

**Virginia Association of Science Teachers**  
**2021 VIRTUAL PROFESSIONAL DEVELOPMENT INSTITUTE**  
**NOVEMBER 16-18**

**PRE-RECORDED PRESENTATIONS**

(All presentations are available throughout the entire time of the PDI.)

**It's Electric!**

Barbara Adcock, Powhatan County Public Schools

Cover the electricity standards on the cheap with these hands-on ideas and strategies!

Grade Level: ELEM      Main Content: Physics/Physical Science, STEM

Session 12, Virtual Room A

**Standard-Based Escape Rooms & Forensic Scenes**

Ben Bache, PBL Project

Participants in this session will be introduced to the related strategies of Escape Rooms and Forensic Scenes, which help students to develop critical and creative thinking while reviewing standard-based content. Attendees to this virtual session will also be provided with dozens of FREE digital Escape Rooms and Forensic Scenes that they can use throughout the school year.

Grade Level: ELEM-MS      Main Content: Earth/Space Science, Biology/Life Science, Physics/Physical Science

Session 12, Virtual Room B

**Investigating the Chesapeake Bay with Place-based Education**

Ani Basica, James Madison University

Robbie Higdon, James Madison University

Place-based education provides opportunities to make real life connections between the classroom content and events taking place in the world at the time students are learning it. For students, especially those living in the Chesapeake Bay Watershed, studying this unique ecosystem in relation to the classroom content in the four major subject areas can lead to a deeper understanding of how current environmental issues may impact their home and environment.

Grade Level: MS      Main Content: Biology/Life Science, Environmental Science

Session 12, Virtual Room C

**Addressing Student Anxieties about the Climate Crisis**

Michael Bentley, University of Tennessee

Increasingly, students express awareness of and anxieties about pollution and the global climate-extinction crisis, primarily caused by human overgrowth and overconsumption. How do we respond to children's fear of doom? The presenter draws upon work by F.M. Lappe' and Joanna Macy on how redirect anxiety and depression toward lament and non-attachment, fostering 'eco-minds' and a positive emotional response that can lead to action.

Grade Level: ALL GRADES      Main Content: Biology/Life Science, Environmental Science, General

Session 12, Virtual Room D

**Sprouting Success with Agriculture in the Classroom**

Lynn Black, Virginia Agriculture in the Classroom

Join Agriculture in the Classroom for an engaging virtual session full of practical tips and classroom-ready activities to get you growing! The focus of this session will be on germination, life cycle, and plant systems activities for the elementary classroom. From school gardens to hydroponics to classroom germination projects, we'll show you how to sprout success in your classroom with our curriculum and resources.

Grade Level: ELEM      Main Content: General

Session 12, Virtual Room E

### **Makerspace on the Move: Engaging Students in Engineering.**

Pam Caffery, hand2mind

How can you use makerspace while teaching in different learning environments? You'll learn great tips and strategies to engage students in science and engineering practices through hand2mind makerspace configurations while teaching in any type of learning environment. A drawing for a giveaway will be done at the end of the session.

Grade Level: ELEM-MS      Main Content: Engineering, STEM  
Session 12, Virtual Room F

### **Coding for the Ages: Engaging Students in Offline Coding**

Pam Caffery, hand2mind

Your young coders can develop early STEM concepts through offline and online coding. Spend some time with us as we introduce you to hand2mind's coding solutions that teach fundamental coding skills. We'll begin with offline coding solutions for PreK-5 grades and then show you how students can progress from offline coding activities to online using our Artie 3000, an artistic robot.

Grade Level: ELEM-MS      Main Content: Engineering, STEM  
Session 12, Virtual Room G

### **Camps, Un-Camps and Professional Development Workshops at VT**

Victoria Corbin, College of Science at Virginia Tech

Kristy Morrill, College of Science at Virginia Tech

We will describe programs we've developed for inspiring and engaging your students in the process of doing science. In summers 2020-21, we ran short online "camps"—Un-Camps—and realized they would make fun and effective modules for use in middle school classrooms. We will describe these as well as in-person camps and a professional development workshop for high school science teachers for summer 2022. Our goal is to make science teaching and learning fun, easy and effective!

Grade Level: MS-HS      Main Content: Math in Science, General, STEM  
Session 12, Virtual Room H

### **Using Biotic and Abiotic Factors to Determine Stream Health**

Chandler DeHaven, Clarke County High School

Students will be capturing benthic macroinvertebrates from stream to gain a further understanding of the quality of the water from the type of organism in the water. After they complete the field studies, they will research ways to improve river health. They will find the best plants for the stream and share this information with the Ag class. Finally, Environmental Science class will study the data from Ecology and Ag classes in order to develop a law of sustainability for the local watershed.

Grade Level: HS      Main Content: Environmental Science, Biology II Ecology Class  
Session 13, Virtual Room A

### **Real Science: Science Teachers in Research Labs**

Elizabeth Edmondson, Virginia Commonwealth University

Megan Rihn, Varina High School

Renee Goode-Boyd, George Wythe High School

James Key, Huguenot High School

Learn about the National Institute of Health funded project Health Education Research Opportunities for Teachers (HERO-T). Hero-T offers secondary science teachers an amazing opportunity to be mentored and work with a VCU research scientist for two consecutive summers.

Grade Level: MS-HS      Main Content: Biology/Life Science  
Session 13, Virtual Room B

### **If Newton Had Hot Wheels- Physics Fun Through Demos and Labs**

Thomas Fitzpatrick, Roanoke City Public Schools

Angelo Bonilla, Breckinridge Middle School

Leslie Barrett, Breckinridge Middle School

We will share simple low-cost demonstrations and lab activities designed to promote inquiry in your students and bring science to their real world. We will include pipe wrap roller coasters, embroidery hoop physics, toilet paper roll cannons, Newton's Laws demos with cheap skateboards, and as much more as we can cram into the time! Easy and natural connections to SOL.1 and engineering design. Intended for grades 5 to 8, can be adapted for lower grades and physics.

Grade Level: ELEM-MS      Main Content: Physics/Physical Science, Engineering, STEM

Session 13, Virtual Room C

### **Differentiating Science-The Possibilities are Endless**

Mindy Gumpert, Old Dominion University, Virginia Wesleyan University

Differentiation is an instructional approach whereby teachers adjust their curriculum and instruction to maximize the learning of all students: average learners, English learners, struggling students, students with disabilities, and gifted students. In this session, participants will learn how to differentiate instruction for groups of students in the areas of content, process, and product. Strategies learned in this session can be applied to all grade levels and subjects.

Grade Level: ALL GRADES      Main Content: All science content

Session 13, Virtual Room D

### **Shifting the Middle School Science Instructional Sequence**

Emily Harris, Appomattox Middle School

Shanee Dawson, Appomattox Middle School

In an effort to improve cumulative standardized test scores, a change in instructional pacing was implemented at our middle school. Instead of teaching sixth-general science, seventh-life science, and eighth- physical science we shifted the sequence to teach sixth- life science, seventh-physical science, and eighth-general science. Listen in to hear how we integrated this into our hybrid-block schedule and made it successful.

Grade Level: MS      Main Content: Science Curriculum

Session 13, Virtual Room E

### **Leading from the Classroom**

Stephanie Harry, VAST Chemistry Content Chair

This presentation will provide ideas and suggestions on how teachers can teach in the classroom and become a leader in education. I will share some personal experiences and different teacher leadership opportunities available to educators.

Grade Level: ALL GRADES      Main Content: General

Session 13, Virtual Room F

### **Using Biodiversity to Promote Diversity in STEM**

Deirde Gonsalves-Jackson, Virginia Wesleyan Univeristy

Victor Townsend, Virginia Wesleyan Univeristy

At Virginia Wesleyan University there is an initiative underway to establish outreach programs with local schools to attract students to STEM. One initiative is a dual enrollment course, The Diversity of Life, in partnership with local secondary schools to promote diversity in STEM. This presentation shares results of this program so that it may serve as a model for how secondary schools can collaborate with area institutions to create similar partnerships.

Grade Level: HS-COL      Main Content: Biology/Life Science, Environmental Science, STEM

Session 13, Virtual Room G

### **Assessing Students in an Online Environment**

Debbie Huffine, American College of Education

As a teacher herself Debbie has had to adjust to working in an online environment and both developing and adjusting her instructional materials to fit. In this session we will be looking at engagement strategies, online tools for spot checks, discussing online procedure for learning, and the big one, assessing what and how well they understand. Got a great idea to share? Please join us as we learn together in another online learning environment.

Grade Level: ALL GRADES      Main Content: Assessment Strategies

Session 13, Virtual Room H

### **What's the Point, Curie?**

Andy Jackson, Harrisonburg High School

The Currie temperature will be determined for a piece of iron wire through the use of ohm's law and the relationship between temperature and resistance of a metal wire. This is an advanced concept lab that can be done with materials from a local hardware store, an ammeter and a recording voltage probe, like a labQuest.

Grade Level: HS-COL      Main Content: Physics/Physical Science

Session 14, Virtual Room A

### **Megadrought: Ancestral Puebloan Culture and Environment**

Russell Kohrs, Massanutten Regional Governor's School

The 13th century megadrought in the American southwest is often presented as the single most important reason for the depopulation of the major cultural centers at that time. Environmental records do indeed point to the occurrence of such a drought. However, was this the main factor? This virtual field trip experience will explore various lines of cultural and scientific evidence gathered to explore this very question. The work presented was supported by the 2020 Donna Sterling Award.

Grade Level: MS-HS-COL      Main Content: Earth/Space Science, Biology/Life Science, Environmental Science

Session 14, Virtual Room B

### **Gamify Your Canvas Classroom**

Stacey Ludington, Stafford High School

Learn how to turn your Canvas courses into a Choose Your Own Adventure/RPG-like game. By setting up your Canvas course a little differently you can turn your classroom into an adventure game that increases the student engagement. A sample course will be shown as an example of how to set it up and run it smoothly

Grade Level: ALL GRADES      Main Content: General

Session 14, Virtual Room C

### **Project-based Learning in Diverse Learning Environments**

Acacia McKenna, Toshiba/NSTA ExploraVision

Learn strategies to engage students in science and engineering concepts; 2. Obtain tools to foster a learning environment and classroom culture grounded in the habit of reflection and reasoning; and 3. Gain practical resources and tools to apply project-based learning in a diverse K-12 learning environment that you can begin implementing in your classroom this fall.

Grade Level: ALL GRADES      Main Content: Biology/Life Science, General, STEM

Session 14, Virtual Room D

### **Conducting Field Trips for Virtual Experiments**

Heather Overkamp, I.C. Norcom High School/Portsmouth Public Schools

Whether students are in the classroom and collecting data outside with their teacher, or at home learning virtually, this presentation will provide you with ideas for collecting data outside and online. Tools will also be presented for students to collect and analyze data in either scenario, including mapping software, environmental testing, citizen science projects, and smartphone apps.

Grade Level: ALL GRADES      Main Content: All Topics; Specific to Tools.

Session 14, Virtual Room E

### **QUAD P: Post-AP Physics Projects Potpourri**

LoriAnn Pawlik, Charles Colgan High School

What do you do in class after the AP Test in early-May... when school continues through mid-June? This presentation will suggest some ideas that you can implement with little cost and/or prep. These can be student-driven or whole-class.

Grade Level: HS-COL Main Content: Physics/Physical Science, STEM

Session 14, Virtual Room F

### **Training and Volunteering as a Virginia Master Naturalist**

Michelle Prysby, Virginia Master Naturalist Program (Virginia Cooperative Extension/Virginia Tech)

The Virginia Master Naturalist (VMN) program provides training on natural resources and engages volunteers in environmental education, citizen science, and stewardship in their communities. The 40-plus hour basic training course teaches about the plants, animals, and ecological systems of the local area through field and classroom learning. Trained volunteers participate in any of dozens of projects, from wildlife monitoring to habitat restoration to educating others about nature.

Grade Level: ALL GRADES Main Content: Biology/Life Science, Environmental Science, General

Session 14, Virtual Room G

### **Nature Journaling; VAST Mini Grant Funded Project**

Becky Schnekser, Cape Henry Collegiate

Let's investigate how to use nature, writing, art, social emotional learning, and scientific observation to engage learners in nature journaling that features skills across all content and skill areas. This project was funded with VAST mini grant funds, come learn how your idea can be funded too!

Grade Level: ELEM Main Content: General

Session 14, Virtual Room H

### **Expedition Science: Empowering Learners through Exploration**

Becky Schnekser, Cape Henry Collegiate

Humans are natural scientists, let's tap into their curiosity and create meaningful experiences for them within the world of science and beyond. Come learn strategies to place learners in the driver seat of exploratory and investigative science.

Grade Level: ELEM Main Content: General

Session 15, Virtual Room A

### **Designing Online Lab Reports - Cut Down on Paper Use!**

Jen Sharp-Knott, Floyd County High School

One of the benefits of a year of online teaching is learning some more efficient ways to do things! Come and see some ways to create online versions of lab reports - what are the easiest ways to format? Is a google doc or a google form better for a certain lab? What about a virtual or make-up version? Attend this session to see some options and hear the pros and cons of different formats.

Grade Level: MS-HS-COL Main Content: Biology/Life Science, Chemistry, Environmental Science

Session 15, Virtual Room B

### **Sweet and Salty Investigations with a 3-D Twist**

Stacy Thibodeaux, Southside High School/Texas Instruments

Jessica Kohout, Howard County Public Schools

Discover how to implement three-dimensional learning into any science curriculum, all while engaging learners to become phenomenal! In this session, participants will use real world data collection to determine a phenomenon, why salt is added to freezing roads and making homemade ice cream but also added to boiling water when making pasta. Participants will use the data collected to argue with evidence while creating a visible molecular level diagram of what occurred.

Grade Level: MS-HS-COL Main Content: Chemistry, General

Session 15, Virtual Room C

### **Ramp Up Your STEM Data Collection**

Stacy Thibodeaux, Southside High School/Texas Instruments

Jessica Kohout, Howard County Public Schools

Want to add more data collection to your STEM classroom? Then this session is for you! Data collection in the STEM classroom is what should drive all engineering design processes. This session will have you collecting real world data, analyzing that data, and use the analysis to design a digital pH monitoring system.

Grade Level: MS-HS-COL      Main Content: Biology/Life Science, Chemistry, Math in Science

Session 15, Virtual Room D

### **Citizen Science: Authentic, Accessible, 3-Dimensional**

Angela Webb, James Madison University

Citizen (or community) science provides science learners rich opportunities to engage in meaningful science. In doing so, learners use science and engineering practices in authentic contexts and build scientific literacy. In this session, JMU preservice teachers discuss the benefits and barriers of including citizen science in the secondary classroom and share ideas for engaging learners in authentic, accessible, 3D citizen science projects that are aligned with the curriculum and standards.

Grade Level: HS      Main Content: General

Session 15, Virtual Room E

### **STEM Majors in Sustainability, Environment, & Conservation**

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.

Grade Level: HS-COL      Main Content: Earth/Space Science, Environmental Science, STEM

Session 15, Virtual Room F

### **Argumentation, Radio Waves, and Engineering Design**

Valarie Bogan, National Radio Astronomy Observatory

This presentation guides teachers through an inquiry lesson on radio waves and antennas. During the lesson students learn about how antennas receive radio waves then design, test, and redesign an antenna configuration that will improve reception in the classroom. This is the first of nine electromagnetic spectrum lessons in the NRDZ program. Information will be provided on becoming part of the NRDZ cohort which entitles you to free teaching materials and additional PD.

Grade Level: HS      Main Content: Physics/Physical Science, Engineering

Session 15, Virtual Room G

### **Climate Literacy: The Future of Our World**

Rachel Weisbrot, EARTHDAY.ORG

The world is facing a climate emergency. In order to act, schools everywhere must utilize accurate and accessible information and resources. The time is now for climate literacy to create a generation of citizens and leaders who understand why and how to stop climate change and environmental degradation. This presentation will discuss the importance of climate literacy, how to incorporate it in various subjects, and what EARTHDAY.ORG is doing to promote it

Grade Level: ALL GRADES      Main Content: Climate Literacy: The Future of Our World

Session 15, Virtual Room H