



ISSN 1945-7405
<http://www.VAST.org>
Check the web for news, conference updates, registration, and forms.

The Science Educator

Summer 2015 A Publication of VAST, The Virginia Association of Science Teachers Vol. 64, No.1

Register Today for the 2015 VAST PreCon and PDI

VDOE Superintendent's Memo Encourages VAST Opportunity as Part of YOUR Professional Development Plan

Are you aware of the new Professional Development requirements adopted by the Virginia Department of Education this July that designate the number of points a teacher may earn by attending a workshop, institute or seminar? The new manual defines the activities and the required time spent doing the activity.



Attending the VAST PDI is an effective way to build your professional portfolio and to increase your skills and experience as an educator. Being a presenter earns you even more points than just attending. Join your colleagues this fall at the VAST Professional Development Institute (PDI).

See page 3 for an excerpt from the new manual.

PreCon: Donna R. Sterling Institute

Team with Fellow Teachers and an Administrator to Achieve Excellence

The VAST PDI will feature the Donna R. Sterling Institute, **Uncovering Student Thinking in Science Through Formative Assessment** for the first time this year. In this one day workshop, participants will learn how to use formative assessment probes to uncover and analyze student thinking about key science concepts; practice formative assessment strategies that inform teaching and deepen students' understanding of science content; and apply techniques that weave assessment into the



Dr. Donna R. Sterling 1948-2014

process of instruction and learning. Plan to attend, preferably with your team of three teachers and an administrator. Registration for the preconference may be added to your PDI registration and special fees are available for just the preconference or for your team of three teachers and an administrator.

Registration Price includes 1 free book, lunch, and access to short courses as well as speaker Thursday night!

See more PreCon information on page 8.

General Session Speakers Promote Science Literacy



Dave Burgess



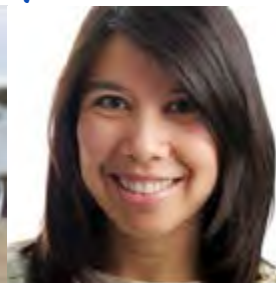
Baruti Kafele



Frederic Bertley



Shah Selbe



Gwyneth Card

New Speaker

Read more about all five of this year's General Session speakers on pages 9-10.

From the Executive Director



Have You Made a Professional Development Plan?

IT's time to earn Recertification Points and even the bonus points that some of your divisions are requiring.

Just for attending you can earn points so why wait?

IT's time to run into the principal's office and invite him or her to attend the PreCon with you; then you can stay for the rest of the events.

Just think, together you can be the driving force to:

Design Inquiring Minds by Uncovering Student Thinking in Science.

Your SOL scores will shine when your students can question, engage, integrate with math, and descriptively write about it. Talk about authentic assessment!

The General Assembly will be coming into your classroom asking you to speak to them about how you are creating the young scientists and engineers of the future. So run don't walk and get your principal on board.

We look forward to seeing you and your team in November.

Susan Booth, EdS



Next Year's PDI Doubletree by Hilton Hotel, Williamsburg, November 15 - 20, 2016 Theme: Faces of Science in Virginia

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From the President:



From the President:

Welcome back to school! I can't believe how fast this summer has flown by! It seems like only yesterday June was here and summer was just beginning! In this edition of our VAST newsletter you will find all things related to our annual Professional Development Institute.

This year's PDI will be held at the Westfields Marriott in Chantilly, VA. We hope you will be able to join us! This year's theme is Designing Inquiring Minds. As educators, we know The hallmark of critical thinking is an inquiring mind. Good thinkers are good questioners. What they see, read, hear, or engage with results in questions. If good thinkers are good questioners, then are good questioners good thinkers? Absolutely they are and science education plays a significant role in the development of critical thinkers! Designing inquiring minds in our students begins with the teacher and the practices he or she uses in the classroom. Instructional strategies become the tools to model how to think and ask questions. Assessment practices help teachers to design instruction to continue to move students along in their journey towards developing an inquiring mind. Books become resources students use to find answers to questions they ask and infusing writing across the curriculum using science experiences provides students with a way to make their thinking visible. This year's professional development institute will provide learning opportunities for teachers to develop the ability to engage students in effective science practices while encouraging the growth of an inquiry mindset in our students. I look forward to meeting all of you and seeing you in November!

Jenny Sue Flannagan, Ed.D.
VAST President

Virginia Licensure Renewal Manual July 1, 2015

Professional Conference A professional conference is defined as any formal meeting, workshop, institute, or seminar of four or more hours which addresses educational concerns through objectives such as upgrading skills and knowledge, providing information, and/or providing motivating activities for educators or students.

A. Maximum number of points: 45

B. Point value assignment: 1) Participation - 5 points per

day 2) Presentation - 15 points per topic presentation.

Points may be assigned for only one presentation on the same topic per validity period.

C. Criteria: 1) Must be four or more hours in length. 2)




Must include only time spent in those portions of the conference program that contribute to the participants' professional knowledge, competence, performance or effectiveness in education.

See page 1 for more.



The **Toshiba/NSTA ExploraVision** competition for K-12 students engages the next generation in **real world problem solving** with a strong emphasis on **STEM**. ExploraVision challenges students to envision and communicate new technology 20 years in the future through **collaborative brainstorming** and research of current science and technology.

Beyond engaging your students in problem solving, team-based learning, critical thinking, and communication skills, ExploraVision aligns with the **Next Generation Science Standards**.

-  1-800-EXPLOR-9
exploravision@nsta.org
-  Toshiba Innovation
-  @ToshibaInnovate

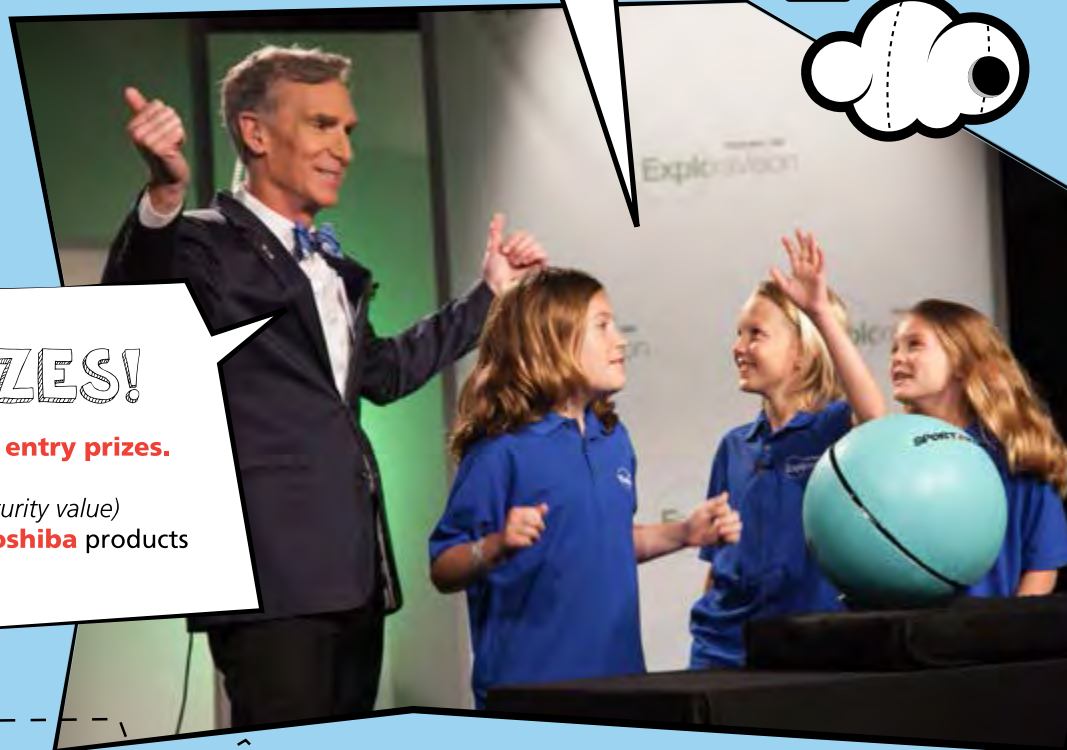
WIN PRIZES!

ALL students receive entry prizes.

Up to **\$240,000** (at maturity value) in savings bonds and **Toshiba** products for winning students.

Find out more about ExploraVision's 24th Anniversary **TEACHER PRIZE** at www.exploravision.org/scienceeducator

THE SCIENCE OF
A-HA!



TOSHIBA
Leading Innovation >>>

NSTA

Through **Toshiba's** shared mission partnership with **NSTA**, the Toshiba/NSTA ExploraVision competition makes a vital contribution to the educational community.

2015 VAST Field Trips

Register Today



Janelia Farms: Dr. Maryrose Franko, Science Program Manager, will provide an introduction of the HHMI Research Facility and a walking tour (4 hours) Limit: 15. Cost \$24.



Janelia Farms



Great Falls National Park

Geology of Great Falls National Park: Meadowlark Park Staff will lead a field trip to the Falls to interpret the unique geology of the Fall (4 hours). Limit 15. Cost: \$36.

Chesapeake Bay Foundation Stream Side (Site TBD) **Field Investigation** led by Bill Portluck to conduct water quality data collection and analysis and biotic sampling. Limit 18. Cost: \$36.



Chesapeake Bay Foundation Stream Side

Register online when you register for the PDI by going to:

<http://www.vast.org/annual-pdi.html>



COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION

P.O. BOX 2120

RICHMOND 23218-2120

DATE July 7, 2015

TO: Science Educators

FROM: Eric M. Rhoades, Director
Office of Science and Health Education

Barbara Young, Science Specialist
Office of Science and Health Education

Jim Firebaugh, Science and Mathematics Specialist
Office of Science and Health Education

SUBJECT: 2015 Virginia Association of Science Teachers Professional Development Institute

The Virginia Association of Science Teachers (VAST) has spent the past year planning for the 2015 Professional Development Institute (PDI) that will be held November 19-21, 2015 at the Westfield Marriott, Chantilly, Virginia. This year's VAST PDI supports the Science Standards of Learning (SOL) by offering over 200 concurrent sessions, several field trips, and nationally known keynote speakers. Science educators and administrators will be able to hear exciting speakers, network with fellow science teachers from all over the state, gain new ideas to enhance their content knowledge, and experience cutting-edge technology. The PDI preconference provides educators and administrators the opportunity to participate in a one-day pre-conference titled Uncovering Student Thinking in Science Through Formative Assessment to learn more about this topic as a team or individual.

Educators at every level of science will find many topics of interest with which to build their expertise. VAST, a professional association with over 2000 members, advocates for high-quality science instruction for all students at all levels. The PDI provides an avenue for communication among all members of the science teaching community.

We encourage science educators to take the opportunity to use the VAST PDI as a part of their professional development plan in order to expand and promote excellence in science education, as well as science literacy in Virginia. The VAST PDI provides educators an engaging opportunity to earn recertification points or college credit.

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.



2015 VAST PDI Schedule At-A-Glance

Wednesday November 18, 2015

5:30 p.m. – 8:30 p.m.

VAST Board Meeting & Dinner

Thursday, November 19, 2015

8:00 a.m.-8:30 a.m.

8:30 p.m.-3:00 p.m.

8:30 a.m.-5:00 p.m.

8:30 a.m.-3:00 p.m.

Registration Desk for Pre-Conference/Short Courses Opens

Field Trips

Donna R. Sterling Institute

General Session I: Uncovering Student Thinking in Science Through Formative Assessment.

Presenter: Joyce Tugel.

Registration Desk Opens for Short Courses/Conference

*Session 2: Short Courses 1, 2, 3 **Pre-Registration and tickets required.*

VAST Professional Development Institute Opening

Keynote General Session I: Frederic Bertley, Franklin Institute.

Sponsor: Virginia Space Grant Consortium

Night with the Exhibitors

3:00 p.m.-7:30 p.m.

3:15 p.m.-5:15 p.m.

5:30 p.m.-6:45 p.m.

7:00 p.m.-8:30 p.m.



Friday, November 20, 2015

7:00 a.m.-8:30 a.m.

7:30 a.m.-6:00 p.m.

8:00 a.m.-9:30 a.m.

9:00 a.m.-6:00 p.m.

10:00 a.m.-11:00 a.m.

11:15 a.m.-12:15 p.m.

12:30 p.m.-1:00 p.m.

1:15 p.m.-1:45 p.m.

1:30 p.m.-2:00 p.m.

1:45 p.m.-2:45 p.m.

2:45 p.m.-3:15 p.m.

3:15 p.m.-4:15 p.m.

4:30 p.m.-5:30 p.m.

5:45 p.m.-6:15 p.m.

6:15 p.m.-7:15 p.m.

7:30 p.m.-8:30 p.m.

Continental Breakfast

Registration Desk Open

General Session II- Business Meeting. Keynote Speaker: Baruti Kafele

Exhibit Hall Open Pick up Raffle ticket for Friday's Exhibitor Raffle

Concurrent Session 1

Concurrent Session 2

Ticketed Lunch I (Orange Ticket)

Ticketed Lunch II (Green Ticket)

Exhibitor Lunch (Blue Ticket)

Concurrent Session 3

Exhibit Hall Raffle

Concurrent Session 4

Concurrent Session 5

Meet your Regional Directors. Door Prizes.

Ticketed Dinner

Awards Ceremony

Guest Speaker Gwyneth Card, Janelia Farm HHMI

General Raffle and DJ.

8:45 p.m.-10:30 p.m.

Saturday November 21, 2015

7:30 a.m.-10 a.m.

8:00 a.m.-10:00 a.m.

Registration Desk Open

General Session III VAST Membership Meeting.

Keynote Speaker: Shah Selbe, National Geographic Explorer.

Sponsored by National Geographic: CENGAGE Learning

Exhibits

Concurrent Session 6

Concurrent Session 7

Ticketed Lunch (Yellow Ticket)

Concurrent Session 8

General Session IV Keynote Speaker: "Teach Like a Pirate": Dave Burgess, Dave Burgess Consulting

8:30 a.m.-12:00 p.m.

10:05 a.m.-11:05 a.m.

11:20 a.m.-12:10 p.m.

12:15 p.m.-1:00 p.m.

1:00 p.m.-2:00 p.m.

2:15 p.m.-3:30 p.m.





Dr. Donna R. Sterling

Uncovering Student Thinking in Science through Formative Assessment

Location: Lincoln Forum Auditorium, Westfields Marriott

Time: 8:30 a.m.-3:00 p.m.

Cost:

\$100 with registration to the VAST PDI

\$120 Preconference Only (Thursday)

\$350 Team Registration (3 Teachers + 1 Administrator-Thursday Only)

Description:

Students come to the classroom with preconceptions about how the world works. There is a growing body of research showing if we do not gather and interpret evidence of students' thinking, they will not build a bridge from their existing ideas to new concepts and information. So how do we uncover student ideas in science – and – what do we do once they're revealed?

Join us as we:

- **Learn** how to use formative assessment probes to uncover and analyze student thinking about key science concepts
- **Practice** formative assessment strategies that inform teaching and deepen students' understanding of science content
- **Apply** techniques that weave assessment into the process of instruction and learning

Bio of Speaker: Joyce Tugel provides professional development and consultation services to school districts and science organizations throughout the United States. Her work is primarily focused on the areas of formative assessment, standards and research on learning, and teacher leadership. Joyce is a co-author of two books in the NSTA Press **Uncovering Student Ideas in Science** series and editor of **Notes from the Field – Teaching for Conceptual Change: Uncovering Student Thinking in Science Through Action Research**. Joyce taught high school chemistry and physical science, and was formerly a researcher in environmental biogeochemistry. Joyce serves on the National Science Education Leadership Association's Board of Directors, and has served as the National Science Teachers Association's District II Director and Professional Development Division Director. She is a Fellow of the third cohort of the National Academy for Science and Mathematics Education Leadership. During her accomplished teaching career, Joyce received the Presidential Award for Excellence in Secondary Science Teaching and the Milken Foundation National Distinguished Educator Award.

Session 2: Short Courses

3:30 p.m.-5:00 p.m.

Short Course 1: Engage your students with real world problems. Leaders: Elizabeth Kirk (VCU VISTA) plus an elementary teacher from the VCU VISTA program. Local problems can capture student interest and their desire to know more. Problem-based Learning can be the avenue to guide your design. Come with an idea, and leave with an outline for a unit to use this spring.

Short Course 2: Find your balance: Integrating science and math at the middle school level. Can you integrate science and math without losing your focus? In this session, leaders Laura Domalik (VCU) and a middle school teacher will lead you through activities that integrate mathematics and science and will assist you in developing research-based strategies for seamlessly integrating science and mathematics in your instruction.

Short Course 3: Authentic assessment in middle and high school: Developing and using rubrics. Session leaders Eric Pyle (JMU) and Anne Petersen (Gloucester County) will lead you through a workshop on developing and using authentic assessments in middle and high school science classrooms. Come with an idea for a rubric or two that you want to work on!

Session 3: Keynote Session and Opening of the 2015 VAST Professional Development Institute 5:30 p.m.-6:45 p.m.

Speaker: Dr. Fredrick Bentley, The Franklin Institute

In this presentation, Dr. Bentley will discuss the progress of science, technology, engineering and mathematics (STEM) and the impact of this scientific and technological revolution on our society. Building off of Moore's Law, the presentation will showcase cutting edge innovations and discoveries from scientists and engineers around the world that can solve some of the world's greatest challenges and provide hope for future generations. From nanotechnology and computer science, to genomics and bioengineering, Bentley will take you through a tour-de-force of technological advances. Despite these incredible STEM resources, and the ever-growing dependency on science and technology, as well as, the increasing career diversity and employment opportunities, there simultaneously exists massive general illiteracy about STEM. Dr. Bentley discusses this duality and challenges us as educators, to think about how to positively impact the current and next generation of students around STEM. The role for teachers in developing basic science literacy skills in the k-16 space will be discussed.

General Session Speakers

Kathy Frame,
VAST President-elect



Thursday, General Session 1 Keynote Speaker

Dr. Frederic Bertley

Senior Vice President of Science and Education, The Franklin Institute

Sponsored by the Virginia Space Grant Consortium

As the Senior Vice President of Science and Education of The Franklin Institute, scientist and educator Dr. Frederic Bertley oversees the Science Department along with other departments and programs aimed at improving the quality of science education throughout the K-16 population as well as improving science literacy for families and the non-scientist adult population. Dr. Bertley oversees both research-based projects as well as program development and implementation including: Gender, Adult Learning and Community Engagement; K-12 Professional Development; Learning Technologies, Youth Programs (STEM Scholars, Partnerships for Achieving Careers in Technology and Science (PACTS) and The Franklin Institute's magnet high school, Science Leadership Academy). Dr. Bertley also oversees the PECO Energizing Education Program (PEEP) and founded and directs the "Color of Science" which highlights the fantastic contributions of women and persons of color to modern day science and engineering. Frederic also directs the prestigious Franklin Awards Program, the long-running Journal of The Franklin Institute and the Institute's international educational efforts including projects in Africa and South America.



Frederic Bertley



Friday, General Session II. Keynote Speaker

Baruti Kafele

Principal

Recipient of the National Alliance of Black School Educators Hall of Fame Award, the New Jersey Education Association Award of Excellence and the prestigious Milken National Educator Award and best-selling author, Principal Baruti Kafele is ON FIRE! He has distinguished himself as an award-winning educator, an internationally-renowned speaker and a best-selling author. As a middle and high school principal, he led the transformation of four different urban New Jersey schools, including "The Mighty" Newark Tech, which went from a low-performing school in need of improvement to national acclaim, which included U.S. News and World Report Magazine recognizing it as one of America's best high schools.

An internationally-renowned education speaker and consultant, Principal Kafele is sought after for transforming the attitudes of at-risk student populations in America. He works with hundreds of schools and districts to assist them with closing what he coined, the "attitude gap" – the gap between those students who have the will to strive for academic excellence and those who do not.

He is a leading authority on professional development strategies for creating a positive school climate and culture, transforming the attitudes of at-risk student populations, motivating Black males to excel in the classroom and school leadership development.



Baruti Kafele

Friday Night Awards Ceremony Speaker

Gwyneth Card, PhD

Neuroscientist, Group leader, Howard Hughes Medical Institute's Janelia Research Campus

By watching fruit flies take flight, Gwyneth Card is trying to learn how the brain makes decisions and then translates those decisions into action. The path that brought Card to this research started at Harvard University, where she conducted an undergraduate research project with Andrew Biewener, an expert in the biomechanics of animal movement. "It was a great experience," she says. "We went to Australia and chased kangaroos and wallabies to study the mechanics of how they hop." As she was conducting this research, Card realized that to truly understand how animals move she would also have to study the body's control center—the brain. That insight brought her to the neuroscience laboratory of Simon Laughlin and Holger Krapp at the University of Cambridge, where she spent a year learning how to conduct brain recordings—or electrophysiology—in house flies. With this expertise, Card returned to her home state of California to pursue a Ph.D. at the California Institute of Technology. There, under the supervision of Michael Dickinson, she started looking at how the fruit fly *Drosophila melanogaster* initiates flight. At Janelia, Card hopes to soon be able to unravel how the fly decides which maneuvers to make while taking off in flight. And such understanding may provide insights into the decision-making process in general, even when it comes to more complex choices. "The decision to have coffee or tea in the morning probably does not come down to a single neuron in humans," says Card. "But the fly has a relatively simple system in comparison and it might be possible to understand decisions at the neuronal level."



Gwyneth Card

New Speaker

General Session Speakers Continued

Saturday, General Session III Keynote Speaker

Shah Selbe

Engineer and Conservation Technologist

National Geographic Explorer

Sponsored by National Geographic

Shah Selbe created FishNET, a platform approach harnessing technology to detect and track illegal, unreported, and unregulated fishing worldwide. He is a satellite propulsion systems engineer at Boeing Space and Intelligence Systems and the Southern California region representative of Engineers Without Borders. Selbe's brainchild, FishNET, was born during a Stanford University independent graduate study program with the Center for Ocean Solutions. "I knew that no single technology could solve every aspect of overfishing, so I developed FishNET as a road map to show an entire technology ecosystem that can be customized to help." He hopes it will dramatically boost the efforts of coastal communities, government regulatory and enforcement agencies, NGOs, and industry. "I bring an engineering perspective to these groups, showing which technologies they could use and exactly how much it will cost." Selbe's open-source, Internet-based platform tackles the problem on three levels: collecting, sharing, and managing information.



Shah Selbe



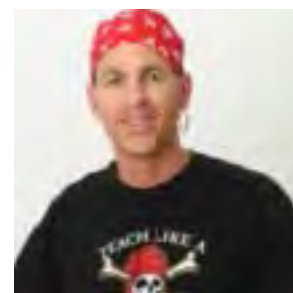
Saturday, General Session IV Keynote Speaker

David Burgess

Consultant and Motivational Speaker

Burgess Consulting

Teach Like a PIRATE keynotes, seminars, and workshops are high-energy, interactive, and entertaining experiences that will leave your staff unbelievably inspired, motivated, and with the practical skills to dramatically increase student engagement. According to Burgess, his presentations are a unique blend of outrageously energetic performance art and magic, mixed with an inspirational message of how and why to become more passionate in the classroom. In addition, don't expect a presentation filled with fluff, theory, and a boring PowerPoint; He demonstrates and models his engagement strategies as if the audience is his class and leaves no doubt about how to apply the techniques in the real-world. Teachers will leave with the ability to create a classroom experience that will have students knocking down the doors to get in.



David Burgess



Next Year's PDI
Doubletree by Hilton Hotel, Williamsburg,
November 15 - 20, 2016
Theme: Faces of Science in Virginia



Hotel Registration - VAST PDI 2015



Westfield Marriott Conference Center

Virginia Association of Science Teachers 2015 PDI

November 19, 2015, Thursday PreCon
November 18-21, 2015, Friday - Saturday

**ROOMS are FILLING
FAST...BOOK NOW!!!!**

Hotel Information - Westfields Marriott **Reservation Deadline October 28, 2015**

Location: Westfield Marriott 14750 Conference Center Drive
Chantilly, VA 20151, Room Reservations

Room rate: \$109.00 for single and double occupancy.

Taxes: 12% occupancy tax (totaling \$122.08).

Parking: Complimentary self-parking, valet parking is \$25.00 for overnight guests and \$15.00 for event day parking.

Check in: 4:00 PM

Check out: 12:00 PM

High-Speed Internet

Guest rooms: Wireless for Marriott Rewards Members. Others: \$12.95/day.

Public areas: Wireless

Meeting rooms: Wired, Wireless

Reserve your room NOW online by clicking the link on the VAST website page:

<http://www.vast.org/hotelinfo.html>

Make your reservation online or call (800) 266-9432, Note: when making reservations online, there is a box for special request and you can add king or queen bed in this box.

The Westfields Marriott Washington Dulles combines elegant hotel accommodations with a sophisticated meeting and wedding venue in Chantilly, VA. The conference center hotel offers convenient access in a retreat like setting and is located near the Dulles Expo Center, Dulles International Airport and a short drive to downtown Washington, DC. The National Air and Space Museum, Virginia wineries and the Wolf Trap Center for Performing Arts are all within 10 miles of this premier Virginia getaway. The hotel also features access to the Signature Westfields Golf Club by Fred Couples. Enjoy a variety of hotel services and amenities, including a fitness center, indoor & outdoor pool and our newly renovated onsite restaurant, Wellington's. The Westfields Marriott hotel is dedicated to helping you make the most of your meeting, conference or wedding reception in Northern Virginia.



2015 VAST PDI: Designing Inquiring Minds Registration

Registration Information

Please Register online.

Online at <http://www.vast.org/annual-pdi.html> Please see the Website for the most up-to-date information about availability, fees and dates. FULL PDI Registration includes admission to all general and concurrent sessions (Thursday night-Saturday afternoon) exhibits, and continental breakfast Friday.

Payment Methods

Secure credit card, check payable to VAST, or purchase order.

Important dates

August 1 to September 5, 2015. Presenter (Member, Nonmember, Commercial) PDI Registration.

April 30 to September 30, 2015. Field Trip Registration.

Early Bird-Registration. Deadline: October 18, 2015

April 30 to October 18, 2015. Early Bird Registration.

Standard-Registration. Deadline: October 28, 2015

October 19 to October 28, 2015. Standard Registration.

Fee Structure

VAST Membership (Due on the anniversary of your subscription) \$25

Thursday Preconference (Includes 1 free book, lunch and access to short courses and Thursday night speaker)

\$100 With paid registration to the VAST PDI

\$120 Preconference Only (Thursday)

\$350 Team Registration (3 Teachers + 1 Administrator-Thursday Only)

**Pre-registration is required for
Precon, short classes, Field Trips and
conference lunches.**

Thursday Short Course Fee

\$5 per Short Course

Field Trip Registration due September 30, 2015

- Janelia Farms: Limit:15. Cost \$24.
- Geology of Great Falls National Park: Limit 15. Cost: \$36.
- Chesapeake Bay Foundation Stream Side: Limit 15. Cost: \$36.

Professional Development Institute (PDI)

- **Presenter** (Member, Nonmember, Commercial) Registration. Deadline: September 5, 2015

Member Presenter Registration: \$155

Nonmember Presenter Registration: \$200

Commercial Presenter Registration: \$150/hour

Early bird-Registration. Deadline: October 18, 2015

Member Registration (this includes Life Members and Retired Members): \$170

Nonmember Registration \$220

Student Registration: \$100

- **Standard-Registration.** Deadline: October 28, 2015

Member Registration: \$205

Nonmember Registration: \$250

Student Registration: \$130

Spouse/Guest: \$100

Saturday Only: \$100

Ticketed Items:

Lunch Friday: \$10 (if you purchase lunch, VAST is matching \$10 fee. This is a plated lunch)

Lunch Saturday: \$10 (if you purchase lunch, VAST is matching \$10 fee. This is a plated lunch)



Ballot

Proposed Additions to VAST's Operating Procedures:

At its March 28, 2015 meeting, the VAST Board approved the following:

Adding the following position on the Board:

Article VII, section 1

***The Regional Director Coordinator is appointed by the President and confirmed by the Board.
The Regional Director Coordinator will be a non-voting member of the Executive Committee and the Board.***

_____Approve _____Do Not Approve

Article VII, sect 2.A.1.c.viii

The Assistant Treasurer/PDI Treasurer is selected by the treasurer and approved by the Board.

_____Approve _____Do Not Approve

Article VII, sect 2.A.1.c.ix

The PDI Director is appointed by the President & approved by the Executive Committee; this position is a voting member of the board.

_____Approve _____Do Not Approve

At the July 25, 2015 meeting, the VAST Board approved the following change to the mission statement:

Mission:

The Virginia Association of Science Teachers (VAST) is a community of science educators whose mission is to:

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

_____Approve _____Do Not Approve

Deadline for receipt of ballots is November 2, 2015.

Return your completed ballot to: Julian Barnes, email: vice.president@vast.org

or mail to: Julian Barnes,
P.O. Box 823, Salem, VA 24153

Dr. Jenny Sue Flannagan, VAST President



Special Friday Night Event

2015 PDI

November 20, 2015
8:45 pm - 10:30 pm



DJ Music AUCTION FUN SCIENCE AUCTION

How about an Auction? There is seldom a better floorshow for a group of science teachers than to see them bidding against each other for that one thing they could really use. The best part is that to participate, it will cost you exactly nothing. That's right – NOTHING! Besides, real money isn't good at the auction!

Do you have a box of glassware sitting in the back of your stockroom that has only a future of collecting dust? Maybe you have an old telescope that you would love to use, if only you could find a replacement part? Wouldn't it be great to be able to trade these and other surplus bits with your fellow teachers of science, and have a good time doing it?

VAST BUCKS

Everybody can visit the exhibitors to receive VAST Bucks! Now mind you, it is not real money! They are VAST Bucks, good only at the auction to be held Friday night, November 20th. When else have you had the chance to burn through hundreds and thousands of other people's money?

HOW TO EARN MORE VAST BUCKS

All that you have to do to "earn" VAST Bucks is to:

- (a) Register for the conference,
- (b) Visit the exhibitors during the open hours of the Exhibit Hall up through Friday evening. You may need to remind them to give you some VAST Bucks!!

A FEW RULES TO FOLLOW

- First, and foremost is safety – if the item is not safe to use, then consider disposing of this item another way. Please don't donate such items. On the other hand, if an item is broken and could be repaired or is useful for parts, tag it as such.
- Second, don't bring chemicals to the auction. There are just too many safety and storage issues, and besides, passing off a problem to someone else just isn't nice!
- Third, you need to make sure that if you are "buying" something, you intend to use it in the teaching of science and not selling it at your next yard sale.
- And Fourth, is permission, make sure that any item you donate is yours to donate OR that you have permission to donate the item for our auction. Finally, you need to make sure that anything you buy you can carry away. We don't deliver and we don't store, so if you bought it, you're taking it that evening!



**VIRGINIA ASSOCIATION OF SCIENCE TEACHERS
PROFESSIONAL DEVELOPMENT INSTITUTE
NOVEMBER 19—21, 2015**

CONCURRENT SESSIONS - Subject to Change

FRIDAY PRESENTATIONS

(organized by grade level)

Engineering for K? Yes?

- Knansie Griffing, Carolina Biological Supply Co.

Yes, kindergartners can master the E in STEM. Engage with us as we complete a variety of engineering projects specifically designed for Kindergarten students and the NGSS.

Content: Engineering

Grade: preK-2

Strand: Beyond Just Books

Jack and the Beanstalk Across the Curriculum

- Kelly Patullo and Donna Gershon, Cougar Elementary School,

In collaboration with the homeroom teacher and the science/social studies teacher, our class delved into a rigorous nine week study that included the writing process, reading a variety of texts, online researching, utilizing Google Forms, using flip cameras to interview peers, the plant life cycle, measurement, and so much more! Applicable state standards were covered and technical life skills were gained throughout this cross-curricular unit. *Work Samples will be included.

Content: Engineering

Grade: preK-2

Strand: Literacy and Science

Designing with Electrical Circuits

- Barbara Adcock, Pocahontas Elementary School

Learn how your students can apply what they know about electrical circuits through several different design briefs! Come away with the ready-made design briefs. Create a design yourself with the provided materials. Learn how to do meaningful lessons in electricity inexpensively!

Content: Engineering

Grade: 3-5

Strand: Instructional Strategies for Science

Interdisciplinary Teaching: A Science Focus in the Classroom

- Jodie Brinkmann, Longwood University

Are you looking for a new way to engage your students in meaningful, student-centered projects to help ignite their passion for science? Then, this is the opportunity for you! Participants will learn how to set the stage for successful interdisciplinary teaching and put the science focus back in the elementary classroom. This workshop will transform your thinking about active engagement, 21st century skills, science integration, and meaningful instructional outcomes for teachers and students!

Content: Math in Science

Grade: 3-5

Strand: Instructional Strategies for Science

A Pathway to Authentic Assessments in Grade 3 Science

- Jason Calhoun, Prince William County Public Schools

This presentation will share the process that Prince William County Public Schools (PWCS) followed from inception to delivery, of a task list that allows teachers flexibility and choice in addressing the grade 3 science alternative assessment requirement. Detailing the work done, we will provide insight into how PWCS is addressing the need for teachers to not only know science, but to do science through authentic assessments. We will share the processes and implementation utilized and the challenges encountered.

Content: General Science

Grade: 3-5

Strand: Assessment For and Of Learning in Science

It's Problem-Based Not Problematic

- Shandra Claiborne-Payton, Virginia State University; Meredith Kier, College of William and Mary; Laura Domalik, Virginia Commonwealth University; and Harold Geller, George Mason University

In today's classrooms, problem-based learning can be unwieldy, but doesn't have to be. In this session elementary teachers will participate in a problem-based lesson that can be used across the curriculum. Teachers will receive handouts to assist them in implementation of problem-based learning.

Content: Engineering

Grade: 3-5

Strand: Instructional Strategies for Science

Learning to Investigate Toys like Scientists

- Robin Curtis, The College of William & Mary; Alma Cheisa, Kiln Creek Elementary School; Colleen Lawrence, Dare Elementary School

Join us to learn how to motivate and engage students to approach investigations like scientists! First, students are challenged to investigate toys in teams. They may research NASA data after predicting how the toys will operate in weightlessness. Each team will then report their findings and demonstrate their toys to the rest of the class. All resources and necessary background information will be provided for you to use this "post-hole" problem in your class.

Content: Physics/Physical Science

Grade: 3-5

Strand: Instructional Strategies for Science

PRESCHOOL - KINDERGARTEN
GRADES 3-5
ELEMENTARY



Friday - NOVEMBER 20 2015

Using Scientific Strategies to Enhance Instruction

- Susan Bardenhagen, VAST Region 4 Director

Encouraging students to be scientific readers, scientific data collectors and recorders, scientific mathematicians, and inquiring researchers infuse Science as an integral piece of elementary instruction. Presenter will share strategies which model a Scientist in action. With this, curious minds are encouraged to become literate scientists and STEM-inspired.

Content: Math in Science

Grade: ELEM

Strand: Instructional Strategies for Science

Creating a New Generation of earners Pk-5

- Knansie Griffing, Carolina Biological Supply Co.

Reflect on the makeup of the Next Generation Science Standards: Disciplinary Core Ideas, Science and Engineering Practices, Crosscutting Concepts, and Performance Expectations. Experience lessons that demonstrate the three dimensional model of learning.

Content: Engineering

Grade: ELEM

Strand: Beyond Just Books

Engaging the Young Scientist with Discrepant Events

- Lawyer Johnson, Sycamore Park Elementary School

In this session you will witness exciting mind blowing discrepant event activities to increase student interest and content knowledge. These activities have been created to dispel everyday misconceptions and to develop the 'thinker' in all of us. You will walk away with ideas and resources to enrich your practice and student learning.

Content: Physics/Physical Science

Grade: ELEM

Strand: Instructional Strategies for Science

Using Mammal Life-Cycle Stories to Explore Science

- Dia Michels, Science, Naturally!

Each baby mammal must grow from total helplessness to self-sufficiency. This lively, hands-on workshop introduces life cycle curricula through engaging mammal stories. The author of "If My Mom Were A Platypus" will show you creative ways to understand how adaptations provide the young with what they need to grow and flourish. We will do activities on baby bat identification, lion tongues, and koala parasites. Have fun and learn as we gain a keen sense of what makes mammals special.

Content: Biology/Life Science

Grade: ELEM

Strand: Beyond Just Books

Infusing S.T.R.E.A.M. into the Elementary School Community

- Robin Orndorff, Alice Bauserman, and Steve Povlish; Ashby Lee Elementary School

The presenters will discuss the school-wide STEM initiatives at Ashby Lee Elementary School. They will discuss how they have successfully infused S.T.R.E.A.M. (Science, Technology, Reading, Engineering, Arts, and Math) into their school community through STEM Nights, Monthly STEM Home Challenges, the Dyson Ideas Box, Engineering is Elementary curriculum, 3D Printing, everyday instruction, and much more!

Content: Engineering

Grade: ELEM

Strand: Instructional Strategies for Science

You could be the Next Elementary Science PAEMST Awardee

- Eric Rhoades, Virginia Department of Education

This year elementary teachers (K-6) are eligible to apply for one of the highest honors in science teaching, the Presidential Award for Excellence in Mathematics and Science Teaching. Learn more about his award program from Virginia awardees and the state coordinator. You could be the next Virginia PAEMST Awardee!

Content: General Science

Grade: ELEM

Strand: None

Sci-Tastic- Activities for Elementary Students

- Trina Spencer, Edith Rudd, Sarah Witiak, and Leslie Whiteman; Virginia State University

How do wiggling worms improve our soil for plant growth? How much kinetic energy is generated by the twists, turns, rolls, and loops of a roller coaster? This session will provide fun and enriching activities that are appropriate for elementary students. These hands-on activities in physics, engineering, chemistry, and biology will inspire your students to think and act like scientists.

Content: Biology/Life Science

Grade: ELEM

Strand: Instructional Strategies for Science

Birds, Bees, and Butterflies: Wings Across the Curriculum

- Mary Van Dyke, Green STEM Learning, Christine Payack, Jamestown Elementary School

Grow native plants to encourage birds, bees, butterflies, and other pollinators on your school grounds. Investigate migratory neotropical birds and Monarchs with programs connected with schools in Central America. Explore ways to integrate cultural and environmental themes across curriculum and target SOLs. Chris Payack, Science Lead Teacher, and Mary Van Dyke, Visiting Horticulturalist at Jamestown ES, share ideas and innovative outdoor teaching strategies that take flight across the curriculum!

Content: Environmental Science

Grade: ELEM

Strand: Instructional Strategies for Science

ELEMENTARY

ELEMENTARY - MIDDLE SCHOOL



VDOE Science Update - Elementary School

- Barbara Young, and Tyler Waybright, Virginia Department of Education

VDOE instruction and assessment specialists offer updates on instruction and assessment resources and programs. Learn about professional development, instruction, and assessment resources available to elementary school science teachers.

Content: General Science

Grade: ELEM

Strand: 🖐️ Instructional Strategies for Science

Looking Up: Making Cloud Observations with a Satellite Match

- Sarah Crecelius and Tina Harte, NASA Langley Research Center

Use NASA satellites to validate your students cloud observations. This session will cover the steps needed to obtain a satellite over pass schedule, and some tips and tricks to have your students observing clouds like the pros!

Content: Earth/Space Science

Grade: ELEM-MS

Strand: 📖 Literacy and Science

STEM Engagement: SciGirls Strategies and NASA Activities

- Sarah Crecelius, and Kristyn Damadeo, SSAI/ NASA LaRC

SciGirls is an Emmy Award winning PBS Kids TV show, aimed at sparking girls' (8-12) curiosity in STEM. In 2014, SciGirls teamed up with NASA and the CERES Students' Cloud Observations On-Line Project (S'COOL) to film an episode featuring Citizen Science. Participants will learn about the SciGirls Program, discuss SciGirls Seven: seven strategies to engage students in STEM, and walk through hands-on activities aligned to these strategies. All resources are available online.

Content: Earth/Space Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

Incorporating STEM into your HS Science Classroom

- Gary Curts, It's About Time

Active Physics and Active Chemistry are the perfect vehicles to integrate real-world STEM ideas and concepts into your classroom. Students learn the major concepts of the Physical Sciences while actively engaged in this critically acclaimed, project-based curricula!

Content: Physics/Physical Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

Investigate Sky Color with New Science Literacy Resources

- Kristyn Damadeo, SSAI/NASA Langley Research Center

This hands-on session will show how NASA sky color resources improve literacy and encourage investigation. Products are being developed to engage students in NASA's SAGE Mission, launching in 2016, to study aerosols. Session participants will meet storybook characters that ask why the sky isn't always blue. In the story, the kids observe and collect data. Participants will learn how students can observe and submit photos to NASA's Sky Art site. Participants will also engage in a complimentary lesson.

Content: Earth/Space Science

Grade: ELEM-MS

Strand: 📖 Literacy and Science

Teaching Writing in the Science Classroom

- Leslie Lausten, Hartwood Elementary School; Sherrie Roland, Grafton Village Elementary School

Do you have pressures to drop science instruction and teach more language arts? Why not extend your science time instead to include writing in the science classroom? Using proven strategies, we will introduce you to how to turn responses into written paragraphs through true integration.

Content: General Science

Grade: ELEM-MS

Strand: 📖 Literacy and Science

Is It Alive? FOSS-tering language and scientific thinking through argument and inquiry

- Kip Bisignano, Leslie Lausten, and Sherrie Roland, Delta Education

During the process of scientific inquiry, some scientists will make evidence-based claims while others make rebuttal claims. By engaging in argumentation, students learn to refine their observations skills, think about what those observations mean, and relate observations to the claim. In this workshop, we explore FOSS investigations, strategies, scaffolds for accommodating a variety of learners, and resources that help students form logical arguments based on substantive claims, sound reasoning, and relevant evidence.

Content: General Science

Grade: ELEM-MS

Strand: 📖 Beyond Just Books

Exploring the Lynchburg Train Derailment using PBL

- Cheryl Lindeman, Randolph College; Addie Moore, Randolph College

Problem-based learning (PBL) activities incorporating ways children are encouraged to make STEM decisions based on the Lynchburg train derailment story will be shared. Participant involvement will include role playing stakeholders and proposing new local protective measures.

Content: Environmental Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

Time to Renew Your Membership!



Your VAST Membership

Don't let your membership expire! We would miss you and just think of what you would be missing:

- VAST newsletter
- Reduced rate for VAST PDI
- Access to awards and grants
- Important information about current educational trends and news
- Points for recertification
- 4 newsletters a year (electronic)
- Annual PDI Newsletter
- Journal of Virginia Science Education
- Monthly updates through E-Blasts
- Networking opportunities

Why VAST?

Formed in 1952, VAST has focused on promoting excellence in science teaching and learning in Virginia. As times continue to change, VAST continues to change. VAST stands behind you in all that you do for the students in Virginia and membership in VAST is your tool to provide you access to resources, discounted conference rates, and connection with other science teachers in Virginia.

By joining VAST, you become part of an exciting comprehensive professional organization, dedicated to the support and advancement of science education for all Virginians. Membership dues are \$25.00 a year. As a member, you will receive:

Did you know that you can print your VAST professional development certificates from the VAST website? Just login to Membership at VAST.org! You can also see future professional development opportunities, as well as your past and current training records!

To Join:

To sign up online, you will use our online system. Our membership system puts you in control of your membership! You can update your information whenever it changes. The VAST membership database allows you to pay via a secure link using a credit card or you can register and submit payment by mailing in your payment!

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Friday - NOVEMBER 20 2015

Promote Curiosity and Model Inquiry with Science Nuggets

- Dia Michels, Science, Naturally!

Kids know more than they think they know. They learn facts, but often don't know how to connect the dots. Help get them to the "Ah-ha!" moment. Using short questions from "101 Things Everyone Should Know About Science" and brainteasers from "One Minute Mysteries You Solve With Science," we will look at how we can extend and expand simple problems to better understand life outside the classroom. Content is interdisciplinary, supports current curriculum, and is designed to be used in small amounts of time.

Content: General Science

Grade: ELEM-MS

Strand: Beyond Just Books

Learning Physical Science through Engineering

- Dara Brinkman and Heather Groffy, Portsmouth Public Schools

Teachers will learn how to incorporate engineering design into their science classroom by building a rubber band car and a "brushbot". This lesson is typically taught in the physical science classroom to help students learn how to apply scientific concepts to real-world situations.

Content: Physics/Physical Science

Grade: MS

Strand: Instructional Strategies for Science

STEM in the Middle School Classroom? It's Easy!

- Gary Curts, It's About Time

Project Based Inquiry Science (PBIS) is a curricula that seamlessly inserts and uses STEM ideas to teach major science concepts and tenets in your classroom. PBIS strengthens and hones 21st Century Skills with your students via project-based learning principles while actively engaging every student.

Content: Physics/Physical Science

Grade: MS

Strand: Instructional Strategies for Science

da Vinci Lends a Hand: Literacy and Hands-On STEM

- Mark Friedlander, Science Naturally

The middle grade fiction novel, Leonardo da Vinci Gets A Do-Over, is an adventure not just through Florence, Italy, but a range of STEM topics. Join author Mark Friedlander in performing hands-on activities that bring to life the problem based learning encountered in his book. If you want to learn to integrate literature into your science curriculum, gain cross-curricular perspectives, and do hands-on activities that explore the science behind aviation, art, the plague and more, then stop by!

Content: General Science

Grade: MS

Strand: Literacy and Science

Argument Driven Inquiry in Middle School Science

- Joanna Garner and Melani Loney, Old Dominion University

Argument Driven Inquiry (ADI) is an evidence-based instructional model for increasing scientific discourse in science lessons (Sampson, et al., 2013). This session will provide an overview of ADI and how it can be used in middle school science classrooms. It will describe SOL-based ADI lessons developed by Virginia teachers. The professional development model used to facilitate teachers' usage of ADI will also be described.

Content: General Science

Grade: MS

Strand: Instructional Strategies for Science

Making Waves in Middle School

- Knansie Griffing, Carolina Biological Supply Co.

Focus on getting started with STEM education while effectively teaching the Next Generation Science Standards through inquiry-based practices. Experience lessons that demonstrate the learning progression.

Content: Engineering

Grade: MS

Strand: Beyond Just Books

Differentiated Instruction in the Inquiry Classroom

- Rebecca Musso, Stafford Middle School

How to differentiate instruction in the inquiry classroom to meet all learners at their levels and to appropriately address their needs. Attendees will receive sample activities for grades 6-8 that are already differentiated. Attendees will have a hands on practice in differentiated instruction.

Content: General Science

Grade: MS

Strand: Instructional Strategies for Science

Problem-Based Learning in the Science Classroom

- Bree Raburn, Belmont Ridge Middle School

Are you struggling to make material relevant and matter to students? This session is designed to make SOL standards meaningful, through problem-based learning, by relating the real world to the curriculum across multiple grade levels.

Content: Earth/Space Science

Grade: MS

Strand: Instructional Strategies for Science

ELEMENTARY - MIDDLE SCHOOL

MIDDLE SCHOOL

Friday - NOVEMBER 20 2015




VDOE Science Instruction and Assessment Update-Middle School

- Eric Rhoades and Tyler Waybright; Virginia Department of Education

VDOE instruction and assessment specialists offer updates on instruction and assessment resources and programs. Learn about professional development, instruction, and assessment resources available to middle school science teachers.

Content: General Science

Grade: MS

Strand:  Instructional Strategies for Science


Integrated Learning for a Changing Planet

- Lindsey Bailey, Population Connection

Science literacy and data literacy are critical in helping us make everyday decisions that affect our environment and our global society. In this hands-on workshop, the presenter will engage participants in interdisciplinary activities that help students explore human impacts on the planet including population growth, climate change, and biodiversity loss. The presented activities build skills in science, math, social sciences, and language arts, while applying learning to authentic problems.

Content: Environmental Science

Grade: MS-HS

Strand:  Literacy and Science

Design Challenge: Create an Energy Efficient Home

- Cassie Chesson and Bekki Lamb, The NEED Project

Come explore how HVAC systems, electrical equipment, and the building envelope work together to make your home more efficient. Design and build a model home that demonstrates the efficient use of these systems that also meets design parameters and building codes while being comfortable for residents. Explore the engineering design principles and efficiency strategies used by industry professionals.

Content: Environmental Science

Grade: MS-HS

Strand:  Instructional Strategies for Science


Pearly Insights: Making Sense of an Experiment

- Julia Cothron, MathScience Innovation Center (retired); Paula Leach, ITTIP and Virginia Lewis, Longwood University

Observe soaked water pearls and make a hypothesis (claim). Then, examine raw data on the mass of pearls and photographs of their shape and surface braiding. Interpret data tables and graphs (evidence) and use existing knowledge to explain findings. After a “simulated review of the literature,” articulate a conclusion in which you argue the validity of the hypothesis. Relate experiment to personal care products, agriculture, and intelligent gels.

Content: General Science

Grade: MS-HS

Strand:  Literacy and Science

Connect Science with Technology, Engineering, & Mathematics

- Paula Leach, ITTIP at Longwood University

In this workshop, you will work through the engineering design process to design a device to solve a problem directly that is related to science content taught in the classroom. Resources will be provided to show examples of how the integration of science with technology, engineering, and mathematics can be achieved in your classroom.

Content: Engineering

Grade: MS-HS

Strand:  Instructional Strategies for Science


MY NASA DATA: Using NASA Data to understand our World!

- Preston Lewis and Daniel Oostra, NASA Langley Research Center

This session will focus on how to utilize the volumes of NASA Earth system science data that you can use right in your classroom. We will cover how to access the data and go over different ways that it can be used in the classroom.

Content: Earth/Space Science

Grade: MS-HS

Strand:  Beyond Just Books

Using Simulations and Inquiry to Teach Nature of Science

- Jennifer Maeng, Lindsay Wheeler, and Amanda Gonczi, University of Virginia

Incorporating simulations is a great way to enhance inquiry and nature of science teaching and learning! In this session we model an inquiry-approach using simulations to teach key nature of science ideas including science is evidence-based, tentative, social, and subjective. We demonstrate lessons from life, earth, and physical sciences for middle and high school students that explicitly teach NOS ideas. Participants receive resources including lesson plans for the activities presented.

Content: General Science

Grade: MS-HS

Strand:  Instructional Strategies for Science

Engaging Inquiry: Pre-service Teachers Share Tested Lessons

- Jackie McDonnough, 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.

Content: General Science

Grade: MS-HS

Strand:  Instructional Strategies for Science

MIDDLE SCHOOL

MIDDLE SCHOOL - HIGH SCHOOL



Friday - NOVEMBER 20 2015

A Flipped POGIL Science Classroom

- Jennifer Peairs, Monticello High School

Flipping a classroom has been generally thought of teachers making videos; students watching them; taking notes and coming to class with the work done. In this presentation, we'll talk about alternative techniques to use that do not require making lecture videos, but focus on helping student understand the material by presenting data and coming up with their own conclusions/definitions at home. POGIL is an acronym for "Process Oriented Guided Inquiry".

Content: General Science

Grade: MS-HS

Strand: 🖐️ Instructional Strategies for Science

A Physics Smorgasbord

- Tony Wayne, Albemarle High School

Come by and see several teachers from the Virginia Instructors of Physics show a variety of physics demonstrations, labs and/or activities. There will be handouts and so much more. This session is an open door session. This means participants can come and go any time during the session and see everything. After the conference check out the handouts at <http://vip.vast.org/2015VASTPDI>

Content: Physics/Physical Science

Grade: MS-HS

Strand: 📖 Beyond Just Books

CRESST: Inquiry+Research=Student Engagement+Healthy Choices

- Suzanne Kirk, Virginia Commonwealth University

"It's All About You", so join CRESST as we use online collaborative tools to collect and analyze data to generate research questions and hypothesis. We will discuss strategies to encourage student research using health and wellness topics that foster collaboration across the curriculum while emphasizing ethical study research design. This workshop will also introduce the CRESST curriculum, videos and online resources available on the CRESST webpage.

Content: Biology/Life Science

Grade: MS-COL

Strand: 🖐️ Instructional Strategies for Science

Potential "Differences" in Science Disciplines

- Rachel White, Princess Anne High School

Participants will build a battery with pennies, salt water, coffee filters and aluminum foil. This presentation is meant to demonstrate the power of collaboration in not only one particular field of science but various fields including physics, AP physics, chemistry and AP chemistry through the STEM design process.

Content: General Science

Grade: MS-COL

Strand: 📖 Beyond Just Books

Virginia Instructors of Physics (VIP) Share-a-thon Session

- Timothy Couillard, Virginia Instructors of Physics (VIP)

Got a great Physics lesson, lab, demo, or instructional strategy? Bring something to share or just come to learn! Virginia Instructors of Physics host their annual VAST PDI share session.

Content: Physics/Physical Science

Grade: HS

Strand: 🖐️ Instructional Strategies for Science

Southeastern Forests & Climate Change

- Lisa Deaton, Virginia Department of Forestry

Project Learning Tree® and the University of Florida have developed a new secondary module to help educators in the Southeast teach about climate change impacts on forest ecosystems, the role of forests in sequestering carbon, and strategies for reducing greenhouse gas emissions and adapting to changing climatic conditions. Learn how scientists, including the Virginia Department of Forestry, have been cross-breeding families of pine trees for the past 50 years to meet the demands of society.

Content: Biology/Life Science

Grade: HS

Strand: 📖 Beyond Just Books

Sample Biology II - Ecology Curriculum Framework

- Lisa Deaton, Virginia Dept. of Forestry

Become familiar with teaching resources that support the sample curriculum framework, as well as local natural resource educators that can assist you. Participants will receive copies of the Project Learning Tree® Focus on Forests module and try a few of the activities.

Content: Biology/Life Science

Grade: HS

Strand: 🖐️ Instructional Strategies for Science

VDOE Science Instruction and Assessment Update - High School

- Eric Rhoades and Tyler Waybright, Virginia Department of Education

VDOE instruction and assessment specialists offer updates on instruction and assessment resources and programs. Learn about professional development, instruction, and assessment resources available to high school science teachers.

Content: General Science

Grade: HS

Strand: 🖐️ Instructional Strategies for Science

Friday - NOVEMBER 20 2015



Improving Science Instruction with a 3D Printer

- David Slykhuis, James Madison University

We will show you how to use a 3D printer to improve your instruction and to increase your student's learning. We will feature examples in physics, chemistry, biology, and earth science and have suggestions for using just a single 3D printer or a classroom set.

Content: General Science

Grade: HS

Strand: Beyond Just Books

Manipulation of Anticipation Guide Response Structure

- Lauren Casey, Chesapeake Bay Governor's School

Anticipation guides have been a proven literacy strategy since they were introduced by H.L. Hoover, but does the response structure alter student participation and engagement? Anticipation guides can require students to simply note the page # the correct post reading response is found on or they can require students to support their response with evidence from the text. Because the second response strategy requires higher order thinking it will enhance student participation and engagement.

Content: General Science

Grade: HS-COL

Strand: Literacy and Science

Enhancing Student Independent Laboratory Work in Chemistry

- Elizabeth Ciancio, Hampton High School

Enhancing Student Independent Work in Chemistry is a project designed to expose inner-city students to real scientific research, to build students' reading, communication, and laboratory skills as they solve an independent research question. Come explore how the project was started, the struggles and achievements faced by the teacher and students, and how you can tackle the daunting task of providing students with experiences that will prepare them for a career in science.

Content: Chemistry

Grade: HS-COL

Strand: Literacy and Science

Colleges and Universities Share Session

- Suzanne Donnelly, Longwood University; Tricia Easterling, Radford University; David Slykhuis, James Madison University; Jillian Wendt, Virginia International University

This session is an opportunity for college/university-based science teacher educators and other current/future teacher educators to participate in a professional learning community to encourage each other in developing best practices for preparing elementary, middle, and high school science teachers. Come share how you incorporate inquiry methods into your courses, problem solve, and engage in a lively roundtable discussion.

Content: General Science

Grade: HS-COL

Strand: Instructional Strategies for Science

Flip the Lecture, Flip the Lab: The Problem Based Lab Fad

- Harold Geller, George Mason University

Attendees participate in a problem based learning (PBL) laboratory session as implemented in a course in astrobiology. In our astrobiology lab sessions, students focus on a semester-long project culminating in a written paper and oral presentation. The laboratory sessions were themselves flipped with respect to the fact that students performed traditional laboratory exercises on their own prior to laboratory meetings.

Content: Earth/Space Science

Grade: HS-COL

Strand: Instructional Strategies for Science

MORE Fun Chemistry Labs & Projects

- Paula Nottingham, Stonewall Jackson High School/Prince William County Schools

This is a follow-up to last year's session and will provide more fun and hands-on projects, laboratory experiments and activities to reinforce the VA Chemistry SOL essential knowledge and skills? This is a session that both new and tenured teachers will not want to miss.

Content: Chemistry

Grade: HS-COL

Strand: Instructional Strategies for Science

Back to Your Grandmother's Basics

- Sheila Barnett, Virginia Department of Conservation & Recreation

Participants will use the scientific method to determine whether a mixture of baking soda and salt can work as well as a commercial cleaner. After testing their hypothesis, participants will learn why using natural cleaners is safer for the environment and will make a sample of homemade cleaners to try out at home.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Integrating iPad with Vernier Technology

- Jackie Bonneau, Vernier Software & Technology

Using data-collection technology builds deeper student understanding of critical concepts in science and increases test scores. See how you can use Vernier sensors, including our Go Wireless Temp, to support science inquiry in classrooms using iPad. This technology empowers students to collaboratively collect and independently analyze their data.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

HIGH SCHOOL

HIGH SCHOOL - COLLEGE

ALL GRADES



Friday - NOVEMBER 20 2015

Investigating Renewable Energy with KidWind and Vernier

- Jackie Bonneau, Vernier Software & Technology

Learn how you can incorporate engineering design principles into lessons focusing on renewable energy using KidWind Wind Experiment Kits and Vernier data-collection technology including the Vernier Energy Sensor. These hands-on activities from our Investigating Wind Energy and Renewable Energy with Vernier lab book embody the spirit of STEM education through this highly relevant topic.

Content: Environmental Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Using Non-formal Learning Experiences in a Formal Classroom

- Erika Carson, Science Museum of Virginia

Often field trips to non-formal learning institutions turn into outings where students are confused about the purpose of the trip, and teachers are under-prepared or intimidated by what they don't know. Providing teachers with tools and strategies to use while visiting these institutions will help them focus on their goals and to be better prepared before, during, and after, their trips. Most importantly students will feel that they've accomplished something at the end of the experience.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Energize Your Classroom While Teaching Tough Energy Concepts

- Cassie Chesson and Bekki Lamb, The NEED Project

Come explore forms of energy and energy transformations through center-based experiments on motion, thermal, radiant and chemical energy! Leave this session with free resources and the confidence to teach energy concepts to your students.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Make Your Own Paper

- Lisa Deaton, Virginia Dept. of Forestry

"Make Your Own Paper" is a Project Learning Tree® activity appropriate for grades 1-8. Learn how to make recycled paper with your students by trying it firsthand. Participants will receive the printed activity and samples of paper made by the eight mills in Virginia. We will discuss effective recycling programs and how to connect them to the Virginia Environmental Literacy Challenge.

Content: Environmental Science

Grade: ALL GRADES

Strand: Beyond Just Books

Tech Infusion into the Classroom

- Sarah DeWees, Tabitha Duquette, Lyndria Bland, and Felecia Lewis, Stone Hill Middle School

Let us show you how to make technology useful for all levels and availability. Learn how to use free software, web based programs, and apps in ways that are easy to immediately incorporate into your classroom.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Specifically for Pre-Service Teachers: What You Need to Know

- Suzanne Donnelly, Longwood University; Tricia Easterling, Radford University

Local and statewide opportunities await those who are committed to excellence in science education. Come learn about your chosen profession, resources available to you, and how VAST can help you throughout your science teaching career. There will be door prizes, drawings for PDI scholarships, and goodies! Your university supervisors are invited to attend the session, too!

Content: General Science

Grade: ALL GRADES

Strand: None of the Above

Meeting the Challenge - Environmental Literacy in Virginia

- Cindy Duncan and Bill Portlock, Chesapeake Bay Foundation

Participants in this session will become familiar with the national, state and local initiatives that enable students in Virginia to graduate with the skills to act responsibly to protect their local environment. Discover how the Chesapeake Bay Agreement, the Virginia Environmental Literacy Challenge, and the Chesapeake Bay Foundation can help bring academic success to your classroom and promote environmental Literacy in our next generation of citizens.

Content: Environmental Science

Grade: ALL GRADES

Strand: Literacy and Science

ALL GRADES

Friday - NOVEMBER 20 2015



It's Sort of Easy Being Green!

- Thomas Fitzpatrick, Roanoke City Public Schools

Whether you would like to try a few “green” initiatives in your school or want to become a Green Ribbon School, this workshop will give you practical suggestions from a public school that was remade into an Environmental Science Focus School but still serves its local students. We will talk about recycling and composting, gardening, special events for monthly earth hour sessions and our annual earth week celebration and give you activities, advice, and lessons learned to help you get started.

Content: Environmental Science

Grade: ALL GRADES

Strand: 🖐️ Instructional Strategies for Science

Wild Side of Education

- Chapin Hardy, Wildlife Center of Virginia

The Wildlife Center of Virginia offers online teaching tools through our live Critter Cams, interactive moderated discussion, and website.

Through resources such as online discussions and classes, video libraries, species information, and patient stories, it's easier than ever to “bring” the Wildlife Center into the classroom! Supplement lesson plans and promote positive attitudes towards wildlife and the environment with free online resources that can be tailored to your curricular needs.

Content: Environmental Science

Grade: ALL GRADES

Strand: 📖 Literacy and Science

Critical Leadership Questions for Inspiring Schoolwide Excellence

- Baruti Kafele, *The Principal 50*

Based on the new book, *The Principal 50: Critical Leadership Questions for Inspiring Schoolwide Excellence*, Principal Kafele makes the case that building a learning environment that inspires schoolwide excellence can never be overstated; particularly in lower-performing schools. In this high-energy, highly-engaging workshop, administrators will be challenged to look critically within themselves through reflective questions about their leadership practices relative to how they inspire energy, excitement and enthusiasm for learning.

Content: General Science

Grade: ALL GRADES

Strand: None

The Fossil Time Machine

- Chris Kaznosky, Shenandoah County Public Schools; Steve Leslie, James Madison University

Recent performance data has shown that Virginia students have difficulty remembering how fossils form, where they're found, and the clues that they provide about our geologic past. In this session, multiple techniques including word sorts, songs, labs, and digital techniques such as Google Earth and Maps will be used to make instruction more engaging and learning deeper. Take home materials will be provided.

Content: Earth/Space Science

Grade: ALL GRADES

Strand: 🖐️ Instructional Strategies for Science

Informal Educators Discussion Panel

- Karen McKenzie and Chuck English, Science Museum of Virginia

Informal Science Education colleagues from around the state share with the audience their resources, and tools as well as what has helped them create successful and productive partnerships with local schools. Come learn about the tools available in Virginia as well as getting the support to make the most of them. Explore how to engage and enhance relationships with your community informal education centers.

Content: General Science

Grade: ALL GRADES

Strand: None

Enhancing Classroom Management for Pre-Service Teachers

- Guleser Ozturkler, Virginia International University; Jillian Wendt University of the District of Columbia

Classroom management in the science classroom is one of the main concerns for pre-service teachers. This presentation will emphasize specifically why classroom management and teachers' professional development is crucial.

Content: General Science

Grade: ALL GRADES

Strand: None

Electricity Basics: An Introduction to Renewable Energy

- Remy Pangle, James Madison University

This session will feature hands on activities to help students understand the basics of electricity-from how a generator works and creating basic circuits to how to measure electricity and calculate work and power. All of these skills are essential for students to master before getting into the discussion of renewable energy. The session will also include an overview of energy sources and renewable energies in particular and showcase resources available to teachers.

Content: Physics/Physical Science

Grade: ALL GRADES

Strand: 🖐️ Instructional Strategies for Science

ALL GRADES



Friday - NOVEMBER 20 2015

One To the World: Project Based Learning

- Tracy Rossi, Laura Currier, and Bridget O'Malley, Farmwell Station Middle School
Science teachers from Farmwell Station MS in LCPS will highlight 21st century project-based learning with technology integration in their classroom. Quarterly projects are presented that tie to the Virginia SOLs and emphasize real-world questions that can be answered using action and creative uses of technology. Presenters will highlight several projects completed in the classroom and give opportunity for workshop participants to work on developing projects that fit their classrooms.

Content: Biology/Life Science

Grade: ALL GRADES

Strand: Beyond Just Books

Virginia is for Frogs

- Jessica Ruthenberg and Suzie Gilley, Virginia Dept of Game and Inland Fisheries
This year the Dept. of Game and Inland Fisheries is celebrating its frogs and toads with the Virginia is for Frogs Campaign. The session will introduce educators to the purpose of the campaign, Virginia's abundant frog species, their status and where they can be found. Educators will be introduced to the ways that classrooms can help frogs and toads survive in their schoolyards in order to study life cycles in their natural environment. Teachers will receive a copy of A Guide to the Frogs and Toads of VA.

Content: Environmental Science

Grade: ALL GRADES

Strand: None of the Above

Virginia STEM Learning Network: Connecting through Collaboration

- Amy Sabarre, Harrisonburg City Public Schools; Todd Lynn, Winchester City Schools
Come join us as we share in the unveiling of the VA STEM learning network. Whether you are a teacher, administrator, IHE, or outreach program this organization is developing resources to help you meet your goals while connecting and collaborating with others. Together we can build a better Virginia.

Content: Engineering

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Awakening Your STEM School

- Aaron Smith, Aviation Academy
Awakening Your STEM School is a book just released that guides educators and business leaders through STEM involvement which is based on the rich experiences of over twenty years of public high school STEM development at the pioneering Aviation Academy in Newport News, VA. Attendees will learn some of the proven ideas and actions for STEM advancement that will help transform their school into an elite STEM site.

Content: Earth/Space Science

Grade: ALL GRADES

Strand: Beyond Just Books

Culturally Responsive Teaching in K-12 Science Classrooms

- Kiana Thomas and Arthur Bowman, Norfolk State University
This session will focus on culturally responsive teaching in science classrooms to address disparities among minority students. Moreover, the session will highlight research and training material(s) that was conducted by the presenters. In addition, the presentation will provide participants with strategies to enhance science learning for all students.

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

To Infinity and Beyond: Astronomy for Today's Generation

- Shanil Virani, James Madison University; Chris Kaznosky, Shenandoah County Public Schools; Robert Turner, James Madison University
According to recent state achievement data, Virginia students have difficulty identifying the components and processes of our solar system and other space systems. In this session, you'll discover how kinesthetic activities, labs, online sources, songs, word sorts, and external experiences can help engage students and learn this content in a deeper manner. Take-home materials will be provided.

Content: Earth/Space Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Inquiry or Bust!!

- Christina Wade, Dupont Elementary School
Having a hard time getting students engaged? Not sure what inquiry in science instruction looks like? What is "Hands On" learning? Here are a few simple ideas that can clarify the mysteries around these concepts while helping students become engaged in science!

Content: General Science

Grade: ALL GRADES

Strand: Instructional Strategies for Science

Important Dates

April 30 to September 30, 2015. Field Trip Registration.

Early Bird-Registration. Deadline: October 18, 2015

Standard-Registration. Deadline: October 28, 2015

ALL GRADES



VIRGINIA ASSOCIATION OF SCIENCE TEACHERS PROFESSIONAL DEVELOPMENT INSTITUTE NOVEMBER 19—21, 2015

Saturday - NOVEMBER 21, 2015

Cloudy With a Chance of Seasons: Use of Interdisciplinary PBLs

- Catherine McCormick, Hannah Bailey and Patti Horne, Longwood University

Hear how recent graduates from Longwood's Teacher Prep Program linked Literacy and Science through 2 week interdisciplinary PBLs based on the children's book *Cloudy with a Chance of Meatballs* as well as other texts. Leave with some very creative ideas on how to merge science and literacy in a way that will leave your students hungry for more of both!

Content: General Science

Grade: preK-2

Strand: Literacy and Science

Challenge Lab: Project Based STEM Learning

- Laura Kramer, Science Museum of Virginia

What bridges the gap between traditional and free-form "making" and what can be done using inexpensive materials? Challenge Lab programming is easily adaptable to a variety of skill and learning levels, incorporates STEM disciplines, and encourages creative problem solving, collaboration and other 21st century skills. During this interactive session, you'll design, build, and test a device to meet a challenge. Come; see what all the fun is about!

Content: Engineering

Grade: 3-5

Strand: Instructional Strategies for Science

Physics is Elementary with VIP

- Jeff Steele, Liberty High School; Catherine Brewington, Cosby High School

The Virginia Instructors of Physics polled elementary teachers and the VA DOE to ask "What areas of physical science can we help with?" Come find the answer in the forms of lessons you can put into action immediately that will have your students experiencing and learning physical science through inquiry. You will find answers to your questions, ideas to implement, and make-and-take experiments to implement while you enjoy experiencing some inquiry learning of your own.

Content: Physics/Physical Science

Grade: 3-5

Strand: Instructional Strategies for Science

Learn to Love Teaching Science with the 5E Model

- Patti Horne, Longwood University

Longwood University student teachers will share their early experiences designing and delivering 5 E Science Lesson Plans in elementary classrooms. This session is designed for the science resistant or any pre-service/new teacher who wants to bolster their efficacy in teaching inquiry based, student-centered science. Through an interactive discussion with attendees, the presenters will share lessons learned and the impact of their experiences on students' engagement and their own professional confidence.

Content: General Science

Grade: ELEM

Strand: Instructional Strategies for Science

Making Learning Memorable: Interactive Notebooks in Science

- Melodye Paruszkiewicz, and Christina Wade, Dupont Elementary School

Come learn tricks and techniques for helping your students interact with their learning. Tools and ideas for using interactive notebooks in the elementary science classroom will be shared. Student and teacher examples will be available from across the elementary grades.

Content: General Science

Grade: ELEM

Strand: Instructional Strategies for Science

Making STEM Real for African-American Students and Teachers

- Clair Berube, Hampton University; Patti Horne, Longwood University

The number of African Americans partaking in STEM education and careers has not shown a substantial increase in recent years. In an effort to contend with this lack of representation of sub-groups pursuing STEM, many school districts have begun to raise the level of STEM education in the elementary grades. Why aren't there more African-American women going into science, and how can pre-service teacher training programs help solve this problem?

Content: General Science

Grade: ELEM-MS

Strand: Instructional Strategies for Science

Incorporating Hands-On Science Every Day

- Miriam Musco, and Hannah Weiss, Science Museum of Western Virginia

Come explore some hands-on science activities that you can use in your classroom throughout the year! The Science Museum of Western Virginia has a number of experiments and activities at hand, using simple and easy-to-source materials. We will show you how they work and how they can be incorporated into the SOLs. We'll get you working on a few activities from different grade levels and show you the science behind them.

Content: General Science

Grade: ELEM-MS

Strand: Instructional Strategies for Science

PRE-SCHOOL - KINDERGARTEN

ELEMENTARY-GRADES 3-5

ELEMENTARY

ELEMENTARY - MS



Saturday - NOVEMBER 21 2015

Utilizing Women STEM Professionals to Inspire Girls

- Miriam Musco, and Hannah Weiss, Science Museum of Western Virginia

The Science Museum of Western Virginia has developed and run “Science Girls,” a girls-only summer program. We bring women in STEM fields to camp and incorporate hands-on activities aligned with current research. We will model our science teaching to show how we engage girls with science and research. We will provide resources for engaging girls in science and show how to bring researchers and other female role models into the classroom.

Content: General Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

Design Briefs for Environmental Education in Makerspaces

- George Meadows, University of Mary Washington; Scott Elchenko, Hartwood Elementary School; Bob Freeman, Ferry Farm Elementary School; Greg Machi, Anne E. Moncure Elementary School

This presentations describes the implementation of a collaborative environmental education project developed by educators from three Stafford County exemplary STEM Schools, the Friends of the Rappahannock River, and the College of Education at the University of Mary Washington. The project involved elementary students in designing and building a motorized device to clean oil spills from surface water. A Design Brief, developed by the project team, provided the format for the student's work.

Content: Environmental Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

Gearing Up with Gizmo Labs in Science

- Rebecca Schieber, Caroline Middle School for ExploreLearning Inc.

Gizmos are online virtual simulations that can supplement or replace costly and time-consuming labs. Gizmos cover almost all science SOLs from grades 3-12 and allow for teachers to quickly and easily integrate technology in their classrooms. Students and teachers love using Gizmos, which can be used in versatile classroom environments. Come to this session to learn more about using Gizmos in your science classroom!

Content: General Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

New Materials Please: Variety is the Spice of Your Classroom

- Becky Schnekser, Cape Henry Collegiate School

Are you in need of new ways to teach your science concepts? Do you need new assessments or ways for students to practice skills in science? Examples of learning activities, technology integration, assessments, and student practice will be displayed. Learn new ways to teach common topics such as life cycle, properties of matter, chemical vs physical changes, watersheds, etc. Bring your own technological device.

Content: General Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

FOSS-tering Connections of Inquiry and Literacy: The Bridge from Hands-on Experiences to Scientific Understanding

- Kip Bisignano, Leslie Lausten, and Sherrie Roland, Delta Education

Inquiry and literacy skills are best acquired and developed through first-hand experiences. Incorporating best practices of language arts instruction within inquiry-based, hands-on science activities supports deep understanding of science concepts and develops excellent oral and written communication skills. In this session, we model and examine appropriate strategies for the four domains of ELA aligned to the Standards of Learning, from FOSS (Full Option Science System), that allow learners to extract meaning from and inquire about hands-on experiences. Using this “bridge,” results in maximized science and literacy learning. After all, scientists develop disciplinary language, argue, read, and write, too! Participants will receive easy-to-implement resources they can use in the classroom on Monday!

Content: General Science

Grade: ELEM-MS

Strand: 🖐️ Instructional Strategies for Science

STEM and Out-of-School Time

- Mark Emery, Fairfax County Public Schools; Kimberly Kardelis, Kilmer Middle School; Deborah Metzker, Frost Middle School; Sandra Perry, Whitman Middle School

Learn how after-school programs at the middle school level complement the school day and play a major role in providing opportunities for a diverse group of youth to engage in challenging, experiential STEM learning activities. Find out how state-wide after-school networks are driving improvements in program quality and forging partnerships to expand informal STEM learning. Learn what parents, business leaders, and educators can do to expand out-of-school time STEM supports for youth.

Content: General Science

Grade: MS

Strand: 🖐️ Instructional Strategies for Science

Session 1: Lesson Plans for Light and Optics Activities at the Middle School Level

- Richard Lindgren, Frackson Mumba, and Jenifer Maeng, University of Virginia

Lesson plans written during a two-week summer workshop and introduced into the classroom in the following year following an inquiring learning based model called POE (Predict, Observe, and Explain) will be presented by teachers presenting as a team. The activities are based on a kit of materials ranging over 50 different activities covering a wide range of SOLs through grade levels 3-10. This work is supported by a grant from the MSP Virginia Department of Education.

Content: Physics/Physical Science

Grade: MS

Strand: 🖐️ Instructional Strategies for Science



Session 2: Lesson Plans for Electricity, Magnetism, & Energy Transfer Activities at the Middle School Level

- Richard Lindgren, Frackson Mumba, and Jenifer Maeng, University of Virginia

Lesson plans written during a two-week summer workshop and introduced into the classroom in the following year following an inquiring learning based model called POE (Predict, Observe, and Explain) will be presented by teachers presenting as a team. The activities are based on a kit of materials ranging over 50 different activities covering a wide range of SOLs through grade levels 3-10. This work is supported by a grant from the MSP Virginia Department of Education.

Content: Physics/Physical Science

Grade: MS

Strand: 🖐️ Instructional Strategies for Science

Promoting STEAM Learning through Story

- Robin Stevens Payes, Out of Time Media

Story can create impetus for learning and a spark for non-scientists to engage in STEM. A fictional narrative presents a new place in time for young people to explore in ways they might not normally engage. The time travel adventures of a middle school STEM-smart teen girl provide the spark for transmedia storytelling Out of Time: Lost with Leonardo is supported by an interactive Web learning platform.

Out of Time Media (www.outoftimemedia.com).

Content: General Science

Grade: MS

Strand: 📖 Beyond Just Books

Using Tradebooks to Foster Scientific Thinking

- Jillian Wendt, University of the District of Columbia

As achievement in science is in many ways dependent on formation of habitual scientific habits of mind, this presentation will highlight strategies to integrate literacy instruction with the purpose of increasing opportunities for development of key scientific habits of mind.

Content: Environmental Science

Grade: MS

Strand: 🖐️ Instructional Strategies for Science

Feral Hogs in Virginia

Suzie Gilley, Virginia Dept. of Game and Inland Fisheries; Ruthanne Cole, Bland County Schools

Not as cute as Porky Pig and a lot more dangerous. Feral hogs in Virginia are the number one invasive species. They destroy habitats, pollute streams and carry disease. Developed by VA teachers and Game and Inland Fisheries, this secondary unit will introduce the issue using interdisciplinary and engaging activities. Participants will receive a CD with the curriculum.

Content: Environmental Science

Grade: MS-HS

Strand: None

What is a Living Thing? A Learning Cycle Based Lesson Plan

- Robbie Higdon, James Madison University

This session inspired a lively discussion at VAST 2014 and returns to involve participants in a learning cycle based lesson designed to investigate the characteristics of living things. This guided inquiry approach is based on the 4E x 2 instructional model including an engage, explore, explain, and extend portion.

Content: General Science

Grade: MS-HS

Strand: 🖐️ Instructional Strategies for Science

"I Like This Class". Ideas for Increasing Student Engagement

- Mark Levy, Roanoke City Public Schools

Even the most well-aligned curriculum and carefully constructed lecture notes will fall short if the students are not engaged with the content. We will discuss broad strategies that will get the students' heads off their desks and into your science lesson.

Content: General Science

Grade: MS-HS

Strand: 🖐️ Instructional Strategies for Science

Beyond the Flora of Virginia Book: the App

- Marion Lobstein, Northern Virginia Community College

Participants will be briefly introduced to the book Flora of Virginia and then to examples of the Flora App that is currently under development. Participants will be encouraged to share ideas of what they would find educationally useful in such an app and how they would use it in their classrooms and in outdoor field trips or student assignments.

Content: Biology/Life Science

Grade: MS-HS

Strand: 📖 Beyond Just Books

BioCONNECT (Biology of Cancer, ...)

- Casandra Gabriele, Rutgers School of Public Health/ BioCONNECT

The overall goal of the curriculum is to improve science skills and increase awareness of cancer among high school students. Students, through the process of scientific inquiry, develop problem-solving and decision making skills, apply their knowledge of the structure and functions of organisms, expand their understanding of genetics and explore interrelationships between science and technology.

Content: Biology/Life Science

Grade: MS-COL

Strand: 📖 Beyond Just Books



Saturday - NOVEMBER 21 2015

Using Games to Increase Academic Success

- Kathleen Spears, Tallwood High School; Joel Guldenschuh, Independence Middle School

Come find out how to create and use games to increase academic success (from no technology to BYOD or the 1:1 classroom). This session will give teachers strategies that can be used immediately to incorporate learning, review, and even literacy games into every lesson with little to no effort. See how learning can be fun and educational for middle school students to college students.

Content: General Science

Grade: MS-COL

Strand: 🖐️

Instructional Strategies for Science

Build a Model, Tell a Story and Science Becomes Real!

- Sherri Story, King's Fork High School

Come discover how to create interactive activities using clay modeling, storytelling, and graph interpretation for your classroom. We will investigate the relationship between the unregulated kinase, BCR ABL and the onset of leukemia using free classroom resources from HHMI Biointeractive. We will model the sequence of biochemical events leading to the effective action of the leukemia drug, Gleevec. All participants will receive free resources to take home.

Content: Biology/Life Science

Grade: MS-COL

Strand: 🖐️

Instructional Strategies for Science

Thinking and Problem Solving through Literacy

- Ana Cingel, Virginia Beach City Public Schools

In this session participants will learn strategies for incorporating scientific reasoning, problem-solving, communication, and decision-making skills in their daily instruction. Strategies will focus on how to engage students to think actively, draw conclusions from data, and help students propose, support, critique, justify, and defend their positions based on textual evidence.

Content: General Science

Grade: HS

Strand: 📖

Literacy and Science

Autonomous Underwater Vehicles for Learning

- Daniel Dickerson, Old Dominion University; William McConnell, Virginia Wesleyan College; Daniel Lewandowski, and Daniel Borick, Portsmouth Public Schools

Come learn how you can incorporate the construction and use of autonomous underwater vehicles (AUVs) in your science classes. Talk to university and public school teachers who are part of the NOAA-funded, Policy-Ready Citizen Science project, to get personalized feedback on how to bring the excitement of underwater robots to your students.

Content: Engineering

Grade: HS

Strand: 🖐️

Instructional Strategies for Science

"Inquiry-Based Learning Using Cultural Heritage Materials"

- Stephanie Harry, Kecoughtan High School; Kisha Coleman-Pender, Phoebus High School

The presentation will focus on the results of a two-week summer institute (part of a pilot study) during which the teachers designed and tested inquiry-based laboratory activities utilizing resources from Hampton University's vast inventory of cultural heritage and historical materials (museum collections, art work, documents, archives, the Emancipation Oak, etc.), the Chesapeake Bay watershed, and Hampton University faculty research programs.

Content: Chemistry

Grade: HS

Strand: ★

Assessment For and Of Learning in Science

Assessing Readiness for a Climate Event: Stakeholder Meeting

- Kristen Sharpe, Chesapeake Bay National Estuarine Research Reserve in Virginia; Jaclyn Beck, The College of William and Mary
- Join educators from the Chesapeake Bay National Estuarine Research Reserve in Virginia as they highlight how their program is aimed at improving climate literacy within high schools. Attendees will explore the designed student driven, mock stakeholder meeting, in which local impacts of climate changes are reviewed. Attendees will engage with online NOAA tools including the NOAA Sea Level Rise Viewer and Coastal County Snapshots. Activity resources will be made available.

Content: Environmental Science

Grade: HS

Strand: 📖

Literacy and Science

Good Cells Gone Bad: The Genetics of Cancer

- Melissa Csikari, Colonial Forge High School

Explore the genetic and cellular mechanisms that lead to cancer using free classroom resources from HHMI's BioInteractive. You will be introduced to several hands-on activities, video clips, and interactive tutorials focusing on the mutated genes that cause cancer, and how they normally function to regulate cell growth and division. Using data from actual cancer patients, students work in small groups to recognize patterns, analyze data, and engage in scientific thinking.

Content: Biology/Life Science

Grade: HS-COL

Strand: 🖐️

Instructional Strategies for Science

BEST Physics Demos From More Than a Quarter Century of VIP!

- Andrew Jackson, Harrisonburg City Public Schools; Tony Wayne, Albemarle County Public Schools

The presenters worked together to dig through more than a quarter century's worth of demos and lessons shared through the Virginia Instructors of Physics to find the very best. Tony and Andy put their nearly 60 years of combined experience together to bring the very best of VIP to you in an action packed session.

Content: Physics/Physical Science

Grade: MS-COL

Strand: 🖐️

Instructional Strategies for Science



STEM Literacy Strategies for Statistics

- Mark King, Chesapeake Bay Governor's School for Marine and Environmental Science

This session will explore whether the K-N-W-S literacy strategy improves scores in the STEM classroom. The study involves gifted and high ability high school students enrolled in a two-semester, dual-enrollment statistics course geared toward science applications.

Content: Math in Science Grade: HS-COL Strand: 📖 Literacy and Science

Engaging Students through Virtual Field Trips: Calhoun CZO

- Katherine O'Neill, and Alexandra Ramey, Roanoke College

Place-based education is central to engaging students in the Environmental Sciences. Virtual field trips can provide students with the opportunity to explore real landscapes and engage with current scientific data within a site-specific context. We discuss the use of emerging science from the NSF Critical Zone Observatory network as a framework for exploring interactions between the earth, life, and hydrologic sciences.

Content: Environmental Science Grade: HS-COL Strand: 🖱️ Instructional Strategies for Science

The Virginia Museum of Natural History in Your Classroom!

- Christy Deatherage, Virginia Museum of Natural History

VMNH outreach educators bring STEM and natural history programs to schools throughout Virginia. Age-appropriate programs are designed to correlate to the Virginia Standards of Learning and incorporate best practices using literacy, nature of science, inquiry, and hands-on explorations. All programs are presented by experienced and enthusiastic VMNH educators. Session participants will learn about the wide range of programs while taking part in engaging sample activities.

Content: General Science Grade: ALL GRADES Strand: None

Strategies for Sustainability

- Jim Disbrow, Millennium Project

Engage students in critical/clear thinking by having them consider what is important in nature. Discussions about Sustainability support this strategy. Complex topics can be: the local nexus of {Food Energy Environment Water Soil} = FEEWS; three types of general principles: environmental, economic, and social; tightly entangled strategic goods offer practice in clear thinking.

Content: General Science Grade: ALL GRADES Strand: 🖱️ Instructional Strategies for Science

Data Mining: Conducting Research for Science Education

- Angel Ford, George Washington University; Kurt Michael, Liberty University

The information age has created a warehouse of collected yet un-analyzed data. Data Mining concerns itself with finding archival data sources and asking relevant research questions. Science educators can benefit from analyzing these untapped sources to help better understand the current state of education. In this session, you will learn how to data mine, find available databases, gain access, and formulate research questions for studies. Examples of studies that use data mining will be shared.

Content: General Science Grade: ALL GRADES Strand: ☆ Assessment For and Of Learning in Science

Wildlife Wonders: Dive In and Get Recognized

- Page Hutchinson, Virginia Dept. of Environmental Quality

Would you like to be among the first to be recognized for meeting the Governor's Conservation Classroom Challenge? Come learn more about this program and add to your bag of tricks by participating in some fun, engaging activities related to water science and conservation that you can do with your students to meet this challenge.

Content: Environmental Science Grade: ALL GRADES Strand: 🖱️ Instructional Strategies for Science

Wildlife Wonders: Outdoor Science Inquiry

- Sandra Marr, Collegiate School

Research is blossoming with reasons to give students more outdoor, full-sensory experiences - ones where they move (kinesthetic), observe (visual), listen (auditory), smell (olfactory), and feel (tactile) the world around them. Experience for yourself how science inquiry can benefit from nature studies. This is a full participatory session, come play and reflect together!

Content: Environmental Science Grade: ALL GRADES Strand: 🖱️ Instructional Strategies for Science

Inquiry in Environmental Science

- Sarah Pope, Booker T. Washington School

Tired of the same old "cookie cutter" labs? Come get a fresh take on labs with STEM 21! Science Technology Engineering Mathematics Inquiry and 21st century skills. Attendees will get hands on experience with an Environmental Science Lab that can be catered to any age group!

Content: Environmental Science Grade: ALL GRADES Strand: 📖 Beyond Just Books



Saturday - NOVEMBER 21 2015

Which Weighs More, Whole Milk or Skim Milk?

- Donia Spott, Powhatan County Public Schools

This interactive session uncovers and addresses common student misconceptions about density. Using hands-on activities to reinforce principles of metric units, tools, and measurement, the lessons also highlight the distinction between measurement, accuracy, and precision. The activities provide opportunities for student driven questioning and investigations related to the density of various materials. Activities can be modified for a wide range of grade levels.

Content: Physics/Physical Science Grade: ALL GRADES

Strand: 🖐️ Instructional Strategies for Science

Spend Less Time on Discipline and More Time on Instruction

- Jeannine Tate, Jeannine Tate Education Consulting

Learn practical classroom management strategies that eliminate repeated warnings, requests, and low-level disturbances. This approach teaches behavioral expectations and provides a model to show students how to take responsibility for their own behavior so you will have more time to teach.

Content: General Science

Grade: ALL GRADES

Strand: None of the Above

Expanding Your Classroom With a Global Perspective

- Sandra Thornton, Broadwater Academy

Globally competent students are able to investigate the nearer and larger world around them, recognize perspectives beyond their own, communicate ideas effectively, and take action. Doesn't this sound a lot like 21st Century Skills? NGSS? If you are interested in finding ways to add a global perspective to your classroom then this is the session for you! Resources, lesson plans, and instructional techniques will be shared.

Content: General Science

Grade: ALL GRADES

Strand: 📖 Beyond Just Books

Taking Engineering Design to the Next Level

- Patricia Watson, Skyline Middle School

Are you excited about trying STEM engineering challenges, but not quite sure how to facilitate the "engineering" part? Are you a veteran of STEM and engineering design challenges, but just not getting the quality you want from your students? Learn about how subtle differences between engineering and science can help you design better challenges and help your students develop better ideas and solutions.

Content: Engineering

Grade: ALL GRADES

Strand: 🖐️ Instructional Strategies for Science



Outstanding Biology Teacher Award

Every year, the Outstanding Biology Teacher Award (OBTA) program attempts to recognize an outstanding biology educator (grades 7-12 only) in each of the 50 states; Washington, DC; Canada; Puerto Rico; and overseas territories. Candidates for this award do not have to be National Association of Biology Teachers (NABT) members, but they must have at least three years of public, private, or parochial school teaching experience. A major portion of the nominee's career must have been devoted to the teaching of biology/life science, and candidates are judged on their teaching ability and experience, cooperativeness in the school and community, inventiveness, initiative, and student-teacher relationships. OBTA recipients are special guests of Carolina Biology Supply Company at the Honors Luncheon held at the NABT Professional Development Conference, receive gift certificates from Carolina Biological Supply Company, resources from other sponsors, and award certificates and complimentary one-year membership from NABT.

The 2015 Virginia OBTA winner is:

Jamie Durbin Carpenter

Princess Anne High School, Virginia Beach, Virginia



Five Teachers Selected as State Finalists for Presidential Math & Science Teaching Award

Five Virginia teachers have been selected as state finalists for the 2015 Presidential Award for Excellence in Mathematics and Science Teaching. The award — regarded as the nation's top honor for mathematics and science teachers — recognizes teachers who develop and implement high-quality instructional programs that improve student learning.

The 2015 Virginia finalists — five public school teachers in grades 7-12 — are as follows:

- **Robert Carroll** — Plaza Middle School, Virginia Beach, for science
- **Blythe Samuels** — Powhatan High School, Powhatan County, for mathematics
- **Kelle Scott** — Robinson Secondary School, Fairfax County, for mathematics
- **Stephanie Sowers** — Peasley Middle School, Gloucester County, for science
- **Camilla Walck** — Princess Anne High School, Virginia Beach, for science

Selection committees convened by the Virginia Department of Education chose the finalists from among 80 mathematics nominees and 78 science nominees.

President Obama is expected to announce the 2015 winners next year. The winners will receive \$10,000, a presidential certificate and a trip to the nation's capital for a series of recognition events and professional development activities.

The Presidential Award for Excellence in Mathematics and Science Teaching program is administered by the National Science Foundation on behalf of the White House. Each year, the award alternates between teachers in grades K-6 and teachers in grades 7-12.

The program was established by Congress in 1983 and authorizes the president to bestow awards each year to honor outstanding mathematics and science teachers in the 50 states, District of Columbia, federal territories, Puerto Rico and Department of Defense schools.

Contact: Charles B. Pyle, Director of Communications, (804) 371-2420

The 2015 PAEMST finalists will be honored at the VAST PDI Awards ceremony Friday, November 20, 2015 during the VAST Professional Development Institute (PDI).



Making Natural Connections to the Chesapeake Bay

2015 Region II Educator's Conference & Professional Development

Join us as we take the classroom outside to make natural connections to the Chesapeake Bay.

The two-day conference includes free registration, free membership to VAST, educational resources, and recertification points!

Space is limited to 25 teachers per workshop weekend.

Please contact Adrienne Sawyer for questions: adriennesawyer@gmail.com and bring a bagged lunch.

**Registration/arrival 9:30. Saturday Paradise Creek Nature Park and Sunday
Grandy Village Learning Center – The Learning Barge**

10:00 am – 2:00 pm each day

Targeted Audience

30 teachers for each
2-day conference

Location: Day 1

Paradise Creek Nature Park
1141 Victory Blvd., Portsmouth, VA

Location: Day 2

The Learning Barge
Grandy Village Learning Center
2971 Kimball Loop
Norfolk, Virginia

**Choose one of these
weekends**

**1.) Grades 3-6
2.) Grades 3-6**

**September 19, 2015
October 3, 2015**

**September 20, 2015
October 4, 2015**





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2015 VAST Leadership



President

Dr. Jenny Sue Flannagan
757-531-5057
president@vast.org

Immediate Past President

Shirley Sypolt
757-826-3573
past.president@vast.org

President-Elect

Kathy Frame
703-476-6460
president.elect@vast.org

Vice President

Julian Barnes
540-562-3900
vice.president@vast.org

Secretary

Robin Curtis
757-903-4586
secretary@vast.org

Treasurer

Jimmy Johnson
804-752-7727
treasurer@vast.org

Editor Science Educator

Jean Foss
434-973-3709
newsletter@vast.org

Executive Director

Susan Booth
757-897-3104
executive.director@vast.org

Is Your Address Changing?

Be sure to let VAST know your new contact information. Neither the post office or the Internet will forward our newsletters. Please e-mail Barbara Adcock, Membership chair: membership@vast.org

VAST Regional Directors:

Director, Region 1,

TBA
region1@vast.org

Director, Region 2, Adrienne Sawyer

757-546-9776
region2@vast.org

Director, Region 3, Sherrie Roland and

Leslie Lausten
region3@vast.org

Director, Region 4, Susan Bardenhagen

703-338-9589
region4@vast.org

Director, Region 5, Eric Pyle

540-574-0483
region5@vast.org

Director, Region 6, Tom Fitzpatrick

540-314-4522
region6@vast.org

Director, Region 7, Diane Tomlinson

276-889-4421
region7@vast.org

Director, Region 8, Pam Aerni

region8@vast.org



Join the VAST community on line. "LIKE" the Virginia Association of Science Teachers so that the latest science educational news will appear on your page.

Region 2 has a new Facebook page. Please visit and join our community at:

<https://www.facebook.com/Region2VAST>.

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



VAST is a comprehensive educational organization dedicated to the nurturing and advancement of superior science education.

A. The objective of VAST shall be to advance the study of science, to promote excellence in the teaching of science, and to provide an opportunity for communication among science educators in the Commonwealth of Virginia.

B. Mission Statement: On October 19, 1991 the Advisory Board (henceforth the Board of Directors) developed the following statement:

"The Virginia Association of Science Teachers is a comprehensive educational organization dedicated to the nurturing and advancement of superior science education. VAST provides leadership by:

1. promoting the study of science at all grade levels;
2. supporting conditions which ensure an optimal environment for the teaching of science;
3. advocating high quality science instruction for all students at all levels; and
4. providing an avenue for communication among the members of the science teaching community."

This Mission Statement was reaffirmed on July 29, 2000 and March 8, 2014.

Please update any changes in your P.O. or e-mail addresses by sending in a new membership form as an update. P.O. will not forward the newsletter.

Please send articles, letters to the editor, or labs by the submission deadline, October 1, 2015, for inclusion in the next digital VAST Newsletter.

The Virginia Association of Science Teachers is incorporated in Virginia as a charitable, scientific, and educational organization, is an IRS 501 (c) 3 qualified organization, and is registered with the Virginia Department of Consumer Affairs.