VIRGINIA ASSOCIATION OF SCIENCE TEACHERS 2022 PROFESSIONAL DEVELOPMENT INSTITUTE
FRIDAY MORNING CONCURRENT SESSION PRESENTATIONS

(This list and an Index of Presenters are on the WHOVA APP and on the Annual PDI page at www.VAST.org/2022pdi)
(Last minute cancellations are on the WHOVA APP)

Session 1: Fri. 8:30-9:20 AM, Amphitheatre (first floor), **Grade:** ALL GRADES, **Content:** Biology/Life Science, Math in Science, STEM

1. Flattening the Curve of the Zombie Apocalypse

Jeff Lukens, Roosevelt High School, Sioux Falls, SD

By making use of pop culture trends, we can raise the levels of engagement and interest in our STEM-Based classrooms. In recent years, few trends have been as wildly--or widely--popular as zombies! In this session, we will use zombies to model brain anatomy and physiology and then develop a model for the spread of a "Zombie Virus" in a population of humans. Once we establish the seriousness of the Zombie Apocalypse, we will attempt to "flatten the curve" of a Zombie Pandemic.

Session 1: Fri. 8:30-9:20 AM, Room D (first floor), **Grade:** ALL GRADES, **Content:** General

2. Gotta Talk: Using Discourse in the Science Classroom

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

It can be frustrating for teachers when implementing a lesson that involves classroom interactions yet none of students will speak OR they speak over each other. Learn strategies that build discourse skills and promote robust discussions in your classroom.

Session 1: Fri. 8:30-9:20 AM, Central Lounge (first floor), **Grade:** ELEM, **Content:** Engineering, General, STEM

3. Using Machine Learning (AI) in the Elementary Classroom

Liz Lynch, Patrick Henry Elementary School
Karlee Young, Patrick Henry Elementary School
Cameron Cooper , Patrick Henry Elementary School
Ashley Taylor, Patrick Henry Elementary School

Machine learning (ML) is the process of giving a computer a sample set of data, so that it can “learn” by making associations. Attendees will leave with an understanding of machine learning. Sample machine learning lessons include vascular/nonvascular plants, measuring angles, identifying shapes, and more! Attendees will create their own ML lesson and will leave with a collaborative library of resources produced by the attendees to enable them to implement AI in their classroom immediately.

Session 1: Fri. 8:30-9:20 AM, Room 2-3 (first floor), **Grade:** MS-HS, **Content:** Biology/Life Science

4. Inclusive Teaching of the Bird-Beak Lab

Meredith Kier, College of William & Mary
Secondary Science Preservice Teachers College of William & Mary,

William & Mary preservice teachers will facilitate a "tried-and-true'/traditional lab on natural selection based (i.e. the bird-beak lab). During facilitation of the lab, preservice teachers will stop the participants to make explicit adaptations for students with mild-moderate disabilities. They will also provide curricular materials and demonstrate teaching moves that make this lab more culturally responsive to diverse learners in their classroom.

Session 1: Fri. 8:30-9:20 AM, Room AB (first floor), **Grade:** ELEM, **Content:** General, STEM

5. No TIME for Science!

Lori Pawlik, Prince William County Schools

Difficulty fitting science in to your school day? We'll explore ideas and easy take-homes to help you manage all your responsibilities efficiently while engaging your students. See you there!

Session 1: Fri. 8:30-9:20 AM, Room 4 (first floor), **Grade:** ALL GRADES, **Content:** Engineering, General, STEM

6. Navigating Barriers & Challenges: K-6 Engineering Education

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

Are you wondering how to do it all in your elementary classroom? There are many barriers and challenges for elementary educators as you navigate ways to successfully integrate engineering into your curriculum to meet the revised science SOLs. During this session, stakeholders in various levels of education in Virginia will uncover these barriers and discuss ways to navigate through uncharted engineering waters. Online Ed+gineering resources will be provided. Stop by to join the conversation!

Session 1: Fri. 8:30-9:20 AM, Room 16 (second floor), **Grade:** ELEM-MS, **Content:** Biology/Life Science

7. Life Science and Cells: No More Boring Worksheets

Erika Hackworth, Woodrow Wilson Middle School

Worksheets are easy prep for teachers, but they are not always fun. Students need to be engaged and make connections to the material that they are learning. This presentation will provide you with a variety of fun and hands on activities to help teach cells. No boring worksheets here.

Session 1: Fri. 8:30-9:20 AM, Room I (second floor)

8. No Presentation

Session 1: Fri. 8:30-9:20 AM, Room 17 (second floor), **Grade:** MS-HS, **Content:** Biology/Life Science, Environmental Science

9. Using Historical and Real Time Data for Authentic Projects

Patrick Scharf, Louisa County Middle School

A model project on climate change is used to demonstrate how students can work on the five C's while doing authentic research and presentations. The use of NASA and NOAA data will be implemented to develop research, graphing and analysis skills. Examples of seventh grade students' projects will be shown for discussion and questions. Ideas can be shared for other ways to use this model. Rubric framework and abbreviated instructions will be provided.

Session 1: Fri. 8:30-9:20 AM, Room J (second floor), **Grade:** HS-COL, **Content:** General, STEM

10. ESCAPE-Eco, Social, Cultural, Across-Planet Education

Robbie Higdon, James Madison University

Andy Jackson, James Madison University

Seth Shantz, Harrisonburg High School Governor's STEM Academy

Learn about a global virtual exchange initiative involving students from the Harrisonburg High School Governor's STEM Academy and Coláiste Chú Chulainn in Ireland. Students at both schools compared and contrasted Ireland and Virginia with regard to physical geography and laws that affect energy production and use. Then, they investigated the means used for electrical energy production in Ireland and Virginia. Finally, students from both schools shared their findings via video conference.

Session 1: Fri. 8:30-9:20 AM, Room 18 (second floor), **Grade:** HS-COL, **Content:** Biology/Life Science, Environmental Science

11. Antibiotic-Resistant Bacteria and Recycled Water

Amanda Gardner, Virginia High School

Are antibiotic resistance genes in recycled water a threat to human health? In this lab experiment, we will test for the presence of antibiotic resistant genes in the water leaving a wastewater treatment plant, interpret graphics that illustrate how bacteria become resistant to multiple antibiotics, and explain how the presence of antibiotics in wastewater might increase the frequency of multi-drug resistant bacteria.

Session 1: Fri. 8:30-9:20 AM, Room H (second floor), **Grade:** MS, **Content:** Earth/Space Science

12. Exploring the Earth with Google Earth

Carla Kersten, Goochland Middle School

Looking for ways to bring Earth Science alive for your students? Come take a virtual trip around the planet to investigate latitude and longitude, plate tectonics, volcanoes, and our beautiful planet. Learn how to utilize Google Earth to engage students and travel the world without leaving school.

Session 1: Fri. 8:30-9:20 AM, Room 15 (second floor), **Grade:** MS-HS, **Content:** General, STEM

13. Science News in the Classroom

Victoria MacEntee, Woodside High School

Science News and Science News for Students provide students access to the latest in scientific research through digital and print formats. Both resources can be used to promote data analysis, literacy practices, research and design, diversity in STEM, and more! Learn how to use available resources to engage students with current, reliable references. This session will focus on learning and modeling ways to implement this resource in your classroom.

Session 1: Fri. 8:30-9:20 AM, Room 11 (second floor), **Grade:** ALL GRADES, **Content:** Env. Science, Math in Science, Cross Curricular Env. Literacy

14. Place-based Learning: Using Waste Audits to Bring Change

Melinda Landry, Prince William County Schools

Jessica Doiron, Prince William County Schools

Integrate a variety of ways to use school grounds and facilities to engage students in place-based learning for energy and sustainability topics. All lessons include STEM components. Attendees will walk through the steps for a tried and tested successful waste audit at their school with clear guidelines for communication, procedures for lunchrooms, cafeterias, and

classrooms, how to use the data gathered, and leading students to develop real world solutions to complete the story with action.

Session 1: Fri. 8:30-9:20 AM, Room 10 (second floor), **Grade:** MS, **Content:** Earth/Space Science, Environmental Science, General

15. Incorporating Environmental Justice Into the Classroom

Jennifer Pinney, Rippon Middle School
Sharon Bicey, Rippon Middle School

By introducing environmental justice in Middle School Science, educators can promote advocacy in all communities across Virginia & increase inclusivity in the classroom. Many Virginia communities face issues of environmental justice including exposure to higher levels of air pollution, proximity to superfund sites & points of wastewater release. Through Science students can learn about current issues facing our global society such as water scarcity, food scarcity, and the increase in pollution.

Session 1: Fri. 8:30-9:20 AM, Room 8 (second floor), **Grade:** ELEM, **Content:** General

16. Placed-based Lesson Plans for Elementary Science: Framework, Praxis and Plans

Kathryn Lanouette, College of William & Mary

In this presentation, we will share prospective elementary teachers' approaches to centering place and space in K-6 SOL-aligned science lesson plans. We will discuss possibilities and challenges encountered in the design and enactment of these lesson plans, as well as resources we have found helpful in the process.

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Session 2: Fri. 9:35-10:25 AM, Amphitheatre (first floor), **Grade:** MS-HS, **Content:** General, STEM

17. Order Up a Helping of Forensics, With a Side of Maggots!

Jeff Lukens, Roosevelt High School, Sioux Falls, SD

Thanks to the popularity of crime-based TV shows and movies, public interest in forensics has never been greater. As such, the number of Forensic Science course offerings in U.S. high schools continues to mushroom. Most of the "cases" in a typical Forensics class, however, arise from studying famous crime scenes from the past. This session offers a twist! It isn't a "whodunit", it's a "who is it". A body is found and it's up to you to figure out the identity. True STEM at it's finest!

Session 2: Fri. 9:35-10:25 AM, Room D (first floor), **Grade:** ALL GRADES, **Content:** General

18. What Do I Do About Vocabulary?

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

Vocabulary is critical when sharing information in any discipline; however, research indicates that teaching vocabulary after students have an experience provides context for students to tie to the vocabulary to as they build conceptual understanding. This session focuses on best practice for the introduction of science vocabulary in the classroom.

Session 2: Fri. 9:35-10:25 AM, Central Lounge (first floor), **Grade:** ALL GRADES, **Content:** Biology/Life Science, Environmental Science, STEM

19. MWEE: Engaging Watershed Activity

Barbara Adcock, Powhatan County Public Schools
Lisa Brown, Powhatan COunty Public Schools

See how our Bio 2 and Environmental Science high schoolers have a MWEE with our county's fourth graders! We will go through the organization, each of the stations, and share digital copies of the activity plans. You will also have the opportunity to participate in a modified indoor version. Door prizes, too!

Session 2: Fri. 9:35-10:25 AM, Room 2-3 (first floor), **Grade:** MS-HS, **Content:** STEM

20. Integrating Original Research in a Science Curriculum

Pamela Dixon Kuhn, Science Research for All, Inc.

Science research programs are prevalent in many high-achieving STEM specialized schools; however, we believe ALL students can participate in the scientific method by doing original research within the science classroom. In this session, we will outline the process for incorporating a capstone research project in a high school or middle school science course. (Not-For-Profit Exhibitor)

Session 2: Fri. 9:35-10:25 AM, Room AB (first floor), **Grade:** ELEM, **Content:** Biology/Life Science, Physics/Physical Science, STEM

21. Hands-on Plus! Driving Student-Centered Learning K-5

Cheryl Lindeman, Carolina.com

How does hands-on learning incorporate digital and print resources to promote active learning? See how Smithsonian Science for the Classroom K-5 storylines engage students with science and engineering practices, strengthen sensemaking skills, and

promote scientific literacy for all students. Experience lesson activities using strategies for helping students share their curiosity and ideas. Leave with classroom resources and ways to integrate Carolina's online resources in English and Spanish. (Commercial Exhibitor)

Session 2: Fri. 9:35-10:25 AM, Room 4 (first floor), **Grade:** MS-HS-COL, **Content:** STEM

22. Real Science: Science Teachers in Research Labs

Elizabeth Edmondson, Virginia Commonwealth University

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

Three teachers, from summer 2022, will share their experience working at VCU. Come learn about their exciting summer and how you can bringing authentic science into your classroom that motivates your students with rigorous hands-on activities.

Session 2: Fri. 9:35-10:25 AM, Room 16 (second floor), **Grade:** HS, **Content:** Physics/Physical Science, Engineering, STEM

23. Quantum Computing for YOUR High School Students!

Andrew Jackson, Harrisonburg City Public Schools

Students in the Program , Harrisonburg High School

Learn how YOUR students can enroll in Introduction to Quantum Computing where they will learn quantum physics, learn how to code in Python, learn more about the intersection of quantum and cyber security by carrying out a quantum cryptography protocol, quantum key distribution (QKD), in Python. Learn how to make this happen for your students from a teacher and students who have experienced this exciting opportunity and the program coordinator who will make it happen for you! The presenters acknowledge the involvement of the HHS students who are in the program.

Session 2: Fri. 9:35-10:25 AM, Room I (second floor), **Grade:** ALL GRADES, **Content:** Earth/Space Science, Biology/Life Science, Environmental Science

24. Explore Earth: Monitoring Microplastic Pollution from Space

Anne Weiss, NASA Langley Office of STEM Engagement

Projections indicate that by 2050, there may be more plastics in our rivers, streams and rising oceans than fish, leading to calls for a worldwide treaty restricting plastic pollution. To track movements of plastic trash through marine ecosystems, scientists have developed ways to re-purpose NASA Earth-observing satellite data sets. In this session, we'll explore these new tools and capabilities as part of a comprehensive portfolio of missions that monitor Earth's changing climate.

Session 2: Fri. 9:35-10:25 AM, Room 17 (second floor), **Grade:** MS-HS-COL, **Content:** Biology/Life Science, Oceanography

25. Scallops & A Deep-Sea Killer: Research to K-12 Classroom

Lisa Lawrence, VIMS/VA Sea Grant

Celia Cackowski, VIMS/VA Sea Grant

Bethany Smith, VIMS/VA Sea Grant

Sarah Nuss, VIMS/CBNERR

Graduate students at the Virginia Institute of Marine Science have translated their research into hands-on VA SEA activities for K-12 classrooms. This session shares two engaging activities with real-world connections. In the first activity, students serve as fisheries scientists "sampling" sea scallops to develop recommendations for sustainably managing the fishery. In the second activity, students learn about deep-sea adaptations and solve the mystery of which predator killed the copepod. (Not-For-Profit Exhibitor)

Session 2: Fri. 9:35-10:25 AM, Room J (second floor), **Grade:** ELEM, **Content:** Computer Science Integration

26. Integrating Computer Science in the K-5 Classroom

Shanan Chappell Moots, Old Dominion University

Melani Loney, Old Dominion University

Keisha Tennessee, Virginia Department of Education

Natalie Rhodes, CodeVA

This session introduces the Advancing Rural Computer Science (ARCS) project, a VDOE-supported program that provides paid PD for K-5 teachers across the Commonwealth. Attendees will discover how ARCS (available for all K-5 teachers in VA) delivers high-quality PD through CodeVA, Microcredentials through ODU, and classroom materials. Presenters will discuss how ARCS enables teachers to meet CS SOL requirements and ensure that all students receive CS education before entering secondary school.

Session 2: Fri. 9:35-10:25 AM, Room 18 (second floor), **Grade:** MS-HS, **Content:** Chemistry, Physics/Physical Science

27. Level Up Your Science/STEM Program with Game Based Learning

Kristen Holland, Plasma Games

Alison Baker, Plasma Games

Join is for a hands-on epic adventure with Plasma Games. This session will provide you access to our platform which includes a one-of-a-kind video game, STEM career spotlights, a teacher portal full of curriculum resources, and free professional development. Bring your laptop so you can get your game on and level up your learning! (Commercial Exhibitor)

Session 2: Fri. 9:35-10:25 AM, Room H (second floor), **Grade:** MS-HS, **Content:** Biology/Life Science, Environmental Science
28. Hatching in Higher Grades
Stephanie Bender, Salem Church Middle School
Patricia Thurston, Salem Church Middle School
Chicken hatching projects aren't just for littles! While typically chicken hatching projects are used as a part of life cycle studies in lower grades and elementary school, they can add depth and unique experiences to secondary classroom's genetics units. Through chicken hatching projects students can get great experience directly viewing embryo development by candling the eggs, see genetic variation with different egg colors and sizes- resulting in varied chicks, and more!

Session 2: Fri. 9:35-10:25 AM, Room 15 (second floor), **Grade:** ALL GRADES, **Content:** STEM
29. Finding Funding for STEM Education
Victoria MacEntee, Woodside High School
Do you have a great idea you want to implement in your classroom, but no funding to support it? Learn and share about funding opportunities that can help your dream become reality. Participants should bring a charged laptop.

Session 2: Fri. 9:35-10:25 AM, Room 11 (second floor), **Grade:** ELEM-MS, **Content:** STEM
30. TOP Chocolate Bar Design Challenge
Katherine Mangum, St. Catherine's School
Try your hand at a Chocolate Bar Design Challenge inspired by a Transatlantic Outreach Program (TOP) STEM Study Tour to Germany and Ritter Sport, a climate-neutral company committed to sustainable cocoa production. Learn about TOP, their complementary classroom resources - including their latest standards-aligned lessons, and how you can apply for your own two-week STEM Study Tour experience. All resources will be shared!

Session 2: Fri. 9:35-10:25 AM, Room 10 (second floor), **Grade:** ELEM, **Content:** General
31. Your Standards, Your Time, Your Students
Kim Dye, School Specialty
Trying to find time to engage yor students in VA standards-based, fun, active science instruction? Join us for a fast-paced session exploring how to engage your students in the Scientific and Engineering Practices (leaves) embedded in multi-modal lessons supported with digital resources for differentiation. (Commercial Exhibitor)

Session 2: Fri. 9:35-10:25 AM, Room 8 (second floor), **Grade:** ELEM-MS, **Content:** Physics/Physical Science, General, STEM
32. Five E Model: Ways to Engage the Students in Science
Thomas Fitzpatrick, Roanoke City Public Schools
Angelo Bonilla, Breckinridge Middle School
Leslie Barrett, Breckinridge Middle School
The 5-E lesson model starts with Engage. We will share demos, quick activities, and “made you think” moments to make your students pay attention and start to engage in the lesson. The activities are done with basic science supplies. We will provide a handout explaining the activities and the science behind them. Designed for Physical Science and Science 5, we will mostly focus on Force and Motion concepts. Adaptable for lower grades. Walk away with a smile and a handout you will use.