2022

Innovation, Inspiration & Connection

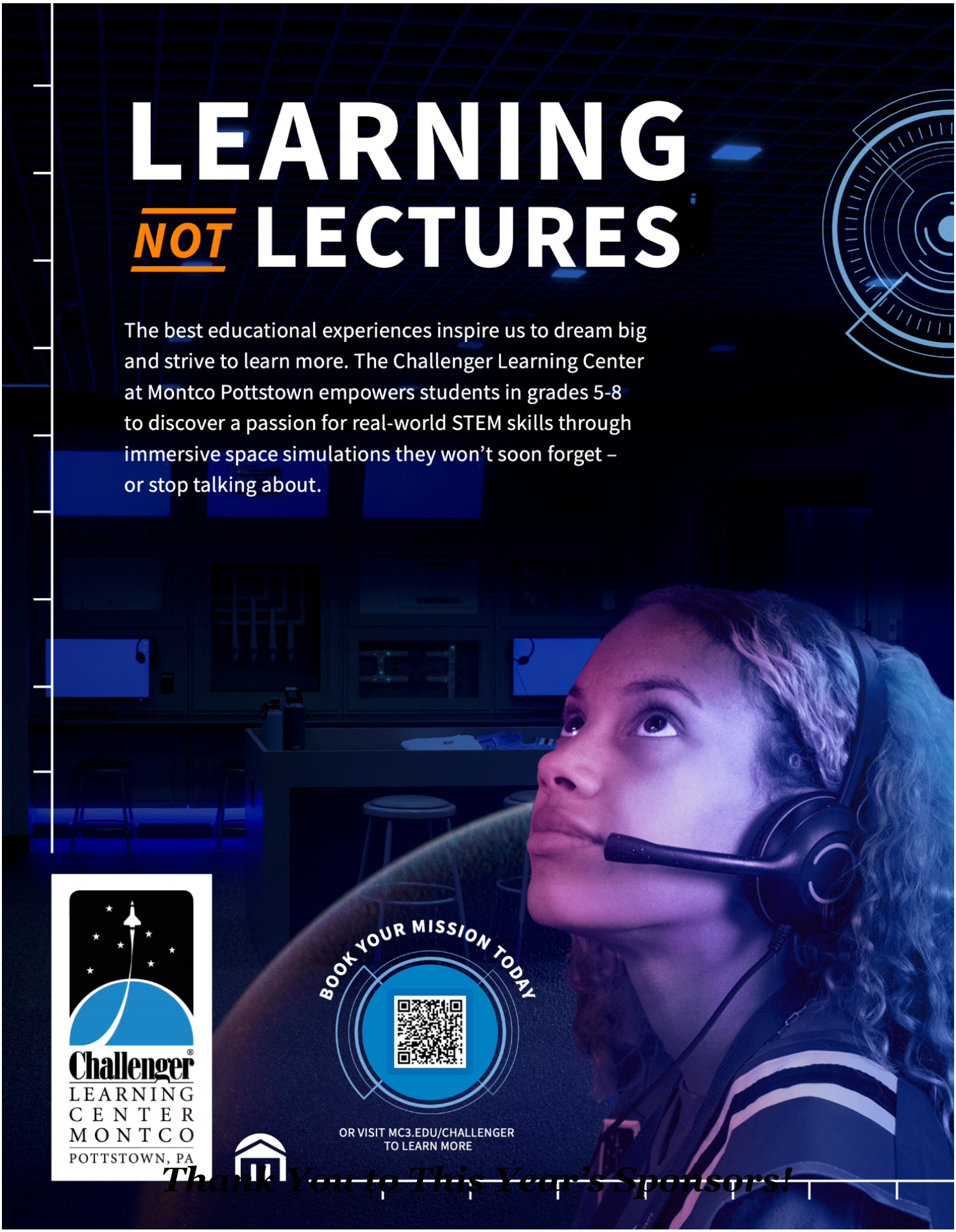
Pennsylvania Science Teachers Association

The PSTA 2022 Annual Conference

DoubleTree Resort by Hilton

Lancaster, PA

October 2nd & 3rd


LEARNING
NOT LECTURES
The best educational experiences inspire us to dream big and strive to learn more. The Challenger Learning Center at Montco Pottstown empowers students in grades 5-8 to discover a passion for real-world STEM skills through immersive space simulations they won't soon forget – or stop talking about.
Challenger
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BOOK YOUR MISSION TODAY
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Thank You to This Year's Sponsors!

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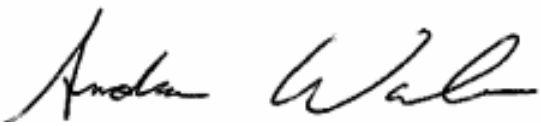
Welcome to the 2022 Pennsylvania Science Teachers Association Conference

We would like to welcome you to this year's Pennsylvania Science Teacher Association annual conference. As we look to the future of science in Pennsylvania, we're at the crossroads of crucial time. As teachers and scientists, we know the importance of real-world, first-hand experiences for students. We know to truly prepare our students for future science-related careers we need to present these students with opportunities not just to learn science, but to be scientists. Over the past few years, Pennsylvania has stepped up its focus on Career Readiness for students through technology and career readiness programs. Science has been lagging behind other states with outdated standards and missed opportunities. With much excitement, Pennsylvania is in the process of finalizing new standards for Science Education. These standards will be out shortly, and can truly be the catalyst Pennsylvania needs to get back to being one of the leading states for science and STEM education.

Just as good ingredients do not make a great chef, we know a great educator goes beyond standards. Being here at this year's conference shows your commitment to bettering your craft. We are excited about the opportunities available to you at #PSTA2022. We are pleased to welcome teachers from the Penn State University Center for Science and the Schools (CSATS) program, who have done scientific research and are now using that real-world data in the classroom with their students. The Keynote Sunday night by Sam Moore will motivate and encourage the great things going on in your classroom with a closer look at PA as a leading state in the space industry. Through the many great sessions Sunday and Monday, we hope you find new ways to challenge, inspire, and encourage your students to become scientists in their everyday life.

We hope you find your time here with us rewarding, but PSTA has much more to offer after the conference is over. To stay up to date with all of the latest news, make sure to follow PSTA on Twitter @TeachPASci and Facebook.

Most of us are here today because of a teacher who helped to spark a scientific interest in our life. We have the ability to instill that passion in our students. We hope PSTA can help support you on that journey!



Andrew Walton
PSTA President 2022

Conference Schedule

Sunday, October 2nd, 2022

2:00 pm	Registration opens
3:00 pm	Sessions begin
6:00 pm	Exhibit hall opens with cash bar and light refreshments
6:00 pm	Center for Sciences and the Schools (CSATS) Poster session
6:15 pm	Happy Hour with PSTA & PDE: New Science Standards
7:15 pm	Dinner begins
7:30 pm	Official Welcome
7:45-8:45 pm	**Keynote: Sam Moore & Blue Origin**
8:45-9:30 pm	Exhibit Hall & Networking

Monday, October 3rd, 2022

7:30-9:30 am	Registration Open and Continental Breakfast in Palm Court
8:00 am	Exhibit Hall opens
8:00-11:45 am	Morning Breakout Sessions
11:45-1:00 pm	Lunch, Awards, PSTA General Meeting, Guest Speaker
1:00-1:30 pm	Exhibit Hall time
1:30-4:15 pm	Afternoon Breakout Sessions
3:00 pm	Refreshments and Cookies in Palm Court

Conference Committee

Robert Cohen	Conference Chair
Andrew Walton	Planning, Registration, Exhibit Hall and Web Support
Samantha Ramaswamy	Social Media, Sessions, Program, Tech Support
Eileen Coughlin	Membership
Don Kline	Treasurer
Christine Royce	PSTA Executive Secretary
Cathy Stephenson	Professional Development Basket Raffle
Sunny Weiland	Cover Contest

PSTA Proudly Welcomes

Sam Moore

Sam Moore (he/him) is the executive director of the Moonshot Museum, a new museum coming to Pittsburgh's Northside in 2022. The Moonshot Museum is focused on inspiring people to find their place in the future of human space exploration and settlement through access to real spacecraft and space industry professionals.

Prior to the Moonshot Museum, Moore served in leadership positions with museums and cultural nonprofits in Pittsburgh and beyond, including the Senator John Heinz History Center, the National Aviary, Missouri Historical Society, and St. Louis's Campbell House Museum. He is a past member of the graduate faculty in Museum Studies at the University of Missouri-St. Louis.

Moore serves as communications chair for the Public Relations & Marketing Professional Network of the American Alliance of Museums (AAM), is a member of the Creativity & Experimentation Task Force for the American Association for State and Local History (AASLH), and is a past member of AAM's National Program Committee.

Conference Information

Registration Hours

The registration area will be open during the following times to pick up your registration materials. Save time and money and pre-register!

Sunday, October 2nd, 2022
2:00 pm - 6:30 pm

Monday, October 3rd, 2022
7:30 a.m. – 9:30 a.m.

Meeting Rooms

All sessions will be held at the DoubleTree Resort in Lancaster. Meeting Rooms are found on the Main Level and Ground Level. Maps are provided for your convenience. Conference attendees are asked to utilize the maps provided throughout the hotel and conference center or ask any of the volunteers at the conference for directions.

Information Booth

An Information and Troubleshooting Booth is located at the Registration Area and provided for your convenience. General conference questions can be answered at this location.

Meals

Sunday night dinner, Monday breakfast, lunch, and is provided for all attendees as part of the registration fee.

Coffee Break

Coffee break drinks and snacks will be available in Palm Court throughout the day Monday thanks to our sponsors.

Thank you to our Monday Lunch Sponsor:

PSTA Silent Auction

This year PSTA will once again be holding a silent auction during the conference. Many unique items and theme baskets will be available on which to place your bid. The auction will take place Sunday from 6:00-9:00 and on Monday from 8:00 AM-12:00 PM in the Exhibit Hall. All proceeds will go directly into the newly created science teacher professional development fund. The highest bidder on each item will be notified by phone Monday afternoon. Pick-up with payment can be made between the hours of 2:00-3:00 PM on Monday. Items not claimed by this time will go to the next highest bidder.

In addition, conference attendees have the opportunity to receive a science teacher professional development award. The number and amount of each award will be determined based on the number of registrants.

The 2022 winner(s) will be drawn at noon on Monday during lunch. The stipend will be sent directly to the school superintendent or college dean of the awardee. It may be used by the winner to attend a specific science or STEM related conference or workshop or to help defray the cost of a science professional development activity at your school.

Map of DoubleTree - Main Level

DOUBLETREE RESORT
BY HILTON
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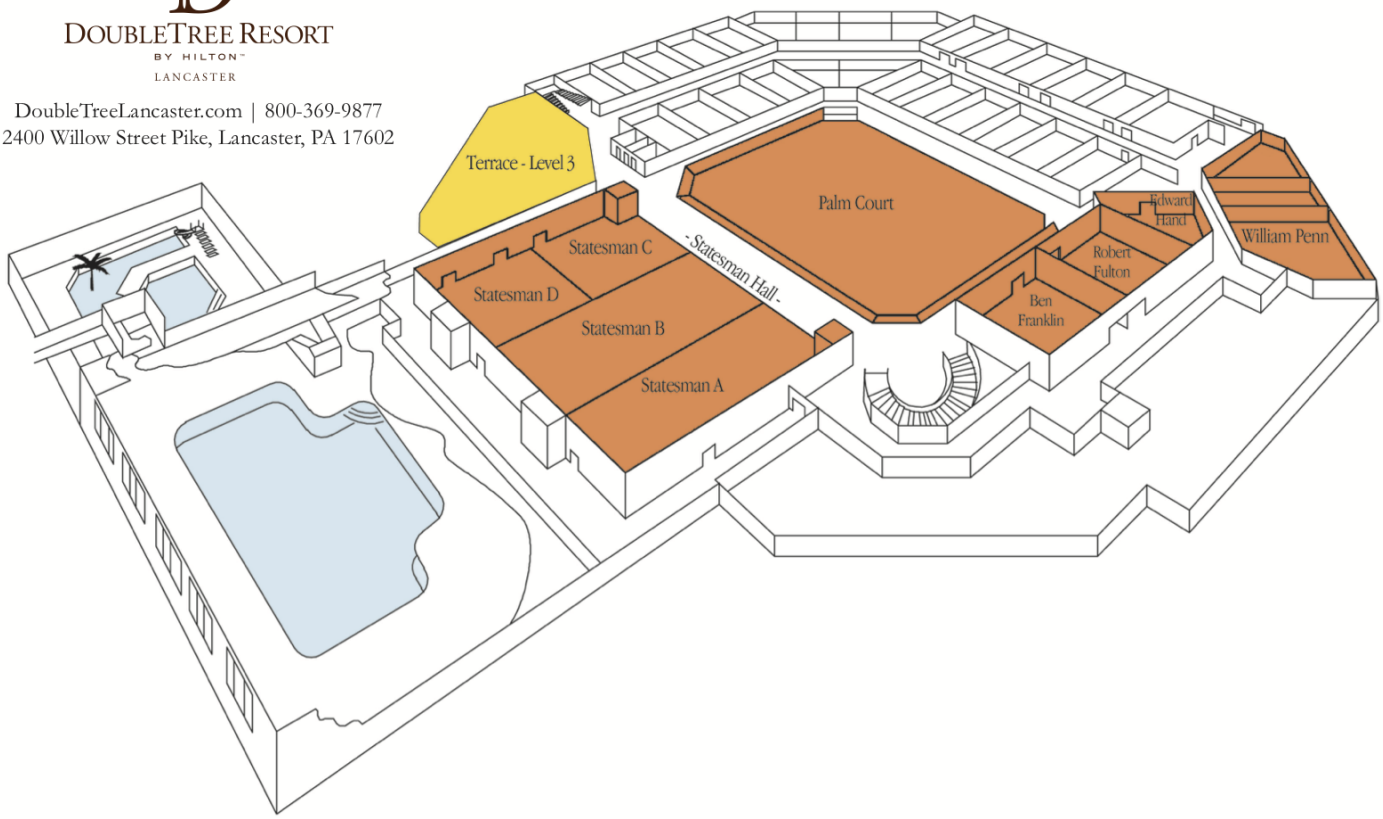
DoubleTreeLancaster.com | 800-369-9877
2400 Willow Street Pike, Lancaster, PA 17602



STEMscopes™
K-12 SCIENCE

STEMscopes SCIENCE

Tour our digital science curriculum to see how we empower teachers through the 5E+IA instructional model and promote flexibility in planning and assessment.

STEMscopes CODING

Powered by Bitsbox, STEMscopes Coding is an affordable, exciting way to teach your student how to build and share their own, personalized apps. The best part, teachers? No prior coding experience is required.

STEMscopes DIVE-In ENGINEERING

Unleash your students' creativity with DIVE-in Engineering, a curriculum where makerspace meets engineering design and being an engineer becomes a reality.

LEARN MORE

Scan the code to explore all our STEM programs.

For more information and a free preview,
please contact your STEMscopes Account Manager, Walt Coatsworth, at wcoatsworth@acceleratelearning.com.

Act 48 Credit at the PSTA Conference

Act 48 attendance verification will once again be available at the PSTA Conference. PSTA is not an approved Act 48 provider and thus cannot offer official Act 48 credit. PSTA will, however, provide you with verification of attendance to conference sessions. If you intend to use your attendance at the conference for Act 48 credits, it is your responsibility to make sure your district accepts your conference attendance as part of their approved program.

At the end of each breakout session, you will be provided with a session evaluation link. Once you submit the session evaluation, you will be emailed a certificate of attendance. If you leave the session early, you will not receive the evaluation code. It is your responsibility to submit the session evaluation in order to receive your certificate. If you have any questions or issues with submitting the evaluation link, please email the Board of Directors at pstaboard@gmail.com.

General Membership Meeting

Monday, October 3, 2022
11:45 am - 1:00 pm
Main Hall
PSTA General Membership Meeting
Presiding: Andy Walton, PSTA President
As designated in the PSTA Constitution, each year one General Membership Meeting is to be held and presided over by the President. The purpose of this meeting is to gather input from the membership at large, summarize the activities of the organization for the year, and act on any business requiring action of the membership. Your attendance and input are encouraged.

PSTA needs you!

We are looking for new board members!
The following positions are currently vacant on the board:

- Vice President
- Regional Representatives
  - Region 1 (IU 22, 23, 24, 25 & 26)
  - Region 3 (IU 18 & 19)
  - Region 6 (IU 8, 10 & 11)
  - Region 7 (IU 1, 2, 3, 7 & 27)
  - Region 8 (IU 4, 5, 6 & 28)
- State At-Large Representatives
- Eastern College Representative (open to college and university faculty only)
- Central College Representative (open to college and university faculty only)

If you are interested in running for any of these positions, please e-mail the Board of Directors at pstaboard@gmail.com. When you reply, please indicate your interested position, your school/institution affiliation, a short bio about your qualifications, and that you are a PSTA member in good standing.

APPLICATIONS DUE FRIDAY, OCTOBER 14th

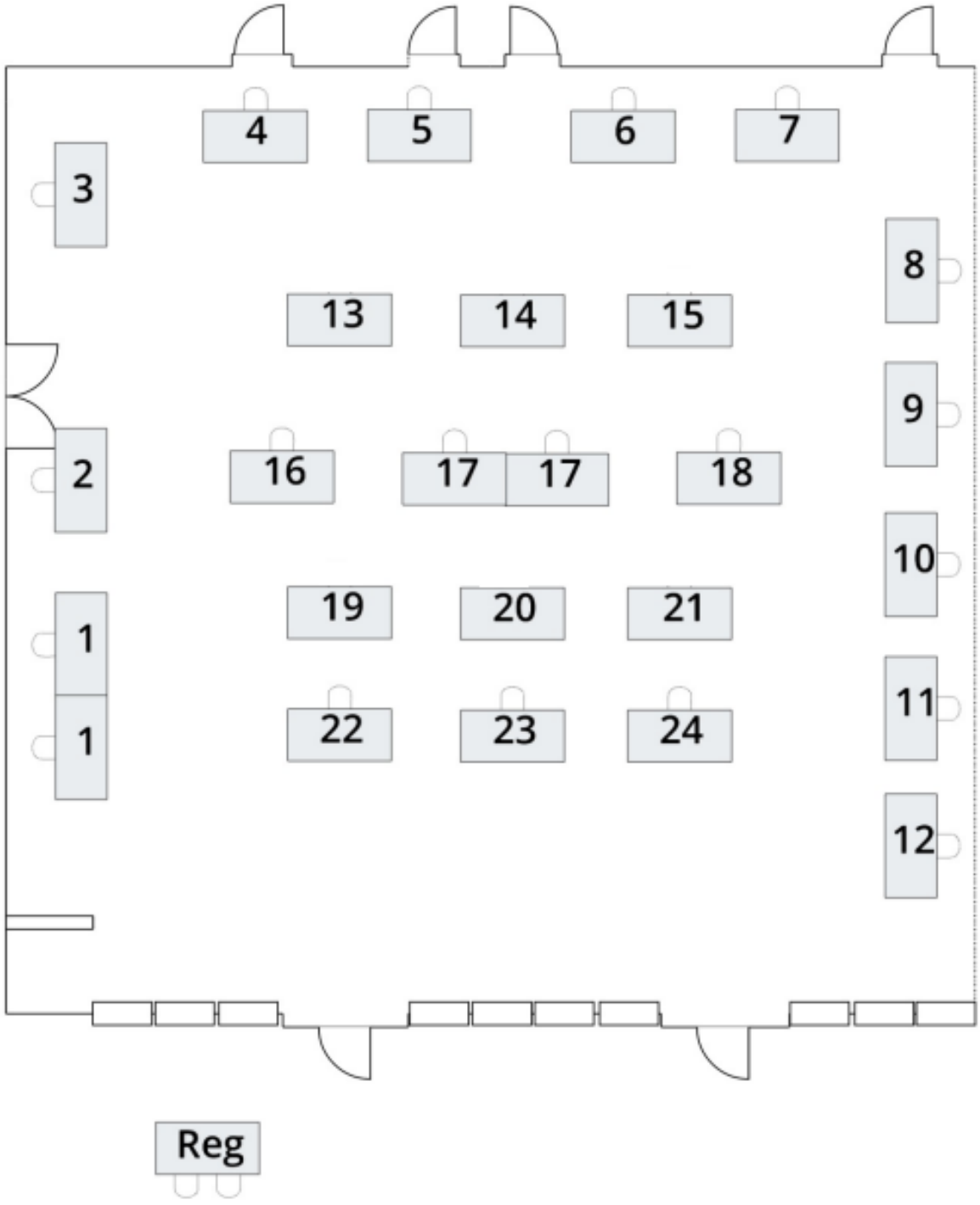
Exhibit Hall Information

Part of the PSTA Conference features an exhibit hall representing vendors of science education materials. Under one roof, you will have the opportunity to view textbooks, audiovisual equipment, software scientific equipment, and other science classroom materials. This is also the location of the NSTA Science Store. The Exhibit Hall is open Sunday, October 2nd beginning at 6:00 pm through 9:30 pm. It will reopen on Monday, October 3rd from 8:00 am through 4:00 pm.

Exhibit Hall Vendors

1	STEMscopes
2	Challenger Learning Center at Pottstown
3	Keystone Teacher
4	Penn State Center for Science and the Schools
5	PA Environmental Literacy
6	Stroud Water Research Center Education Programs
7	ExploreLearning
8	The Living DoNATION
9	Discovery Education
10	BIOZONE Corporation
11	Savvas Learning Company
12	Stile Education
13	PLTW - Project Lead The Way
14	Conservation Adventures
15	LEGO Education
16	The Pennsylvania Society for Biomedical Research (PSBR)
17	PSTA Silent Auction
18	School Specialty Delta Education
19	AEOP eCYBERMISSION
20	Shell Science Lab Regional Challenge booth
21	NSTA
22	Phenomenon Science Education
23	Amplify
24	Lab-Aids, Inc.
25	Toshiba/NSTA ExploraVision

Exhibit Hall Map



Sunday Sessions

3:00 pm - 3:45 pm

Now Trending: Science Simulations to Make Things Stick!
Room: Franklin
Interactive – K-5 – Biology, Earth & Space, Physical Science, STEM/STEAM, Scientific Practices, Crosscutting Concepts
Presenter(s): Jenna Mercury, ExploreLearning
Everyday events should make us wonder! And while some events are easily explained, others, not so much! But when we can take those concepts and examine and test them thoroughly with virtual simulations, it can give students an opportunity to think bigger, dig deeper, and be inspired by it all!

NGSS and Chemistry: Making it Happen
Room: Fulton
Informative – 6-12 – Chemistry
Presenter(s): Patti Duncan, Discovery Education
Let's discuss and share resources and best practices for aligning our Chemistry instruction to the NGSS standards. What does it look like? What does it NOT look like? What are your favorite resources?

Getting Started with Anchor Phenomena in FOSS Elementary
Room: Statesman C
Interactive– K-5 – Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology, Scientific Practices, Crosscutting Concepts
Presenter(s): Amy Hamacher, FOSS Science
Take a peek at the newest Edition of FOSS: Pathways using the third grade module: Water and Climate. Students need to experience and make sense of relevant science phenomena - a challenging task for teachers. Participate in a lesson that engages you with local and relevant phenomena. Plan to incorporate phenomena into your everyday instruction.

Unlocking the Mystery of Data Literacy
Room: Statesman D
Informative – K-College – Scientific Practices
Presenter(s): Nicole Wilkinson and Kristina Fulton, IU 13
Data literacy is becoming a hot button issue, but what even is it? Students are bombarded daily with large amounts of data, but can they actually read and understand the data? Join us as we provide skills and tools needed to equip learners to make sense of data, construct arguments and analyze and interpret graphical data through data talks and graph annotations. You will walk away with activities that you can immediately implement into your classroom due to the teacher-facilitated student-driven nature.

NGSS phobia? We gotcha covered!
Room: William Penn
Interactive – K-12 – Scientific Practices
Presenter(s): Christie Orlosky, ARIN IU 28 and Lisa Adams, Homer Center School District
Participants will experience an interactive, hands-on session that introduces essential aspects of the Next Generation Science Standards (NGSS). We will work through a few exciting lessons that can be taken straight to the classroom. Teachers will leave with a greater understanding of 3-dimensional teaching and feel empowered to try out some cool science with their students.

4:00 - 5:30 pm

Biofuels: Planning and Carrying Out Investigations

Room: Terrace Room

Hands-on – 6-College – Biology, Chemistry, STEM/STEAM, Research, Scientific Practices, Crosscutting Concepts

Presenter(s): Dr. Sarah Durkin, US Naval Academy

The Biofuels session prepares teachers to engage their students in the NGSS science and engineering practice of Planning and Carrying Out Investigations through a laboratory experiment focused on the use of biotechnology to produce biofuels from renewable biomass. Participants will be eligible to receive a classroom set of supplies.

4:00 pm - 4:45 pm

Competency Framework Derived from the NGSS Cross-cutting Concepts and Science and Engineering Practices

Room: Franklin

Informative – 9-12 – Biology, Physics, Physical Science, STEM/STEAM, Environmental & Ecology, Scientific Practices, Crosscutting Concepts

Presenter(s): Kurt Ahrens, School District of Philadelphia

Science is a multifaceted enterprise that shapes our lives in many ways. We are not just teaching a body of facts (disciplinary core ideas or DCIs), but also skills and techniques (science and engineering practices or SEPs), as well as the intersectional applications of significant cross-cutting concepts (CCCs). The U School uses a set of grade-level expectations for assessing student competency in the SEPs and CCCs; these skills and concepts are taught in the context of the relevant DCIs for each science course.

101 Websites for Science

Room: Fulton

Informative – K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM

Presenter(s): Patti Duncan

I will share my current collection of web-based resources for science teachers. Tons to share, tons to learn! Come ready to check them out! Bring a device if you have one.

The Time is NOW: Integrating Literacy in the Science Classroom

Room: Statesman C

Interactive– K-6 – Scientific Practices, Crosscutting Concepts, Science centered language development

Presenter(s): Amy Hamacher, FOSS Science

Who has time for science instruction?! We do! Participate in a lesson and learn how to integrate science instruction into your literacy programming by using FOSS hands-on materials. Leave with strategies you can use in every science classroom to increase language development and literacy skills.

Finding Renewable Energy for Potato Town

Room: Statesman D

Interactive – 6-12 – STEM/STEAM

Presenter(s): Brittney McMullen, Michael Palmiero, Olivia Oley, Ryan Bennett, Wesley Newman, and Heather Mitchell

We created a field trip where "Potato Town" ran out of potatoes that powered the town. Students visited stations covering different sources of renewable energy and got experience building some. At the end of the trip, students had to decide which would be most effective for Potato Town.

Implementing a Mastery Approach with Struggling and Reluctant Learners

Room: William Penn
Informative – 9-12 – Biology, Instructional practices
Presenter(s): Alison Stone, Central Bucks School District
The Modern Classrooms Project model provides and instructional framework that mixes blended learning, self-paced and mastery based learning. The model works well with all levels of students and offers a manageable way to truly differentiate instruction for student success. Self-pacing in science can be a challenge however, the blended learning component allows students to self-pace even when conducting laboratories.

5:00 pm - 5:45 pm

A journey towards more authentic STEM and workforce development

Room: Franklin
Informative – K-College – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology, Research, Scientific Practices, Crosscutting Concepts
Presenter(s): Jeff Remington, Penn State Center for Science and the Schools
As PA embarks on implementation of the newly adopted STEEL standards, educators will have to journey toward more authentic STEM and workforce development. This session will offer insight on how federal and state grant programs like PA Smart, the Chips & Science Act, and TIPS will play a part.

21st Century Science Using 21st Century Tools

Room: Fulton
Informative – 6-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology
Presenter(s): Patti Duncan
What are the latest and greatest technologies and websites for science instruction? Come learn about them and how they can be used.

Using Literacy and Writing Elements to Strengthen Science Understanding

Room: Statesman C
Interactive– 6-12 – Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology, Elementary
Presenter(s): Alicia Chiasson, STEMscopes by Accelerate Learning
Come learn how to use effective literacy strategies so that students can better understand science content. Help students successfully analyze, discuss, and summarize science text. Student understanding and critical-thinking skills will improve with these techniques. Join our constructivist approach that promotes literacy in the science classroom.

A Meta-transcriptomic Analysis of Complicated Diverticulitis Tissue: The Role of Xenobiotics in the Gut

Room: Statesman D
Interactive – K-12 – Biology, Research, Microbiology
Presenter(s): Brittney McMullen
Diverticulitis is a common inflammatory disease affecting over 58% of adults over 60. Little is known how the gut microbiome may influence or change as a result, so we resected tissue from complicated and uncomplicated diverticulitis patients. 16S and meta-transcriptomic analysis revealed exciting sulfur cycling and xenobiotic degradation findings.

3-Dimensional Assessments in Chemistry: Developing Rigorous, Relevant, Engaging, and Empowering Assessments
Room: William Penn
Interactive – 6-12 – Chemistry, Physical Science, Scientific Practices, Crosscutting Concepts
Presenter(s): Dina Dormer and Allyson Kearney, Pennridge School District
Three-dimensional assessments aligned with the NGSS disciplinary core ideas, science and engineering practices, and crosscutting concepts challenge students to communicate using the language and concepts of science while making sense of information that crosses multiple disciplines. Students investigate real-world phenomena and devise solutions to relevant problems while expressing their thinking and demonstrating their understanding of chemistry and science.

Monday Sessions

8:00 am – 9:30 am

FOSS: Conducting Engineering Experiences

Room: Statesman C
Hands-on– K-6 – Physical Science, STEM/STEAM, Scientific Practices, Crosscutting Concepts
Presenter(s): Amy Hamacher, FOSS Science
Can you design an air trolley that safely delivers its passengers to a destination? Accept the challenge and join us to put your ideas to the test. Learn engineering strategies to ignite your students' curiosity and problem solving skills using the new STEM modules in the FOSS Science curriculum.

8:00 am – 8:45 am

STEAM Ahead

Room: Franklin
Interactive – K-12 – STEM/STEAM
Presenter(s): Laura DeLawder and STEAM Student Interns: Elektra Leiphart, Marylee Geiger, Landon Craley, Kacy Sparks, Jack Gulley, Ian Stambaugh, and Makenzie Wagaman, Red Lion Area School District
Discover the art of empowering your students to develop STEAM-based skills through hands-on teaching and learning with peers. Join in on the excitement with our team of high school student interns, as they share the leadership opportunities and program details of STEAM Ahead, a student-taught elementary STEAM-based event.

NSTA K-5 Resources to address STEM

Room: Fulton
Interactive – K-5 – STEM/STEAM
Presenter(s): Debra Sawyer, Ph.D., NSTA
Learn how to integrate STEM and literacy through the use of high-quality STEM-related lessons, picture books, and manipulatives authored by Emily Morgan and Karen Ansberry. Inspire curiosity through natural phenomenon with the Next Time You see series author Emily Morgan.

Evolution for Middle School Educators

Room: Statesman D
Informative – 6-8 – Biology
Presenter(s): Rachel Kannady
Teach evolution with confidence! The presenter will model an entire free unit of instruction, focusing on evolution content, hands-on activities, and engaging online resources. Our website features free monthly webinars and dozens of resources organized by content standard.

Biology Keystone Strategies

Room: William Penn
Interactive – 9-12 – Biology
Presenter(s): Samantha Redinski and Jennifer Henney, Penn-Trafford School District
In this session, we will share strategies that our district implements before, during, and after Keystone testing. Participants will have the opportunity to engage with a select number of instructional strategies and manipulatives utilized in our classrooms to help prepare our students for the Keystone exams.

9:00 am – 10:30 am

Conservation Science

Room: Franklin
Hands-on – 9-12 – STEM/STEAM, Environmental & Ecology
Presenter(s): James McChesney
New Conservation/Recreation-Based Science Curriculum: The Conservation Science curriculum engages students in doing science and developing important skills such as critical thinking, problem solving, communication, data collection, etc. The curriculum focuses on the North American Model of Wildlife Conservation and the related outdoor recreation: Hunting, fishing, trapping, shooting sports and boating. Students learn and develop skills related to relevant and applicable topics.

9:00 am – 9:45 am

Not Your Average Elementary STEM Workshop: Build A Ride for Your Toy

Room: Fulton
Interactive – K-8 – Physical Science, STEM/STEAM
Presenter(s): Linda Culpepper, Lab-Aids
With the Tinkering Labs Electric Motors Catalyst, your students can create their own inventions using real wood, real hardware, and real motors. They will learn STEM through project based design challenges that allow them to wonder, test, invent (and yes, play!) while learning important physical science and engineering core ideas, such as force, motion, electricity and energy. The Tinkering Labs STEM curriculum was designed for grades K-5 by a team led by Gever Tulley, founder of the award-winning, independent Brightworks School in San Francisco. This hands-on workshop challenges participants to make a vehicle to move a toy or other small object using motors, wheels, wires and other equipment. This activity is one of 10 engineering design challenges in the Electric Motors Catalyst, a STEM curriculum for grades K-5 that comes complete with equipment, lesson plans, assessments, embedded support for ELA, and is fully aligned to NGSS. The program is distributed exclusively by Lab-Aids. Lesson samples and literature will be distributed.

Introducing #ScienceSaves, a Project that Promotes Science Appreciation

Room: Statesman D
Informative – K-12 – Biology, Physical Science, STEM/STEAM, Environmental & Ecology
Presenter(s): Rachel Kannady
ScienceSaves promotes the fact that thanks to science, individual lives are healthier and easier. Our free lessons teach graphing, data analysis, engineering practices, and more. They include teacher notes, standards, response sheets, rubrics, and lesson plans. Our resources are at www.sciencesaves.org, with a $15,000 scholarship opportunity for high school seniors.

Developing Critical Thinking Skills with Phenomena

Room: William Penn
Interactive – 6-12 – Earth & Space, Scientific Practices
Presenter(s): Patti Duncan, Discovery Education
Helping students develop critical thinking skills is key in today's science classroom. The use of video, sound effects, images and simulations to discuss scientific phenomena is a great way to accomplish this goal. Let's discuss instructional strategies for encouraging questioning, arguing from evidence, analyzing data and more using digital media!

What's Standardized Testing Got to Do With It?
Room: Terrace Room
Informative – K-12 – STEM/STEAM
Presenter(s): Ethan Ake-Little, Wallingford-Swarthmore School District
Standardized testing often strikes fear in the hearts of students and teachers alike. In this session, we will demystify standardized testing especially as it relates to the core science and mathematics content areas. By understanding the logic and structure of standardized tests, we can better prepare ourselves and our students to take them.

10:00 am – 11:30 am
Bioterrorism: Spread of Disease and Use of Biotechnology for Detection (90 minute session)
Room: Terrace Room
Hands-on – 6-College – Biology, Chemistry, STEM/STEAM, Research, Scientific Practices, Crosscutting Concepts
Presenter(s): Dr. Sarah Durkin, US Naval Academy
Explore how biotechnology is used to fight bioterrorism. Investigate the spread of disease, learn how to use an antibody diagnostic test to detect infection, and use logic and reasoning to identify the source of the outbreak. Participants will be eligible to receive a classroom set of supplies.

10:00 am – 10:45 am
Looking for Patterns in Species Diversity
Room: Fulton
Interactive – 9-12 – Biology
Presenter(s): Linda Culpepper, Lab-Aids
Look for patterns in species diversity in coral reef ecosystems and other animals to determine cause and effect relationships and understand how ecosystem interactions affect patterns of biological diversity. Participants will receive a set of materials to use with students in the classroom.

Burn-Out
Room: Statesman C
Interactive– K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology
Presenter(s): Rebecca Cottington
If someone hands me another worksheet on self-care, I may combust. We know what burn-out feels like, but what is it and how do we fix/prevent it?

The World Outside My Window: How Covid shifted our Classroom Practice to Place Based Science Learning
Room: Statesman D
Informative – K-5 – Biology, STEM/STEAM, Environmental & Ecology, Scientific Practices, Crosscutting Concepts
Presenter(s): Sarah Presogna, Amy Marsch, and Rebekah Sheeler, Nolde Forest EEC - DCNR
No Field Trips? No Problem! Students are fascinated by phenomena right outside their windows. We've developed lessons for both school yards big and small as well as student's homes (no matter where they live) that integrate science, math, art and excite and engage students about their "own" section of nature.

Meeting the PA Science Standards with Discovery Education

Room: William Penn
Informative – K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology, Scientific Practices, Crosscutting Concepts
Presenter(s): Patti Duncan, Discovery Education
Discovery Education has 1000's of resources, innovative lessons and digital tools that help science teachers meet the new PA Science Standards. If you already have a Discovery Education account, and want to learn how, come chat with us!

11:00 am – 11:45 am

Lettuce Get Students EXCITED about STEM!

Room: Franklin
Informative – K-12 – Crosscutting Concepts
Presenter(s): Samantha Johnson, Commonwealth Charter Academy
AgWorks at CCA is an innovative controlled environment agriculture program, including a tissue culture lab, R&D lab, genetics lab and mobile aquaponic classroom. We use a sensor system to display data in real-time, so students in the lab, as well as those attending virtually, can see how the lab is functioning on a daily basis. Students can explore ag-based STEM careers through a variety of options - including job shadowing, field trips, clubs, independent studies, internships, elective courses and more! During this presentation, AgWorks staff will demonstrate how we leverage these tools to provide K-12 instruction tied to careers in Pennsylvania. We will also provide resources you can bring back to your classroom surrounding aquaponics, aeroponics and hydroponics!

The Full Course: Modeling Antibiotic Resistance

Room: Fulton
Interactive – 6-12 – Biology, Environmental & Ecology, Scientific Practices
Presenter(s): Linda Culpepper, Lab-Aids
Looking for an engaging phenomena to launch your evolution unit? In this lesson, students use a model to explore the cause-and-effect relationship between inappropriate use of antibiotics and the phenomenon of the evolution of antibiotic resistance. As they use the model, students use mathematical representations to support their analysis of patterns and trends in the results and to develop explanations for how and why the population of bacteria is changing.

Integrating original student research within a science course curriculum

Room: Statesman C
Informative– 6-12 – STEM/STEAM
Presenter(s): Pamela Dixon Kuhn, Science Research for All, Inc.
Science research programs are prevalent in many high-achieving STEM specialized schools; however, we believe ALL students can participate in the scientific method by doing original research within the science classroom. In this session, we will outline the process for incorporating a capstone research project in a high school or middle school science course. Through this process, instructors will be able to engage their students in independent and original research as part of the course learning outcomes. By empowering teachers to implement science research within their curriculum, we hope to shift STEM education from traditional instruction to open inquiry where students connect to the real-world scientific community.

Planning Meaningful Field Trips to the PA State Parks
Room: Statesman D
Interactive – K-12 – Environmental & Ecology
Presenter(s): Valerie Stone, Advancing Science at Gettysburg College and Renae Weidner, Codorus State Park
Learn how to plan a meaningful PA State Park field trip for your students. Topics will include engaging community partners, selecting activities that enhance classroom learning, and preparing your students for outdoor learning. Presenters will share a field trip planning template, examples, and best practices.

Tech Tools That Support Success in the Classroom!
Room: William Penn
Interactive – 6-12 – Biology, STEM/STEAM, Environmental & Ecology
Presenter(s): Judith Lucas-Odom, Chester Upland
Integrate technology into your classroom that helps everyone be more successful improving skills! Close the learning gaps using digital apps, tools, surveys, and forms that help setup, collect, analyze, present, and complete labs and activities that will make your classroom more Student driven and integrates with various school platforms immediately!

1:30 pm – 3:00 pm
Using Phenomena to Engage Students in Science (90 minute session)
Room: Terrace Room
Hands-on – K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Scientific Practices, Crosscutting Concepts
Presenter(s): Patti Duncan
Explore example phenomena-based stations as I share resources to get you started on building your own phenomena based science experiences.

1:30 pm – 2:15 pm
The DEP Environmental Education Grant Program
Room: Franklin
Informative – K-12 – Environmental & Ecology
Presenter(s): Kathleen Banski, Department of Environmental Protection
Looking for funding for your environmental education program? Each year, Pennsylvania Department of Environmental Protection (DEP) invests in its schools, colleges and universities to improve environmental literacy among youth and adults. Grant amounts range from $5000 to $85,000.

Next Level Learning: Using Interactive STEM Cases to Power Up Thinking!
Room: Fulton
Interactive – 9-College – Biology, Chemistry, STEM/STEAM, Research, Scientific Practices, Crosscutting Concepts
Presenter(s): Jenna Mercury, ExploreLearning
Working with Interactive STEM Cases will empower our students to jump into the role of a real STEM professional tasked to solve real-world problems. Participants will view interactive case studies, form and test ideas and find solutions. BYOD with any browser to jump into the program too!

Equitable PD
Room: Statesman C
Interactive– K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology
Presenter(s): Rebecca Cottington
Providing equal opportunities for our students will require equal opportunities for our teachers. Currently, there is a disparity in the accessibility of high quality professional development across the state. How can we make quality PD more accessible and support teachers during implementation?

Delivering Meaningful, Safe, and Accessible Watershed Education Through a Watershed on Wheels!
Room: Statesman D
Interactive – 9-12 – Biology, Earth & Space, STEM/STEAM, Environmental & Ecology, Scientific Practices
Presenter(s): Tara Muenz & Steve Kerlin, PhD, Stroud Water Research Center
To better serve students and communities facing barriers such as little or no accessibility to pathways of Environmental-STEM (E-STEM) and environmental injustices (e.g. water pollution, climate change impacts, increased natural disasters), we created a Watershed Education Mobile Lab that puts an accessible, transportable, and innovative solution on wheels. Outfitted with E-STEM equipment and bilingual Spanish/English instructional supplies, a box trailer and education staff can deliver freshwater-focused E-STEM experiences to residential parking lots, mobile home parks, schools, and other sites walkable for audiences of all ages. Immersive, culturally responsive lessons are included for audiences with tools and techniques to enact positive change in their local watershed. A tour of the mobile lab along with live examples of hands-on lessons will be presented.

Local Phenomenon-Based Projects
Room: William Penn
Interactive – 6-12 – STEM/STEAM, Research, Scientific Practices, Crosscutting Concepts
Presenter(s): Matthew Hartman, NSTA
The use of phenomenon-based lessons has started to become commonplace in science classrooms. The use of the Next Generation Science Standards requires this type of teaching. This workshop will help you build learning opportunities for your students and will include information about eCYBERMISSION, a competition for students in grades 6-9.

2:30 pm – 4:00 pm

Unpack 3-Dimensional Standards with Phenomenal Science Instruction
Room: Franklin
Hands-on – K-8 – STEM/STEAM, Scientific Practices, Crosscutting Concepts
Presenter(s): Tom Gantt, Amplify
Phenomena-based science instruction designed around real-world problem solving can incorporate 3-D standards. This session begins with standards review then turns to hands-on activities, model lessons, digital tools, active reading and dynamic discussion where teachers will be creating 3-D statements around real lessons. Teachers will earn freebies.

It's Phenomenal! Using Real-World Connections to Support Three Dimensional Learning

Room: Fulton
Hands-on – 9-12 – Crosscutting Concepts
Presenter(s): Kelly McHugh, Savvas
What's so phenomenal about phenomena? Join the Savvas science team for an engaging, hands-on workshop as we explore the purpose of phenomena, the power of using it to drive your instruction, and the way it will support your students as they bring their own life experiences into your classroom. Attendees will leave with purposeful strategies they can replicate in their classrooms immediately.

What is a Phenomenon Anyway? How to Read and Use the New Pennsylvania Science Standards

Room: Statesman C
Hands-on – K-12 – Biology, Chemistry, Physics, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology, Scientific Practices, Crosscutting Concepts
Presenter(s): Sharon Cates and Josh Smith, Phenomenon Science Education
Phenomena are the basis for scientific discovery. As both scientists and educators, your guides in this session will help you understand what phenomena are and how they work with the new Pennsylvania Science Standards. At the end of the session, participants will better understand what phenomena are and why they are a key to science education.

2:30 pm – 3:15 pm

Integrating the Arts into the Science Classroom

Room: Statesman D
Interactive – K-12 – Biology, Earth & Space, Physical Science, STEM/STEAM, Environmental & Ecology
Presenter(s): Alicia Chiasson, STEMscopes by Accelerate Learning
Arts integration is a holistic approach that enables students to access the entire curriculum while developing scientific skills needed for the twenty-first century, including creativity, critical thinking, collaboration, and communication. Learn how poetry, music, storytelling, drama, visual art, and creative movement can be meaningfully embedded within the science curriculum.

Teaching engineering in elementary settings: Challenges and opportunities

Room: William Penn
Informative – K-5 – STEM/STEAM
Presenter(s): Bethany Thompson, Heather Haney, Ashton Fox & Ashlea Cowher, Philipsburg-Osceola Area School District
The newly-released Pennsylvania Science and Technology Standards, K-12 teachers will be asked to teach technology and engineering content and practices within their classes. But what is engineering? And what does it look like in elementary classrooms? This session will begin with a discussion about why engineering design projects are great ways to engage students of all abilities in fun and meaningful learning experiences. Then, we'll introduce a new engineering curriculum designed to broaden participation in engineering by all students, scaffold language, and engage students in engineering practices. Last, two groups of teachers who have taught engineering in their 2nd and 4th grade classes will lead a discussion about their experiences in teaching engineering, what they learned about their students, and to address any questions from the audience.

2022 PSTA Leadership

President	Andy Walton
President Elect	Robert Cohen
Vice President	Michele Whitecraft
Past President	Samantha Ramaswamy
Executive Secretary Emeritus	William McIllwaine
Executive Secretary	Christine Royce
Treasurer Emeritus	Don Keys
Treasurer	Don Kline (2020-2024)
Recording Secretary	Todd Smeltz (2020-2024)

Regional Representatives

Region 1 (IU 22, 23, 24, 25, 26)	*Vacant*
Region 2 (IU 14, 20, 21, 29)	Jason Jones (2022-2024)
Region 3 (IU 18 & 19)	*Vacant*
Region 4 (IU 9, 16, 17)	Kathy Hill (2021-2023)
Region 5 (IU 12, 13, 15)	Ryan Argot (2022-2024)
Region 6 (IU 8, 10, 11)	Cathy Stephenson (2020-2022)
Region 7 (IU 1, 2, 3, 7, and 27)	Debbie Reynolds (2020-2022)
Region 8 (IU 4, 5, 6, and 28)	*Vacant*
State At-Large Representative	Kit Martin (2020-2022)
State At-Large Representative	Eileen Coughlin (2022-2024)
State At-Large Representative	*Vacant*
State At-Large Representative	Ethan Ake-Little (2021-2023)

College Representatives

Eastern Region	Sunny Weiland (2020-2022)
Central Region	*Vacant*
Western Region	Christie Orlosky (2021-2023)

Appointed Positions

Nominations	Todd Smeltz
Membership Chair	Eileen Coughlin
Legislative	Joe Shane
PDE	David Bauman
Business Industry	David Garbe

PSTA Past Presidents

1951-1953	Orin Kaltriter
1954	Charles F. Beck
1955-1956	Herbert Richard
1957	C. Richard Snyder
1958-1959	Charles Rutsky
1960	Charles Bickle
1961	John Heilman
1962-1963	Mary Gilmore
1964	G. William Donovan
1965	Charles F. Hensley
1966	David Ulmer
1967	Dorothy Alfke
1968	Sr. Mary William
1969	Joseph M. Joseph
1970	Herbert Snyder
1971	Donald Kramer
1972	Stephen Rituper, Jr.
1973	Clyde Dry
1974	Harrie Caldwell
1975	Stephen B. Lucas
1976	H. Seymore Fowler
1977	Roy Allison
1978	Wayne Mikach
1979	John Stankiewicz
1980	Mary Sweeney
1981	William McIllwaine
1982	Barry Barnhart
1983	Kenneth Mechling
1984	Rosemary T. Barbacci
1985	Donna Oliver
1986	Dennis Showers
1987	Robert Wyble
1988	Bruce Smith
1989	Thomas Arnold
1990	Anthony Lazzaro
1991	David A. Wiley
1992	Walter Placek
1993	Linda Whren
1994	Edward Zielinski
1995	Judi Hechtman
1996	Donald Kline
1997	Carl Brehmer/Judi Hechtman
1998	Judi Hechtman
1999	Donald Pratt
2000	Donald Kline
2001	Dave Bauman
2002	Christine Ann Royce
2003	William Ayers
2004	Ruth Ruud
2005	Catherine Stephenson
2006	Christine Anne Royce
2007	William Ayers
2008	Ruth Ruud
2009	Robert Penrose
2010	Carli Yeager Hall
2011	Keith Butler
2012	Kathleen Conn
2013	Kathleen Jones
2014	Kathleen Blouch
2015	Donald Kline
2016	Todd Hoover
2017-2019	Kathleen Jones
2020	Andrew Walton
2021	Galen Kreiser
2022	Samantha Ramaswamy

PSTA Awards

THE DONALD KEYS EXCELLENCE IN SCIENCE TEACHING AWARD

Donald Keys was a thirty year PSTA member, board member, Honor Roll of Fellows Awardee, and longtime PSTA Treasurer. He taught Physics at North Hills High School for many years. PSTA is committed to honoring Don's work by dedicating this award to excellence in science teaching. As part of this effort, we annually recognize up to four teachers, one from each level: elementary school, middle school, high school, and higher education.

Recipients of the Donald Keys Award include:

2022	Justin Weaver (HS) Christine Anne Royce (Higher Ed)

PENNSYLVANIA SCIENCE ADMINISTRATOR OF THE YEAR AWARD

The Science Administrator of the Year Award recognizes ongoing excellence in the role of administrator of science education and commitment to its improvement. This award was created to recognize a school administrator (Superintendent, Principal, Assistant/Associate Principal, etc.) who acts as a champion for science education and science educators.

Recipients of the Administrator Award include:

2022	Jeffrey Nesbitt, Ed.D.

Nominate a deserving teacher!

PSTA looks to recognize teachers across the state. Be on the lookout for the call for nominations in the spring. You can nominate a teacher for any of our PSTA awards, as long as they fulfill the requirements.

NOMINATION FORMS WILL BE AVAILABLE IN THE SPRING!

PSTA FELLOWS AWARD

The Fellows Award is designed to recognize individuals who, through active leadership and scholarly activities, have made extraordinary contributions to the advancement of education in the sciences and science education. The individual must have served as an officer or Director of PSTA and have been a sustaining member within the organization. The Fellows Award is the highest honor the organization can bestow upon an individual.

Recipients of the Fellows Award include:

1985	William McIllwaine	2000	Judi Hechtman
1985	Kenneth Mechling	2000	Anthony Lazzaro
1986	Roy Allison	2001	Mary Sweeney
1986	H. Seymore Fowler	2003	Donald E. Kline
1988	Donna Oliver	2005	Christine Anne Royce
1990	Wayne Mikach	2006	William Ayres
1990	Barry Barnhart	2008	Ruth Ruud
1991	Clyde Dry	2011	G. Kip Bollinger
1991	Bruce Smith	2012	Catherine Stephenson
1993	David A. Wiley	2015	Keith Butler
1994	Donald Keys	2018	Kathleen Jones
1996	Laura Yoder		

McILWAINE SCIENCE TEACHING AWARD

The William B. McIlwaine Science Teaching Award was established to recognize outstanding novice K-12 science teachers after the completion of student teaching up through their second year of science teaching. The award was first given in 2000, and remains the premiere science award in Pennsylvania to recognize excellence in young science teachers. The nomination must be completed by a PSTA member in good standing and the nominee must complete some information. The application is submitted to the PSTA Awards committee and reviewed. The award is announced at the annual convention.

Recipients of the McIlwaine Award include:

2000	Mary Maxwell	2007	Jennifer Long
2001	Donna Barrett	2007	Jessica Saienni
2003	Diane Womer	2010	Kaja Spaseff Manuel
2003	Steve Kochis	2011	Andrew R. Blass
2004	Amanda Potteiger	2012	Blake Colainne
2004	Andrea Ferraco	2014	Nicole (Fuhrman) VanTassel
2005	Brian Chubb	2018	Nicole Berger Grinsell

PSTA LEADERSHIP IN SCIENCE EDUCATION AWARD

The Leadership in Science Education Award, which was established in 1995, is presented by the Pennsylvania Science Teachers Association to an individual not actively involved in classroom teaching or an organization, which over a period of at least five years, has made outstanding contributions in support of PSTA and individuals members of PSTA.

Recipients of the Science Leadership Award include:

1995 Daryl Flynn & Silver Burdett and Ginn
1999 Randy Stom & Delta Education
2002 Reeny Davison
2002 Jane Conrad
2004 G. Kip Bollinger
2005 Spectroscopy Society of Pittsburgh (SSP)/Society for Analytical Chemists of Pittsburgh (SACP)
2006 PA Society of Biomedical Research
2007 Delta Education
2008 Dr. Kathleen Blouch
2009 Representative David J. Steil
2010 Charles Howard
2010 Dr. Patricia Vathis
2013 Dr. Mitch Bathoff
2013 C. Edward Owens
2014 Dr. Herb Crawford

PRESIDENTIAL AWARD FOR EXCELLENCE IN MATHEMATICS AND SCIENCE TEACHING (PAEMST)

The PAEMST Award is the most prestigious award given nationally to outstanding math and science teachers. A teacher must have a minimum of five years of successful full time, science teaching to be eligible. Established in 1983, the PAEMST award starts with a nomination and a lengthy application process ensues involving a lot of self-reflection. Nominated individuals must submit their packets to the PAEMST coordinator for Pennsylvania. A committee is selected to review the applications and up to three state finalists are sent to the national competition. A number of years ago, it was decided that K-6 teachers would be nominated in even years and 7 – 12 teachers would be nominated in the odd years.

Opening Your Doors Into Tomorrow.

The Shell Science Lab Regional Challenge, awards prizes and support for science teachers (grades K-12) throughout the U.S. who have found innovative ways to deliver quality lab experiences.

Win up to a $20,000 lab makeover support package for your school!

WHO:	**Teachers of grades K–12 in the US**
WHAT:	**The 2022–2023 Shell Science Lab Regional Challenge, a program of NSTA**
HOW:	**Share your exemplary approach to science lab instruction in your school using limited school and lab resources**
WHY:	**$330,000 in prizes will be awarded, including a school science lab "makeover" worth up to $20,000 for high schools and up to $15,000 for elementary schools**
WHERE:	**For more information, visit *http://shellsciencelab.nsta.org* or write to *ShellScienceLab@nsta.org***

Deadline for the Shell Science Teaching Award and the Shell Urban Science Educators Development Award is December 21, 2022

Shell Science Lab REGIONAL CHALLENGE | nsta

Shell Urban Science Educators Development

The Shell Urban Science Educators Development awards seven diverse educators with prizes and support, in pursuit of professional development, and serves to increase the science educator talent pool of minority educators.

You can win $10,000 with the Shell Science Teaching Award

You can earn $1800in support with the Shell Urban Science Educator Awards

Deadline for the Shell Regional Science Lab Challenge competition is February 17, 2023

Learn more at:
www.nsta.org/shell

Shell Science Lab REGIONAL CHALLENGE | nsta

Interdisciplinary Materials Summer Research Experience for Teachers

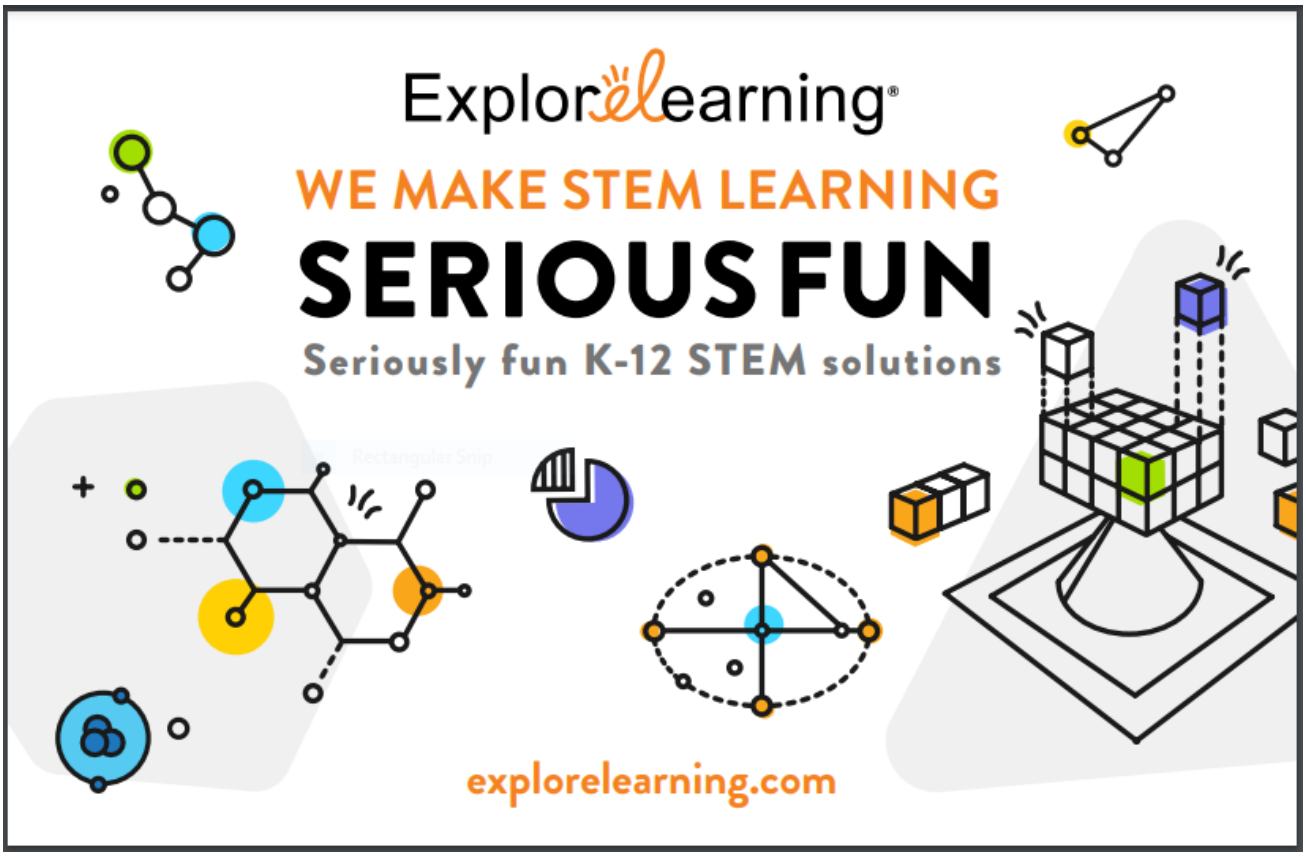
- **Work with leading scientists on cutting-edge research in nanotechnology, chemistry, physics, or materials science**
- **Take part in lab tours, research seminars, professional development workshops**
- **Develop lesson plans based on your own research topic**
- **Receive a stipend of $6000, housing, and travel reimbursement**
- **For info about Summer 2023 - https://sites.psu.edu/materialsret/**

Background Image: Scanning electron microscope image of a micro-electrical-mechanical system. Credit: Flavio Griggio, Penn State

A six-week program for middle and high school teachers at Penn State University - University Park Campus

Thank you to this year's sponsors!

You can find all of our sponsors throughout the program, as well as on our sponsors page at http://www.pascience.org



Keep up with what PSTA is doing!

Follow us on Twitter @TeachPaSci

Use #PSTA22 during the conference to share what you are learning!

Like us on Facebook: PA Science Teachers Association

Check out our website: www.pascience.org

- Register for webinars
- PSTA Members can access the latest blog postings and webinar recordings
- Find links to our sponsors and vendors
- Stay up to date on all the latest PSTA news

PSTA needs you!

We are looking for new board members!
The following positions are currently vacant on the board:

- Vice President
- Regional Representatives
  - Region 1 (IU 22, 23, 24, 25 & 26)
  - Region 3 (IU 18 & 19)
  - Region 6 (IU 8, 10 & 11)
  - Region 7 (IU 1, 2, 3, 7 & 27)
  - Region 8 (IU 4, 5, 6 & 28)
- State At-Large Representatives
- Eastern College Representative (open to college and university faculty only)
- Central College Representative (open to college and university faculty only)

If you are interested in running for any of these positions, please e-mail the Board of Directors at pstaboard@gmail.com. When you reply, please indicate your interested position, your school/institution affiliation, a short bio about your qualifications, and that you are a PSTA member in good standing.

APPLICATIONS DUE FRIDAY, OCTOBER 14th