

Wild About Science



WVSTA
WEST VIRGINIA SCIENCE
TEACHERS ASSOCIATION

Canaan Valley Resort
Oct. 27-29

2022

West Virginia Science Teachers Association
Annual Conference



NASA West Virginia
Space Grant Consortium
WVSPACEGRANT.ORG

West Virginia University, 341 Mineral Resources Building
Morgantown, WV 26506
(304) 293-4099

STEM Grant Opportunities for Educators

- ❖ K-12 Professional & Curriculum Development
- ❖ Extension and Public Outreach Program

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- ❖ Research Initiation Grant
- ❖ College Course Development

Now accepting applications for 2023-2024 funding:

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Dedicated to building research infrastructure and the promotion of science, technology, engineering and math (STEM) education in WV

Consortium Affiliates

West Virginia University (Lead)
Bethany College
Bluefield State University
Columbus Technologies and Services, Inc.
Community and Technical College System of WV
Fairmont State University
Glenville State University
Green Bank Observatory
Marshall University
NASA Katherine Johnson IV & V Facility
Polyhedron Learning Media, Inc.
Shepherd University
West Liberty University
WV High Technology Foundation
West Virginia State University
WVU Institute of Technology
West Virginia Wesleyan College
Wheeling University

Thank you NASA WVSGC for funding the “Next Generation Science Standards: Forensic Science Professional Development” grant, a K-12 Professional and Curriculum Development Program which provided registrations & rooms for 10 Forensics teachers at this year’s conference!

NASA WVSGC

Dr. Melanie Page, Director
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www.wvspacegrant.org

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President's Message

Welcome to the 2022 WVSTA Conference!

From the WVSTA President,

Welcome to the West Virginia Science Teachers Association (WVSTA) Annual Fall Conference. I hope you are *WILD ABOUT SCIENCE!* If so, you are in great company as a member of WVSTA. This weekend you will be surrounded by educational vendor representatives, WVSTA veterans, teachers who are new to our organization, as well as educators who are leaders in science education. You will find that WVSTA teachers are committed to lifelong learning, excellence in science education, and the continuous improvement of science teaching in West Virginia.



This weekend is not only a retreat for you and an opportunity to rejuvenate your love of science, but also a time to share and learn along with fellow professionals. This conference ensures that as an organization of passionate professionals, we can return to our classrooms enthusiastically with new ideas, strategies, and connections. Let us leverage our time together by attending workshops, visiting the vendor hall, thanking our sponsors, and enjoying meals and conversation with our colleagues and friends.

This year's conference would look like a wild stampede if it weren't for our dedicated Conference Chair, Rachel Eades-Gill. Thanks are extended also to the Conference Committee who assisted in planning this conference. WVSTA is a volunteer organization with no paid staff. Your WVSTA Executive Board works with these conference coordinators throughout the year attending to the details of organizing this conference. Please join me this weekend in thanking them for their hard work and dedication. I urge every member of WVSTA to consider ways you can become more involved and help in planning the 2023 conference.

Be Brave-

Josh Revels, NASA IV&V ERC
2020-22 President, WVSTA

"Above all, don't fear difficult moments. The best comes from them." - Rita Levi-Montalcini

Conference at a Glance

Thursday, October 27th

Time	Room	Event
3:30pm – 9:30pm	Lobby	Registration
5:00pm – 9:00pm	Maple	Preconference Workshop
6:00pm – 9:00pm	Aspen	Exhibits Open
6:00pm – 9:00pm	Spruce/Balsam	Exhibitors' Reception
8:45pm – 10:00pm	Spruce/Balsam	Auction ☺

Friday, October 28th

Time	Room	Event
6:30am – 8:00am	Hickory	Breakfast
7:30am – 5:00pm	Lobby	Registration
8:00am – 5:00pm	Aspen	Exhibits Open
8:00am – 10:15am		Concurrent Sessions
10:30am – 12:00pm	Spruce/Balsam/Maple	Opening Session
12:00pm – 12:30pm	Spruce/Balsam/Maple	Forums
1:15pm – 5:30pm	Meet in Lobby	Tours
12:30pm-1:30pm	Hickory	Lunch
1:30pm – 5:00pm		Concurrent Sessions
2:30pm - 2:45pm	Laurel Lounge	Break
6:30pm – 8:30pm	Spruce/Balsam/Maple	Grand Banquet
8:30pm – 10:30pm	Spruce/Balsam/Maple	Dessert Reception

Saturday, October 29th

Time	Room	Event
6:30am – 8:00am	Hickory	Breakfast
8:00am – 10:00am	Lobby	Registration
8:00am – 12:00 noon	Meet in Lobby	Tours
8:30am – 12:00 noon		Concurrent Sessions
8:30am – 11:45am	Aspen	Exhibits Open
12:00 noon – 1:30pm	Spruce/Balsam/Maple	President's Luncheon & WVSTA Business Meeting
1:30pm – 2:30pm	Laurel Lounge	WVSTA Board Meeting

**Welcome to Canaan Valley Resort and Conference Center in
Davis, WV!**

Keynote Speakers

Opening Session - Friday, October 28, 11:00am



Sue Ann Heatherly is the Senior Education Officer at the Green Bank Observatory in Green Bank, WV. She has trained thousands of high-school and middle school teachers and students to use the 40-Foot radio telescope to carry out open-ended research projects. In 2017, Sue Ann received the Thomas J. Brennan Award from the Astronomical Society of the Pacific for her exceptional commitment to North American classrooms, planetarium education, and excellence in teaching astronomy. As the Principal Investigator of the First 2 Network NSF INCLUDES project, Sue Ann seeks to double the number of first generation students in West Virginia who graduate with a STEM degree.

Keynote Speakers

Grand Banquet - Friday, October 28, 6:30pm-8:30pm



Nick Underwood is the Programs and Integration Engineer for the National Oceanic and Atmospheric Administration's Aircraft Operations Center (NOAA AOC), a.k.a. the NOAA Hurricane Hunters, located in Lakeland, FL. Since 2016 Nick has worked to safely evaluate and integrate science instruments onto NOAA's fleet of research aircraft. In addition, Nick has served as an aircrew member aboard those aircraft in support of numerous science missions, including Arctic sea ice surveys, marine mammal surveys, atmospheric river reconnaissance, and hurricane research and reconnaissance. To date, he has flown into over 20 hurricanes across the Atlantic and Pacific Oceans, including Hurricanes Irma, Florence, and Dorian.

Prior to working for the Hurricane Hunters, Nick worked as a flight test engineer for Naval Air Systems Command at Patuxent River Naval Air Station in Patuxent River, MD. He supported structural loads flight tests of advanced weapons systems for the F/A-18 Super Hornet, and for the airframe of the F-35 Lightning II.

Nick was born and raised in Beaver, WV. He received a B.S. in Aerospace Engineering from West Virginia University in 2014 and is currently pursuing a M.S. in Physical Oceanography from the University of South Florida. His research focuses on data validation and future uses of air-launched ocean sensing instruments. Nick is passionate about sharing NOAA's mission of environmental stewardship, promoting hurricane awareness, and STEM education.

General Information

Registration

The registration area will be located in the Lobby and will be open during the following times:

- **Thursday, October 27th** _____ **3:30pm – 9:30pm**
- **Friday, October 28th** _____ **7:30am – 5:00pm**
- **Saturday, October 29th** _____ **8:00am – 10:00am**

Conference Meals and Breaks

All meals and breaks are included in your registration (provided you selected them during pre-registration) and are available at the following times (with your ticket):

Thursday, October 27th

Exhibitors' Reception _____ 6:00pm– 9:00pm _____ Spruce/Balsam/Maple
(Sponsored by All of Our Exhibitors)

Friday, October 28th

➤ Breakfast _____ 6:30am– 8:00am _____ Hickory
➤ AM Break _____ 10:15am _____ Laurel Lounge
(Sponsored by WVSTA)

➤ Lunch _____ 12:30pm– 1:30pm _____ Hickory

➤ PM Break _____ 2:30pm– 2:40pm _____ Laurel Lounge
(Sponsored by WVSTA)

➤ Grand Banquet _____ 6:30pm– 8:30pm _____ Spruce/Balsam/Maple

➤ Dessert Reception _____ 8:30pm– 10:30pm _____ Spruce/Balsam/Maple
(Sponsored by PAEMST)

Saturday, October 29th

➤ Breakfast _____ 6:30am– 8:00am _____ Hickory Dining Rm

➤ President's Luncheon _____ 12:00pm– 1:30pm _____ Maple/Balsam/Spruce
(Sponsored by WVSTA)

General Information

Exhibits

Stop by and visit the exciting booths, get free resources for your classroom, see the newest products, services, and opportunities for science educators located in the **Aspen Room**. The exhibit hall is open during the following times:

- **Thursday, October 27th** _____ **6:00pm – 9:00pm**
- **Friday, October 28th** _____ **8:00am – 5:00pm**
- **Saturday, October 29th** _____ **8:30am – 11:45am**

WVSTA Meetings and Events

Remember, this is YOUR organization. Get involved and engaged by attending WVSTA formal and informal meetings held during the conference at the following times:

Friday, October 28th

- Opening Session _____ 10:30am–12:00pm _____ Maple/Balsam/Spruce
- Lunch Forums _____ 12:15pm– 1:15pm _____ See Forums Page
Join like-minded people at a roundtable while eating lunch!

Saturday, October 29th

- WVSTA Business Meeting _____ 12:00pm–1:30pm _____ Spruce/Balsam/Maple
- Executive Board Meeting _____ 1:30pm–2:30pm _____ Laurel Lounge



Pre-Conference Workshop

Registration is required. Please see the registration desk if you are interested!

Thursday, October 27, 5:00 p.m.- 9:00 p.m

Becca Myers, Community-Based Learning Coordinator, collaborates with schools to implement outdoor learning programs into the classroom through education and field experiences. She earned her BS in Sport and Exercise Psychology from West Virginia University and has been involved with the outdoor industry through various local projects and conservation efforts. Becca can usually be found adventuring with her dogs through hiking and trail runs or wandering along a trout stream on fly-fishing excursions.



Vicki Fenwick-Judy oversees program and curriculum development with a focus on schoolyard and community-based learning. She represents the organization on several statewide and regional education advisory boards. She has a BA and MA in psychology from Marshall University and has more than 20 years of experience in the field of environment-based and outdoor education. Vicki likes to experience the outdoors with her husband and two daughters through skiing, hiking, and biking.

Beyond the Classroom with Place-based Learning

Join presenters from Experience Learning to hear about their pilot program, STREAM, in five counties in West Virginia. Experience Learning staff and classroom teachers are developing project-based units which integrate content areas while using a place-based approach at hands-on education in and around the school community. Currently, the STREAM projects are targeting third through fifth grade with project-based units that use the schoolyard as a laboratory for learning. Additionally, literacy-based projects will be used to engage pre-K through first grade students in exploring their schoolyards and natural world too! Hear about some of the sample lessons and find out how your school can get involved too.



experience
LEARNING

Post-Conference Workshop

Saturday, October 29, 1:30 p.m.- 3:30 p.m



Callie Cronin Sams rejoined the WVDEP as the new Save Our Streams (SOS) program coordinator in February of 2021. Cronin Sams brings with her six years of prior experience working with the WVDEP’s Youth Environmental Program (2011-2017), three years of grant writing and program development experience with the City of Buckhannon and Buckhannon Volunteer Center (2017 – 2021), volunteer time with the Buckhannon River Watershed Association, and a Master of Arts in Teaching in Biological Sciences from Miami University of Ohio and Project Dragonfly. She lives in Elkins with her husband, Nathan, and daughter, Willow, where she loves spending time with family, trail running, hiking, biking, and enjoying live music. To learn more about the Save Our Streams program, visit the Save Our Streams website or email Callie at callie.c.sams@wv.gov.

WV Save Our Streams- Field Experience

This is a 2 hour field experience in coordination with a 1-hour conference session. Participants that do both sessions and complete the certification exam will receive the Save Our Streams Level 1 certification. Additionally, after completion they will receive a benthic macroinvertebrate sampling kit that includes a kick net, trays, magnicubes, and more depending on their specific needs. The kit will be delivered to their class during their first stream survey outing, which the WVSOS Coordinator will attend and assist teachers as they lead their initial survey with students. During this post-conference session, participants will carpool or caravan to an area stream and will learn how to assess physical conditions and stream habitat, measure flow/discharge and its relationship to pollution and total maximum daily loads, and conduct a benthic macroinvertebrate survey. Participants can then depart directly from the site (make sure to check out at Canaan before we head out).



Special Events

18th Annual WVSTA Auction

Thursday, October 27th _____ 8:45pm– 10:00pm

Surplus your extra supplies by donating them to a good cause . . . other teachers! Do you have stuff in your stock room that has not been touched in years? Just hate to throw it away because you know somebody somewhere can use it? Bring it and the rest of your surplus supplies to the WVSTA Auction! MONEY IS NO OBJECT (and it isn't real either)!!! WVSTA Bucks are provided with your Registration, and are awarded by Visiting Exhibitors, or Donating Equipment. Auctioneer **Jim Cozort** wants to remind you, "The more you bring, the more you can get!!!"

Spruce/Balsam



Photo Booth

➤ **Thursday October 27- Saturday October 29**

Foyer

Find the photo booth and take a science selfie, or a group photo with your favorite science friends! Post your photo, and any others you take at the conference, to social media along with #wvsta18 as a hashtag. Let's show WV and the world our amazing science teachers!

Door Prize Winners Circle

➤ **Saturday, October 29th _____ 12:00pm**

Spruce/Balsam/Maple

Items donated by vendors are displayed at the registration booth throughout the conference. You receive several slips in your registration packet that can be used to "bid" on these items. Winners will be announced at the President's Luncheon and you **MUST** be present to win!

Vendor Bingo Cards

➤ **Saturday, October 29th _____ 12:00pm**

Spruce/Balsam/Maple

Collect all stickers from all vendors by visiting them Friday- Saturday noon in the exhibit hall. You keep the contact information, bring your completed bingo sheet to the registration desk, we'll cut off the bottom and put your name in the drawing. The winner gets a free registration to next year's conference!!



Conference Tours

Pre-registration, prepaid required for all field trips. Didn't pre-register? Check for availability at the registration desk. All tours meet in the Lobby. Please arrive 15 minutes before departure time.

Freeland Boardwalk

Friday, October 28, 2022 8:00am-10:00am

Canaan Valley National Wildlife Refuge was designated in 1994 because of the unique and abundant wetland communities found in the valley. Wetlands are a vital ecosystem and serve multiple direct and indirect benefits for the people who live here, and it is important that the next generation can learn their importance. During your time at the refuge, you will take a tour of Freeland Boardwalk, which is one of our most popular trails and a great example of wetland and transitional edge habitat. You will see some of the unique features that make this first area of the refuge special. After that we will travel to the Visitor Center, where you can look at some of the displays and learn about some of the activities we do in the schools to engage students with the natural environment.



Canaan Ski Lift & Hike

Friday, October 28, 2022 1:00pm-5:00pm

Get a breathtaking bird's eye view of the valley and Allegheny Mountains from the Canaan Valley Resort chairlift. The picturesque landscape becomes even more so in the fall as the leaves change and surround you in a sea of color. It's the best seat in the house. We will ride the lift to the top and hike 2.5 miles back to base camp with a stop at the scenic Bald Knob. Nature hike will include tree and plant identifications facilitated by Rebecca Meyers, Experience Learning, & Todd Ensign, NASA IV&V ERC.

Please note: Guests are required to wear close-toed shoes, and carry water and rain gear.



Blackwater Falls State Park

Saturday, October 29, 2022 8:00am-11:00am

Spend the morning with Aaron Graham, a field biologist with Friends of Blackwater, and take in the astounding views along the canyon. Tour the red spruce forests that are an iconic part of the West Virginia highlands where we hope to encounter a variety of wildlife such as the salamanders and birds that live in these forests. Visit some of the waterfalls that can be found in the canyon where the tour will offer some history on what this area was like before it was settled to give a sense of how wild these areas truly were and still are today. While some transportation will be done by vehicle, foot travel will occur throughout the park with hiking attire being recommended. If you have binoculars or a camera those are also recommended to offer better views at some of the avian life.



WVSTA Leadership

West Virginia Science Teachers Association: 2022 Executive Board

President _____	Josh Revels
President-Elect _____	Leslie Lively
Immediate Past President _____	Erika Klose
Membership Vice President _____	Laura Bohrer
Treasurer _____	Wayne Yonkelowitz
Secretary _____	Davita Melander
Executive Director _____	Deb Hemler
Electronic Services _____	Todd Ensign
WVDE Liaison _____	Erika Klose
Webmaster/Social Media Director _____	Angela McKeen
Elementary School Representative _____	Tiffany Pace
Middle School Representative _____	Michele Adams
High School Representative _____	Teresa Barton

Past Presidents:

2018-2020 Erika Klose	2004-2006 “Page” Stevenson	1992-1993 George Gruber
2016-2018 Carolyn Thomas	2003-2004 Eric Pyle	1991-1992 Patricia Obenauf
2014-2016 Elizabeth Strong	2001-2003 Jody Cunningham	1988-1990 Sylvia Cooper
2012-2014 Linda Fonner	1999-2001 Larry Oyster	1987-1988 Robert Phipps
2009-2012 Deb Hemler	1997-1999 Diane Furman	1985-1987 Rayman Richardson
2008-2009 Ed Evans	1995-1997 Joe Evans	1984-1985 Larry Wilkinson
2006-2008 “Jo” Hendricks	1993-1995 Jerry DeLuca	

Conference Committee Members

Conference Chair _____	Rachel Eades-Gill
Program Coordinators _____	Erika Klose, Deb Hemler, Josh Revels
Registration Coordinators _____	Deb Hemler, Josh Revels, Gordon Swiger, Delaney Mohr
Speaker Coordinators _____	Deb Hemler, Josh Revels, Carolyn Thomas
Exhibitor Coordinator _____	Leslie Lively
Tour Coordinators _____	Mollie Craven, Daphne Smith, Margie Suder
Merchandise Coordinators _____	Wayne Yonkelowitz & Todd Ensign
Auction Coordinators _____	Jim and Patty Cozort
Hospitality Coordinators _____	Teresa Barton & Robin Sizemore
AV Coordinator _____	Todd Ensign
Additional Committee Members _____	Nikki Moriarity, Amy Cottrill

WVSTA Guiding Principles

WVSTA Mission

The mission of the WVSTA is to promote scientific growth through professional development and networking in the science community.

Purpose

The purpose of the WVSTA is to encourage interest and active participation in science and science education at all levels, to provide a medium for the exchange of views regarding the teaching of science, and to promote the cooperative study of problems and challenges to the teaching of science.

Goals

1. Facilitate and cooperate in providing for national, regional, state and local conferences on science education.
2. Prepare and distribute articles, reports, and classroom materials which are appropriate and helpful to teachers of science.
3. Disseminate information which promotes science and science education universally throughout the state at all levels, i.e. school, community, business and industry, and government.
4. Encourage investigations, experimentation and research in science, and science education.
5. Cooperate with the National Science Teachers Association in formulating plans and projects which advance the quality of science teaching and which promote a more widespread acceptance of science as a subject worthy of serious study from elementary school through college.



Opening Session

Friday, October 28th, 10:30am –12:00pm
Stonewall Ballroom

Opening _____ **Josh Revels**
WVSTA President

Invited Announcements

State of Science Education in West Virginia _____ **Ms. Erika Klose**
State Science Coordinator

Presidential Award for Excellence _____ **Dr. Deb Hemler**
in Math and Science Teaching *WV PAEMST Coordinator*

Keynote Speaker _____ **Sue Ann Heatherly**
First 2 Network

Conference Announcements _____ **Rachel Eades-Gill**
WVSTA Conference Chair



Grand Banquet

Friday, October 28th, 6:30pm (doors open 6:15)
Stonewall Ballroom

Introductions _____ Josh Revels
2020-22 WVSTA President

Invocation _____ Dr. Pat Obenauf ☺

Dinner _____ Buffet

Presentation of Awards _____ *see next pages*

Introduction of Keynote Speaker _____ Josh Revels
2020-22 WVSTA President

Keynote Speaker _____ Nick Underwood
NOAA AOC



Special Recognition Awards

2022 Awards Ceremony

2021 Presidential Award for Excellence in Math and Science Teaching

Presenter:..... Deb Hemler
WV PAEMST Coordinator

Secondary Science State Finalists.....**Rachel Eades-Gill**
Midland Trail High School

Renee Haines
Martinsburg High School

Dianna Moriarity
Horace Mann Middle School

2022 Presidential Award for Excellence in Math and Science Teaching

Presenter: Deb Hemler
WV PAEMST Coordinator

Elementary Science State Finalist.....**Leslie Lively**
Shortline Elementary



Special Recognition Awards (cont.)

2022 WVSTA Fellow

Presenter: _____ Erika Klose
WVSTA Past President

WVSTA Fellow _____ **It's A Surprise!**

2022 Patricia Obenauf Scholarship

Presenter: _____ Deb Hemler
WVSTA Executive Dir.

Scholarship Recipient _____ **Peggy Moore**
Pike View High School

Please consider applying for this scholarship which awards free registration to the WVSTA Conference!!

This award honors the 33 year commitment of Dr. Patricia "Pat" Obenauf, a founding member of WVSTA.



Dr. Patricia Obenauf (1932-2017)
I honor the place in you in which the universe dwells.

Recent PAEMST* Science Award Winners

Elementary

2020 Tiffany Pace
2018 Jamie Pettit

2016 Margaret Howells
2014 Nancy Holdsworth

2012 Barbara “Tootie” Black
Gabrielle Rhodes
2010 Michele Adams
2006 MaryLu Hutchins
2004 Kathryn Edwards
2002 Barbara Haines
2001 Rebecca Kittle
2000 Philip Guseman
1999 Linda Fonner
1998 Annette DeLuca
1997 James Giles
1996 Bonnie Mae Mueller
1995 Carol Lou Mathis

Secondary

2021 TBA
2019 Angela McKeen
2017 Erika Klose
2015 Maureen Miller
2013 Eric Kincaid
Pete Karpyk
2011 Angela McDaniel

2009 Rebecca Jones
2007 Mickie Richardson
2003 Alicia Spears
2002 Wayne Yonkelowitz
2001 Linda Robinson
2000 Cynthia Keeling
1999 Sonya Picklesimer
1998 Cindy Willis
1997 Mary Sue Burns
1996 Kathryn Ann Conway
1995 Kathryn Burns Jacquez



***Presidential Award for Excellence in Math and Science Teaching**

WVSTA Distinguished Fellow

At the 2002 WVSTA conference in Charleston, WVSTA began recognizing outstanding leaders in our organization. In 2004, the Executive Committee bestowed on these winners the title of “WVSTA Fellows” and drafted the following guidelines for future winners:

Nominees must meet a minimum of four (4) of these seven criteria, and a minimum of two of the starred criteria:

1. Past officer of WVSTA *
2. Help plan/execute a WVSTA conference *
3. Leadership in statewide educational activities or grants *
4. Presenter at several WVSTA conferences
5. Significant contributions to the enhancement of science education
6. Recipient of other significant recognition (e.g. Presidential Award, Milken Award)
7. Served on state committees (such as WESTEST construction, or state curriculum development/revision, or state textbook adoptions)

Past Winners

2020	Ms. Robin Sizemore	2018	Ms. Libby Strong
2017	Mr. Kip Bisignano	2016	Mr. Wayne Yonkelowitz
2015	Ms. Linda Fonner		
2013	Ms. Jody Cunningham Ms. Jo Hendricks	2014	Dr. Deb Hemler
2011	Mr. Patrick Balch	2010	Mr. Bob Seymour
2009	Ms. Cindy Willis	2008	Ms. Sheila “Page” Stevenson
2007	Dr. Rayman Richardson	2006	Mr. Larry Oyster
2005	Mr. David Goodwin	2004	Mr. Jerry DeLuca
2003	Ms. Diane Furman Dr. Edward Keller, Jr. Dr. Thomas Repine Ms. Brenda West	2002	Ms. Phyllis Barnhart Dr. Robert Behling Dr. H. Andrew Cook Dr. Joe Evans Dr. Jim Meads Dr. Patricia Obenauf

Please contact your officers for future nominations for WVSTA Fellow.

President's Luncheon & Business Meeting

**Saturday, October 29th, 12:00pm- 1:30pm
Stonewall Ballroom**

Presider _____ **Josh Revels**
2020-2022 WVSTA President

Welcome

Introduction of Officers

Recognition of Conference Committee & Contributors

Lunch

WVSTA Business Meeting _____ **Josh Revels**
2020-2022 WVSTA President

New Business

Art Contest Winner

Passing of the Gavel

Door Prizes



Friday October 28th, 8:00am-9:00am

Environmental Science in a World of 8 Billion

Maple

Tamara Westfall, WV Department of Education, tamara.westfall@k12.wv.us

In November 2022, our planet becomes home to 8 billion people, a doubling in less than 50 years. Understanding human population dynamics is vital to the study of environmental science as our species' numbers and activities affect every ecosystem.

In this inquiry-based, hands-on workshop, the presenter will demonstrate how to use 3D learning to explore population trends and projections, and their connections to several environmental challenges, including climate change, pollution and biodiversity loss. Participants will engage in large group simulation games, concept mapping, as well as collaborative data analysis and inquiry. This session is applicable for teachers of Earth & Space Science, Biology and Environmental Science (general and AP). Receive lesson plans and background materials matched to state standards.

Game On! Gamification vs. Game Based Learning

Balsam

Mike Tuggle, Plasma Games, mike@plasma.games

Julie Cozzie, Plasma Games, julie@plasma.games

It's all fun and games but does it work? Take a deep dive into the difference between gamification and game based learning and how to incorporate both into your classroom for the best outcome. Bonus: Leave with an all inclusive access code to a 3D game based platform!

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

Spruce

Jeff Lukens, Roosevelt High School, Sioux Falls, SD, jeffreylukens0613@gmail.com

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

Friday October 28th, 8:00am-9:00am (continued)

Give the "A" a Voice

Pine

Sandra Cress, Fairview Middle School, sandra.cress@gmail.com

Imagine what the cell wall would sound like if it made sounds. Stop by for hands-on practice and experimentation with putting the A in STEAM using this and other prompts, along with Makey Makey circuit boards and Scratch coding. We already have students draw diagrams of things such as the anatomy of a plant cell. Make such assignments a little more arty and interactive by using the graphite drawing as a conductor and pairing it with a Makey Makey so that when each part of the cell is touched, it speaks. Students can record their proposed cell wall sound, for example, and use Scratch to add that sound along with recorded information to explain what the cell wall is and what it does.

Students can also mix water solutions of the primary colors to create a water rainbow, then map relative sound frequencies to color frequencies. By recording and attaching a sound of the relative frequency to each color, they create a rainbow of sounds and color.

No prior experience is necessary. (One participant will win a Makey Makey Invention Kit)

Into the Woods: Leveraging the Psychology of Attention to Improve Observation Skills

Birch

Brian Kinghorn, PhD, Marshall University/National Youth Science Camp, Director@nyscamp.org

Most human minds engage in selective attention, which includes filtering out what our subconscious minds deem “unimportant” or “irrelevant” before the information can move from sensory memory to working memory. Although this filtering is essential for us to be able to pay attention to important phenomena, it can negatively impact our observation skills. In this session I will engage participants in an activity I call “Into the Woods” that I have facilitated with both preservice and inservice science teachers. The activity helps participants to better understand and recognize the inherent gaps in their observational skills and then helps them to broaden and improve those skills as they shift their observation paradigms. This presentation can help participants recognize the psychological barriers to developing effective observation skills which can then help them facilitate better observational understanding and strategies for their students.

Note: Part of this activity will be conducted outdoors.

Friday October 28th, 8:00am-9:00am (continued)

Cross-Curricular Thematic Units for K-2

Hawthorne

Alicen Adkins, Moorefield Middle School, alicen.adkins@k12.wv.us

Bonnie Crites, Moorefield Middle School, bonnie.crites@k12.wv.us

The goal of this session is to easily include science content in your early elementary classroom that will help support other content areas (literacy, math, etc). We will focus on how to develop a thematic unit centered around a book study that helps meet science standards, as well as standards from other content areas. Teachers will be given a sample thematic unit developed around the book “Rosie Revere, Engineer”. After walking through this example, teachers will work through a sample engineering design challenge to develop confidence and experience prior to use in their own classrooms, and be given the tools to begin developing their own thematic unit(s).

Think Like an Engineer with Phenomenal Science Instruction!

Elm

Molly Catalano, Amplify, mcatalano@amplify.com

Gregg Ritchie and Cassandra Kauppi

Teachers will learn how student driven engineering internships incorporate all aspects of the Science & Engineering Practices from the West Virginia Next Generation Content Standards and Objectives for Science. This session engages educators with hands-on activities, digital tools, active reading and dynamic discussion with the purpose of integrating phenomena-based science instruction around real-world problem solving. The Amplify connection includes a Force and Motion Engineering Internship where participants design a hands-on egg drop as well as utilize digital modeling tools. Teachers will leave with print resources as well as digital demo accounts. Bring your own device!

Classifying the Wild and Wonderful Jellious genus

Willow

Nikki Moriarty, George Washington High School, dmoriarty@mail.kana.k12.wv.us

Come explore the wonderful world of the newly discovered, completely wild, Jellious genus. In this session, experience classifying a new genus of organisms and learn how to assess students’ understanding of dichotomous keys. Students will not only create their own key but will also be tasked with peer reviewing keys from other classmates/classes.

Friday October 28th, 9:15am-10:15am

Energy House Challenge!

Maple

Wayne Yonkelowitz, National Energy Education Development Project, wyonk62@gmail.com

NEED's Energy House Challenge incorporates science, engineering, and math. Learn how to conduct this student (and teacher) favored activity in your classroom or afterschool setting! Concepts include how heating and cooling uses more energy than any other energy task in the home, insulators are materials that do not conduct heat well, and many materials can be used to reduce the energy needed to keep houses at comfortable temperatures. The materials to conduct this activity are inexpensive (cardboard box, aluminum foil, caulk, cotton batting, etc.), as budget concerns play a factor in what engineering activities can be implemented in the classroom. This activity applies engineering principals and problem-solving skills to energy efficiency, while incorporating math with a set budget and cost for materials. Students will be able to describe efficiency and conservation measures for the home and justify why these measures make sense economically.

3D STEM Careers: Diversity, Diversity, Diversity!

Balsam

Mike Tuggle, Plasma Games, mike@plasma.games

Julie Cozzie, Plasma Games, julie@plasma.games

Let's expose students to the diversity in STEM careers x3! Explore how to inspire the next generation of STEM experts by showing them STEM experts who are diverse in how they look, diverse in what they do, but most importantly diverse in how they got there.

Flattening the Curve of the Zombie Apocalypse

Spruce

Jeff Lukens, Roosevelt High School, Sioux Falls, SD, jeffreylukens0613@gmail.com

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

Friday October 28th, 9:15am-10:15am (continued)

STEAM-a-lama-ding-dong

Pine

Wendy Peel, Texas Instruments, wpeel@ti.com

Music is a great way to get kids excited about STEAM. Learn how to use your calculators, a TI-Innovator hub, and some imagination to get kids excited about coding and engineering. This session will help any coding novice become comfortable with the basics by challenging them to create a popular song using a little imagination, cooperation, and coding on their calculator!

Introduction to Forensic Lesson Plan Assessment

Birch

Mark Flood, Fairmont State University, mflood@fairmontstate.edu

Kristy Henson, Deb Hemler, Angela McKeen

Participants will begin the process of learning how to assess standards-based lesson plans based on the criteria. This hands-on session will be lead by forensic science content specialists and science educators, and will use a collaborative peer model for lesson plan assessment. This is a required session for West Virginia Space Grant Consortium teacher collaborators.

STEAM Dating: Speed Dating But Without the Awkward Small Talk

Hawthorne

Mary E Lind, Jefferson County Schools, mlind@k12.wv.us

Traci Davis, Traci.davis@k12.wv.us; **Jean Nedorostek**, jnedorstek@k12.wv.us; **Kandi**

Kaiser, Kandi.kaiser@k12.wv.us; **Mary Malin**, mmalin@k12.wv.us; **Allison Moody**,

Alison.p.moody@k12.wv.us; **Jen Vogel**, jvogel@k12.wv.us; **Leslie Boyd**, laboyd@k12.wv.us

The Jefferson County STEAM Team will lead you through an exciting session of STEAM dating! Much like speed dating, every ten minutes you will rotate through the STEAM stations. You're guaranteed to have hands-on fun while quickly getting briefed on an original STEAM lesson, Prek-5! Each attendee will receive a STEAM SWAG bag full of goodies and a book!

STEAM lessons were created by the STEAM Team. The lessons all focus on a piece of current and relevant literature. The lessons were also created with a Tier system keeping in mind the Social and Emotional needs of our youngest learners in Pre K-5. As teachers, we understand that the growth mindset is something we must teach with a lot of patience and love. Each lesson and all the materials are contained in a bin that teachers across the county can borrow for their classrooms for the 2022-2023 school year.

Think Like an Engineer with Phenomenal Science Instruction!

Elm

Molly Catalano, Amplify, mcatalano@amplify.com

Gregg Ritchie and Cassandra Kauppi

Teachers will learn how student driven engineering internships incorporate all aspects of the Science & Engineering Practices from the West Virginia Next Generation Content Standards and Objectives for Science. This session engages educators with hands-on activities, digital tools, active reading and dynamic discussion with the purpose of integrating phenomena-based science

instruction around real-world problem solving. The Amplify connection includes a Force and Motion Engineering Internship where participants design a hands-on egg drop as well as utilize digital modeling tools. Teachers will leave with print resources as well as digital demo accounts. Bring your own device!

Friday October 28th, 9:15am-10:15am (continued)

STEAM TAC: Wild and Wonderful Wiggle Bots

Willow

Anna Tucker, WVU/WVDE STEAM TAC, artucker@k12.wv.us

Melissa Bane, WVU/WVDE STEAM TAC, mmbane@k12.wv.us

This session provides an overview of the WVDE/WVU STEAM Technical Assistance Center (STEAM TAC) and the free STEAM immersion experiences offered to West Virginia students in grades 6-8. STEAM TAC specialists will guide participants through an engaging, hands-on engineering design lesson to plan and build "Wildlife Wiggle Bots." Join us to discover how to incorporate a STEAM approach to learning for increased student engagement while meeting West Virginia College and Career Readiness content standards.

Friday, October 28th, 10:30am-12:00pm

Opening Session

Maple/Balsam/Spruce Ballroom

Friday, October 28th, 12:00pm-12:30pm Forums!

Just after the opening session and before your lunch at Hickory, join a conversation with like-minded folks. We have many forums to choose from and if you would like to suggest another, let us know and we'll add it next year! We'll announce the forums and direct you to the right convener and table in the Ballroom to begin your discussion. Afterwards you can move as a group to lunch if you would like to continue your conversation!

National Youth Science Foundation
WV Climate Change PD
2023 Conference Planning
Diversity, Equity, & Inclusion
Presidential Awards
Elementary Science
Forensics Teacher Grant
WV Science & Engineering Fair

Dennis Schatz
Kathryn Williamson
Leslie Lively
Laura Bohrer
Angela McKeen
Tiffany Pace
Mark Flood & Kristy Henson
Erika Klose



What is in the Aquarium?

Maple

Robert E. Strong, SMART-Center, robert@smartcenter.org

We all know or think we know what is in an aquarium. But, how often do you ask your students an open-ended question without grading or scoring, in an off-the-record manner? Asking a question having a seemingly obvious answer seems like a waste of precious class time. However, allowing your students to answer an open-ended question without academic repercussions allows the teacher to receive an answer based not upon student's need to satisfy an academic answer in the framework for receiving the highest score. The teacher may see, for perhaps the first time, a window into the breadth and depth of the inner workings of their student's prior accumulated and useful general knowledge, reasoning skills, and extrapolation cleverness when confronted by a real world seemingly simple question. Join Robert E. Strong from the SMART-Center in an educational odyssey to answer the question of what is actually in your aquarium.

3 Dimensional Instruction

Balsam

Pamela Temons, Biozone International, mptemteach@aol.com

Presentation of a lesson structured around disciplinary core idea integrated with cross-cutting concepts and science and engineering practices.

Sloth Talk! Megalonyx jeffersoni and the Ice Age

Spruce

John Tudek, West Virginia Geological and Economic Survey, jtudek@wvgs.wvnet.edu

Elizabeth Rhenberg, West Virginia Geological and Economic Survey,
erhenberg@wvgs.wvnet.edu

Learn all about West Virginia's state fossil, *Megalonyx jeffersoni* (aka 'Jeff') from the geologists at the West Virginia Geological and Economic Survey. Find out how it lived, when it became extinct, and what its living relatives are. Time permitting we will discuss possible class activities. A skull of *Megalonyx jeffersoni* will be on display for close examination.

ACES and Science Education

Hawthorne

Rachel Eades-Gill, Midland Trail High, reades@K12.wv.us

This session will focus on ACES (Adverse Childhood Experiences) and how they affect children's education. Participants will gain a foundational understanding of how ACES affect behavior and learning, and thus how we as educators can promote a safe classroom environment.

Friday, October 28th, 1:30pm-1:55 (Continued)

Integrating Original Student Research Within a Science Course Curriculum Elm

Pamela Dixon Kuhn, Science Research for All, Inc., pdixonkuhn@scienceresearchforall.org

Science research programs are prevalent in many high-achieving STEM specialized schools; however, we believe ALL students can participate in the scientific method by doing original research within the science classroom. In this session, we will outline the process for incorporating a capstone research project in a high school or middle school science course. Through this process, instructors will be able to engage their students in independent and original research as part of the course learning outcomes. By empowering teachers to implement science research within their curriculum, we hope to shift STEM education from traditional instruction to open inquiry where students connect to the real-world scientific community.

Free Opportunities for Teachers and Students to access extracurricular and Summertime Programming Offered by the National Youth Science Foundation Willow

Brian Kinghorn, PhD, Marshall University/NYSCamp, Director@nyscamp.org

Ryan Haupt PhD, NYSF, Ryan.haupt@nysf.com

Since 1963, the National Youth Science Camp (NYSCamp) has provided the free opportunity for 2 high achieving students (called “delegates”) from each state to gather in the mountains of Pocahontas County for a world-class STEM-themed outdoor adventure camp. More recently, the National Youth Science Foundation (NYSF), which funds/organizes the NYSCamp, has obtained the National Youth Science Center in Tucker County, to expand STEM opportunities to more West Virginia students and educators. The NYSCenter hosts programming such as summer day camps, educator workshops, and MakerSpace challenges. We’ve recently partnered with WV Science Adventures to offer K-12 STEM summer camps across the state including in Cabell, Kanawha, Fayette, and Tucker Counties. We also host a STEM lecture series, and partner with Project Wet, Project Learning Tree, and Project Wild to provide teacher professional development opportunities. Join our session to learn more about the educational opportunities we can provide you and your students.

Friday, October 28th, 1:30pm-2:30pm

STEM-tastic Projects for Middle and High School Students

Pine

Wendy Peel, Texas Instruments, wpeel@ti.com

Come join TI as we highlight a few of our STEM projects that you and your students can do with your graphing calculator. Learn how to code and fly a drone, design a smart water project and complete other projects that you can do at STEM Camps, during after school programs, after Exams or other STEM events you might host. TI STEM Projects help students learn problem solving skills, the basics of coding, and some engineering. No experience necessary!

Forensic Lesson Plan Assessment Part 1

Birch

Mark Flood, Fairmont State University, mflood@fairmontstate.edu

Deb Hemler, Angela McKeen, Kristy Henson

In this first session, participants will apply the criteria to begin selecting quality, standards-based lesson plans that will be posted on the Fairmont State Forensic Science website for high school forensic science educators to use. This hands-on session will be led by forensic science content specialists and science educators, and will use a collaborative peer model for lesson plan assessment. This is a required session for West Virginia Space Grant Consortium teacher collaborators.



Friday, October 28th, 2:05pm-2:30pm

What is in the Science Center?

Maple

Robert E. Strong, SMART-Center, robert@smartcenter.org

The Intended Audience of this presentation is Preschool through College.

Libby and Robert Strong have recently purchased an 1884, four-story building in downtown Wheeling, West Virginia. Each floor is approximately 2,600 square feet (240 square meters). The first floor will house an interactive Science Store (SMART Centre Market), 1950s style Ice Cream Parlor, and a small West Virginia Natural History Museum. The second floor will be home for the hands-on Science Center (SMART-Center) and Children's Museum.

We would like to have the input of the attendees at the WVSTA Conference to help with the direction, themes, and exhibit contents of the SMART-Center and Children's Museum so that you might visit us on a class field trip. Join Robert E. Strong from the SMART-Center and engage in a give and take session to answer the burning question of "What is in the Science Center". Great Door Prizes at the end!

Go Wild for Vernal Pools! WV Vernal Pool Mapping & Monitoring Project Balsam

Callie Cronin Sams, WV Dept. of Environmental Protection - Watershed Improvement Branch, callie.c.sams@wv.gov

What is a vernal pool? Which wildlife species rely on them for survival? Get a quick primer on these temporary wetlands during this intro to vernal pool ecology. You'll learn how to predict where to find them and take your students to visit a pool. Learn about the WV Dept. of Environmental Protection's new volunteer Vernal Pool Mapping & Monitoring project and future opportunities for vernal pool educator training. Practice classroom activities to introduce and reinforce concepts related to amphibians, watersheds, mapping, helpful apps, and wetland delineations.



Friday, October 28th, 2:05pm-2:30pm (continued)

Radiocarbon Spikes Found in Tree Rings Shed Light on Solar Storms **Spruce**
Meagan Walker, West Virginia University, mrw0044@mix.wvu.edu

Solar proton events (SPE), affect the upper atmosphere and pose a threat to our modern technologies. The recent discovery of spikes in past atmospheric $\Delta^{14}\text{C}$ concentration, first identified in annually dated tree ring series, are thought to be a result of interactions between solar activity and the heliosphere, triggered by SPEs. These $\Delta^{14}\text{C}$ spikes, known as Miyake Events (M12), provide insight into the past frequency and magnitude of SPEs. Developing a history of $\Delta^{14}\text{C}$ spikes, may yield improvements in forecasting future space weather and for risk assessments of severe space-based hazards for modern technological society.

M12 provides a foundation for STEM resources that align with WV teaching standards and could be adapted at many levels and across many areas of earth and space science, chemistry, biology, and physics. By including model testing and parameterization, a module/kit centered on M12, allows students to learn basic concepts of science discovery and a solid basis for research in the field of extreme events.

ACES Coping Strategies for the Classroom **Hawthorne**
Rachel Eades-Gill, Midland Trail High, reades@k12.wv.us

As part two of ACES Training, participants will learn coping activities that promote a calm learning environment for all invested parties. Attendees will practice skills such as focused breathing strategies, progressive muscle relaxation and mindfulness meditation.

What can Kami do for you? **Elm**
Sophie Youngs, Kami, sophie.youngs@kamiapp.com

Get introduced to Kami, the digital classroom hero that brings learning to life. Use your materials and your LMS with Kami to make teaching and grading easy-peasy. No more fighting with the copy machine and no more crumpled up worksheets. Bring your device to dive in!

STEAM-minded WV/STEAM in the Elementary Classroom **Willow**
Keisha Runion Thompson, WV Department of Education, krunion@k12.wv.us

This session will provide a brief introduction to the available resources for STEAM-minded WV. Participants will also learn about planning effective STEAM instruction based around the WV College- and Career-Readiness Standards.

Friday, October 28th, 2:45 - 3:45pm

Exploring Energy Forms and Transformations!

Birch

Wayne Yonkelowitz, National Energy Education Development Project, wyonk62@gmail.com

Learning about the science of energy and energy transformations doesn't have to be complex and intimidating. NEED's Science of Energy stations provide a hands-on approach to experimenting with objects used in student's daily lives. How a toy car, yo-yo, and a balloon demonstrate potential and kinetic energy, using your hands and paperclips to discuss thermal energy and motion energy, how an apple uses chemical energy, and using batteries and a compass to understand the relationship between electricity and magnetism. Stations incorporate scientific processing skills such as making observations, measuring, recording results, compare and contrast, categorize, make predictions, analyze and graph results, and draw conclusions. Each station is designed for students to be able to identify the forms of energy present at various stages of a transformation. The stations include a "What's Happening" section as well, that help to further explain how these energy forms and transformations apply in real life.

WV Save Our Streams: StreamLAB Water Quality Monitoring & Stream Ecology

Balsam

Callie Cronin Sams, WV Dept. of Environmental Protection - Watershed Improvement Branch, callie.c.sams@wv.gov

During the Save Our Streams conference session, you will learn how to set up and plan for a StreamLAB with your class, including study design, safety, and site selection. We will discuss how StreamLAB allows students to engage in meaningful inquiry into their local watershed and community. We will work with Lamotte and Hanna water testing kits that you can use in your StreamLAB. Finally, we will review benthic macroinvertebrate ecology and identification strategies, then practice your ID skills. Those who also participate in the post-conference field trip, will appreciate this macroinvertebrate identification practice using Kahoot!. Participation in both sessions is required if you wish to receive a Save Our Streams StreamLAB kit with a kicknet, trays, magnicubes, and other sampling equipment.

Explore Solar System & Beyond: NASA Astrobiology

Spruce

Anne E. Weiss, NASA Langley Office of STEM Engagement, anne.e.weiss@nasa.gov

NASA recently confirmed the existence of over 5,000 exoplanets orbiting other stars in our Milky Way galaxy, greatly expanding our conception of our place in the universe. What are exoplanets made of? Do they have atmospheres? Could they harbor life? In this session, we'll explore how one hunts for habitable planets, what has been discovered so far, and what that data suggest about Earth's planetary history and the familiar (and not so familiar) life forms that call this blue planet home.

Friday, October 28th, 2:45 - 3:45pm (Continued)

Forensics Share-a-Thon

Pine

Mark Flood, Fairmont State University, mflood@fairmontstate.edu

Kristy Henson, Fairmont State University, Kristy.Henson@fairmontstate.edu

Participants will be encouraged to bring a short forensics lesson to share with other middle school to high school level teachers. This session will allow time for forensics teachers to demonstrate their hands-on lesson that is linked to current science standards. This hands-on session will be led by forensic science content specialists. This is a required session for West Virginia Space Grant Consortium teacher collaborators.

Sensory Consideration in the Science Classroom

Birch

Diana Aston, Cameron Middle/High School, daston@k12.wv.us

The Sensory Considerations in the Science Classroom session will provide educators with insights and ideas on how to effectively address the needs of special education students in general science classrooms.

Research has demonstrated that engaging the senses during lesson activities provides a pathway to deepen understanding, activate the brain, and build connections to previous and new complex science content topics.

Participants will experience meaningful involvement and gain useful information for decrease student stress and anxiety in the classroom, helping them to connect and find real-world relevance to the content.

Diversity in Elementary STEM

Hawthorne

Tiffany Pace, Cross Lanes Elementary, tpace@mail.kana.k12.wv.us

All students should see themselves in STEM stories. They need opportunities to identify with heroes of STEM while learning to appreciate and explore the uniqueness of others. Let's celebrate diversity and inclusivity with Diversity in Elementary STEM. This hands-on session will feature information on how to design STEM learning experiences using picture books with diverse voices. Participants will then explore their creativity through a variety of STEM challenges based upon a selection of these stories. Let's help the next generation of STEM innovators to dream big, create the impossible, and see themselves and others as world changers.

Level Up Your Instructional Materials

Elm

Sophie Youngs, Kami, sophie.youngs@kamiapp.com

Learn how you can easily and quickly level up your existing instructional materials and increase student engagement with built-in tools that are accessible for all. Bring a device to fully participate.

Friday, October 28th, 2:45 - 3:45pm (Continued)

STEAM TAC: Wild About Second Chances

Willow

Angela McDaniel, WVU/WVDE STEAM TAC, ammcdani@k12.wv.us

Cliff Sullivan, WVU/WVDE STEAM TAC, csullivan@k12.wv.us

This session provides an overview of the WVDE/WVU STEAM Technical Assistance Center (STEAM TAC) and the free STEAM immersion experiences offered to West Virginia students in grades 6-8. STEAM TAC specialists will guide participants through an engaging, hands-on engineering design lesson to plan and build hydraulic-powered prosthetics for injured birds. Join us to discover how to incorporate a STEAM approach to learning for increased student engagement while meeting West Virginia College and Career Readiness content standards.



Friday, October 28th, 4:00-5:00pm

Share-A-Thon: Climate Change Activities

Pine

Kathryn Williamson, West Virginia University, kewilliamson@mail.wvu.edu

Jamie Shinn, West Virginia University; **Debbie McKay**, WVU HSTA; **Jonathan Benedum**, Liberty High School; **Aubrey Watring**, Preston High School; **Michele Martin**, Harrison County Schools; **Deb Hemler**, Fairmont State University; **Josh Revels**, NASA IV&V; **Amy Owens**, West Virginia University

During this climate change Share-A-Thon, come and see standards-based science activities to engage your students in climate change learning and action. Drop in to learn about the WV Climate Change Professional Development (WVCCPD) project. Learn from teachers who have implemented climate change lessons in their classrooms across all grade bands. Resources include Open Educational Resources, online games, paper-based investigations, and concrete strategies for effective climate communication.

Elementary Engineering Design Challenges With Purpose

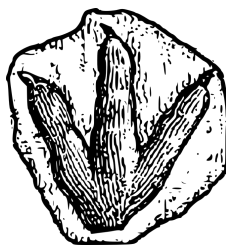
Birch

Suzanne McDonald, WVU, smcdonal@mail.wvu.edu

Emma Gardner, CSTE STEM Specialist, emgardner@mail.wvu.edu

Dr. Jen Robertson-Honecker, STEM Specialist, Jen.Robertson@mail.wvu.edu

In this hand-on session, K-5th grade teachers will be provided demonstrations of engineering challenges as well as access to free engineering design resources and materials for their classrooms. Standards-aligned engineering design challenges were tested with elementary students in classroom and out-of-school-time settings as tools for enhancing student engagement. A story provided elementary students with context for design challenges. For each of the five lessons, students were given time to explore the topic and test materials, emphasizing the importance of iterations and prototype revision to increase persistence and resiliency. Evaluation results indicated growth mindset and interest in science improved for 12% of participants (n=563).



Friday, October 28th, 4:00-5:00pm (Continued)

Hosting a Community Science Night

Hawthorne

Alicen Adkins, Moorefield Middle School, alicen.adkins@k12.wv.us

Bonnie Crites, Moorefield Middle School, bonnie.crites@k12.wv.us

Join us for tips, tricks, and resources on how to host a successful Science Night event for your school and community. Participants will receive organizational tools to help prepare for hosting an event and will participate in a mini- science night experience, complete with fun hands-on activities!

Time to Get Ready for the Upcoming Solar Eclipse Double-Header!

Elm

Dennis Schatz, Institute for Learning Innovation, DSchatz@pacsci.org

Ryan Haupt, National Youth Science Foundation, ryan.haupt@nysf.com

There are two solar eclipses coming up in 2023 and 2024! This session will help educators prepare for eclipse-related formal and informal education and public outreach. The session will introduce attendees to effective resources available to K-12 teachers, how to best distribute these resources, and especially how to inform administrators about the value of students safely observing the eclipses. Other topics will include lessons learned from the experience of working with K-12 teachers, principals, and students during the 2017 eclipse and how improve on those practices for 2023/2024. We'll also give hands-on instructions for how to develop activities using ordinary items to make models and explore common questions that kids have. And we'll outline important ways for kids and their families to view a solar eclipse so they can best understand and experience the awesome experience of witnessing "when the sun goes dark".

Escape Rooms In A Hurry!

Willow

Holly M Cain, Wetzel County Schools, hcain@k12.wv.us

We all know Escape Rooms and Breakouts are a great way to maintain student interest and engagement. They are adaptable to any content area, as well as any skill level, and can be used at any stage of a lesson. However, setting up all the clues and puzzles can be time consuming and overwhelming. This session focuses on websites, online resources, and tech tools that can help with clue and puzzle creation and cut down on the time spent designing Classroom Escape Rooms and Breakouts. This session will also include ways to incorporate technology into physical Escape Rooms and Breakouts without going the full digital route.

Saturday, October 29th, 8:30am–8:55am

JASON Argonauts Reunion/Information

Birch

Teresa Barton, PikeView High School, tbarton@k12.wv.us

Calling all former JASON Argonauts! This will be a time for all Argonaut alumni to meet and for others to learn about the Argonaut program.

Making Science Learning Lifelong, Lifewide, and Lifedeeep

Elm

Dennis Schatz, Institute for Learning Innovation, DSchatz@pacsci.org

Ryan Haupt, National Youth Science Foundation, ryan.haupt@nysf.com

What's the value of out-of-school STEM learning in inspiring lifelong interest in STEM? This lecture will explore the evidence for the impact of out-of-school (informal) STEM learning. Lifelong learning is about making science learning something people engage in throughout their lives. Lifewide learning means making science learning something people experience in a variety of situations through the day/year (e.g., school, home, afterschool, museums/science centers, summer camp). And lifedeeep is about encouraging people to engage in science learning at a level that is right for them (e.g., in the media, participating in a citizen science project, becoming an amateur astronomer, or even pursuing a career in the sciences). Updating our model of STEM education to embrace both in-school and out-of-school learning has policy and funding implications as well, and the challenge is how to best increase support for schools while also expanding it to foster lifelong STEM learning as well.

STEAM Trek - A free, fun learning adventure

Willow

Deana White, West Virginia Alliance for STEM and the Arts, deanaw.wvallstar@gmail.com

Josh White, West Virginia Alliance for STEM and the Arts

Tamara Westfall, WV Department of Education, tamara.westfall@k12.wv.us

West Virginia Alliance for STEM and the Arts (WV All STAR) has developed a free, web-based interactive game platform “STEAM Trek” which is now available to students, educators, and the public. STEAM Trek promotes and shares the educational resources and opportunities of over 22 different contributors from WV and beyond, and includes over 250 unique links to material including but not limited to virtual tours, lectures, student support material (e.g. career exploration and college readiness resources), activities, films, etc. Users are incentivized to explore and learn via free play and guided treks, earning virtual coins which can then be redeemed for virtual prizes to be used in fun ways in the game. Educators and learners can also contribute to the game by sharing their own created content as exemplified by Tamara Westfall’s Poca High School coding classes’ contributions found in the Arcade portion of the game.

Saturday, October 29th, 8:30am–9:30am

WV Science Standards and Assessment Updates

Maple

Erika Klose, WV Department of Education, eklose@k12.wv.us

Timothy Butcher, WV Department of Education, tbutcher@k12.wv.us

This session provides an opportunity for educators to ask questions and receive updates regarding state science policies, as well as an update and demonstration of resources related to the West Virginia General Summative Assessment in Science for Grades 3-8.

When It Rains... It Pours

Balsam

Josh Revels, Fairmont State University/ NASA IV&V ERC, jrevels@fairmontstate.edu

Climate Change is no exception to the proverb "When it rains it pours". Earth systems, when out of balance, experience feedback loops that more often than not intensify the consequences of global warming. In this session you will learn some age-adaptable activities that uses NASA Satellite data to create precipitation and water mass concentration graphs, which can be used to examine aspects of the Earth's water cycle.

STEM for the "Everyday" Science Teacher

Spruce

Jeff Lukens, Roosevelt High School, Sioux Falls, SD, jeffreylukens0613@gmail.com

The integration of science and mathematics should be a natural thing, and it is the foundation of any good STEM teaching. Data collection is crucial for learning in all science classes and the analysis of data is a great way to bring math into the science classroom. This session will involve all participants in data collection activities that can be done in any classroom, regardless of class size or student backgrounds. Common, easy to use technology will be used for the activities and this session is sure to motivate teachers to collect and analyze data with their students--and then share their results with their math colleagues.

Introduction to Bloodstain Pattern Analysis

Pine

Roger Jefferys, West Virginia University Department of Forensic and Investigative Science, rjeffery@mail.wvu.edu

The workshop will introduce students to the fundamentals of bloodstain pattern analysis (BPA) including terminology, classification, processing methodologies, motion and directionality, alpha, gamma, and beta angles, and areas of convergence/origin.

Saturday, October 29th, 8:30am–9:30am (Continued)

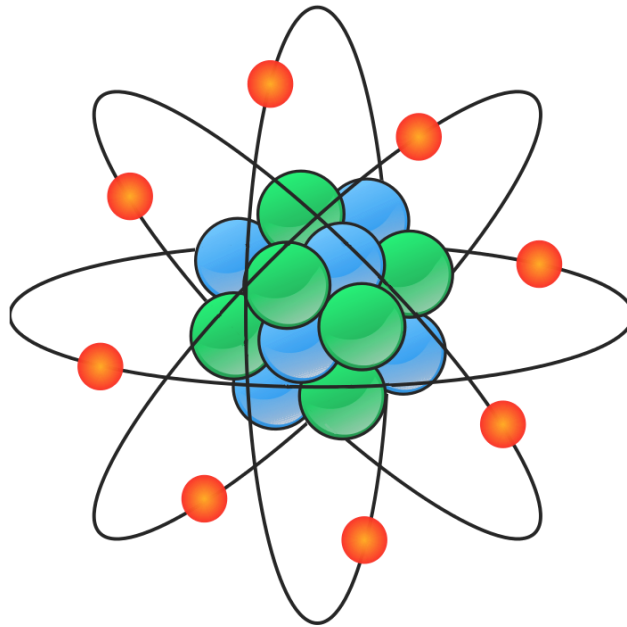
**Using Passionate High School Students as STEM Teachers
in Elementary Schools**

Hawthorne

Chuck Trautwein, Garrett County Public Schools, chuck.trautwein@garrettcountyschools.org

Natalie Warne, Garrett County Public Schools, natalie.warne@garrettcountyschools.org

Whether it's VEX, SkillsUSA or FIRST, these youth robotics teams instill a passion for all things STEM in students who compete in these programs. Garrett County Public Schools (GCPS) uses its high school robotics students to help ensure elementary students gain the skills they need for their success in STEM. Every year, passionate GCPS high school robotics students teach highly engaging and impactful lessons to every third, fourth, and fifth grade student in Garrett County. Our session will feature the “gadgets” our students use to teach these lessons which include a LEGO Top Spinner, a set of five cards that help teach the rudiments of binary numbers, AND, a set of LEGO calipers that exactly determine the Golden Ratio. This has been such a huge “Win-Win” success in Garrett County, our students are excited to share about our program... you might even leave with your very own awesome “gadget”!



Saturday, October 29th, 9:05am–10:45am

Forensic Lesson Plan Assessment Part 2

Birch

Mark Flood, Fairmont State University, mflood@fairmontstate.edu

Kristy Henson, Deb Hemler, Angela McKeen

In this second session, participants will apply the criteria to continue selecting quality, standards-based lesson plans that will be posted on the Fairmont State Forensic Science website for high school forensic science educators to use. This hands-on session will be led by forensic science content specialists and science educators, and will use a collaborative peer model for lesson plan assessment. This is a required session for West Virginia Space Grant Consortium teacher collaborators.

Saturday, October 29th, 9:05am–9:30am

Preparing For Your Best Eclipse Viewing in 2023 and 2024

Elm

John Tudek, WVGES, jtudek@wvgs.wvnet.edu

Cassie Kelly Tudek, Monongalia County Schools, cmkelly@k12.wv.us

The Great American Eclipse will arrive on April 8, 2024 and an annular eclipse will occur on October 14, 2023 (three weeks before next year's WVSTA). Therefore this is the year to start preparing for the eclipses! In this talk we will go over strategies for eclipse observation as well as equipment necessary for showing the eclipse to groups of people. Weather permitting, there will be a demonstration of low cost eclipse viewing techniques. Time permitting, there will be a discussion about education opportunities for the eclipse.

Dream It, Design It, Make It: Distributing Makerspace Technology To Eastern Panhandle Teachers And Librarians To Foster Innovation And Entrepreneurship In Rural And Underserved Students

Willow

Maya Paul, National Youth Science Foundation, maya.paul@nysf.com

Ryan Haupt, National Youth Science Foundation, ryan.haupt@nysf.com

Since last August, the National Youth Science Foundation in partnership with Eastern WV Community and Technical College has been working to distribute MakerSpace technology to schools and libraries around the eastern panhandle (Counties: Grant, Hardy, Hampshire, Mineral, Pendleton, and Tucker). The goal was to find educators who were interested in MakerSpace technology, working with them to identify and provide technology within certain categories (e.g., 3D printing, drones, programming robots, etc.), and offer training so provided technology could be used to the maximum benefit of their students. The project culminated in the BRITE (Breakthrough Revolutionary Innovation Technology and Excitement) Challenge held at the National Youth Science Center where 19 teams presented their ideas to expert judges and were awarded amazing prizes for their efforts. This project demonstrates how rural students can benefit and be excited by state-of-the-art equipment and be inspired to come up with bright ideas to shape the future.

Saturday, October 29th, 9:45am–10:45am

Introducing Plate Tectonics With Colorful Data Maps

Maple

Stephen C. Kuehn, Concord University, skuehn@concord.edu

Colorful maps of landscapes, earthquakes, ocean floor rock ages, and volcano locations can be a powerful way to explore our planet while modeling the process of discovery that led to the theory of plate tectonics. This hands-on session will work with wall-size maps and other resources to explore major characteristics of plate boundaries and will discuss ways to scaffold the activity for different grade levels.

Comics + Phenomenon + CER = Scientific Literacy

Balsam

Mike, Plasma Games, mike@plasma.games

Julie Cozzie, Plasma Games, julie@plasma.games

Scientific literacy goes beyond understanding and requires students to make a claim that is supported with fact and reasoning. By incorporating comics, anchoring phenomenon, and repetition, we are taking these CER charts to the next level! Bonus: Leave with an all inclusive access code to a 3D game based platform!

Sea-Level Rise Classroom Activities

Spruce

Josh Revels, Fairmont State University/ NASA IV&V ERC, jrevels@fairmontstate.edu

Looking to build your confidence when teaching concepts such as global warming and climate change? These classroom activities are sure to help you address misconceptions but also provide an engaging avenue for learning about physical and earth science content such as specific heat capacity, thermal expansion, sea-level rise and understanding scientific data. We will complete two NASA JPL lessons during this session, which is intended to give you familiarity with the activities so that you'll want to use the provided lesson plans to replicate the activities in your classroom.

Analysis and Interpretation of Evidence at Crime Scenes

Pine

Roger Jefferys, WVU Forensic Science, rjeffery@mail.wvu.edu

This workshop will cover the analysis and interpretation of crime scene evidence, focusing specifically on bloodstains. Students in this course will look at how bloodstains are classified and subsequently used in the reconstruction of bloodstained scenes. In addition, students will analyze and interpret various bloodstains and bloodstain patterns.

Saturday, October 29th, 9:45am–10:45am (Continued)

Extreme Weather Challenge: Hurricanes

Hawthorne

Tiffany Pace, Cross Lanes Elementary, tpace@mail.kana.k12.wv.us

The forecast is calling for extreme weather! But what is extreme weather? In this session we will explore extreme weather through an interactive game and virtual field trips. We will then take a look at the extreme weather of hurricanes. But the fun doesn't stop there! You will use your knowledge of hurricanes and the given supplies to design and build a structure to withstand a hurricane! Will your structure remain standing? Learn how to share your results with a green screen newscast! Grab your raincoat and get ready for EXTREME learning and EXTREME fun!

Vocab Poems in the Science Classroom

Elm

Sophie Youngs, Kami, sophie.youngs@kamiapp.com

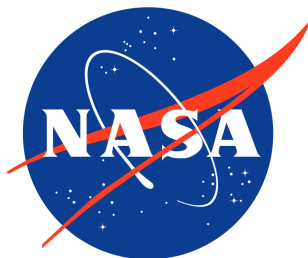
Do your students struggle to use and remember science vocabulary? Then come to this interactive session to participate in three vocabulary based poetry activities. Bring your device, and if there is time, then we will also play a vocab game!

Making Space with NASA

Willow

Emily Helton, NASA IV&V ERC / Fairmont State University, ehelton@fairmontstate.edu

Students learn best when the content they are expected to know aligns with their existing knowledge and experiences in a way that is meaningful to them. Using NASA's public domain images as a jumping off point to create analogy models is one way to connect what they already value to what we want them to learn. Analogy models don't look anything like what they are modeling, but instead create analogies for function. Dive in and let's make some space for student identity!



Saturday, October 29th, 11:00am-12:00pm

Photographic Documentation of Crime Scenes

Pine

Roger Jefferys, WVU Forensic Science, rjeffery@mail.wvu.edu

This workshop will introduce students to the fundamentals of photographing a crime scene, focusing specifically on bloodstains. The topics covered in the workshop will include camera functions, photographic methods, flash photography, and more.

Explore Wild & Wonderful Aquatic Ecosystems

Birch

Tomi M. Bergstrom, WV Dept. of Environmental Protection, tomi.m.bergstrom@wv.gov

Are you looking for hands-on, inquiry-based learning, interdisciplinary lessons for teaching Environmental Science?

We have interactive, objective, science-based activities that have been localized to West Virginia's wild and wonderful ecosystems. They were written to teach about the impacts of invasive species, pollution, and climate change on the stability of an ecosystem, how population growth affects land use, and to prompt investigation of predator/prey relationships. This is not a sit and listen session, but a get up and participate session! Leave our session with a smile, and the knowledge and tools you need to lead these activities in your classroom. Two activity kits will be given away as part of the training. Grade level adaptations will be shared and discussed as part of the session, but it is most suitable for fourth through twelfth grade educators.

Activities will be presented from three different Project WET Educator Guides, offering standard correlations to English Language Arts, Math and the Next Generation Science Standards. The guides adhere to the National Science Standards Framework, STEM Educational Coalition objectives and NOAA Ocean Literacy Standards.

Explore Earth: Monitoring Microplastic Pollution from Space

Hawthorne

Anne Weiss, NASA Langley Office of STEM Engagement, anne.e.weiss@nasa.gov

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

Saturday, October 29th, 11:00am-12:00pm (continued)

STEAM Trek - A Fun Learning Adventure

Elm

Deana White, West Virginia Alliance for STEM and the Arts, deanaw.wvallstar@gmail.com

Josh White, West Virginia Alliance for STEM and the Arts

Tamara Westfall, Program Specialist, WVDE, tamara.westfall@k12.wv.us

West Virginia Alliance for STEM and the Arts (WV All STAR) has developed a free, web-based interactive game platform “STEAM Trek” which is now available to students, educators, and the public. STEAM Trek promotes and shares the educational resources and opportunities of over 22 different contributors from WV and beyond, and includes over 250 unique links to material including but not limited to virtual tours, lectures, student support material (e.g. career exploration and college readiness resources), activities, films, etc. Users are incentivized to explore and learn via free play and guided treks, earning virtual coins which can then be redeemed for virtual prizes to be used in fun ways in the game. Educators and learners can also contribute to the game by sharing their own created content as exemplified by Tamara Westfall’s Poca High School coding classes’ contributions found in the Arcade portion of the game.

WVU Extension 4-H STEM Challenge Kits

Willow

Emma Gardner, WVU Extension 4-H Youth Development, emgardner@mail.wvu.edu

Suzanne McDonald, WVU Extension 4-H Youth Development, smcdonal@mail.wvu.edu

The 4-H STEM Challenge is an annual initiative to inspire kids everywhere to take an interest in science, technology, engineering, and math through experiential learning. Designed for 3rd-8th grade youth, the 4-H STEM Challenge kits contain up to five hands-on lessons on topics ranging from computer science to ocean exploration or living on Mars. Kits can be borrowed from most local county WVU Extension offices or purchased online. West Virginia Standards alignment information is available for each kit upon request.

Plan to join us for Future Conferences

October 26th-28th, 2023

Oglebay Resort

Wheeling, WV



Exhibitors

3Z's Instruments, LLC.

<http://3zslc.com/>
Mr. Tim Zickefoose
Tim@3zslc.com
(800) 247-2726

Amplify Education

amplify.com
Molly Catalano
mcatalano@amplify.com
Melissa Webb
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Biozone Corporation

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Mark Temons
Pamela Temons
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by the Robin

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bytherobin on Facebook

McGraw Hill

<https://www.mheducation.com/>
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Plasma Games

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Mike Tuggle
mike@plasma.games

Savvas Learning Company

<https://www.savvas.com/>
Amanda Ansell
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SMART Centre Market

www.smartcenter.org
www.smartcentremarket.com
Robert Strong
robert@smartcenter.org
Libby Strong
libby@smartcenter.org
304-23-DINOS (304-233-4667)

Exhibitors (continued)

<p>Texas Instruments</p> <p>www.education.ti.com Wendy Peel wpeel@ti.com 214-567-6705</p>	<p>West Virginia State University 4-H</p> <p>www.wvstateu.edu/public-service/wvsu-extension-service/4-h-youth.aspx</p> <p>Tiffany Ward Tiffany.Ward@wvstateu.edu</p>
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Non-Profit Vendors

Non-Profit Exhibitor	Website
Concord University	https://www.concord.edu/
First2 Network	https://first2network.org/
Garrett County Public Schools Robotics Program (GaCo)	chuck.trautwein@garrettcountyschools.org
June Harless Center at Marshall University	https://www.marshall.edu/juneharless/
NASA IV&V ERC/Fairmont State University	https://nasaivverc.org
West Virginia Alliance for STEM and the Arts	deanaw.wvallstar@gmail.com
WVDE STEAM TAC/West Virginia University	https://steamtac.wvu.edu
W.V. Dept. of Environmental Protection	https://dep.wv.gov
West Virginia University C. Eugene Bennett Department of Chemistry	https://wvu.edu
WV SPOT	https://wvspot.org

Special Thanks

This conference would not be possible without the above and beyond actions of many individuals and organizations. Please make an effort to give special thanks to:

- WV SPACE GRANT CONSORTIUM for providing the Next Generation Science Standards: Forensic Science Professional Development scholarships for 10 teachers to attend the conference.
- WV SPACE GRANT CONSORTIUM for providing travel funds for WV 2 student projects participating in the International Science & Engineering Fair
- WVSTA for sponsoring the conference bags.
- WVSTA for providing the name badge holders
- WVSTA for sponsoring the programs.
- WVSTA for sponsoring Breaks.
- VENDORS for sponsoring the Vendor Reception
- PAEMST for sponsoring the Dessert Reception.
- FAIRMONT STATE UNIVERSITY for printing registration materials.
- Gordon Swiger and Delaney Mohr for their tireless work on the registration materials.
- ALL THE GENEROUS VENDORS that supplied door prizes.
- ALL OF THE PRESENTERS who prepared and shared their passion for science education;
- ALL who made tours possible and helped to make this a great conference; and
- ALL of you who attended, because without attendees, there is no conference!

A state conference is a huge undertaking and is the work of many people. The cooperation and helping hands that have been extended to WVSTA and

the conference committee have been invaluable. Thank you to everyone who made this conference possible.

WVSTA 2022 Art Contest Winner



Zoey Vaughn
Winfield Middle School
Teacher: Melinda Owens

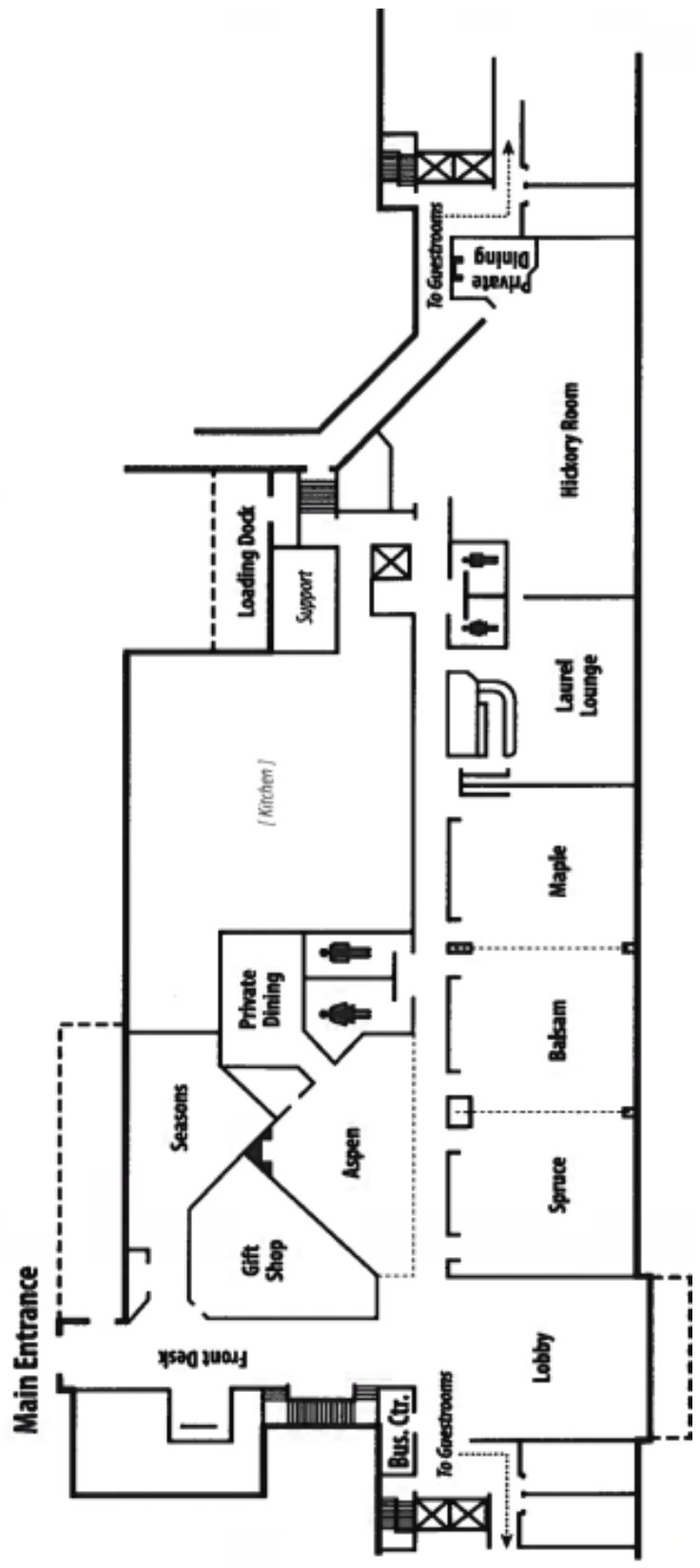
*CERTIFICATE OF
ATTENDANCE*

Presented to

for Participation in the
West Virginia Science Teachers Association Conference
October 27-29, 2022
Canaan Valley Resort in Davis, WV

Josh Revels
2020-22 WVSTA President

Dr. Deb Hemler
WVSTA Executive Director



NASA EDUCATION RESOURCE CENTER



Did you know NASA is sending a drone the size of a minivan to Titan? The Dragonfly Mission will launch in 2026, but your students can engage with educational drones today, via our newest competitive robotics program: Aerial Drones!

VEX • FIRST • and now the Aerial Drone Competition

If you haven't had a chance to visit our new website, use your phone to scan the QR code at right. All of our programs are now organized in one place, with thematic resources, signups for our STEM events, and detailed info on our kits.

Loan and Learn • Student Webinars • STEM Events



WWW.NASAIVERC.ORG



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