VAST's Vision:
Excellence in Science Education
Through Innovation

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

The Science Educator

Fall 2021 A Publication of the Virginia Association of Science Teachers Vol. 70, No.2

Science, Systems, and Solutions

Nov. 16-18 Virtual

Whova App 2021

Barbara Adcock, PDI Committee

The Whova app is back at the PDI again this year! Whova allows networking prior to, during and even after the PDI! Having both the app on your smart device and the web-based interface on your computer will allow you to seamlessly access the PDI on the go and when seated at your desk.

In Whova, you will be able to:

- See the complete agenda, and build your personal agenda.
- Visit our virtual exhibitor hall and take part in valuable exhibitor promotions!
- Access the links for the recorded and live sessions in both the app and the web version.
- Ask sessions presenters questions about their sessions.
- Network with fellow attendees, presenters and exhibitors.

In the community networking portion of the app, you will be able to post discussion topics, participate in discussion boards, and ask and answer questions. Networking is a huge piece of any conference, and with the app, you will be able to network prior to the PDI, during the PDI and even after the PDI!

You will also be able to take part in three contests within the app to be put into a drawing for a free 2022 PDI registration (registration only—hotel and meals are not included). There will be a photo contest, a passport contest where visiting each exhibitor booth gets you put in the drawing, and a leader board contest for participating in the networking opportunities in the app.

Join us at the 2021 Virtual PDI. Use Whova to schedule meet-ups, virtually, or in person!

Membership

Barbara Adcock, VAST Membership Chair

Your membership in VAST is important to the community of science educators. VAST stands behind you in all that you do for the students in Virginia. Membership in VAST is your tool to provide you access to resources, discounted conference rates, and connection with other science teachers in Virginia.

We hope you can attend the PDI in November, which includes a VAST membership; however, if you can't attend, we still need YOU! Be sure to renew your membership so that you do not miss out on all the resources which VAST has to offer, and so that the science education community which is VAST does not miss out on YOU!

YOU are important to the community!
Renew now!

During the PDI Tweet to:
#2021VASTPDI

Visit the PDI page for up-to-date information.

From the Executive Director

A Virtual Reality Moving Towards In-Person On-Site

The **VAST Professional Development Institute** will hold its annual statewide PDI from **November16-18 virtually** with the Whova platform from **4:00-9:00 pm.** to support the Science SOL by offering both synchronous and asynchronous sessions conducted by nationally known keynote speakers and teachers and leaders throughout the Commonwealth. Educators at every level of science will find topics of interest to build their expertise.

Register Early to begin networking with colleagues and vendors in early October. During this time and throughout November you will have three opportunities to participate virtually with competitions.

Competitions will vary from uploading pictures for a photo contest and seeing how many likes you can acquire. Another will be a leader board to earn points by networking, doing polls and posting questions. Finally, a passport so you will visit each exhibitor. All of these will have virtual drawings.

There will always be a stone unturned...
Develop relationships, have coffee talks, be involved with discussion boards and support groups, to name a few possibilities.

During the PDI you will view both live and pre-recorded presentations..

After the VIRTUAL PDI you will have access to pre-recorded presentations, that with the support of your division, you can gain recertification points, possibly 5 points for every 3 pre-recorded sessions. We hope you will continue to grow with us.

See what we have to offer and encourage others to join us. You are important to us, and we want to retain your membership and facilitate your positive growth. By providing our newsletters, journals, connections, and website we work to continue to disseminate information and assist you in reaching your goals as members, leaders, and trainers.

Susan Booth, Ed.S., Executive Director

MENU

2021 VAST PROFESSIONAL DEVELOPMENT INSTITUTE PROGRAM
LINKS TO PDI RESOURCES

PDI 2021 Page or VAST Web Site

2021 Online Registration & Fees for Virtual PDI attendees, presenters, exhibitors, W-9 form.

Schedule-At-A-Glance

General Session Speakers:

Tuesday 6:00 pm – 6:45 pm: General Session One (Live Webinar)
Dr. Don Duggan-Haas, Director of Teacher Programming, The Paleontological Research Institution Title: **"It's Too Late. Let's Get to Work Anyway."**

Wednesday 6:00 pm – 6:45 pm: General Session Two (Live Webinar)
Dr. Carole Nash, Director, Environmental Archaeology Laboratory
Title: **"Spinning Stories: The Science of Archaeology and Complex Problem Solving"**

Thursday 6:00 pm – 6:45 pm: General Session Three (Live Webinar)
Dr. Joi Merritt, James Madison University
Title: **"Systems for Success in the Elementary Science Classroom"**

Thursday 8:00 pm – 9:30 PM: General Session Four (Live Webinar)
Dr. Eric Pyle, President - National Science Teaching Association, James Madison University
Title: **"STEM in the 18th Century: How Navigation, Geodesy, and the Romance of Euclid made the Industrial Revolution Possible."**
VAST Awards Ceremony
PDI Closing and Welcome to the 2022 PDI,
Becky Schnekser, VAST President-Elect

Live Concurrent Presentations

Pre-recorded Concurrent Presentation (available throughout the PDI)

Exhibitor List

Keep in touch and share with others before, during and after the PDI. #2021vastpdi

Russell Kohrs, M.S. N.B.C.T.

Greetings from the President's Prep-room!

Dear VAST Member!

It is my sincere hope that you have had an excellent start to your school year. Of course, I know that in reality it's been another challenging year for you. At VAST, we want to be here for you as a support. We want to celebrate your successes and be a shoulder to lean on during your challenges.

This fall has been another unusual and yet also extraordinary season for all of us in education. VAST has been working hard to be the support that our members need during good, bad, tough, and easy times. We have and will continue to offer high-quality cutting-edge professional development experiences to support our membership.

Our annual professional development institute (PDI) will still go forward in the virtual form during the afternoons and evenings of November 16-18. However, due to a wide array of circumstances, the VAST Executive and PDI Committees have made the very difficult decision to cancel the in-person "plus" portion of the PDI. This add-on event would have been held at Hotel Madison in Harrisonburg, November 19-20. If you registered and paid the $50 for this add-on, you will be refunded in the weeks after the PDI has ended.

As stated, we will still be having our annual PDI as planned, delivered virtually November 16-18. There is NO chance we will cancel this. Through Whova, you will interact with our fabulous keynote speakers, colleague presenters, and one another. So, come join us as we explore "Science, Systems, Solutions" in our classrooms, industry, and everyday lives!

Most of all, come and join us on these three afternoons and get recharged and excited for the rest of your school year. And, watch our upcoming communications for some exciting regional events that are in the works for after January 1st!

I hope to see you online!

Russ Kohrs, **VAST President 2021**

COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION

P.O. BOX 2120
Richmond 23218-2120

DATE: August 3, 2021

TO: Science Educators

FROM: Anne M Petersen, Ph.D.
Science Coordinator
Office of STEM and Innovation

Myra Thayer and Gregory MacDougall
Science Specialists
Office of STEM and Innovation

SUBJECT: 2021 Virginia Association of Science Teachers Professional Development Institute

The Virginia Association of Science Teachers (VAST) and the Virginia Department of Education are pleased to announce the 2021 VAST Professional Development Institute (PDI), Science, Systems, Solutions, to be held November 16-20, 2021. The PDI will be a vvirtual online portion that will be held from 4:00PM-9:00PM on November 16-18, 2021. The virtual sessions will be held online after traditional school hours in order to allow teachers to attend synchronous sessions. In addition, asynchronous sessions will be provided to allow flexibility in obtaining meaningful professional development aligned to the participant's interests and teaching assignments. Registration for the PDI will provide teachers and leaders with access to all training and resources until November, 2021.

The VAST PDI is a forum for science educators and administrators to network with fellow science teachers, gain new instructional strategies and lesson ideas, enhance science content knowledge, and experience cutting-edge technology. This year's VAST PDI will offer over 200 concurrent sessions and in person learning experiences intended to support the Virginia Science Standards of Learning as well as Virginia Department of Education initiatives. In addition, presentations will be conducted by nationally known keynote speakers.

VAST, a professional association with over 2000 members, advocates for high-quality science instruction for all students. The VAST PDI is designed to provide sessions for educators and administrators in all science content areas and at all grade levels. The PDI also provides an avenue for communication among all members of the science teaching community.

We encourage science educators and administrators to take the opportunity to include VAST PDI as part of their professional development plan. The VAST PDI provides educators an engaging opportunity to earn relicensure points while learning strategies to be used in the classroom.

For more information regarding the Virginia Association of Science Teachers or the annual PDI, please visit www.vast.org or contact Susan Booth, Executive Director at susan.science@gmail.com.

2021 PDI Sponsors

$5000 Donor

Dominion Energy

Actions Speak Louder

$2500 Donors

Discovery Education

Science Museum of Virginia

Virginia Department of Aviation

$1000 Donors

American College of Education

hand2mind

Legends of Learning

Virginia Space Grant Consortium

Virginia Transportation Construction Alliance

VTCA

Virginia Transportation Construction Alliance

2021 PDI Exhibitors

Accelerate Learning, Inc./ STEMscopes

American Chemical Society

American College of Education

Booksource

Carolina Biological Supply Co.

Discovery Education

Dominion Energy

Earth Day Network

ExploreLearning

Five Ponds Press Books Inc.

hand-2-mind

JMU Center for the Advancement of Sustainable Energy

Legends of Learning

NEED

PBL Project

Plasma Games

SAVVAS Learning Company

School Specialty/ FOSS

Science Museum of Virginia

Texas Instruments

Vernier Software & Technology

Virginia Agriculture in the Classroom

Virginia Association of Science Teachers

Virginia Junior Academy of Science

Virginia Master Naturalist Program (Virginia Cooperative Extension/ Virginia Tech)

Virginia Space Grant Consortium

Virginia Tech- College of Natural Resources and Environment

Virginia Tech- Outreach Opportunities with the College of Science

Virginia Transportation Construction Alliance (VTCA)

WHRO Public Media

2021 VAST VIRTUAL PDI SCHEDULE AT A GLANCE (10-07-2021)

"Science, Systems, Solutions"

The 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!
Presentation recordings will be available to VAST members beginning in January 2022.

Tuesday, November 16

3:30 pm – Welcome to the PDI, Russ Kohrs – VAST President (Live Presentation)

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

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

6:00 pm – 6:45 pm: General Session One (Live Webinar)
Dr. Don Duggan-Haas, Director of Teacher Programming, The Paleontological Research Institution
Title: "***It's Too Late. Let's Get to Work Anyway.***"

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

8:00 pm – 8:45 PM: Concurrent Session Four - Live Presentations

Wednesday, November 17

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

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

6:00 pm – 6:45 pm: General Session Two (Live Webinar)
Dr. Carole Nash, Director, Environmental Archaeology Laboratory
Title: ***"Spinning Stories: The Science of Archaeology and Complex Problem Solving"***

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

8:00 pm – 8:45 PM: Concurrent Session Eight - Live Presentations

9:00pm – Treasurer's Report, Matt Scott (Live Presentation)

Thursday, November 18

4:00 pm – 4:45pm: Concurrent Session Nine - Live Presentations

5:00 pm – 5:45 pm: Concurrent Session Ten - Live Presentations

6:00 pm – 6:45 pm: General Session Three (Live Webinar)
Dr. Joi Merritt, James Madison University
Title: ***"Systems for Success in the Elementary Science Classroom"***

7:00 pm – 7:45 pm: Concurrent Session Eleven - Live Presentations

8:00 pm – 9:30pm: General Session Four (Live Webinar)
Dr. Eric Pyle, President - National Science Teaching Association, James Madison University
Title: ***"STEM in the 18th Century: How Navigation, Geodesy, and the Romance of Euclid made the Industrial Revolution Possible."***
VAST Awards Ceremony
PDI Closing and Welcome to the 2022 PDI, Becky Schnekser - VAST President Elect

2021 VAST Board of Directors Election

The biographies of the VAST Board of Directors nominations are listed below. Because our annual Professional Development Institute will be virtual this fall, our election will also be virtual. Since we will all be voting by "absentee ballot," your ballot must be cast by **November 2, 2021**. All members will be sent an email that provides your membership ID number and well as a link to the virtual ballot.

To cast your ballot you will need your VAST Member ID number. To find your VAST Member ID, log in at www.vast.org and click on edit profile. Your number is on the first line. While you are there, edit your account information to insure you receive all the benefits of VAST membership.

Stephanie Harry - President-elect

Stephanie Harry has served on the VAST board as the Chemistry Content Chair. Along with the creation of the Chemistry content page on the VAST website, Stephanie has been instrumental with launching the content chair "Coffee Talks" this past year and has presented at the Annual PDI for each of the past six years. She continues to serve on several VAST board committees, participates in Board of Directors meetings, volunteers at Region II events, and has submitted articles and pictures for the VAST journal and the newsletter. Stephanie is also an active member in several science related professional organizations such as AACT, NSTA, ACS and NOBCChE.

Michael Pratte - Vice President

Michael Pratte is a K-12 Facilitator of Science with Stafford County Public Schools. Michael is beginning his 26th year as a Virginia science educator. As a classroom teacher, Michael presented a wide variety of topics at both VAST PDI and regional conferences. His journey to provide better inquiry, equity, and investigation of science content opened the opportunity for him to serve as a preK-12 facilitator of science supporting both content and professional learning. Michael served as VAST President during the 2019-2020 term where VAST held its first full virtual PDI and is extremely proud of every member of our organization and how everyone contributed to make the PDI such a success in such atypical times. He is a member of both NSTA and an officer in VSELA and has collaborated with VDOE to support science standards and curriculum development. Michael firmly believes that maintaining great professional relationships and collaboration with county leaders and colleague teachers is the most effective way to provide valuable professional learning experiences and connections to reach all children. Past awards include the VAST Earth Science Award for outstanding science teacher in 2013.

Region I- no nominations

Margaret Green - Region III

Margaret Greene has served as Region III Director and as the Earth Science/VESTA representative on the VAST Board over the past several years. An active member of VESTA since it's genesis, she served as both Vice-President and President and holds membership in NSTA, VIP, and NAGT. In 2000-2001 Ms. Green was selected Teacher of the Year at Victory Academy in Gloucester County and is an active Middle Peninsula Master Naturalist member where she has helped with the watershed education SOL for 4th graders in Gloucester County. Margaret believes in hands-on science activities and teacher learning opportunities which was evident in an after-school enrichment program she supported called Young Astronauts.

Robbie Higdon - Region V Co-director

Dr. Robbie Higdon teaches undergraduate courses in general instructional methods for grades 6-12 and coordinates a field placement experience within the AVID programs in Harrisonburg City Schools. She currently serves as VAST Director of Region V and serves as the Co-advisor for the JMU chapter of the National Science Teachers Association and co-advisor for the ROOP Residential Learning Community for Education. Currently, Dr. Higdon co-directs the College of Education Northern Ireland Cross-cultural Field Experience in partnership with schools in Newry, N. Ireland taking JMU students to live and engage with the local community during Maymester.

Angela Webb - Region V Co-director

Dr. Angela Webb has held a career interest in the preparation and early career development of science teachers. Her scholarship seeks to understand the experiences of beginning science teachers as they prepare to teach and during their first few years in the profession. Specifically, she is interested in the identity development and meaning-making of beginning science teachers during their induction into the teaching profession. She brings this lens of teacher development to the courses she teaches at James Madison University. Before earning her Ph.D., she taught high school biology, physical science, and AP Environmental Science. Dr. Webb maintains a current teaching license in North Carolina and Virginia.

Donna Rowlett - Region VII Co-director

As region director, Donna says "It has been an honor and a pleasure to serve Region VII." She coordinated regional workshops including Project WILD, WILD about Elk, and Project Learning Tree, for science teachers. She developed a working relationship with Virginia Tech Southwest Virginia Center's Director, Penny McCallum, as well as Natural Tunnel State Park in order to better serve the region's science teachers. Donna has been a member of VAST for ten years, serving as Region VII Director for the past four years. An active member of Virginia Science Education Leadership Association (VSELA), she serves on the program committee. She also serves on the Cove Ridge Education Council at Natural Tunnel State Park, Duffield, Virginia.

She is a facilitator for Project WILD and Project Learning Tree. In 2012-13, she completed the VISTA New Science Coordinators Academy at George Mason University. Donna is a mentor teacher at Gate City High School and has served as department chair for her school and district. Past awards include: 2017 recipient of VAST's RISE Award for Biology and the 2016-2017 Project WILD State Facilitator of the Year for Virginia. As current VAST Region VII Director, Donna wishes to be considered for re-election as co-director so she can continue serving the science teachers of Southwest Virginia.

Jinx Rasmussen - Region VII Co-director

Jinx Rasmussen is an exceptional 7th grade life science teacher in Virginia Middle School in Bristol City Public Schools. As a classroom teacher and Division science leader, Ms. Rasmussen represents her region with both VSELA and as an active member of VAST. Ms. Rasmussen was awarded the VAST RISE award for middle school science in 2017.

Weird Ways to Observe the Moon

David Prosper

International Observe the Moon Night is on October 16 this year– but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially polarized sunglasses! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble plastic bottle cap! John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun: "The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a plastic soft drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can project the Moon! Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun– a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.

Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5 inches).

Safety tip: *NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.*

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

HHS Engineering Students Create Fidgets For Elderly

By MEGAN WILLIAMS Daily News-Record

Andy Jackson, Secondary Science Coordinator and Co-Director of HHS Governor's STEM Academy in Harrisonburg, a long-time board member and a past president of VAST, created an engineering CTE lesson. His engineering students worked to create real life solutions in a creative engineering CTE lesson.

Editor

Daniel Lin, Daily News-Record

When Andy Jackson's mother-in-law was approaching the end of her journey with Alzheimer's disease, like most patients in this situation, she was often picking at things and using repetitive motions.

Jackson's sister-in-law found a fidget device that is designed for people with dementia and Alzheimer's especially. It was a wooden fish, separated into pieces and held together by elastic. It is colorful and visually engaging, as well as tactile.

Jackson, the Harrisonburg City Public Schools secondary science coordinator, co-director of the Governor's STEM Academy at HHS and engineering teacher, used the fidget as inspiration for a project for his engineering students. Designing and creating the fidgets would be a real-world way of teaching students about safety and tools, a requisite objective for the classes.

A class of 10th-graders are in the engineering II class and a class of ninth-graders are in STEM innovations with Seth Shantz as their teacher. Both classes are creating the fidgets.

The finished products will go to residents of Virginia Mennonite Retirement Community.

"Dementia and especially Alzheimer's ... they get fixated on picking at and manipulating something," Jackson said. "This keeps their hands busy and their minds occupied."

Engineering students were tasked with designing their own fidget in whatever design they liked based off of the research that students read on the best design for a fidget for a person with dementia or Alzheimer's. They then used tools and machinery to cut out their fidget, add any tactile design features, paint it and assemble it with an elastic.

Lucy Ludwig, a sophomore, decided to create a carrot fidget. Once side is painted orange with a green stem, just like a real carrot, but the other side is painted in rainbow hues.

"I read that the best compliment you can receive about a fidget is that it looks like something a toddler would like," Ludwig said of her research into these therapeutic devices. When researching toys that toddlers are drawn to, Ludwig found a food theme.

"With a carrot there are sections that you can see," she said, making it a perfect design for a sectioned device.

Knowing that these fidgets will go to residents in the community, Ludwig said, the project is more meaningful.

"If I were just going to take it home, I might not have put as much thought into it," Ludwig said. For example, she probably would have painted both sides of the carrot orange and green to resemble the real thing. But knowing that people who use these devices prefer bright colors, she took the time to paint one side in different colors.

In a different year, the students would have taken a day to deliver the fidgets to the residents of VMRC and would have interacted with them. However, with the ongoing pandemic, that is not possible, Jackson said.

He is hoping to set up a Zoom call between students and residents once the fidgets have been delivered.

Contact Megan Williams at 574-6272 or mwilliams@dnronline.com.
Follow Megan on Twitter @Valley_Learn. dlin@dnronline.com

Contact Andy Jacson at ajackson@harrisonburg.k12.va.us

Online Vaccine Educational Research Study

What is this study about?

Researchers from Georgetown University Medical Center and Hampden-Sydney College are conducting this study to help young people learn more about vaccines-what they are, what they do, and how they can help prevent diseases.

This research study has been approved by the Hampden-Sydney College Institutional Review Board (IRB) and is designed to find out if 10th grade students will learn new information after watching educational videos about vaccines.

Who can participate?

This study is open to any 10th grade student in the Virginia public school systems with access to a computer or mobile device with internet capability.

What will you need to do if you decide to participate?

It will take about 80-90 minutes to complete the study.

Participants will be asked to:

- Complete a brief survey with 16 multiple choice questions (10 minutes).
- Watch some educational videos. One group will watch some educational videos about vaccines. The other group will watch educational videos about the biology of cells. This will take about 60 minutes.
- Complete another brief survey with 20-25 multiple choice questions (10-15 minutes) after watching the videos.

One of the student's parents will need to give permission first and then the student will also need to sign a form agreeing to be involved in this study.

What will you get for participating?

All participants will have the opportunity to view the vaccine videos which contain important information about vaccines.

Participants who successfully complete the study will receive a check for $40 for contributing their time to this research.

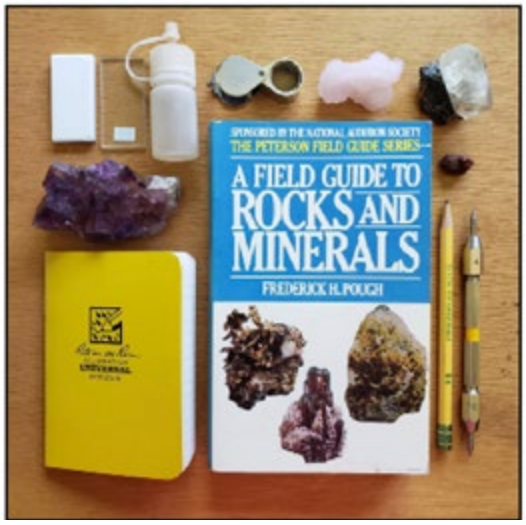
What if you have any questions?

If you are interested in participating or have any questions, please contact Dr. Edward Lewin's research team at mwolyniak@hsc.edu .

These materials are neither sponsored nor endorsed by the Board of Education the Superintendent of Schools, or this school.

Mineral Corner: Sponsored by Friends of Mineralogy Inc.

Friends of Mineralogy is a national organization dedicated to mineralogy and geoscience education with an emphasis on bridging the gap between academia, industry, policymakers, and the public. A new Virginia chapter has been developed and you can learn more on our website, Facebook, or Instagram. Like these short mineral articles? Follow FM National on Facebook! (Credit: Jessica Robertson, Erin Delventhal)



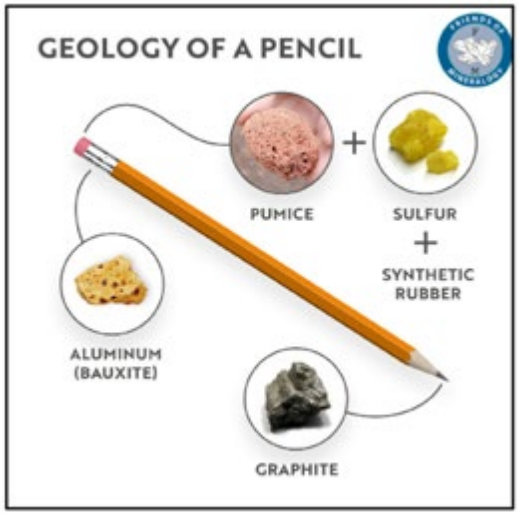
Intro to Mineral Collecting

Do you want to know more about mineral collecting, or want to encourage a young person who just loves rocks and minerals? This flatlay shows one great kit that could be an excellent start. What do you need to be a mineral collector?

1. Mineral samples you like! For now, collect what you like, either purchased or "self collected."
2. Recordkeeping methods! Here, a simple pencil and notebook are a great start.
3. Mineral identification tools. Here, we have a hand lens magnifier, an acid bottle, streak and glass plates, and a hardness probe. We'll get into how to use these another day.
4. Most important: knowledge and learning! A simple classic guidebook is a fantastic starting reference.

Mineralogy of Fireworks

All the beautiful bright flaming colors of fireworks are derived from minerals. When fireworks explode, the heat from the explosion causes metal salts to absorb energy from the heat and to emit light of different colors. The color of the light depends on the type of metal or combination of metals present, because the electrons within different metals will excite to different energy states that emit light of a specific energy and that will produce a characteristic color. The heated elements of strontium (usually obtained from celestine, strontium sulfate) produce red light. The addition of sodium salts (from sodium nitrate or sodium chloride) will produce a yellow to orange light. Copper compounds, while producing blue light on their own, will produce lovely purples when mixed with the red of strontium. Green light is from barium (derived from barite, barium sulfate) combined with chlorine. Flashes and bangs and sparks come from aluminum powder or iron filings.



Geology of a Pencil

Pencil "lead" is actually graphite. In the 1500s, most graphite came from Cumbria, England, in blocks that were cut to use as writing implements. In the early days of chemistry, graphite was thought to be a form of lead. The term had well stuck by the time it was sorted out. A pencil's ferrule (the metal bit) is usually aluminum. Although aluminum is the most common metallic element on earth, it's too reactive with other elements to occur by itself.

Bauxite, a sedimentary rock with high concentration of aluminum oxide, is the primary source of all our aluminum. Traditional 'pink pearl' type erasers are made of synthetic rubber, stabilized with sulfur, that have a fine pumice added as an abrasive. The pumice is the magic ingredient that makes them actually erase instead of just smudging marks around the paper. These erasers don't have to be pink. Back in 1916, the Eberhard Faber Pencil Co. sourced a particular Italian pinkish pumice that made their pinkish erasers much prettier than the other drab ones on the market.

Virginia Junior Academy of Science Virtual Symposium: May 13-14, 2022

Dr. Julia H. Cothron
VJAS Representative to VAST Board

1. ***What Is the Virginia Junior Academy of Science (VJAS)?***
   VJAS is a STEM competition and symposium for 7-12 students. Over 600 students participate annually in more than thirty categories such as botany, engineering, environmental and earth science, mathematics and statistics, and medicine and health. Middle and senior high students participate in separate categories. The 2022 VJAS Virtual Symposium will be held May 13-14, 2022.
2. ***How Do Students Participate?***
   Students complete individual or team projects which are supervised by a teacher, mentor or parent. A school or individual joins the Virginia Junior Academy of Science. The student(s) submit a formal research paper by March 2.
3. ***How Are Students Selected?***
   STEM Readers review and score projects using criteria which are applicable to all STEM disciplines. Readers recommend projects for the symposium and the projects are ranked in the various categories. Selected students are invited to present at the May 14 Virtual Symposium, held in connection with the College of William & Mary. All students receive feedback from the STEM Readers.
4. ***How Are Students Judged at the VJAS Symposium?***
   Students make a presentation. STEM Judges score the research paper, presentation and responses to questions. Category winners are selected with first, second, third and honorable mentions awarded. The first place category winners become eligible for over twenty-five honor awards and scholarships. Two students, or teams, are selected to attend the American Junior Academy of Science. The project abstracts and first place papers are published in the VJAS Symposium Proceedings. All presenters receive feedback from the judges.
5. ***How Do Students Benefit from VJAS?***
   Students have increased understanding of Virginia's Standards of Learning (SOL) for STEM subjects. They use creative and critical thinking skills and develop technical reading, writing and presentation skills. Students obtain an enhanced understanding of careers by interacting with STEM professionals, participating in symposium lectures, and visiting university campus and research laboratories. In addition, students can develop citizenship skills by serving as a VJAS officer and/or volunteering at the symposium. Students can use feedback from STEM Readers and Judges to improve future research.
6. ***How Can I Obtain Support for Student Research? Learn More?***
   The Virginia Academy of Science (VAS) supports student research by providing mentors for teacher. VJAS Student Officers, or a prior VJAS presenter, can mentor a beginning researcher. Experienced teachers within a division are a valuable resource for teachers beginning to involve students with VJAS.

To learn more, visit the Virginia Junior Academy of Science website (http://vjas.org). Be inspired by images from prior symposia, abstracts and papers in the VJAS Symposium Proceedings, and the student publication, The Voice. Learn details by reviewing the VJAS Handbook and by contacting the VJAS Leadership Team.

VAS and VJAS Partner a Mentorship Project for Science Educators and Students

The Virginia Academy of Science has launched an effort in recent years to promote learning science by doing science in the Commonwealth's middle and high school classrooms. We have sponsored a mentorship initiative that matches classrooms with one or more mentors to guide students through the design and implementation of a long-term research project. We are looking to recruit both mentors (undergraduates, grad students, postdocs, instructors, scientists, etc.) and high school teachers who would like their students to participate in a virtually-driven long-term research project. We have partnered with the **Virginia Junior Academy of Science** (www.vjas.org) in this endeavor in the hopes that this project will encourage participation in their 2022 Annual Research Symposium and give students the juried research experience necessary to earn the Virginia Department of Education's new Seal for Excellence in Science and the Environment on their diploma. Mentorships may be in-person, virtual, or hybrid, and we would like to offer middle and high school instructors the opportunity to either do a project of local interest or to participate in a "Citizen Science" type initiative in which their class will work with others across the Commonwealth and (sometimes) the nation in the collection and analysis of data. I am excited for this model since it should allow a greater level of participation with geography and distance not being limiting factors.

If you are interested in serving as a mentor in this project, please fill out the form found at:
https://secure4.hsc.edu/forms/view.php?id=117158

If you are a high school teacher with an interest in having a mentor work with your class, please fill out the form found at:
https://secure4.hsc.edu/forms/view.php?id=116443

Please do not hesitate to contact me with any questions you may have, and please pass this announcement along to any other contacts you think may wish to participate. Thank you for your consideration of this opportunity!

Michael J. Wolyniak, McGavacks Associate Professor of Biology, Hampden-Sydney College, 434-223-6175

My VAST 2021 Professional Development Plan

Do you need a record of what you sessions and presentations you attend at the PDI? Your administrator may require documentation of your participation and you will have a more valuable experience by planning ahead. After the VIRTUAL PDI you will have access to the pre-recorded presentations that with the support of your division you can gain recertification points, possibly 5 points for every 3 pre-recorded sessions.

Below, is part of the planning document. To download the full document use the following link. See the lists of presentations both live and pre-recorded in this newsletter and decide which ones you want to attend. Be sure to show your administrator before the PDI to guarantee that your plan will be approved. Finally, plan to participate both before, during and after the PDI while Whova is open to you.

Link to the PDF download of the Professional Development Plan.

VIRGINIA ASSOCIATION OF SCIENCE TEACHERS
2021 VIRTUAL PROFESSIONAL DEVELOPMENT INSTITUTE
NOVEMBER 16-18

My VAST 2021 Professional Development Plan

NAME: _____

Date watched	Time (Hrs.)	PRESENTATION TITLE	Teacher initials
	0.5	Welcome from the VAST President	
	1.0		
	1.0	**General Session I: Dr. Don Duggan-Haas, Director of Teacher Programming, The Paleontological Research Institution Title: "It's Too Late. Let's Get to Work Anyway."**	
	1.0	**General Session II: Dr. Carole Nash, Director, Environmental Archaeology Laboratory *"Spinning Stories: The Science of Archaeology and Complex Problem Solving"***	
	1.0	**General Session III: Dr. Joi Merritt, James Madison University *"Success in the Elementary Science Classroom"***	
	1.0	**General Session IV: Dr. Eric Pyle, President, National Science Teaching Association *" STEM in the 18th Century: How Navigation, Geodesy, and the Romance of Euclid made the Industrial Revolution Possible."***	
	0.5	Closing Presentation from the VAST President-Elect	
		LIVE AND PRE-RECORDED CONCURRENT SESSION PRESENTATIONS	
	0.75		

ICON A5 Introduction to Flight Program Available to Come to Your School

Would you like an airplane to visit your school to assist in teaching an aviation lesson? The **ICON A5 Program** is FREE and brings a hands-on aviation lesson and educators to your school. The ICON A5 will be on a trailer connected to a transit van that contains a flight simulator.
The ICON A5 display will be used as an aviation education tool to introduce students to aviation, teach them about the aircraft and its flight controls, and encourage them to consider aviation as a future career.

The Virginia Department of Aviation offers a **Teacher's Grant** that allows educators in grades K-12 to apply for a grant of up to $500.00 to implement an aviation lesson plan for their class. Teachers in any discipline may apply as long as the lesson involves aviation.

Email Kim Wells at **kimberly.wells@doav.virginia.gov** or Betty Wilson at **betty.wilson@doav.virginia.gov** for more information about teacher's grant and for information on how to get the ICON A5 to your school.

Live Presentations

Green Schoolyards Enable Students to Become Problem Solvers
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room A
Grade Level: ALL GRADES Main Content: Environmental Science, STEM
Laurie Witt, Albert Harris Elementary School **Krista Hodges, Dan River Basin Association**
Elementary students can learn the science necessary to address global problems. We have created the Green Schoolyard concept where students join action with learning. With a Monarch Butterfly Waystation, rain barrels, compost bins and a tasting garden, K-5 students experience being part of the solution to problems ranging from growing water shortages, decreasing bee populations, to increasing food insecurities. The Green Schoolyard provides hands-on opportunities to teach Virginia Science SOL.

Evaluating and Teaching Spatial Reasoning
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: Earth/Space Science, Environmental Science
David Matchen, Madison County High School
Spatial reasoning is vital to understanding modern issues in Geoscience, yet spatial reasoning is difficult to teach, and evaluate. To evaluate the spatial reasoning ability in my Environmental Science classes, I use a short text article with geographic information and require my classes 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.

Spreadsheets Aren't Only for Accountants: They're for STEM!
Day and Time: Wednesday Session 1: 4:00pm-4:45pm Virtual Room C
Grade Level: ELEM Main Content: STEM
Amanda Gonczi, Michigan Technological University **Jennifer Maeng, University of Virginia**
In this session you will learn how spreadsheets can enhance your STEM instruction and strengthen students' STEM skills. We will model a lesson that takes advantage of spreadsheets for data collection and analysis. You will learn how spreadsheets can facilitate student engagement in science, engineering, and mathematics. Participants will work in small groups to brainstorm how to integrate spreadsheets into an existing lesson and will share these with the larger group.

Interdisciplinary Planning: IDM Meets Science!
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room D
Grade Level: ELEM Main Content: Interdisciplinary Approach
Jessa Campbell, Greer Elementary School
Incorporating science throughout the day from morning meeting, math, literacy, and the content block. Using local resources in your community to support science learning.

NASA's X-57 Maxwell & Advanced Air Mobility
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room E
Grade Level: MS-HS-COL Main Content: Physics/Physical Science, Engineering
Anne Weiss, NASA Langley Research Center Office of STEM Engagement
With attention on the Commercial Crew Program and Perseverance rover, it might be easy to forget the first "A" in NASA. However, our engineers are creating new experimental planes that build upon the storied legacies of the X-1 and X-15. With breakthroughs in electric power technology, NASA is working towards a sustainable, more inclusive aviation future. In this session, we'll explore the X-57 and advanced air mobility vehicles...more ways that, "NASA is with you when you fly."

Blending the 5E: An Innovative Approach to Student Inquiry
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room F
Grade Level: MS-HS Main Content: General
Jacquelyn Calder, Mechanicsville High School **Cierra Coyner, Mechanicsville High School**
Science teachers embrace the 5E lesson format because of its focus on inquiry. 5E can be integrated into a blended learning classroom to enhance student inquiry. Blended learning is a pedagogical approach where students have some control over path, pace and place. When the two are used together, students become active learners, while teachers become learning facilitators. This session will showcase example lessons of the 5E blended approach.

Using Environmental Cartoons as Conversation Starters
Day and Time: Tuesday Session 1: 4:00pm-4:45pm Virtual Room G
Grade Level: ALL GRADES-Main Content: Biology/Life Science, Environmental Science, Cartoons Can Stimulate Students
Richard Groover, Hanover Films & Communications
This program will demonstrate how cartoons can be an educational resource for teachers to engage student learning and create memorable knowledge.

Teaching Human Ecology with Models and Simulations
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room A
Grade Level: MS Main Content: Earth/Space Science, Biology/Life Science, Environmental Science
Rafael Woldeab, Population Education
Discover activities that use models and simulations to help students understand ecological concepts and cause-and-effect relationships in nature, including how human activities can change the physical landscape, affect ecosystems on land and in water, and alter the atmosphere. Demonstrations and interactive digital tools engage learners in the creation of 3-D representations of global land use, modeling amounts and sources of fresh water, simulating world population growth trends, and more.

New Tools and Content in eMediaVA for Science Educators!
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: Earth/Space Science, Biology/Life Science, Environmental Science
Lindsey Horner, eMediaVA | WHRO Public Media
The goal of this session is to introduce you to the redesigned eMediaVA, with new easy-to-use features like LMS embedding and teacher-created collections. Educators will leave the session with ready-to-use digital media like videos, simulations, and interactives for science learners of all ages, as well as strategies educators can utilize to successfully integrate digital media into lessons to both engage learners and make content relevant to student's lives and experiences.

Engage Students With Books About Women Who Defy the STEM Gap
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room C
Grade Level: ALL GRADES Main Content: General, STEM
Melissa Reif, Booksource **Elizabeth Blackmon, Booksource**
Diane Garavaglia, Booksource **Tony Haney, Booksource**
We will explore the use of authentic literature to enhance science lessons with high interest, STEM related trade books with an emphasis on the accomplishments of women and minorities. Our discussion will include a book talk with select books across all grade bands that will elevate your students' interest in science!

Explore Smithsonian Science: Investigating Freshwater (1)
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room D
Grade Level: ELEM Main Content: Environmental Science, Engineering, STEM
Cheryl Lindeman, Retired STEM teacher educator **Knans Griffing, Smithsonian/Carolina**
Our live workshop will explore the Smithsonian Science for the Classroom™ module, How Can We Provide Freshwater to Those in Need? Teachers will experience how engineering design, phenomena, and investigative science raise the bar for students solving for real-world problems. Using resources from the Smithsonian, this module scaffolds NGSS 3D collaborative systems thinking. Post workshop materials will be shipped for those interested.

The Art & Science of NASA's James Webb Space Telescope
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room E
Grade Level: ALL GRADES Main Content: Earth/Space Science, Arts/STE(A)M

Anne Weiss, NASA Langley Research Center Office of STEM Engagement
NASA, along with the European and Canadian Space Agencies, is now preparing the James Webb Space Telescope (JWST) for launch no earlier than November 2021. From its Lagrange (L2) vantage point one million miles away from Earth, the JWST promises to re-define humanity's perspectives of our Universe's history...from the Big Bang to birth of our Solar System. In this session, we'll combine space science with art to create an interdisciplinary cosmic connection that inspires your students.

Favorite Physics Demonstrations
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room F
Grade Level: MS-HS-COL Main Content: Physics/Physical Science
Tony Wayne, Albemarle High School
Physics teachers in the Virginia Instructors of Physics, with decades of experience, will share with you some of their favorite demonstrations -both new and old. Many will use materials found at hardware stores, eBay, and/or Amazon. Descriptions and instructions will be provided.

Science and Literacy: Refining Sense Making Skills?
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room G
Grade Level: ALL GRADES Main Content: Biology/Life Science
Eeman Salem, Chesterfield County Public Schools
To prepare the next generation of scientists and critical thinkers, we need to combine what we know about excellent literacy instruction with what we know about excellent science instruction. The benefits of this session is to develop students ways of thinking to better understand science ideas for reading and writing that are essential to the science discipline in refining sense making skills.

VA STEM: Inspiration through Integration
Day and Time: Tuesday Session 2: 5:00pm-5:45pm Virtual Room H
Grade Level: ALL GRADES Main Content: General, STEM
Chuck English, Science Museum of Virginia
Virginia STEM continues to evolve. There are many great programs in the Commonwealth, but less in terms of collaborative efforts in STEM Education. The VA STEM Education Advisory Board is helping align STEM programming to create a more unified vision and collective impact in Virginia's STEM Education. There are various models of how schools implement STEM. What can we do as educators and leaders to ensure the most equitable access to this deeper learning opportunity for all youth?

GIS 101: Helping Students Become Map Producers
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room A
Grade Level: HS Main Content: Earth/Space Science, Environmental Science, STEM
Matthew Scott, Freeman High School
Students are constantly bombarded with packaged lessons and teacher-made products. Turn your classroom around by putting them in charge! Learn how to help students make Story Maps, collect data to create public information maps, and create their own personal GIS projects for science. You'll also get started setting up free professional-level GIS resources for your school.

Using Real-World Phenomena to Engage Students in Science
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: General
Brad Fountain, Discovery Education **John David Son, Discovery Education**
By introducing science concepts through real-world phenomena we help students experience the world the way scientist do, which is through asking questions and working toward solutions. We will explore real-world phenomena as it relates to challenges facing our world today and experience how having our students serve as lead scientist in our classrooms opens the door for them to be solution seekers.

I'm Fixin' to Simulate That: Simulations Make Science Stick!
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room C
Grade Level: ELEM Main Content: General
Jenna Mercury, ExploreLearning
Everyday events make us wonder. Some events are easily explained, while others cannot. When these events are examined and tested through virtual simulations, they give students an opportunity to think. Why do some objects float and others sink? What is the difference between a solar eclipse and a lunar eclipse and how often does that happen? Learn how to use virtual simulations to help K-5 students dig deeper and get inspired by science and STEM phenomenon!

Using the Leafs as a Basis for Student Ownership in Learning
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room D
Grade Level: ALL GRADES Main Content: General
Anne Petersen, Virginia Department of Education **Myra Thayer, Virginia Department of Education**
Gregory MacDougall, Virginia Department of Education
Leafs are used in the 2018 Science Curriculum Framework to indicate that students are to use the Scientific and Engineering Practices to support the development of science conceptual understanding. Learn how to effectively integrate opportunities for students to "do science" as they meet the expectations of the 2018 Science Standards of Learning.

NASA Digital Badging Resources for Educators & Students
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room E
Grade Level: ALL GRADES Main Content: General
Anne Weiss, NASA Langley Research Center Office of STEM Engagement
For more than a year, lockdown measures in response to the global COVID-19 pandemic drastically altered how we interacted socially, economically and academically with each other. This session provides an overview of online NASA instructional resources, such as digital badges, that combine STEM content, mission assets (e.g., Orion spacecraft), and hands-on activities (with options to include social justice elements) for use in face-to-face, blended or virtual learning environments.

Practical Physics Pedagogy
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room F
Grade Level: MS-HS-COL Main Content: Physics/Physical Science
Tony Wayne, Albemarle High School
The Virginia Instructors of Physics, (V.I.P.) will pool decades of experience in the classroom to share what works in the science classroom. How do you focus students when entering the room, do labs, present demonstrations, group your students, and/or check for understanding? We will provide a plethora of proven practiced methods to answer these questions. Bring your ideas to share because we love discussions.

Teaching Evolution Virtually or In-Person
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room G
Grade Level: MS-HS Main Content: Biology/Life Science
Bertha Vazquez, The Teacher Institute for Evolutionary Science
The Teacher Institute for Evolutionary Science has FREE student-guided evolution units to cover your middle school evolution content standards in person or virtually. The units include: 1. The slideshow with embedded online games, hands-on activities, engaging videos, and interactive websites. 2. The student response sheet 3. The answer key and rubric 4. The final assessment and answer key. www.tieseducation.org is your one-stop shop for evolution education!!

Enlarging Projects in a Model STEM System
Day and Time: Tuesday Session 3: 7:00pm-7:45pm Virtual Room H
Grade Level: HS-COL Main Content: STEM
Kenneth Chapman, American Chemical Society volunteer
Projects are a major constituent of a Model STEM System based on more than 50 years of teaching STEM content at high school and college levels and observing attempts at improving high school STEM education through national-level efforts by federal agencies and STEM membership organizations. This presentation will briefly describe the Model STEM System and emphasize elements of projects that may be new or not considered by most teachers.

The Importance of Mentoring Teachers
Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room A
Grade Level: ALL GRADES Main Content: General
Myron Blosser, Harrisonburg High School **Erich Sneller, Harrisonburg High School**
Are you an educator that has won awards for your teaching? Are you a teacher or administrator interested in improving instruction in your school? Hear stories of mentoring from school leaders, teachers and preservice teachers and share your ideas on how to encourage and support others in your school. Presentation will include the importance of mentoring, and ask for the exchange of ideas and examples of mentoring.

From Seed To Harvest: Cultivating CRE & Academic Liberation
Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room B

Grade Level: ALL GRADES Main Content: Culturally Responsible Ed

LaNika Barnes, Albemarle High School/Albemarle County Public Schools

Remember when learning new things was not a requirement but just a part of life that brought joy and connection to the world around you? Or maybe you discovered later in life that we "do science" all the time? If you answered "Yes" to either of these questions, join me to discuss how we can effectively partner with colleagues, students, & families to plant culturally responsive & responsible learning seeds, in the realm of science education, in order to cultivate lasting academic liberation.

Improving Critical Thinking Skills with Virtual STEM Cases!

Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room C

Grade Level: MS-HS-COL Main Content: STEM

Jenna Mercury, ExploreLearning

We need to provide our students with more in-depth, practical, concepts and practices to promote STEM career-readiness. Interactive STEM Cases will empower our students to jump into the role of a real STEM professional tasked to solve real-world problems. Participants will view interactive case studies, form and test ideas and find solutions. BYOD with any browser to jump into the program too!

Climate Change and the 2018 Science Standards of Learning

Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room D

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

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

Gregory MacDougall, Virginia Department of Education

Climate change is a hot topic in today's news and many opinions exist as to whether human actions directly impact the climate of the planet. This session will focus on providing opportunities for students to analyze evidence of the key indicators of climate change, to engage in discourse using the evidence, and develop their understanding of climate change.

Virginia Instructors of Physics - Share and Organizational

Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room F

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

Andrew Jackson, Harrisonburg City Public Schools **Tony Wayne, Albemarle County Public Schools**

A virtual meeting of the Virginia Instructors of Physics. We are an organization of and for physics teachers. We share lessons, labs, demonstrations, and pedagogy related to physics teaching at the physical science, physics, and college level.

Sketching Science in Biology Classrooms

Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room G

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

Emma Arents-Quagliano, Henrico County Public Schools, Henrico High School

With its reliance on systems-level understanding, students may find the biology curriculum intimidating. One of the greatest challenges of biology teaching for me has been the encouragement of students' model-based reasoning skills. This presentation will highlight drawing to learn techniques that have proven successful in the elicitation of higher-order thinking skills during my first year of teaching.

Coffee Chat with the Content Chairs

Day and Time: Tuesday Session 4: 8:00pm-8:45pm Virtual Room H

Grade Level: ALL GRADES Main Content: General

Stephanie Harry, VAST Chemistry Content Chair **David Matchen, VAST Earth Science Content Chair**

Tony Wayne, VAST Physics Content Chair **Jessica Jasmine White, VAST Biology Content Chair**

The goal of the VAST Content Chairs is to ensure all science teachers know they are not alone. We want to strengthen science community and we plan to do this content by content. Please join the VAST Content Chairs and let's have a discussion on how we can assist you to achieve your goals as a science educator.

Do You Mentor Students in Research for Competitions?

Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room A

Grade Level: MS-HS-COL Main Content: Any Subjects: Research

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

If you mentor students in research for competitions such as eCybermission, VJAS, JSHS, Broadcom, Regeneron, or ISEF qualifiers, join me for a conversation about how we can form a cohort to support each other. I have written grants and been a part of programs that

support teachers financially and with professional development. I also know of other competitions that may be a good stepping stone for your students to level up to more challenging and competitive science and engineering symposia.

Five Minute Creations
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room B
Grade Level: ELEM-MS Main Content: STEM
Shannon Crawford, Virginia Virtual Academy at K12
What could you create in five minutes, that could help solve a problem, using everyday objects found around your home? Join me as we explore a five-minute engaging STEM activity. We will be finding, developing, and sharing our creations as a group. I always close my live class sessions by providing students with three everyday objects. I allow them to assume we have tape, scissors, string, and glue. They have five minutes to create a useful new product and share with our class.

Give Them Something to Talk About!
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room C
Grade Level: ELEM-MS Main Content: General, STEM
Jacqueline Orgain, Savvas Learning
Students may be talking, but are they talking about science? Foundational communication skills in writing, speaking, and discourse in the context of science and engineering is essential for your students' success. Scientists and engineers collaborate while designing solutions, solving problems, presenting ideas, and providing meaningful feedback. Take home strategies and tools to get the most out of your students in their presentations and stimulate healthy conversations.

Science "FUN"damentals
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room D
Grade Level: MS Main Content: General
Kristen Boudreau, Prospect Heights Middle School
Do you want to engage your middle school science students? The presenter will share with you ideas gathered from 20 years of teaching middle school science such as PBL projects, learning menus, stories, demonstrations, activities, songs, and yes even costumes! Because when science is real and exciting students not only remember facts better but they want to inquire more!

RAD Science (Resources and Data Science)
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room E
Grade Level: ALL GRADES Main Content: Earth/Space Science, Environmental Science, Physics/Physical Science
LoriAnn Pawlik, Prince William County Schools- Colgan High School
Interested in using real-world data or finding abundant resources for your classroom? This session will share lessons and activities that you may not know about to help spark your science teaching. Better yet, design integrated content lesson around your science!

Ooh's & Aah's of Energy Transformations!
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room F
Grade Level: ALL GRADES Main Content: Chemistry, Physics/Physical Science, General
Kimberly Swan, National Energy Education Development Project
Explore six, hands-on stations: motion, sound, thermal, radiant, electrical and chemical energy! Using items encountered in our daily lives – glow sticks, hand warmers, batteries, etc. – but often have little understanding of the science behind how they work. Leave feeling confident to teach energy forms & transformations to your students. Receive resources and creative ideas for teaching energy concepts correlated to Virginia state standards.

Re-Imagining School Education
Cindy Duncan, Education Consultant
How do we provide school environments that are restorative places to heal, commune and nurture academic achievement, citizenship, stewardship, and compassion?
2020 was a year of challenges and opportunities for the everchanging American Education system. We no longer will attend schools that look like they have since the industrial revolution. See positive initiatives and opportunities in education that will IMPACT & ENHANCE the educational system in this country and possibly the world.
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room G
Grade Level: ALL GRADES Main Content: Social Emotional Learning

Oceanography Blended Learning Lab Activities
Day and Time: Wednesday Session 5: 4:00pm-4:45pm Virtual Room H
Grade Level: HS Main Content: Oceanography
Paula Irwin, Unity Reed High School/ Prince William County Schools
I have converted some "typical" Oceanography lab activities to online versions that students can do in person in class, synchronous online or asynchronous. They are great because they are all environmentally friendly - no paperwork - all electronic. There will be some Excel graphing and Google My Maps activities that you will learn.

Student Goals: The Classroom Compass
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room A
Grade Level: ALL GRADES Main Content: General
Erich Sneller, Harrisonburg City Public Schools
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 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 embolden your mission as an educator.

Rock of Ages: Geologic Maps and the Stories They Tell
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: Earth/Space Science, Environmental Science
Chris Kaznosky, Central High School (Shenandoah County) **Steve Leslie, James Madison University**
Ever have a student bring you a rock and ask "what is it?". Well, now is your time to learn how to be their hero and more. In this session, you'll experience how to use free geologic maps and government resources to identify what's in your backyard and beyond as well as how each can be used to instruct concepts such as geologic history, rocks, soil, tectonics, and the story behind your local landscape. Resources and sample lessons will be provided including ones correlated with hands-on labs.

The Challenge is On: Using Engineering in Chemistry
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room C
Grade Level: MS-HS Main Content: Chemistry, Engineering
Jacqueline Orgain, Savvas Learning
The challenge is on! Join chemistry teachers for an engaging, hands-on session as we explore the ways open inquiry and engineering and design challenges can be used within a chemistry program to support language development and deepen conceptual understanding for your diverse learners. The session will support teachers in the implementation of Scientific and Engineering Practices and offer suggestions for celebrating and meeting the needs of the diverse learners in their classroom.

Inquiry Training for Preservice teachers: Virtual Water 3-6
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room D
Grade Level: ELEM Main Content: STEM Preservice Virtual
Cheryl Lindeman, retired STEM teacher educator **Sabrina Johnson, Randolph College**
Taylor Murphy, Randolph College
We will share our 45-minute virtual inquiry lab experiences for Randolph College's 2021 virtual Science Festival and an afterschool face to face program. As preservice teachers planned the lab based on the Smithsonian Science for the Classroom™ module, How Can We Provide Freshwater to Those in Need, it became evident that inquiry labs are vigorous. The "wizards" facilitated a virtual PBL challenge with a Google slide deck. The afterschool program revealed the true essence of inquiry teaching.

Get Your Game On: Student Engagement and Science Learning
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room E
Grade Level: ELEM-MS Main Content: Math in Science, General, STEM
Joselyn Whetzel, Legends of Learning
Experience how SOL-aligned gaming increases science test scores and student engagement. Learn science and math by flying helicopters, building ecosystems and LAUNCHING COWS into outer space! Participants will have hands-on fun and learn how to: make lessons fun while encouraging students to take personal responsibility for their education, personalize student learning based on their academic level, and create an equitable learning environment where students can progress at their own rate.

Illuminate Your Classroom with Solar Energy!
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room F
Grade Level: MS-HS Main Content: Physics/Physical Science, General
Kimberly Swan, National Energy Education Development Project
Most of the energy on Earth originates from radiant energy emitted by the sun. Explore hands-on activities for students to visualize just how solar energy can be used in many different ways. Investigate with UV beads, build a solar oven, and see how photovoltaic (PV) cells work! Activities align with state standards and contains hands-on inquiry investigations to explore how we use the sun's energy to produce heat, light, and electricity.

Chesapeake Bay Foundation Programs Supporting Virginia
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room G
Grade Level: ALL GRADES Main Content: General
Cindy Duncan, Chesapeake Bay Foundation
The Chesapeake Bay Foundation's program have supported VA teachers and students for over 35 years. The immersive hands-on field investigations provided by CBF can enhance all the learning that happens virtually or in person in any subject discipline. Come see all the opportunities offered to assist teachers in and out of the classroom.

Google My Maps in the Science Classroom
Day and Time: Wednesday Session 6: 5:00pm-5:45pm Virtual Room H
Grade Level: ALL GRADES Main Content: General
Paula Irwin, Unity Reed High School/Prince William County Schools
Come learn how to incorporate Google My Maps into your Science classroom. Google My Maps is so versatile. It can be used for individual lab activities or group activities.

Supporting Science Teachers During and After COVID-19
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: Science Teacher Development
Angela Webb, James Madison University **Robbie Higdon, James Madison University**
Kerry Cresawn, James Madison University
Supporting teachers is crucial, especially during these uncharted pandemic times. In this session, we will share the ways in which the JMU Robert Noyce Teacher Scholarship Program supported preservice and novice science teachers during the pandemic and how we will continue to be responsive in our support as teachers and schools return to a semblance of pre-pandemic 'normal'. This presentation will be of interest to science teacher educators, division and school leaders, and professional developers.

Ensuring Access & Equity for All: It isn't Rocket Science!
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room C
Grade Level: ALL GRADES Main Content: Earth/Space Science, Engineering, STEM
Jacqueline Orgain, Savvas Learning
Take on the role of a consultant for NASA to design a system to model a rocket launcher. This challenge will highlight tools to support Gender Equity, Economically Disadvantaged Youth, English Learners, Students with Disabilities, and Advanced and Gifted Learners. Participants can immediately implement strategies with their students by using the workshop resources suggested and great take-aways. This really is rocket science but ensuring access and equity doesn't have to be.

VDOE Update
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room D
Grade Level: ALL GRADES Main Content: General
Anne Petersen, Virginia Department of Education **Myra Thayer, Virginia Department of Education**
Gregory MacDougall, Virginia Department of Education
The VDOE Update session is intended to provide teachers updates on current state and national science initiatives as well as to inform educators of new instructional resources and professional development opportunities. Time will also be built in for Q&A with the VDOE Science Instruction Team.

Coding in a STEM Classroom: It is More Than Just Gaming!
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room E
Grade Level: ALL GRADES Main Content: Math in Science, General, STEM
Michelle Plunkett, Riverside High School
Anything from robots, making a calculator, making a simulation, to keeping a lab notebook! Coding is becoming the language of science in modern jobs. This presentation will go over coding from kindergarten all the way up to AP science courses in high school. There will be multiple platforms, a resource bank for future exploration, and tons of time for questions or help.

Wind Can Do Work!
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room F
Grade Level: MS-HS Main Content: Physics/Physical Science, General, STEM
Kimberly Swan, National Energy Education Development Project
With an increased focus on engineering and design instruction, teachers are looking for activities that incorporate these concepts into their curriculum. Join in on our hands-on, critical thinking challenges designed for students to work as engineers in a competitive setting! Build an anemometer and a windmill to see just how wind can do work. Activities designed for students to analyze and interpret data, construct explanations and design solutions, and to plan and carry out investigations.

Marsh to Lobster Eggs: Research Translated to K-12 Classrooms
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room G
Grade Level: ALL GRADES Main Content: Biology/Life Science, Environmental Science, Physics/Physical Science
Tara Rudo, Chesapeake Bay National Estuarine Research Reserve-Virginia
Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve-Virginia
Lisa Lawrence , Virginia Institute of Marine Science Celia Cackowski , Virginia Institute of Marine Science
What can we learn from marsh accretion? How does temperature affect lobster egg development? 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.

Capital Science
Day and Time: Wednesday Session 7: 7:00pm-7:45pm Virtual Room H
Grade Level: ALL GRADES Main Content: All Science Disciplines
Carolyn Elliott, Goochland Middle School/VAST Region 1 Director
Whether virtual or in-person, a visit to Richmond Metropolitan Area (Region1) offers teachers and students a wide variety of opportunities to enrich their science knowledge. This presentation will provide an overview of science sites that offer educational opportunities in Region One.

Enhancing the Science Learning Environment with Mathematics
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: Math in Science
Kianga Thomas, Norfolk State University Opel Jones, Towson University
This presentation will focus on how teachers can use mathematics concepts to enhance the teaching of science concepts, the scientific investigation process and basic experimentation exercises in the classroom. Attention will be given towards differentiating instruction to maximize learning for all learners, to include students with disabilities, English language learners and high ability learners. In addition, strategies for student-centered learning will be provided during the session.

Geology, Geothermal Energy, & Geography - Exploring Iceland
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room C
Grade Level: ALL GRADES Main Content: Earth/Space Science, Biology/Life Science, Environmental Science
Jennifer Burgin, Hoffman-Boston Elementary School/Arlington Public Schools & Virginia Geographic Alliance
Becky Schnekser, Expedition Schnekser & Virginia Geographic Alliance
Iceland is a place with unique geology, geothermal energy, and geography and your learners deserve to travel there, virtually or IRL! Join us to learn how using Iceland in your teaching practice will instill a sense of exploration, curiosity and excitement with learners of all ages. Attendees will leave with lesson inspiration, time for collaboration AND information on GeoCamp Iceland and how VA educators can apply for a scholarship to go on their own Icelandic Expedition!

PAEMST Information Session
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room D
Grade Level: ELEM-MS Main Content: K-6 Science, CS, Eng, and Math
Anne Petersen, Virginia Department of Education **Myra Thayer, Virginia Department of Education**
Gregory MacDougall, Virginia Department of Education
The Presidential Award of Excellence of Science and Mathematics Teachers (PAEMST) is regarded as the nation's top honor for math and science teachers. This award recognizes educators who develop and implement high-quality instructional programs that improve student learning in mathematics and science. This session will provide information and guidance concerning the PAEMST application process.

Invention STEM: Giving the Chance to be Innovative in High School
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room E
Grade Level: HS-COL Main Content: Engineering, General, STEM
Michelle Plunkett, Riverside High School
Students have opportunities to demonstrate the 5C's but do not often get a chance to demonstrate citizenship in advanced science courses. This presentation will go through how to switch up your labs to have students develop and practice skills that build to letting them be prepared to enter undergraduate research, invention competitions, or generally changing the world in STEM.

Project Based Learning in the Science Classroom
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room F
Grade Level: MS Main Content: Physics/Physical Science
Kiara Thompson, Thomas C. Boushall Middle School (Richmond Public Schools)
Erin Kichinko-Willis, Thomas C. Boushall Middle School (Richmond Public Schools)
In this session, Kiara Thompson and Erin Kichinko-Willis will share how they incorporate project based learning into their middle school classrooms. Specifically, they will share the details of how they developed and implemented the Energy (PS.5c) and Element (PS.4a) projects, both of which are adaptable for virtual and in-person learning.

Trawls to Antibiotics: Research Translated to K-12 Classrooms
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room G
Grade Level: MS-HS-COL Main Content: Biology/Life Science, Environmental Science, STEM
Bethany Smith, Virginia Institute of Marine Science **Lisa Lawrence, Virginia Institute of Marine Science**
Celia Cackowski, Virginia Institute of Marine Science
Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve Virginia
What can we learn from a fish census? How can we determine antibiotic resistance? 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 online access to 40+ additional lessons at https://tinyurl.com/VASEA-Lessons. MS – HS – COL

Ditch the Worksheets with Wizer.me
Day and Time: Wednesday Session 8: 8:00pm-8:45pm Virtual Room H
Grade Level: ALL GRADES Main Content: General
Pernell Denson, Norfolk Public Schools
With Wizer, teachers can create digital worksheets by using different types of questions, incorporating images and videos, and even recording directions. Teachers can ask students to label images, categorize information, respond to open-ended and multiple-choice questions, or respond to video content. Flip the classroom by following videos with open response questions to be discussed in class. Create cloze reading passages to assess reading comprehension and vocabulary skills.

How to BLOW Your Students' Minds as They Learn About Weather
Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room A
Grade Level: HS-COL Main Content: Earth/Space Science, Environmental Science, General
Bonnie Keller, Colgan High School
Use the Null School website to help students discover pressure centers and how they relate to weather. Students will compare pressure systems in Northern/Southern Hemispheres, and also see the other characteristics that the Nullschool website can teach.

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

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room B

Grade Level: ALL GRADES Main Content: General

Jennifer Maeng, University of Virginia **Kaitlyn Smith, James Madison University**

Sunny Johnson, Old Dominion University **Myra Thayer, Virginia Department of Education**

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 you are just beginning a teacher preparation program or graduating in May!

How to Teach Nature Journaling

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room C

Grade Level: ALL GRADES Main Content: Environmental Science

Kathy Frame, Papillon Education Services LLC

Nature journaling is an extremely effective and engaging way to teach observation, curiosity, and creative thinking. Juoirnals are the ubiquitous tools of scientists, naturalists, thinkers, poets, writers, and engineers. Using a journal is a skill that can change [your] students' lives forever.

Explore Smithsonian Science: Investigating Freshwater (2)

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room D

Grade Level: ELEM Main Content: Environmental Science, Engineering, STEM

Cheryl Lindeman, Retired STEM teacher educator **Knans Griffing, Smithsonian/Carolina**

Our live workshop will explore the Smithsonian Science for the Classroom™ module, How Can We Provide Freshwater to Those in Need? Teachers will experience how engineering design, phenomena, and investigative science raise the bar for students solving for real-world problems. Using resources from the Smithsonian, this module scaffolds NGSS 3D collaborative systems thinking. Post workshop materials will be shipped for those interested.

Islands No Longer: Environmental Science Community Solutions

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room E

Grade Level: HS-COL Main Content: Environmental Science

Anajai Peterson, Henrico County Public Schools / Varina High School

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

An environmental science teacher and a university-based STEM educator created a 9-weeks project that infused life skills and childhood play memories with the current issues of urban and suburban heat islands, food deserts, and lack of community green space. The project was designed to promote inquiry, research, critical thinking, community learning, creativity, and play. The goal for this project was to provide engaging learning opportunities with a focus on culturally relevant issues.

JMU STEM Outreach and Engagement Opportunities for K-12

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room F

Grade Level: ALL GRADES Main Content: STEM

Kerry Cresawn, James Madison University **Remy Pangle, James Madison University**

Visitors will learn about the multitude of opportunities for K-12 students and teachers to participate in informal STEM education with JMU faculty and students, both on and off campus. We will share information materials and discuss the programs' target audience, accessibility, platform, timing, and the types of STEM skills and disciplines practiced. We will also share measures taken by the various programs to increase access for historically excluded groups in STEM.

Strategies for Engaging EVERY Learner

Day and Time: Thursday Session 9: 4:00pm-4:45pm Virtual Room H

Grade Level: ALL GRADES Main Content: General

Robbie Higdon, James Madison University

Frustrated with students tuning out? In this session, participants will have the opportunity to experience active, meaningful learning experiences that can engage all students. 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.

Introduction to Bioinformatics
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room A
Grade Level: HS-COL Main Content: Biology/Life Science, Math in Science
Mark Levy, Roanoke Valley Governor's School
The goal of this session is to give the opportunity for folks with limited or no background in bioinformatics to a comfort with the fundamental concepts in the field. We will start with an overview of key background information and terminology and will then touch on some important databases and techniques. The session will close with a guided demonstration of an activity that could be used in the classroom with students.

Get involved with JVSE! There is Room for Everyone!
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room B
Grade Level: ALL GRADES Main Content: General
Jennifer Maeng, University of Virginia **Amanda Gonczi, Michigan Technological University**
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.

Claim Evidence Reasoning: Strategies for Student Success
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room C
Grade Level: ELEM-MS Main Content: General
Pam O'Brien, STEMscopes by Accelerate Learning
Join us for an interactive workshop on Claim Evidence Reasoning (CER). We will discuss and explore strategies for implementing CER, scaffolding the process to reach more learners, and communicating clear expectations to students.

Engaging in Science: Learning with Preservice Teachers
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room D
Grade Level: MS-HS Main Content: Biology/Life Science, Chemistry, Physics/Physical Science
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.

Enliven Student Learning with Experimentation
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room E
Grade Level: MS-HS-COL Main Content: General, STEM
Angie Harr, Vernier Software & Technology
Excite your students with hands-on science whether you're in the classroom or teaching remotely through collaborative data collection and real time analysis. Seeing data collected right before their eyes using the Vernier Graphical Analysis™ Pro app gives students the ability to connect abstract concepts to real-world applications. We will show you how to use our app to energize your classroom through data sharing, interactive sample experiments with synced data, custom videos, and more.

Engaging Students in Creating Clean Energy Solutions
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room F
Grade Level: MS-HS-COL Main Content: Environmental Science, Engineering, STEM
Remy Pangle, JMU Center for the Advancement of Sustainable Energy
Explore ways to engage students finding solutions to problems such as climate change and energy justice. Participants will learn more about a summer camp offered by CASE that featured a solar solutionary suitcase built by high school students and deployed to Kenya to power a school in a refugee camp. The resources used for the camp will be reviewed and we will discuss how to do this with students in their classroom and how to develop a make-shift version using other resources.

Adapting to the New Normal: What Has the Pandemic Taught Us?
Day and Time: Thursday Session 10: 5:00pm-5:45pm Virtual Room H
Grade Level: ALL GRADES Main Content: General
George Dewey, Fairfax County Public Schools, retired

We all have had many questions about what our school's "new normal" might look like and how we adapt to it. Join us for an informal discussion where we share major successes and concerns: *What has the past year taught me? *What has worked well? *What has not worked so well? *What support do we need moving forward? *Successes and issues with remote, hybrid, and in-person learning? *How best to conduct lab work? Please email me in advance with any issues you want discussed: gtdewey3@outlook.com.

Diving Deeper into Bioinformatics
Day and Time: Thursday Session 11: 7:00pm-7:45pm Virtual Room A
Grade Level: HS-COL Main Content: Biology/Life Science, Math in Science
Mark Levy, Roanoke Valley Governor's School
The goal of this session is to help folks explore techniques and databases used in the field of bioinformatics. A participant most likely to benefit from this session would have a basic understanding of the field (consider attending concurrent session "Introduction to Bioinformatics"), but lacks experience or college coursework. We will explore a variety of databases and software tools and guided demonstrations of several software tools will be provided.

College and University Science Educators Share Session
Day and Time: Thursday Session 11: 7:00pm-7:45pm Virtual Room B
Grade Level: HS-COL Main Content: General
Jennifer Maeng, University of Virginia **Sarah Nuss, Virginia Institute of Marine Science**
Anne Petersen, 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 to use with pre-service teachers.

Let's Talk Science: Strategies to Encourage Student Voice
Grade Level: ELEM-MS Main Content: General
Day and Time: Thursday Session 11: 7:00pm-7:45pm Virtual Room C
Pam O'Brien, STEMscopes by Accelerate Learning
Join us as we explore a simple yet effective talk process that will encourage students to more fully own their thinking and effectively communicate their ideas to peers. This interactive session will include a variety of talk strategies that support the Virginia Science Standards of Learning as well as best-practice instruction for all learners!

Not Another Buzz Word: Culturally Responsive Science
Day and Time: Thursday Session 11: 7:00pm-7:45pm Virtual Room E
Grade Level: MS-HS Main Content: Biology/Life Science, Chemistry, Physics/Physical Science
Anthony Little, Little Solutions
Buzz words. They can be found all throughout education. While some of them can be fluff, there are always best practices that indeed help students to succeed. The latter is true for culturally responsive teaching. Culturally responsive teaching is a research-based pedagogy that connects students' learning in the classroom to their culture and life experiences. Join us as we discuss using culturally responsive teaching in the secondary science classroom to help all students succeed.

High Altitude Balloon Research
Day and Time: Thursday Session 11: 7:00pm-7:45pm Virtual Room F
Grade Level: HS-COL Main Content: Engineering, STEM, Student Designed Research
Andrew Jackson, Harrisonburg High School **Erich Sneller, Harrisonburg High School**
Seth Shantz, Harrisonburg High School
Hear from the staff and students who have conducted multiple successful flights of a high altitude research balloon to altitudes of approximately 98,000 feet. See video and data from the last two missions and hear why students gave a week of their summer to do it!

Don't forgrt to download the Whova App. See your email sent to you on October 7 from "VAST PDI".

Virginia Department of Transportation

K-12 OUTREACH AND STEM EDUCATION

Visit our website at

http://www.virginiadot.org/info/stem.asp

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- Our student bridge building competition
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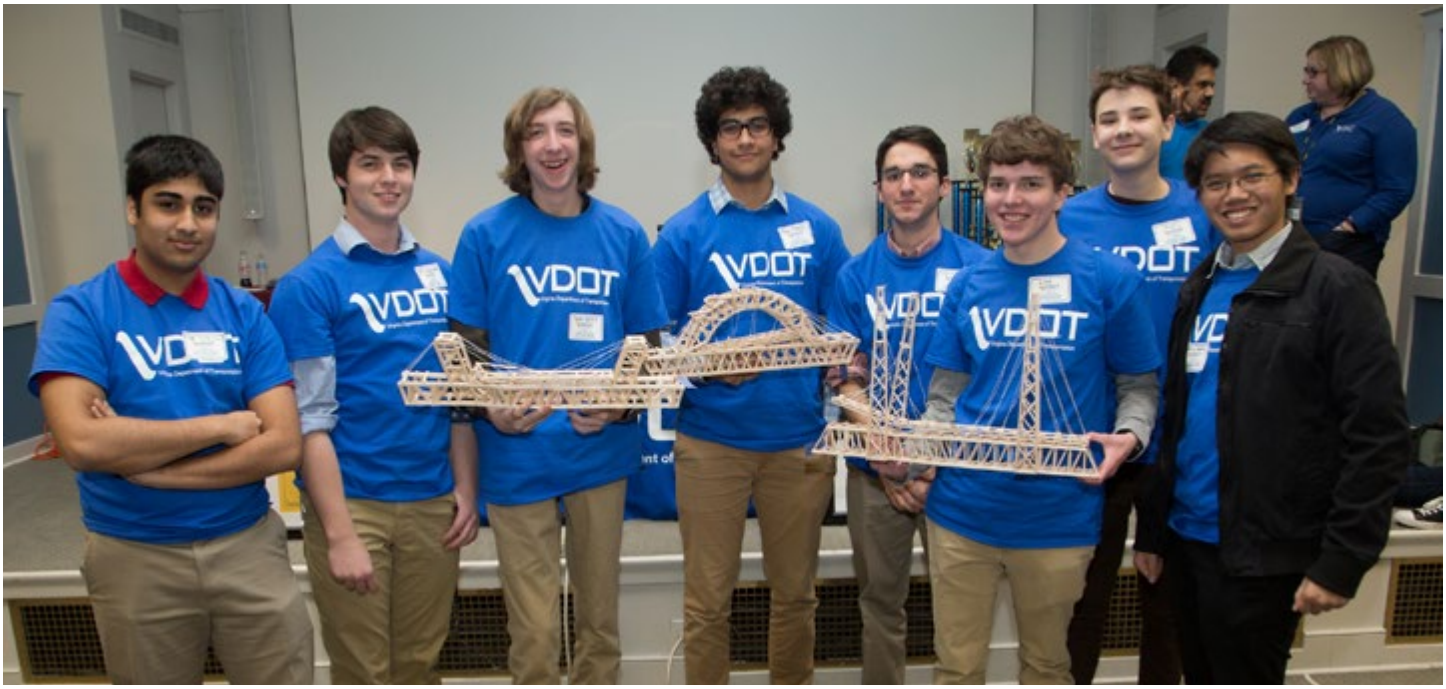

Virginia Association of Science Teachers

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! **Session 12, Virtual Room A**

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

Barbara Adcock, Powhatan County Public Schools

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

Standard-Based Escape Rooms & Forensic Scenes **Session 12, Virtual Room B**

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

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.

Investigating the Chesapeake Bay with Place-based Education **Session 12, Virtual Room C**

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

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.

Addressing Student Anxieties about the Climate Crisis **Session 12, Virtual Room D**

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

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.

Sprouting Success with Agriculture in the Classroom **Session 12, Virtual Room E**

Grade Level: ELEM Main Content: General

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.

Makerspace on the Move: Engaging Students in Engineering. **Session 12, Virtual Room F**

Grade Level: ELEM-MS Main Content: Engineering, STEM

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.

Coding for the Ages: Engaging Students in Off-line Coding **Session 12, Virtual Room G**
Grade Level: ELEM-MS Main Content: Engineering, STEM
Pam Caffery, hand2mind
Your young coders can develop early STEM concepts through off-line 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 off-line coding solutions for PreK-5 grades and then show you how students can progress from off-line coding activities to online using our Artie 3000, an artistic robot.

Camps, Un-Camps and Professional Development Workshops at VT **Session 12, Virtual Room H**
Grade Level: MS-HS Main Content: Math in Science, General, STEM
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!

Using Biotic and Abiotic Factors to Determine Stream Health **Session 13, Virtual Room A**
Grade Level: HS Main Content: Environmental Science, Biology II Ecology Class
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.

Real Science: Science Teachers in Research Labs **Session 13, Virtual Room B**
Grade Level: MS-HS Main Content: Biology/Life Science
Elizabeth Edmondson, Virginia Commonwealth University **Megan Rihn, Varina High School**
Renee Goode-Boyd, George Wythe High School **James Key, Hugenot 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.

If Newton Had Hot Wheels- Physics Fun Through Demos and Labs **Session 13, Virtual Room C**
Grade Level: ELEM-MS Main Content: Physics/Physical Science, Engineering, STEM
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.

Differentiating Science-The Possibilities are Endless **Session 13, Virtual Room D**
Grade Level: ALL GRADES Main Content: All science content
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.

Shifting the Middle School Science Instructional Sequence **Session 13, Virtual Room E**
Grade Level: MS Main Content: Science Curriculum
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.

Leading from the Classroom **Session 13, Virtual Room F**
Grade Level: ALL GRADES Main Content: General
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.

Using Biodiversity to Promote Diversity in STEM **Session 13, Virtual Room G**
Grade Level: HS-COL Main Content: Biology/Life Science, Environmental Science, STEM
Deirde Gonsalves-Jackson, Virginia Wesleyan University **Victor Townsend, Virginia Wesleyan University**
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.

Assessing Students in an Online Environment **Session 13, Virtual Room H**
Grade Level: ALL GRADES Main Content: Assessment Strategies
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.

What's the Point, Curie? **Session 14, Virtual Room A**
Grade Level: HS-COL Main Content: Physics/Physical Science
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.

Megadrought: Ancestral Puebloan Culture and Environment **Session 14, Virtual Room B**
Grade Level: MS-HS-COL Main Content: Earth/Space Science, Biology/Life Science, Environmental Science
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.

Gamify Your Canvas Classroom **Session 14, Virtual Room C**
Grade Level: ALL GRADES Main Content: General
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 runit smoothly.

Project-based Learning in Diverse Learning Environments **Session 14, Virtual Room D**
Grade Level: ALL GRADES Main Content: Biology/Life Science, General, STEM
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.

Conducting Field Trips for Virtual Experiments **Session 14, Virtual Room E**
Grade Level: ALL GRADES Main Content: All Topics; Specific to Tools.
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.

QUAD P: Post-AP Physics Projects Potpourri **Session 14, Virtual Room F**

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

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.

Training and Volunteering as a Virginia Master Naturalist **Session 14, Virtual Room G**

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

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.

Nature Journaling; VAST Mini Grant Funded Project **Session 14, Virtual Room H**

Grade Level: ELEM Main Content: General

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!

Expedition Science: Empowering Learners through Exploration **Session 15, Virtual Room A**

Grade Level: ELEM Main Content: General

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.

Designing Online Lab Reports - Cut Down on Paper Use! **Session 15, Virtual Room B**

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

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.

Sweet and Salty Investigations with a 3-D Twist **Session 15, Virtual Room C**

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

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.

Ramp Up Your STEM Data Collection **Session 15, Virtual Room D**

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

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.

Citizen Science: Authentic, Accessible, 3-Dimensional **Session 15, Virtual Room E**

Grade Level: HS Main Content: General

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.

STEM Majors in Sustainability, Environment, & Conservation **Session 15, Virtual Room F**

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

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.

Argumentation, Radio Waves, and Engineering Design **Session 15, Virtual Room G**

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

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.

Climate Literacy: The Future of Our World **Session 15, Virtual Room H**

Grade Level: ALL GRADES Main Content: 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.

FIELD TRIPS
ARE BACK!

Nothing is better than the sights and sounds of young minds discovering the awesome science all around them!
From dissections to engineering challenges, there is something for curious minds of all ages at the Science Museum of Virginia.
If you're looking for a scientific adventure, but are unable to visit us in-person, we also offer a wide variety of Digital Demos.

Learn more at smv.org/groups

Science Museum of Virginia

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

Please send articles,
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for inclusion in the next Newsletter.

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