2011–2012 NSTA President



#### **STEM Forum Steering Committee**

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Margie Gifford-Hawkins

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#### **Shannon Hamilton**

Northeast Learning Zone Math Facilitator Charlotte-Mecklenburg Schools Huntersville, NC 28078

#### **NSTA Conferences Go Green!**

The National Science Teachers Association is committed to meeting today's environmental challenges by adopting eco-friendly practices both in our own day-to-day operations and at our STEM Forum & Expo, conferences, workshops, and other events. In addition, we strongly encourage our contracted conference facilities to follow green practices as well. Here are some of the ways NSTA's conference department has worked to minimize our impact on the environment:

#### **Forum Previews**

Gone are the days of bulky, newspaper-style advance programs. Brief forum previews allow us to be more focused in our forum content, since each preview is specific to a particular forum or conference. As an added bonus, they are more environmentally friendly, as they dramatically reduce both our print and mailing requirements.

#### **Online Forum Information and Personal Scheduler**

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

#### **Final Forum Programs by E-Mail**

Forum registrants are now given the option of receiving an electronic version (PDF) of the final forum program by e-mail approximately two weeks prior to the forum, further reducing printing and shipping requirements.

#### **Recycled Paper and Sustainable Print Services**

Forum previews and final forum programs are now printed on recycled paper. In addition, Walsworth Print Group, the printer for our forum materials, is in strict compliance with all environmental laws and exceeds these standards in many areas. Wherever possible, Walsworth Print Group works to reduce and recycle waste, use reduced or low-VOC chemicals, increase the recycled content of raw materials, and use soy- and/or vegetablebased inks. Walsworth Print Group has also obtained chain-ofcustody certification for paper products to ensure they are being harvested from environmentally responsible sources.

#### Green Initiatives at Atlantic City and the Atlantic City Convention Center

The Atlantic City Convention Center is committed to promoting environmental stewardship while providing a safe, healthy atmosphere for their guests. Recent awards include the 2010 Partnership Award awarded by NJ Clean Communities, the 2009 Resource Efficiency Achievement Award awarded by PlanSmart NJ, and a nomination and finalist for the 2009 ENR Energy Construction Project of the Year, awarded by Platts Global Energy Awards.

- Solar Roof: In 2008, installation was completed on the largest single roof-mounted solar array in the United States. The 2.37 megawatt rooftop solar power system is capable of producing 26% of the Convention Center's annual electrical consumption.
- Wind Energy: In 2005, five 380-foot-high wind turbines were erected at the Atlantic County Utilities Authority Wastewater Treatment Facility in Atlantic City. The turbines power the facility, with any excess energy being directed to the main power grid. It is estimated that the energy produced by the wind farm will save the energy equivalent of 23,613 barrels of crude oil.
- **Recycling:** In addition to cardboard, bottles, and cans, the Convention Center recycles many nontraditional items, including carpet, computers, lamps, ballasts, shrink wrap, pallets, and copper and iron from used electrical equipment.

#### **Eco-friendly Exhibition Practices**

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

#### "Go Green" at the STEM Forum & Expo!

- Recycle your forum programs in the clearly marked recycle bins located throughout the Convention Center.
- Recycle or reuse your plastic badge holders—you can either turn them in at the NSTA Registration Counter or use them at future conferences.
- If you prefer to bring handouts to your session, use doublesided printing and/or recycled paper.
- Walk or use public transportation when possible at the conference.
- Bring your own refillable water bottle to the forum.
- In advance of the forum, presenters are encouraged to post their presentations and handouts on the Session Browser/Personal Scheduler.
- Evaluate sessions attended via your smartphone or online.

# Accessible, Informative, and Affordable!

NSTA's free electronic publications will help you build your educational portfolio and keep you up-to-date on issues, events, science topics, teaching resources, and special offers.



#### NSTA Express (weekly)

Delivers the latest news, events, classes, seminars, and NSTA happenings.



#### NSTA Scientific Principals (monthly)

Exclusively for elementary school principals and based on typical themes found in elementary science curricula, each issue offers a science toolbox full of new ideas and practical applications. <complex-block>

#### Science Class (monthly)

With separate editions for elementary, middle, and high school teachers, theme-based content that is supported with pertinent resource suggestions.



#### NSTA's Book Beat (monthly)

Our newest electronic publication is aimed to keep NSTA Press readers and the wider audience of science teachers informed on the latest books and teacher resources. Each issue highlights selected topics in science education, with links to free sample chapters and lessons.

Sign up for one or all today at www.nsta.org/publications/enewsletters.aspx



#### **Registration, Travel, and Hotels**



#### Meeting Location and Times

STEM Forum & Expo hotels are Bally's Atlantic City, Sheraton Atlantic City Convention Center Hotel, Resorts Casino Hotel, and Trump Plaza Hotel & Casino. Forum registration, the exhibits, the Science Bookstore, and sessions will be located at the Atlantic City Convention Center. The Expo Preview and Welcome Reception is Wednesday, May 16, 4:00– 7:00 PM. The forum will end on Saturday, May 19, at 5:00 PM.

#### Registration

Registration is required for participation in all forum activities and the exhibits. The lapel badge mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities.

NSTA Registration and the Science Bookstore, located in Hall B of the Convention Center, will be open during the following hours:

Wed., May 16	3:00-7:00 PM
Thu., May 17	7:00 AM-6:00 PM
Fri., May 18	7:00 AM-5:00 PM
Sat., May 19	7:30 AM-12 Noon

If you misplace your badge or tickets, present your personal ID at the Badge Reprint Counter in the Registration Area and you will be issued replacements. Only one replacement badge will be issued.

#### **Transportation to/from Atlantic City**

• Atlantic City International Airport (AC) Serviced by Spirit Airlines, the Atlantic City International Airport *(www.acairport.com)* is located 12 miles outside of Atlantic City. The Atlantic City Jitney *(www.jitneyac.com)* provides service from the airport to Atlantic City for \$10 and service from Atlantic City to the airport for \$15. Taxi service from the Atlantic City International Airport to Atlantic City ranges from \$27 to \$50.

#### • Philadelphia International Airport

The Philadelphia International Airport (*www.phl.org*) is located 60 miles from Atlantic City. From the Philadelphia International Airport, you can take a Septa High Speed Rail Line train (*www.septa.org*) to the 30th Street Train Station in Philadelphia and connect with NJ Transit (*approximately \$5.50 one way*). Tropiano Transportation provides service to the Sheraton Convention Center for only \$45. Arrangements for Tropiano service must be made in advance (*www. tropianotransportation.com*; 800-559-2040). Taxi service from the Philadelphia International Airport to Atlantic City ranges from \$105 to \$150 plus tolls/tip.

#### • Amtrak, NJ Transit

Amtrak (*www.amtrak.com*) provides service from all major East Coast destinations (New York, Boston, Washington, D.C.) to the 30th Street Train Station in Philadelphia.

NJ Transit (*www.njtransit.com*) provides service from 30th Street Train Station in Philadelphia to Atlantic City. Trains run on the hour. Estimated cost is \$10 one way.

#### **Getting Around Town**

Jitneys (*www.jitneyac.com*) are Atlantic City's most convenient and chief mode of affordable transportation. The Jitney operates 24 hours daily and Jitney service includes shuttle bus service from the Atlantic City Rail Terminal to various casinos located throughout the city for \$2.25 per person. The maximum cost for a taxi ride within city limits for up to five passengers is \$13, not including tip.

#### Parking

Parking at the Convention Center is \$12 for the first four hours, \$2 for the fifth hour, and \$1 each additional hour. Parking for 24 hours is \$33. For a map and listing of Atlantic City parking locations, go to *www.accenter.com/ aboutthecenter/parking.pdf*.

#### **Discounted Rental Cars**

The toll-free number to contact our NSTAdesignated car rental company is as follows:

Enterprise 800-593-0505 16AH230

#### **Airlines/Rail Discounts**

The toll-free numbers to contact NSTAdesignated airlines are as follows:

AirTran	866-683-8368	NSTA12*
American	800-433-1790	3652DE
www.aa.com		
Amtrak Rail	800-872-7245	X49K-949**

#### \*For AirTran phone reservations only

\*\*Amtrak offer not valid on Auto Train and Acela service. Phone reservations only.

#### **Registration, Travel, and Hotels**



- 1. Bally's Atlantic City 1900 Boardwalk 609-340-2000
- 2. Sheraton Atlantic City Convention Center Hotel Two Convention Blvd. 609-344-3535
- 3. Trump Plaza Hotel & Casino The Boardwalk at Mississippi 609-441-6000
- 4. Resorts Casino Hotel 1133 Boardwalk 800-334-6378

#### **STEM Forum & Expo Resources**



Don't forget to visit the NSTA Science Bookstore. We offer a wide range of books as well as "I Love Science" product lines.

#### **NSTA Exhibits**

NSTA exhibits are an essential feature of every NSTA conference. Here you will find the latest textbooks, computer hardware and software, laboratory equipment, industry-supported educational materials, summer opportunities, and many other exhibits that are designed to enhance your knowledge and teaching skills.

The lapel badge mailed to you with your confirmation, or issued to you at registration on-site, is your "ticket of admission" to the Exhibit Hall and all conference activities. The Exhibit Hall floor plan is on page 88 and a complete list of exhibitors and contact information starts on page 89.

**Exhibit Hall Hours.** Located in Hall B of the Convention Center, exhibits will be open for viewing during the following hours:

\*Wed., May 16 4:00–7:00 PM \*Expo Preview and Welcome Reception with Special Opening Feature "NAO Is the Time for STEM Education" Thu., May 17 3:00–6:00 PM Fri., May 18 2:00–5:00 PM

#### Showtime—Special Opening Feature

Bruno Maisonnier, robot entrepreneur at Aldebaran Robotics, will present a special performance "NAO\* Is the Time for STEM Education" during the Expo Preview and Welcome Reception on Wednesday, 4:00–7:00 PM, at NSTA Exhibits, Hall B. \*NAO is pronounced "Now." Lead Retrieval. NSTA exhibitors use lead retrieval, a paperless tracking system to allow them to receive fast, accurate information about forum attendees who have visited their booths. With the lead retrieval system, an exhibitor scans your badge as you visit the booth. This allows exhibitors to follow up and provide further information to you while the STEM Forum & Expo is still fresh in your mind.

**Exhibitor Workshops.** Exhibitor-sponsored workshops for science teachers are offered throughout the forum. These workshops give you an opportunity to use a variety of commercial instructional materials. Attendance is on a first-come, first-served basis. See page 98 for a complete listing of exhibitor workshops.

#### **Housing Questions or Concerns?**

If you have any questions or concerns about your housing, please contact The Housing Connection toll-free at 877-352-6710.

#### **Presenters and Presiders Check-In**

If you are presenting or presiding at a session, please check in and pick up your ribbon at the Presenters/Presiders booth in the Registration Area after you have registered for the forum and received your name badge.

#### Wi-Fi in Convention Center

Free wireless internet is available inside the halls as well as a less reliable signal at "public spaces" of the second floor of the Convention Center. The access code is "free1." See *www.nsta.org/stemwifi* for detailed access instructions.

#### **NSTA Science Bookstore**

The NSTA Science Bookstore is located in Hall B of the Convention Center. Browse the newly redesigned NSTA Science Bookstore for hundreds of professional titles for science educators of all grade bands and disciplines. For this event, we'll be showcasing more than a dozen brand-new books, among them a couple outstanding STEM titles. Better yet-not only do we offer a wide range of books to sharpen your content knowledge and expand your teaching strategies, we also offer dozens of wonderful NSTA Gear items as reminders of your forum experience or as gifts for your family, colleagues, and students. And remember-all forum attendees enjoy discounts of 20% on NSTA Press items and 10% on books from other publishers. We also offer free shipping when you place your order online in the Store for both books and Gear.

#### **Forum Evaluation**

All forum attendees are invited to complete a forum evaluation online at *http://ecommerce.nsta.org/2012atl/conference\_evaluation.asp.* 

#### Lost and Found

All lost-and-found items will be turned in at the NSTA Exhibitor Registration counter at the Convention Center.

#### **Graduate Credit Opportunity**

STEM Forum & Expo attendees can earn one graduate-level credit in professional development through FraminghamStateUniversity. You can learn more about the assignment requirements at *www.framingham. edu/nsta*. For questions regarding the Framingham State University graduate credit, e-mail Nancy Proulx at *nproulx@framingham.edu* or call 508-626-4034.

#### **STEM Forum & Expo Resources**

#### **NSTA Mobile Website**



We invite you to visit the NSTA Mobile Website, *m.nsta.org*, the best way to keep track of what's happening at the forum

from your phone. The mobile website features a slimmed-down version of our popular session browser tool, allowing you to view sessions by Date/Time, Session Format, Subject, and Keyword, and to evaluate those you have attended. The site also includes a map of Atlantic City with bookmarks for the forum hotels and Convention Center, a link to the #nsta Twitter feed, NSTA news, and other important information. Please note that the site has been optimized for use with iPhone and Android devices. We welcome your feedback about the conference mobile website. (*Note:* This is not an app; it is a website optimized for viewing on phones.)

#### **Audiovisual Needs**

NSTA will fulfill AV needs originally requested on the program proposals as long as the request is within the limits of equipment that NSTA provides (an LCD projector and screen). For any last-minute AV needs, presenters must arrange and pay for their own equipment. Technology Express, the designated AV company onsite, is located in the following room:

• Room 307, Convention Center

#### **Message Center**

A Message Center for forum attendees is available in the NSTA Registration Area. No messages, except extreme emergencies, can be broadcast over the public address system.

#### **First Aid Services**

EMTs will be on-site at the Convention Center during forum hours. Should you require or know of a medical situation, call NSTA Registration at 609-449-3920 or go to the Registration desk located in Hall B for assistance.

#### **Business Services**

The UPS Business Center (609-449-2480) is on the first floor Atrium of the Convention Center. Hours are 7:30 AM-5:00 PM Monday through Friday, and 8:30 AM-12:30 PM on Saturday. Services include photocopies and laser prints (color and black/white), binding, faxes, PC rentals, network connections to both printers and the internet, shipping services, and motorized chair rentals. E-mail your requests to *store3584@ theupsstore.com*.

#### **NEW!** Online Session Evaluations and Tracking Professional Development

All attendees can now evaluate sessions via their smartphones or online while simultaneously tracking their professional development certification (based on clock hours).

Help NSTA's **GREEN** efforts by completing session evaluations online May 17–31, 2012, via your smartphone (*m.nsta.org*) while the session is fresh in your mind! Or attendees can visit *www.nsta. org/evaluations* at a later time to complete a short online session evaluation for each session they attend.

Concurrent session presenters may also complete evaluations for their own sessions in order to track professional development credit.

To evaluate a session via *www.nsta.org/evaluations*:

- Enter your badge number (if you don't remember your badge number, click "help me find my badge number").
- Type the beginning of the session title in the "Lookup Session" field, scroll down to find the correct session, and click the "Submit Session" button. The session information will appear and you can begin to evaluate the session.
- When finished evaluating the session, click the "Submit Evaluation" button.
- Repeat this process for each session attended.

To evaluate a session via your smartphone, visit *m.nsta.org* and:

- Locate the appropriate session by schedule, format, subject, or keyword search from the home page and then click on the "Evaluate This Session" button.
- Enter your badge number at the top of the form and then answer the nine questions.

A Professional Development Documentation Form is included following page 32 to help attendees keep track of sessions/events attended that are NOT available for online session evaluation. This form can also be used to take notes on sessions attended that are available for online session evaluation.

Beginning June 6, 2012, an attendee can view his or her transcript at the NSTA Learning Center *(learningcenter.nsta.org)* by clicking on "My PD Record and Certificates." Attendees can also document credit for activities that are not being evaluated (e.g., Exhibit Hall visits, featured speakers, meetings, etc.). Each attendee is responsible for tracking his or her own attendance at such events. The transcript can be printed here and presented to an administrator who requires documentation of participation in the forum. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

## **Atlantic City Convention Center**

Hall A H SCIENCE BOOKSTORE **NSTA EXHIBITS** REGISTRATION Hall B DRIVE-IN RAMP NSTA DRIVE-IN RAN 4 L Ñ 0100  $\diamond$ FLEX HALI DRIVE-IN RAMP • Ы DRIVE-IN RAMP Hall D

Second Level (Exhibit Halls)



## Atlantic City Convention Center



# New Science Teacher Academy Comprehensive Professional 2012–2013

**Development Scholarships for New Teachers** 

NSTA offers second- and third-year middle and high school science teachers the opportunity to participate in the New Science Teacher Academy, a one-year professional development and mentoring program. Emphasizing quality science teaching, enhanced teacher confidence, classroom excellence, and solid content knowledge, participants (Academy Fellows) enjoy top-notch face-to-face and online support and access to comprehensive education resources.

#### **Academy Fellow Benefits:**

- Full membership in the National Science Teachers Association
- Facilitated online curriculum focusing on science content and applicable classroom pedagogy
- Unlimited use of resources, including vetted web links for lesson plans, links to state and national standards, professional organizations, safety tips, and more
- E-mentoring from experts in the Fellow's science discipline and grade level
- All-expenses-paid (accommodations, airfare, meals, and registration fees) attendance to the NSTA National Conference on Science Education
- Attendance at a Professional Development Institute or a Research Dissemination Conference

#### **Eligibility:**

- Applicants must reside in the U.S.
- Applicants must be entering their second or third year of teaching
- Applicants must be working a schedule with 51% of their classes in middle or high school science



Visit *www.nsta.org/academy* to learn more or to apply by July 1, 2012.

*"This was a great program that provided excellent resources and inspiration."* 

"The New Science Teacher Academy has made a huge impact on my teaching and my ability to cope with the stresses of teaching. I believe my third year is going much smoother and easier because of my participation in the academy. I hope that this program may be expanded and maintained for many years to come."



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Gerald F. Wheeler, Interim Executive Director

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

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#### National Conferences on Science Education

San Antonio, Texas April 11–14, 2013

Boston, Massachusetts April 3–6, 2014

#### 2012 Area Conferences on Science Education

Louisville, Kentucky October 18–20

Atlanta, Georgia November 1–3

Phoenix, Arizona December 6–8

#### 2013 Area Conferences on Science Education

Portland, Oregon October 24–26

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#### LOUISVILLE October 18–20, 2012

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#### ATLANTA November 1–3, 2012 Strands:

- Providing Access for All Students to the Science in STEM
- Effective and Engaging K-8 Science
- No Student or Teacher Left Inside

#### PHOENIX December 6–8, 2012

#### Strands:

- The STEM Puzzle—Putting It Together
- Sustainability: Growing, Nurturing, and Ensuring Our Future
- Literacy: Communicating and Understanding Science



For more information or to register, visit www.nsta.org/conferences or call 1-800-722-6782



### **STEM Forum & Expo Program •** Highlights



		Wednesday, May 16
4	:00-7:00 PM	Expo Preview and Welcome Reception
		Thursday, May 17
9:	15-10:30 AM	General Session I: Kenneth Wesson
2	:00-3:30 PM	Roundtable for STEM Recommendations from Higher
		Education/STEM Industry Leaders—Teachers Invited
		Your Input Is Critical!
3	:00-6:00 PM	Exhibits Open 31
		Friday, May 18
11:45	AM-1:00 PM	General Session II: Mary Ellen Weber
Summer and the second second	:30-2:30 PM	Featured Session: Stay Engaged and Current in
		STEM After the Forum: The NSTA Learning Center:
		Zipporah Miller and Flavio Mendez
2	:00-3:30 PM	Roundtable for STEM Recommendations from Higher
		Education/STEM Industry Leaders—Teachers Invited
and it was the second to		Your Input Is Critical!
	:00-5:00 PM	Exhibits Open (Final Opportunity) 40
	2:30–9:00 PM	"Family" STEM Night 40
		Saturday, May 19
10:30	AM–12 Noon	Poster Session
	2:15-5:00 PM	Wrap Session (Open Forum) 43



Photo courtesy of The Atlantic City Convention & Visitors Authority



The STEM Forum & Expo Steering Committee has planned the forum around the following five strands, enabling you to focus on a specific area of interest or need.

#### PreK-2 (Early Childhood)

How do we get students prepared to think and work in a global word? This process will not happen overnight, but it begins with effective preK–2 STEM instruction. Providing students with inquirybased experiences in science, technology, engineering, and mathematics are the keys to unlocking the world around them. Many foundational skills are taught and mastered during the early years, but through STEM integration, elementary students will not only master required skills, they will be able to unlock the doors before them and enter our global world proficient and prepared. *These sessions begin on page 44*.

#### Grades 3–5

How do we respond to research that indicates that by the time students reach fourth grade, a third of boys and girls have lost an interest in science? How do we ensure that our students receive an education with a solid foundation in the STEM areas so that they are prepared to both work and live in the 21st century? To reverse this trend, it is important that students have successful early STEM learning experiences to generate the curiosity, interest, and confidence in these topics that students will need to pursue careers in STEM fields. The sessions in this strand showcase programs and instructional strategies that support STEM and have been successfully integrated into the elementary core curriculum. *These sessions begin on page 48*.

#### Grades 6–9

With a national push to ensure middle grades students demonstrate mastery of basic skills in math and language arts, how do we teach these subjects most effectively? The answer is an integrated approach to teaching and learning. While science and math have traditionally been relegated to a distinct block of time, effective STEM education is essentially an integrated approach to teaching and learning. The sessions in this strand showcase programs and instructional strategies that support STEM and have been successfully integrated into the traditional middle grades curriculum. *These sessions begin on page 58*.

#### **Administrators**

The United States possesses the most innovative, technologically capable economy in the world, and yet its science, technology, engineering, and mathematics (STEM) education is failing to ensure that all American students receive the skills and knowledge required for success in the 21st-century workforce. The STEM fields are collectively considered core technological underpinnings of an advanced society, according to both the National Research Council and the National Science Foundation. In many forums (including political/governmental and academic), the strength of the STEM workforce is viewed as an indicator of a nation's ability to sustain itself. Maintaining a citizenry that is well versed in the STEM fields is a key portion of the U.S. public education agenda.

Successful STEM programs at the primary and secondary levels align the interrelated nature of science and mathematics education with an emphasis on technology and engineering through hands-on and real-life applications for elementary, middle school, and high school students. As the world moves toward a knowledge-based economy, we need to consider new ways to seed, nurture, and cultivate our manpower to sustain long-term growth. To address this challenge, STEM education must play a key role in the school improvement plan, master schedule, and support and accountability from all stakeholders...from elementary to the university and beyond. *These sessions begin on page 74.* 

#### **Community/After-School/Outreach Programs**

As the nation recognizes the importance of STEM education to our economic future, we are seeing a proliferation of informal initiatives in STEM education and community programs in STEM, with varying degrees of success and impact. The sessions in this strand highlight select initiatives that have demonstrated impact and have been successfully implemented on a broad scale. *These sessions begin on page 81.* 

#### "Family" STEM Night

Friday, May 18, 7:30–9:00 PM Room 302, Convention Center

All STEM Forum & Expo registrants are invited to this exciting and funfilled evening event. Join us as we model a "Family" STEM Night and learn how to organize one at your school.

"Families" will be comprised of four teachers who will be your "family" members. So, whether you already have a "ready-made" family of four; or, if you need to be "adopted" into a family, you can participate! If you already have a "ready-made" family of four colleagues, you may sign up together. If not, don't worry...we can provide adopted "family" members for you!

Families will be challenged with STEM activities and a special prize will be awarded to the winning family.

All participants will receive a "take-away" flash drive that includes additional activities and instructions, PowerPoints, templates for tickets, flyers, and all the materials and resources you'll need to organize one in your community.

There is limited availability for "families." However, you are still invited to participate as an observer. In either case, you won't want to miss this evening of fun, excitement, and learning!

Secure your "Family" by registering at the designated booth in the NSTA Registration area located in Hall B of the Convention Center! See page 40 in the daily program.

#### **Roundtable Task Force**



#### Roundtable for STEM Recommendations from Higher Education/STEM Industry Leaders Teachers invited ... your input is critical!

Innovating STEM education requires a systems approach. While the primary focus of the STEM Forum & Expo is geared toward the elementary and middle school levels, input and considerations from the higher education communities, business, and industry leaders is essential to understand and identify the practices, core concepts, habits of mind, and skill sets that are necessary for today's students to be prepared for tomorrow's workforce

The objective of this series of roundtable discussions is to hear from business and industry representatives as well as higher education and secondary teachers of science, technology, engineering, and mathematics who will provide recommendations and ideas that are designed to improve the academic experiences of preK–8 students and to better prepare them for successful STEM-related careers!

#### Thursday, May 17

Roundtable Session 2:00-3:30 PM 305/306, Convention Center See page 30 in daily program.

#### Friday, May 18 Roundtable Session

 Roundtable Session
 305/306,

 2:00-3:30 PM
 See page 4

305/306, Convention Center See page 40 in daily program.

#### Saturday, May 19 Wrap Session

Hall A, Convention Center

The wrap session will provide an opportunity to hear discussions regarding tools and applications that were shared during the three days of the STEM Forum & Expo. A report from each of the five strand leaders (PreK–2, 3–5, 6–9, Community/After-School/Outreach, and Administrators) as well as discussions from the Higher Education/STEM Industry Leaders roundtables will be provided during this wrap session. Questions will be answered at the end of these reports.

2:15-3:30 PM	Report from Moderators, Strand
	Leaders, Steering Committee (p. 43)
3:30-5:00 PM	SoHow Does STEM "Fit" into
	the Next Generation Science
	<b>Standards?</b> (p. 43)

#### **STEM Forum & Expo Program** • Special Programs

#### **Poster Session**

Saturday, May 19, 10:30 AM–12 Noon Room 411/412, Convention Center

All five Forum strands (PreK–2, 3–5, 6–9, Community/After-School/Outreach, and Administrators) will be represented in this session that has been organized for poster display. This is an opportunity to speak with presenters, ask questions, and give feedback on topics that have been chosen to be of particular interest to you and your teaching community. See page 41 for a complete list of the posters.



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\*Special offer for STEM conference attendees. See page 39 for details and exceptions.



#### **Daily Program**

#### 4:00–7:00 PM Expo Preview and Welcome Reception

#### Hall B, Convention Center

The STEM Forum & Expo will kick off with an exclusive three-hour sneak preview of the Exhibit Hall, including a reception featuring light refreshments. Be among the first to take in the sights and sounds of the Expo as you visit with old friends and meet new friends while enjoying complimentary refreshments throughout the exhibit hall. Brand-new and soon-to-be-released STEM resources will be featured by industry leaders such as Carolina Biological Supply Company, Texas Instruments, Vernier Software & Technology, and many more.

#### Showtime—Special Opening Feature

Bruno Maisonnier, robot entrepreneur at Aldebaran Robotics, will present a special performance "NAO\* Is the Time for STEM Education" during the Expo Preview and Welcome Reception. (\**NAO is pronounced "Now."*)

Powered by Aldebaran Robotics, the NAO Next Gen humanoid robot embodies all that STEM education represents. See how the disciplines of Science, Technology, Engineering, and Mathematics are realized in a breathtaking performance by humanoid robots and learn how humanoid robotics is the next revolution in technology today.

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



#### **Science Area**

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title.

The science areas and their abbreviations are:

(Bio)	=	Biology/Life Science
(Chem)	=	Chemistry/Physical Science
(Earth)	=	Earth/Space Science
(Env)	=	Environmental Science
(Gen)	=	Integrated/General Science
(Phys)	=	Physics/Physical Science

#### Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The strand sessions begin on page 44 (see page 21 for strand descriptions).

#### 8:00–9:00 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 44
Grades 3–5 sessions	page 48
Grades 6–9 sessions	page 58
Administrators sessions	page 74
Community/Outreach sessions	page 81

#### 9:15–10:30 AM General Session I

The STEM Hologram: Several Disciplines; One Interdependent Picture

(General)

Hall A, Convention Center



Kenneth Wesson, Educational Consultant, Neuroscience, San Jose, Calif.

Welcome and Introduction of Speaker: Patricia Simmons, NSTA President, and North Carolina State University, Raleigh

Platform Guests: Kenneth Wesson; Patricia Simmons; Margie Gifford-Hawkins, Chairperson, STEM Forum

& Expo, and Winfree Bryant Middle School, Lebanon, Tenn.; Michael Heinz, New Jersey Dept. of Education, Trenton; John Quinn, Baltimore County Public Schools, Towson, Md.; Tanisha Wesby, Hattie Cotton STEM Magnet Elementary School, Nashville, Tenn.; Michele Williams, SECME, Inc., Atlanta, Ga.

The human brain processes, retrieves, and applies information, not by compartmentalizing it, but instead by integrating it into neural circuitry designed to connect the related parts of "disciplines" in order to make sense of both content and curriculum. STEM should be delivered in learning contexts where disciplinary interdependence is highlighted for young learners. In real-world contexts, the STEM subjects often converge, mimicking the various layers composing a hologram. A single coherent image emerges when academic "layers" produce a single picture from instructionally pragmatic frameworks, where learners regularly exclaim, "Oh, now I see!"

Kenneth Wesson works as an educational consultant for preschool through university institutions and organizations. An expert on the neuroscience of learning and methods for creating classrooms and learning environments that are "brain considerate," Wesson regularly addresses educational organizations and institutions. His work is frequently referenced in Parents Magazine and the journal Brain World.

#### 10:30–11:30 AM Exhibitor Workshops

#### A New Kind of Blended Learning (Gen)

(Grades K–8) 201, Convention Center Sponsor: Carolina Biological Supply Co.

#### Carolina Teaching Partner

How do you find quality e-learning resources that enhance hands-on and inquiry STEM programs? Whether you are looking for whiteboard activities for whole-class instruction or interactive student assignments, this session models how you can find e-learning tools to support hands-on learning and create a blended learning experience in your classroom.

#### Practical Approaches to STEM for Younger Students (Gen)

(Grades K–3) 202, Convention Center Sponsor: PASCO scientific

Joseph Todd, PASCO scientific, Roseville, Calif.

Come learn how to engage younger students with quick and easy STEM activities that make use of PASCO's awardwinning SPARKscience<sup>TM</sup> probeware solutions, including our handheld SPARK and our new SPARKvue HD® solution for the iPad. Hands-on activities will include thermal, light, and sound energy, and force and motion.

#### Project-Based Inquiry Science: PBIS<sup>™</sup> Takes the Confusion Out of Implementing STEM in Middle School (Gen)

(Grades 5–9) Sponsor: It's About Time

Mary Starr, University of Michigan, Ann Arbor

304, Convention Center

PBIS removes the challenges of blending STEM at the middle school level. This middle school curriculum is designed to incorporate the Next Generation Science Standards framework practices in both science and engineering throughout the three-year span of middle school. By increasing students' opportunities to explore both science and engineering through grade-appropriate projects blended with core ideas and crosscutting themes, PBIS encourages students to become student scientists and engineers.

#### A Simple Connection Between STEM and Data Logging (Gen)

(Grades 8–12) 309, Convention Center Sponsor: Frey Scientific/School Specialty Science

Lou Loftin, Northwest Regional Professional Development Program, Reno, Nev.

**Doug Welles,** Frey Scientific/School Specialty Science, Nashua, N.H.

Conduct a STEM-focused activity that links science concepts with the technology of data logging using the new USB  $uLog^{TM}$ . Integrate technology and hands-on inquiry activities effortlessly into the classroom with a cost-effective, easy-to-use data collection and analysis system.

#### Middle School Genetics "Breeding Critters" (Bio)

(Grades 6–8) 322, Convention Center Sponsor: LAB-AIDS, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Make the study of genetics more meaningful for students. Join us for an activity sequence from the Science Education for Public Understanding Program (SEPUP) curriculum from LAB-AIDS that lays a framework for dominant/recessive and other patterns of inheritance. Breed critters to show Mende-lian patterns of inheritance as well as incomplete dominance, co-dominance, and nature *vs.* nurture. In follow-up activities, pedigrees are introduced as another way to study the behavior of certain genes in humans.

#### Anatomy in Clay® Learning System Hands-On Workshop (Bio)

(Grade 9)

401, Convention Center

Sponsor: Anatomy in Clay Learning System

**Leslie Peterson** (*leslie*@*anatomyinclay.com*), Anatomy in Clay Learning System, Loveland, Colo.

The Anatomy in Clay Learning System is an innovative and successful system for teaching and learning anatomy. Join us for a hands-on workshop where you can experience the power of building with clay. Build on a Maniken® model and witness how this system promotes student collaboration, problem-solving skills, and motivation.

#### National Best Practices STEM Curriculum to Improve STEM Literacy for All (K–12) Students (Gen)

(Grades K–12) 404, Convention Center Sponsor: The STEM Academy®

Alan Gomez (alan.gomez@stem101.org), The STEM Academy, Peoria, Ariz.

**Chris Strzok** (*strzokc@cudahy.k12.wi.us*), School District of Cudahy, Wis.

The STEM Academy® is a national nonprofit organization dedicated to improving STEM literacy for all students. Representing a recognized national next generation high-impact academic model, the practices, strategies, and programming are built upon a foundation of identified national best practices that are designed to improve underrepresented minority and low-income student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and improve teacher and principal effectiveness.

#### STEM-ify Your Science Lessons! (Gen)

(Grades 7–12) 405/406, Convention Center Sponsor: Science Kit

Andrew Fulton, VWR Education, West Henrietta, N.Y. Encourage critical thinking and integrate STEM concepts into your science labs with the guided inquiry experiments in this hands-on workshop. We'll use Really Easy Data (RED) probeware to show how easy it is to add practical technology applications to every lesson. Learn and share ideas for life, environmental, and physical science.

#### STE + M: Making the Equation Work in Your Elementary Classroom (Gen)

415, Convention Center

Sponsor: Science Companion

Sam Felicia (skatenrun@aol.com) and Molly Felicia (mollyfelicia@yahoo.com), Science Companion, Medford, N.J.

Join Sam and Molly Felicia as they share practical tips for building strong connections to the math your students need from an inquiry science, technology, and engineering curriculum. From content knowledge to process skills, it's easier than you think to add up to STEM in your classroom.

#### NAO Teach STEM

(Grades 7–College)

(Grades K-6)

419, Convention Center

(Gen)

Sponsor: Aldebaran Robotics

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.

#### 10:45–11:45 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 44
Grades 3-5 sessions	page 49
Grades 6-9 sessions	page 59
Administrators sessions	page 74
Community/Outreach sessions	page 81

#### 12 Noon–1:00 PM Exhibitor Workshops

Engineering the Future: A Practical Approach toSTEM for High School(Gen)(Grades 8–12)304, Convention CenterSponsor: It's About Time

**Yvonne M. Spicer,** Museum of Science, Boston, Mass. STEM is not a buzzword, it's a real need, and Engineering the Future is a real answer. See how the Museum of Science, Boston has packaged a project-based solution that makes implementing STEM as easy as 1, 2, 3, 4. Learn how Engineering the Future's four practical projects make real-world connections, giving students an opportunity to see how science, technology, engineering, and mathematics are part of their everyday world.

#### Solving the Mystery of STEM Using Forensic Science (Gen)

(Grades 9–12) 309, Convention Center Sponsor: Frey Scientific/School Specialty Science

Lou Loftin, Northwest Regional Professional Development Program, Reno, Nev.

**Doug Welles,** Frey Scientific/School Specialty Science, Nashua, N.H.

Conduct a number of STEM-focused forensic activities that link the scientific method with analysis and investigative skills to solve multifaceted "cases" involving fingerprint, trace, DNA, and document evidence. Examine additional STEMfocused assets. See how the program software allows the integration of virtual labs, investigative activities, the preparation of web-based content, and individualized assessment.

#### 12 Noon–1:00 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 45
Grades 3–5 sessions	page 49
Grades 6-9 sessions	page 61
Administrators sessions	page 75
Community/Outreach sessions	page 82

## Fast Cars, Speed, and Collisions!(Chem)(Grades 6-8)322, Convention Center

Sponsor: LAB-AIDS, Inc. Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

How do you choose the safest vehicle to purchase? Analyze motion graphs to understand the mathematics behind a student's trip to school and calculate the changing speeds of a vehicle racing down a track! Students will love exploring force and motion with hands-on activities as they try to gather evidence to make a decision on a vehicle purchase. Research based, field tested, and hands on, the Science Education for Public Understanding Program (SEPUP) builds content and process skills in the context of an issue. SEPUP is Next Generation Science Standards framework ready!

#### Investigating Real-World Physical Science with TeacherGeek (Phys)

(Grades 5–9)

405/406, Convention Center

Sponsor: Science Kit Matt Benware, VWR Education, Rochester, N.Y.

Using high-quality yet affordable physical science equipment, we'll help you bring STEM teaching to life in your classroom. You'll get to try out activities in physical science and engineering concepts to help inspire your students. Get ideas from our staff and other teachers, plus a chance to win prizes.

NAO Teach STEM	(Gen)
(Grades 7–College)	419, Convention Center

Sponsor: Aldebaran Robotics

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.

#### 1:15–2:15 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 45
Grades 3–5 sessions	page 50
Grades 6–9 sessions	page 61
Administrators sessions	page 76
Community/Outreach sessions	page 82

#### 1:30–2:30 PM Exhibitor Workshops

#### FREE Life Science and Biology Resources from HHMI's BioInteractive (Gen)

(Grades 7–College) 201, Convention Center

Sponsor: Howard Hughes Medical Institute

**Jennifer D. Bricken** (*brickenj@hhmi.org*), Howard Hughes Medical Institute, Chevy Chase, Md.

Learn about high-quality, award-winning resources for teachers and students from the Howard Hughes Medical Institute on topics like evolution, DNA, and infectious diseases. Discover free animations, lesson plans, video clips, hands-on activities, short documentary films, interactive Click and Learn features, virtual labs, and more, for use in your biology and life science classroom. All participants will receive resources for their classrooms.

#### A Teacher's Perspective: Project-based STEM

(Phys)

(Grades 9–12)

202, Convention Center

309, Convention Center

Sponsor: Paxton/Patterson Dan Radin, Springfield High School of Science & Technology, Springfield, Mass.

**Bud Johnson** (*bud@paxpat.com*), Paxton/Patterson, Chicago, Ill.

An experienced STEM teacher explains why he implemented a project-based program. Discover how this learning system can expand and enhance your ability to teach all aspects of STEM with engaging, interactive multimedia; handson activities every day; and open-ended problem solving. Students acquire 21st-century skills while improving their performance.

#### The Game Changer in Science Lab Design (Gen)

(Grades 7–11)

Sponsor: Frey Scientific/School Specialty Science Gordon Strohminger and Doug Welles, Frey Scientific/ School Specialty Science, Nashua, N.H.

Explore how STEM impacts the environments in which we teach and how STEM influences lab environment design

to strengthen the 21st-century skills of collaboration and communication. See how technology integration can push traditional boundaries to facilitate access to essential concepts. Discussions include lab design creation and future trends.

Power Up and Design Your Own Battery!(Chem)(Grades 6-8)322, Convention Center

Sponsor: LAB-AIDS, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Although we live a battery-powered lifestyle, most of us (middle school and high school students included) have no idea how batteries actually work. In this hands-on workshop, engage in an activity from *Issues and Physical Science* from LAB-AIDS. Make a wet cell battery, explore the effect of using different metal electrodes on battery output, and consider ways to reduce the number of discarded batteries in the waste stream.

New Ways to Prepare Your Students Using 21st-<br/>Century STEM Initiatives—GO DIGITAL! (Bio)<br/>(Grades 7–College)(Bio)<br/>401, Convention Center

Sponsor: Swift Optical Instruments, Inc. David Doty (david@swiftoptical.com), Swift Optical Instru-

ments, Inc., San Antonio, Tex. The future of science classrooms and workplaces is digital technology. Prepare your students for this future by incorporating Motic software, Swift digital microscopes, and Next Generation Motic digital cameras into your STEM curriculum. Learn how to integrate digital technology and assessment into your current teaching...and get students involved digitally!

Hit the Common	Cores in	Science	(Env)
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(Grades 5–College) 404, Convention Center Sponsor: HANNA® instruments

Kimberly Andrade (kandrade@hannainst.com) and David Minsk (dminsk@hannainst.com), HANNA instruments, Smithfield, R.I.

This workshop will demonstrate how to hit the common core areas in science with HANNA's Backpack Lab Series science test kits. Learn how to take your classroom into the 21st century while getting students involved—interacting and enhancing a variety of skills.

#### STEM-ify Your Science Lessons! (Gen)

(Grades 7–12) 405/406, Convention Center Sponsor: Science Kit

Andrew Fulton, VWR Education, West Henrietta, N.Y. Encourage critical thinking and integrate STEM concepts

#### 2:00–3:30 PM Open Forum Roundtable Discussions

(Open to All) 305/306, Convention Center Roundtable for STEM Recommendations from Higher Education/STEM Industry Leaders—Teachers Invited... Your Input Is Critical!

Innovating STEM education requires a systems approach. While the primary focus of the Forum & Expo is geared toward the elementary and middle school levels, input and considerations from the higher education communities, business, and industry leaders is essential to understand and identify the practices, core concepts, habits of mind, and skill sets that are necessary for today's students to be prepared for tomorrow's workforce.

The objective of this series of roundtable discussions is to hear from business and industry representatives as well as higher education and secondary teachers of science, technology, engineering, and mathematics who will provide recommendations and ideas that are designed to improve the academic experiences of preK–8 students and to better prepare them for successful STEM-related careers!

Your participation in these sessions is important.

A summary of these discussions will be provided during the Wrap Session on Saturday, May 19 from 2:15 to 5:00 PM (see page 43).

in your science labs with the guided inquiry experiments in this hands-on workshop. We'll use Really Easy Data (RED) probeware to show how easy it is to add practical technology applications to every lesson. Learn and share ideas for life, environmental, and physical science.

#### NAO Teach STEM

(Grades 7–College) Sponsor: Aldebaran Robotics (Gen)

419, Convention Center

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.

#### 2:30–3:30 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK–2 (Early Childhood) sessions	page 45
Grades 3–5 sessions	page 51
Grades 6–9 sessions	page 62
Administrators sessions	page 76
Community/Outreach sessions	page 82

#### 3:00-4:00 PM Exhibitor Workshops

Combining Science and Math in Exploring Crystal			
Structures of Salt and Water	(Chem)		
(Grades 3–5)	202, Convention Center		
Sponsor: 3D Molecular Designs &	MSOE Center for Bio-		
Molecular Modeling			

**Margaret Franzen,** MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Explore states of matter using magnetic water and salt models, while reinforcing concepts of shape recognition and calculating volume. A simple activity demonstrates pattern recognition, and development and testing hypotheses. "Feel" the differences in solid, liquid, and gas states with these models, which are available from a free model lending library.

PROGRAM

Modeling a STEM Project and Applying the National Standards to an Engineering Problem (Phys)

(Grades 7–12) 309, Convention Center Sponsor: CPO Science/School Specialty Science

Scott W. Eddleman and Lynda Pennell, CPO Science/ School Specialty Science, Nashua, N.H.

In this hands-on workshop, participants will use the engineering cycle to design and build a wind turbine. Experience how the engineering cycle works and discover tools for implementing STEM projects. How is energy transferred between systems?

#### CAN I Have a Soda? Plastic, Aluminum, or Glass? (Chem)

322, Convention Center

(Grades 6-8)

Sponsor: LAB-AIDS, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

How does designing and manufacturing a drink container relate to the periodic table? This real-life issue is explored as students use evidence to research and choose a material for a soft drink container, test physical and chemical properties of different materials, and apply this to the organization of the periodic table. Activities are selected from the *Chemistry of Materials* Science Education for Public Understanding Program (SEPUP) unit from LAB-AIDS that participants can take home. This unit reflects how SEPUP embeds the Next Generation engineering practices and uses real issues to powerfully deliver content learning.

# Teach the Concepts Well: Online Professional Devel-opment for STEM Teachers and Classrooms(Gen)(Grades K-12)404, Convention Center

Sponsor: EDU2000

Michael Liu (mliu@education2000.com), Michael Baum (mhbaum@gmail.com), and Richard Vineyard, EDU2000, Reno, Nev.

Learning starts with understanding. Highly effective STEM teachers need to communicate an imposingly wide range of concepts in science, technology, engineering, and math. The EDU2000 web-based resource explains all K–12 concepts in multiple ways to ensure mastery. Learn how the same powerful tool works both with teachers and in the classroom.

#### Investigating Real-World Physical Science with TeacherGeek (Phys)

(Grades 5–9)		40	05/40	6, Coi	nvention	Center
Sponsor: Sciend	ce Kit					
17 D			P	1		

Matt Benware, VWR Education, Rochester, N.Y.

Using high-quality yet affordable physical science equipment, we'll help you bring STEM teaching to life in your classroom. You'll get to try out activities in physical science and engineering concepts to help inspire your students. Get ideas from our staff and other teachers, plus a chance to win prizes.

#### 3:00-6:00 PM Exhibits

Hall B, Convention Center Come see the most up-to-date science textbooks, software, equipment, and other teaching materials. Some exhibitors will offer materials for sale.

#### Invitation to a Discussion of STEM Standards of Practice

Thursday, May 17, 4:00–6:00 PM Room 315, Convention Center

Join Donna Clem, coordinator of STEM Initiatives for Maryland's Department of Education, for an open dialogue on STEM standards of practice and their potential implementation. STEM education is an approach to teaching and learning that integrates the content and skills of science, technology, engineering, and mathematics. STEM Standards of Practice guide STEM instruction by defining the combination of behaviors, integrated with STEM content, which is expected of a proficient STEM student. These behaviors include engagement in inquiry, logical reasoning, collaboration, and investigation. The goal of STEM education is to prepare students for postsecondary study and the 21st-century workforce.

#### 8:00–9:00 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 46
Grades 3-5 sessions	page 51
Grades 6-9 sessions	page 64
Administrators sessions	page 77
Community/Outreach sessions	page 83

#### 8:00–9:00 AM Exhibitor Workshops

#### Build and Explore the Future of Space with LEGO Education (Phys)

(Grades 2–5) 201, Convention Center Sponsor: LEGO Education

**Tracey Gunter-Rosen,** LEGO Education, Pittsburg, Kans. Investigate the use of simple machines and forces in microgravity using LEGO Education models and the scientific method. Follow the LEGO 4C process—connect, construct, contemplate, and continue. After being told a story, solve a problem and then use a LEGO Education hammer model to conduct experiments, record data, compare results with data from the International Space Station via video, and answer questions. A design challenge will be issued to complete the workshop.

#### Let's Get Helical: Exploring DNA Structure in Middle School Science (Bio)

(Grades 5-8)202, Convention CenterSponsor: 3D Molecular Designs & MSOE Center for Bio-

Molecular Modeling **Margaret Franzen,** MSOE Center for BioMolecular Modeling, Milwaukee, Wis.

Your students will immediately engage with this friendly, interactive foam DNA model. The DNA Starter Kit<sup>®</sup> is a schematic model that transforms from the familiar ladder shape to the double helix. Your students can explore the structure and replication of color-coded DNA bases that connect to a continuous sugar-phosphate backbone.



#### Developing STEM Process Skills with the Discovery Education Science Techbook (Gen)

304, Convention Center

Sponsor: Discovery Education

(Grades 1-12)

**Patti Duncan** (*patti\_duncan@discovery.com*), Wallenpaupack Area School District, Hawley, Pa.

One of the most important aspects of a quality STEM curriculum is the opportunity for students to develop crucial process skills. Skills such as these are not taught directly but must be developed by experience. Learn how the Discovery Education Science Techbook brings these experiences to the forefront.

#### Materials in Our World (Early Childhood) (Gen)

(Grades K–3) 309, Convention Center Sponsor: Delta Education/School Specialty Science–FOSS Larry Malone and Linda De Lucchi, Lawrence Hall of Science, University of California, Berkeley

For thousands of years, humans have used natural fibers to produce useful materials. Join us to see how early childhood students use FOSS® to explore the properties of paper and investigate how it can be designed and engineered into diverse products.

#### Hot Bulbs

(Chem)

322, Convention Center

(Grades 6–8) Sponsor: LAB-AIDS, Inc.

LAB-AIDS, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

If you've touched a light bulb and wondered how much electrical energy is being "lost" as heat, then you have to attend this workshop. Gather experimental evidence in this engaging lab in order to support a decision about lighting in your house. Students go on to figure light efficiencies and extend their learning about energy in this research-based unit from Science Education for Public Understanding Program (SEPUP).
# NSTA 2012 STEM Forum & Expo Professional Development Documentation Form

All attendees can evaluate concurrent teacher and exhibitor sessions online while simultaneously tracking professional development certification (based on clock hours). Use this form to keep track of all sessions/events attended during the STEM Forum & Expo. Sessions/events such as the poster session, featured speakers, the General Session, meetings, and exhibit hall visits are not available for online evaluation. However, these events still qualify for professional development.

**Beginning June 6, 2012, STEM Forum transcripts can be accessed at the NSTA Learning Center (learningcenter.nsta.org)** by logging on with your STEM Forum Badge ID# and then clicking on "My PD Record and Certificates." Keep this form and use it to add the following activities to your STEM Forum transcript. Completed transcripts can be printed from this website and presented to an administrator who requires documentation of participation in the conference. All information in these transcripts will be maintained (and can be accessed) indefinitely as part of an attendee's individual profile.

First Name	Last Name	Badge ID#
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Visit *m.nsta.org* to evaluate sessions via your smartphone, or go to *www.nsta.org/evaluations* to evaluate sessions (work-shops, presentations, and exhibitor workshops) online. See page 11 of the program for instructions.

Sample Questions:	2. The session met my needs.		
I. I selected this session:	3. The information presented was clear and well organized		
a. for immediate classroom use.	4. Safe practices were employed.		
<ul> <li>c. to improve my personal pedagogical knowledge/skill.</li> <li>d. to improve my science content knowledge.</li> </ul>	<ol> <li>The session avoided commercial solicitation (n/a for exhibitor workshops and NSTA Press sessions).</li> </ol>		
, , ,	6. The session should be repeated at another NSTA conference.		
Sample Responses: I=Strongly Agree 2=Agree 3=Neutral 4=Disagre	e 5=Strongly Disagree		
Wednesday, May 16 4:00–7:00 PM			
Start Time End Time Activity/Event Title			

Thursday, May 17	8:00 AM-	6:00 PM
Start Time	End Time	Activity/Event Title
Eriday May 19 9	.00 AM 9.00	DM
Start Time	End Time	
Start Time		Activity/Event Title
Saturday, May 19	8:00 AM-5:0	00 PM
Start Time	End Time	Activity/Event Title

New Ways to Prepare Your Students Using 21st-<br/>Century STEM Initiatives—GO DIGITAL!(Bio)<br/>(Grades 7–College)401, Convention Center

Sponsor: Swift Optical Instruments, Inc.

**David Doty** (*david@swiftoptical.com*), Swift Optical Instruments, Inc., San Antonio, Tex.

The future of science classrooms and workplaces is digital technology. Prepare your students for this future by incorporating Motic software, Swift digital microscopes, and Next Generation Motic digital cameras into your STEM curriculum. Learn how to integrate digital technology and assessment into your current teaching...and get students involved digitally!

#### Teach the Concepts Well: Online Professional Development for STEM Teachers and Classrooms (Gen)

(Grades K–12) 404, Convention Center Sponsor: EDU2000

Michael Liu (mliu@education2000.com), Michael Baum (mhbaum@gmail.com), and Richard Vineyard, EDU2000, Reno, Nev.

Learning starts with understanding. Highly effective STEM teachers need to communicate an imposingly wide range of concepts in science, technology, engineering, and math. The EDU2000 web-based resource explains all K–12 concepts in multiple ways to ensure mastery. Learn how the same powerful tool works both with teachers and in the classroom.

# Exploring STEM Careers: Viniculture, Enology, and the Role of Science in Wine Making (Chem)

(Grades 9–College) 405/406, Convention Center Sponsor: Fisher Science Education

**Robert Marshall** (marshallr@carnegiesciencecenter.org), Carnegie Science Center, Pittsburgh, Pa.

From the vineyard to the table, modern winemakers employ a multitude of scientific techniques to help them control every stage of the wine-making process. Learn how biology and chemistry are critical components in the creation of highquality wine. Gain hands-on experience using real-world equipment and scientific techniques and walk away with a greater appreciation of the role science plays in this multibillion dollar industry. Discuss ways to incorporate what you learn into your lesson plans and take home activity guides.

## A World In Motion Primary Literacy-based STEM Workshop (Phys)

(Grades K-3) 415, Convention Center Sponsor: SAE International's A World In Motion® Chris Ciuca, SAE International, Warrendale, Pa.

Join SAE International as we share our four new curricular additions to the award-winning A World In Motion (AWIM) family—the new AWIM Primary (K–3) challenges. Walk away with tools to offer hands-on STEM activities to young learners through literacy-based challenges.

NAO Teach STEM	(Gen)
(Grades 7–College)	419, Convention Center

Sponsor: Aldebaran Robotics

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.

# 9:15–10:15 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 46
Grades 3-5 sessions	page 52
Grades 6–9 sessions	page 65
Administrators sessions	page 77
Community/Outreach sessions	page 83

# 9:30–10:30 AM Exhibitor Workshops

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tior	ı									(B	io)
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(Grades 5–9) 201, Convention Center Sponsor: Howard Hughes Medical Institute

Eriko Clements (clementse@hhmi.org), Howard Hughes Medical Institute, Chevy Chase, Md.

Discover classroom-ready lessons, hands-on activities, and online resources to help you teach central and difficult biological concepts in evolution, such as selection, phylogenetic trees, drug resistance, and biodiversity. These free, engaging multimedia resources include inquiry-based investigations, data collection, analysis, and computation.

# Elementary School Science: Key Concepts ThroughHands-On Probeware-based Activities(Gen)(Grades 4-6)202, Convention Center

Sponsor: PASCO scientific

Joseph Todd, PASCO scientific, Roseville, Calif.

Get hands-on experience with a state-of-the-art way to meet elementary science standards when you conduct an activity from the Sally Ride Science<sup>TM</sup> SPARKlabs® series. These activities from Sally Ride Science and PASCO cover the content you already teach through integrated, probewarebased, guided inquiry lessons.

#### Taking Science Notebooks to a New Dimension via Notebook Foldables® (Gen)

(Grades K–12) 303, Convention Center Sponsor: Dinah-Might Adventures, LP

Nancy F. Wisker (nancy@dinah.com), Dinah Zike Academy, Comfort, Tex.

Time flies by in this fast-paced hands-on workshop in which participants cut, fold, and more as they transform basic classroom materials into memorable and useful 3-D graphic organizers called Notebook Foldables. Add dimensionality to student notebooks and leave with your own mini composition book filled with ideas ready to use immediately.

# Project-Based Inquiry Science: PBIS<sup>TM</sup> Takes the Confusion Out of Implementing STEM in Middle School (Gen)

304, Convention Center

(Grades 5–9)

Sponsor: It's About Time

Mary Starr, University of Michigan, Ann Arbor

PBIS removes the challenges of blending STEM at the middle school level. This middle school curriculum is designed to incorporate the Next Generation Science Standards framework practices in both science and engineering throughout the three-year span of middle school. By increasing students' opportunities to explore both science and engineering through grade-appropriate projects blended with core ideas and crosscutting themes, PBIS encourages students to become student scientists and engineers.

#### STEM Experiences for Middle School (Gen)

(Grades 6–8) 309, Convention Center Sponsor: Delta Education/School Specialty Science–FOSS Larry Malone and Linda De Lucchi, Lawrence Hall of Science, University of California, Berkeley

Students work systematically with electronic components and meters to build circuits, measure and monitor electric properties, and use mathematics and logic to construct meaningful explanations for the powerful interactions taking place in their designed systems. Join us for a STEM experience using digital instrumentation from the FOSS® electronics course.

Constructive Destruction	(Earth)
(Grades 6–8)	322, Convention Center
Sponsor: LAB-AIDS, Inc.	

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

When is the last time you engineered a coastal breakwater? Here's your chance! Engineer a coastal breakwater (from the Issues and Earth Science "Erosion and Deposition" unit from LAB-AIDS) and analyze the trade-offs of the design. Explore how the natural world is influenced by our engineered world, which in turn creates more societal issues that must be solved through science and engineering practices. Activities exemplify Next Generation Science Standards frameworks and show how Science Education for Public Understanding Program (SEPUP) embeds the engineering practices and uses real issues to powerfully deliver content learning.

# Bridging STEM and Vernier Technology (Gen)

(Grades 6–12) 401, Convention Center

Sponsor: Vernier Software & Technology

**David Carter** (*info@vernier.com*) and **Patty Rourke** (*info@vernier.com*), Vernier Software & Technology, Beaverton, Ore. Taking STEM education from buzzword to classroom implementation can be challenging. In this workshop, you will participate in a STEM activity appropriate for middle school and high school students that makes use of Vernier Technology. The activity will model an approach you can use to implement STEM education into your curriculum.



#### eCYBERMISSION: Accept the Challenge (Gen)

(Grades 6–9) 404, Convention Center Sponsor: U.S. Army/eCYBERMISSION

Linda McLean and Katie Smith, eCYBERMISSION, Belcamp, Md.

eCYBERMISSION is a web-based STEM competition for grades 6–9 students attending any U.S. or Department of Defense education activity school. eCYBERMISSION challenges students to think about real-world applications of STEM by working in teams to identify a problem in their community and use the scientific method, scientific inquiry, or engineering design process to find a solution. Students compete for state, regional, and national awards, with potential winnings of up to \$8,000. Army leadership recognizes the fundamental importance of STEM fields in education to the global competitiveness and security of our nation, and strives to increase the number of students studying these subjects nationwide.

#### Exploring STEM Careers: Engineering Basics Using K'NEX (Phys)

(Grades 3–8) 405/406, Convention Center Sponsor: Fisher Science Education

**Robert Marshall** (marshallr@carnegiesciencecenter.org), Carnegie Science Center, Pittsburgh, Pa.

In order to be successful in a STEM career, students need to master problem solving, demonstrate the ability to take

#### 10:30–11:30 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 46
Grades 3-5 sessions	page 53
Grades 6-9 sessions	page 66
Administrators sessions	page 77
Community/Outreach sessions	page 84

risks, and make mistakes and learn from them. With the United States creating more than 100 million jobs requiring highly skilled workers, professionals such as engineers will be in high demand. Discover how to use hands-on learning as a way to encourage your students' natural creativity and give them the tools and skills they need to become innovators of the future.

#### A World In Motion Elementary STEM Workshop

(Phys)

(Grades 4–6) 415, Convention Center Sponsor: SAE International's A World In Motion®

**Chris Ciuca,** SAE International, Warrendale, Pa. Experience SAE International's award-winning A World In Motion (AWIM) curriculum designed for grades 4–6. Get a chance to build the popular JetToy car, as well as experience the Skimmer and Gravity Cruiser in this fun, interactive session.

NAO Teach STEM	(Gen)
(Grades 7–College)	419, Convention Center
Sponsor: Aldebaran Robotics	

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.

## 11:00 AM–12 Noon Exhibitor Workshops

Engineering in the Elementary	and Middle School
Classroom: Opportunities for	<b>Integrating Across</b>
Your Curriculum	(Gen)
(Grades K–8)	201, Convention Center
Sponsor: Carolina Biological Supply	Co.
Carolina Teaching Partner	
K-8 engineering requires a fundam	entally different teach-

ing process than typical science teaching. Explore how to integrate engineering design across your curriculum and develop collaboration skills in your students. Experience how to translate engineering processes into classroom best practices. Learn how incorporating engineering design processes affects assessment practices and professional development.

#### STEM Module: Egg Drop

304, Convention Center

(Grades 6–8) Sponsor: PASCO scientific

Joseph Todd, PASCO scientific, Roseville, Calif.

Explore acceleration, gravity, and impact force through hands-on activities, which are part of a problem-based engineering project that incorporates technology and math concepts in a dynamic way. Experience PASCO's awardwinning SPARKscience<sup>TM</sup> probeware solutions, including our handheld SPARK and our new SPARKvue HD® solution for the iPad.

#### STEM Solutions for Elementary and Middle School Classrooms (Gen)

(Grades 6–12)

Sponsor: It's About Time

Tom Custer, It's About Time, Armonk, N.Y.

It's About Time and Fourier Systems have teamed up to help you seamlessly integrate STEM into your science programs. Using a project-based curriculum as an example, learn how to implement probes, data logging, and analysis seamlessly with your students. Walk away with several examples of how to build your STEM classroom.

#### Designing with Electrons (Grades 4–6) (Gen)

(Grades 4–6) 309, Convention Center Sponsor: Delta Education/School Specialty Science–FOSS Larry Malone and Brian Campbell, Lawrence Hall of Science, University of California, Berkeley

Used to make hundreds of things happen, electricity can transfer energy to make light and sound, make things move, and make things hot or keep them cold. Join us to see how FOSS® provides opportunities for students to use electrical components to design and evaluate effective, efficient circuits to solve problems.

#### What's That in Your Breath?

**(Bio)** 322, Convention Center

(Grades 6–8)

Sponsor: LAB-AIDS, Inc.

Lisa Kelp, LAB-AIDS, Inc., Ronkonkoma, N.Y.

Students explore the contents of their exhaled breath by first collecting qualitative data and then quantitatively measuring the amount of carbon dioxide exhaled. Chemical indicators are used to perform a titration. This hands-on inquiry-based lab activity is selected from the *Body Works* Science Education for Public Understanding Program (SEPUP) unit from LAB-AIDS that participants can take home.

# Bridging STEM and Vernier Technology (Gen)

(Grades 6–12) 401, Convention Center Sponsor: Vernier Software & Technology

**David Carter** (*info@vernier.com*) and **Patty Rourke** (*info@vernier.com*), Vernier Software & Technology, Beaverton, Ore. Taking STEM education from buzzword to classroom implementation can be challenging. In this workshop, you will participate in a STEM activity appropriate for middle school and high school students that makes use of Vernier Technology. The activity will model an approach you can use to implement STEM education into your curriculum.

# STEM to S.T.E.R.N. (Science Teaching Enriched by Retired Nerds) (Gen)

(Grades K–8) 404, Convention Center Sponsor: Educational Innovations, Inc.

**Peter Suchmann,** Educational Innovations, Inc., Bethel, Conn.

This workshop will focus on wonder-filled teaching tools and resources collected during 30 years of my science teaching career in Great Neck, N.Y. I will present my favorite interdisciplinary internet resources highlighting STEM and the arts combined with a unique and exciting combination of "motivational magic" and "scientific superlatives."

#### Exploring STEM Careers: Alternative Energy (Env)

(Grades 8–12)

405/406, Convention Center

Sponsor: Fisher Science Education **Robert Marshall** (marshallr@carnegiesciencecenter.org), Carnegie Science Center, Pittsburgh, Pa.

Gain an overview of the real-world issues driving emerging discoveries and growing career opportunities in energy fields. Hands-on investigations will focus on solar, hydrogen, and other alternative energy sources. Uncover techniques you can use to integrate technology and incorporate 21stcentury learning skills into your curriculum. Discuss ways to help introduce career options for your students.

#### A World In Motion Middle School STEM Workshop (Phys)

(Grades 6-8)

415, Convention Center Sponsor: SAE International's A World In Motion®

Chris Ciuca, SAE International, Warrendale, Pa.

Experience SAE International's award-winning A World In Motion (AWIM) curriculum designed for grades 6-8. Get a chance to build the popular Glider, as well as experience the Fuel Cell Vehicle, Gravity Cruiser, and Motorized Toy Car in this fun, interactive session.

#### NAO Teach STEM

## (Gen)

(Grades 7–College) Sponsor: Aldebaran Robotics 419, Convention Center

Nat Dukan, Aldebaran Robotics, Boston, Mass.

Join us for this workshop designed to educate you on humanoid robotics in the classroom in conjunction with STEM and daily life.



#### 11:45 AM–1:00 PM General Session II

#### To Boldly Go: The Unbounded Opportunities in Science and Math

(General)



Hall A, Convention Center

Mary Ellen Weber, Astronaut and Founder of STELLAR Keynotes & Consulting, Dallas, Tex.

Welcome and Introduction of Speaker: Patricia Simmons, NSTA President, and North Carolina State University, Raleigh

The road is long, hard, and trying. How do we convince young gen-

erations to take on STEM fields? The answer is far more complicated than simply making science fun. Drawing from her own diverse experiences and career, Dr. Mary Ellen Weber will share her perspectives and insights on choosing a STEM education, as well as the majesty and inspiration of spaceflight.

Mary Ellen Weber was a NASA astronaut for 10 years, a veteran of two Space Shuttle flights, and one of the youngest to ever go to space. She flew in 1995 aboard Discovery to launch a communications satellite and again in 2000 aboard Atlantis to construct the International Space Station. She is the recipient of the NASA Exceptional Service Medal.

More recently, Dr. Weber was vice president for government affairs for nine years at University of Texas Southwestern Medical Center in which she focused on strategic communications and analytical strategies, successfully increasing annual appropriations from \$100 million to \$170 million.

She is currently with STELLAR Keynotes & Consulting, bringing her unique insights to provide consulting services in communications, in legislative strategy, and in strategies for high-stakes operations. She is a member of the NASA Advisory Council Committee on Technology and Innovation.

An active skydiver, Mary Ellen has logged nearly 5,000 jumps and has 13 medals to date at the U.S. National Skydiving Championships as well as a 2002 world record for the largest freefall formation with 300 skydivers. She received a B.S. degree in chemical engineering from Purdue University, an MBA from Southern Methodist University, and her PhD in physical chemistry from the University of California Berkeley.

(Grades 6-12)

## 12:30–1:30 PM Exhibitor Workshops

STEM and Common Core Standards and Next Generation Crosscutting Concepts and Core Ideas

(Phys)

201, Convention Center

304, Convention Center

Sponsor: LJ Create Mark Weiss (mweiss@ljcreate.com) and Chris Rowe, LJ Create, Holtsville, N.Y.

Let us show you an easy-to-use resource that can allow you to address next generation crosscutting concepts and core ideas, as well as common core literacy standards for science and technology. Our team of specialists has been busy linking STEM scenarios to both common core activities and the next generation crosscutting concepts and core ideas. This is a resource that can be easily and effectively used in any science classroom. All attendees will leave with FREE software.

#### Inspiring STEM Through Robotics (Phys)

(Grades 7–12) Sponsor: FIRST®

**James Novotny,** Livingston High School, Livingston, N.J. **Tim Clarke,** Moorestown Friends School, Moorestown, N.J.

Vincent Frascella, BAE Systems, Wayne, N.J.

See how robotics brings excitement to STEM. Hosted by *FIRST*® Tech Challenge, we'll move beyond traditional robotics competitions to cover teacher experiences, class-room demos/projects, and emerging robotics curricula—all focused on bringing STEM to life.

## CATALYST: STEM Programming in Authentic Contexts (Gen)

(Grades 3–12) 401, Convention Center Sponsor: Connecticut Center for Advanced Technology, Inc. Nicholas Balisciano (nbalisciano@ccat.us), Connecticut Center for Advanced Technology, Inc., East Hartford

CATALYST is grounded in authentic STEM contexts—aerospace, sustainable energy, and oceans. In-school and OST offerings are available in customized packages with professional development, online resources, and individualized support. CATALYST has been field-tested in high-needs districts and is being revised to directly address the Next Generation Science Standards.

#### Exploring STEM Careers: Water and Our Environment (Env)

(Grades 7–12) 405/406, Convention Center

Sponsor: Fisher Science Education

**Robert Marshall** (marshallr@carnegiesciencecenter.org), Carnegie Science Center, Pittsburgh, Pa.

With global population growth creating a rise in demand, access to clean water is becoming increasingly important. In this workshop, you will gain hands-on experience by conducting experiments that use real-world water quality testing and monitoring techniques. This workshop will provide you with the knowledge to conduct water quality monitoring as an inquiry-based environmental education experience with your students.

Posters and Projects in Science Education (Gen)

(Grades 3–10) 415, Convention Center Sponsor: ArtSkills

#### Denise Marshall, Linda Rush, and Michele Demsky, ArtSkills, Easton, Pa.

In this unique workshop, learn the step-by-step process of creating posters by using Poster Wizard technology and hands-on creation materials. These lessons align themselves with the upcoming Common Core Standards, specifically with multimedia components and visual displays in presentation. Make it and take it back to school with you!



#### 1:30–2:30 PM Featured Session

# Stay Engaged and Current in STEM After the Forum: The NSTA Learning Center

(General) 303, Convention Center



Zipporah Miller

#### Speakers:

Zipporah Miller, Associate Executive Director, Professional Programs and Conferences, NSTA, Arlington, Va. Flavio Mendez, Senior Director, NSTA Learning Center, NSTA, Arlington, Va.

The Learning Center is NSTA's professional learning portal designed to enhance educators' pedagogical content knowledge. With more than 8,700 resources, a suite of tools, and a professional learning community—the Learning Center can help! Join us and learn how to activate your account, find the learning resources, manage your learning plan, stay engaged with others online, access the presenters' materials, and retrieve your conference transcript.

\*All conference attendees receive complimentary access to all fee-based resources in the NSTA Learning Center for one year, excluding books, e-books, and online courses.



Flavio Mendez

Zipporah Miller is associate executive director for professional programs and conferences at the National Science Teachers Association. In this position, she leads the Association's efforts in providing professional development and e-learning opportunities to teachers of science nationwide. She oversees NSTA's regional and national conferences, which draw more than 21,000 teachers annually; the NSTA Learning Center, an online portal where thousands of teachers pursue quality professional development resources and specific science content; and the NSTA New Science Teacher Academy for middle school—high school teachers.

Prior to her current appointment, Zipporah served as the K-12 science supervisor and STEM coordinator for the Prince George's County (MD) Public School System. She managed the science office at the Department of Curriculum and Instruction and oversaw more than 150 district science coordinators.

Flavio Mendez is the senior director for the NSTA Learning Center at the National Science Teachers Association. He has more than 17 years of experience in formal and informal education initiatives designed to enhance teachers' professional learning, initially as education coordinator for the Hubble Space Telescope project at the Space Telescope Science Institute, then as director of two science exhibits at the Maryland Science Center, and in his current position at NSTA. Flavio uses his formal training in science and instructional systems to develop high-quality blended programs (on-site and online) for educators across the country. He oversees the implementation of the Learning Center's resources, professional learning tools, and community to enhance cohorts of K–12 teachers' pedagogical content knowledge.

#### 1:30–2:30 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 46
Grades 3-5 sessions	page 54
Grades 6-9 sessions	page 66
Administrators sessions	page 78
Community/Outreach sessions	page 84

#### 2:00–3:30 PM Open Forum Roundtable Discussions

(Open to All) 305/306, Convention Center Higher Education Teachers, Administrators, and STEM Business Leaders invited-your input is critical!

#### Roundtable for STEM Recommendations from Higher Education/STEM Industry Leaders—Teachers Invited...Your Input Is Critical!

Innovating STEM education requires a systems approach. While the primary focus of the Forum & Expo is geared toward the elementary and middle school levels, input and considerations from the higher education communities, business, and industry leaders is essential to understand and identify the practices, core concepts, habits of mind, and skill sets that are necessary for today's students to be prepared for tomorrow's workforce.

The objective of this series of roundtable discussions is to hear from business and industry representatives as well as higher education and secondary teachers of science, technology, engineering, and mathematics who will provide recommendations and ideas that are designed to improve the academic experiences of preK–8 students and to better prepare them for successful STEM-related careers!

Your participation in these sessions is important.

A summary of these discussions will be provided during the Wrap Session on Saturday, May 19 from 2:15 to 5:00 PM (see page 43).

#### 2:00-5:00 PM Exhibits

Hall B, Convention Center This is your final opportunity to see the most up-to-date science textbooks, software, equipment, and other teaching materials. Some exhibitors will offer materials for sale.

#### 2:45–3:45 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 46
Grades 3-5 sessions	page 54
Grades 6-9 sessions	page 67
Administrators sessions	page 78
Community/Outreach sessions	page 84

#### 7:30–9:00 PM "Family" STEM Night

(Open to All) 302, Convention Center

All Forum registrants are invited to this exciting and funfilled evening event! Join us as we model a "Family" STEM Night and learn how to organize one at your school.

"Families" will be comprised of four teachers who will be your "family" members. So, whether you already have a "ready-made" family of four; or, if you need to be "adopted" into a family, you can participate! If you already have a "readymade" family of four colleagues, you may sign up together. If not, don't worry...we can provide adopted "family" members for you.

Families will be challenged with STEM activities and a special prize will be awarded to the winning family.

All participants will receive a "take-away" flash drive that includes additional activities and instructions; PowerPoints; and templates for tickets, flyers, and all the materials and resources you'll need to organize one in your community.

There is limited availability for "families." However, you are still invited to participate as an observer. In either case, you won't want to miss this evening of fun, excitement, and learning!

Secure your "Family" by registering at the designated booth in the NSTA Registration area!

#### 8:00–9:00 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

Grades 3–5 sessions	page 55
Grades 6–9 sessions	page 69
Administrators sessions	page 79
Community/Outreach sessions	page 85

# 9:15–10:15 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 47
Grades 3-5 sessions	page 56
Grades 6–9 sessions	page 69
Administrators sessions	page 79
Community/Outreach sessions	page 85

## 10:30–11:30 AM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 47
Grades 3-5 sessions	page 56
Grades 6-9 sessions	page 70
Administrators sessions	page 79
Community/Outreach sessions	page 86

#### 10:30 AM-12 Noon Poster Session

(General) 411/412, Convention Center All five Forum strands will be represented in this session that has been organized for poster display. This is an opportunity to speak with presenters, ask questions, and give feedback on topics that have been chosen to be of particular interest to you and your teaching community.

# **ADMINISTRATORS Strand**

STEM Education: Preparing for and Opening a STEM Academy Bonnio Mour Monroe (Conn.) Public Schools

Bonnie Maur, Monroe (Conn.) Public Schools

STEM for K-8: Making Quite an Impact in Education Kellie M. Lauth and Tracy Tellinger, Adams 12 School District, Thornton, Colo.

**STEM: Super Teachers Engaging Minds! Kathleen S. Crooks,** Hiram College, Hiram, Ohio

# **Community/Outreach Strand**

The Explorer's Club—Let's Design and Invent: An After-School STEM Partnership Kathleen K. Blouch and Alicia Klepper, Elizabethtown College, Elizabethtown, Pa.

How to Succeed in Robotics Without Really Trying Gail H. Sestito and Doug Rendell, Greenwich Academy, Greenwich, Conn.

Reach Out to Your Kids, Their Families, and the Community by Building a Google Earth Tour Vin Urbanowski, Academy of Information Technology and Engineering, Stamford, Conn.

# Engaging Urban Youth in Climate Science Education Through Service Learning

**Sharon Kinsey** and **Maggie McCann**, Rutgers Cooperative Extension, Cherry Hill, N.J.

## Community/Outreach Strand, cont.

# Oakley STEM Center NASA Teacher Liaisons and User Group

Sally J. Pardue, Tennessee Technological University, Cookeville

Jennifer N. Casey, East Hamilton Middle/High School, Ooltewah, Tenn.

**Paula K. Lansford,** Mount Juliet Middle School, Mount Juliet, Tenn.

#### **Building STEM Gardens**

**Rebecca J. Kalenak** and **Marissa Blodnik**, Rutgers University, Newark, N.J.

# PreK-2 (Early Childhood) Strand

Fairy Tales—Assembly Required!

Elizabeth Kersting-Peterson and Cher Obst, Piedmont Elementary School, Duluth, Minn.

#### Using an eBook to Publish Inquiry Results in Lower School Science

Margaret McCarthy, Eric Walters, and Kathryn Cohen, Marymount School, New York, N.Y.

## Bobsleds: STEM Connections and Collaborations Between Elementary and High School Students

Katheryn Kennedy and Brian Blackmore, Stevens Institute of Technology, Hoboken, N.J.

**Danielle Pearce,** Maple Road School, West Milford, N.J. **Michael Rose,** West Milford High School, West Milford, N.J.

Exploring the Science Encountered in the Young Child's World: Nurturing, Observing, Questioning, Investigating, Thinking, and Talking About Science Donna L. Knoell, Educational Consultant, Shawnee Mission, Kans.

#### Integrated STEM Through Engineering in K–5: Models That Work

Elizabeth A. Parry, North Carolina State Unversity, Raleigh

# STEM at Four and Five: Harnessing Discovery Learning

Linda L. Burroughs, The College of New Jersey, Ewing Nancy Evans Bennett, College of St. Elizabeth, Convent Station, N.J.

#### Grades 3-5 Strand

**Trebuchets: An Interdisciplinary STEM Unit David S. Lisnitzer,** PS/MS 124Q, South Ozone Park, N.Y.

#### Get Caught Engineering

**Wendy S. Goldfein** and **Cheryl A. Nelson**, Newington Forest Elementary School, Springfield, Va.

#### Exciting Hands-On Astronomy Activities for Elementary Students!

**Timothy E. Kent,** Baltimore County Public Schools, Baltimore, Md.

#### Technology Rocks: iPad Apps in Action!

Lisa M. Nyberg, California State University, Fresno Julie V. McGough, Clovis Unified School District, Fresno, Calif.

#### A Gathering of Geologists

Angela J. Marzilli, South Portland (Maine) School District Jamie R. Cluchey, Dyer Elementary School, South Portland, Maine

#### STEM Investigations: Critical Thinking and Problem Solving John D. Hunt, Mississippi College, Clinton

Engineer Through the Year Sandi Reyes, Walden, N.Y.

# Grades 6–9 Strand

#### Effective Strategies for Teaching Science to ELL Middle School Students

Kathryn Scantlebury, University of Delaware, Newark Beth Wassell, Rowan University, Glassboro, N.J. Michael Tamagni, Camden's Promise Charter Middle School, Camden, N.J.

#### **Engaging Youth Through Engineering (EYE) Robert C. Foley, Susan Pruet, Melissa Dean,** and **Judy Dukes,** Mobile Area Education Foundation, Mobile, Ala.

# Grades 6–9 Strand, cont.

# Use a Social Networking Tool to Facilitate Scientific Skills and New Literacies

#### **Shiang-Kewi Wang, Hui-Yin Hsu,** and **Lisa Runco,** New York Institute of Technology, Old Westbury

**Steve Green,** IS 109 Jean Nuzzi Intermedia School, Queens, N.Y.

Mayen Davis, The Young Women's Leadership School of Queens, N.Y.

**Vivian Alforque,** The Middle Village School, Middle Village, N.Y.

# The Freshman Robot Project

Heather B. Sondel, Thomas Jefferson High School for Science & Technology, Alexandria, Va.

# Scalable STEM Activities for Grades 3–9

**Gregg J. Molotsky,** Eastern Regional School District, Voorhees, N.J.

Lynn C. Molotsky, Educational Consultant, Voorhees, N.J.

#### Modeling Problem-to-Project Design on Roller Coaster Model

Muhammet Mustafa Alpaslan, Gokhan Ozturk, and Carol Stuessy, Texas A&M University, College Station

## Mission Possible: Good-Bye Diabetes Type II

**Carrie Stokes** and **Felita Wiggins**, Woodson K–8 Academy, Houston, Tex.

# Critical Thinking as THE Unifying Goal of STEM

Peter Rillero, Arizona State University, PhoenixHelen Padgett, Arizona State University, ScottsdaleJames A. Middleton, Arizona State University, Tempe

## Integrating STEM with Media Literacy

Nicole Hesson, Temple University, Philadelphia, Pa. Cecilia D'Antonio, Alice Deal Middle School, Washington, D.C.

# 11:45 AM–12:45 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 47
Grades 3–5 sessions	page 57
Grades 6–9 sessions	page 71
Administrators sessions	page 80
Community/Outreach sessions	page 86

# 1:00–2:00 PM Strand Sessions

Concurrent sessions are scheduled for each strand. See the following pages:

PreK-2 (Early Childhood) sessions	page 47
Grades 3–5 sessions	page 57
Grades 6-9 sessions	page 72
Administrators sessions	page 80
Community/Outreach sessions	page 86

# 2:15–5:00 PM Wrap Session

*(Open to All) Hall A, Convention Center* The wrap session will provide an opportunity to hear discussions regarding tools and applications that were shared during the three days of the STEM Forum & Expo. A report from each of the five strand leaders (PreK–2, 3–5, 6–9, Community/After-School/Outreach, and Administrators) as well as discussions from the Higher Education/STEM Industry Leaders roundtables will be provided during this wrap session. Questions will be answered at the end of these reports.

2:15-3:30 PM	Report from Moderators, Strand Leaders, Steering Committee
3:30-5:00 PM	SoHow Does STEM "Fit" into the Next Generation Science Standards?



# **Science Area**

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title.

The science areas and their abbreviations are:

(Bio)	=	Biology/Life Science
(Chem)	=	<b>Chemistry/Physical Science</b>
(Earth)	=	Earth/Space Science
(Env)	=	Environmental Science

- (Gen) = Integrated/General Science
- (Phys) = Physics/Physical Science

#### Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The sessions listed in this section with red tabs are in the PreK–2 (Early Childhood) Strand (see page 21 for strand descriptions).

# PreK-2 (Early Childhood) Strand Sessions

#### 8:00-9:00 AM Workshops

Using Foldables® to Demystify Scientific Inquiry	
in the Primary Grades	(Gen)
(Preschool–Elementary)	420, Convention Center
Doriel Inez Larrier (learntogrows	a@gmail.com), P.S. 29
James Harrigan School, Brooklyn, N	I.Y.

Foldables and scientific inquiry can go hand in hand. Join me and discover how they can enhance learning in your young students.

# Bridging the Gap: Building Literacy Through STEM (Bio)

(Preschool–Elementary) 421, Convention Center **Pamela S. Chapman** (chapman@exploringtheelements.org) and **Oliver Thomas Roberts** (roberts@exploringtheelements. org), Exploring the Elements, Inc., Jacksonville, Fla.

Empower educators with STEM applications that bring books to life by exercising imagination, integrating realworld experiences, and creating an opportunity for individualized reading experiences.

#### 10:45–11:45 AM Workshops

#### Creating STEM-embedded Literacy Learning Centers (Gen)

(Preschool–Elementary) 310, Convention Center Greg Kelahan (gkelahan@oriskanycsd.org), Oriskany (N.Y.) Central School District

Many primary classrooms use independent student literacy centers to introduce and reinforce literacy concepts. Learn how to develop literacy centers that also address STEM concepts.

#### STEM at Four and Five: Harnessing Discovery Learning (Chem)

(Preschool–Elementary)

**Linda L. Burroughs** (burrough@tcnj.edu; lianateach@aol. com), The College of New Jersey, Ewing

Nancy Evans Bennett (nancyevansbennett@comcast.net), College of St. Elizabeth, Convent Station, N.J.

Use best science practices within investigations incorporating STEM concepts and early childhood discovery learning. Harness what children do naturally and produce creative science learning.

420, Convention Center

# STEM Education for All Early Childhood Students (Gen)

(General) 421, Convention Center

Heidi Gold-Dworkin (drheidi@little-scientists.com), Little Scientists, New Haven, Conn.

Young children are naturally inquisitive. In this workshop, you will learn simple ways to engage their innate curiosity to foster a passion for learning STEM.

# 12 Noon–1:00 PM Workshop

Putting the Leaves in STEM

# (Env)

(Preschool–Elementary) 421, Convention Center Angela Marzilli (marzilan@spsd.org), South Portland (Maine) School Department

Experience a study completed by kindergarten students who learned about trees and surveyed the trees around their school using the Leafsnap iPad application.

# 1:15–2:15 PM Presentation

## Using an eBook to Publish Inquiry Results in Elementary School Science (Earth)

(General) 310, Convention Center Margaret McCarthy, Marymount School, New York, N.Y.

Presider: Eric Walters (ewalters@marymountnyc.org), Marymount School, New York, N.Y.

Join us and learn how to use eBooks as both a publishing tool and an assessment tool in elementary science.

# 1:15–2:15 PM Workshop

#### STEM Literacy: Putting It All Together (Gen)

(Elementary) 420, Convention Center Sara D. Moore (smoore@hand2mind.com), ETA hand2mind, Vernon Hills, Ill.

Take part in hands-on activities with an inquiry focus and literacy grounding. Aligned with current standards, participants will engage in experiences that model fully integrated learning.

#### 2:30–3:30 PM Presentation

Integrated STEM Through	Engineering in K-5:
Models That Work	(Gen)
(General)	310, Convention Center

Elizabeth A. Parry, North Carolina State University, Raleigh

Join me as I introduce an effective model for K–5 integrated STEM schools using engineering and involving every student and teacher. Curricular approach, assessment, and professional development will be presented.

# 2:30-3:30 PM Workshops

#### Engineer Through the Year

(Preschool–Elementary) 420, Convention Center

**Sandi Reyes** (*reyes.sandi@gmail.com*), Walden, N.Y. Discover how weaving engineering projects into existing lessons engages students, promotes higher-level thinking, and teaches problem solving. Explore how these projects support a differentiated classroom.

Fairy Tales—Assembly Requi	red! (Gen)
(Preschool–Elementary)	421, Convention Center
Beth Kersting Peterson (elizabet	h.kerstingpeterson@duluth.
k12.mn.us) and Cher Obst, Piedn	nont Elementary School,
Duluth, Minn.	

In this hands-on workshop, participants use literature, common household materials, science, engineering, and inquiry to engage K–2 students in creative adventures.



(Gen)

#### 8:00-9:00 AM Workshop

Linking Home and School with P.A.S.S. (PortableAffordable Simple Science)(Gen)(Preschool-Elementary)420, Convention Center

Reneé G. O'Leary, Holy Angels School, Newark, Del.

**Peggy Vavalla** (vavallme@comcast.net), DuPont, Wilmington, Del.

Discover simple, multisensory, hands-on early childhood/ elementary explorations (preK-2) in zippered plastic bags with take-home and multidisciplinary follow-up. Walk away with sample lesson plans, bags, and more.

#### 9:15–10:15 AM Presentation

Education Kaleidoscope: Seeing the World ThroughDifferent Lenses(Env)(General)420, Convention CenterJudy L. Moody, Northeastern State University, BrokenArrow, Okla.

**Emily Mortimer** *(emortimer@tulsazoo.org),* Tulsa Zoo, Tulsa, Okla.

By using nontraditional settings, you can improve traditional education through inquiry-based training. Come learn how!

#### 10:30-11:30 AM Workshop

# Engineering the K-2 Curriculum(Gen)(Preschool-Elementary)420, Convention CenterMijana Lockard (mijana.lockard@polk-fl.net), Lincoln

Avenue Academy, Lakeland, Fla. Learn about the engineering process as an integrating

concept in primary curricula. Walk away with a hands-on activity and samples of developed, complete, integrated inquiry-based units for grades K–2.

#### 1:30–2:30 PM Presentation

#### STEM Inquiry, ELL, and Problem Based Learning (PBL) (Gen)

(Elementary) 421, Convention Center Allison Silvaggio (allison.m.silvaggio@adams12.org) and

Jeannine Marie Tennant (jeannine.m.tennant@adams12. org), STEM Magnet Lab School, Northglenn, Colo.

Learn about authentic inquiry Mountain Pine Beetle PBL. Hear how STEM students, including English language learners, developed unique, creative, and innovative solutions using authentic experiences with scientists, researchers, experts, and high-tech presentations.

#### 2:45–3:45 PM Presentation

Engaging Students in Real-World Science Explora-tions, Innovation, and Problem Solving(Gen)(General)421, Convention CenterDonna L. Knoell (dknoell@sbcglobal.net), Educational Consultant, Shawnee Mission, Kans.(Gen)

Have your students doing science while applying mathematics, collaborative thinking, exploration, and critical thinking. Teach your students to observe, investigate, read, utilize peer group discussions and brainstorming, and apply their mathematics and critical-thinking skills as a basis for exploration and real-life problem solving.

## 2:45-3:45 PM Workshop

Let's Rock and Roll!

(Phys)

(Elementary) 420, Convention Center Lisa Nyberg (Inyberg@csufresno.edu), California State University, Fresno

Julie V. McGough (mrmagoojulie2@att.net), Valley Oak Elementary School, Fresno, Calif.

Come explore the concepts of balance, force, and motion through games, toys, and technology. We'll build contraptions to demonstrate specific concepts. Resources galore!

# Saturday, May 19

#### 9:15–10:15 AM Presentation

Kindergarten Engagement Lessons

(Preschool–Elementary) 320, Convention Center Andrea Zdinak Andretta (aandretta5@optonline.net),

(Gen)

Norwalk (Conn.) Public Schools

Education, Flagstaff, Ariz.

Kindergarteners are easily engaged. Let's look at how the inquiry process is accessible for these young learners, beginning with planned engagement lessons.

#### 10:30–11:30 AM Presentation

Inquiry-based Experiences in STEM at the Early<br/>Childhood Level (Ages 2–5)(Gen)<br/>(Preschool–Elementary)320, Convention CenterLillian A. Rankel (lil.rankel@gmail.com), Mt. Airy Happy<br/>Time School, Lambertville, N.J.

**Marilyn Winograd,** MDW Educational Services, LLC, Edison, N.J.

Discover materials for introducing STEM concepts to young children. Fun, exciting, multisensory activities, strategies, and lessons for early childhood years will be presented.



#### 10:30-11:30 AM Workshop

Early Childhood Environmental Education: A Multi-	
disciplinary Start to STEM	(Env)
(Preschool)	321, Convention Center

Barbara R. Pietrucha, Point Pleasant, N.J. Elizabeth Faircloth (*newjerseyplt@gmail.com*), New Jersey Dept. of Environmental Protection, Jackson

Discover hands-on activities that encourage outdoor exploration and nature experiences fostering developmental skills necessary for success in STEM. Handouts!

#### 11:45 AM–12:45 PM Presentation

#### Managing Science in the Early Childhood Setting

	(Gen)
(General)	320, Convention Center
Andrea Zdinak Andretta	(aandretta5@ontonline net)

Norwalk (Conn.) Public Schools

Let's discuss how to incorporate science into the already busy day without dropping other subjects. See how this kindergarten teacher blends science and other subjects.

# 11:45 AM-12:45 PM Workshop

#### Introducing the Engineering Design Process to Young Children (Gen)

(Preschool–Elementary) 321, Convention Center Carol Shields (carol.shields@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Participants will be introduced to primary-level engineering lessons that involve designing, creating, and testing solutions to practical problems presented in children's literature.

# 1:00–2:00 PM Presentation

What Is Science? Integrating Science, Math, Technology, and Literacy in Grade K–12 (Phys) (General) 320, Convention Center William Banko (wbanko@phaco.com), Knowing Science LLC, Armonk, N.Y.

Attention will be paid to how the human brain integrates information that informs our knowledge of how the world works.



# **Science Area**

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(Chem)	=	<b>Chemistry/Physical Science</b>

- (Earth) = Earth/Space Science
- (Env) = Environmental Science
- (Gen) = Integrated/General Science
- (Phys) = Physics/Physical Science

## Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The sessions listed in this section with green tabs are in the Grades 3–5 Strand (see page 21 for strand descriptions).

#### 8:00–9:00 AM Presentation

#### **Revising Curriculum and Implementing STEM**

(Bio)

(Elementary) 410, Convention Center Sumi Hagiwara-Gupta, Stephanie Avena (savena@ cgps.org), and Geneva "Genny" Elias-Warren, Columbia

Grammar and Preparatory School, New York, N.Y. Attention will be placed on the process of curricular integration of STEM into grades 1–5 at a New York City independent school, and the initial outcomes based on teachers' experiences. The revised curriculum places a particular emphasis on STEM with an exploration of the environment and food through a spiraled science curriculum across grade levels.

# 8:00-9:00 AM Workshops

Preparing the Next Generation of Math and ScienceTeachers(Gen)(General)308, Convention Center

Lisa Wilkes (lisa-wilkes@utc.edu), The University of Tennessee at Chattanooga

Hear about an innovative way math and science teachers are being trained. We will examine the UTeach Institute model as practiced by UTeaChattanooga that combines both hands on and lecture.

#### A Two-Part Maglev Challenge (Gen)

(Elementary–Middle Level) 407, Convention Center David Lisnitzer (dlisnitzer@gmail.com), PS/MS 124Q, South Ozone Park, N.Y.

Maglev cars are cars that float on magnets. Design, build, and test your own maglev car...and take home the entire unit, which includes rubrics, writing prompts, and templates.

#### A Gathering of Geologists

(Earth)

(Elementary–Middle Level) 409, Convention Center Angela Marzilli (marzilan@spsd.org), South Portland (Maine) School Department

Jamie Cluchey (jamiecluchey@gmail.com), Dyer Elementary School, South Portland, Maine

Using an article from NSTA *Science Scope* as inspiration, students participate in a geology conference through blogging and a website, deepening their understanding of plate tectonics.

#### Mad About Madagascar: Incorporating STEM via Foldable<sup>®</sup> Projects (Gen)

(Elementary) 411, Convention Center

Robert Stremme, Twin Spring Day Farm School, Ambler, Pa.

In this fast-paced make-and-take session, participants fold, cut, and more to create a Madagascar-themed Foldables project designed with STEM at the forefront.

# 10:45–11:45 AM Presentations

#### **Evolution of an Elementary STEM Charter School** (Gen)

(General)

(Elementary)

408, Convention Center Jack Samuelson (jsamuelson@wi.rr.com), Wauwatosa STEM School, Wauwatosa, Wis.

Hear how the Wauwatosa STEM School became a pioneer in elementary STEM education in Wisconsin through visionary leadership, parental engagement, and community partnerships.

#### Green and Renewable Energy Workshop (GREW): A STEM Summer Experience for K-8 Teachers

(Gen)

(Elementary–Middle Level/College) 410, Convention Center Lauren D. Rentfro (rentfrla@lewisu.edu), Dorene Huvaere (huvaerdo@lewisu.edu), and Ray Klump, Lewis University, Romeoville, Ill.

Get an overview of a grant-funded summer professional development experience for practicing K-8 teachers designed to enhance the participants' STEM knowledge using the timely topic of green and renewable energy as a focus.

#### **Imagine and Invent: Inspiring Engineering Design** (Gen)

(Elementary–Middle Level/Informal) 411, Convention Center Alan J. McCormack (amccorma@mail.sdsu.edu), NSTA Retiring President, and San Diego State University, San Diego, Calif.

Recent reports warn that the U.S. is slipping in the area of innovation. Here are some exciting techniques that can be used to stimulate students' creativity.

## 10:45–11:45 AM Workshops

#### **Interactive Formative Assessment** (Gen)

(Elementary—Middle Level) 308, Convention Center Rebecca Bowers (rbowers@gstboces.org), Brande Flaitz, Michael Bostwick (mbostwic@gstboces.org), and Jeremy Wheeler, The Greater Southern Tier BOCES, Elmira, N.Y. Walk away with a multitude of formative assessment strategies that can be quickly and easily implemented into your classroom.

Much A	Ado	About	Almost	Nothing:	Vacuums	and
Gravity	<i>,</i>				(P	hys)

409, Convention Center

**Donna M. Barton** (*bartond*(*a*)*duvalschools.org*) and **Betty J.** Kelley (kelleyb1@duvalschools.org) and Cedar Hills Elementary School, Jacksonville, Fla.

How does a vacuum affect the force of gravity? A 5E (Engage, Explore, Explain, Elaborate, and Evaluate) instructional model unit will be used to investigate this question.

# 12 Noon–1:00 PM Presentations

Igniting a Passion for STEM: Ways to Increase Access, **Equity, and Engagement** (Gen) 408, Convention Center (Elementary) Kelli Ellickson and Cathy Kindem (cathy.kindem@ district196.org), and Cedar Park Elementary STEM School, Apple Valley, Minn.

Nurture active student participation, inquiry, and a deeper understanding of STEM through the use of effective grouping strategies, citizen science projects, and Building Understanding Zones (BUZ).

#### Engineering Now: A Multidimensional, Inquirybased Professional Development STEM Immersion Experience (Phys)

(Elementary—Middle Level)	410, Convention Center
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Regina D. Rahn (rrahn@aurora.edu), Aurora University, Aurora, Ill.

Jessica Astrug (jessicaastrug@gmail.com), Bardwell Elementary School, Aurora, Ill.

Discussion centers on Aurora University's "Engineering Now" program, a collaborative STEM experience in physical science for elementary teachers. Examples of classroom implementations will be highlighted.

#### 12 Noon–1:00 PM Workshops

#### The Marshmallow Challenge: Using an Engineering **Design Exercise to Get Kids Thinking Critically** (Gen)

#### (General)

308, Convention Center

Mary Lou Blanchette Smith (msmith@eastconn.org), EASTCONN Regional Education Service Center, Hampton, Conn.

Using spaghetti, string, tape, and a marshmallow, build the tallest freestanding structure. It's not just what you do, but what you don't do, that assures success!

#### Bring Literacy and Science Together: B.L.A.S.T.© for Success at School and Home (Gen)

(Elementary) 409, Convention Center

Reneé G. O'Leary, Holy Angels School, Newark, Del.

Presider: Peggy Vavalla (vavallme@comcast.net), DuPont, Wilmington, Del.

Discover simple, multisensory, hands-on elementary (grades 2-5) explorations using fairy tales as catalysts with takehome and language arts follow-up. Take home sample plans and materials.

#### 1:15–2:15 PM Presentations

**Engineering for the Elementary Schooler** (Gen) (Elementary) 408, Convention Center Jhanna Levin (jhanna.levin@pgcps.org), Asiha Stallworth, and Jessica Witteman, Prince George's County Public Schools, Beltsville, Md.

We brought the "E" in STEM to elementary school. Come learn how we infused standards with the design process to actively engage students authentically.

Schoolwide STEM Program	ı (Gen)
(General)	410, Convention Center
Anitra Jensen, Utah State Un	iversity, Logan

STEM education takes place in many classrooms behind closed doors. Throw open the doors and involve the entire school!

#### Effective Inquiry STEM Lessons for Grades 3-8 (Gen)

(Elementary–Middle Level) 411, Convention Center Arlene Vinion-Dubiel (dubiel@sbc.edu) and Jill Nelson Granger (granger@sbc.edu), Sweet Briar College, Sweet Briar, Va.

Join us as sample inquiry-based STEM lessons for grades 3-8-designed and implemented by teachers with subsequent reflective practice-are assessed using an adapted Science Lesson Plan Analysis Instrument.

#### 1:15–2:15 PM Workshops

#### **Beyond Hands On: Design Challenge Learning**

(General)

(Phys)

308, Convention Center Greg Brown (greg@raft.net), Resource Area for Teaching (RAFT), San Jose, Calif.

Design and build a simple vehicle powered by a spring-loaded badge retractor. Learn how to teach and measure impact of design challenges in your classroom.

#### Hands-On Performance Assessment in Science: An Effective Strategy to Assess Inquiry in STEM Courses (Phys)

(Elementary–Middle Level/Supervision) 421, Convention Center Deborah L. Tucker (deborahlt@aol.com), Independent Science Education Consultant, Napa, Calif.

Grant Gardner (grantmgardner@msn.com), Assessment Services, Inc., Pepperell, Mass.

Assessing inquiry is essential in all STEM courses. Engage in a hands-on science performance task, and explore the uses and advantages of this form of assessment.

# 2:30–3:30 PM Presentations

Creating Future Scientists: Beginning at the Elementary Level (Gen) (Elementary) 408, Convention Center Rebecca Lewis (rnjlewis@comcast.net), Girard College, Philadelphia, Pa.

Walk away with a practical and exciting approach to creating future scientists starting at the elementary ages.

#### Exploring STEM and Increasing Attendance with Discovery Station Days (Gen)

(General) 410, Convention Center

**Oliver Thomas Roberts** (roberts@exploringtheelements.org) and **Pamela S. Chapman** (chapman@exploringtheelements. org), Exploring the Elements, Inc., Jacksonville, Fla.

Join us for a dynamic presentation focusing on how to engage students in rigorous, relevant, and exciting STEM activities that increase both proficiency and attendance.

# 2:30–3:30 PM Workshops

## Teaching Temperature Through Art Integration

(Gen) (Elementary) 409, Convention Center Patricia M. LanzGrand Jacquelyn Lesko (jleskol7@ yahoo.com), Henry Ford Community College, Dearborn, Mich.

Join us for this fun, research-based, hands-on workshop demonstrating how to teach temperature to third-grade students by integrating art with science.

#### **CSI:** Flight Adventures

(Phys)

(Elementary) 411, Convention Center Becky Wolfe (beckyw@childrensmuseum.org), The Children's Museum of Indianapolis, Ind.

STEM projects don't have to be large scale. Discover Flight Adventures, a program using aircraft models to connect engineering, math, and the science of flight.

# Friday, May 18

#### 8:00–9:00 AM Presentations

Technology Rocks: iPad Apps in Action!(Gen)(General)301, Convention CenterLisa Nyberg (Inyberg@csufresno.edu), California State University, Fresno

Julie V. McGough (mrmagoojulie2@att.net), Valley Oak Elementary School, Fresno, Calif.

Learn about engaging iPad apps for STEM instruction and assessment. Yes! There is an app for that!

# EcoSTARS: A STEM Teaching Partnership Between K–12 and Higher Education (Gen)

(General) 308, Convention Center Amy Tanner (aetanner@stkate.edu), St. Catherine University, St. Paul, Minn.

EcoSTARS combines math, science, and social studies methods courses with an intensive fieldwork experience, culminating in a unit of STEM teaching in an elementary setting.

## Online Elementary Math and Science Professional Development Duality (Phys)

(General) 408, Convention Center **Chuck G. Fidler** (cfidler@wheelock.edu) and **Barbara Joseph** (bjoseph@wheelock.edu), Wheelock College, Boston, Mass. Join us as we address the delivery of online mathematics and

Join us as we address the delivery of online mathematics and science professional development focusing on both content

and process for the elementary classroom. Emphasis will be placed on mathematics, physical science, and life science.

#### BioEYES: An Inquiry-based Science Outreach Program (Bio)

(General) 410, Convention Center Karena Curtis (kcurtis@bcps.org), Baltimore County Public Schools, Middle River, Md.

**Tracy Nelson** (*tracyn@mail.med.upenn.edu*), University of Pennsylvania, Philadelphia

Join us and learn about an inquiry-based science outreach program that teaches conceptual understanding of life science content and processing skills while exciting children to the thrill of scientific discovery.

# Get Caught Engineering (Gen)

(Elementary)

421, Convention Center

Wendy Goldfein (wendy.goldfein@fcps.edu) and Cheryl A. Nelson (cheryl.nelson@fcps.edu), Newington Forest Elementary School, Springfield, Va.

Learn how to set up your own program as the developers share their ideas and adventures in creating an elementary engineering program. Handouts!

#### 8:00-9:00 AM Workshop

**Engineer Through the Year** (*Elementary*)

(Gen)

(Elementary) 409, Convention Center Sandi Reyes (reyes.sandi@gmail.com), Walden, N.Y.

Discover how weaving engineering projects into existing lessons engages your students, promotes higher-level thinking, and teaches problem solving. Explore how these projects support a differentiated classroom.

#### 9:15–10:15 AM Presentations

#### Enhancing Elementary Teachers' STEM Content Knowledge (Bio)

(Elementary/College/Supervision) 408, Convention Center Adah Leshem (adah@iastate.edu) and Karri Haen (khaen@ iastate.edu), Iowa State University, Ames

Learn about socially relevant science workshops that provide elementary school teachers with STEM content and resources for inquiry-based curriculum and instruction development as well as lifelong learning.

#### The Perfect Storm—When Technology and Science Collide (Gen)

(Elementary) 410, Convention Center

**Christine M. Mazza** (*cmazza4@schools.nyc.gov*), New York City (N.Y.) Dept. of Education

Francesca Cristofaro Williams (fcristofaro@wcs.org), Wildlife Conservation Society, Bronx, N.Y.

Discover how to use free or inexpensive technology tools in the classroom to enhance science instruction while bridging the gap between literacy and math.

#### 9:15–10:15 AM Workshops

STEM Explorations for	Elementary Children and
Their Parents	(Gen)
(Elementary)	301, Convention Center

David R. Heil (dheil@davidheil.com), David Heil & Associates, Inc., Portland, Ore.

**Mia Jackson** (*mjackson@davidheil.com*), Foundation for Family Science & Engineering, Portland, Ore.

Inspire the next generation of critical thinkers, innovators, and problem solvers with hands-on science and engineering activities for the whole family.

# The Framework for Igniting Students' Interest in STEM Careers (Gen)

(Elementary) 308, Convention Center Leesa Hubbard (leesa@sallyridescience.com), Teacher in Residence, Sally Ride Science, Lebanon, Tenn.

Using the research-based framework developed by Sally Ride Science, learn ways to stimulate student knowledge and interest in STEM careers.

#### STEM Investigations: Critical Thinking and Problem Solving (Phys)

(Elementary/Supervision) 409, Convention Center John D. Hunt (jhunt@mc.edu), Mississippi College, Clinton Join me and learn how to engage students in STEM investigations. In these investigations, students use everyday materials to build a workable structure.

#### Exciting Hands-On Astronomy Activities for Elementary Students! (Earth)

(Elementary–Middle Level) 421, Convention Center **Timothy E. Kent** (*tkent@bcps.org*), Baltimore (Md.) County Public Schools

Let's engage in activities that integrate science, technology, engineering, math, and art experiences into an elementary space science curriculum.

#### 10:30–11:30 AM Presentations

Inquiry Central: Create an Elementary STEM Lab in<br/>Your School (Gen)<br/>(Elementary) 408, Convention CenterTara C. Bell (tbell@ista-il.org), Washington STEM Academy,<br/>Champaign, Ill.Make STEM Lab—a K–5 lab dedicated to integrating STEM<br/>and emphasizing inquiry—the heart of your STEM program.<br/>Curriculum, lessons, research, and raffles provided!

Forget the Rain Forest—SAVE My Campus! (Gen)(General)410, Convention CenterLisa N. Hinson, Center for the Effectiveness, Fayette-ville, Ga.

Educators on average are losing 5–9 hours a week on lowerlevel discipline challenges. Academics and discipline go hand in hand. Learn how to avoid the "debate bait" and eliminate warnings and multiple requests.

#### 10:30-11:30 AM Workshops

McGyver Science	(Gen)
(Preschool–Middle Level)	301, Convention Center
Linda L. Smith (elementary.scien	ce.teacher@gmail.com), Loud-
enslager Elementary School, Pa	ulsboro, N.I.

From duct tape to paper clips, use everyday items to make science come alive for your students.

#### Science Notebooking: Integrating Literacy and Science Instruction (Gen)

(Elementary–Middle Level) 308, Convention Center Brande Flaitz (bflaitz@gstboces.org) and Jeremy Wheeler (jwheeler@gstboces.org), The Greater Southern Tier BOCES, Elmira, N.Y.

With recent shifts in literacy instruction related to the English language arts (ELA) Common Core standards, science notebooking can provide a bridge between science instruction and these changes.

#### Teaching Problem-solving Strategies in the Elementary Classroom: Helping Students See the Interconnectedness of STEM (Gen)

421, Convention Center

**Donna L. Knoell** (*dknoell@sbcglobal.net*), Educational Consultant, Shawnee Mission, Kans.

(General)

Discussion centers on identifying essential problem-solving strategies and process skills, demonstrating how to develop these process skills across the curriculum, and receiving a wide range of engineering applications for these skills. Handouts!

#### Energy and Its Transformation: An Integration of STEM—What Happens When You Flip a Switch? (Phys)

(Elementary)	409, Convention Center
Gerald Darling, Saint Joseph	College, West Hartford
Conn	-

Join me for a series of inexpensive hands-on activities to help students understand what energy is and how we generate electrical energy...or what happens when you flip a switch.

#### Trebuchets: An Interdisciplinary STEM Unit

	(Gen)
(Elementary)	418, Convention Center
David Lisnitzer (dlisni	tzer@gmail.com), PS/MS 124Q,
South Ozone Park, N.Y.	

Build a trebuchet, a Medieval counterweight catapult, using common classroom materials. Take home the unit plan that incorporates math, social studies, science, and writing.

#### 1:30–2:30 PM Presentations

Constructing Problem Solvers Using LEGO Education WeDo<sup>TM</sup> Robotics(Gen)(Elementary)301, Convention Center

Melissa G. Daniels, John Maple (*jmaple@bcps.org*), and Stefanie Trentacoste (*strentacoste@bcps.org*), Woodholme Elementary School, Baltimore, Md.

Learn about an innovative program that integrates STEM, facilitates teamwork among fourth- and fifth-graders, and promotes problem solving and critical thinking using LEGO Education WeDo<sup>TM</sup> Robotics.

#### PBL3 = Teaching the Whole Child Through STEM (Gen)

(Preschool-Elementary)

Mary E. LaLuna, Michigan City (Ind.) Area Schools

Amanda E. LaLuna-Chorak, Aquinas Catholic Academy, Kankakee, Ill.

PBL3 is an approach that embraces the learning needs of elementary students. This Problem-Based Learning approach engages the learner through play, project, and ultimately Problem-Based Learning through STEM.

#### ITEEA-EbD-TEEMS: Elementary Integrative STEM Education (Gen)

(General) Barry Burk 410, Convention Center

**Barry Burke** (*bburke@iteea.org*), International Technology and Engineering Educators Association, Gaithersburg, Md. Invigorate your science classroom with Engineering byDesign (EbD<sup>TM</sup>), an articulated K–12 elementary STEM curriculum based on the common core standards that engages hands-on design and inquiry to study the grand challenges for engineering. This session is brought to you by International Technology and Engineering Educators Association (ITEEA).

#### 1:30-2:30 PM Workshop

#### Elementary STEM Initiative in Baltimore City Schools (Gen)

(Elementary/Supervision) 409, Convention Center

Katya Denisova (eddenisova@bcps.k12.md.us) and Keisha Matthews (kdmatthews@bcps.k12.md.us), Baltimore (Md.) City Public Schools

**Terrell M. Davis** (*tdavis01@bcps.k12.md.us*) and **Renae L. Newton** (*rlnewton@bcps.k12.md.us*), Montebello Elementary Junior Academy, Baltimore, Md.

This year, Baltimore City Public Schools launched an initiative to engage K–5 students in 45 schools in an integrated science, math, engineering, and literacy project. Sample activities include how to study motion of student-built cars with Vernier hardware; how we teach global ecological issues by having students design motorized oil-cleaning boats and build windmills; and how to teach science and engineering through children's literature.

#### 2:45–3:45 PM Presentations

STEM Demonstration Classrooms: How They AreChanging the Ways We Do Business(Gen)(General)308, Convention CenterKellie Lauth (kellie.lauth@adams12.org) and Tracy Tellinger(tracy.tellinger@adams12.org), STEM Magnet Lab School,<br/>Thornton, Colo.

This presentation will showcase a critical component to STEM education—the classroom—and how teachers are taking on the challenge of STEM education and sharing their classrooms with others, innovating the way traditional professional learning is done. Demonstration classrooms are models of STEM best practice and are expected to house the best teaching and learning. So what do they look like and what impact do they have?

Grades 3–5

# Science STEMs from Interest (Gen)

(Elementary) 408, Convention Center Judy L. Moody, Northeastern State University, Broken Arrow, Okla. Emily Mortimer (emortimer@tulsazoo.org), Tulsa Zoo,

Tulsa, Okla.

Learn how to stimulate interest in science using nontraditional educational venues and connections to life experiences.

#### STEM and Thinkfinity—Perfect Together (Gen)

(Elementary) 410, Convention Center Barbara De Santis (bsdesantis@yahoo.com), Sayreville Public Schools, Parlin, N.J.

Locating high-quality STEM resources for all grades can be time consuming. Explore free lesson plans, interactives, and activities at *http://thinkfinity.org*.

# 2:45–3:45 PM Workshops

#### Forget Science, Teach Literacy—How to Do Both (Gen)

(Elementary) 301, Convention Center Sharon LaRosa (larosa@swampscott.k12.ma.us), Hadley

Elementary School, Swampscott, Mass. Discover how to incorporate science into your curriculum with applicable hands-on literacy strategies.

# Parallel Processes: Problem Solving and Scientific Inquiry (Gen)

(Elementary–Middle Level) 409, Convention Center Sara Delano Moore (smoore@hand2mind.com), ETA hand-2mind, Vernon Hills, Ill.

Learn how inquiry processes across disciplines are very much the same, and bring these processes for mathematics and science together through common language and learning experiences.

# Saturday, May 19

#### 8:00-9:00 AM Workshops

# STOP for Science! A Schoolwide Science Enrichment Program (Gen)

*(Elementary–Middle Level/Informal)* 313, Convention Center **Patrick Slane,** Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass.

Hear how innovative materials and demonstrations on topics ranging from swinging a baseball bat to exploding stars can make your students STOP for Science!

#### Growing Science Achievement with the Junior Master Gardener Program (Env)

(Elementary) 408, Convention Center Lisa Whittlesey (*l-whittlesey@tamu.edu*), Texas AgriLife Extension Service/Texas A&M University, College Station Junior Master Gardener showcases hands-on garden activities, highlighting basic gardening, plant parts/processes, and growing techniques. You'll discover activities you can use in your classroom.

#### Blending STEM Curriculum with a Study of Forces and Motion (Phys)

(General)	409, Convention Center
Nancy Magnani	(nmagnani@eastconn.org), EASTCONN,

Hampton, Conn.

This workshop incorporates the engineering design process into intriguing blended STEM curricula. Engage in handson inquiry-based lessons, including huffer/puffer cars and pop rockets.

#### Engaging Students in Problem-Based Learning (PBL) (Gen)

(Elementary) 410, Convention Center Eileen Patrick (eileen.patrick@adams12.org), STEM Magnet

Lab School, Northglenn, Colo.

Learn to engage your students in authentic PBLs by actively participating in one. Discussion centers on how to select panel participants and rubrics.

#### 9:15–10:15 AM Workshops

**Fingertip Dip Paper Shapers** 

(Elementary)

(Gen)

313, Convention Center Edward C. Robeck, ClaudiaR. Burgess, and Brandy J.

Terrill, Salisbury University, Salisbury, Md.

Make small pieces of recycled paper and experience how this process can lend itself to lessons that support integrated STEM and standards-oriented instruction.

#### ConnectE2D: Engaged and Exploring the Elementary Classroom! (Gen)

(Elementary) 408, Convention Center Amanda Stone (amstone@hoover.k12.al.us) and Dana **Joyner** (*djoyner*(*a*)*hoover.k12.al.us*), Hoover (Ala.) City Schools ConnectE2D is a hands-on workshop for participants to come learn about STEM units through activities, conversations, and resources that actively engage students. Walk away with many technology resources, hands-on lessons, examples of units, wiki links to all lessons used, and great conversations.

#### **Keeping Things in Motion...**

#### (Earth)

(General) 409, Convention Center Linda L. Smith (elementary.science.teacher@gmail.com), Loudenslager Elementary School, Paulsboro, N.J.

Use STEM techniques and NASA Space Science to spice up your classes, excite your students, and teach about Newton's laws of motion.

Investigating Science, Using Technology, and Facilitating Learning—Really? Really! (Env) (General) 410, Convention Center

William J. Donahue (donahwil@wcps.k12.md.us), Washington County Public Schools, Hagerstown, Md.

What happens when you integrate technology with a science experiment? Come experience how you can use video podcasts to help students conduct lab investigations.

#### 10:30–11:30 AM Presentation

Developing Next Generation P	rofessionals Through
Schoolwide STEM Activities	(Gen)
(Elementary)	408, Convention Center
John Maple (jmaple@bcps.org) and	Stefanie Trentacoste
(strentacoste@bcps.org), Woodholr	ne Elementary School,
Baltimore, Md.	

Hear how Woodholme Elementary School successfully serves a very large and diverse population by enriching students' STEM education through a variety of curricula, programs, and after-school activities.

## 10:30–11:30 AM Workshops

**Rocket Building Is Out of This World** (Earth) (Elementary–Middle Level) 313, Convention Center Joan Gillman (joan.gillman@calhoun.org), The Calhoun School, New York, N.Y.

How often do children look up at the stars and imagine themselves traveling to new planets and galaxies? This workshop will demonstrate how to design, build, and test straw rockets. In the process, we will see how to integrate STEM components into the curriculum.

#### **Building Bridges**

(Phys)

(Elementary–Middle Level) 409, Convention Center Becky Blumenthal, The Berkeley Carroll School, Brooklyn, N.Y.

Bring simple physics and engineering concepts to life through building bridges out of inexpensive materials such as paper and rope. Note: Hands-on activities available to the first 30 participants.

#### We Can! WeDo Elementary STEM (Gen) (Elementary) 410, Convention Center

Jack Fahle and Michele Bubley Wiehagen (michele. wiehagen@sdhc.k12.fl.us), School District of Hillsborough County, Tampa, Fla.

Based on standards that incorporate elementary robotics, learn how WeDo lessons and design challenges can teach STEM to your students.

#### 11:45 AM-12:45 PM Workshop

#### Integrative STEM: An Elementary School Model at Work (Gen)

(Elementary) 410, Convention Center

**Amy Sabarre** (*asabarre*@*harrisonburg.k12.va.us*) and **Jackie Gulino**, Harrisonburg (Va.) City Schools

Learn the ropes behind planning, developing, and implementing I-STEM design challenges directly with science pacing in an elementary school setting.

#### 1:00–2:00 PM Presentation

Engineering in Elementary	y Schools: Designing a
Rubber Band Car	(Phys)
(General)	408, Convention Center
Augusto Z. Macalalag, Jr. (au	gusto.macalalag@stevens.edu),
Stevens Institute of Technology,	, Hoboken, N.J.
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Marilyn Ortiz and Marlene Aviles, Reverend Dr. Ercel F. Webb School, Jersey City, N.J.

Design a rubber band car, which is an activity from a workshop that engaged teachers in the engineering design process.

#### 1:00-2:00 PM Workshop

How Do You STEM Up?	(Gen)
(General)	409, Convention Center
Renee Williams (rwilliams@as	setinc.org) and Emily A.
<b>Dennis</b> (edennis@assetinc.org), A	SSET STEM Education,
Pittsburgh, Pa.	

Make the most of your time! Discover ways to intentionally address the T.E.M. in a typical science lesson to enhance any elementary core curriculum.



**Grades 3-5** 

# Thursday, May 17

# **Grades 6–9 Strand Sessions**



# **Science Area**

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title.

The science areas and their abbreviations are:

(Bio)	=	Biolog	y/Life	Science
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- (Chem) = Chemistry/Physical Science
- (Earth) = Earth/Space Science
- (Env) = Environmental Science
- (Gen) = Integrated/General Science
- (Phys) = Physics/Physical Science

#### Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The sessions listed in this section with orange tabs are in the Grades 6–9 Strand (see page 21 for strand descriptions).

#### 8:00–9:00 AM Presentations

#### Authoring Science Case Studies Using a Wiki

(Gen) (Middle Level–College) 310, Convention Center Judith Ann Bazler (jbazler@monmouth.edu), Monmouth University, West Long Branch, N.J.

Join me as I present the process of authoring integrated science case studies for a group assignment using a wiki.

#### Sneaking in STEM

(Gen)

(General) 318, Convention Center Kathy R. Brandon, Robert Sayers, Laurie Ilgenfritz, Christy Bucker, Wendy Jordan, Katie Saravia, and Benjamin Williamson, STARBASE Louisiana, Barksdale Air Force Base

Discover creative and inspiring ways to weave STEM emphasis into your curriculum. Enjoy fun and practical ideas to help students recognize that STEM skills are foundational and interdependent. STEM is EVERYWHERE, and STEM is for EVERYONE!

ISS Live! Using Real Data in Your Classroom (Gen) (Middle Level—High School/Informal) 319, Convention Center Rebecca L. Jaramillo (rebecca.jaramillo@nianet.org), National Institute of Aerospace, Hampton, Va.

Sharon Bowers (sharon.bowers@nianet.org), National Institute of Aerospace/Virginia City Beach Public Schools, Hampton, Va.

Connect students to real data from the International Space Station. Find out how the most complex structure ever built in space works on a daily basis.

#### The World of Google in STEM (Gen)

(Elementary—High School) 413, Convention Center Ben Smith (ben@edtechinnovators.com), Jared P. Mader (maderj@rlasd.net), and Eric Wilson (wilsone@rlasd.net), Red Lion (Pa.) Area School District

Google is more than just a search engine. Join us as we explore the many tools created by Google and discover how to use them in your classroom.

# 8:00-9:00 AM Workshops

#### Connecting STEM and Real-World Issues (Gen)

(Elementary–Middle Level) 313, Convention Center Karen E. Johnson (karen.johnson@adams12.org), STEM Magnet Lab School, Northglenn, Colo.

Walk away with a model of integrated STEM instruction that facilitates student learning of authentic problem-based scenarios.

Scalable STEM Activities for Grades 3–9 (Phys) (Elementary–High School) 314, Convention Center Gregg Molotsky (gmolotsky@comcast.net), Eastern High School, Voorhees, N.J.

**Lynn Molotsky,** Educational Consultant, Voorhees, N.J. Engage in activities that promote scientific thinking and engineering principles while providing a focused learning context. One involves "alien" artwork and the other involves constructing a functional dog collar that lights up. These hands-on activities can be used at any level.

# STEM Today, Degree Tomorrow (Gen)

(General) 315, Convention Center Elizabeth Sutton (emsutton@uwm.edu), University of

Wisconsin-Milwaukee

The STEM Today, Degree Tomorrow program introduces students to the STEM fields through integrated activities. Explore the engineering design process through this inquirybased program.

# Whole Lot of Shaking Going On (Earth)

(Middle Level)

320, Convention Center

**Curtis J. Varnell** (*curtis.varnell@wscstarfish.com*), Western Arkansas Educational Cooperative, Branch

**Minnietta Ready** (*mready@uca.edu*), University of Central Arkansas, Conway

Join us for an interdisciplinary approach using engineering, literacy, math, history, and science to investigate the New Madrid earthquake. Take home lesson plans and activities.

# An Engineering and Technology Twist on the Egg Drop Activity (Gen)

(Middle Level) 417, Convention Center **Fran Zak** (fzakutan@gmail.com), Retired Educator, Montvale, N.J.

Engineer and create a device to protect your egg during a fall. This activity incorporates Problem-Based Learning, engineering, technology, and collaboration.

# 10:45–11:45 AM Presentations

# Water Purification: A STEM Approach to Physical Separation (Chem)

(Middle Level–High School) 313, Convention Center John C. Scali (john.scali@bsd.k12.de.us), Concord High School, Wilmington, Del.

Learn about a unit developed around STEM principles where students explore physical separation and properties as well as identification of matter in the context of water purification.

## The Harnessed Atom: New Ideas, Tools, and Resources for Teaching Nuclear Science and Energy as Middle School STEM Extension (Phys)

(Middle Level) 314, Convention Center

Marie Westfall (marie.westfall@orau.org), Oak Ridge Associated Universities, Oak Ridge, Tenn.

**Peter Xiques** (*peter.j.xiques@saic.com*), SAIC, Inc., Oak Ridge, Tenn.

Walk away with free STEM materials on energy science and nuclear energy. Harnessed Atom includes lesson plans, interactive games, hands-on activities, student collaboration, and teacher resources. Go West, Lewis and Clark! Enhancing History with STEM Integration (Gen) (Elementary–High School) Robert Miller (millerma (2) mac.com), Port Orange Elementary School, Port Orange, Fla. See how one class integrates science, math, and orienteering

in a culminating excursion that models the scientific ventures of Lewis and Clark.

#### 10:45–11:45 AM Workshops

Who Knew Rocks Could Be So Interesting?(Earth)(General)319, Convention CenterSusan Holmes (sholmes@fi.edu), The Franklin Institute,Philadelphia, Pa.

Teaching any science content effectively requires engaging approaches and content relevance. Experience learning related to rock types and tectonics that continuously elicits the session title.

#### NASA Smart Skies: Investigating Motion with an Air Traffic Control Simulator (Phys)

(Middle Level) 320, Convention Center **Rebecca Green** (arc-smartskies@mail.nasa.gov), NASA Ames Research Center, Moffett Field, Calif.

Use a web-based simulator to predict the movement of aircraft and resolve air traffic control conflicts. Join us for this interactive approach that connects science with distance– rate–time mathematics.

#### 10 Awesome STEM Lessons

(Gen)

(Middle Level—High School) 318, Convention Center Patti Duncan (duncanpatt@gmail.com), Wallenpaupack Area School District, Hawley, Pa.

Integration, integration, integration—that is what STEM is all about! These lesson ideas show how real-life learning is STEM learning.

#### **It's Infectious!**

(Bio)

(Middle Level) 407, Convention Center Eva M. Ogens (eogens@ramapo.edu), Ramapo College of New Jersey, Mahwah

Let's play a game and then use a computer simulation to model the effects of antibiotics on bacteria while learning about the impact of bacterial resistance.

#### Building Underwater Remotely Operated Vehicles (SeaPerch) in the Classroom (Gen)

(Middle Level–High School/Informal) 417, Convention Center **Maureen B. Barrett** (mbarrett@mountlaurel.k12.nj.us), Harrington Middle School, Mount Laurel, N.J.

Come see how middle school students are exploring ocean technology by building remotely operated vehicles (ROVs) called SeaPerch.

# 12 Noon–1:00 PM Presentations

#### Increasing Student Research by Maximizing Participation in Fairs: Three Exemplary Programs (Gen)

(Middle Level–High School) 314, Convention Center Peter Rillero (rillero@asu.edu), Arizona State University, Phoenix

Independent research in science, mathematics, and engineering is an important part of STEM education. Hear about case studies from Ireland, Costa Rica, and Marlborough, Massachusetts, that maximize participation in fairs.

# Middle Level STEM: Public School/University Curriculum Development Partnership for Engaging Problem Solving (Gen)

(General) 315, Convention Center **Karen A. High** (karen.high@okstate.edu), Oklahoma State University, Stillwater

**Rebekah Hammack** (bhammack@stillwaterschools.com), Stillwater Middle School, Stillwater, Okla.

Engage problem solving in your students with five middlelevel integrated STEM curriculum units developed by a local middle school and university that include art, creativity, and writing.

#### BOB and EVA Go to Middle School! (Env)

(Middle Level–High School) 320, Convention Center June Teisan, Harper Woods Middle School, Harper Woods, Mich.

Water quality data collection has never been more exciting. Hear how one urban middle school is building and deploying buoys to energize STEM learning!

Computer Models: A Common STEM Thread (Gen)(Middle Level-College/Supervision)417, Convention CenterCharlotte M. Trout and Chris Kopco (kopcochr@wcps.k12.md.us), Washington County Public Schools, Hagerstown, Md.Computer models are mathematics based and used in scienceand by engineers in their work. Learn how we have usedcomputer models to inspire our students.

#### 12 Noon–1:00 PM Workshops

Create an Epidemic!	(Bio)
(Middle Level High School)	313 Convention Center

(Middle Level–High School) 313, Convention Center **Tammy Loper** (tloper@mcpss.com), Jeremiah Denton Middle School, Mobile, Ala.

**Marshall Winters** (marshallwinters@dynamicstrategiesllc. com), Dynamic Strategies LLC, Wetumpka, Ala.

Use project-based technology to engage students in a science fiction plot to reduce the human population for a secret society by creating a virus.

#### GeoMapApp Learning Activities (Earth)

(Middle Level–College) 319, Convention Center Andrew Goodwillie, Lamont-Doherty Earth Observatory, Palisades, N.Y.

**Steve Kluge,** Resources for Geoscience Education, New Milford, Conn.

GeoMapApp Learning Activities are ready-to-use inquirybased STEM modules that promote multidisciplinary learning in today's cutting-edge geoscience classroom.

## 1:15–2:15 PM Presentations

Engaging Youth Through Engineering (EYE) (Gen)(Middle Level)315, Convention CenterRobert C. Foley (rfoley@jaguar2.usouthal.edu), MobileCounty Public School System, Orange Beach, Ala.

**Melissa Dean** (*mdean@maef.net*), Mobile Area Education Foundation, Mobile, Ala.

**Carolyn DeCristofano,** Blue Heron STEM Education, Plympton, Mass.

Learn how the Mobile County Public School System (60,000 students, 100 schools, 70% free/reduced lunch) is using Engaging Youth through Engineering (EYE), a partnershipdriven initiative, as a catalyst for districtwide, systemic STEM reform in the middle grades.

#### Dazzling Deceptions: Discrepant Events That Delight and Mystify! (Gen)

(Elementary–Middle Level/Informal) 318, Convention Center Alan J. McCormack (amccorma@mail.sdsu.edu), NSTA Retiring President, and San Diego State University, San Diego, Calif.

Science experiences that seem contrary to "common sense" are great motivators for kids in STEM programs!

# The Power of Choice: Simulation and STEM Education for Middle School Students (Earth) (Middle Level) 319, Convention Center Rita K. Karl rkarl@challenger.org) and Carlos Nunez (cnunez@challenger.org), Challenger Center for Space Science

Education, Alexandria, Va. Join us as Challenger Center for Space Science Education presents a review of recently published educational research on STEM education and the use of simulation.

#### Connecting Scientists and Engineers in the Laboratory with Teachers and Students in the Classroom (Gen)

(General) 320, Convention Center **Mary B. Satterfield** (mary.satterfield@nist.gov), National Institute of Standards and Technology, Rockville, Md. Let me introduce you to the NIST Summer Institute for

#### 1:15–2:15 PM Workshops

#### Support STEM Teaching Using a Web-based Graphing and Analysis Tool with Long-Term Data Sets

(Bio)

(Middle Level-College) 313, Convention Center Jay Holmes (jholmes@amnh.org), Jim Short (jshort@amnh. org), and Hudson Roditi (hroditi@amnh.org), American Museum of Natural History, New York, N.Y.

This hands-on session demonstrates an online graphing and analysis tool to investigate biotic and abiotic data sets charting the zebra mussel invasion of the Hudson River over 20 years.

#### Sounds Like Inquiry: Building Sound Toys to Teach Science, Technology, and Engineering (Phys)

(Elementary–Middle Level) 314, Convention Center Lisa Nyberg (lnyberg@csufresno.edu), California State University, Fresno

**Ana G. Lopez** (*anaglopez4@att.net*), Central Valley Science Project, Fresno, Calif.

Rock on! Use problem-solving skills to build a sound toy! See how a sound unit may be launched with student scientist/ musician/engineers.

#### Engineering the World: Using STEM as a Vehicle for Developing Citizen Scholars (Phys)

(Middle Level—High School) 407, Convention Center Cherisse Campbell (cherisse.m.campbell@gmail.com), Amana Academy, Alpharetta, Ga.

Learn how to use expeditionary learning practices that engage students through developing engineering products that address a real-world need. Middle School Science Teachers. You'll learn how cuttingedge research at the National Institute of Standards and Technology (NIST) is translated into STEM activities for middle school students.

#### STEM Integration Made Easy (Gen)

(Middle Level—High School) 417, Convention Center Dave G. Neese and Philan North (dnorth@fwps.org), TAF Academy, Nat, Wash.

Experience a proven approach to creating an interdisciplinary, technology-rich, standards-based project based on STEM-focused issues relating to systems thinking.

# 2:30–3:30 PM Presentations

Cultivating New Literacies Th	nrough ICTs: Using
Photosynthesis as an Example	(Bio)
(Middle Level)	313, Convention Center
Lisa Runco, Hui-Yin Hsu (hhsu	02@nyit.edu), and Shi-
ang-Kwei Wang (skwang@nyit.edu)	), New York Institute of
Technology, Old Westbury	

**Cindy Roter** (*rgilcin@aol.com*), Queens School of Inquiry, Flushing, N.Y.

Join us as we demonstrate a photosynthesis project using information and communication technologies (ICTs) to engage middle school science students and cultivate their new literacy skills.

Designing a Model Aircraft	(Phys)
(General)	314. Convention Center

Augusto Z. Macalalag, Jr. (augusto.macalalag@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Marlene Aviles and Marilyn Ortiz, Reverend Dr. Ercel F. Webb School, Jersey City, N.J.

Design and launch an aircraft into targets located between 12 and 20 feet away from the takeoff area.

#### Integrating Science and Reading (Gen)

(General) 318, Convention Center Alfred Porter (aporter@atlantapublicschools.us), Atlanta (Ga.) Public Schools

Even with the best teacher efforts, content-area reading comprehension still remains a significant problem for many students. Get introduced to a four-part reading strategy developed and used successfully in a NSF-funded project in Florida. Using an interactive format, apply the strategy to text materials ranging from easy to more complex levels of understanding. The strategy will be linked to inquiry-based science activities, journal writing, vocabulary development, and select graphic organizers, thus illustrating the importance of reading in science learning.



#### 2:30–3:30 PM Workshops

Authentic STEM Assessment: Active, Engaging Prod-<br/>uct and Performance Measures(Gen)(Middle Level-High School/Supv.)315, Convention CenterKaren Crow Roark (kroark@amle.org), Association for<br/>Middle Level Education, Westerville, Ohio

Twenty-first century adults need the capacity to continue learning new information and skills and to be flexible and adaptive thinkers. Fifty assessment strategies set forth detailed explanations of specific activities that can be used to authentically assess student progress in STEM courses.

#### Model My Watershed: An Online Hydrologic Model for Your Neighborhood (Earth)

(Middle Level) 319, Convention Center Susan E. Gill (sgill@stroudcenter.org), Stroud Water Research Center, Avondale, Pa.

**Nanette Dietrich** (*ndietrich@millersville.edu*), Millersville University of Pennsylvania, Millersville

Join us and learn about The Model My Watershed project, which allows students to model hydrology in their own neighborhoods using real data and a professional-grade model.

#### "Stuff," STEM, and Sustainability: Engaging Students in Examining Systems, Resources, and Consumption (Env)

(Informal Education) 320, Convention Center

**Dave Wilton** (*dave@facingthefuture.org*), Facing the Future, Seattle, Wash.

STEM offers tools to answer questions and create solutions. What are the questions? What needs solving? Explore the materials economy, systems, and sustainable design to create solutions in ways that benefit people, economies, and environments.

# Friday, May 18

#### 8:00–9:00 AM Presentations

Use a Social Networking Tool to Facilitate Scientific **Skills and New Literacies** (Bio) (Middle Level) 313, Convention Center Vivian Alforque (valforque928@gmail.com), PS/IS87Q The Middle Village, Middle Village, N.Y. Stephen Green, Jean Nuzzi I.S. 109, Queens, N.Y. Mayen Davis, The Young Women's Leadership School of Queens, N.Y. Hui-Yin Hsu (hhsu02@nyit.edu), Shiang-Kwei Wang (skwang@nyit.edu), and Lisa Runco, New York Institute of Technology, Old Westbury

Join us as we discuss middle school science teachers' experience using a social networking tool (Edmodo) to facilitate students' skills in science and new literacies.

#### Time to Teach

(Gen) (Middle Level) 317, Convention Center David Ricci, St. Lucie County Public Schools, Fort Pierce, Fla.

Learn about research-based classroom management strategies and techniques that can be implemented next week with observable positive results.

## 8:00–9:00 AM Workshops

**Explore Building Mousetrap Vehicles to Integrate** Science, Technology, Engineering, and Mathematics (STEM) (Phys)

(Middle Level) 314, Convention Center Alden James Balmer (al@docfizzix.com), Educational Consultant, Spicewood, Tex.

Presider: Karen L. Ostlund (klostlund@mail.utexas.edu), NSTA President-Elect, and Retired Professor, The University of Texas at Austin

Find out how to integrate science, technology, engineering, and mathematics by building and modifying mousetrap vehicles to improve speed and distance traveled. Mousetrap vehicle kits and handouts will be provided for all participants.

#### Taking Things Apart: How Reverse Engineering **Facilitates Learning** (Gen)

318, Convention Center

Jack Samuelson (jsamuelson@wi.rr.com), Wauwatosa STEM School, Wauwatosa, Wis.

Learn the process of Reverse Engineering (RE) to teach the interdependence of science, engineering, and technologyand practice RE by dissecting a disposable camera.

#### Scaling Across the Solar System: Students Using NASA Technology (Earth)

(Middle Level) 319, Convention Center Louise McMinn (Imcminn@ci.stamford.ct.us), Stamford (Conn.) Public Schools

Challenge your students to develop scale models and explore the Earth, Sun, and Moon using NASA satellites and the International Space Station.

#### To Observe Earth and Visualize the Future—Building Sea Breezes (Env)

(Informal Education) 320, Convention Center Christopher J. Petrone (petrone@udel.edu), University of Delaware, Lewes

How does a sea breeze form? How is it affected by land-use changes? Explore environmental observing system data and role-play a discussion on coastal development.

#### **The Freshman Robot Project** (Gen)

(General) 417, Convention Center Heather B. Sondel, Committee for the Advancement of STEM Specialty Schools, Washington, D.C.

At Thomas Jefferson High School for Science and Technology, all freshmen are exposed to core engineering concepts in their required Introduction to Technology course. The highlight of the course is the student robot project and competition in which each student creates an individual programmable machine from scratch.

(General)

#### 9:15–10:15 AM Presentations

Utilizing the "TE" in STEM: Maglev Train (Phys)(Middle Level/Informal Education)314, Convention CenterMichael Tedeschi (mtedeschi@bcps.org), Perry Hall MiddleSchool, Baltimore, Md.

Allow engineering and technology to drive your content! Have your students create a maglev train and learn content without even knowing it by engaging in the design process.

#### Toward Energy-aware STEM Leaders for the 21st Century (Env)

(Middle Level—High School) 320, Convention Center Michael Robinson (robinson@unr.edu), University of Nevada, Reno

Learn how a recently funded NSF grant to develop green energy projects for secondary science students will be carried out.

# Get SIMulated!

(Elementary–High School) 417, Convention Center Diane L. Kasparie, Quincy Notre Dame High School, Quincy, Ill.

(Gen)

Online science simulations are research-proven, studentcentered, relevant tools that empower great teaching and active learning! Engaging and effective, simulations are aligned to STEM and to state/national standards.

#### 9:15–10:15 AM Workshops

Using Simulations to Engage Students in Inquiry on		
Tough Concepts	(Chem)	
(Middle Level)	313, Convention Center	
Candy Ellard and Elyse	Zimmer (elyse.zimmer@gmail.	

com), The University of Texas at Austin

Engage in an inquiry lesson that has a PhET simulation and discuss the effectiveness of inquiry-based teaching with simulations in the classroom. Take home lesson plans. Visit *http://phet.colorado.edu* for more information.

The	Way	Things	Move
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(Phys) 317, Convention Center

(Middle Level) 317, Convention Center **Karen Kulish** (kkulish@ci.stamford.ct.us), **Eileen Wargo** (ewargo@ci.stamford.ct.us), **Frances D'Agostino** (fdagostino@ ci.stamford.ct.us), and **Janis Rossman**, Scofield Magnet Middle School, Stamford, Conn.

Join us for a comprehensive STEM unit on forces, motion, and rate of change. Participants will receive and experience components of this unit.

#### LEGOS® In Perspective (Gen)

(Elementary–Middle Level) 318, Convention Center Kenton D. Wesby (kwesbysecme@gmail.com), Madison Middle School, Madison, Tenn.

LEGOS In Perspective is designed to teach sixth- and seventh-grade students about the six major educational components: art, history, and STEM (science, technology, engineering, and math).

Measuring Sea Level	from Space	(Earth)
(Middle Level)	319.	Convention Center

(Middle Level) 319, Convention Center Carol A. Kraft (carol.kraft@rps205.com), Rockford Environmental Science Academy, Rockford, Ill.

This activity uses data acquired by the TOPEX/Poseidon altimeter to investigate the relationship between the topography of the sea surface and of the seafloor.

#### 10:30–11:30 AM Presentations

#### Bringing STEM into the Classroom (Gen) (Elementary–Middle Level) 313, Convention Center

**Catherine Krause** (*krause@avesnj.org*), Avalon Elementary School, Avalon, N.J.

Bringing STEM into the classroom can be a challenge. Join me as I discuss my experiences infusing STEM into an existing science program.

#### Research and Technology Ideas in Middle School Education (Phys)

(Informal Education) 314, Convention Center Manju Prakash (manju.prakash@walshstcs.org), Archbishop Walsh Academy, Olean, N.Y.

Join me as I present characteristic properties of the plasma state—the fourth state of matter. I'll highlight the role of plasma in space and astrophysics and discuss the merits of plasma as a source of fusion energy in the future.

# Examining World Problems: Creating Solutions Through Interdisciplinary STEM Activities (Gen)

(Middle Level) 317, Convention Center **Sydney Schuler** (schulesy@dist102.k12.il.us), Park Junior High School, LaGrange Park, Ill.

This presentation examines the design of units based on the theme of world problems. Students use design and technology to help solve world problems.

#### Teach STEM? NASA Explorer Schools Can Help! (Gen)

(General)

319, Convention Center

Jodie Rozzell (nasa-explorer-schools@mail.nsta.org), Director, NASA Explorer Schools, NSTA, Arlington, Va.

NASA Explorer Schools is NASA's classroom-based gateway to middle school and high school classrooms—inspiring students and teachers to participate in NASA's mission through inquirybased experiences.

#### 10:30-11:30 AM Workshop

NSTA Press Session: Everyday Engineering (Gen) (Middle Level) 318, Convention Center Richard H. Moyer, University of Michigan–Dearborn Engage in STEM activities related to everyday engineering (such as ballpoint pens or paper clips) and learn how to create your own lessons accordingly.

#### 1:30–2:30 PM Presentations

#### Jr. BIOTECH

(Bio)

(Middle Level/Supervision) 313, Convention Center Nadja Anderson (nadja@bio5.org) and Uwe Hilgert (hilgert@ email.arizona.edu), The University of Arizona, Tucson

Jr. BIOTECH successfully trains middle school teachers in providing hands-on biotechnology experiences. Join us for details about the Jr. BIOTECH curriculum, teacher recruitment, training, and retention.

#### A Class Called SECME

(Phys)

(General) 314, Convention Center **Mark Eyerman** (mark.eyerman@browardschools.com), Blanche Ely High School, Pompano Beach, Fla.

My SECME Research class is an elective class using a STEM curriculum adapted from SECME hands-on projects. I'll share standards-aligned activities from SECME, a nonprofit organization founded in 1975 by engineering deans from six southeastern universities to address the national challenge of equity in STEM access and education.

Start Me Up! A Quick and Easy Guide to Implement-ing a STEM Initiative at Your School(Gen)(Middle Level)317, Convention CenterBarbara A. Noppinger (bnoppinger@bcps.org) and MatthewCranston (mcranston@bcps.org), Middle River Middle School,Middle River, Md.

What is a STEM initiative? What do you need? How do you do it? Join us for quick and clear answers to those questions and get details on our first-year journey into STEM. Your students will beg to come to STEM class!
# Implementing a STEM Curriculum Within a Curriculum: What Are the Effects of the Human Populationon the Water Supply?(Env)(Middle Level)320, Convention Center

Nadine Gaujean, Patrice Felton, Sidney Bailey, and Jonathan Vermerris, Walker Mill Middle School, Capitol Heights, Md.

Presider: Jonathan Vermerris

Find out how Walker Mill Middle School implemented a STEM module within their school's science and math curriculum. Join us as they share the realities, successes, and challenges they faced.

## 1:30-2:30 PM Workshops

## Simple STEM Projects

(Middle Level) 318, Convention Center Susan E. German (susangermanscienceteacher@gmail.com), Hallsville Middle School, Hallsville, Mo.

(Gen)

Engage in four hands-on activities that emphasize STEM subjects and science practices.

## UODs (Unidentified Old Devices): Using Old-Time Inventions and Oddities to Stimulate Inventiveness (Gen)

(General) 418, Convention Center Alan J. McCormack (amccorma@mail.sdsu.edu), NSTA Retiring President, and San Diego State University, San Diego, Calif.

Sprinkle in creativity and mix in a science teacher with a hobby of collecting century-old kitchen gadgets for this funfilled workshop. Discover how bizarre old-time household implements can be used to promote inference skills, motivation, and scientific/engineering inventiveness in grades 4–9 children.

## Water Quality of the Indian River Lagoon: Integrating TI-Nspire<sup>TM</sup> Technology and Data Analysis

(Env)

(Middle Level—High School) 413, Convention Center Karlheinz Haas (kh76356@gmail.com), Fort Pierce Westwood High School, Fort Pierce, Fla.

Come learn how the unique features of the TI-Nspire, combined with Vernier's DataQuest software, support students' efforts to analyze the factors critical for the ecological health of the Indian River Lagoon marine ecosystem.

## 2:45–3:45 PM Presentations

NETS + STEM = Success in the Digital Age (Gen) (Elementary–High School) 313, Convention Center Ben Smith (ben@edtechinnovators.com), Jared P. Mader (maderj@rlasd.net), and Eric Wilson (wilsone@rlasd.net), Red Lion (Pa.) Area School District

The National Educational Technology Standards are the road map to effective learning. Technology literacy is critical to success in today's society. Add these standards to your curriculum.

# Rube Goldberg: "Engineering" Our Science for the21st-Century Education(Phys)

(Middle Level–High School) 314, Convention Center Joanne F. Aronson (aronsonj@miamicountryday.org), Miami Country Day School, Miami, Fla.

An eighth-grader in motion stays in motion...that's inertia. No, that's the Eighth-Grade Rube Goldberg project—a student-focused and student-driven process. Get details on this science/engineering fair without parental assistance! Rube Goldberg machines introduce engineering design and teamwork at their best. Journal of Integrated STEM Teacher Education (Gen) (Middle Level-College) 317, Convention Center William Hunter (whunter@ilstu.edu) and Brad Christensen (bachris@ilstu.edu), Illinois State University, Normal This presentation will be a chance for interested school and university researchers and practitioners to share ideas for future directions for the journal.

#### Toshiba/NSTA ExploraVision (Gen)

(General)

## 318, Convention Center

**Brian P. Short** (*exploravision@nsta.org*), Assistant Director, Science Education Competitions, NSTA, Arlington, Va. ExploraVision is a K–12 competition that motivates students and challenges them to think creatively about scientific innovation 20 years into the future. Discover how students can win up to \$240,000 in savings bonds for envisioning new technologies. Learn how ExploraVision supports classroom goals; illustrates connections between science and technology; and offers recognition, computers, and other prizes for schools, students, teachers, and mentors. Session participants have a chance to win a Toshiba product!

## Teaching Climate Science Using Data (Env)

(Elementary–High School) 319, Convention Center Jacob Tanenbaum (jtanenbaum@socsd.org), Cottage Lane Elementary School, Blauvelt, N.Y.

Find where to get the resources and training you need to teach climate science and help your students gather and contribute their own data.

## Effective Strategies for Teaching Science to ELL Middle School Students (Gen)

(Middle Level) 413, Convention Center **Kathryn Scantlebury** (kscantle@udel.edu), University of Delaware, Newark

School, Camden, N.J.

Learn about effective science teaching strategies for middle school English language learners.

## 2:45–3:45 PM Workshops

Integrating STEM Topi	ics into a Study of Wind
Energy	(Env)
(General)	316, Convention Center
Nancy Magnani (nmagnan	i@eastconn.org), EASTCONN,
Hampton, Conn.	

Math and language arts can be taught effectively by integrating them into a STEM-based study of wind energy that will intrigue students with hands-on lessons.

## STEM Is Only the Start: A Professional Conversation About Creating Meaningful Contexts for Learning (Gen)

(Middle Level—High School) 320, Convention Center Dave Wilton (dave@facingthefuture.org), Facing the Future, Seattle, Wash.

From the stuff of daily life to pressing 21st-century challenges, STEM offers opportunities to develop knowledge and explore interconnections. Hear examples, experience curricula, and share with your peers about creating our future.

## Remote Sensing: Measuring Sea Level from Space (Gen)

(Middle Level–High School) 417, Convention Center Shanna Kahler, Maple Shade High School, Maple Shade, N.J.

During this easy, fun STEM activity; we'll graph satellite data and use it to build a simple 3-D model of the ocean surface and seafloor.

## Saturday, May 19

## 8:00–9:00 AM Presentations

STEMulate—Engage and Inspire! (Gen)

(Middle Level) 315, Convention Center Helen L. Padgett (helen.padgett@asu.edu), Arizona State University SkySong, Scottsdale

**Peter Rillero** (*rillero@asu.edu*), Arizona State University, Phoenix

Are you looking for ways to integrate STEM education into your classroom or school? Learn easy-to-implement strategies to "STEM up" your class or school!

## Increasing the STEM Pipeline with Problem-Based Learning (PBL) (Env)

(General) 316, Convention Center

**Judith Donnelly** (*jdonnelly@trcc.commnet.edu*), Three Rivers Community College, Norwich, Conn.

Engage students through real-world problems and sharpen their critical-thinking and problem-solving skills with PBL challenges for sustainable technology.

## Make It Connect! Link STEM and Real-World Applica-

tions with Electrophoresis Chambers(Bio)(Middle Level-High School)417, Convention CenterBridgette L. Davis, The University of Southern Mississippi, HattiesburgSouthern Mississippi

Help your students make meaningful connections with fields of STEM by guiding them through the engineering process of developing low-cost electrophoresis chambers using common household items.

## Science 2.0: Putting Web 2.0 into the Classroom

(Gen)

(Elementary—High School) 413, Convention Center Ben Smith (ben@edtechinnovators.com), Jared P. Mader (maderj@rlasd.net), and Eric Wilson (wilsone@rlasd.net), Red Lion (Pa.) Area School District

Web 2.0 tools allow students to create products online, all while focusing upon collaboration and creativity. Come learn how to use the best free tools on the web.

## 8:00-9:00 AM Workshops

sown, N.J.

 Let's Go STEM!
 (Phys)

 (Middle Level)
 314, Convention Center

 Cheryl Frye (cfrye@menifeeusd.org), Lisa Waller (lwaller@menifeeusd.org), Shelly Munoz (smunoz@menifeeusd.org), and Theresa Ladd (tladd@menifeeusd.org), Menifee Valley

Middle School, Menifee, Calif. We want to share our first-year experiences of STEM classes with you! Join us in a hands-on workshop where we will share our activities that worked.

## Biomimicry: Using Nature to Inspire Sustainable Design (Env)

(General) 319, Convention Center Daniel Gross (dgross242@live.com), Valleyview Middle School, Denville, N.J., and Centenary College, Hackett-

Learn how to introduce biomimicry and challenge students to create sustainable inventions inspired by nature. Lessons are hands on and incorporate multiple modalities.

Blood Pressure, Fitness, and Student Health (Bio) (High School) 417, Convention Center

**Tony Alteparmakian** (tony\_alteparmakian@kernhigh.org), Foothill High School, Bakersfield, Calif.

Participants will use the Vernier blood pressure sensor and the TI-Nspire<sup>TM</sup> CX CAS calculator to study blood pressure and health factors.

## 9:15–10:15 AM Presentations

Promoting Ocean and Climate Literacy Through Problem-Based Learning (Gen)

(Elementary–Middle Level) 315, Convention Center Natalie Macke (nmacke@pascack.k12.nj.us), Pascack Hills High School, Montvale, N.J.

Join us as a former "Teacher at Sea" discusses how online resources from NOAA can be used in a Problem-Based Learning classroom to promote ocean and climate literacy.

What Color Feeder Do Hummingbirds Like Best? Students Ask Their Own Original Questions (Bio) (Elementary–Middle Level) 316, Convention Center Kathleen McIntosh, Wilson Middle School, Wilson, N.Y. Walk away with practical advice and resources that support original research by your students using citizen science projects from the Cornell Lab of Ornithology. ken, N.J.

## Integrating Art into STEM Through Engineering Design (Gen)

(Middle Level) 318, Convention Center Henry R. Harms, Stevens Institute of Technology, Hobo-

**Diane Lufrano,** Thomas Grover Middle School, West Windsor, N.J.

Learn about the Integrating Art into STEM Through Engineering Design (STEAM) project developed by the Center for Engineering and Science Education at Stevens Institute of Technology.

## Integrated Math, Science, and Literacy Through NASA Resources (Gen)

(Middle Level–College) 319, Convention Center Sharon Bowers (sharon.bowers@nianet.org), National Institute of Aerospace/Virginia City Beach Public Schools, Hampton, Va.

**Sten F. Odenwald,** NASA Goddard Space Flight Center, Greenbelt, Md.

**Rebecca L. Jaramillo** (*rebecca.jaramillo@nianet.org*), National Institute of Aerospace, Hampton, Va.

Bring current events to life using NASA press releases, integrated Space Math problems, and NASA eClips videos.

## The 4 Cs of Highly Engaged Students (Gen)

(Middle Level–High School) 413, Convention Center **Rhonda M. Brown** (bioteach1255@yahoo.com), National Science Foundation, Arlington, Va.

The 4 Cs is a strategy to engage students by incorporating real-world connections, cross-curricular collaboration, and community service projects into the required science curriculum.

## Electronic Playgrounds (iPads) Go to School: SECME STEM Club (Gen)

(General) 417, Convention Center Gwendolyn L. Maturo-Grasso, Lincoln Middle School, Syracuse, N.Y.

Are you seeking to integrate STEM into your English Language Arts (ELA) program? Want to inspire students to do MORE homework? Want your students to collaborate and turn in high-quality assignments, both digitally and in written formats? This presentation will explores how a SECME STEM Club increases Common Core standards in both classroom-based and STEM outreach activities, connecting the digital world to what you are already teaching.

## 10:30–11:30 AM Presentations

Making the Pieces Fit: Integr	rating STEM into the
Middle School Curriculum	(Gen)
(Middle Level)	316, Convention Center
Chad S. Pavlekovich, Salisbury M	Middle School, Salisbury,
Md	

Explore cross relationships in this how-to session centered around best practices for integrating cross-curricular activities with a focus on science (STEM).

## Student-tested, Content-focused Engineering Design for Middle School (Gen)

(Middle Level) 318, Convention Center Kelly Vaughan (kvaughan@brooklynprospect.org), Brooklyn Prospect Charter School, Brooklyn, N.Y.

Join me and learn how I used the engineering design cycle as a springboard for designing content-focused challenges for sixth graders. My students have designed, built, and tested pulley systems, roller coasters, wind turbines, and more... and learned the engineering design cycle, basic physics concepts, and 21st-century skills along the way. I'll provide practical tips and materials for launching engineering challenges that allow students to apply content knowledge, think creatively, and fail successfully.

## Creating and Using 3-D Topographic Maps (Earth)

(Elementary–High School) 413, Convention Center **Amy F. Carpinelli** (acarpinelli@wtps.org), Washington Township High School, Sewell, N.J.

Let me introduce you to the design and analysis of 3-D topographic maps for use in middle school science, mathematics, and social studies classrooms.

## Digitizing the Learning Experience and Taking IT Mobile (Gen)

(Elementary–High School) 417, Convention Center Ben Smith (ben@edtechinnovators.com), Jared P. Mader (maderj@rlasd.net), and Eric Wilson (wilsone@rlasd.net), Red Lion Area School District, Red Lion, Pa.

Discover how to use iDevices and other mobile technologies in your classroom. Come learn how to get your content onto your students' devices.

## 10:30–11:30 AM Workshop

NASA Helium Balloon	<b>Challenge: Project-based</b>
Engineering Design	(Gen)
(Middle Level)	319, Convention Center

**Rebecca L. Jaramillo** (*rebecca.jaramillo*@*nianet.org*), National Institute of Aerospace, Hampton, Va.

Sharon Bowers (sharon.bowers@nianet.org), National Institute of Aerospace/Virginia City Beach Public Schools, Hampton, Va.

Make a helium balloon neutrally buoyant while exploring the aerodynamic principles involved in flight in this NASA Design Challenge.



## 11:45 AM-12:45 PM Presentations

<b>Teaching Students</b>	with Learnin	g Disabil	ities in the
Inclusive Classroo	m		(Gen)
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(Elementary–Middle Level) 315, Convention Center

**Patricia Ann Higgins,** Kean University, Union, N.J. Let's discuss special education law as it pertains to including students with disabilities in general education, as well as a presentation of strategies and modifications in the science classroom.

## STEM Content as an Integrating Context for Implementing New Standards for Science, Mathematics, and English Language Arts (Gen)

(Elementary–Middle Level) 316, Convention Center **Mel Goodwin** (mgoodwi8@bellsouth.net), Laing Middle School, Mount Pleasant, S.C.

Find out how STEM content can be used to provide a unifying context for addressing new standards in science, mathematics, and English language arts.

## Top 10 STEM Resources

(Elementary-High School) 318, Convention Center Patti Duncan (duncanpatt@gmail.com), Wallenpaupack Area School District, Hawley, Pa.

Join me for a review of 10 (plus a few more) of the best online resources for STEM lessons, ideas, and networking.

## Learning About Biorenewables in Middle-Level Science Classes (Gen)

(Middle Level-College) 319, Convention Center Eric Hall (eric.hall@dmschools.org) and Adah Leshem (adah@iastate.edu), Iowa State University, Ames

Learn about cutting-edge research in the field of biorenewables, as well as how Iowa State University has supported area teachers in delivering associated content to students.

## The STEM Learning Center: A Successful Middle School Program Integrating Science and Math in Engineering (Gen)

(Middle Level) 413, Convention Center Brooks Twilley and John Singer, P.S. duPont Middle School, Wilmington, Del.

Presider: Michelle Kutch, Brandywine School District, Claymont, Del.

Our STEM Learning Center uses engineering to integrate science and math to get students excited in STEM while using iPads, robots, and full-sized solar buggies.

(Gen)

## 11:45 AM-12:45 PM Workshops

## Where Does All the Water Go? STEM Preparation for Secondary Career and Technical School Programs (Gen)

(Elementary–High School) 314, Convention Center Ross Ruschman (rruschman@monroeeti.org), Monroe Career and Technical Institute, Bartonsville, Pa.

Learn about the relationship between STEM education and career and technical education through a hands-on activity modeling the effects of urban development on groundwater infiltration.

## Using Effective Technology Tools for Curriculum Integration (Gen)

(Middle Level–High School) 417, Convention Center Stephanie S. Eggers, Heritage Middle School, Valdese, N.C.

Emphasis will be placed on strategic technology tools for proven success in seamless curriculum integration. These tools can be used as a class demonstration, hands-on lab for student involvement, project-based instruction, or as part of an existing lesson. Let these learning platforms provide you with the tools you need to successfully deliver content and evaluate student knowledge and demonstrate skills.

## 1:00–2:00 PM Presentations

STEMulate—Engage and Inspire!(Gen)(Middle Level)315, Convention Center

Helen Padgett (helen.padgett@asu.edu), Arizona State University SkySong, Scottsdale

**Peter Rillero** (*rillero@asu.edu*), Arizona State University, Phoenix

Are you looking for ways to integrate STEM education into your classroom or school? Learn easy-to-implement strategies to "STEM up" your class or school!

## STEM Projects for the Middle School Science Classroom (Gen)

(Elementary–Middle Level) 315, Convention Center DJ West (djwest78@gmail.com), Schoolcraft College, Livonia, Mich.

Examine a variety of projects that can be used in middle school science to integrate STEM concepts into the classroom. Walk away with instructions for each of the projects discussed.

## Integrating Science and Mathematics Instruction in a Middle School STEM Course (Gen)

(*Middle Level/Supervision*) 318, Convention Center **Michelle Kutch** (michelle.kutch@bsd.k12.de.us), Brandywine School District, Claymont, Del.

Michelle Dech, Springer Middle School, Wilmington, Del.

Presider: Lincoln Hohler, Brandywine School District, Claymont, Del.

Hear about research from an integrated STEM course study and its impact on student attitudes and achievement. We will share implementation and professional development recommendations as a result of this research.

## The Literacy STEM Connection (Gen)

(Middle Level) 319, Convention Center Donna Darden-Irons, Morgan Village Family School, Camden, N.J.

**Barbara Mammen** (*bmammen@stevens.edu*), Stevens Institute of Technology, Hoboken, N.J.

Promoting student literacy through instructional strategies that integrate STEM content, science inquiry, engineering design, and 21st-century skills will be the focus of this interactive presentation.

## 1:00–2:00 PM Workshops

## Got Milk? No? You Can Have COWs! (Gen)

(Middle Level) 314, Convention Center Nancy Evans Bennett (nancyevansbennett@comcast.net), College of St. Elizabeth, Morristown, N.J.

**Linda Burroughs** (*burrough@tcnj.edu; lianateach@aol.com*), The College of New Jersey, Ewing

James L. Messersmith, Rider University, Lawrenceville, N.J.

Each week, introduce your middle school students to a COW (Challenge of the Week) to create learning outside the curriculum, using process skills and fostering persistence.

## Strategies to Engage and Enrich Kids in STEM: An Integrated Approach (Gen)

(Elementary–Middle Level) 316, Convention Center Shirley A. Disseler, High Point University, High Point, N.C.

Enliven your grades 4–9 classrooms with effective strategies to integrate STEM. Handouts!

## STEM and Inquiry: The Perfect Blend (Chem)

(Middle Level) 413, Convention Center Greg Dodd (gbdodd (contain.com), George Washington High School, Charl Ston, W.Va.

The combination of inquiry, technology, and STEM instruction is the perfect blend for amazing science instruction.



## Thursday, May 17

## **Administrators Strand**



## **Science Area**

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title.

The science areas and their abbreviations are:

Bio) =	Biology/Life	Science
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- (Chem) = Chemistry/Physical Science
- (Earth) = Earth/Space Science
- (Env) = Environmental Science
- (Gen) = Integrated/General Science

(Phys) = Physics/Physical Science

## Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The sessions listed in this section with purple tabs are in the Administrators Strand (see page 21 for strand descriptions).

#### 8:00–9:00 AM Presentations

STEM: Super Teachers Engaging Minds!(Gen)(General)316, Convention CenterKathleen S. Crooks (crooksks@hiram.edu), Hiram College,Hiram, Ohio

STEM in school involves everyone! Learn how professional development has encouraged all content areas—including art, music, and physical education—to develop engaging STEM projects.

STEM Education: Courses of Study to Promote Student Success in School and Beyond (Gen)

(Supervision/Administration) 317, Convention Center Judson Wagner (judson.wagner@bsd.k12.de.us) and Michelle Kutch (michelle.kutch@bsd.k12.de.us), Brandywine School District, Claymont, Del.

Presider: Lincoln Hohler, Brandywine School District, Claymont, Del.

Hear how Brandywine School District has STEM disciplines as courses of study within the school schedule with the help of administrators, teachers, businesses, and higher education.

## STEM Education: Preparing for and Opening a STEM Academy (Gen)

(General) 416, Convention Center Bonnie Maur (bmaur@monroeps.org), Monroe (Conn.) Public Schools

Planning for an inquiry-based, integrated STEM school program can seem daunting. Yet inquiry as a hands-on core model for experiential learning in all disciplines along with integration throughout all classes, including engineering and unified arts classes, leads to greater student achievement. Come see a model for designing a program that meets all STEM initiatives and allows for greater achievement for your students.

## 10:45–11:45 AM Presentations

#### A Statewide Approach to Preparing Teachers and Students in STEM (Gen)

(Supervision/Administration) 316, Convention Center Elissa Hozore and Donna Clem (dclem@msde.state.md.us), Maryland State Dept. of Education, Baltimore

Join us as we share Maryland's STEM Standards of Practice for students and teachers as well as elements of Maryland's innovative elementary STEM teacher preparation programs.

## Behold the POWER of Inquiry in Your Curriculum! (Gen)

(Elementary–High School) 317, Convention Center Caysie H. Heil, Nixa High School, Nixa, Mo.

Scientific inquiry is a process and a way of thinking, not a list of facts that can be memorized. When schools embrace teaching students to think scientifically, test scores soar, student confidence increases, and teachers feel empowered. We will look at simple ways to incorporate scientific inquiry into your current curriculum and focus on vertical alignment.

## STEM Learning Studios: Creative, Collaborative Partnerships Between Classroom Teachers and Local STEM Professionals (Gen)

(Middle Level–High School/Supv.) 416, Convention Center Jeffrey L. Dilks (jdilks@nctaf.org), National Commission on Teaching and America's Future, Washington, D.C.

Learning Studios are Project Based Learning (PBL) environments in which four to six teachers within the same school work in interdisciplinary, cross-curricular teams. Learning Studios are not a curriculum intervention; they change the teaching process.

## 12 Noon–1:00 PM Presentations

#### Using Wikis to Promote Collaborative Learning in Science with Preservice Elementary School Teachers (Gen)

(College)

316, Convention Center

Letitia Graybill (*lgraybil@monmouth.edu*), Monmouth University, West Long Branch, N.J.

Learn how to use collaborative techniques to stimulate discussion and learning of science topics with preservice elementary school teachers. Collaborative techniques to foster lab topic engagement include discussion boards, current science topics, and wikis. Students work together in an online meeting environment to share ideas, plan lessons, and develop strategies for effective instruction.

# The Greater Southern Tier STEM Education Project (Gen)

(General) 317, Convention Center Mark D. Vaughn (vaughnmd@corning.com), Corning Inc., Corning, N.Y.

**Brande Flaitz** (*bflaitz@gstboces.org*) and **Jeremy Wheeler** (*jwheeler@gstboces.org*), The Greater Southern Tier BOCES, Elmira, N.Y.

Hear how top employers like Corning, area colleges, The Greater Southern Tier Board of Cooperative Educational Services, the Syracuse Universities Office of Professional Research and Development, and a consortium of seven school districts have partnered together to achieve a shared vision of significantly enhancing STEM education in the Greater Southern Tier Region of New York. Discussion centers on project development history, the need for a redesigned approach to STEM education, and creation of a sustainable model.

## STEM for K-8: Making Quite an Impact in Education (Gen)

(General) 416, Convention Center Kellie Lauth (kellie.lauth@adams12.org) and Tracy Tellinger (tracy.tellinger@adams12.org), STEM Magnet Lab School, Thornton, Colo.

Walk away with a flexible guide on how to begin a K-8 STEM school, improve the one you have, or even offer a STEM program within your school based on the lessons learned from the STEM Magnet Lab School and their compelling student data and success.

## 12 Noon–1:00 PM Workshop

A New Pair-O-Dimes (Paradigm) for Building a Schoolwide STEM Culture (Gen) (General) 420, Convention Center

Becky Ashe, L&N STEM Academy, Knoxville, Tex.

Presider: Donna Wright, Knox County Schools, Knoxville, Tenn.

Engage in model discussion protocols to assess staff readiness for change and leave with action templates to help your teachers shift paradigms regarding STEM.

## 1:15–2:15 PM Presentations

#### Montessori Teachers Using STEM

(General) 316, Convention Center

**Tony P. Murphy** (*apmurphy@stkate.edu*), St. Catherine University, St. Paul, Minn.

Learn about the Montessori STEM Certificate, developed to infuse STEM into a school's curriculum.

## Integrated STEM Education: What Is It Today, and What Should It Be in the Future? (Gen)

416, Convention Center

(Gen)

David R. Heil (dheil@davidheil.com), David Heil & Associates, Inc., Portland, Ore.

**Greg Pearson** (gpearson@nae.edu), National Academy of Engineering, Washington, D.C.

Find out about a new National Academies committee exploring integrated STEM education. Take part in a facilitated discussion on iSTEM and its impact on teaching and learning.

(General)

## 2:30–3:30 PM Presentations

Creating and Sustaining a STEM Academy in a Traditionally Diverse K–12 Feeder System (Gen) (Supervision/Administration) 316, Convention Center Heidi L. Ringer (ringer\_heidi@svvsd.org) and Travis O'Hair, Skyline High School, Longmont, Colo.

Experience a highly successful STEM program that partners with the University of Colorado to provide a unique pre-engineering curriculum to a traditionally diverse K–12 population.

Restructuring Teachers' Professional Development Through Co-Teaching and Co-Planning (Gen) (General) 317, Convention Center Todd Dunn (tdunn@udel.edu) and Kathryn Scantlebury (kscantle@udel.edu), University of Delaware, Newark Emphasis will be placed on how co-teaching and co-planning provide professional development for middle school teachers.

## NASA's Endeavor Science Teaching Certificate Project (Gen)

(General) 416, Convention Center Glen Schuster, NASA Endeavor/U.S. Satellite Laboratory, Inc., Rye, N.Y.

Hear from educators sharing best practices as they earn STEM Certificates with Teachers College, Columbia University, online. Learn about the Endeavor project with national board certification.

## 2:30-3:30 PM Workshop

Teaching by Design: Preparing K–12 Teachers to UseDesign Across the Curriculum(Gen)(General)308, Convention CenterLouis S. Nadelson (louisnadelson@boisestate.edu), Boise State

University, Boise, Idaho

**Anne Seifert,** Idaho National Laboratory, Idaho Falls Join us as we take you through a number of design challenges and discuss the opportunities afforded by using engineering design for teaching and integrating STEM.

76

## 8:00–9:00 AM Presentations

#### STEM Professional Development for Elementary Teachers (Gen) (General) 413, Convention Center

Tony P. Murphy (apmurphy@stkate.edu), St. Catherine University, St. Paul, Minn.

A STEM Graduate Certificate has been developed with local school districts to meet their professional development needs. Find out more about this innovative experience for elementary teachers.

#### The Charlotte-Mecklenburg STEM Story (Gen)

(General)

Cindy Moss (cindy\_moss@discovery.com), Charlotte-Mecklenburg Schools, Charlotte, N.C.

414, Convention Center

416, Convention Center

Charlotte-Mecklenburg Schools have a coordinated preK-12 STEM strategy that provides opportunities for students and teachers to experience STEM. The STEM projects are aligned with state objectives, Common Core State Standards, and 21st-century work skills. The projects also involve STEM industry partners.

#### To Observe Earth and Visualize the Future (Earth)

(General)

John D. Moore (mr.moore.john@gmail.com), Palmyra Cove Nature Park, Palmyra, N.J.

Join me for an introduction to the interdisciplinary STEM nature of geoscience, the emerging technological applications of remote sensing, and the capabilities of Earth-observing satellites as well as their classroom applications.

## 9:15–10:15 AM Presentations

#### STEM Leadership: Where Do I Begin? (Gen) 414, Convention Center (General)

Maryann Wolowiec (mwolowiec@ieledconsulting.com), IEL Educational Consulting, Hudson, Ohio

Hear about one critical Akron STEM middle school design principle—distributed leadership. Distributed leadership began with the partners and continues in the school's daily operations.

#### Successful K-12 STEM Education: Identifying Effective Approaches in Science, Technology, Engineering, and Mathematics (Gen)

416, Convention Center (General)

Jerry D. Valadez (jdvscience@yahoo.com), California State University, Fresno

Providing all students with access to high-quality education in STEM is important to their individual futures and the nation's economic and political health. Come find out what works.

## 9:15–10:15 AM Workshop

#### Conjure a Class That Bonds Discipline with Academics (Gen)

(Supervision/Administration) 316, Convention Center Betsy Pozzanghera, Spokane Valley, Wash.

Learn strategies for managing minor classroom misbehaviors, including techniques that eliminate gimmicks, reduce teacher stress, and work for students. Regain 5-9 hours of your instruction time!

## 10:30–11:30 AM Presentations

#### Connecting the Dots for PreK-12 STEM Education (Gen)

#### (General)

414, Convention Center Cindy Moss (cindy\_moss@discovery.com), Charlotte-Mecklen-

burg Schools, Charlotte, N.C.

Hear how the Charlotte-Mecklenburg Schools have created a deliberate STEM pathway from preK to college for their students with a clear focus and coherence in curricula, activities, technology, and competitions. Also, take away focused professional development for administrators and teachers.

## **Building a STEM School**

(General)

(Gen) 416, Convention Center

Rachael Manzer (manzr001@hartfordschools.org) and Melony Brady (bradm002@hartfordschools.org), Annie Fisher STEM Magnet School, Hartford, Conn.

Are you interested in building a STEM program? Learn how we built a STEM school that ranks as one of the top schools in Connecticut.

## 10:30-11:30 AM Workshop

This session will shed a new light on black holes and their surroundings when viewed in high-energy wavelengths. Take home NASA curricula, activities, and a poster.

## 1:30–2:30 PM Presentation

 Vertical Integration of Engineering Education in

 K-12 Rural Schools
 (Gen)

 (General)
 416, Convention Center

 Stephen Marlette (smarlet@siue.edu), Southern Illinois
 University, Edwardsville

Elizabeth Pressler (beth.pressler@frontier.com), Carrollton (Ill.) Community Unit School District #1

Join us as we outline efforts to improve the quality of STEM education in a district and expand efforts to other rural schools for a broader regional impact.

## 1:30–2:30 PM Workshops

# What Is Your Cosmic Connection to the Elements? (Chem)

(High School) 316, Convention Center Cheryl Niemela, NASA/Universities Space Research

Association, Puyallup, Wash. Join me for activities and curricula from NASA that discover the origin of the periodic elements. Take home a workbook, poster, and *Imagine the Universe* DVD.

STEM Curriculum Strategies: Moving Beyond the Acronym and into Classroom Practice (Gen)

(General) 414, Convention Center Jo Anne Vasquez (jvasquez@helios.org), 1996–1997 NSTA President, and Helios Education Foundation, Phoenix, Ariz. Michael Comer (michael\_comer@mcgraw-hill.com), Columbus, Ohio

STEM teaching requires a different approach to curriculum organization. It requires integration. Is all integration the same? Are there different approaches? Experience STEM curriculum integration.

## Integrating Hands-On Science with Math, English Language Arts, and Technology (Gen)

(Elementary–High School) 420, Convention Center Deborah Tucker (deborahlt@aol.com), Science Education Consultant, Napa, Calif.

Create learning activities that integrate hands-on science, literacy, and math to help your students master the Common Core State Standards.

## 2:45–3:45 PM Presentations

#### Strategic Planning for STEM Education Success (Ge

(Gen)

(Supervision/Administration) 414, Convention Center Barbara Mammen (bmammen@stevens.edu), Stevens Institute of Technology, Hoboken, N.J.

Sam Choi, Mustard Seed School, Hoboken, N.J.

Keith Edwards (kedwards@camden.k12.nj.us), Veterans Memorial Family School, Camden, N.J.

Develop a STEM education strategic plan? This interactive presentation will focus on how a large school district and a small private school are doing it.

## Environmental Education in Action: A Model School Approach for Systemic Change (Gen)

(Elementary–Middle Level) 416, Convention Center Barbara R. Pietrucha (bpietrucha418@comcast.net), Point Pleasant, N.J.

Elizabeth Faircloth (newjerseyplt@gmail.com), New Jersey Dept. of Environmental Protection, Jackson

Nancy Yard (nyard@hollandschool.org), Holland Township School, Milford, N.J.

Discover how a rural school in New Jersey implemented environmental education across the curriculum for all grades to increase STEM achievement for its students. Hear from the principal and project coordinator, and take home lessons and ideas for your school.

## 8:00–9:00 AM Presentations

Improving STEM Teacher Education with a Resi-		
dency Model	(Gen)	
(Supervision/Administration)	414, Convention Center	
Nanette I. Dietrich (ndietrich@	millersville.edu), Millersville	
University of Pennsylvania, Mill	ersville	
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Learn how Millersville University restructured their undergraduate science teacher education program using a Professional Development School Model that includes a yearlong teacher residency.

## 9:15–10:15 AM Presentations

## STEM Middle School: A Bold Collaboration (Gen) (General) 414, Convention Center

**Maryann Wolowiec** (mwolowiec@ieledconsulting.com), IEL Educational Consulting, Hudson, Ohio

Collaborative partners—a public school district, a city, businesses, a university, and a nonprofit organization—created a STEM public middle school that no one entity could have created alone.

#### Learning from Successful STEM Schools (Gen)

(General)

## 416, Convention Center

**Heather B. Sondel,** Committee for the Advancement of STEM Specialty Schools, Washington, D.C.

STEM schools across the country are as varied as the landscape of education itself, but we can learn from flagship schools with a history of success. Join us as we closely examine the curriculum, policies, budgets, professional development, and proven strategies that contribute to a culture of student achievement in STEM.

# Strategic Teaching to Empower Minds with STEM (Gen)

(Supervision/Administration) 416, Convention Center

Mary D. Baier (baiermary@gmail.com), Diocese of Paterson, Clifton, N.J.

Get an overview on how to adopt and adapt a STEM curriculum for the middle school grades.

## 10:30–11:30 AM Presentations

Understanding STEM for Administrators(Gen)(Supervision/Administration)315, Convention CenterChris Strzok (strzokc@cudahy.k12.wi.us), School District ofCudahy, Wis.

Not sure what STEM is? Need to understand how to build or grow STEM in your school? Come to this session to learn more. We will work together in this session to help administrators and district leaders understand the scope and execution of STEM in schools. Resources will be highlighted and strategies for staff development will be discussed.

## Working Collaboratively to Improve Science Instruction (Bio)

(Middle Level-High School/Supv.) 414, Convention Center Michael P. Mahan (mmahan@gdn.edu), Gordon College, Barnesville, Ga.

Learn how to use End of Course Test (EOCT) results to identify the weakest strands of instruction in middle and secondary science courses. These weakest strands can then be targeted for professional development opportunities.

## Middle School STEM Summer Enrichment Program (Phys)

(General)

Edward J. McGrath (edward.mcgrath@redclay.k12.de.us), Red Clay Consolidated School District, Wilmington, Del. Come learn about a three-week program of project-based activities based on STEM that is open to all middle school students in the district. Pilot year was 2011.

416, Convention Center

## 11:45 AM-12:45 PM Presentation

Global Virtual STEM Classroom (General)

(Env) 414, Convention Center

Larisa Schelkin (larisa.schelkin@gmail.com), Global Technology and Engineering Consortium, Needham, Mass.

Join us and learn about the Global Technology and Engineering Consortium (GTEC) and how it contributes to developing the 21st-century global workforce through educating secondary school students to work on joint STEM projects with international schools.

## 1:00-2:00 PM Workshop

## STEM Education for All Elementary School Classrooms (Gen)

(Elementary/Supervision) 313, Convention Center Heidi Gold-Dworkin (drheidi@little-scientists.com), Little Scientists, Milford, Conn.

Children are naturally inquisitive. Come learn how to engage their innate curiosity to foster a passion for learning STEM.

## 1:00–2:00 PM Presentations

VISTA Promotes STEM Integration	on Through Problem-
Based Learning (PBL)	(Gen)

(Supervision/Administration) 414, Convention Center Jennifer Mosser (jmosser@gmu.edu) and Andre Radloff

(aradloff@gmu.edu), George Mason University, Fairfax, Va. Join us and learn about Virginia Initiative for Science Teaching and Achievement (VISTA), a statewide initiative in Virginia that utilizes STEM education to promote collaboration among elementary and secondary science teachers, science coordinators, and education faculty.

What Is STEM? What Is a STEM School?(Gen)(General)416, Convention CenterHeather B. Sondel, Committee for the Advancement of

STEM Specialty Schools, Washington, D.C. Gain an introduction to the conflicting and often confusing world of STEM. Join us as we discuss types of STEM schools and provide some research on what makes them successful, and how to best prepare students.



## 8:00–9:00 AM Presentations

Claremont Robotics Competition: A K–12/Higher Education Partnership (Phys)

(Middle Level-College/Supervision) 321, Convention Center June K. Hilton (jhilton@cusd.claremont.edu), Claremont High School, Claremont, Calif.

**Brian N. Hilton** (*brian.hilton@cgu.edu*), Claremont Graduate University, Claremont, Calif.

Take home an overview and lessons learned from the Claremont Robotics Competition, a collaborative K–20 partnership. Teams of elementary and secondary students work with college undergraduate and graduate students to learn and apply STEM skills while building robots.

# STEM Expo: Innovative Alternatives to Typical Science Fairs (Gen)

(General) 414, Convention Center

Eric K. Bull (ebull@jessup.edu), William Jessup University, Rocklin, Calif.

This highly successful STEM Expo enables students to participate in areas that relate to their interests and strengths. Learn how to create an exciting event that encourages science literacy throughout the community. Visit *www.stemexpo.org* for more information.

## 10:45–11:45 AM Presentation

## The View Below: Using Stream Snorkeling to Teach Science (Env)

(Middle Level–High School/Informal) 414, Convention Center Keith Williams (kwilliams@northbayadventure.com), North-Bay, North East, Md.

The underwater view of our creeks is amazing! Delve into a science teaching program that uses stream snorkeling to promote scientific thinking and habits of mind in students.

## 10:45-11:45 AM Workshop

Engineering Adventures: Engineering in Out-of-<br/>School-Time Programs(Gen)<br/>(Elementary)(Elementary)418, Convention Center

**Melissa Higgins** (*mhiggins@mos.org*), Museum of Science, Boston, Mass.

Engage in hands-on activities from Engineering Adventures, a new, free, downloadable engineering curriculum being designed specifically for use in out-of-school-time programs.



## **Science Area**

A science area category is associated with each session. These categories are abbreviated in heavy type at the right immediately following the session title.

The science areas and their abbreviations are:

(Bio)	=	Biology/Life Science
(Chem)	=	Chemistry/Physical Science
(Earth)	=	Earth/Space Science
(Env)	=	Environmental Science
(Gen)	=	Integrated/General Science
(Phys)	=	Physics/Physical Science

## Strands

The STEM Form & Expo Steering Committee has planned the conference around five strands, enabling you to focus on a specific area of interest or need. The sessions listed in this section with magenta tabs are in the Community/After-School/Outeach Programs Strand (see page 21 for strand descriptions).

## 12 Noon–1:00 PM Presentations

## Professional Development for Elementary Teachers: The Virginia Science Institute for STEM Education (Gen)

#### (Elementary)

321, Convention Center

**Dennis Casey** (dennis.casey@vmnh.virginia.gov), Virginia Museum of Natural History, Martinsville

Hear about a weeklong summer residential professional development experience for grades 2–5 teachers that is designed to support STEM education and Virginia standards.

## Engaging the School Community in Innovative and Meaningful STEM Activities (Gen)

(General) 413, Convention Center **Prent Klag** (klag@suu.edu), Southern Utah University, Cedar City

Bolster community support, build excitement, and broaden partnerships for local STEM initiatives by involving schools, businesses, universities, and government agencies in innovative and meaningful STEM activities.

## Urban Advantage: Formal/Informal Science Education Partners Working Together in STEM Education

(Gen)

(General) 414, Convention Center Jim Short (jshort@amnh.org) and Hudson Roditi (hroditi@ amnh.org), American Museum of Natural History, New York, N.Y.

Karen Saur (ksaur@nyscience.org), New York Hall of Science, Queens

**Verneda Johnson** (*vjohnson3@schools.nyc.gov*), Isaac Newton Middle School for Math and Science, New York, N.Y. Hear how the Urban Advantage program in New York City has developed an effective partnership between eight informal science education institutions and the New York City school system to support student investigations and STEM education.

## 12 Noon–1:00 PM Workshop

4-H Climate Change Program After School (Env) (General) 418, Convention Center Rebecca Kalenak and Marissa Blodnik, Rutgers University, Newark, N.J.

Sharon Kinsey (kinsey@aesop.rutgers.edu), Maggie McCann, and Nick Timpanelli, Rutgers Cooperative Extension of Camden County, Cherry Hill, N.J.

The 4-H Climate Change Program works with youth in afterschool settings to teach the causes, impacts, and community solutions to climate change.

## 1:15–2:15 PM Presentations

## Using VEX Robotics Competitions to Immerse Students in STEM (Phys)

(Middle Level–High School) 414, Convention Center David B. Kelly (dkelly@sau53.org), Pembroke Academy,

Pembroke, N.H.

Find out how to excite students by having them design, build, and program VEX robots to compete locally, nationally, and internationally in the VEX Robotics competitions.

Need a STEM Club in Your School? Start One! (Gen) (Middle Level) 418, Convention Center Trudy Giasi (tgiasi 3707@columbus.k12.oh.us), Kim Chasteen, Kate Dennison, and Bryan Stoker, Hilltonia Middle School, Columbus, Ohio

Beth Carnate (bcarnate@hotmail.com), Retired Educator, Columbus, Ohio

Engage students, families, teachers, and the community in an after-school student-driven STEM Club, including student projects and activities, field trips, speakers, and family STEM nights.

## 2:30–3:30 PM Presentations

## Oakley STEM Center NASA Teacher Liaisons and User Group (Earth)

(Informal Education) 321, Convention Center Sally J. Pardue (spardue@tntech.edu), Tennessee Technological University, Cookeville

**Jennifer Casey** (*jncasey530@gmail.com*), East Hamilton Middle/High School, Ooltewah, Tenn.

**Paula Lansford,** Mt. Juliet Middle School, Mt. Juiliet, Tenn.

Hear about an effective teacher team-driven outreach model that uses NASA CORE curricula.

## STEM Education for All (Gen)

(General) 414, Convention Center Heidi Gold-Dworkin (drheidi@little-scientists.com), Little Scientists, New Haven, Conn.

Engage in simple STEM investigations that engage all learners in informal settings and foster a passion for learning STEM.

## 2:30-3:30 PM Workshop

Girls Science Investigations (GSI) at Yale Universitysity(Phys)(Middle Level)418, Convention CenterVirginia Baltay (vbaltay@aol.com), Girls Science Investigation, Yale University, Guilford, Conn.Irene Cai (irene.cai@yale.edu), Student, Yale University,<br/>New Haven, Conn.Bailey Fryer (baileyfryer@rocketmail.com), Student, Branford<br/>High School, Branford, Conn.Quinn Ivy Gruver (quinngruver@aol.com), Student, New<br/>Canaan High School, New Canaan, Conn.GSI motivates middle school girls to pursue STEM through

physical science investigations informally in a university setting. Gender-gap data, mentorship, and sample activities are included.

## Friday, May 18

## 8:00-9:00 AM Workshops

Building STEM Gardens

(Env)

(General) 310, Convention Center **Rebecca Kalenak** (kalenak@njaes.rutgers.edu) and **Marissa Blodnik** (mblodnik@rci.rutgers.edu), Rutgers University, Newark, N.J.

Join 4-H educators and volunteers to learn about implementing STEM gardens by establishing student-built greenhouses, compost bins, rain barrels, and garden beds.

## GEE: Girls Engaged in Engineering (Phys)

(Informal Education) 418, Convention Center Charre L. Todd (ctodd@csd.k12.ar.us), Crossett Middle School, Crossett, Ark.

GEE is a hands-on inquiry-based Saturday program for girls in grades 3–12. GEE activities highlight various fields of engineering. Join in and learn about program specifics and projects.

## 9:15–10:15 AM Presentation

# Innovation and Engineering Camp for Middle School Students (Gen) (Middle Level) 315, Convention Center

Henry R. Harms and Adam Scribner (*adam.scribner@*, *stevens.edu*), Stevens Institute of Technology, Hoboken, N.J. This presentation will describe the Innovation and Engineering Camp offered by Stevens Institute of Technology. Take home an Engineering Camp Implementation Guide.



## 9:15-10:15 AM Workshops

 The Explorer's Club: Let's Design and Invent—An After-School STEM Partnership (Gen)

 (Informal Education)
 310, Convention Center

 Kathleen K. Blouch (blouchk@etown.edu), Alicia Klepper (kleppera@etown.edu), and Melissa Gettys (gettysm@etown.edu), Elizabethtown College, Elizabethtown, Pa.

It's definitely not quiet at this library. Find out about a partnership between the local library, a college methods class, and an NSTA student service organization.

## Engineering Is Elementary: Engineering Is for Everyone! (Phys)

(Elementary)	418, Convention Center
Molisso Higgins (mhissing)	mag and) Museum of Science

**Melissa Higgins** (*mhiggins*(*@mos.org*), Museum of Science, Boston, Mass.

What does engineering look like in an elementary school classroom? In this workshop, participants will use the engineering design process to design sails for boats.

#### 10:30–11:30 AM Presentations

#### How to Succeed in Robotics Without Really Trying (Gen)

(General)

310, Convention Center

Gail Sestito (gsestito@greenwichacademy.org) and Doug Rendell (drendell@greenwichacademy.org), Greenwich Academy, Greenwich, Conn.

Learn how to easily start and run an after-school robotics club/team at various grade levels.

#### Building a Successful STEM Summer Camp for Middle School Girls (Gen)

(General) 315, Convention Center Kathleen S. Crooks (crooksks@hiram.edu), Hiram College, Hiram, Ohio

Learn how an innovative summer camp has engaged middle school girls in LEGO® robotics, welding, foreign language, and hands-on STEM activities for 10 years.

## Building a Museum STEM Education Program from the Ground Up (Gen)

(Informal Education) 321, Convention Center Dennis Casey (denny.casey@vmnh.virginia.gov) and Glenda Hairston (glenda.hairston@vmnh.virginia.gov), Virginia Museum of Natural History, Martinsville

Virginia Museum of Natural History staff will share successful strategies and best practices in the implementation of a museum-wide STEM education program.

## 1:30–2:30 PM Presentations

## Reach Out to Your Kids, Their Families, and the Community by Building a Google Earth Tour

#### (Earth)

(Elementary–High School) 310, Convention Center Vin Urbanowski (vurbanowski@aitestamford.org), Academy of Information Technology and Engineering, Stamford, Conn.

With cell phone pictures from kids and their families, you can really "put your neighborhood on the map"—with an interactive Google Earth tour. Here's how.

## Aim for the Stars! Build a Sustainable Informal Summer Science Program (Gen)

(General) 315, Convention Center **Constance E. O'Brien** (connieobrien@unomaha.edu), University of Nebraska at Omaha

More than 13,000 children have experienced hands-on STEM inspiration at the University of Nebraska, Omaha's Aim for the Stars Science and Math Outreach. Find out how.

#### STEM Learning in After School: National Policy and Local Practice (Gen)

(Elementary–Middle Level/Informal) 321, Convention Center **Ramya Sankar**, Afterschool Alliance, Washington, D.C. Join our discussion on STEM education policy as a local after-school program shares their experiences integrating a STEM curriculum.

## 2:45-3:45 PM Workshop

Tracking Water from Space: STEM Resources Using Global Visualization and NASA Data Sets (Earth) (Middle Level-College) 418, Convention Center Jim Short (jshort@amnh.org), Hudson Roditi (hroditi@ amnh.org), and Jay Holmes (jholmes@amnh.org), American Museum of Natural History, New York, N.Y.

NASA's Gravity Recovery and Climate Experiment (GRACE) mission tracks changes in total water storage using two satellites that have been orbiting Earth for seven years. Explore ways to use data visualizations and scientific data sets to teach about climate change.

## 2:45–3:45 PM Presentations

Engaging Urban Youth in Climate Science Education Through Service Learning (Env) (Middle Level) 310, Convention Center Sharon Kinsey (kinsey@aesop.rutgers.edu), Maggie McCann, Debbie Troiani, and Nick Timpanelli, Rutgers Cooperative Extension, Cherry Hill, N.J.

The 4-H Jersey Roots Global Reach climate science program teaches urban middle school youths about the causes and impacts of climate change. Youths also recognize their capacity to positively form the local environment through service learning activities. Sample lesson plans, hands-on activities, and service learning projects will be shared.

## Moving Beyond Remedial: Combining STEM and Enrichment in After-School Programs (Gen)

(Elementary/Supervision) 321, Convention Center Cathy J. Kindem (cathy.kindem@district196.org), Cedar Park STEM Elementary School, Apple Valley, Minn.

Learn how my magnet school has transformed its after-school program to offer schoolwide, creative STEM enrichment and intervention classes!

## Saturday, May 19

## 8:00–9:00 AM Presentation

Organize a STEM Career Day at Your School(Gen)(Elementary-High School)421, Convention CenterConnie Goochee, School District of Philadelphia, Pa.Jane Horwitz (janeh@sas.upenn.edu), University of Penn-

sylvania, Philadelphia

Walk away with "how-to" instructions for organizing a STEM Career Day. Take home a packet full of resource materials.

## 8:00-9:00 AM Workshop

## STEM Stars: Community Collaboration (Gen)

(General) 418, Convention Center Freda Vine (fvine10@gmail.com), Ed W. Clark High School,

Las Vegas, Nev. How can we build 21st-century STEM leadership through community and creative collaboration? Learn about successful initiatives connecting schools, local communities, businesses, and government.

## 9:15–10:15 AM Presentations

Pre- and Post-Assessment with EiE (Engineering is Elementary®) Units (Gen) (Elementary) 314, Convention Center Amanda Crabb (acrabb@bcps.org) and Elizabeth Steele (esteele@bcsp.org), Milbrook Elementary School, Baltimore, Md.

Join us for a discussion of findings from an action research study and learn about a summer engineering program. We'll discuss strategies that were used to promote vocabulary development among ESOL and other student groups.

Nano After S	chool
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(General)

(Gen) 421, Convention Center

James McGonigle (jmcgon@seas.upenn.edu), University of Pennsylvania, Philadelphia

**Wanda Cruz,** LULAC National Education Service Center, Philadelphia, Pa.

Walk away with highlights from a multiyear program in which high school students visited a college campus to explore nanoscale science and engineering and engage in hands-on and inquiry-based activities. (General)

(General)

#### 10:30–11:30 AM Presentation

Urban STEM Education

(Gen) 421, Convention Center

Lauren Birney (*lbirney@pace.edu*), Pace University, New York, N.Y.

Inner city educators are often faced with many obstacles to effective instruction, including classroom management, student discipline, and teacher organization. Especially impacted are STEM teachers who are required to maintain exemplary environments while conducting laboratory and inquiry-based activities. Creating specific systems and structures will assist in the development of a teaching practice that is beneficial, productive, and effective for both the urban STEM teacher and the student.

## 11:45 AM-12:45 PM Presentation

## Leveraging Community Partnerships for STEM Outcomes (Env)

421, Convention Center

**Thor Snilsberg** (thor@cityscience.org), CityScience, New York, N.Y.

Mike Powell, New Jersey Community Development Corp., Paterson

Engaging community partners can be a powerful step in the design of STEM programs. Explore how informal resources enhance Service-Learning projects with connections to careers and the real world. We'll illustrate how the voice and original research of youth are contributing to the plan for the newest National Park in Paterson, New Jersey.

## 1:00–2:00 PM Presentation

Designing Fun(Phys)(Elementary-Middle Level/Informal)417, Convention CenterSandra Roberts (sandy@klcnj.com), Kaleidoscope LearningCenter, Blairstown, N.J.

Explore the use of an inquiry-based approach to create design challenges that not only teach physics, but engage students' spirit of innovation.

## 1:00–2:00 PM Workshops

STEMcubation(Gen)(General)418, Convention CenterCheryl White Sundberg (sundbergrc@bellsouth.net), TheUniversity of Alabama, Tuscaloosa

Learn how to use incubator sessions to explore emerging technologies and applications to STEM teaching and learning. Bring your own Wi-Fi tablet/laptop and join us to learn about emerging technologies and applications for STEM teaching and learning.

Mad About STEM	(Gen)
(Middle Level)	421, Convention Center
Ashley Nocera (anocera@scs.kl.	2.va.us), Ni River Middle
School, Spotsylvania, Va.	
Brenda Conway (bconway@sc	s.k12.va.us), Brock Road
Elementary School, Spotsylvania	, Va.
Dianne Clowes (dclowes@scs.k1	2.va.us), Chancellor High
School, Fredericksburg, Va.	C C

STEM activities and embedded coaching were the pedagogical approach used to simultaneously provide an after-school program for students and professional learning for teachers.





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#101

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LAB-AIDS, Inc.	#313
17 Colt Court	M, HS
Ronkonkoma, NY 11779	
Phone: 631-737-1133	
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#### New Jersey Science Teachers #607 Association (NJSTA) PO Box A Cranbury, NJ 08512 E-mail: njstamembership@gmail.com Website: www.njsta.org

New Jersey Science Teachers Association (NJSTA) strives to support science educators at all levels, advocates high-quality science instruction in varied and diverse settings and—through leadership and service—seeks to generate and promote public interest in science as well as excellence and innovation in science teaching and learning for all.



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Website: www.nsta.org/involved/cse	

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NSTA Learning Center	#605
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#612 E, M, HS

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Washington, DC 20005			
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E-mail: msosa@aaas.org			
Website: www.sbfonline.com			

SB&F Online and Science NetLinks are American Association for the Advancement of Science (AAAS) STEM online resources for teachers, librarians, and informal science educators.

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E-mail: russell.mickelson@stem101.org	
Website: www.stem101.org	

The STEM Academy as a national nonprofit is dedicated to improving STEM literacy for all K-12 students. The practices, strategies, and programming are built upon a foundation of identified national best practices which are designed to improve underrepresented minority and low-income student growth, close achievement gaps, decrease dropout rates, increase high school graduation rates, and improve teacher and principal effectiveness.

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206
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#### Toshiba/NSTA ExploraVision #606

E, M, HS

Μ

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Toshiba/NSTA ExploraVision is a fun handson science competition that encourages K-12 students to imagine what technology might be like in the future. They will choose a technology that is relevant to the world today and then imagine their chosen technology 20 years from now. Up to \$240,000 in savings bonds and Toshiba products are awarded each year.

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Touchboards.com specializes in educational technology, microscopes, document cameras, projectors, and more. Tequipment.NET contains a variety of brands of the test and measurement industry.

#### **U.S. Army eCYBERMISSION** #615

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eCYBERMISSION is a web-based science, technology, engineering and mathematics (STEM) competition for students in grades 6-9 attending any U.S. or Department of Defense Education Activity School. eCYBERMISSION challenges students to think about real-world applications of STEM by working in teams to identify a problem in their community and use the scientific method, scientific inquiry, or engineering design process to find a solution. Students compete for state, regional, and national awards, with potential winnings of up to \$8,000. Army leadership recognizes the fundamental importance of STEM fields in education to the global competitiveness and security of our nation, and strives to increase the number of students studying these subjects nationwide.

#519

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#108

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## Index of Exhibitor Workshops

3D Molecular De	signs & MSOE Center	for BioMolecular Model	ing (Booth #208)
Thursday, May 17	3:00-4:00 PM	202, Convention Center	Combining Science and Math in Exploring Crystal Structures of Salt and Water (p. 30)
Friday, May 18	8:00-9:00 AM	202, Convention Center	Let's Get Helical: Exploring DNA Structure in Middle School Science (p. 32)
Aldebaran Robot	tics (Booth #520)		
Thursday, May 17	10:30-11:30 AM	419, Convention Center	NAO Teach STEM (p. 27)
Thursday, May 17	12 Noon-1:00 PM	419, Convention Center	NAO Teach STEM (p. 28)
Thursday, May 17	1:30-2:30 PM	419, Convention Center	NAO Teach STEM (p. 30)
Friday, May 18	8:00-9:00 AM	419, Convention Center	NAO Teach STEM (p. 33)
Friday, May 18	9:30-10:30 AM	419, Convention Center	NAO Teach STEM (p. 35)
Friday, May 18	11:00 AM-12 Noon	419, Convention Center	NAO Teach STEM (p. 37)
Anatomy in Clay	® Learning System (Be	ooth #103)	
Thursday, May 17	10:30-11:30 AM	401, Convention Center	Anatomy in Clay® Learning System Hands-On Workshop (p. 27)
ArtSkills® (Booth	n #523)		
Friday, May 18	12:30-1:30 PM	415, Convention Center	Posters and Projects in Science Education (p. 38)
Carolina Biologic	al Supply Co. (Booth a	#501)	
Thursday May 17	10·30–11·30 AM	201 Convention Center	A New Kind of Blended Learning (n. 26)
Friday, May 18	11:00 AM-12 Noon	201, Convention Center	Engineering in the Elementary and Middle School Classroom:
·····			Opportunities for Integrating Across Your Curriculum (p. 35)
Connecticut Cent	ter for Advanced Tech	nology, Inc. (Booth #614	1)
Friday, May 18	12:30-1:30 PM	401, Convention Center	CATALYST: STEM Programming in Authentic Contexts (p. 38)
CPO Science/Sch	ool Specialty Science (	(Booth #301)	
Thursday, May 17	3:00-4:00 PM	309, Convention Center	Modeling a STEM Project and Applying the National Standards to
			an Engineering Problem (p. 31)
Delta Education/	School Specialty Scier	nce–FOSS (Booth #301)	
Friday, May 18	8:00-9:00 AM	309, Convention Center	Materials in Our World (Early Childhood) (p. 32)
Friday, May 18	9:30-10:30 AM	309, Convention Center	STEM Experiences for Middle School (p. 34)
Friday, May 18	11:00 AM-12 Noon	309, Convention Center	Designing with Electrons (Grades 4–6) (p. 36)
Dinah-Might Adv	ventures, LP (Booth #3	312)	
Friday, May 18	9:30–10:30 AM	303, Convention Center	Taking Science Notebooks to a New Dimension via Notebook Foldables® (p. 34)
Discovery Educat	tion (Booth #618)		
Friday, May 18	8:00–9:00 AM	304, Convention Center	Developing STEM Process Skills with the Discovery Education Science Techbook (p. 32)
EDU2000 (Booth	#110)		
Thursday, May 17	3:00-4:00 PM	404, Convention Center	Teach the Concepts Well: Online Professional Development for STEM Teachers and Classrooms (p. 31)
Friday, May 18	8:00–9:00 AM	404, Convention Center	Teach the Concepts Well: Online Professional Development for STEM Teachers and Classrooms (p. 33)

## Index of Exhibitor Workshops

Educational Innovations, Inc. (Booth #407)			
Friday, May 18	11:00 AM–12 Noon	404, Convention Center	STEM to S.T.E.R.N. (Science Teaching Enriched by Retired Nerds) (p. 36)
FIRST® (Booth #1	106)		
Friday, May 18	12:30-1:30 PM	304, Convention Center	Inspiring STEM Through Robotics (p. 38)
Fisher Science Ed	ucation (Booth #412)		
Friday, May 18	8:00-9:00 AM	405/406, Conv. Center	Exploring STEM Careers: Viniculture, Enology, and
			the Role of Science in Wine Making (p. 33)
Friday, May 18	9:30–10:30 AM	405/406, Conv. Center	Exploring STEM Careers: Engineering Basics Using K'NEX (p. 35)
Friday, May 18	11:00 AM-12 Noon	405/406, Conv. Center	Exploring STEM Careers: Alternative Energy (p. 36)
Friday, May 18	12:30-1:30 PM	405/406, Conv. Center	Exploring STEM Careers: Water and Our Environment (p. 38)
Frey Scientific/Sc	hool Specialty Science	e (Booth #301)	
Thursday, May 17	10:30-11:30 AM	309, Convention Center	A Simple Connection Between STEM and Data Logging (p. 27)
Thursday, May 17	12 Noon-1:00 PM	309, Convention Center	Solving the Mystery of STEM Using Forensic Science (p. 28)
Thursday, May 17	1:30-2:30 PM	309, Convention Center	The Game Changer in Science Lab Design (p. 29)
HANNA® instrun	nents (Booth #320)		
Thursday, May 17	1:30-2:30 PM	404, Convention Center	Hit the Common Cores in Science (p. 30)
Howard Hughes	Medical Institute (Boc	oth #221)	
Thursday, May 17	1:30-2:30 PM	201. Convention Center	FREE Life Science and Biology Resources from HHMI's
		,	BioInteractive (p. 29)
Friday, May 18	9:30-10:30 AM	201, Convention Center	FREE Resources from HHMI for Teaching Evolution (p. 33)
It's About Time (	Booth #619)		
Thursday, May 17	10:30-11:30 AM	304, Convention Center	Project-Based Inquiry Science: PBIS <sup>TM</sup> Takes the Confusion Out
,, , ,		,	of Implementing STEM in Middle School (p. 26)
Thursday, May 17	12 Noon–1:00 PM	304, Convention Center	Engineering the Future: A Practical Approach to STEM for High School (p. 28)
Friday, May 18	9:30-10:30 AM	304, Convention Center	Project-Based Inquiry Science: PBIS <sup>TM</sup> Takes the Confusion Out
, , , , , , , , , , , , , , , , , , ,		,	of Implementing STEM in Middle School (p. 34)
Friday, May 18	11:00 AM-12 Noon	304, Convention Center	STEM Solutions for Elementary and Middle School Classrooms (p. 36)
LAB-AIDS, Inc. (B	ooth #313)		
Thursday, May 17	10:30-11:30 AM	322, Convention Center	Middle School Genetics "Breeding Critters" (p. 27)
Thursday, May 17	12 Noon-1:00 PM	322, Convention Center	Fast Cars, Speed, and Collisions! (p. 28)
Thursday, May 17	1:30-2:30 PM	322, Convention Center	Power Up and Design Your Own Battery! (p. 29)
Thursday, May 17	3:00-4:00 PM	322, Convention Center	CAN I Have a Soda? Plastic, Aluminum, or Glass? (p. 31)
Friday, May 18	8:00-9:00 AM	322, Convention Center	Hot Bulbs (p. 32)
Friday, May 18	9:30–10:30 AM	322, Convention Center	Constructive Destruction (p. 34)
Friday, May 18	11:00 AM–12 Noon	322, Convention Center	What's That in Your Breath? (p. 36)
LEGO Education	(Booth #317)		
Friday May 18	8·00_9·00 AM	201 Convention Center	Build and Explore the Future of Space with LEGO Education (p. 32)
riduy, may 10	0.00-2.00 /11/1	201, Convention Center	band and Explore the rature of opace with EEGO Education (p.52)

## Index of Exhibitor Workshops

LJ Create (Booth	#609)		
Friday, May 18	12:30-1:30 PM	201, Convention Center	STEM and Common Core Standards and Next Generation Crosscutting Concepts and Core Ideas (p. 38)
PASCO scientific	(Booth #500)		
Thursday, May 17 Friday, May 18	10:30–11:30 AM 9:30–10:30 AM	202, Convention Center 202, Convention Center	Practical Approaches to STEM for Younger Students (p. 26) Elementary School Science: Key Concepts Through Hands-On Probawara based Activities (p. 34)
Friday, May 18	11:00 AM-12 Noon	202, Convention Center	STEM Module: Egg Drop (p. 36)
Paxton/Patterson	n (Booth #506)		
Thursday, May 17	1:30-2:30 PM	202, Convention Center	A Teacher's Perspective: Project-based STEM (p. 29)
SAE Internationa	l's A World In Motion	® (Booth #612)	
Friday, May 18	8:00-9:00 AM	415, Convention Center	A World In Motion Primary Literacy-based STEM Workshop (p. 33)
Friday, May 18	9:30-10:30 AM	415, Convention Center	A World In Motion Elementary STEM Workshop (p. 35)
Friday, May 18	11:00 AM-12 Noon	415, Convention Center	A World In Motion Middle School STEM Workshop (p. 37)
Science Compani	on (Booth #423)		
Thursday, May 17	10:30–11:30 AM	415, Convention Center	STE + M: Making the Equation Work in Your Elementary Classroom (p. 27)
Science Kit & Bor	eal Laboratories (Boo	th #212)	
Thursday, May 17	10:30-11:30 AM	405/406, Conv. Center	STEM-ify Your Science Lessons! (p. 27)
Thursday, May 17	12 Noon–1:00 PM	405/406, Conv. Center	Investigating Real-World Physical Science with TeacherGeek (p. 28)
Thursday, May 17	1:30-2:30 PM	405/406, Conv. Center	STEM-ify Your Science Lessons! (p. 30)
Thursday, May 17	3:00-4:00 PM	405/406, Conv. Center	Investigating Real-World Physical Science with TeacherGeek (p. 31)
Swift Optical Ins	truments, Inc. (Booth	#507)	
Thursday, May 17	1:30-2:30 PM	401, Convention Center	New Ways to Prepare Your Students Using 21st-Century STEM Initiatives—GO DIGITAL! (p. 29)
Friday, May 18	8:00-9:00 AM	401, Convention Center	New Ways to Prepare Your Students Using 21st-Century STEM Initiatives—GO DIGITAL! (p. 33)
The STEM Acade	my® (Booth #408)		
Thursday, May 17	10:30-11:30 AM	404, Convention Center	National Best Practices STEM Curriculum to Improve STEM Literacy for All (K–12) Students (p. 27)
U.S. Army eCYBE	RMISSION (Booth #61	5)	
Friday, May 18	9:30-10:30 AM	404, Convention Center	eCYBERMISSION: Accept the Challenge (p. 35)
Vernier Software	e & Technology (Booth	n #307)	
Friday, May 18	9:30-10:30 AM	401, Convention Center	Bridging STEM and Vernier Technology (p. 34)
Friday, May 18	11:00 AM–12 Noon	401, Convention Center	Bridging STEM and Vernier Technology (p. 36)

## **Index of Participants**

Α

Alforque, Vivian 43, 64 Alpaslan, Muhammet Mustafa 43 Alteparmakian, Tony 69 Anderson, Nadja 66 Andrade, Kimberly 30 Andretta, Andrea Zdinak 47 Aronson, Joanne F. 67 Ashe, Becky 76 Astrug, Jessica 49 Avena, Stephanie 48 Aviles, Marlene 57, 62

## B

Baier, Mary D. 79 Bailey, Sidney 67 Balisciano, Nicholas 38 Balmer, Alden James 64 Baltay, Virginia 83 Banko, William 47 Barrett, Maureen B. 60 Barton, Donna M. 49 Baum, Michael 31, 33 Bazler, Judith Ann 58 Bell, Tara C. 53 Bennett, Nancy Evans 42, 44, 73 Benware, Matt 28, 31 Bernardi, Jenny 70 Birney, Lauren 86 Blackmore, Brian 42 Blodnik, Marissa 42, 82, 83 Blouch, Kathleen K. 41, 83 Blumenthal, Becky 56 Bostwick, Michael 49 Bowers, Rebecca 49 Bowers, Sharon 58, 70, 71 Brady, Melony 77 Brandon, Kathy R. 58 Bricken, Jennifer D. 29 Brown, Greg 50 Brown, Rhonda M. 70 Bucker, Christy 58 Bull, Eric K. 81 Burgess, ClaudiaR. 56 Burke, Barry 54 Burroughs, Linda L. 42, 44, 73

## С

Cai, Irene 83 Campbell, Brian 36 Campbell, Cherisse 62 Carnate, Beth 82 Carpinelli, Amy F. 70 Carter, David 34, 36

Casey, Dennis 82, 84 Casey, Jennifer N. 42, 82 Chapman, Pamela S. 44, 51 Chasteen, Kim 82 Choi, Sam 78 Christensen, Brad 68 Ciuca, Chris 33, 35, 37 Clem, Donna 74 Clements, Eriko 33 Clowes, Dianne 86 Cluchey, Jamie R. 42, 48 Cohen, Kathryn 42 Comer, Michael 78 Conway, Brenda 86 Crabb, Amanda 85 Cranston, Matthew 66 Crooks, Kathleen S. 41, 74, 84 Cruz, Wanda 85 Curtis, Karena 51 Custer, Tom 36

## D

D'Agostino, Frances 65 D'Antonio, Cecilia 43 Daniels, Melissa G. 54 Darden-Irons, Donna 72 Darling, Gerald 53 Davenport, Jackie 70 Davis, Bridgette L. 69 Davis, Mayen 43, 64 Davis, Terrell M. 54 Dean, Melissa 42, 61 Dech, Michelle 72 DeCristofano, Carolyn 61 De Lucchi, Linda 32, 34 Demsky, Michele 38 Denisova, Katya 54 Dennis, Emily A. 57 Dennison, Kate 82 De Santis, Barbara 55 Dietrich, Nanette I. 63, 79 Dilks, Jeffrey L. 75 Disseler, Shirley A. 73 Donahue, William J. 56 Donnelly, Judith 69 Doty, David 29, 33 Dukan, Nat 27, 28, 30, 33, 35, 37 Dukes, Judy 42 Duncan, Patti 32, 60, 71 Dunn, Todd 76 Ε Eddleman, Scott W. 31 Edwards, Keith 78

Eggers, Stephanie S. 72

Elias-Warren, Geneva "Genny" 48 Ellard, Candy 65 Ellickson, Kelli 49 Eyerman, Mark 66 F Fahle, Jack 56 Faircloth, Elizabeth 47, 78 Felicia, Molly 27 Felicia, Sam 27

Felton, Patrice 67 Fidler, Chuck G. 51 Flaitz, Brande 49, 53, 75 Foley, Robert C. 42, 61 Franzen, Margaret 30, 32 Frascella, Vincent 38 Frye, Cheryl 69 Fryer, Bailey 83 Fulton, Andrew 27, 30

## G

Gardner, Grant 50 Gaujean, Nadine 67 German, Susan E. 67 Gettys, Melissa 83 Giasi, Trudy 82 Gifford-Hawkins, Margie 26 Gill, Susan E. 63 Gillman, Joan 56 Gold-Dworkin, Heidi 45, 80, 82 Goldfein, Wendy S. 42, 51 Gomez, Alan 27 Goochee, Connie 85 Goodwillie, Andrew 61 Goodwin, Mel 71 Granger, Jill Nelson 50 Graybill, Letitia 75 Green, Rebecca 60 Green, Stephen 64 Green, Steve 43 Gross, Daniel 69 Gruver, Quinn Ivy 83 Gulino, Jackie 57 Gunter-Rosen, Tracey 32

## Η

Haas, Karlheinz 67 Haen, Karri 52 Hagiwara-Gupta, Sumi 48 Hairston, Glenda 84 Hall, Eric 71 Hammack, Rebekah 61 Harms, Henry R. 70, 83 Heil, Caysie H. 75 Heil, David R. 52, 76

Heinz, Michael 26 Hesson, Nicole 43 Higgins, Melissa 81, 83 Higgins, Patricia Ann 71 High, Karen A. 61 Hilgert, Uwe 66 Hilton, Brian N. 81 Hilton, June K. 81 Hohler, Lincoln 72 Holmes, Jay 62, 84 Holmes, Susan 60 Horwitz, Jane 85 Hozore, Elissa 74 Hsu, Hui-Yin 43, 62, 64 Hubbard, Leesa 52 Hunt, John D. 42, 52 Hunter, William 68 Huvaere, Dorene 49

## I

I

Ilgenfritz, Laurie 58

Jackson, Mia 52 Jaramillo, Rebecca L. 58, 70, 71 Jensen, Anitra 50 Johnson, Bud 29 Johnson, Karen E. 59 Johnson, Verneda 82 Jordan, Wendy 58 Joseph, Barbara 51 Joyner, Dana 56

## K

Kahler, Shanna 68 Kalenak, Rebecca J. 42, 82, 83 Karl, Rita K. 62 Kasparie, Diane L. 65 Kelahan, Greg 44 Kelley, Betty J. 49 Kelly, David B. 82 Kelp, Lisa 27, 28, 29, 31, 32, 34, 36 Kennedy, Katheryn 42 Kent, Timothy E. 42, 52 Kersting-Peterson, Elizabeth 42 Kindem, Cathy J. 49, 85 Kinsey, Sharon 41, 82, 85 Klag, Prent 82 Klepper, Alicia 41, 83 Kluge, Steve 61 Klump, Ray 49 Knoell, Donna L. 42, 46, 53 Kopco, Chris 61 Kraft, Carol A. 65 Krause, Catherine 66

## **Index of Participants**

Kulish, Karen 65 Kutch, Michelle 71, 72, 74

#### L

Ladd, Theresa 69 Lansford, Paula K. 42, 82 LaRosa, Sharon 55 Larrier, Doriel Inez 44 Lauth, Kellie M. 41, 54, 75 Leshem, Adah 52, 71 Levin, Jhanna 50 Lewis, Rebecca 51 Lisnitzer, David S. 42, 48, 53 Liu, Michael 31, 33 Lockard, Mijana 46 Loftin, Lou 27, 28 Loper, Tammy 61 Lopez, Ana G. 62 Lufrano, Diane 70

## Μ

Macalalag, Augusto Z. Jr. 57, 62 Macke, Natalie 69 Mader, Jared P. 58, 67, 69, 70 Magnani, Nancy 55, 68 Mahan, Michael P. 79 Maisonnier, Bruno 25 Malach, Jayne 70 Malone, Larry 32, 34, 36 Mammen, Barbara 72, 78 Manzer, Rachael 77 Maple, John 54, 56 Marlette, Stephen 78 Marshall, Denise 38 Marshall, Robert 33, 35, 36, 38 Marzilli, Angela J. 42, 45, 48 Matthews, Keisha 54 Maturo-Grasso, Gwendolyn L. 70 Maur, Bonnie 41, 74 Mazza, Christine M. 52 McCann, Maggie 41, 82, 85 McCarthy, Margaret 42, 45 McCormack, Alan J. 49, 61, 67 McGann, Meredith 70 McGonigle, James 85 McGough, Julie V. 42, 46, 51 McGrath, Edward J. 79 McIntosh, Kathleen 69 McLean, Linda 35 McMinn, Louise 64 Mendez, Flavio 39 Messersmith, James L. 73 Middleton, James A. 43

Miller, Zipporah 39 Minsk, David 30 Molotsky, Gregg J. 43, 59 Molotsky, Lynn C. 43, 59 Moody, Judy L. 46, 55 Moore, John D. 77 Moore, Sara Delano 45, 55 Mortimer, Emily 46, 55 Moss, Cindy 77 Mosser, Jennifer 80 Moyer, Richard H. 66 Munoz, Shelly 69 Murphy, Tony P. 76, 77

#### Ν

Nadelson, Louis S. 76 Nelson, Cheryl A. 42, 51 Nelson, Tracy 51 Newton, Renae L. 54 Niemela, Cheryl 78 Nocera, Ashley 86 Noppinger, Barbara A. 66 Novotny, James 38 Nunez, Carlos 62 Nyberg, Lisa M. 42, 46, 51, 62

## 0

O'Brien, Constance E. 84 O'Hair, Travis 76 O'Leary, Reneé G. 46, 50 Obst, Cher 42, 45 Odenwald, Sten F. 70 Ogens, Eva M. 60 Ortiz, Marilyn 57, 62 Ostlund, Karen L. 64 Ozturk, Gokhan 43

## P

Padgett, Helen L. 43, 69, 72 Pardue, Sally J. 42, 82 Parry, Elizabeth A. 42, 45 Patrick, Eileen 55 Pavlekovich, Chad S. 70 Pearce, Danielle 42 Pearson, Greg 76 Pennell, Lynda 31 Peterson, Beth Kersting 45 Peterson, Leslie 27 Petrone, Christopher J. 64 Pietrucha, Barbara R. 47, 78 Porter, Alfred 63 Powell, Mike 86 Pozzanghera, Betsy 77 Prakash, Manju 66 Pressler, Elizabeth 78 Pruet, Susan 42

## **Q** Quinn, John 26

R Radin, Dan 29 Radloff, Andre 80 Rahn, Regina D. 49 Rankel, Lillian A. 47 Ready, Minnietta 59 Rendell, Doug 41, 84 Rentfro, Lauren D. 49 Reves, Sandi 42, 45, 52 Ricci, David 64 Rillero, Peter 43, 61, 69, 72 Ringer, Heidi L. 76 Roark, Karen Crow 63 Robeck, Edward C. 56 Roberts, Oliver Thomas 44, 51 Roberts, Sandra 86 Robinson, Michael 65 Roditi, Hudson 62, 82, 84 Rose, Michael 42 Rossman, Janis 65 Roter, Cindy 62 Rourke, Patty 34, 36 Rowe, Chris 38 Rozzell, Jodie 66 Runco, Lisa 43, 62, 64 Ruschman, Ross 72 Rush, Linda 38

## S

Sabarre, Amy 57 Samuelson, Jack 49, 64 Sankar, Ramya 84 Saravia, Katie 58 Satterfield, Mary B. 62 Saur, Karen 82 Sayers, Robert 58 Scali, John C. 59 Scantlebury, Kathryn 42, 68, 76 Schelkin, Larisa 80 Schuler, Sydney 66 Schuster, Glen 76 Scribner, Adam 83 Seifert, Anne 76 Sestito, Gail H. 41, 84 Shields, Carol 47 Short, Brian P. 68 Short, Jim 62, 82, 84 Silvaggio, Allison 46 Simmons, Patricia 26, 37 Singer, John 71 Slane, Patrick 55 Smith, Ben 58, 67, 69, 70

Smith, Katie 35 Smith, Linda L. 53, 56 Smith, Mary Lou Blanchette 50 Snilsberg, Thor 86 Sondel, Heather B. 43, 64, 79, 80 Spicer, Yvonne M. 28 Stallworth, Asiha 50 Starr, Mary 26, 34 Steele, Elizabeth 85 Stoker, Bryan 82 Stokes, Carrie 43 Stone, Amanda 56 Stremme, Robert 49 Strohminger, Gordon 29 Strzok, Chris 27, 79 Stuessy, Carol 43 Suchmann, Peter 36 Sundberg, Cheryl White 86 Sutton, Elizabeth 59

## T

Tamagni, Michael 42 Tanenbaum, Jacob 68 Tanner, Amy 51 Tedeschi, Michael 65 Teisan, June 61 Tellinger, Tracy 41, 54, 75 Tennant, Jeannine Marie 46 Terrill, Brandy J. 56 Timpanelli, Nick 82, 85 Todd, Charre L. 83 Todd, Joseph 26, 34, 36 Trentacoste, Stefanie 54, 56 Troiani, Debbie 85 Trout, Charlotte M. 61 Tucker, Deborah L. 50, 78 Twilley, Brooks 71

## U

Urbanowski, Vin 41, 84 **V** 

Valadez, Jerry D. 77 Varnell, Curtis J. 59 Vasquez, Jo Anne 78 Vaughan, Kelly 70 Vaughn, Mark D. 75 Vavalla, Peggy 46, 50 Vermerris, Jonathan 67 Vine, Freda 85 Vineyard, Richard 31, 33 Vinion-Dubiel, Arlene 50

## W

Wagner, Judson 74 Waller, Lisa 69
## **Index of Participants**

Walters, Eric 42, 45 Wang, Shiang-Kwei 43, 62, 64 Wargo, Eileen 65 Wassell, Beth 42 Weber, Mary Ellen 37 Weiss, Mark 38 Welles, Doug 27, 28, 29 Wesby, Kenton D. 65 Wesby, Tanisha 26 Wesson, Kenneth 26 West, DJ 72

Westfall, Marie 59 Wheeler, Jeremy 49, 53, 75 Whittlesey, Lisa 55 Wiehagen, Michele Bubley 56 Wiggins, Felita 43 Wilkes, Lisa 48 Williams, Francesca Cristofaro 52 Williams, Keith 81 Williams, Michele 26

Williams, Renee 57 Williamson, Benjamin 58 Wilson, Eric 58, 67, 69, 70 Wilton, Dave 63, 68 Winograd, Marilyn 47 Winters, Marshall 61 Wisker, Nancy F. 34 Witteman, Jessica 50 Wolfe, Becky 51 Wolowiec, Maryann 77, 79 Wright, Donna 76

## Х

Xiques, Peter 59 Y

Yard, Nancy 78 Ζ

Zak, Fran 59 Zimmer, Elyse 65

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