



VAST's Vision:
Excellence in Science Education
Through Innovation

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Check the web for news, conference updates, registration, and forms.

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ZOOM Meeting



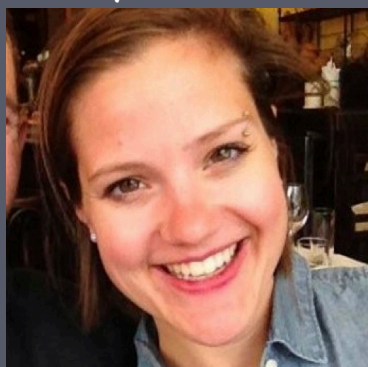
Cindy Moss, Ph.D.



Ken Miller, Ph.D.



Zipporah Miller, Ed.D.



Em Stephens, M.P.H.



Engage and Network



Pres. Michael Pratte, M.S.



Virginia Space
Grant Consortium

Content, Courses, and Career Pathways

Registration fee only \$25.00 • November 12-14, 2020

How can VAST provide the best professional development and fulfill the mission: to “inspire students, provide professional learning opportunities, build partnerships, and advocate for excellence at the school, local, state and national level” while keeping everyone safe? Create a virtual PDI!

Novel experiences and technologies were explored and implemented. Not only is it possible to achieve a safe conference that addresses our goals, but we are of trying

new ways to develop and improve future PDIs. General session speakers and presenters are able to communicate by both live and recorded presentations. Attendees will use several new ways to network and share with colleagues across the state, and new personal links may become new colleagues to contact and share with in the future. Inside this newsletter you will find all the current information about the PDI. Future updates will be found in the VAST website, vast.org.

Click Here For More Information



We are meeting our mission by INSPIRING!

Engaging you at the VIRTUAL PDI: An Exclusive Event for Members

Here is how we do it...

- Earn Recertification points
- Engage in synchronous and/or asynchronous presentations
- Come listen to the General Session speakers whenever you want since they will be pre-recorded...have questions then launch a discussion board to see that you are the conduit between student, lesson and speaker.

YOU MAKE A VAST DIFFERENCE!

Encourage others to join and come to the PDI for \$25

- Have fun with WHOVA Networking opportunities to meet new people and engage in new learning opportunities
- Get ready for the Regional Challenge by voicing your opinion and show you are knowledgeable about your region to your director...
- Visit the Virtual Exhibit Hall for scavenger hunts/game play and to get great stuff for your classroom.
- Make MEMORIES!

FULLFILL YOUR MISSION!

Susan Booth, Ed.S.
Executive Director

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From the Desk of Your President



Michael Pratte
VAST President 2020

Dear fellow VAST members,

Hopefully along with the current summer heat each of you are experiencing some well-deserved summer fun. As we look forward to the start of a landmark school year where meeting the needs of all of our students may entail 100% virtual or a hybrid face-to-face model, please know that your VAST organization is there with you and for you in every sense of professional learning, networking, and providing opportunities to grow with incredible grants and awards for your consideration.

Your VAST PDI committee has been hard at work planning to bring you a nourishing reprieve this November in the form of our virtual professional development institute. In fact, this year will mark the most dedicated effort by your entire VAST board to share their talents providing asynchronous sessions, facilitating content networking groups on the conference Whova app, and serving as session hosts and co-hosts for presenters in our synchronous sessions.

Our theme “Our Contents, Our Courses, Leading to Many Career Pathways” will still guide us as our conference theme. Best practices with presenting and teaching remotely will complement this theme as it is relevant to our teaching of science during our current pandemic.

Keynote speakers inspire us and our colleague’s presenters provide us useful tools for our instruction. Dr. Zipporah will lead the learning in using phenomenon to increase student engagement using 3-D dimensional learning experiences. Dr. Miller will provide us the tools to dismiss the misperceptions of who can be a scientist. Master of Public Health Em Stephens will share with us skills and formative experiences that she draws upon from in her career as she works with the epidemiology and visualizes the data for Virginia regarding the Covid-19 pandemic. Dr. Moss will anchor our presentations with how we prepare our students for the careers of tomorrow and how we as teachers of science can inspire and challenge all students to see themselves as the thought engineers and cognitive players crafting this future.

I encourage all of you to join VAST this November for this extremely flexible and comprehensive PDI experience. Please approach your school division for funding assistance. However, for twenty-five dollars consider our three-day event plus a year of professional learning with our asynchronous recorded sessions well worth a personal investment to join, connect, network, and learn with VAST in a truly innovative way.

Take care,

Mike Pratte

VAST President, 2020

2020 VAST PDI SCHEDULE AT A GLANCE

“Our Courses, Our Contents, Leading to Many Career Pathways”

Virtual Exhibit Hall is available throughout the PDI

Pre-recorded presentations are available throughout the PDI

Be sure to check out the Community button on the WHOVA app!

You will be able to take part in discussion boards on teaching strategies, content areas, and even propose discussion topics of your own. This is a great networking feature to explore!



Thursday, November 12

3:30 pm – Welcome to the PDI (Pre-recorded)

Michael Pratte – VAST President

Russ Kohrs – VAST President Elect

Special Presentation by Em Stephens M.P.H. (pre-recorded, watch anytime during the PDI)

“A Pandemic Shaped Education. How Can Education Shape Future Pandemics?”

4:00 pm – 4:45pm: Concurrent Session One - Live (Synchronous) Presentations

5:00 pm – 5:45 pm: Concurrent Session Two - Live (Synchronous) Presentations

6:00 pm – 6:45 pm: General Session One (pre-recorded)

Dr. Zipporah Miller sponsored by SAVVAS Learning Co.

7:00 pm – 7:45 pm: Concurrent Session Three - Live (Synchronous) Presentations

8:00 pm – 8:45 pm: Concurrent Session Four - Live (Synchronous) Presentations

Friday, November 13

4:00 pm – 4:45pm: Concurrent Session Five - Live (Synchronous) Presentations

5:00 pm – 5:45 pm: Concurrent Session Six - Live (Synchronous) Presentations

6:00 pm – 6:45 pm: General Session Two (pre-recorded)

Treasurer’s Report

Dr. Kenneth Miller sponsored by SAVVAS Learning Co.

7:00 pm – 7:45 pm: Concurrent Session Seven - Live (Synchronous) Presentations

8:00 pm – 8:45 pm: Concurrent Session Eight - Live (Synchronous) Presentations

Saturday, November 14

9:00 AM – 9:45 am: Concurrent Session Nine - Live (Synchronous) Presentations

10:00 AM – 10:45 am: Concurrent Session Ten - Live (Synchronous) Presentations

11:00 AM - 11:45 AM: General Session Three (pre-recorded)

Election Results

Dr. Cindy Moss sponsored by Discovery Education

Noon – 12:45 pm: Concurrent Session Eleven - Live (Synchronous) Presentations

1:00 PM – 1:45 pm: Concurrent Session Twelve - Live (Synchronous) Presentations

2:00 PM – 2:45 pm: Concurrent Session Thirteen - Live (Synchronous) Presentations



2020 Donna Sterling Institute

Virtual Professional Development for Educators

The Path Forward: Finding Smart Solutions in Energy and Climate Science Using Problem-based Learning

October, 2020

Register online: <https://vast.wildapricot.org/Registration-Information>

We are pleased to announce the 2020 Donna Sterling Institute will be held virtually Oct 5-17, 2020. Donna Sterling was instrumental in her vision of problem-based learning (PBL) as a means of teaching and integrating science with math, engineering, technology, and language arts. PBL prepares students for academic, personal, and career success and readies young people to rise to the challenges of their lives and the world they will inherit. Here is your chance to learn how to implement this powerful teaching strategy!

K-12 students need a fundamental understanding of energy to develop a thorough, comprehensive understanding of climate science and the path forward to climate and energy resiliency. However, decisions about climate and energy policy are seldom made from a foundation of science.

The 2020 Sterling Institute, in collaboration with NEED Energy, will engage participants in a PBL unit using the topic of climate and alternative energy that is adaptable for elementary through high school students. Participants will learn about climate and alternative energy from Dr. Don Haas in a virtual presentation and engage in NEED activities to support understanding climate and alternative energy. Teachers will learn the key components of a PBL unit including designing an authentic scenario and essential question, question map development, and creating culminating activities. Teachers will consider how to modify what they learn to meet the Standards they teach and the needs of students in their own classroom context.

Instructors: Jaclyn Claytor, Dr. Elizabeth Edmondson, Dr. Don Hass, Dr. Sue Kirk, Dr. Jennifer Maeng, Dr. Anne Mannarino, Dr. Juanita Jo Matkins, Dr. Jackie McDonnough, LoriAnn Pawlik.

Sterling Institute Schedule

Part 1 of the Sterling Institute will support teachers in developing and enacting problem-based learning units in their classroom. The Institute will take place over 3 weeks and use both asynchronous and synchronous instruction for a total of 10 hours of instruction.

Week 1 - Oct. 5 -10

Asynchronous, combination of videos, readings, and reflections

- Introduction to Sterling Institute and PBL
- Introduction to the Scenario, Overarching Question, Culminating Activity
- Climate Science (Don Haas)
- Reflection questions

Synchronous: Saturday October 10 (9-noon)

- Introduction to question mapping
- "Hands on" inquiry activity
- Introduce PBL planning template

Week 2 - Oct. 11 - 17

Asynchronous:

- PBL Planning: Each participant develops a unit plan, question map, and culminating activity
- Reflection questions

Synchronous: Saturday October 17 (9-noon)

- Small breakout groups (4-6 people) by content area/grade level with a Sterling facilitator.

Part 2 of the Sterling Institute will take place in January and February of 2021. Part 2 will be both synchronous and asynchronous. Part 1 participants will be invited to attend. Part 2 will focus on reflecting on fall PBL implementation and refining PBLs with the support of Institute staff.

Donna Sterling Institute Registration Fee: \$25

DEVELOPING EFFECTIVE SCIENCE EDUCATORS





2020 VAST Professional Development Institute Keynote Speakers

Thursday, November 12, 6:00 pm – 6:45 pm: General Session One

Dr. Zipporah Miller sponsored by SAVVAS Learning Co.



“Using Phenomena to engage Students in 3-Dimensional Learning Experiences”



Dr. Zipporah Miller

Dr. Zipporah Miller will focus on how the use of phenomena establishes a purpose for learning. Instead of focusing on a single topic, she shifts the learning to trying to figure out why something is happening. This makes learning meaningful for students as they are actively engaged in the learning process.

Zipporah Miller serves as the Director of Learning with Anne Arundel County Public School System. Previously, she was the K-12 Coordinator for Science in Anne Arundel County. She conducts national training to science stakeholders on the Next Generation Science. Dr. Miller is a past Associate Executive Director for Professional Development Programs and conferences at the National Teachers Association (NSTA) and was a reviewer during the development of Next Generation Science Standards. Dr. Zipporah Miller holds a doctoral degree from University of Maryland College Park, a master's degree in school administration and supervision from Bowie State University, and a bachelor's degree from Chadron State College.

Friday, November 13, 6:00 pm – 6:45 pm: General Session Two

Dr. Kenneth Miller sponsored by SAVVAS Learning Co.



“You do not need a lab coat, degree or laboratory to be a scientist. What you need is an inquiring mind, the patience to look at nature carefully, and the willingness to figure things out.”



Ken Miller

Dr. Kenneth Miller

Dr. Kenneth R. Miller grew up in Rahway, New Jersey, attended the local public schools, and graduated from Rahway High School in 1966. Miller attended Brown University on a scholarship and graduated with honors. He was awarded a National Defense Education Act fellowship for graduate study and earned his Ph.D. in Biology at the University of Colorado. Miller is professor of Biology at Brown University in Providence, Rhode Island, where he teaches courses in general biology and cell biology. Miller's research specialty is the structure of biological membranes. He has published more than 70 research papers in journals such as “Cell”, “Nature”, and “Scientific American”. He has also written the popular trade books **Finding Darwin's God and Only a Theory**. His honors include the Public Service Award from the American Society for Cell Biology, the Distinguished Service Award from the National Association of Biology Teachers, the AAAS Award for Public Engagement with Science, the Stephen Jay Gould Prize from the Society for the Study of Evolution, and the Laetare Medal from Notre Dame University. Miller lives with his wife, Jody, on a small farm in Rehoboth, Massachusetts. He is the father of two daughters, one a wildlife biologist and the other a high-school history teacher. He swims competitively in the masters swimming program and umpires high school and NCAA softball.

2020 VAST Professional Development Institute Keynote Speaker

Saturday, November 14, 11:00 AM -11:45 AM: General Session Three

Dr. Cindy Moss sponsored by Discovery Education



Dr. Cindy Moss

Vice President, Global STEM Initiatives, Discovery Education

"Preparing Your Students for the Careers of Tomorrow"

Dr. Cindy Moss will explore how we can prepare our student's today for tomorrow's careers in STEM-related fields, including those that may only require one semester of community college. Attendees will learn how to position science as a way to provide students with real-world problems and grow their student's confidence in their own problem-solving abilities. Additionally, attendees will hear how STEM teaching and learning can help decrease the achievement gap in districts of all sizes.

Dr. Cindy Moss is currently the Vice President of Global STEM Initiatives for Discovery Education and travels the world helping companies, nonprofits, Ministries of Education and school districts understand the importance of STEM education and how to implement it successfully. Previously Dr. Moss served 10 years as the PreK-12 Director of STEM for the 145,000 students and 10,000 teachers in the Charlotte Mecklenburg School system. While there her work to decrease the achievement gap helped earn the district the Broad Award, often considered the super bowl of urban education. As a teacher, Dr. Moss taught Biology, Chemistry, Anatomy and Earth Science for 20 years, and earned numerous awards, including the Milken National Educator Award. She earned a BS in Zoology from the University of North Carolina, where she was a Morehead Scholar; her master's in Science Teaching from Syracuse University and her Ph.D. from Curtin Institute of Technology in Perth, Western Australia. Her recent awards include Top 100 Women in STEM Award from STEM Connector, the top 100 women in Diversity in STEM from Diversity Matters and 1 of the top 25 Businesswomen in Charlotte from the Charlotte Business Journal.

[For Information and to Register Click Here](#)

Online registration is open for attendees until October 31.

Deadline for presenters and exhibitors is October 1.

VAST is pleased to be able to continue providing quality professional development through our online virtual Professional Development Institute (PDI)!

The 2020 VAST PDI will focus on the theme: "Science Content, Courses, and Career Pathways".

- * In addition to presentations related to our theme there will be concurrent session presentations in all subject areas for grades K-12.
- * Attend the 3 general sessions featuring speakers who will challenge you with up-to-date scientific discoveries and instructional strategies.
- * Interact with vendors in our Exhibit Hall as you collect samples of new instructional materials and explore cutting-edge technologies.
- * As an added bonus you can shop for cool science themed stuff.

A Special Presentation:



“A Pandemic Shaped Education:

How Can Education Shape Future Pandemics?”

- Em Stephens, M.P.H.

In 2020, COVID-19 changed the way we think about education. What have we learned about how pandemics change our methods of education? How can we prepare students and educators in the future to handle disease crises more effectively? Join Virginia Department of Health epidemiologist Em Stephens as she discusses how disease has been handled, how to better prepare the education system for pandemics, and what kinds of thinking and skills we need to enable our students to become the next generation of critical thinkers.

Journal Reminder!



The theme is **Science: An Opportunity to Improve Students' Literacy Skills**. We welcome manuscripts focused on this important topic but welcome manuscripts on any topic. The journal accepts manuscripts that fall within one of three categories: Lesson Activities, Research, and Sharing Solutions. Guidelines for each of these categories are described on the journal homepage. Please note: Although the deadline to submit an article for winter 2020 was July 31st, if you were planning to submit, please contact the editors. If you have any questions please feel free to email, journal editor, at journal@vast.org.

(Co-editors Amanda Gonczi and Jennifer Maeng)

[Link To Journal](#)

2020 VAST VIRTUAL PROFESSIONAL DEVELOPMENT INSTITUTE

DRAFT LIST OF CONCURRENT SESSION PRESENTATIONS (as of July 19th)

General

Michele Baird, Norfolk Public Schools, Ana Santillan, Norfolk Public Schools, Angela Lewis, Norfolk Public Schools, Jessica O Grady, Norfolk Public Schools

Come learn about 5 fantastic apps you can use in your science classroom. Engage your students, enhance your lessons, and make learning fun! Spend a few minutes learning about the apps and spend of the rest of the session **DOING** them!

Teach Me On MY Terms! Transform Learning & Tear Off Labels

Earth/Space Science,

General

Tammy Bartlett, Dinwiddie Middle School, Caitlyn Edwards, Dinwiddie Middle School
Tina Winesett, Dinwiddie Middle School

Changing up instruction to reach all students has never been easier! We'll show you how to engage students on THEIR terms and take your science lessons to the next level. Easy hands on experiments, mind blowing demonstrations and room transformations will have your students excited to come to class. Step outside your comfort zone and let us show you how to shake things up!

Project Plant It! Teaches Students about Trees & Pollinators

Environmental Education

Melanie Beale, Dominion Energy

Dominion Energy's Project Plant It! is adding an exciting new pollinator program to its popular tree-planting program. VAST members will be the first audience to hear the news and learn how to sign up for wildflower seed packets that attract bees and other pollinators as well as the redbud tree seedlings. Don't miss this buzz-worthy opportunity to teach your students about environmental sustainability with Project Plant It! (Commercial presentation)

Exploring Earth's Resources with Ag in the Classroom

Environmental Science, General

Lynn Black, Agriculture in the Classroom

Join the staff from Agriculture in the Classroom for this hands-on session to explore Earth's natural resources using scientific investigation with your elementary students. Engaging lessons will demonstrate the importance of soil and water. Additionally, participants will have the opportunity to make their own bio-plastic as they discover the ways in which the Earth's resources impact their daily lives. Teachers in attendance will receive AITC curriculum and resources.

Crash Boom Chemistry

Chemistry, Physics/Physical Science

Angelo Bonilla, James Beckinridge Middle School, Brian Kreppeneck, Lucy Addison Middle School

Struggling with how to complement your science lessons with engaging demonstrations? Allow us to share simple demonstrations for the science class room that will engage and connect science to the world around them. Attendees will engage in simple activities and be provided with a written copy of the demonstrations performed during the session.

Online Lesson: Cells - The Structure of Life

Biology/Life Science

Susan Booth, VAST

Life Science: Biological levels from simple to complex - Understand how an organism has levels of complexity-cells, tissues, organs, systems which support the needs of a multicellular organism.

Mission to Mars: Gamifying Environmental Science

Environmental Science, General

Colin Bouchillon, Manassas Park High School

Motivating students is a struggle, especially when it comes to environmental topics that students may not think much about. But what if your class was a real life game with storylines and award rankings? Learn how to redesign your environmental science course to be more engaging and entirely student-driven! Topics include course organization, game layout, assignments, and grading.

Flip that Feedback

ALL GRADES

General

pre-recorded presentation

Kristen Boudreau, Prospect Heights Middle School

Brandi Shumake, Prospect Heights Middle School

Want to learn to identify student learning gaps before the assessment, make real connections with students, and allow students to experience success? Wondering how this can be done in one class period and be differentiated for each student? This session will teach you how to use google forms and slides to create a flipped formative lesson that utilizes checkpoints and leveled assignments/grouping for personalized learning. Leave with the tools needed to create your own flipped formative.

Make Your Virtual Classroom a “Bit-Moji” Fun

ALL GRADES

General

pre-recorded presentation

Kristen Boudreau, Prospect Heights Middle School

This session will help teachers create an interactive virtual science classroom using google slides and personalized with their own bit-moji. Virtual classrooms are fun and can be filled with interactive elements such as videos, virtual labs, instruction, resources, assignments, virtual field trips, and more! This isn't just any old hyperdoc! Best of all your virtual classroom can be updated for the time of year, material you are covering, or special school events. It's fun easy, and interactive.

HOTS (Higher Order Thinking Skills) for STEM Instruction

ALL GRADES

All STEM Disciplines

live presentation

Arthur Bowman, Norfolk State University

Analysis of everyday STEM phenomena can enhance critical thinking and provide 5Es engagement. This analysis is classified as HOTS (Higher Order Thinking Skills) and can be used for any STEM disciplines or grade level. HOTS supports use of hands-on materials, while students become co-presenters. HOTS take about 10 minutes and address standards. HOTS are interdisciplinary in nature and make all students part of the lesson. HOTS will be shared and attendees will create their own HOTS.

Get Interactive! : Integrating Science Notebooks

MS-HS

Biology/Life Science, Chemistry

live presentation

Bryan Buckalew, Patrick Henry High School

Alice Scheele, Patrick Henry High School

In this session, learn how to integrate interactive notebooks into your science classroom. With a focus on life sciences and chemistry, we will show how to use science notebooks to increase organization, engagement, and retention with your students. Examples will be provided for ALL high school levels. Come and get interactive!

Enhancing Labs Through the Incorporation of Modeling

ALL GRADES

General

live presentation

Benjamin Campbell, Longwood University

Kimia Jahangiri, Longwood University

Modeling is one of the NGSS Science and Engineering Practices, yet it is not often explicitly taught when conducting lab activities. In this session, you will learn how to evaluate written lab plans for their inclusion of modeling practices. Then, we'll practice making adjustments to labs so that they include models in such forms as diagrams, analogies, and mathematical formulations. Perfect for all grades and subject areas.

From Trade to Research, It's All STEM: Advising Students

HS-COL

General

live presentation

Kenneth Chapman, American Chemical Society

Teachers will be given insights into work in the non-academic STEM world, informed of what STEM workers do, and prepared to suggest various pathways for various occupations along the workforce spectrum of STEM. The presenter is a chemical engineer with 31 years addressing a wide variety of workforce issues at the ACS and 16 years teaching high school and college science and engineering. He has developed cooperative education curricula, textbooks, and career development programs.

The Price of Palm Oil: A High School Ecology PBL Unit

HS

Biology/Life Science

live presentation

Kristen Conklin, Francis Lewis High School,

Tyler St. Clair, Longwood University

In this unit, students use interactive websites, in-class activities, and adapted primary literature to learn about how the palm oil industry affects biodiversity in Malaysia and how they are connected to this issue as consumers in the US. During the presentation, teachers will learn about how to implement the pedagogical strategies used in the unit and receive all materials and resources needed for doing it.

K-12 Student/Teacher Science Opportunities at Virginia Tech

ALL GRADES

General

pre-recorded presentation

Victoria Corbin, Virginia Tech, College of Science

Kristin Morrill, Virginia Tech, College of Science

The College of Science at Virginia Tech comprises eight units—including Biological Sciences, Chemistry, Economics, Geosciences, Mathematics, Physics, Psychology, Statistics, Integrated Sciences, and Neuroscience. All of these units provide hands-on science training to K-12 students and/or professional development workshops to secondary teachers—in person or virtually. Our presentation will discuss these opportunities and the benefits of participating!

Reimagining the 5E Model through Blended Learning

ALL GRADES

General

pre-recorded presentation

Cierra Coyner, Lee-Davis High School / Hanover County,

Jacquelyn Calder, Lee-Davis High School, Hanover County,

Brendan Meng, Lee-Davis High School, Hanover County, Brennan

Neal, Lee-Davis High School, Hanover County

As school continues to shift towards more technology-integrated classrooms, the push for blended learning has become more prevalent. Blended learning merges both online and face-to-face instruction, giving students some choice in path, pace, and place. The 5E Model provides a foundation for lesson delivery, which easily adapts to a blended environment. This session will provide an overview of blended learning, tools and methods for implementation and resources to use in your classroom.

Wizer.me (Digital Worksheets to Enhance Student Engagement)

ALL GRADES

General

live presentation

Pernell Denson, Norfolk Public Schools

Wizer.me is a web-based application that allows teachers the ability to create engaging activities that will allow ongoing formative assessments. Within the Wizer.me applications teachers will be able to create worksheets that include video, open ended questions, fill in the blanks, image labeling, matching, sorting, and much more. Teachers will also have access to content created by other users that will save time.

Tech Tools to Flip Over

ALL GRADES

General

live presentation

Alison Dossick, Virginia Commonwealth University,

Sue Kirk, Virginia Commonwealth University

Mindy VanDevelder, Virginia Commonwealth University

Learn more about various programs and platforms to help you flip between in-person and at home learning. Explore flippity, symaloo, peardeck, goosechase, and more as you navigate the uncertainties of learning with learning tools that easily switch between school and home.

Math-infused Science: Writing About Data in FRQs and DBQs

MS-HS-COL

Math in Science, AP and IB Courses

live presentation

Kristen Dotti, Catalyst Learning Curricula

How do we talk and write about data? In this workshop you will discover ways to help your student be specific, using the correct terms, in context, as they identify and describe trends in a set of numbers. We will play two games useful for building a working vocabulary and increasing student reliance on mathematically accurate communication. The activities can be used as an introduction to descriptive mathematics in K-12 or a repeatable method for completing FRQs and DBQs on an AP or IB exam. (Commercial Presentation)

Engaging Inquiry: Pre-service Teachers Share Tested Lessons

MS-HS

General

pre-recorded presentation

Elizabeth Edmondson, Virginia Commonwealth University

Do you want to wow your students? Do you need to inject some pizzazz into your instruction? Attend our session where secondary science preservice teachers will share inquiry-based, hands-on lessons in this interactive session. You will have an opportunity to see and participate in these classroom tested activities.

Motivating Students to be Cognizant Learners

MS-HS

General

pre-recorded presentation

Amira Elsieh, Freedom High School, Prince William County

Research has proven that motivated students have increased engagement, self-efficacy and overall better scores. Yes, not every single student of ours will be a scientist, but every one of them is currently taking science (Which let's be honest, can get challenging). This presentation is about showing compassion and understanding towards our students. When they see us invested in their education, they start caring, too.

Addressing Race & Gender Stereotypes in STEM through Books

ELEM

STEM Career Awareness

live presentation

Donna Farland-Smith, Ohio State University

The Eureka! series is intended to expand opportunities for students to understand the nature of science and the work of STEM fields. In this session, participants will 1) engage in two sample lessons from the book series and 2) learn how the biographical stories of real-world people who pursue science and engineering methods are the basis for the lessons, and 3) gain an understanding of STEM as a human pursuit to link scientific literacy and STEM career aspirations.

Aaron Hernandez Case Study: The Anatomy and Physics of CTE

HS-COL

Physics/Physical Science, Anatomy/Physiology

live presentation

Mike Florek, Glenvar High School, Lezlie Yaeger, Glenvar High School

This collaborative approach to studying chronic traumatic encephalopathy (CTE) begins with a case study of former NFL player Aaron Hernandez. Students applied critical thinking to Hernandez's story, beginning with mass media reporting and shifting to technical writing about the football-related brain damage. Anatomy and physics students collaborated to design, construct, and test padding for football helmets. Anatomy students capped their case study with artistic depictions of CTE.

Art of Inquiry in Science with Discovery Education

ALL GRADES

General

live presentation

Brad Fountain, Discovery Education

Engage your students to think and act like scientists. Be the teacher that transforms everyday lesson plans into authentic, memorable learning experiences with inquiry-focused instruction. Come with a willingness to inspire learning; leave with strategies and tools to make it happen. (Commercial Presentation)

Using Phenomena to Engage Students in Science

ALL GRADES

General

live presentation

Brad Fountain, Discovery Education

What is Phenomena and what makes it engaging? By centering science education on phenomena that students are motivated to explain, the focus of learning shifts from learning about a topic to figuring out why or how something happens and connects that learning to the natural world. Explore example phenomena-based lessons as we share resources to get you started on building your own phenomena based science lessons. (Commercial Presentation)

Engaging Students in Authentic Science Experiences

ALL GRADES

General

live presentation

Brad Fountain, Discovery Education

In a student-centered learning environment, we want students to ask deep, meaningful questions, collaborate with their peers, arrive at meaningful conclusions and solve real world problems. Join us to learn about a variety of digital resources and instructional strategies to engage all students in authentic science experiences. (Commercial Presentation)

At-Home Chemistry Labs

HS

Chemistry, Math in Science

pre-recorded presentation

Verlese Gaither, Wakefield High School

This presentation is for the chemistry teacher who wishes to provide students with a lab experience that they may do "At-Home" in the event that instruction is provided virtually. The presentation will detail labs that cover the Virginia state standards of learning, with accompanying resources to support learning such as accessible technology. Attendees will be provided with a copy of the framework, worksheets, sample labs, and technology recommendations.

Modeling Chemical Reaction Types

HS

Chemistry

pre-recorded presentation

John Garrett, Lab-Aids

In this activity from the Natural Approach to Chemistry program, participants investigate representative examples of major reaction types, including single- and double-replacement, precipitation, oxidation-reduction, and more. The written directions model safe laboratory procedure, and the analysis questions explore applications of these reactions in the chemistry of the human body and the environment. (Commercial Presentation)

Get Involved With JVSE! There is Room for Everyone!

ALL GRADES

General

live presentation

Amanda Gonczi, Michigan Technological University, Jennifer Maeng, University of Virginia

Did you know that publishing an article can be used toward teacher re-licensure points? Or that when you review a journal article submission you can include this on your resume as professional service? This session will help all members get involved with VAST's journal by publishing their own work or reviewing submitted manuscripts. Session attendees will brainstorm an idea for an article and work with the journal editors in developing an outline for their own publication.

Designing STEM Career-based Lessons for the K-5 Classroom

ELEM

STEM Integration

live presentation

Courtney Gonzalez-Vega, York County School Division, Melani Loney, Old Dominion University-Center for Educational Partnerships
Fostering awareness of STEM careers in elementary provides students with knowledge that can impact their life beyond the K-12 arena. While most know STEM career awareness is important, how exactly can teachers successfully integrate this with the Virginia SOLs? This workshop will review a sample K-5, STEM career based, inquiry lesson containing a STEM challenge and integrated content. Teachers will have time to design their own integrated lesson using the STEM Lesson Design Template.

Differentiating an Elementary Science Lesson

ELEM

General

pre-recorded presentation

Mindy Gumpert, Old Dominion University

The majority of students with disabilities spend their day in the general education classroom. General education teachers often feel ill-prepared to teach these diverse learners. In this session, a special education co-teacher will revise an elementary science lesson to demonstrate how to include tried-and-true differentiation strategies and evidence-based practices into science instruction. The session will provide teachers with differentiation strategies that can be applied to any lesson.

Ed+gineering: Preparing Elementary Educators in Engineering

ELEM

Engineering

live presentation

Kristie Gutierrez, Old Dominion University, Jennifer Kidd, Old Dominion University

ODU preservice teachers and engineering students collaboratively created and shared engineering lessons for 4th and 5th grade students in the Hampton Roads area using the 5E instructional model with emphasis on the engineering design process. In this session students and faculty will provide attendees with digital lesson plans and interactive presentations that meet the revised VA Science SOLs, and guide attendees through a sample engineering lesson for use in upper-elementary classrooms.

Watershed Management: A Local Focus

ALL GRADES

Earth/Space Science, Biology/Life Science

pre-recorded presentation

Shanan Hambrick, Clarke County High School, Yvonne Rivera, Clarke County Public Schools

How do you teach on improving your local watershed with your normal curriculum? Learn how to integrate projects (some classroom-based and others hands-on) into your normal lesson plans. Project ideas range from stream monitoring to soil management, and everything in between. No matter the curriculum, local watershed education can be included.

Leading from the Classroom

ALL GRADES

General

pre-recorded presentation

Stephanie Harry, Tabb High School

This presentation will provide ideas and suggestions on how teachers can continue their work in the classroom but be a leader in education. I will share my experiences and provide ideas on how teachers different leadership opportunities teachers can consider.

Citizen Science for Teaching, Learning and Research

ALL GRADES

Biology/Life Science, Environmental Science

live presentation

Sujan Henkanathgedara, Longwood University

Citizen science is citizen volunteers actively being involved in scientific research. These programs share lesson plans and rich data online and anyone can use this data to teach and learn scientific inquiry, and conduct scientific research. This workshop will introduce you to citizen science, explain how you can join as a volunteer, and discuss how you can teach, learn and do publishable research with these programs.

Using Gifted Strategies in the Classroom

ALL GRADES

General

live presentation

Deb Hicks, Spratley Gifted Center

This session will show you different gifted strategies that can be used by any classroom teacher. You will leave this session with ideas and strategies for use in your classroom. Some of the strategies include; choice boards, Kaplan's Icons, and independent learning contracts. A lot of these strategies can be adjusted to work in the inclusion classroom.

More Strategies to Actively Engage Every Student

MS-HS

General

pre-recorded presentation

Robbie Higdon, James Madison University

Session participants will have the opportunity to participate in active, meaningful learning experiences that engage all students. Current pre-service teachers will provide several examples of "tried and true" strategies that can be implemented in any classroom. Use of these strategies can assist teachers in facilitating learning opportunities that can result in deeper understanding and higher levels of mastery for all students.

Using Place-based Learning to Teach Beyond the Test

ALL GRADES

Place-based Learning

pre-recorded presentation

Robbie Higdon, James Madison University, Cindy Klevickis, James Madison University

Participants in this session will construct a deeper understanding of the content presented in state curriculum standards; view experiential learning events as a critical aspect of science education in their classrooms; and discover how investigations of local natural phenomena can serve as the foundation on which investigations of more distant or abstract phenomena can be constructed through the lens of place-based education.

People and the Biosphere: Hands-on Ecology Lessons

MS

Biology/Life Science, Environmental Science

live presentation

Melissa Holmes, Carl Sandburg Middle Schools (FCPS)

In this on-line session, the presenter will lead participants in hands-on activities (demonstrations, simulations and modeling) that engage middle school students in a number of ecology topics including natural resource use, land use, populations, climate change, biodiversity and ecosystem health. She will share techniques for both in-class and distance learning that help students connect the science to their personal experiences and to relevant content in math and social studies.

Engaging Science with eMediaVA's Free Digital Media

ALL GRADES

General

live presentation

Lindsey Horner, WHRO Education

How do you make your content more engaging and relevant to today's digital learners? eMediaVA has you covered. eMediaVA is a free digital content library for Virginia educators, featuring over 150,000 digital learning resources from state and national leaders in educational content. The goal of this session is to share resources available in eMediaVA to successfully integrate digital media into your science lessons to engage learners and make your content relevant to students' experiences.

Using Microsoft Word Apps to Enhance Your Science Class

ALL GRADES

Technology in Science

pre-recorded presentation

Paula Irwin, Stonewall Jackson High/Prince William County Schools

Many of you have been using Microsoft Word since the 90s. However, when is the last time you scrolled through the toolbar of Word to see all the applications that are now available? This session is to point out the overlooked awesome features Word has to offer to enhance your science classroom instruction and better prepare your students for the future in technology.

Beyond Experiments: Integrating Science and Literature

ALL GRADES

Science and Literacy

pre-recorded presentation

Brandi Ivester, Booksource

While students learn science best by doing, integrating literacy helps students connect experiments they're doing with facts and stories they're reading. In this interactive workshop, participants will gain concrete strategies for incorporating fiction and nonfiction books into science instruction and receive title suggestions tailored to their grade-band. Educators can immediately apply these ideas to help students connect course content with real world people, applications, and experiences. (Commercial Presentation)

Culturally Relevant STEM Through Literature and Lessons

ELEM

General

pre-recorded presentation

Angerina Jones, Chesapeake Public Schools

In this session, attendees will learn about and engage in literature and lessons that are culturally responsive. The resources discussed in the session will cover each area of STEM. Primary level science educators will leave with culturally relevant book titles and sample lessons they can use in their classrooms and share with their colleagues.

Nurturing Data Literacy in Your Science Instruction

ALL GRADES

General

live presentation

Elizabeth Joyner, NASA Langley Research Center

Patrick Scharf, Biology Teacher, Louisa County Schools

Do you facilitate Problem-Based Learning in your Earth Science, Ecology, or Biology classroom and are looking for new ideas and inspiration? Do you encourage your students to analyze professionally-collected data to solve real-world problems? Do you want to use Earth Systems data in your lesson but you get bogged down by complicated user interfaces and funny naming datasets? Need ideas for engaging students in NASA maps, data, and graphs. Let NASA help.

A Whole New World: Blended Learning with Google Earth & Maps

ALL GRADES

Earth/Space Science, Environmental Science

pre-recorded presentation

Chris Kaznosky, Central High School / Shenandoah County

Blended learning gives students some control over the time, place, path, and pace of their learning, with Google Earth, Maps, My Maps, and Tours providing a means for helping students expand their content knowledge. In this presentation, attendees will use these Google tools to create labs that students can complete in a face-to-face, blended, or online environment. In addition, sample lessons for astronomy, environmental science, geology, meteorology, and oceanography will be provided.

Earth Science Reference Tables

HS-COL

Earth/Space Science

pre-recorded presentation

Bonnie Keller, Colgan High School

Teach your students Earth Science using a set of diagrams and references that are made just for VA Earth Science students. This is modeled after the ESRT from New York. As you teach the diagrams and graphs in the packet, you are teaching essential content, as well as the skills of reading those graphics. Boost your students' ability to decipher new and "scary looking" graphics as you utilize a set of handouts that teaches them and boosts their confidence.

Classroom Reptiles - Why and How to do it RIGHT

ALL GRADES

Biology/Life Science, General

pre-recorded presentation

Bonnie Keller, Colgan High School

Many teachers keep reptiles in their classrooms, or want to. This session will review the WHY - as in, why should you consider them for the classroom - and the HOW - as in how to do it properly. Unfortunately, many classroom reptiles are NOT kept properly, and this sets a poor example to others who may want to keep them at home. I will show you some of the species that are most appropriate for classrooms, and what you need to set them up.

Bridging the STEM Pipeline in Culturally Relevant Lessons

MS-HS

Engineering, General

live presentation

Meredith Kier, College of William and Mary

This presentation presents a model and example lesson for teachers to see potential in collaborating with underrepresented minority STEM professionals and STEM undergraduates to plan and teach culturally-relevant, career-focused engineering design tasks in science and mathematics classes. William & Mary secondary preservice teachers will show participants an interactive collaborative design notebook for implementing an integrated STEM lesson with career experts and near-peer mentors.

How to Talk with an Astronaut 250 Miles Above You

ALL GRADES

Earth/Space Science

pre-recorded presentation

Kathy Lamont, Antietam Elementary/Prince William County

Learn about how to talk with an astronaut through a free program called ARISS (Amateur Radio on the International Space Station)! This program allows your school or organization the opportunity to ask questions to an astronaut as they travel above you. This session will review the proposal for possible contact, discuss how to integrate space science into your curriculum, and a little bit about how amateur radio works. Appropriate for all grade levels, K-12.

Muck to Radiocarbon: Research Translated to K-12 Classrooms

HS-COL

Chemistry, Environmental Science

live presentation

Lisa Lawrence, Virginia Institute of Marine Science, Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve
Celia Cackowski, VIMS/SA Sea Grant, Tara Rudo, Chesapeake Bay National Estuarine Research Reserve

How can sediment size inform us about what organisms might live in different parts of the Bay? What can carbon isotope ratios tell us about the land use types impacting an estuary? Graduate students at the Virginia Institute of Marine Science have translated their research into hands-on STEM activities for K-12 science classrooms. This session shares inventive activities with real-world connections. Participants receive these lesson plans and have on-line access to 30+ additional lessons.

Collaboration for Impact: Modeling an Integrated Partnership

ALL GRADES

General, Educational Partnership

live presentation

Lillian Ledford, University of Virginia - Blandy Experimental Farm, Doni Hays, Clarke County Public Schools

Supported by a NOAA B-WET grant, formal and nonformal educators collaborate to bring project-based MWEs into the Grade 4-12 curricula. Here we focus on the 6th grade PBL and share both educator perspectives.

We emphasize integration of field experiences with classroom learning; building inter-content lessons, including student choice; strong teaching teams and organizational partnerships; and meaningful action projects. This session will be an interactive presentation with an open discussion.

Spark Inquiry! Primary Sources from the Library of Congress

ALL GRADES

General

pre-recorded presentation

Sherry Levitt, Teaching with Primary Sources, Virginia, Cynthia Szajkowski, Teaching with Primary Sources, Virginia

Intriguing primary source images, notebooks, letters, historical newspaper accounts, records and more can draw students in, lead them to fact check, hypothesize, argue from evidence and engage in scientific thinking and the processes of interpreting fact and meaning. The Library of Congress' unparalleled resources span every field of science and offer compelling entry-points to building scientific literacy skills for all students.

Tips & Tricks for Virtual Learning IN OR OUT of the Class

ALL GRADES

General

live presentation

Angela Lewis, Norfolk Public Schools, Analisa Santillan, Norfolk Public Schools
Michele Baird, Norfolk Public Schools, Jessica O'Grady, Norfolk Public Schools

In this ever-challenging and ever-changing educational environment, this PD is designed by Instructional Technology Resource Teachers to introduce science teachers to several engaging free virtual learning programs that can be utilized in or out of the science classroom.

Elementary STEM Focus: Curiosity and Deeper Learning

ELEM

Math in Science, General, Preservice Teachers

live presentation

Cheryl Lindeman, Randolph College, Sabrina Johnson, Randolph College

How do elementary teachers approach curiosity and deeper learning with their students and their own professional development? We will highlight our findings about how teachers keep up to date with topics and strategies for assisting elementary students to develop STEM habits of mind. Participants will examine and reflect on learning pathways that support how elementary STEM educators practice continuous improvement. Preservice teachers are encouraged to attend.

Using Google to Create Engaging Digital Lessons

ALL GRADES

Biology/Life Science, Environmental Science

pre-recorded presentation

Stacey Ludington, Stafford High School, Natasha Neagle, Stafford High School

Using Google for Education products to create online lessons that engage students through inquiry, investigation, modeling and collaboration. Excellent for blended classes, flipped classes, differentiating lessons, distance learning, absent or homebound students, and sub plans. Gain access to templates and examples through Google Drive.

The Science Language Arts

MS-HS

General

live presentation

Janet Lundin, Mary Ellen Henderson Middle School

Science has its own language and in order for students to succeed in science they have to learn the language. For example; for 8th grade science SOL students are expected to have an essential vocabulary of 155 terms. This session will focus on strategies that will help students to gain mastery of science vocabulary. Sharing of strategies is welcomed and encouraged.

Exclusively for Pre-service Teachers - What YOU Need to Know

HS-COL

General, Preservice Teachers

live presentation

Jennifer Maeng, University of Virginia

Calling all pre-service teachers! Join us to learn how VAST can launch you into your career as a science teacher. Whether this is your first time attending VAST or your third, this session has something for you! Make connections with fellow preservice teachers and others that can support your career whether just you're beginning a teacher preparation program or graduating in May!

College and University Science Educators Share Session

HS-COL

General, Science Education Faculty

live presentation

Jennifer Maeng, University of Virginia, Anne Peterson, Virginia Department of Education

This session is an opportunity for college/university-based science educators and other teacher educators to participate in a professional learning community. We'll begin the session with updates from each institution, then Dr. Anne Peterson, from VDOE, will share relevant information from VDOE including opportunities around the Commonwealth and resources that to use with pre-service teachers.

Welcome to Blue Lake - Teaching Spatial Reasoning

HS

Earth/Space Science, Environmental Science

live presentation

David Matchen, Madison County High School

Spatial reasoning is vital to understanding Geoscience, yet spatial reasoning can be difficult to teach, and to evaluate. To evaluate the spatial reasoning ability level in my Environmental Science class, I use a short text article with geographic information and require myclasses to draw a map based upon what they have read. In this session, I will provide a shortened version of that exercise and ask the group to construct their own maps and provide some other short exercises.

Meet VESTA, the Virginia Earth Science Teacher Association

ALL GRADES

Earth/Space Science, Environmental Science

live presentation

David Matchen, Madison County High School, Bonnie Keller

Meet with the Officers from VESTA and find out how you can participate in building an association of Earth Science Teachers. All are welcome. We will discuss just how we can support the teaching of Earth Science in Virginia, including the development of a summer field course in Virginia, coordination and organization of online teaching materials, the development of a guide to assist new Earth Science Teachers. Attend and find out how you can contribute.

Student Choice Menus: Tips, Tricks, and Lessons Learned

ALL GRADES

Environmental Science, General

live presentation

Hannah Mawyer Barbosa, Henrico High School

The first time I had 100% engagement on content material in my Environmental Science class was when I introduced student choice menus. They're chunky and require planning, but if done well the payoff is huge. Come learn how I changed my classroom's rhythm to empower students and promote engagement.

STEM or Literacy? Both! -- Integrating STEM and Literacy

ELEM

STEM and Literacy Integration

live presentation

Betsy McAllister, Hampton City, National Institute of Aerospace, Maureen Houser, Barron Elementary School, Hampton City

Aimee Ryder, Forrest Elementary School/Hampton City, Melissa Twisdale, Asbury Elementary School/Hampton City

Within an already overcrowded day and with high-stakes testing weighing heavily on the minds of teachers, is it better to utilize precious moments for literacy or STEM instruction? Educators can and should do both! While often viewed as separate educational priorities, the disciplines actually go hand-in-hand. Explore strategies for integrating STEM and literacy in ways that will increase student engagement and more closely model how problems are solved in the real world.

Understanding Environmentally Sustainable Roof Design

ELEM

Earth/Space Science, Environmental Science

pre-recorded presentation

William McConnell, Virginia Wesleyan University, Elizabeth Malcolm, Virginia Wesleyan University

Roofs. Our students see them every day and they can also provide an engaging inquiry-based lesson. This presentation shares an easy way for your students to gather data on various roof types to explore and understand urban heat island effect. Digital lesson materials are shared and possible collaborative citizen-science opportunities are also described.

Teaching Students to Love Learning Geology Online

ALL GRADES

Earth/Space Science, General
Rose McGroarty, Virginia Tech

pre-recorded presentation

How do you teach geology online? As science courses around the globe turn to virtual experiments, dissections, and projects, others are left wondering how to teach online material naturally best taught in person. Some ways to teach geology/earth science online are to include Google Earth activities, rock hunts, and virtual field trips. Activities incorporating both exotic and familiar locations help students appreciate and love the geology in the world around them.

Remote Learning - Keep Students Engaged

MS-HS

Biology/Life Science
Sheryl McLaughlin, Hampton City Schools

live presentation

The pedagogy for remote or online learning differs from teaching in the classroom. This presentation will demonstrate a lesson on Symbiosis using Zoom breakout rooms, video clips, student participation, Google Slides, and Google Forms to keep students engaged, and enhance learning. Those attending will participate as students throughout the lesson, so a computer is required.

The Ultimate K-2 Science Lesson in a Digital Minute!

ELEM

General
Jenna Mercury, ExploreLearning

pre-recorded presentation

K-2 science shouldn't make you feel like you are spinning out of control! Come see how science can be successful when taught in a digital format. Walk away realizing that even though classrooms may be chaotic, a digital minute (or 5!) can lead to a mastery of science concepts! (Commercial Presentation)

We've got 99 Problems, But Solving a STEM Case is Not One!

HS-COL

Interactive STEM Cases
Jenna Mercury, ExploreLearning

pre-recorded presentation

We don't provide HS students with in-depth, practical, concepts and practices. Interactive STEM Cases will empower our students to jump into the role of a real STEM professional tasked to solve real-world problems. They will view interactive case studies, form and test ideas and find solutions. BYOD with any browser to jump into the program too! (Commercial Presentation)

Hello Science, Meet Creative Arts!

ELEM

General
Jenna Mercury, ExploreLearning

pre-recorded presentation

In this session, K-5 educators will learn how to get creative with their palette through the exploration of various multi-sensory, hands-on, creative arts activities that support the Virginia Science Standards of Learning. The teachers will walk away with artistic activities that can be easily interwoven into their day. So, hello Science, meet Creative Arts! (Commercial Presentation)

Preparing Teacher Candidates for Teaching Equitable Science

ALL GRADES

General
Joi Merritt, James Madison University, Angela Webb, James Madison University

live presentation

We aspire to help teacher candidates be aware of the normative practices and identities in their own science classrooms and to work to ensure that these privileged and promoted ways of being a science person are broad and accessible. Our approach is informed by how we, as science teacher educators, might reflect and make visible needed dispositions, beliefs, attitudes and practices in our own teaching to better prepare teacher candidates to teach in equitable and inclusive ways.

Using Phenomena to Engage Students in 3-D Learning

MS

Biology/Life Science, Physics/Physical Science
Zipporah Miller, SAVVAS Learning Co.

live presentation

Create purposeful, scaffolded project-based learning experiences inspiring students to construct explanations of natural phenomena. In this workshop, participants engage in experiences that model how to use storylines based on student questions to drive learning. (Commercial Presentation)

Strategies for Chemistry and Physics Inquiry Online

HS

Chemistry/Physics
Chris Moore, SAVVAS Learning Co.

live presentation

In Spring 2020, social distancing mandates changed the classroom and required teachers to adapt their strategies overnight. This was an unprecedented event, but the classroom is constantly evolving. In this presentation we will discuss practical strategies for online chemistry and physics science teaching and facilitating student interactions online. (Commercial Presentation)

Evolution for Middle School Educators

MS
Biology/Life Science
live presentation
Christopher Moran, The Teacher Institute for Evolutionary Science, Therese Whitehurst, The Teacher Institute for Evolutionary Science
Teach evolution with confidence! The presenter will model an entire free unit of instruction.
During the session, we will share: A bell ringer activity, a slide presentation (with content, online games, videos, and active learning ideas), a tour of the TIES Online Learning Page, and an investigation on natural selection. In addition, our website features free monthly webinars and dozens of resources organized by content standard. Check out our website at www.tieseducation.org

Plankton Poop to DNA: Research Translated to K-12 Classrooms

MS-HS-COL
Biology/Life Science
live presentation
Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve, Lisa Lawrence, Virginia Institute of Marine Science
Celia Cackowski, Virginia Institute of Marine Science, Tara Rudo, Chesapeake Bay National Estuarine Research Reserve in Virginia
What can we learn from plankton poop? How can we detect algal blooms by testing DNA in the water? Graduate students at the Virginia Institute of Marine Science have translated their research into hands-on STEM activities for K-12 science classrooms. This session shares inventive activities with real-world connections. Participants receive these lesson plans and have on-line access to 30+ additional lessons at <https://tinyurl.com/VASEA-Lessons>.

PBL and STEM

ALL GRADES
General
live presentation
Pam O'Brien, STEMscopes / Accelerate Learning
Are you looking for a way to empower all students in Project-Based Learning (PBL)? Join us to discover a simple planning process that engages students in the new Virginia Science Standards while taking ownership of their learning. Student learning is greatly enhanced by actively engaging in real-world and relevant projects. (Commercial Presentation)

Using Argumentation to Increase Student Voice

ALL GRADES
General
live presentation
Pam O'Brien, STEMscopes / Accelerate Learning
Reduce teacher talk and increase purposeful student talk as we model consensus building through argumentation around intriguing science topics that matter. ELA skills and the 21st-century skills of communication and collaboration are a must in today's science classroom! (Commercial Presentation)

Guiding Students Through Literature Review & Paper Writing

HS
Scientific Literacy
pre-recorded presentation
Heather Overkamp, I.C. Norcom High School
This is a webinar that I recorded as a Society for Science & the Public Advocate. It is about walking your students through the literature review process, helping them become more scientifically literate, and preparing their papers and paperwork for submission to several science and engineering fairs. It is based on the premise that the students are starting from scratch, in that they don't have a lot of experience with experimental or engineering design for an independent research project.

Look What We FOUND!!!

ALL GRADES
Environmental Science, Geography
pre-recorded presentation
Judith Painter, Andrew Lewis Middle School
Online or in-person you want engaged and active students. Why not use iNaturalist and the Seek app to get your students excited about the natural world locally, nationally, and globally?!? During the Spring, my students stayed in touch with the natural world in Geography. Participants will receive lessons, resources, and materials to recreate the activities immediately in their class settings be it online or in-person. Materials will be shared for all levels of connectivity or lack thereof.

Understanding the Electric Power Grid: From Source to Home

MS-HS-COL
Environmental Science, Engineering
live presentation
Remy Pangle, Center for the Advancement of Sustainable Energy at James Madison University
In this session, we feature the KidWind Powergrid kit, available for loan from the Center for the Advancement of Sustainable Energy Lending Library at JMU. Participants will learn about the electric power grid, all the components, and discover how to use the Powergrid kit as a jumping-off point for their energy unit.

Supporting K-12 STEM Using Remote Learning Kits in Virginia

ALL GRADES

Environmental Science

pre-recorded presentation

Hannah Patton, Virginia Tech, Molly Hackley, Virginia Tech, Thea Torrisi, Virginia Tech, Erika Bonnett, Virginia Tech

Our project goals are to design, develop, distribute, and assess educational kits focused on water science to K-12 students in VA. We will demonstrate the kits and discuss the process, including: identifying SOL-aligned activities that K-12 students can conduct at home and are appropriate for multiple grade levels; designing methods for kit distribution and assessment; and collaborating with teachers and extension agents to distribute kits and collect data on content and accessibility.

National Geographic Educator Certification

ALL GRADES

General

live presentation

LoriAnn Pawlik, Colgan High School, PWCS

This presentation will allow participants to understand the process of certification and the importance of educators to the mission of National Geographic Education. Participants will earn the first phase of certification during this session. It is for both formal and informal educators at all grade levels and in any content area.

National Geographic's Geo-Inquiry Process

ALL GRADES

General

pre-recorded presentation

LoriAnn Pawlik, Colgan High School PWCS

The Geo-Inquiry Process relies on using a geographic perspective, offering a unique lens to analyze space, place, and the interconnections between both the human and natural world. Using both a geographic perspective and the Geo-Inquiry Process students begin to connect complex components, see patterns, and make connections that change their communities. Curious? Come see how to engage your students!

PBLs: Studying Science Using Mapping

ALL GRADES

Earth/Space Science, Environmental Science

pre-recorded presentation

LoriAnn Pawlik, Colgan High School, PWCS

Projects and Problems... your students can engage and explore solutions across multiple content areas – saving you time. Our focus will be science SOLs - space and water - and you'll learn how easy it is to wrap maps and data into your teaching. Resources available.

PAEMST Information Session

MS-HS

Science, Engineering

live presentation

Anne Petersen, Virginia Department of Education

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the highest honors bestowed by the United States government specifically for K-12 science, technology, engineering, mathematics, and/or computer science teaching. The award recognizes those teachers have both deep content knowledge of the subjects they teach and the ability to motivate and enable students to be successful in those areas. This year's award is open to 6-12 teachers.

VDOE Update

ALL GRADES

General

live presentation

Anne Petersen, Virginia Department of Education, Myra Thayer, Virginia Department of Education

Gregory MacDougall, Virginia Department of Education, Tyler Waybright, Virginia Department of Education

The purpose of this session is to provide all stakeholders an update on current science initiatives within the Virginia Department of Education. Included in these initiatives will be an introduction to the Science Instructional Plans and other resources developed to support the 2018 Science Standards of Learning. Assessment next steps will also be shared in this session.

Special Education in Hands on/Higher Level Science

ALL GRADES

General

pre-recorded presentation

Michelle Plunkett, Loudoun County Public Schools

Have you ever wondered about making sure your classroom is fully immersive and accessible for all students? Come learn some hints, tips, tricks, and network with others for resources. Ms. Plunkett is a blind physicist and teacher who has helped many make sure all students can participate safely and confidently in all levels of science!

Measuring Transpiration in Plant

HS-COL

Biology/Life Science

pre-recorded presentation

Mike Renfro, James Madison University, Robbie Higdon, James Madison University

Students often lack an understanding of the importance of plants to life on our planet. Plants provide many ecosystem services including carbon sequestration, oxygen production, soil stabilization, water purification, and provision of food, shelter, fiber, and medicines. This laboratory investigation focuses on the process of transpiration and can serve as a lesson on plant anatomy and physiology, on environmental effects on plants, or on data collection, analysis, and presentation.

Teaching Science IS Teaching Reading

ELEM

Literacy in Science
Sandi Reyes, Learning A-Z

live presentation

Do you struggle to effectively embed creative and collaborative literacy processes into Science instruction? Students need to read grade level complex scientific texts to learn science concepts, while many students do not have the background content knowledge or the foundational reading skills to accomplish this. We will discuss the challenges, how to successfully integrate science and literacy, and how literacy skills and engagement improve when paired with hands-on inquiry-based science. (Commercial Presentation)

Virtual Classroom Visits with NASA Scientists

ALL GRADES

Earth/Space Science, Environmental Science
Angela Rizzi, NASA Langley Research Center

live presentation

Would you like to have a NASA subject matter expert (SME) connect with your class virtually? Come explore resources to help your students get the most out of the connection. Connections are designed to focus on science topics as well as 21st Century Skills and career awareness objectives. Resources include materials to help students prepare for the visit, activities to do during the visit and resources to facilitate interaction with the SME.

NASA Cloud Resources for Virtual and In Person Learning

ALL GRADES

Earth/Space Science
Angela Rizzi, NASA Langley Research Center

pre-recorded presentation

Are you wondering how to do hands-on science with students if you are not together in a classroom? Join a discussion of a range of options for using NASA Cloud resources in virtual, hybrid, face-to-face, formal and informal settings. The resources presented support active participation in the GLOBE Clouds citizen science effort even from inside! Lessons learned from summer 2020 efforts will be shared along with tips for success.

Keeping It Real: Create a More Authentic Science Classroom

MS

General
Shari Rosenberg, Matoaca Middle School

live presentation

Have you thought about trying to make science more connected to the “real world” but could use some more ideas? Attend this session to learn how to create a “science speaker series” in your classroom (in person or virtually) as well as some other tips and tricks for making science more meaningful and relevant to today’s learners.

Overview of Climate Change

ALL GRADES

Biology/Life Science, Environmental Science
Eeman Salem, Chesterfield County Public School

live presentation

When teaching children about global warming and climate justice, what should teachers know about their emotional readiness? How do children perceive global warming and how are these perceptions felt?

An App for Identifying a Fossil and Determining it’s Age

HS-COL

Earth/Space Science
William Schmachtenberg, Franklin County Public Schools

live presentation

Identifying index fossils to the genus level and determining the geologic age of the fossils can take years of training. Yet, establishing age from fossils is currently part of the Earth Science SOLs. I have created an app that helps students identify fossils and their geologic age. It is free to use at www.evwillc.com. It even runs on a chromebook! The app includes representative fossils from the Cambrian to Cenozoic in Virginia.

Disrupting Science

ALL GRADES

General
Becky Schnekser, Cape Henry Collegiate

pre-recorded presentation

Science is in need of a shake up; disruption, especially as we prepare them for career paths in the world of science. Authenticity, relevance, and application based experiences are foundational to understanding scientific concepts--let’s explore this together by tapping into natural curiosity, field and expedition science, and the mindset of an explorer. Let’s disrupt the science model together and make science what it should be; real, authentic, and a true experience.

The “Real Virginia” VR Map for Earth Science

MS-HS

Earth/Space Science, Environmental Science

live presentation

Matt Scott, Douglas Freeman High School

How can you travel 1700 miles and visit the 5 regions of Virginia while staying in your classroom? With Real Virginia project, a hybrid digital/physical map that connects students to Virginia’s geography, students can use the digitally augmented map to ‘travel’ Virginia, view immersive VR videos, and plan their own road trip covering Earth Science SOL topics. Attendees will learn how to use the map in their classroom by printing it out and linking to the free digital resources.

Computer Science Integration for Equity

ALL GRADES

Computer Science

pre-recorded presentation

Perry Shank, CodeVA, Anita Crowder, CodeVA, Bryan Wallace, CodeVA

Knowledge of the underlying principles and impacts of computer science is a necessity for all STEM educators and students. This presentation will discuss the curricular strategy of integration as a means to provide equity for all of Virginia’s students and provide a deep dive into how the VA Computer Science SOLs prepare students for careers in STEM.

Computer Science Integration Workshop

ALL GRADES

Computer Science

live presentation

Perry Shank, CodeVA, Anita Crowder, CodeVA, Bryan Wallace, CodeVA

The challenge many K-12 educators experience with the addition of the computer science state standards centers around the need to integrate content. This workshop provides an overview on how the CS standards can be integrated into core instruction; defining conceptual strands in CS, defining best practices for integration, and offering pedagogical frameworks for integrated-focused lesson planning.

Teaching Scientific Method with Children’s Literature Books

ELEM-MS

General

pre-recorded presentation

Mythianne Shelton, Fries School, Grayson County

Need ideas to help with teaching the scientific method? What better way to get your students excited about science than through reading. This presentation shares how to incorporate children’s literature books such as Creepy Carrots and Charlotte the Scientist is Squished into your science lessons. The activities will include bending a carrot, balloon rockets, and soap bubble challenge. Great for upper elementary and middle school students, but activities can be adapted for any grade.

Invasive Species - An Opportunity for Project Based Learning

MS-HS

Biology/Life Science

live presentation

Scott Skene, SAVVAS Learning Co., Jackie Orgain, SAVVAS Learning Co.

Invasive species cost Virginia taxpayers over a billion dollars every year! In this workshop, teachers will participate in a real-world PBL where they will investigate an invasive species. Teachers will use the Engineering Design Process to research, plan, design, build and test a solution to reduce the impact of an invasive species on a local ecosystem. (Commercial Presentation)

Great Escape: Break Your Everyday MS Science Class Routine

MS

Earth/Space Science, Physics/Physical Science

live presentation

Scott Skene, SAVVAS Learning Co., Jackie Orgain, SAVVAS Learning Co.

Create an engaging classroom for all students by challenging them to an escape room! In this workshop, teachers will actively participate by drawing on each other’s strengths and abilities by collaborating, finding clues, deciphering codes and solving puzzles. Escape the session with the tools you need to build your own escape room for your students. (Commercial Presentation)

Makerspace: Build a Car + Competition

MS

Earth/Space Science, Physics/Physical Science

live presentation

Scott Skene, SAVVAS Learning Co., Jackie Orgain, SAVVAS Learning Co.

Increase the Design / Think Process in the classroom by applying science knowledge, engineering design and building ingenuity in a fun and engaging way. Design and create wind powered cars using Makerspaces for an engaging and exciting competition. (Commercial Presentation)

Mastering - Digital Platform - AP, Honors Science Offerings

HS-COL

AP, Honors and Elective Science
Scott Skene, SAVVAS Learning Co.

live presentation

Come and get registered for Mastering associated with your AP, Honors or Electives Science offerings. Mastering has completely changed how students learn and instructors teach. The Mastering platform delivers engaging, dynamic learning opportunities focused on course objectives and responsive to help students demonstrate real measurable progress. Mastering is proven to help students absorb course materials and understand difficult objectives. (Commercial Presentation)

Inspiring NASA's Future Workforce Through STEM Engagement

MS-HS

Earth/Space Science, Engineering
Rosemary Smith, NASA

live presentation

NASA is engaging its future workforce through three pilots providing unique learning experiences for students focusing on current NASA missions. Join us as we discuss best practices for integrating STEM concepts and technology into your classroom, explain what you will need to get started, and immerse you in a NASA journey without ever leaving the classroom!

Student Goals: The Classroom Compass

ALL GRADES

General
Erich Sneller, Harrisonburg High School

live presentation

Like stellar constellations for old sailors, specific student goals give specific direction. Without them, we are unmoored from purpose. Thoughtful and detailed goals guide a student's education, providing them with reasons to engage in their learning. In this session, we will explore our current goals and update them. The dialogue and reflection in this session will put wind in your sails and emolden your mission as an educator.

The Sun and Its Energy

ALL GRADES

Physics/Physical Science, General
Kimberly Swan, National Energy Education Development Project

pre-recorded presentation

Come investigate with UV beads, build a solar oven, and explore how photovoltaic (PV) cells work! These hands-on activities let you see just how solar energy can be used in many different ways! You'll leave with a better understanding of radiant energy to share with your students.

Wind Can Do Work

ELEM-MS

Physics/Physical Science, General
Kimberly Swan, National Energy Education Development Project

pre-recorded presentation

With an increased focus on engineering and design instruction in the classroom, we've got some hands-on, critical thinking challenges designed for students to work as engineers in a competitive setting! Come learn about wind energy while building your own anemometer and then design a windmill to see how wind can do work by lifting the most paperclips. Leave with the knowledge, activities, and teaching strategies on how wind generates electricity and factors that affect its ability to do work.

Teach Energy Transformations with Confidence!

ALL GRADES

Chemistry, Physics/Physical Science

live presentation

Kimberly Swan, National Energy Education Development Project

Rotate through six hands-on stations to learn about forms of energy & energy transformations! Experiments highlight the science behind daily objects in our lives from how an apple can produce electricity to why a glow stick lights up when cracked, & more. All stations are designed to be easily differentiated for elementary, intermediate, & secondary grade levels. Leave feeling confident to teach energy forms & transformations to your students.

How the MWEE Flows

ALL GRADES

Teacher Prep and PD per Policy

pre-recorded presentation

Melinda VanDevelder, Virginia Commonwealth University, School of Education - Teaching and Learning

There is a tremendous need for sound environmental policy in public schools and successful outcomes of state recommended MWEEs primarily rests on the shoulders of classroom teachers who may not succeed in meeting environmental literacy requirements. This research focuses on survey data of perceived MWEE success rates of middle school and high school science teachers and investigates potential areas of need reported by teachers in order to fulfill environmental education requirements.

Academic Controversy to Enhance Understanding in Science

HS

General, Science Literacy

pre-recorded presentation

Angela Webb, James Madison University

How do elementary teachers approach curiosity and deeper learning with their students and their own professional development? We will highlight our findings about how teachers keep up to date with topics and strategies for assisting elementary students to develop STEM habits of mind. Participants will examine and reflect on learning pathways that support how elementary STEM educators practice continuous improvement. Preservice teachers are encouraged to attend.

NASA Digital Badging Resources

ALL GRADES

General

pre-recorded presentation

Anne Weiss, NASA Langley Research Center

This session provides an overview of current NASA digital badges for educators and students, as well as K-12 teachers sharing their experiences with digital badges. NASA's Office of STEM Engagement connects individuals with high-quality resources that leverage the Agency's unique assets while inspiring the next generation of explorers. NASA digital badges offer content in areas like Lunar Phases, Culturally Responsive Teaching (CRT), and the Next Gen STEM Themes (e.g., Small Steps Giant Leaps).

NASA's Artemis Generation: Moon to Mars

MS-HS-COL

Biology/Life Science, Engineering

pre-recorded presentation

Anne Weiss, NASA Langley Research Center

This session will provide a brief overview of current NASA student design challenges for inspiring the next generation of explorers to the Moon and Mars, including but not limited to NASA Student Launch and NASA WEAR (Wearable Equipment for Averting Radiation) STEM Challenge. Local teachers will also showcase their participation in a NASA design challenge with their students.

Game-Based Learning Increases Student Engagement

ELEM-MS

Math in Science, General

live presentation

Joselyn Whetzel, Legends of Learning

Log-in to experience how SOL-aligned gaming increases student engagement and science test scores in your young scientists. Explore science (& math) by flying helicopters, building ecosystems & launching cows into outer space. Let's keep students excited about content. Participants will log-out with take-away methods to make their lessons more exciting, equitable, personalized and accessible from home.

Evolution for Elementary School Educators

ELEM

Biology/Life Science

live presentation

Theresa Whitehurst, The Teacher Institute for Evolutionary Science, Christopher Moran, The Teacher Institute for Evolutionary Science The Teacher Institute for Evolutionary Science, TIES, has presented 185 workshops in 50 US States for science teachers. The TIES team now aims to provide elementary school teachers with similar support. The Elementary School Ready-to-Go Evolution Unit can be downloaded from our webpage for free (www.tieseducation.org). Each slide includes friendly teacher notes to guide you through the resources and content. Important terms include: species, adaptation, and population, and variation.

STEM Majors in Sustainability, Environment, & Conservation

HS-COL

Earth/Enviro/Bio/Chem/Phys/Eng

pre-recorded presentation

John Gray Williams, Virginia Tech - College of Natural Resources and Environment

Natural resources rarely come to mind when students hear the term STEM. But when you stop and think, virtually all consumer products, from the most basic to the most innovative, use materials that can ultimately be tied back to a natural resource. Come learn about the "other" STEM majors at Virginia Tech and how you can connect students interested in biology, chemistry, physics, technology, and engineering to career options in the environment, sustainability, and conservation.

Environmental Education Impacts Students' Future Careers

ALL GRADES

Environmental Science and STEM

live presentation

Laurie Witt, Albert Harris Elementary School, Krista Hodges, Dan River Basin Association

Today's students enter the classroom with the mindset that they can change their world. Science and STEM teachers have the opportunity to equip students to be environmental stewards while teaching Science Standards of Learning. Learn to create a Green Schoolyard that provides real-world applications for students, as well as meaningful hands-on learning opportunities. Students will enjoy trying on the roles of agricultural scientists, environmentalists, engineers, botanists, and meteorologists.

Data Interpretation and Explanation - Challenge Them

HS-COL

Biology/Life Science, Environmental Science
Joleen Zackowski, Tidewater Community College

pre-recorded presentation

This presentation models a lesson used to teach more advanced high school/college students how to interpret data and write scientific explanations of that data. Strategies presented include Claim-Evidence-Reasoning and I-squared (Identify and Interpret). The presentation also explores the use of free internet resources such as HHMI Biointeractive for the purpose of finding authentic data from peer-reviewed journals which students can then analyze.

Data Interpretation & Explanation - Scaffolding and Support

MS-HS

Biology/Life Science, General
Joleen Zackowski, Tidewater Community College

live presentation

This presentation models a lesson used to teach middle school/general high school students how to interpret data and write scientific explanations of that data. Strategies presented include Claim-Evidence-Reasoning and I-squared (Identify and Interpret). The presentation also explores the use of free internet resources such as HHMI Biointeractive for the purpose of finding authentic data from peer-reviewed journals which students can then analyze

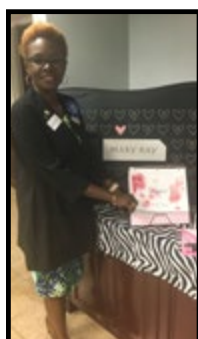
Teaching Science in an Online Environment

ALL GRADES

Earth/Space Science, Environmental Science
Tabatha Zarkauskas, Forest Park High School

live presentation

In an environment where students may be distance learning, learning science without “doing” can be difficult to do and to understand. Participants will engage in online/hands-on learning activities to help students “do” science in an online environment while allowing students to show their understanding of concepts using DOK, preparing students for the 21st century workforce.



Cheryl Coronado
Mary Kay Advanced
Product Consultant



Need more information about the PDI? Check 24/7 on the [VAST PDI web page](#).

Important links for the PDI:

- [Schedule of Events](#)
- [Registration](#)
- [Concurrent Session Presentations](#)
- [Donna Sterling Institute](#)
- [Nomination Form for VAST Awards](#)

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Future PDIs

2020 Virtual, Nov. 12-14

2021 Hotel Madison and Shenandoah Valley Conference Center, Harrisonburg, Nov. 17-20

2022 DoubleTree by Hilton Hotel, Williamsburg, Nov. 11-13



Question your world.



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Mission of the Virginia Association of Science Teachers (VAST)

- *inspire students,*
- *provide professional learning opportunities,*
- *build partnerships,*
- *advocate for excellence at the school, local, state and national level.*



Call for submissions for the next newsletter: Please send articles, letters to the editor, or labs, to newsletter@vast.org by October 1, 2020.

Please consult the website for up to date information, forms for awards and mini-grants, advertising and current PDI information: vast.org



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