



VAST's Vision:
*Excellence in Science Education
 Through Innovation*

ISSN 1945-7405

VAST.Org or <https://vast.wildapricot.org>
 Check the web for news, conference updates, registration, and forms.

The Science Educator

Summer 2018

A Publication of VAST, The Virginia Association of Science Teachers

Vol. 67, No.1

What's New at PDI 2018?

Join us Thurs. Nov 15 for a
NIGHT WITH THE EXHIBITORS,
sponsored by



WorldStrides[®]

Take a **JOURNEY** to our booth
 for a hands-on experience!

Drinks & refreshments will be provided to event attendees

Get your Game on with Legends of Learning!

8:30 pm Friday evening

**Join us for the VAST Auction on Friday,
 November 16th and earn a drink ticket.**



Come to the **Friday night Auction** to learn about how you can transform your classroom using science games. As we get our game on, we will have the following Legendary game stations with some of the original classics: Legends of Learning games, the original Nintendo, Twister and giant Jenga! Play a game and earn a drink ticket. We look forward to a night of fun and games!

***Bonus Legends of Learning Swag** for anyone who dresses up as their favorite superhero or video game character.

Exhibit Doorprize Event
Saturday Morning 10:25 a.m. - 11:15 a.m

Last Chance to Visit the Exhibit Hall.

No other events are scheduled.

Visit exhibits and fill out a raffle for a chance to win.

You must be present to win.



Stay Until the End and WIN!

Support your science colleagues and attend one of twenty presentations during Concurrent Session 10. In each session, one attendee winner will walk away with a **\$50 School Specialty Science Gift Coupon and VAST will add a \$50 gift card.** Select from innovative classroom resources, lab supplies, and 1000 other learning products. **Stay to learn, stay to win!**

Sponsored by School Specialty



PDI Registration

Online registration closes at 4:00 pm on October 31. Register on PDI site after October 31. Preconference registration and purchasing PDI meals will NOT be available on site.

Go to the VAST website to register on line at:
<https://vast.wildapricot.org/Registration-Information>

Registration Closes September 6 for:

- Concurrent Session Presenters
- Full Time Students who are Presenters

Online Registration Closes October 15 for:

- **EARLY BIRD** Attendees Registration (\$170 - Save \$35)
- Full Time Students
- Saturday Registration Only, Guests

Online Registration Closes October 31 for:

- Attendees (\$205)
- Donna Sterling Institute Preconference Short Course
- Afternoon Preconference Ele, MS and HS Workshops
- Meal tickets at the PDI, including Box Lunches

On site registration may be paid for with cash, check, credit card (Master Card or VISA), or an institutional purchase order. (Be sure to bring a copy of the purchase order).

Refund policy: Until October 15th, full refund will be available for registrations. From October 15th-31st, half of registration fees will be refunded on cancellation. After October 31st, we regret that we cannot guarantee a refund for registrations.

*PDI registration includes VAST membership from December 1, 2018 to November 30, 2019.

**Preconference registration does NOT include PDI registration or VAST membership.



VIRGINIA LOTTERY

Watch your email for an e-note in early August for chance to win registration to the VAST 2018 PDI. The Virginia Lottery has sponsored this raffle since 2016.

Menu

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From the desk of the VAST President

Dr. Jackie McDonnough
VAST President 2018



President's Letter for August Newsletter

Fellow VAST Members,

As we wind down from summer and prepare to begin/or have already started the new academic year planning for our 2018 PDI is moving forward. Our theme of "Diversify and Strengthen Science for All" has been generating excitement across the commonwealth. Our general session speakers, presenters, and pre-conference workshops were carefully chosen to provide a wide array of opportunities to support diverse students' science learning.

The term "diverse students" should be defined to clarify any misunderstandings. When used the term refers to learners from racially, ethnically, culturally and linguistically diverse families and some from communities of lower socioeconomical status. We also include students' physical abilities and sexual orientation. Over the past 20 years we have seen a major increase of students fitting these descriptions in our classrooms. Awareness of and teaching to students' diversity in the science classroom provide safe spaces for learning and prepares students the 21st century work environment and citizenship. Our 2018 PDI lineup is geared to do just that!

Let me start with our general session speakers. On Thursday night astronaut Scott "Scooter" Altman and Dr. Jeff Gordon will get our creative juices flowing in their talk "***Creating Scientific Leaders: Stories of Effective Approaches to Teaching Leadership Skills in K-12.***" Friday morning, we will be treated to an inspirational and informative talk by National Geographic Young Explorer and Harvard PhD. candidate Munazza Alam. As she weaves her astronomy research into her topic titled "***Building Stronger Classrooms: Diversity, Equity and Inclusivity.***" Dr. Okhee Lee, internationally recognized science educator in the area of knowledge acquisition of linguistically diverse learners will motivate and instruct in her talk and concurrent session. Her talk "***Science for All: Instructional Shifts to Promote Science and Language with All Students Including English Learners***" will set the stage for her hands-on concurrent session to follow. Dr. Lee's talk is sponsored by Virginia Space Grant Consortium. Each general session talk will conclude with a door prize giveaway.

This year we will have 10 breakout sessions with almost 200 presentations to choose from that cover a wide variety of topics including our theme. Session presenters will bring you tested instructional strategies, innovative new technologies, and valuable skills you can take back to your classrooms. Each presentation in the last concurrent session on Saturday will end with a drawing for a \$50 gift coupon from School Specialty and a \$50 gift card from VAST.

In an effort to accommodate teachers who can only attend the PDI on Saturday we have created a schedule to fully meet your needs. The exhibit hall will be open from 7:30 to 11:15 am. With 4 breakout sessions that include almost 80 presentations to choose from and a general session talk the \$100 one-day registration is an excellent deal!

As I walk the halls and sit in on presentations please take a few minutes to let me know how VAST can better serve your needs. I hope to see many of you November 15 to 17 in Williamsburg.

Jackie

Dr. Jackie McDonnough, VAST President

VAST SCHEDULE AT A GLANCE - 2018



Wednesday, November 14, 2018

7:00 p.m. - 8:30 p.m. VAST Board of Directors Meeting & Dinner

Thursday, November 15, 2018

7:30 a.m.

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

2:30 p.m. - 5:15 p.m.

3:15 - 4:45 p.m.

Ticketed Donna Sterling Institute Preconference Short Course

Short Course Continental Breakfast and check in

Short Course Presentations and Lunch *Collaborative Teaching in Science Content Areas*

PDI Registration Desk Open

Pre-Conference Ticketed Workshops

Elementary: Take a Walk on the High Wire! Exploring Balanced and Unbalanced Forces through Inquiry and Practices of Science! (Sponsored by Delta Education)

Middle School: Integrating Science, Math, and Workplace Skills (Sponsored by Longwood University)

High School: Diversity in Science and Inclusive in the Classroom

(Sponsored by National Geographic/ Cengage)

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

General Session I – Welcome to the PDI

Speaker: **Astronaut Scott “Scooter” D. Altman and Dr. Jeff D. Jordan**

Title: **Creating Scientific Leaders: Stories of Effective Approaches to Teaching Leadership Skills in K-12.**

(Door prize giveaway at the end of the session) (Sponsored by ASRC Federal)

6:45 p.m. - 7:30 p.m.

Regional Science Challenge (general session room)

7:30 p.m. - 9:00 p.m.

Night with the Exhibitors *(Sponsored by WorldStrides)*

Friday, November 16, 2018

7:15 a.m. - 5:00 p.m.

Registration Desk Open

7:30 a.m.

Continental Breakfast in the Exhibit Hall

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

Exhibit Hall Open

8:30 a.m. - 9:20 a.m.

Concurrent Session 1 breakout presentations

9:35 a.m. - 10:25 a.m.

Concurrent Session 2 breakout presentations

10:40 a.m. - noon

General Session II - Business Meeting

Speaker: **Munazza Alam, National Geographic Young Explorer**

Title: **Building Stronger Classrooms: Diversity, Equity, and Inclusivity**

(Door prize giveaway at the end of the session) (Sponsored by National Geographic Learning/Cengage)

Noon - 1:00 p.m.

Ticketed Buffet Lunch

12:30 p.m. - 6:00 p.m.

Exhibit Hall Open

1:10 p.m. - 2:00 p.m.

Concurrent Session 3 breakout presentations

2:15 p.m. - 3:05 p.m.

Concurrent Session 4 breakout presentations

3:20 p.m. - 4:10 p.m.

Concurrent Session 5 breakout presentations

4:25 p.m. - 5:15 p.m.

Concurrent Session 6 breakout presentations

6:15 p.m. - 7:00 p.m.

Ticketed Dinner *(Cash Bar)*

7:00 p.m. - 8:15 p.m.

Awards Ceremony

8:30 pm - 9:15 p.m.

“Get Your Game On” *(Sponsored by Legends of Learning)*

9:15 p.m. - 10:00 p.m.

Auction and DJ

Saturday, November 17, 2018

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

Registration Desk Open

7:30 a.m.

Continental Breakfast in the Exhibit Hall

7:30 a.m. - 11:15 a.m.

Exhibit Hall open

8:30 a.m. - 9:20 a.m.

Concurrent Session 7 breakout presentations

9:35 a.m. - 10:25 a.m.

Concurrent Session 8 breakout presentations

10:25 a.m. - 11:15 a.m.

Last Chance to Visit the Exhibit Hall - Exhibitor Door Prizes

(No other events scheduled, all exhibitors will remain open until 11:15)

11:00 a.m. - 11:25 a.m.

Pickup ticketed box lunch to eat during General Session III

11:30 a.m. - 12:45 p.m.

General Session III - Meet your new VAST officers

Speaker: **Dr. Okhee Lee, New York University**

Title: **Science for All: Instructional Shifts to Promote Science and Language Learning With All Students Including English Learners** *(door prize giveaway at the end of the session)*

(Sponsored by Virginia Space Grant Consortium)

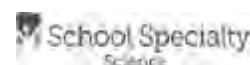
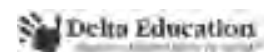
1:00 p.m. - 1:50 p.m.

Concurrent Session 9 breakout presentations

2:05 p.m. - 2:55 p.m.

Concurrent Session 10 breakout presentations

(\$100 gift card giveaway at the end of each presentation of concurrent session 10- sponsored by School Specialty & VAST.)





COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION

P.O. BOX 2120

RICHMOND 23218-2120

DATE: June 18, 2018

TO: Science Educators

FROM: Anne M Petersen, Ph.D.
Science Coordinator
Office of Science, Technology, Engineering, and Mathematics

Laura Casdorff & Myra Thayer
Science Specialists
Office of Science, Technology, Engineering, and Mathematics

SUBJECT: 2018 Virginia Association of Science Teachers Professional Development Institute

The Virginia Association of Science Teachers (VAST) and the Virginia Department of Education are pleased to announce the 2018 VAST Professional Development Institute (PDI), Diversify and Strengthen Science for All, to be held November 15-17, 2018, at the Double Tree by Hilton Hotel, Williamsburg. The VAST PDI is a forum for science educators and administrators to network with fellow science teachers, gain new instructional strategies and lesson ideas, enhance science content knowledge, and experience cutting-edge technology. This year's VAST PDI will offer over 200 concurrent sessions intended to support the Virginia Science Standards of Learning as well as Virginia Department of Education initiatives. The anticipated adoption of the 2018 Science Standards of Learning and the impact of these standards on science instruction will be a focus of several of the sessions. In addition, presentations will be conducted by nationally known keynote speakers to include Scott "Scooter" Altman, Dr. Jeff Jordan, Munazza Alam, and Dr. Okhee Lee.

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

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

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



**2018 ANNUAL PROFESSIONAL DEVELOPMENT INSTITUTE
“DIVERSIFY AND STRENGTHEN SCIENCE FOR ALL”**

**VAST is pleased to announce
the 2018 Donna Sterling Pre-conference:
Powerful Collaborations of Science and SPED Instructors
Working Together for Students’ Success**

**TICKETED DONNA STERLING INSTITUTE
PRE-CONFERENCE SHORT COURSE**

Thursday, November 15, 2018

7:30 a.m.

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

2:30 p.m. - 5:15 p.m.

Donna Sterling Short Course:

Short Course Continental Breakfast and check in

Short Course Presentations and Lunch

Title: *Collaborative Teaching in Science Content Areas*

PDI Registration Desk Open

VAST has brought together a group of experts from across the nation and teams of our best Virginia science and SPED teachers to lead this pre-conference. The morning will be led by **Dr. Sami Kahn and four colleagues** from various institutions, all of whom are nationally recognized researchers in science and special education (SPED). The afternoon will be led by teacher-teams of Virginia teachers.

In the morning, Dr. Kahn and her colleagues will lead participants through three mini-master classes focusing on the critical topics of inclusion and collaboration, drawing from their book, ***Towards Inclusion of All Learners through Science Teacher Education***. The book serves as an indispensable resource for teachers and teacher educators wishing to understand how to educate students with exceptionalities in science. It begins with the voices and stories of the experts: current and former K-12 students with disabilities sharing their experiences in science education classrooms. The voices of students with disabilities are then connected to the work of leading experts in the area of science education for individuals with disabilities in an effort to address the goals of national reform documents by ensuring rigorous science experiences for all students. It is


written in a highly accessible and practical manner, making it ideal for all educators including pre-service and in-service teachers, teacher educators, researchers, and curriculum developers.

After lunch each participant will attend one of 4 sessions led by a team of a collaborative and a science classroom teacher in the areas of Elementary (3-5), Middle (6-8), Biology and Earth Science. These sessions will include strategies to further raise student performance for high stakes testing.

Each participant will receive a copy of ***Towards Inclusion of All Learners through Science Teacher Education***, breakfast, and lunch, as well as ideas and strategies for successful collaborative science teaching.

The registration fee for the pre-conference is \$100. Registration for the Donna Sterling workshop closes on October 31. Please note that this does not include registration to the VAST PDI Nov. 15-17. The VAST PDI begins at 5 pm on Nov. 15 after the pre-conference. To register for the pre-conference please go to www.VAST.org. Use the PDI tab.

**2018 VAST PROFESSIONAL DEVELOPMENT INSTITUTE
THURSDAY PRE-CONFERENCE HANDS-ON WORKSHOPS
November 15: 3:15 PM – 4:45PM
AFTERNOON TICKETED WORKSHOPS**

- | | | |
|------------------|---|---|
| 3:15 - 4:45 p.m. | <p>November 15, 2018. Pre-Conference Ticketed Workshops:
 Elementary: <i>Take a Walk on the High Wire! Exploring Balanced and Unbalanced Forces through Inquiry and Practices of Science!</i>
 (Sponsored by Delta Education)</p> |  |
| 3:15 - 4:45 p.m. | <p>Middle School: <i>Integrating Science, Math, and Workplace Skills</i>
 (Sponsored by Longwood University)</p> | |
| 3:15 - 4:45 p.m. | <p>High School: <i>Diversity in Science and Inclusive in the Classroom</i>
 (Sponsored by National Geographic/Cengage)</p> | |

Preregistration is required. Register online at www.VAST.org. Deadline to register is October 31. Cost is \$5.00/workshop. Each workshop is limited to 25 participants.

ELEMENTARY WORKSHOP – (sponsored by Delta Education)

Take a Walk on the High Wire!

Exploring Balanced and Unbalanced Forces through Inquiry and Practices of Science!

Presenter: Roxane Dupuis, Science Education Consultant

Inquiry and practices of science are best learned when integrated into instruction of science concepts. Sometimes, however, developing the practices and learning the content can be a difficult balancing act. In this make-it/take-it session, engage in FOSS investigations, aligned to the Virginia Standards of Learning, which address concepts of balanced and unbalanced forces through the practices of science. Activities for forces, motion, magnetism, and simple machines will be explored through hands-on activities, engineering design challenges, art, and text. Through the practices and unifying themes of science, such as cause-and-effect, opportunities exist for integrating reading, mathematics, and writing. Can you walk on the high wire?

MIDDLE SCHOOL WORKSHOP

Data Science: Integrating Science, Math, and Workplace Skills – (sponsored by Longwood University)

Presenters: Dr. Ginger Lewis, Longwood University, Dr. Julia H. Cothron, STEM Author & Consultant, Dr. Paula Leach, ITTIP at Longwood University

STEM professionals make discoveries by looking at and analyzing data. How would you like to make discoveries about whales, roller coasters, or long-term plant growth? Not in your repertoire of hands-on investigations. No problem, just learn to use a free web-based data tool (CODAP), which is designed for students in grades 6-14. Use CODAP to search for patterns, identify relationships, or model complex phenomena. Apply CODAP to your classroom data or large data sets available on-line. With data science, students can develop critical workplace skills (5Cs) and make authentic connections between middle school science and mathematics. Data science gives students a new tool for designing and implementing authentic projects, which are increasingly a part of modern STEM competitions such as VJAS and INTEL affiliated fairs. Participants need to bring a laptop computer with an internet connection and modern browser (Chrome works best).

HIGH SCHOOL WORKSHOP – (sponsored by National Geographic Learning-Cengage)

Diversity in Science and Inclusive in the Classroom

Presenter: Munazza Alam, National Geographic Young Explorer

STEM programs have become increasingly focused on expanding the diversity of students in related fields, but these efforts focus have largely overlooked the longstanding barriers that prevent the participation from underrepresented minorities. This dichotomy between “who is in the building” versus “who is trying to get in” must be understood in the context of diversity and equity. In this interactive workshop, we will define the concepts of diversity, equity, and inclusivity and delineate the key differences among these three topics to explore how equitable and inclusive learning environments are linked to excellence in education.



PDI General Session Speakers

**Sponsored by
ASRC Federal**



THURSDAY EVENING GENERAL SESSION SPEAKERS

5:30-6:45 pm

**ASTRONAUT Scott "Scooter" D. Altman and
Dr. Jeffrey "Jeff" D. Jordan**

**"Creating Scientific Leaders: Stories of Effective
Approaches to Teaching Leadership Skills in K-12"**

ASTRONAUT Scott "Scooter" D. Altman

Dr. Jeffrey "Jeff" D. Jordan

United States Navy Captain, Engineer, Test Pilot, NASA Astronaut, and a veteran of four space flights, Altman has logged over 51 days in space and more than 7000 hours flying over 40 types of aircraft. Hear about his exciting work on the Hubble Space telescope, experimental test aircraft, and his myriad experiences that have led him to his current leadership position as Senior Vice President Of Civil Operations for the Engineering, Aerospace and Mission Systems operating group. Relive the excitement of space travel as Scooter shares his many adventures both in space and on the Earth. Follow in his footsteps as he tells his story of an Illinois youth who aspired to be a pilot and who faced challenges and adversity along the way to realizing his dreams. Don't miss the opportunity to learn the history behind an American hero and meet this scientific leader in Williamsburg at VAST 2018!

Dr. Jordan has dedicated much of his career to supporting the NASA mission as both a civil servant and a contractor at the NASA Langley Research Center, where he has mentored students in leadership skills for nearly two decades. These experiences have provided valuable insights into the challenges facing young scientific leaders and informed approaches for successfully coaching leadership skills that result in the development of effective teams. In this presentation, Dr. Jordan will highlight some of his experiences and observations mentoring students in scientific leadership positions, and lead an interactive discussion on effective approaches for cultivating scientific leaders.

Night with the Exhibitors, Thursday evening, 7:30 p.m. - 9:00 p.m.

(Sponsored by WorldStrides)





GENERAL SESSION SPEAKERS

FRIDAY MORNING SPEAKER, 10:40 am to noon Munazza Alam, National Geographic Young Explorer



Sponsored by National Geographic Learning/Cengage

“Building Stronger Classrooms:

While efforts to build inclusive spheres of learning have typically been linked to welcoming diverse perspectives and backgrounds, these attempts do not address longstanding barriers that result in social disparities. In this talk, I will discuss the challenges to tackling equity, the importance of fostering equitable learning environments, and daily practices to create more equitable classrooms.

Munazza Alam is a second year graduate student in the Department of Astronomy at Harvard University. She was a physics major at CUNY Hunter College in New York City, and has worked in various research groups in the Astrophysics Department at the American Museum of Natural History.

Diversity, Equity, and Inclusivity”

Munazza’s research interests include the detection and detailed characterization of the atmospheres of exoplanets, or planets beyond the Solar System. Her work involves using data from the Hubble Space Telescope to infer the presence of different molecules in their atmospheres.

To collect data for her research, Munazza has used world-class telescopes at the Kitt Peak National Observatory in Tucson, Arizona; the Mauna Kea Observatories in Hilo, Hawai’i; and the Las Campanas Observatory in La Serena, Chile. When Munazza isn’t contemplating the cosmos, she is reading anything she can get her hands on, trying new ethnic foods, and learning new languages.

SATURDAY MORNING SPEAKER, 11:30 am- 12:45 pm Dr. Okhee Lee, New York University

SPONSORED BY THE VIRGINIA SPACE GRANT CONSORTIUM



“Diversify and Strengthen Science for All”

“Instructional Shifts to Promote Science and Language Learning With All Students Including English Learners”

In recent years, there have been fundamental shifts in thinking about both science and language learning with all students and English learners (ELs) in particular. Science instructional shifts promote language learning with ELs, while language instructional shifts promote science learning with ELs. Recognizing the science and language instructional shifts as mutually supportive can lead to better and more coherent instructional approaches that promote both science and language learning for all students, especially ELs. This presentation will address a conceptual framework along with examples from science curriculum materials and classroom instruction.

Dr. Okhee Lee is a professor in the Steinhardt School of Culture, Education, and Human Development at New York University. Her

research areas include science education, language and culture, and teacher education. She is currently leading collaborative research between New York University and Stanford University to develop instructional materials aligned with the Next Generation Science Standards (NGSS) in order to promote science learning and language learning of elementary students including English learners. She is also leading collaborative research with MIT and Vanderbilt University to integrate computational thinking and modeling in NGSS-aligned instructional materials. She was a member of the NGSS writing team and served as leader for the NGSS Diversity and Equity Team. She was also a member of the Steering Committee for the Understanding Language Initiative at Stanford University.

Stay for a presentation in session 10 for a chance at a \$100 gift card Raffle!

Get Your Game On with Legends of Learning!

Friday Night PDI - Auction and DJ

November 16, 8:30 pm - 10:00 pm



VAST and Legends of Learning will host the Get Your Game On!

EARN A DRINK TICKET FROM LEGENDS OF LEARNING!

Legends of Learning (legendsoflearning.com) is a game based learning platform with over 1,200 games and simulations for 3-8th grade science. Legends focuses on ongoing research to create standard-aligned (including SOLs) games that deliver a wide range of lessons and assess content proficiency for stronger mastery and classroom engagement.

Since Launching in April 2017, we are already in 6 of the 8 regions in Virginia and partnering with over 20 districts including Prince William, Virginia Beach, Chesterfield, Henrico, Petersburg, Louisa, Rockbridge, and Halifax to name a few.

Come to the Friday night Auction at VAST to learn about how you can transform your classroom using science games. As we get our game on, we will have the following Legendary game stations with some of the original classics: Legends of Learning games, the original Nintendo, Twister and giant Jenga! Play a game and earn a drink ticket. We look forward to a night of fun and games!

Auction and DJ on Friday night at the PDI, and the main way to get the **VAST Bucks** that you need for the auction is by visiting the **Exhibitors Thursday** night and all day Friday.

* **Bonus Legend of Learning Swag for anyone who dresses up as their favorite superhero or video game character.**



Science Auction Winners



DJ, Ron Shaneyfelt

SCIENCE AUCTION - There is seldom a better floor show 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! New this year, If you bring items for the auction you will receive **VAST bucks** for each bag of items.

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 \$\$\$\$ *Do you have VAST Bucks for the Auction?*

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 18th. 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:

Visit the exhibitors during the open hours of the Exhibit Hall Thursday night and all day Friday until Friday evening. You may need to remind Exhibitors to give you some VAST Bucks!!

A FEW RULES TO FOLLOW FOR THE AUCTION

- **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!

Get Your Game on with





A Summary of VAST Bylaws and Operating Procedure Proposed Changes

In March of 2018, Jackie McDonnough, VAST President; Susan Booth, VAST Executive Director; Andy Jackson, VAST Parliamentarian; and Robin Curtis, VAST Secretary; met to review and reorganize the VAST Bylaws and Operating Procedures. The documents, which had been previously mixed together were then separated into three distinct documents: the Bylaws which are the governing rules of our organization, the Operating Procedures which are how our organization operates or gets our mission accomplished, and the Handbook which further details the job of each member of the Board of Directors. In order to make changes to the Bylaws, approval must be made by the Executive Committee, Board of Directors and the general membership. In order to make changes to the Operating Procedures, approval must be made by the Executive Committee and the Board of Directors. The Operating Procedures were approved by the Executive Committee on April 22 and the Board of Directors on April 28. The Handbook is not a document that needs approval.

The VAST membership will be voting on the Bylaws changes at the Annual Meeting at the VAST PDI November 15-17 held at Williamsburg this year. The full documents may be reviewed at www.VAST.org. The Bylaws changes are listed here and highlighted in the Bylaws.

1. Article IV Section 4. Delete old conference terminology
- 1a. Article IV Section 8. Delete old conference terminology
2. Article IV Section 12. Remove “with cause”, redundant. Section 12 was moved from Article XI, Section 6.
3. Article VI Section 2. Meeting times do not need to be stated in Bylaws.
4. Article VII Section 2. Move to operation procedures.
5. Article IX Section 1. Reworded for clarity.
- 6., 7., & 8. Article X Section 1, Section 2, Section 3. Removal of Operating Procedures from Bylaws
9. Article X Section 4. Rewritten for clarity. Operating Procedures removed from text.
10. Article X Section 5. Remove of the words “operating procedures”.
11. Article XI Section 1. Move to operating procedures. “The nominating ...”
12. Article XI Section 3. Move to operating procedures.
New Section 3.
13. Article XI Section 5. Moved to Article IV Section 9. Section 10.
14. Article XI Section 6. Moved to Article IV #2.

To view the original Bylaws and Operating Procedures, go to the following VAST website page:

<https://vast.wildapricot.org/Bylaws-and-Operating-Procedures>

Members will vote to accept the latest amendments at the annual meeting held at the PDI in Williamsburg in November.



COMMONWEALTH of VIRGINIA
Department of Education

**ATTEND THE 2018 VAST PROFESSIONAL DEVELOPMENT INSTITUTE AND GET
THE LATEST UPDATES FROM THE VIRGINIA DEPARTMENT OF EDUCATION**

VDOE Staff members will give the following concurrent session presentations.

2018 Science Standards of Learning: Elementary

This session is designed to provide elementary teachers and leaders with information concerning the 2018 Science Standards of Learning. Although science content has not changed significantly, the wording of the standards has been changed to focus on science concepts. This change was made with the intent of allowing teachers to focus on concept development in science. The skills and processes have been reorganized to support Profile of a Graduate and to aid teachers as they embed these skills into content instruction. (presentation repeats on Friday and Saturday)

2018 Science Standards of Learning: Secondary

This session is designed to provide secondary teachers and leaders with information concerning the 2018 Science Standards of Learning. Although science content has not changed significantly, the wording of the standards has been changed to focus on science concepts. This change was made with the intent of allowing teachers to focus on concept development in science. The skills and processes have been reorganized to support Profile of a Graduate and to aid teachers as they embed these skills into content instruction. (presentation repeats on Friday and Saturday)

You can be a Winner: PAEMST Information Session

The Presidential Award for Excellence in Mathematics and Science Teaching is a prestigious national award that recognizes exemplary teaching in the science and mathematics fields. This year, the grant focuses on 6-12 grade teachers. This session will focus on the application process for PAEMST.

VDOE Science Outcomes Update

Science outcomes have been prepared for Environmental Science, Anatomy and Physiology, Astronomy, and Ecology with the intention that these outcomes become the Standards of Learning for these courses at the next Standards of Learning Revision. Learn more about the outcomes as well as strategies/activities for teaching the Environmental Science Course.

VDOE Update

This session is designed to provide teachers and teacher leaders information as to legislation and initiatives, both state and federal, that may impact science instruction.

An important notice from the VDOE

Anne Petersen, Ph.D.

Science Coordinator

Virginia Department of Education



COMMONWEALTH of VIRGINIA
Department of Education

The proposed **2018 Science Standards of Learning** are available for review and public comment. The public comment window will be open until September 15th. Please share with stakeholders in your divisions. And as always, if you have any comments or concerns with science instruction in the Commonwealth, please feel free to contact the science instructional team at VDOE.
§ MEMO 172-18 § 2018 Science Standards of Learning

For more information goto http://www.doe.virginia.gov/administrators/superintendents_memos/2018/172-18.shtml

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2018 VAST PROFESSIONAL DEVELOPMENT INSTITUTE DRAFT CONCURRENT SESSION PRESENTATIONS LIST

November 15-17, 2018

Doubletree by Hilton, Williamsburg, Virginia

Designing with Electrical Circuits

ELEM, Physics/Physical Science, Engineering

Barbara Adcock, Powhatan County Public Schools

Explore basic circuit design, differences between incandescent and LED lights, and design and create an electronic study guide. Leave with several design briefs that require very few supplies and can be done on a shoestring budget!

Green Screens- Green is No Longer Just for Plants

ELEM, General

Ricky Bain, Rockbridge County Schools

Stephanie Tuttle, Fairfield Elementary School

Green Screens are becoming all the rage in many classrooms, but how can they be used in Science. We have created a number of videos for our YouTube channel giving the students a chance to create from their knowledge of science topics. This process gives students a chance to not only master the given curriculum, but gives them an opportunity to communicate what they know. In this session we will walk the audience through how we create videos, while allowing the students to drive the lessons.

Playing Games to Teach Science Concepts

MS-HS, Environmental Science

Michael Barber, Albemarle County Public Schools

Many of the educational games used in classrooms are “reskinned” review activities. In this workshop, we will try out several hands on/ minds on games that teach academic content in engaging ways. The *Tragedy of the Commons* is a simulation game with cooperation and competition aspects that teaches conservation concepts. *Monster Storms* is a competitive card game wherein players compete to build up the largest storms using weather variables. Additional games will be modeled as time allows.

Encouraging Inclusion & Embracing Diversity with STEAM

ELEM-MS, Engineering, Math in Science

Susan Bardenhagen, VAST Region IV Director

Infusing students’ cultural background and history AND using PBL tasks strengthens learning. Scientists, technologists, engineers, and math educators identify that our future workforce needs problem-solving, critical thinking, and innovative strategies. Artists acknowledge that creative efforts are influenced by inquiry, patterns, and the design process. STEAM-infused education can be a community’s vehicle to preparing its future. Purposeful integration of STEAM has a synergistic effect.

Designing Science Units which Include Math Integration

ELEM, Math in Science

Susan Bardenhagen, VAST Region IV Director

Natural connections occur between Math and Science – patterns, organizing, problem-solving. Measurement supports science experiments, abstract concepts of both Earth & Space Science and place value beyond millions become understandings when partnered; fractional concepts support classification in life science. Whether self-contained or departmentalized, Math and Science units can be planned in tandem, crosscutting curricular areas. Presenter will share strategies with hands-on activities.

Avoiding De-Natured Science: Fun Activities for Teaching NOS

ELEM-HS, General

Randy Bell, Oregon State University

Understanding the nature of science (NOS) is critical for responding to issues of the 21st century such as global climate change, renewable energy, and genetically modified foods. This research-based presentation summarizes major themes of NOS and engages participants in fun and thought-provoking activities designed to teach NOS to elementary and middle school students. These activities are aligned with Virginia’s SOLs and are designed to be flexible so that you can use them right away!

Hands-on Preschool Science

ELEM, General

Josie Bergstrom, Virginia Beach Public Library

Kathleen DuBois, Virginia Beach Public Library

Learn how to plan, research, and implement hands-on science classes for preschoolers that encourage them to ask questions, experiment, explore, and solve problems. Create fun, multi-sensory learning opportunities that encourage parent and child interaction while keeping costs low and using easy-to-find materials. Learn how Preschool Science is connected to Every Child Ready to Read early literacy skill development, and then dive into Preschool STEAM with our hands-on demonstrations.

Science and Literacy - A Natural Integration

ELEM, General

Ashanda Bickham, Norfolk Public Schools

During this session, educators will explore strategies for linking science and literacy to support students’ abilities to read, write, and discuss in the context of science and inquiry-based learning using fiction and nonfiction texts. A hands-on experience of how science supports literacy and literacy supports science will be shown through pre-reading strategies, non fiction reading text, post-reading applications and hands-on science experiments.

Flex it! Science First...Reading and Writing Will Follow

ELEM, General

Kip Bisignano, Delta Education/FOSS
Kim Dye, FOSS Education Consultant

Hands-on science experiences provide three key factors not provided by traditional reading programs. Hands-on experience is motivating, is the fastest way to build background knowledge, and provides context for language for students who struggle with reading and writing. When we flip the instructional sequence, reading becomes authentic. Explore the new ScienceFlex program, from Delta Education, to experience this instructional sequence and program resources (grades 3-5). (Commercial exhibitor presentation)

Exploring Earth's Resources with AITC

ELEM, General

Lynn Black, Agriculture in the Classroom

Join the staff from Agriculture in the Classroom for this hands-on session that will use scientific investigation to explore renewable resources with your elementary students. Participants will have the opportunity to make their own bioplastic as they discover the ways in which the Earth's resources impact their daily lives. Teachers in attendance will also receive AITC curriculum and resources.

Celebrating Our D.N.A.

ALL GRADES, General

Tekita Blackwell, Roots for A-STEM, LLC

Celebrating Our D.N.A. (Demiurgic Notable Ancestry) is a STEM initiative to positively impact the academic performance and career choices of African American and Hispanic students. Hear first-hand testimonials from participants of Roots for A-STEM, LLC - an organization devoted to exposing African American and Hispanic children to pioneers in the Arts and STEM. (Not-for-Profit exhibitor presentation)

Engaging in The Physical Sciences

ALL GRADES, Physics/Physical Science, General

Angelo Bonilla, Breckinridge Middle School

Brian Kreppeneck, Lucy Addison Middle School

Good teachers know that the trick is engaging your students. We will present a wide variety of physics and chemistry demonstrations that will help you engage your students, create memorable experiences for them, and help them understand some relatively abstract concepts covered in the fifth grade and physical science SOL. As the rigor of assessments increases, use these demos to make your students think. From really simple to more elaborate, you will take home ideas you can use.

Integrating BYOD and Chromebooks with Vernier Technology

ALL GRADES, General

Jackie Bonneau, Vernier Software and Technology

Participate in fun and engaging experiments using Vernier digital tools with Chromebooks and BYOD that compare grip strength, investigate pressure and volume relationships, and match position graphs. See how sensor-based experiments teach students about data collection and analysis - practices that promote science inquiry, improve science literacy, and boost test scores. (Commercial exhibitor presentation)

Integrating Chromebook with Vernier Technology

ALL GRADES, General

Jackie Bonneau, Vernier Software and Technology

Participate in fun and engaging experiments using Vernier digital tools with Chromebooks to compare grip strength, investigate pressure and volume relationships, and match position graphs. See how sensor-based experiments teach students about data collection and analysis - practices that promote science inquiry, improve science literacy, and boost test scores. (Commercial exhibitor presentation)

Phylogenetic Trees and Dichotomous Keys

HS, Biology/Life Science

Katherine Bowen, Nottoway High School

Having trouble with your Biology students grasping the concept of a phylogenetic tree? Presentation will include how to create a phylogenetic tree, use it to create a dichotomous key and get your students ready to investigate evolution.

Digital Badges Motif for STEM Classrooms

ALL GRADES, Environmental Science, General

Arthur Bowman, Norfolk State University

Kianga Thomas, Norfolk State University

See how a digital badge motif can be used to enhance STEM instruction in any grades, without the need for fully technological implementation. Currently, full implementation of a digital badge program is technologically beyond the means of most K-12 classrooms. However, digital badge design coupled with an ordinary computer-based delivery can be used to enhance STEM instruction across all grades. Participants will leave this session with great insight into the digital badge process.

The Engineering Curse: Engineering is Everywhere I Look

ALL GRADES, Engineering, General

Arthur Bowman, Norfolk State University

Through hands-on activities, see how everywhere that you look there is evidence of engineering in action. Everyone is constantly impacted by an incredibly large number of different types of engineering. Come see how all of us are really facing an "engineering curse" as we conduct an analysis of every aspect of our daily lives. Participants will leave knowing that all teachers and students have been acting as engineers all of their lives without having an awareness of this circumstance.

Hands-on, Minds-on: 4-H STEM School Enrichment

ALL GRADES, General

Tara Brent, Virginia Cooperative Extension

Field trip and supply funds low? Bring the field trip to your classroom through Virginia 4-H. Come learn the ways that 4-H can enhance your science instruction with SOL correlated lessons and programs. Participants will engage in sample activities and hear impacts of 4-H in Virginia classrooms.

Experiential Learning - Learning through Experience

MS, General

Adrienne Britton, Norfolk Public Schools

As a natural means of learning, experiential learning provides opportunities to reflect and think. Through experiential learning, students form knowledge, skills, and values because of direct experiences.

How Can Outdoor STEM Education Help Your School?

ELEM-HS, Earth/Space Science, General

Charlie Bueche, Astrocamp

Providing information on how outdoor STEM education experience can have immense benefits for students and teachers involved. The benefits for teachers who participate in this program can provide opportunities to expand skills and increase enthusiasm in science subjects. The experiential science curriculum supplements and connects teachers' content, which increases interest and knowledge in science for students. (Not for profit exhibitor presentation)

Not Just Another Field Trip: Museums as Community Partners

ALL GRADES, Biology/Life Science, General

Nicole Burns, Virginia Living Museum

Rethink how you plan your field trips and get more from your out-of-school time. Whether you are booking a bus or having a museum come to you, there are many ways informal science programming can be used to make your curriculum come to life. Museums offer a unique learning environment for all types of learners and should be considered a community partner when developing your curriculum. (Not-for-Profit exhibitor presentation)

Strands and Dimensions: Looking at Lessons from New Angles

ALL GRADES, General

Benjamin Campbell, Longwood University

Matthew Bowman, Longwood University

Are you an early career teacher who wants guidance on robust planning? Or are you a seasoned veteran who could use a refresher on ways to make your curriculum less linear and one-dimensional? Either way, this session will provide guidelines for incorporating the three strands of NGSS—as well as three dimensions for conceptualizing science—into your labs, lessons, and activities. All content areas are welcome!

Provocations: Starting the Morning with Science

ELEM, General

Maria Caragiulo, Newport News

This session focuses on how to take advantage of every moment in your classroom, beginning even before the bell rings. Morning activities can be extended to include hands-on authentic learning with real life scientific artifacts. Provocations are an opportunity for every student to engage and develop background knowledge before science based curriculum lessons begin, while also allowing time for formative assessments through teacher observation.

STEM Friday: Wrapping Up and Setting Off

ELEM, General

Maria Caragiulo, Newport News

STEM Friday is the best day of the month. Learn how to orchestrate a real life culminating activity that incorporates science, math and literacy. STEM Friday is a great way for students to practice collaboration, teamwork, and communication skills. These activities also lend themselves to outside collaboration with older students, or family engagement, and is a great asset to any school.

Downstream Collaborative

ALL GRADES, Environmental Science, General

Katie Catania, VBCPS

William McConnell, Virginia Wesleyan University Molly Lewis, VBCPS

Downstream Collaborative is a pilot program that was created this school year to evaluate opportunities to connect Virginia Beach 4th graders with field experts in order to examine the question, How do our choices and actions affect our shared watershed?

Suitcase Science: Hands-on Lessons Shipped to Your School

ALL GRADES, Biology/Life Science

Rachel Clark, Virginia Aquarium & Marine Science Center

The Aquarium offers six Suitcase Science Kits for grades K – 12 that can be shipped to your school. Each kit includes lesson plans and activity materials to highlight the topic plus games, posters, DVDs, biofacts, and books. Participants will take a closer look at two of our kits – Sea Turtle Science and Climate Science by trying out activities and resources. Participants will receive a copy of all the lessons from the kits plus enter for a chance to win a free suitcase rental. (Not-for-Profit exhibitor presentation)

Using Technology to Engage Scientists!

ALL GRADES, General

Kelly Clough, Louisa County Middle School

Are you looking for ways to integrate science with technology? There are several online options that will give your students an engaging way to practice science concepts in class. This session will introduce you to free sites like Quizlet, Quizizz, Kahoot, and Nearpod. Within each site you can search for already created topics or create your own. Plus, they provide awesome feedback! Join us with your LAPTOP or DEVICE to learn how to take your science review sessions to the next level.

Project Based Learning and the traditional Ecology Classroom

HS, Biology/Life Science, Environmental Science

Denise Coleman, Jefferson Forest High School

Get students to go beyond memorization, to application of real world environmental issues. Students choose an endangered species, introduce it in its natural habitat, and examine how that habitat is being altered by human activities. They will culminate their learning by presenting a presentation entitled “Why Should We Care?” that highlights their journey through ecology and how it is interconnected with our lives.

Escape Room Challenges

ALL GRADES, Math in Science, General

Jill Collins, STEM Academy

Jacob Taylor, STEM Academy

Teachers will be introduced to and experience the Escape Classroom Concept. An Escape Classroom challenge involves solving a series of sequential clues in order to “escape” the challenge. Topics will be geared towards middle school science but can easily be adapted to any grade level.

NASA GLOBE Clouds: Observations and Investigations

ALL GRADES, Earth/Space Science, Environmental Science

Marilé Colón Robles, NASA Langley / SSAI

Cloud observations are important for scientists to understand Earth's Energy Budget. NASA & the GLOBE (Global Learning and Observations to Benefit the Environment) program collected cloud observations from students and citizen scientists during the 2018 GLOBE Clouds Spring Data challenge, available for teachers to do suggested classroom investigations. Discover the suggested investigations and learn how to use technology to make new observations that are then matched to satellite data by NASA.

Simple Machines Digitally

ELEM, Physics/Physical Science

Carolyn Craig, Seatack Elementary School

You will experience with an integrated hands on and digital learning lesson on Simple Machines. This lesson will give some ideas on how to take advantage of technology to personalize learning for students. I will show how to take the information you get from the technology piece to pull small groups of students for differentiation. There is also a hands on activity to be used as an extension to this lesson.

Developing Inclusive K-12 STEM Outreach Programs

HS-COL, Biology/Life Science, General

Kerry Cresawn, James Madison University

Shelby Snowden, James Madison University

Traditional models of K-12 outreach are not accessible to or pique interest in a large population of learners. Many programs are designed based on the scientist's interest and not on the needs of the student. We will present a model that has reached nearly 4,000 children by addressing the common barriers to inclusivity and alignment with teachers' goals. Participants will learn what works and doesn't work in program development and apply this to programs that would best serve their local K-12 community.

Environmental Literacy Model and Cross Curricular Lessons

MS, Biology/Life Science

Maurice Cullen, Virginia Beach Middle School

Erica Dean, Virginia Beach Middle School

Looking for cross curricular ideas for English and Science? This course will demonstrate how to combine those subjects using the Environmental Literacy Model (ELM). The focus will be on creating lessons involving 7th grade students researching insects and plants from the school's pollinator garden. Students use a template to create a digital field guide page and present them in a gallery walk. Discussion will include community involvement opportunities.

Visual Literacy in Science for All Learners

MS-HS, General

Janine D'Elia, Chesterfield County Public Schools

Rachel Hill, Chesterfield County Public Schools

Visual literacy is the ability to extract information from graphics that accompany text. Think: pictures, diagrams, graphs and charts. This session will give teachers strategies to implement immediately that will help ALL learners. Take with you activities that focus on interpreting data! Specific test-taking strategies will be covered as well. Appropriate for middle and high school.

Problem-Based Learning Activities

ALL GRADES, Biology/Life Science, Physics/Physical Science

Anna Desmarais, Goochland

Tanner Winesett, University of Virginia

Frackson Mumba, University of Virginia

We will discuss characteristics of PBL instructional approach. We will demonstrate PBL units and activities we have developed and tested in schools. Participants will learn how to create PBL units, activities, and assessments for their classrooms. Participants will receive PBL template, PBL units, activities and assessments.

“Game-Making” Levels via Revels? Revels via Quick Learning?

ALL GRADES, Environmental Science, General

Jim Disbrow, The Millennium Project

Game-makers consistently reflect both a leveling within the group - and a concurrent reveling emotional state. Game-makers post-tests indicate a better and longer retention than from other teaching modalities. Game-making pulls together each pod of game-makers with this hilariously successful technique. Participants go into a reveling emotional-state as they engage and understand quickly. Using a fairly complex example (environmental flux in the Arctic Circle), a simple game will be developed.

Investigating Inquiry

ELEM, General

Sarah Donnelly, Bettie F. Williams Elementary School

Angela Ryan, Bettie F. Williams Elementary School

Teraya Cowart, Bettie F. Williams Elementary School

Immerse yourself in scientific investigation as you experience hands on learning activities perfect for whole group and small group in the elementary classroom. You will leave with a series of ready to go lessons to support the science SOLs.

Register on line before October 31 to get the Early Bird registration fee.

Enhance Student Learning on a Rural Shoestring Budget

MS-HS, General

Amanda Dorton, Council High School

You are a teacher in a rural school. Your laboratory supplies are meager. How can you implement laboratory activities on a budget and still give your students the same opportunities as other students in Virginia? This presentation (geared primarily at new teachers) will give you lesson ideas, lab activities, and lab safety tips to assist you in engaging your students.

Designing Phenomenon-Based Lessons for AP/IB Biology

HS-COL, Biology/Life Science

Kristen Dotti, Catalyst Learning Curricula

Using simple manipulatives to depict the translation of insulin, students question how the complex processes of the Central Dogma could possibly be carried out. The answer? Gene regulation and molecular signals. Learn how to teach using phenomenon-based activities that nail AP/IB content. Experience this NGSS aligned method firsthand in the role of the student, with a lesson to take back to your classroom. (commercial exhibitor presentation)

Mutant Mice: Helping AP/IB Students Describe Data Correctly

HS-COL, Biology/Life Science, Environmental Science

Kristen Dotti, Catalyst Learning Curricula

Collect data on groups of “mutant mice” and use these sample sets to guide students to make good choices in the use of data descriptors. The control group and the experimental group will have equal means, but the variation in the data set will be extreme and impossible to ignore. This activity leads students to determine logic must be used instead of habit when choosing the best mathematical descriptors. This activity will include take home lesson plans. (Commercial exhibitor presentation)

Add Math to APES/IBESS/Biology with Data Generating Games

HS-COL, Biology/Life Science, Environmental Science

Kristen Dotti, Catalyst Learning Curricula

Discover data-generating activities that teach scientific phenomenon and NGSS practices through modeling. Use the data set to write a mathematic equation and hypothesis supported with evidence. (Commercial exhibitor presentation)

Using Mitosis to Teach Hypothesis Testing in AP/IB Biology

HS-COL, Biology/Life Science

Kristen Dotti, Catalyst Learning Curricula

Turn the root tip mitosis lab into an opportunity to teach test of correlation and chi-squared so students are prepared to analyze more complex data. Teachers will calculate the mitotic index in focal fields progressing up the root tip and then learn to perform a test of correlation and chi-squared analysis on the data sets generated. NGSS practices on the process of science will be implemented through the design of original experiments and the analysis of data using hypothesis testing. (Commercial exhibitor presentation)

Now It Makes Sense! Developing Understanding through Models

ALL GRADES, General

Kim Dye, FOSS Education Consultant

Kip Bisignano, Delta Education/FOSS

Conceptual models aid students in representing and communicating their understanding of science concepts. But how do we get students to develop models that represent their experiences, observations, and thinking? Through “sense-making”! Come explore a hands-on activity from the FOSS program and experience instructional strategies that help students make sense of scientific phenomena and acquiring science language. Hand-outs and resources will be provided. (Commercial exhibitor presentation)

Science and Engineering Practices is Not a Stand-Alone Unit

ELEM-MS, General

Kim Dye, FOSS Education Consultant

Kip Bisignano, Delta Education/FOSS

Science and Engineering Practices describe behaviors that scientists engage in as they investigate the natural world and that engineers use as they design and build models and systems. The practices are the skills, processes, and knowledge that students should regularly use to strengthen critical thinking and deep conceptual learning. Experience a FOSS investigation that authentically incorporates the practices while learning science content. (Commercial exhibitor presentation)

Engaging Inquiry: Pre-service Teachers Share Tested Lessons

MS-HS, Earth/Space Science, General

Elizabeth Edmondson, Virginia Commonwealth University

Do you want to wow your students? Do you need to inject some pizzazz into your instruction? Attend our session where secondary science preservice teachers will share inquiry-based, hands-on lessons in this interactive session. You will have an opportunity to see and participate in these classroom tested activities.

Integrating Deep Ancestry into Integumentary System

MS-COL, Biology/Life Science

Joan Ehlers, Kecoughtan High School

The National Geographic’s Deep Ancestry research and, currently, its April 2018 edition inspired this unit. I have been using this in my high school Human Anatomy class for years. It involves melanocytes in skin, skin tone, skin cancer, Vitamin D production and osteoporosis.

Mousetrap Cars -- A STEM Approach to Forces & Motion

MS, Physics/Physical Science, General

Carolyn Elliott, Goochland Middle School

Are you looking for a new way to teach Forces and Motion? Requiring students to design and build mousetrap cars is a hands-on way to cover the objectives for PS 10 in the VDOE science framework. Newton’s laws, speed, acceleration, work, force, mechanical advantage, efficiency and power can all be taught quickly and easily in the context of a student’s mousetrap car.

Using Online Simulations for Conceptual Understanding

ALL GRADES, General

Bonnie Ellis, Explore Learning

Learn how online simulations, Gizmos, can help teachers take advantage of research-proven instructional strategies and help students of all ability levels develop conceptual understanding in math and science. Teachers can supplement and enhance instruction with powerful interactive visualizations of concepts. Students can manipulate key variables, generate and test hypotheses, and engage in extensive “what-if” experimentation. (commercial exhibitor presentation)

The Magic of Science! (Learn magical demonstrations)

ELEM-MS, Physics/Physical Science, General

Robert Ellis, Fairfax County Public Schools

Have you ever seen a magic act, and wondered how something happened? Would you like to make boredom “disappear”? Learn entertaining and baffling magical effects to grab your student’s attention. These demonstrations and hands-on activities have been perfected by a real magician, and comply with VAST/NSTA safety rules. This session is primarily directed toward K-8 SOL, however anyone interested will learn something new. Lecture notes will be available so you can start the magic right away!

Get Interactive! How to integrate science notebooks

MS-COL, Biology/Life Science, General

Jennifer Falin, Louisa County High School

Alice Scheele, Patrick Henry High School

In this session we will be discussing how to integrate interactive notebooks into your science classroom. With a focus on life sciences, we will show how to use science notebooks to increase organization, engagement, and retention with your students. Examples will be provided for ALL high school levels. Come and get interactive with us!

Teaching Naturally: A Showcase of Outdoor Education Ideas

ALL GRADES, Environmental Science

Charlie Filer, Glenvar High School

Glenvar High School is one of 73 Virginia Naturally Schools. Recognized for our exemplary efforts to increase the environmental awareness and stewardship of its students, Glenvar has developed community partnerships and creative fundraising ideas to further our mission. This presentation highlights some of our efforts including: Trout in the Classroom; Adopt-a-Stream; making and selling products made from on-campus beehives; and other ideas.

Promoting Diversity with School/University Partnerships

ALL GRADES, Biology/Life Science, Environmental Science

Hilve Firek, Virginia Wesleyan University

Deirdre Gonsalves-Jackson, Virginia Wesleyan University,

William McConnell, Virginia Wesleyan University

Victor Townsend, Virginia Wesleyan University

School/University Partnerships promote diversity in the sciences by offering hands-on science experiences for students in grades K-12. From elementary environmental-science camps to summer-long biology courses just for high-school students, Virginia Wesleyan University professors work with area teachers to provide meaningful opportunities that help young people from all backgrounds come to view themselves not just as “students of science,” but as scientists! Learn how you can do it too!

Getting the Best out of VAST- A Session for First Timers!

ALL GRADES, General

Thomas Fitzpatrick, Roanoke City Public Schools

Navigating the PDI and using your time wisely can be a daunting task for first time attendees at VAST. This session will give first time attendees tips for untangling the many offerings and focusing on sessions that fit their specific needs. The session presenter will help first timers set their professional development goals for the PDI, assess offerings, and plan what sessions they will attend. Attendees will leave the session ready to get the most out of their PDI attendance.

Accessible Herb School Gardens

ALL GRADES, Biology/Life Science

Kathy Frame, Papillon Education Services LLC

Gardening is a lifelong pleasure with endless benefits. School gardens foster positive learning environments that can engage ALL students. They level the field for students with physical disabilities, learning and behavior challenges and other special needs. By paying attention to details, compliance with the American Disabilities Act can be implemented. Hands-on experience with garden details will make learning in the garden possible for all.

What Makes for a Good (Scientific) Argument?

ELEM-MS, General

Joanna Garner, Old Dominion University

Melani Loney, Old Dominion University

In this interactive session, participants will explore the components of a scientific argument, and will consider how this approach can accommodate other processes such as the scientific method. Participants will construct a scientific argument by conducting a brief investigation in order to generate a claim, evidence, and a justification. Participants will receive sample lessons through which they can teach scientific argumentation.

The Search for Exoplanets: Classroom Activities

ALL GRADES, Earth/Space Science, Physics/Physical Science

Harold Geller, George Mason University

Attendees will participate in classroom activities focused on the search for exoplanets, especially linked to the Transiting Exoplanet Survey Satellite (TESS) spacecraft launched by NASA on April 18, 2018. This will include demonstrations of both the transit method of detection and the radial velocity method of detection of planets orbiting stars other than our own sun.

Register for the VAST PDI on line at <https://vast.wildapricot.org/Registration-Information>.

Supporting STEM and Literacy Learning Through PBL

ELEM, General

Amanda Gonczy, Michigan Technological University

Jennifer Maeng, University of Virginia

Problem-based learning (PBL) allows for natural integration of science with other content (e.g. STEM, literacy) and supports inquiry instruction. In this session, participants will first learn what PBL instruction is. Then, we showcase activities from several classroom-tested SOL-based PBL units developed by elementary teachers in the VISTA ELIS project. Participants will consider how they can apply these ideas in their instruction and receive resources for the showcased activities.

Scientific Argumentation 101

ELEM, General

Mindy Gumpert, Old Dominion University

William McConnell, Virginia Wesleyan University

The National Research Council (2012) suggests that argumentation is an important goal of science education. Join us to engage in written and oral scientific argumentation with an emphasis on making a claim and justifying it with credible evidence. Scaffolds will be embedded in the lesson to demonstrate how to differentiate instruction. Attendees will be provided with practical ideas to add to their science toolbox.

Teaching Science in an Inclusive Classroom

ELEM, General

Mindy Gumpert, Old Dominion University

Over 66% of students with disabilities spend the majority of their day in the general education classroom. Many classroom teachers feel ill-equipped to teach these diverse learners. Several interventions are effective for teaching science to students with disabilities. This presentation will focus on four of them: peer collaboration, text structure analysis, explicit instruction, and graphic organizers. Participants will be provided with practical ideas to add to their science toolbox.

Case-Based Learning Activities for Science Classrooms

ALL GRADES, Biology/Life Science, Physics/Physical Science

Zihan Guo, University of Virginia

John Sackson, University of Virginia

Frackson Mumba, University of Virginia

We will demonstrate Case-Based Learning (CBL) activities we have developed and tested in schools. Participants will learn how to develop CBL activities using CBL templates we have developed. We will share resources including CBL templates, CBL activities, and assessments.

Get 'em Hooked: Discrepant Events for Elementary Science

ELEM, General

Kristie Gutierrez, Old Dominion University

Discrepant events are events that do not seem to follow the "rules of nature" and often puzzle or astonish the audience. These events are great "hooks" in the Engage portion of the 5E instructional model and can help assess prior student knowledge. In addition to demonstrating their discrepant events, the ODU teacher candidates will provide attendees with access to their discrepant event activities and describe how it fits into a lesson to cover VA Science SOLs. (Preenters are Pre-K Science Methods Students0)

Technology in the Science Classroom

ELEM-MS, Earth/Space Science, General

Eric Hallal, Colonial Heights City Schools

In this session, attendees will learn various technology media that they can use in their classrooms immediately. Media that will be discussed and gone over include plickers, Phet, QR Codes, and many other interactive sights. Participants will leave with examples for their classrooms on how to use these mediums and be shown ways to use each of them in their classrooms to increase student engagement and success. Bring your laptop to this presentation.

Teaching Deaf Students . . . You Can Do It, We Can Help!

ALL GRADES, General

Brita Hampton, Virginia Beach City Public Schools

Kristi Greenstein, Virginia Beach City Public Schools

Astrid White, Virginia Beach City Public Schools

Come and learn how to diversify and strengthen your teaching strategies to reach every child in your classroom . . . especially those with hearing loss! We will demystify hearing loss and some of the equipment you have probably seen or even used (FM systems, hearing aids, cochlear implants). We will explain how even the slightest hearing loss can affect a students' academic progress and share with you research-based, best practice tools that you can implement in your classroom tomorrow!

Real Science: Science Teachers in Research Labs

MS-HS, Biology/Life Science, Chemistry

Rosalyn Hargraves, Virginia Commonwealth University

Jessica White, Benjamin Syms Middle School

Jason Riley, Huguenot High School

Pamela Noble, George Wythe High School

Three Region I teachers, from the summers of 2017 & 2018, will share their experience conducting research at VCU. The areas of study included:

A High School Biology teacher looking at the effects of nicotine on male versus female mice.

A High School Chemistry teacher exploring ways to characterize synthetic drugs like bath salts.

A Middle School Life Science teacher working with mice to determine effects of drug addiction on the brain.

PBL: Project Based Learning at Maymont

ALL GRADES, Biology/Life Science, Environmental Science

Courtney Harlow, Maymont Foundation

Project Based Learning (PBL) focuses on student exploration of a driving question to create a project that will be presented to an audience. Over a period of time, students will be given tools and opportunities that will aid in gaining a deep understanding of their topic. Driving questions should be complex and focus on real-world problems. PBLs at Maymont typically consist of a teacher training day, outreach, and culminate with a site visit that brings all of the student research together.

Citizen Science for Every Curriculum

ALL GRADES, Biology/Life Science, Environmental Science

April Harper, Maymont Foundation

Make teaching & learning Virginia's science SOLs meaningful by incorporating citizen science into your curriculum. Maymont educators will demonstrate how to utilize a wide range of easy to use databases to enhance lessons and research practices, both in the classroom & on field trips. Connections will be made to Project Wild lesson plans to highlight ease of use in the classroom. Educators will also share experiences & benefits of participating in Bioblitz as a part of Project-Based Learning.

Easy STEM Integration with NASA Resources

ELEM-MS, Earth/Space Science, Physics/Physical Science

Joan Harper-Neely, National Institute of Aerospace (NIA)

Sharon Bowers, National Institute of Aerospace (NIA)

Betsy McAllister, Hampton City Schools and National Institute of Aerospace

NASA has many resources to support STEM integration in the science classroom. During this session attendees will participate in hands-on activities involving physical and Earth science standards for grades 3-8. (Not-for-Profit exhibitor presentation)

Laboratory Safety Equipment and Techniques

HS, Chemistry

Stephanie Harry, VAST Chemistry Content Chair

Laboratory safety and laboratory techniques are the first skills students learn in Chemistry. This presentation will share activities and a laboratory experiment that can be used to teach these important skills during the first week of school. This lesson can be adjusted to meet the parameters of your school, students and classroom. These lessons cover SOL CH 1a and 1b.

My Smorgasbord of Chemistry Ideas

HS, Chemistry

Stephanie Harry, VAST Chemistry Content Chair

It's a smorgasbord Chemistry experience. This presentation will share some of my favorite Chemistry experiments, activities, and organization skills that I have used and adopted in my twenty-plus years as a teacher.

SciGirls Seven: Strategies for Engaging Girls in STEM

ALL GRADES, General

Tina Harte, NASA Langley Research Center

Jessica Taylor, NASA Langley Research Center

SciGirls is an Emmy award-winning, NSF-funded, education program drawing on research about what effectively engages girls in science, technology, engineering and math (STEM) learning and careers. SciGirls videos and activities are designed with a singular but powerful goal: to inspire, enable, and maximize STEM learning and participation for all girls. Participants will learn how they can incorporate the SciGirls Seven Strategies to engage students in STEM.

Explore Clouds with NASA and PBS' SciGirls

MS, Earth/Space Science

Tina Harte, NASA Langley Research Center

Jessica Taylor, NASA Langley Research Center

Are you looking for role models to inspire your middle school girls to pursue STEM? NASA Langley's cloud observation program was featured in the PBS show SciGirls in the episode SciGirls: Data Collection. Participants will engage in the hands-on SciGirls activities, explore how to easily make cloud observation for NASA using the GLOBE Observer app, and learn how to use video segments from SciGirls to introduce young girls to female role models in STEM.

Exploring Forms of Energy and Energy Transformations!

ELEM-MS, Earth/Space Science, Physics/Physical Science

Emily Hawbaker, National Energy Education Development Project

Explore six, hands-on stations - motion, sound, thermal, radiant, electrical and chemical energy is fun to teach! The investigations use items encountered in our daily lives - glow sticks, hand warmers, batteries, etc. - but often have little understanding of the science behind how they work. Participants will leave feeling confident to teach energy forms & transformations in their elementary classroom. (Not-for-Profit exhibitor presentation)

Harnessing the Power of the Sun

MS, Earth/Space Science, Physics/Physical Science

Emily Hawbaker, National Energy Education Development Project

Explore scientific concepts of solar energy through hands-on activities geared towards the intermediate level. Interdisciplinary activities reinforce the science behind solar energy. Design and test a solar oven, test UV beads, use PV cells to see how radiant energy can be transformed into electricity and how a motor transforms electricity into motion, and learn how light can be concentrated on an object. (Not-for-Profit exhibitor presentation)

Panorama by Nat Geo: Reading through the Lens of Science

ELEM, Biology/Life Science, General

Sara Heindorf, National Geographic Learning/ Cengage

Sarah Calkins, National Geographic Learning/ Cengage

We will explore National Geographic Learning's groundbreaking new program, Panorama: Science, for Grades K-6. Panorama: Science incorporates life, Earth, and physical science strands through authentic fiction and National Geographic nonfiction. Powered by the MindTap digital platform, students will engage with interactive texts and stunning video. Teachers will have access to differentiated instruction and customized lessons based on reading and science standards. (Commercial exhibitor presentation)

The Concurrent Session Presenter PDI registration deadline is Sept. 6.

National Geographic Science: Engaging program for Grades K-5

ELEM, Earth/Space Science, General

Sara Heindorf, National Geographic Learning/ Cengage

Sara Calkins, National Geographic Learning/ Cengage

In this session, we will explore the National Geographic Science program for students Grades K-5. This program immerses students in the Nature of Science and Inquiry while building scientific and content literacy. The digital platform features interactive games, videos and text to engage the students. We will walk through a lesson to show teachers the Nat Geo experience. (Commercial exhibitor presentation)

New AP Biology Resources from Cengage

HS-COL, Biology/Life Science

Sara Heindorf, Cengage/ National Geographic Learning

Steve McClelland, Cengage/ National Geographic Learning

Our new AP Biology program features an integrated, inquiry-based learning system that guides students through every chapter, starting with key concepts at the beginning of each chapter and learning objectives for each section. In this session, we'll explore the dynamic MindTap platform that gives instructors complete control of their course and powers students from memorization to mastery. (Commercial exhibitor presentation)

Environmental Science from Nat Geo Learning

HS-COL, Environmental Science

Sara Heindorf, Cengage/ National Geographic Learning

Steve McClelland, Cengage/ National Geographic Learning

We will showcase Environmental Science programs from Cengage/Nat Geo Learning, including on-level and AP courses. Our programs focus on core environmental issues while incorporating current research on solutions-based outcomes. National Geographic images, Explorers and scientists are featured to show how real science and engineering practices are used to solve real-world problems. We will demonstrate how our dynamic MindTap platform can be used to customize based on teacher and student needs. (Commercial exhibitor presentation)

Going Against the Flow-Promoting Literacy in Life Science

ALL GRADES, Biology/Life Science, Environmental Science

Delynda Hendricks, North Fork Middle School

Cara Stombeck, North Fork Middle School

A teacher and former student turned colleagues, are using Trout in the Classroom to help promote literacy. Students investigate water quality required for Brook Trout and learn to write scientific reports. English classes develop presentation media, including brochures and slideshows, with a goal of strengthening literacy skills in preparation for public presentations.

Involving Students in Authentic Conservation Research

HS, Biology/Life Science, Environmental Science

Freddy Herrera, Operation Wallacea

Scott Sveiven, Operation Wallacea

Discover the empowerment, independence, and learning that comes with cutting edge biodiversity field research. As science educators, we recognize the importance of credible field work. Laboratory experiments are great, but imagine your students working alongside research scientists, developing protocols, collecting information and contributing to the published body of original research. (Commercial exhibitor presentation)

Edulastic: A Free Online Resource for Creating TEI-like Questions

ALL GRADES, General

Debra Hicks, Syms Middle School

Travis Riddick, Syms Middle School

An online assessment that allows the teacher to create TEI Questions that are similar to those found on the SOL test. This presentation will show examples the various questions, and how to create the questions. Attendee are encouraged bring a computer with them.

Creating an Inquiry-Based Classroom for Student Success

ALL GRADES, General

Stan Hill, Wake Forest School of Medicine

Kelsey Doolittle, Wake Forest School of Medicine

Discover an Inquiry-Based approach to learning that engages students and motivates them to achieve. Participants are introduced to instructional standards that can be used to transform any classroom. These standards are used with Problem and Project-Based Learning cases and hands-on instructional materials to help students develop critical thinking skills. During this workshop, participants will experience a student inquiry and look at how the parts combine to enhance teaching and learning.

Building Literacy Skills through STEM Instruction

MS, Engineering, Math in Science

Cheryl Hinzman, Prince William County Schools

Meghan Waymire, Prince William County Schools

Kristin Rojas, Prince William County Schools

Are you ready to differentiate instruction and implement blended lessons with STEM? Join us as we share experiences from a STEM workshop offered to middle school teachers. Strategies focused on tasks that increased student discourse, conceptual understanding, reasoning, writing, and problem-solving skills. Resources include integrated lessons with hands-on-exploration through manipulatives to engage all learners and build their literacy skills.

Earthquakes, Sediments and Glaciers, Oh My!

MS-COL, Earth/Space Science, Environmental Science

Carol Hopper-Brill, VA Institute of Marine Science, Mar. Advisory Program

Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve

Based on current research, this hands-on activity shows how marine sediments reveal geologic activity on land and in the sea. Students collect mock cores to determine sediment sources including rivers, glaciers, and earthquakes. Some sources, like earthquakes, are catastrophic and some, like glacial melting, are evidence of long-term changes. Both require study so that human populations can be prepared for future occurrences. Can scale for middle, high school, and beginning college use. (Not-for-Profit exhibitor presentation)

Engaging Students in Science Through Hands-On Learning

MS-HS, Biology/Life Science, Environmental Science

Zella Hoyt, Stonewall Jackson High School

A look into how teachers can take every day items in their classroom to create a hands-on, engaging environment for students within the science classroom. This will give teachers a look at labs and activities that can be used for student exploration to help all students within the class, and will take teachers through multiple activities from an inquiry-driven Biology Classroom.

Field, Forest and Stream by Project Learning Tree

ELEM-MS, Biology/Life Science, Environmental Science

Page Hutchinson, VA Dept. of Forestry/ Project Learning Tree

Ellen Powell, VA Dept. of Forestry/Project Learning Tree

Field, Forest and Stream: In this inquiry-based activity you will conduct a field study of three different environments that focus on sunlight, soil moisture, temperature, wind, water flow, plants, and animals in each environment. Two versions of this activity will be presented and experienced: one for 1-3rd grades and one for 4-8th grades. This is one of 96 activities that can be found in PLT's PreK-8 Environmental Education Activity Guide. Participants will receive a copy of the activity. (Not-for-Profit exhibitor presentation)

Fun Chemistry Laboratory Experiments, Activities and Projects

HS, Chemistry

Paula Irwin, Stonewall Jackson High School

Are you a new or tenured chemistry teacher looking for some short, fun and hands-on laboratory experiments, activities and projects that reinforce the VA Chemistry SOL essential knowledge and skills? Then, this is a session you will not want to miss.

Teaching Physics Instead of /Teaching About Physics

HS-COL, Physics/Physical Science

Andrew Jackson, Harrisonburg City Public Schools

Basic, traditional lessons can be tweaked to go from low level learning to multi-dimensional learning. Transform your teaching from teaching about physics to having your students apply a more deep understanding of physics.

VIP Share Session!

MS-COL, Physics/Physical Science

Andrew Jackson, Harrisonburg City Public Schools

Tony Wayne, Albemarle County Public Schools

Physics teachers will do 5-10 minute shares of classroom tested labs, demos, and lessons and provide handouts for you with all the details to take back to your classroom. VA Instructors of Physics (VIP) is a 30 year old collaboration of physics teachers from across the state.

STEM Academy Networking

HS, General

Andrew Jackson, Harrisonburg City Public Schools

Myron Blosser, Harrisonburg High School

Mike Pratte, Stafford County Schools

Jennifer Chang, Loudon County Schools

This is an opportunity for leaders and teachers in STEM Academies across the state to share and network about challenges and successes of operating STEM Academies.

Elementary Physical Science by VA Instructors of Physics

ELEM, Physics/Physical Science, General

Andrew Jackson, Harrisonburg City Public Schools

Let the Virginia Instructors of Physics help you with lessons on energy and the concept of independent variable, dependent variable, and constants in experiment design. We'll address misconceptions and provide lessons to take back to your 4th, 5th, and 6th grade classroom.

METHodical Planning: Science Lessons with ME in Mind

ELEM, General

Angerina Jones, Portlock Primary School

"METHodical Planning: Science Lessons with ME in Mind" aims to encourage and empower educators to deliberately plan primary level science lessons that engage the specific learning styles of African American students. Participants will explore culturally germane learning styles and several relevant instructional strategies for science based lesson planning.

My NASA Data 2.0: Iteration for Earth System Education

ALL GRADES, Earth/Space Science, Math in Science

Elizabeth Joyner, NASA Langley Research Center

My NASA Data 2.0: Iteration for Improved Earth System Education

NASA offers petabytes of global Earth science data collected from satellites but accessing these data in a traditional science classroom can be tricky. After nearly 15 years of offering Earth science data to educators and students, NASA showcases the new face of My NASA Data (MND). This change features new and revised resources for exploring our Earth system from a phenomena-based perspective.

Beyond Dinosaurs: Fossil Evidence of Virginia's Past

ALL GRADES, Earth/Space Science
County)

Chris Kaznosky, Central High School (Shenandoah

Steve Leslie, James Madison University

Fossils are a natural teaching hook that are specifically referenced in SOLs at all three Virginia public school levels as well as in college courses. In this session, attendees will learn how to use fossils to determine how Virginia has changed over time with a focus on fossils that you can find in or close to your part of the State. Technology-based lessons will be shared, and it is suggested that you consider bringing a computer or tablet. Also, samples and resources will be provided.

After October 31 on site is available, but more handling costs are required. SAVE! Register Early!

Phenomenon-based Scientific Investigations

MS-HS, General

Meredith Kier, College of William & Mary

Preservice teachers will select and present one interdisciplinary phenomenon that requires both life science and physical science concepts to explain. Presenters will demonstrate how to elicit students' questions and use these driving questions to create a unit that teaches all standards-based concepts. Presenters will facilitate an introductory lab-investigation based on the phenomenon, showing participants how curriculum can be reframed around real-world events and students' questions.

Newcomer iStem: Developing Language by Design

MS, General

Heather Kimberlain, Thomas Harrison Middle School, Harrisonburg City Public Schools

Emily Imgram, Thomas Harrison Middle School

Stephanie Nelson, Thomas Harrison Middle School

Imagine, plan, and create! Give newcomers an integrated language experience that engages higher order thinking skills and challenges them to problem solve in collaborative groups while accelerating their language acquisition. These classroom-tested strategies will arm students with 21st century skills that will prepare them for the future.

Engaging All Science Learners with PBLs, Inquiry and Literacy

ELEM-MS, General

Suzanne Kirk, Virginia Commonwealth University

Join teachers from VISTA at VCU's Middle/Elementary Literacy Integrated with Science (ELIS/MELIS) as they share their experiences in developing and implementing Problem-Based Learning units. Engage in their lessons and learn from their experiences. The units presented will include a variety of topics from the VA K-8 Science SOLs and will integrate literacy with inquiry and hands-on science instruction. Sample lessons plans with tips and suggested booklists will be provided.

VESTA Bi-Annual Meeting

ALL GRADES, Earth/Space Science, Environmental Science

Russell Kohrs, Virginia Earth Science Teachers Association

Margaret Greene, Virginia Earth Science Teachers Association

The Virginia Earth Science Teachers Association (VESTA) exists to serve all science teachers throughout the Commonwealth by supporting Earth Science, Geoscience, and Earth Systems instruction. This year's session will spend some time exploring the local geology and paleontology of the Williamsburg and Coastal Plain region. A local field experience may be possible and, at minimum, participants will go home with Cenozoic marine fossils!

Accessible Geology: Getting in "The Field" Online

MS-COL, Earth/Space Science, Environmental Science

Russell Kohrs, Massanutten Regional Governor's

School for Environmental Science and Technology

In situations where field trips are not possible due to geography or funding or where students just are not able to go on such adventures due to accessibility, virtual field trips using geovisualization are an excellent answer. Come and explore the work of pioneers in this field who have already created a wealth online GigaPan images of outcrops and sediment samples as well as a library of 3D models of rocks, sedimentary structures, and more. Bring your laptop.

Modeling Method for Chemistry

HS, Chemistry

Leslie Kovach, The Steward School

Participants will practice the techniques used in modeling instruction which include: model development, which attempts to answer a question with explanations supported by evidence collected during experiments; and model deployment, in which students apply the new model to solve problems and deepen conceptual understanding. Participants will also practice using different types of graphic organizers used in the modeling chemistry approach.

Social Media for Science Leaders

ALL GRADES, General

Tim Kubinak, Suffolk Public Schools

The wealth of opportunities available to science teachers, in terms of professional development, partner engagement, and pedagogy, is at times difficult for classroom teachers to navigate. This session will provide science leaders (coordinators, supervisors, specialists, and teacher leaders) strategies for finding, sharing, and coordinating resources for their professional learning communities.

Virtual Reality in the Science Classroom

ALL GRADES, Earth/Space Science, Biology/Life Science

Caitlin Lamb, Forest Middle School

Debby Foran, Forest Middle School

Imagine taking your students to the rain forests in Borneo or to outer space to take a tour inside the ISS (international space station). Using Google Expeditions you can take students on virtual field trips to just about anywhere in the world! Expeditions can be implemented into science lesson plans with relative ease. Come and see how you can use Virtual Reality in your classroom!

Benthic Bugs and Bioassessment

MS-HS, Biology/Life Science, Math in Science

Amanda Lambert, Lee County Public Schools

Jolene Lambert, Lee County Public Schools

Macroinvertebrate monitoring for water quality assessment is the basis of this activity. Because different species of macroinvertebrates react differently to environmental stressors like pollution, sediment loading and habitat changes, quantifying the diversity and density of different macroinvertebrates at a given site can create a picture of the environmental conditions of that body of water.

Participants will engage in a stream sampling simulation.

A STEAM Collaboration: Engaging School Family and Community

All grade levels, Engineering, General

Gloria Peuster, Methodist University

Marilyn Lanier, Fayetteville State University

Cynthia Wooten, Fayetteville State University

A Glogster presentation will be used to portray the developmental strategies involved in organizing the event. Following the Glogster presentation, attendees will take part in a minimum of three engaging STEAM hands-on activities frequently presented at our model event. Attendees will discuss features of the event and be guided through an easily adaptable template for integration into their own school or university's engagement plan.

Science and Language Assessment of All Students

ALL GRADES, General

Okhee Lee, New York University

Science instruction and assessment present challenges to teachers, especially involving student diversity and equity. This session will address how to design science instruction that incorporates formative assessment of science and language with all students including English learners. After engaging in a science investigation, participants will assess student artifacts in terms of both science and language, and consider how to use the assessment to inform instructional next steps.

A Beginner's Guide to Bioinformatics

HS, Biology/Life Science

Mark Levy, Roanoke Valley Governor's School for Science and Technology

We frequently hear about genomic sequencing and the numerous opportunities these data provide to researchers - but did you know that many of these resources are freely available to you and your students? This presentation will equip you with some fundamental concepts, tools, and resources necessary to learn more about bioinformatics techniques to bring them into your classroom and student research projects.

Authentic Learning & Performance Based Assessment in K-5

ELEM, General

Molly Lewis, Virginia Beach City Public Schools

Katie Catania, Virginia Beach City Public Schools

Participants will focus on the importance of authentic learning with real world application in elementary science. Participants will identify the United Nations Sustainable Development Goals and where they align to the science standards of learning to provide students with impactful learning experiences. The session will focus on threading performance based assessments throughout units of study while allowing opportunities for student agency.

Merging the "Bookends" of STEM Through Data Collection

MS-HS, Math in Science, General

Jeff Lukens, Texas Instruments

Daniel Wilkie, Greenville, SC Public Schools

The integration of science and mathematics (the "bookends" of STEM) should be a natural thing, and it is the foundation of any good STEM teaching. Data collection is crucial in all science classes and the analysis of the data is a great way to bring math into the science classroom. This session will involve all participants in data collection activities that can be done in any classroom. Common, easy-to-use technology will be used for the activities and this session. (commercial exhibitor presentation)

Coding in a Flash!

ALL GRADES, General

Jeff Lukens, Texas Instruments

Daniel Wilkie, Greenville, SC Public Schools

Using a simple coding language, we will program a device to do some simple functions. Come and join the fun as we make lights blink, simulate stoplights and code in your favorite songs! No coding experience necessary! (Commercial exhibitor presentation)

Simple Electrical Circuits Inquiry

ALL GRADES, Physics/Physical Science, Engineering

Janet Lundin, Mary Ellen Henderson Middle School

An inquiry based electrical circuit lab that can be suitable for upper elementary, middle and high school level students. This session will demonstrate how to make some very low cost light bulbs and holders, organization of the lab materials, and a grading rubric for a student oral lab demonstration to show understanding of electrical circuits. This inquiry is based on Unit 15 Electrical Circuits of INQUIRY PHYSICS A Modified Learning Cycle Curriculum by Granger Meador.

A Share Fair Extravaganza for K -8 Teachers

ELEM-MS, General

Janet Lundin, Mary Ellen Henderson Middle School

Jaclyn Claytor, Nuckols Farm Elementary School

Join elementary and middle school professionals for an outstanding opportunity! Gather resources to make and take for use in your classroom immediately. Engage in hands-on activities & experiments, and find strategies to excite and encourage your students. There will be door prizes!

PBL and Engineering Design: A Natural Connection

ELEM-MS, Engineering, General

Jennifer Maeng, University of Virginia

Amanda Gonczi, Michigan Technological University

Problem-based learning (PBL) is a great way to integrate engineering design (ED) into science instruction and develop students' creative thinking skills. Participants will learn what PBL instruction is and key components of ED. Then we will model activities that integrate ED from SOL-aligned PBL units and a structured process for developing PBL science units. Participants will apply components of this process to consider how they can generate questions and scenarios into their own instruction.



Watch your email for an e-note in early August for chance to win registration to the VAST 2018 PDI. The Virginia Lottery has sponsored this raffle since 2016.

VAST Colleges and Universities Share Session

HS-COL, General

Robbie Higdon, James Madison University

Jennifer Maeng, University of Virginia

Harold Geller, George Mason 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 engage in a lively roundtable discussion about your current methods practices.

Content Coaching for Science Supervisors and Administrators

ALL GRADES, General

Jennifer Maguire, Virginia Tech

This session is intended to introduce administrators, science supervisors, instructional coaches, or science department chairpersons to the basics of content-based coaching. Content coaching is a method of working with your teachers to co-plan and co-teach lessons. Content coaching is an innovative and transformative way to stay involved in the classroom and work with your teachers toward their goals.

Formative Assessment and Developing Critical Thinking Skills

ALL GRADES, General

Jennifer Maguire, Virginia Tech

This session is intended to discuss the importance of formative assessment as a tool for guiding students and helping all students to make progress. A variety of formative assessment tools will be explored. Most importantly, the use of individual feedback on formative assessments will be demonstrated and we will discuss how this leads to improved metacognition and critical thinking skills for students.

Teaching Stoichiometry with Inquiry Based Methods

HS, Chemistry

Jennifer Maguire, Virginia Tech

This session is intended to present ideas for teaching stoichiometry to chemistry students in a more inquiry-based way. Content that is heavily tied to procedural math skills has historically been challenging for teachers to present through an inquiry-based lens. Join us for discussion and strategy sharing.

VISTA: A Legacy for Virginia Science Education

ALL GRADES, General

Anne Mannarino, Regent University

Jackie McDonnough, VCU retired

Juanita Jo Matkins, William & Mary retired

Elizabeth Edmondson, Virginia Commonwealth University

The Virginia Initiative for Teaching and Science Achievement (VISTA) invites you to join us and other VISTA participants for an update on the VISTA program. Were you part of this movement? Then come see the impact VISTA had on science education in Virginia. Share your VISTA stories, successes, resources, and experiences to highlight the true impact of VISTA in Virginia. Open to all former VISTA participants.

Engaging MWEES: Leaving No Child Inside

ELEM, Environmental Science, Engineering

William McConnell, Virginia Wesleyan University

Caleb Cooper, YMCA

Maury Howard, Virginia Wesleyan University

Hilve Firek, Virginia Wesleyan University

Join us as we share several engaging environmental science activities aligned to VA SOLs in which no child (or teacher) is left inside! Participants in this session will rotate through several workshop-based stations to experience environmental science related activities including species identification, modeling, and engineering design. Materials provided. (Other presenters include Katie Catania, Molly Lewis, Dasia Fulp, Kennedy Scala, Catherine Ponack, Sierra Olson, Sarah Toner.)

Capstone- Putting the Citizen in Citizen Science

MS, Environmental Science, General

Dianna McDowell, Old Donation School

Jared Fritzing, Old Donation School

Capstone is a student centered interdisciplinary project between Civics and Earth Science at our school. In groups of 3-4, students identify an issue in the local community and track their growth as a citizen, and measure the impact of their actions attending to the three pillars of sustainability: environmental, social and economic.

“Do It Again!”

MS, Biology/Life Science, Physics/Physical Science

Sheryl McLaughlin, Jones Magnet Middle School

Sherri Mair, Jones Magnet Middle School

Come and watch as we demonstrate fun, engaging science demonstrations that can be used to “hook” your students on the content. We will show how easy it is to use common materials to excite students through “Do it again!” demonstrations. These demos will serve as a review of 6th – 8th grade content as preparation for our cumulative SOL.

Engaging Learners: A Shift - Inquiry to Practices of Science

ALL GRADES, Biology/Life Science, Environmental Science

Peter Mecca, George Mason High School

Research has shown that inquiry instruction is generally effective in science classrooms. However, few teachers, for whatever reasons, actually engage in inquiry instruction. A new framework for science education encourages teachers to shift from inquiry to the practices of science. The practices of science allows more specific focus on the nature of science and its connection to specific science content. This has implications for learning, instruction, curriculum, and assessment.

Science Literacy: Supporting Learning of Content and Text

ALL GRADES, Earth/Space Science, General

Joi Merritt, James Madison University

Sarah Lupo, James Madison University

Many students are struggling readers in science. In this session, we will talk about how literacy can help improve science learning. Research-based techniques will be introduced as to how to support students in Grades 3-12 in reading science texts. The focus will be on using texts in connection with science instruction, including how to select texts for the sciences and how to grapple with complexity when readers read below grade level.

Bring Engineering Design to the Biology Classroom

MS-HS, Biology/Life Science, Engineering

Angela Morris, Bassett High School

Help students to learn science concepts through engineering and design. Students love to be engaged in activities in the classroom, and teachers like for students to learn from participating in activities. Guide student-learning in the science classroom through prototyping and testing. Water is essential for life to exist and biology is all about life. Designing, building, and testing a water filter is a great challenge for students to learn about water.

Deepening and Assessing Student Learning Through Writing

MS, General

Rebecca Musso, Gayle Middle School

Heather Dudley, Rodney Thompson Middle School

Attendees will participate in an activity demonstrating a writing-in-science technique, leave with ready-to-use differentiated prompts/ideas for each grade level (6-8) and rubrics, and leave with brain-based research on the use of writing in the science classroom to share with colleagues.

Solar System Tour Guide

MS-HS, Earth/Space Science

Angie Mutter, Twin Valley High School

I have just finished action research on project-based learning. I wanted to study the affect on student achievement and attitudes toward science using inquiry-based learning. I chose to develop a large scale solar system for the hallway and classroom. Students were given objects in the solar system to design and create. Each object required an information guide for tourists. Students used math to develop the correct proportions of the planets and their distances from the sun.

Citizen Science: Developing the 5Cs Using Authentic Research

MS-HS, Biology/Life Science, Environmental Science

Deborah Neely-Fisher, Virginia Academy of Science

Julia Cothron, STEM Author and Consultant

Sujan Henkanaththegedara, Longwood University

Learn how Citizen Science is a vehicle for involving your students in meaningful authentic research. Become familiar with a variety of Citizen Science programs which are applicable to concepts taught in middle and senior high science. See how outstanding projects can be formatted for submission to VJAS or science fairs. Become aware of higher education STEM educators and researchers (in various parts of Virginia) who are willing to serve as mentors. (Not-for-Profit exhibitor presentation)

Planning Field Science Experiences: MWEE Lessons Learned

MS-HS, Biology/Life Science, Environmental Science

Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve

Carol Hopper-Brill, Virginia Institute of Marine Science

Want to boost your confidence in taking students on meaningful watershed educational experiences? VIMS educators will share best practices for planning and conducting MWEEs, including multiple examples of scientific investigations you can do outdoors with your students! (Not-for-Profit exhibitor presentation)

Fostering Creativity Through Environmental Education

ALL GRADES, Environmental Science, General

Sarah Nuss, Chesapeake Bay National Estuarine Research Reserve

Environmental education provides students and teachers with diverse resources and experiences, inspires curiosity, and encourages students to pursue a specific interest, even at a young age. Utilizing the framework in The Creativity Challenge (Kim, 2016), outdoor experiences can encourage the building of students' creative and critical thinking skills. Learn the path to creative thinking and innovation using environmental education, including practical tips you can implement now. (Not-for-Profit exhibitor presentation)

Challenge your Students! Renewable Energy Challenges for All

ALL GRADES, Environmental Science, Engineering

Remy Pangle, Center for the Advancement of Sustainable Energy at JMU

Come try your hand at designing a solar structure or a wind turbine! We will be exploring engineering design challenges for student on renewable energy and learning more about educational resources available to prepare teams to compete in Challenges throughout Virginia in 2019 and 2020. (Not-for-Profit exhibitor presentation)

Engaging Transportation STEM Activities for K-12 classrooms

ALL GRADES, Environmental Science, Engineering

Angela Parsley, VDOT (VA Dept. of Transportation)

Explore hands-on STEM programs offered free to Va teachers. Experience a classroom activity from the RIDES program (hundreds of K-8 lessons) and the TRAC program (transportation-related modules for grades 6-12). All lessons encourage scientific exploration of topics including recycling, propulsion, tire performance, structures, engineering, the environment, and physics. No matter what grade you teach, you will see many hands-on activities that will fit into the topics covered in your classroom. (Not-for-Profit exhibitor presentation)

Wonder Science Kaleidoscope

ELEM, General

LoriAnn Pawlik, Prince William County Schools

Still "squeezing in" science? You need to be comfortable using a Wonder Science lens for a new perspective on teaching your content kaleidoscope or maybe you need a kaleidoscope to teach Science Wonder. Come practice stress-free ideas to re-energize your teaching!

Literacy in the Lab - Best Practices Instruction for ELs

ALL GRADES, General

Jeff Peake, Harrisonburg City Public Schools

Alexis Rutt, University of Virginia

Have you ever looked at “Science” as a foreign language? As more English Learners join mainstream science classrooms, the task of literacy instruction is expanding to science teachers. Science is its own language that needs to be intentionally taught, with unique vocabulary and syntax. In this session, you will learn practical ways to better support ELs in their language learning. Methods will target reading, writing, and oral language, and will cover numerous scientific concepts.

Use Forensics to Enrich Your Physical Science 8 Classroom

MS, Physics/Physical Science

Debra Peterman, Louise Benton Middle School

This ten-day introduction to Forensics exposes eighth grade students to a few of the techniques used by crime scene investigators to collect, preserve, and analyze scientific evidence. The unit will enhance the eighth grade SOL objectives in Chemistry and Physics, placing emphasis on real world scenarios.

2018 Science Standards of Learning: Elementary

ELEM, General

Anne Petersen, VDOE

Myra Thayer, VDOE

Laura Casdorff, VDOE

This session is designed to provide elementary teachers and leaders with information concerning the 2018 Science Standards of Learning. Although science content has not changed significantly, the wording of the standards has been changed to focus on science concepts. This change was made with the intent of allowing teachers to focus on concept development in science. The skills and processes have been reorganized to support Profile of a Graduate and to aid teachers as they embed these skills into content instruction.

2018 Science Standards of Learning: Secondary

MS-HS, General

Anne Petersen, VDOE

Myra Thayer, VDOE

Laura Casdorff, VDOE

This session is designed to provide secondary teachers and leaders with information concerning the 2018 Science Standards of Learning. Although science content has not changed significantly, the wording of the standards has been changed to focus on science concepts. This change was made with the intent of allowing teachers to focus on concept development in science. The skills and processes have been reorganized to support Profile of a Graduate and to aid teachers as they embed these skills into content instruction.

You Can Be a Winner: PAEMST Information Session

MS-HS, General

Anne Petersen, VDOE

The Presidential Award for Excellence in Mathematics and Science Teaching is a prestigious national award that recognizes exemplary teaching in the science and mathematics fields. This year, the grant focuses on 6-12 grade teachers. This session will focus on the application process for PAEMST.

VDOE Science Outcomes Update

HS, Biology/Life Science, Environmental Science

Anne Petersen, VDOE

Myra Thayer, VDOE

Laura Casdorff, VDOE

Science outcomes have been prepared for Environmental Science, Anatomy and Physiology, Astronomy, and Ecology with the intention that these outcomes become the Standards of Learning for these courses at the next Standards of Learning Revision. Learn more about the outcomes as well as strategies/activities for teaching the Environmental Science Course.

VDOE Update

ALL GRADES, General

Anne Petersen, VDOE

This session is designed to provide teachers and teacher leaders information as to legislation and initiatives, both state and federal, that may impact science instruction.

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Connecting Kids to Scientists

ELEM-MS, General

Ellen Peterson, Smithfield Middle School

Brianna Peterson, School, Smithfield Middle School

"A new study suggests that students who learn about famous scientists' struggles will perform significantly better in their science classes than students who are just given a laundry list of the same scientists' intellectual accomplishments." Using children's literature, we plan to introduce students to the "human" side of a particular scientist. Following exposure to the life of the scientist, a related hands-on activity helps students explore the work for which the scientist is known.

The Roots of Knowledge: Instruction for Science Literacy

ALL GRADES, General

Michael Petruzzi, Gar-Field High School

William Hammersten, Gar-field High School

This session will cover instructional techniques to integrate science literacy into the Science classroom. Topics to be covered: Writing prompts for different classes and examples, root comprehension (Greek/Latin roots) and how to integrate them, ELL science literacy, and other techniques to enhance instruction through literacy.

Asynchronous Classrooms: How to Build Resources and Control

ALL GRADES, General

Michelle Plunkett, Loudoun County Public Schools

This presentation will walk you through the asynchronous environment for traditional classrooms. Come see how you build a classroom of student control, voice and choice, and student ownership. I will show you sample workbooks, digital resources, games, and classroom management tools that will turn your traditional classroom into a highly differentiated space.

In House Field Trips: Nature Delivered!

ALL GRADES, Biology/Life Science, Environmental Science

Sarah Pope, Ebbing Tides Outreach

Planning an outdoor field trip to the beach or forest can be arduous and downright impossible with some principals and school schedules. Wouldn't it be so much easier if Nature could come to you? Ebbing Tides Outreach does just that! We will bring all the components of an ecosystem right to your class. No planning or stressing required! We can even write your lesson plan for the day too. So sit back, relax, and let your students explore nature, without leaving the classroom! (commercial exhibitor presentation)

SE Forests and Climate Change Module by PLT

MS-HS, Biology/Life Science, Environmental Science

Ellen Powell, VA Dept. of Forestry/Project Learning Tree

Page Hutchinson, VA Dept. of Forestry/Project Learning Tree

This module developed by Project Learning Tree and the University of Florida will help educators 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. While this resource was created with southeastern forests in mind, the lessons can be used with students across the United States. The module can be obtained for free. (Not-for-Profit exhibitor presentation)

Lessons from a Tree Trunk

ALL GRADES, Biology/Life Science, Environmental Science

Ellen Powell, VA Dept. of Forestry

Tree Trunks are full of activities that encourage student inquiry about many aspects of forests. Trunks are available for borrowing from State Forests, but the lesson plans are downloadable and can be used in any forested area. Sample lessons and a list of inexpensive supplies are provided to participants. (Not-for-Profit exhibitor presentation)

Meaningful Science and Field Experiences in Ecology Elective

MS-HS, Biology/Life Science, Environmental Science

Michael Pratte, Stafford County Public Schools

Casey Stringer, North Stafford High School

Shane Yeskey, Stafford High School

Meaningful field experiences belong in every science course and elective. Join us to see how a blend of phenomenon, project, and problem based instruction can set the stage for an engaging student experience in the Biology II Ecology elective class. A focus of using a seasonal campus field study experience will model how dynamic units emphasizing hands on investigation will build biology and environmental literate students. Participants will practice with probeware and testTab kits.

Vast Ocean-Endless Possibilities for a 5th Grade SOL Review

ELEM, Math in Science, General

Michael Pratte, Stafford County Public Schools

Laura VanDyk, Grafton Village Elementary

Katherine Counsell, Grafton Village Elementary School

To effectively review science, one must do science. Join us to complete a variety of performance tasks while traveling across the ocean floor as we explore the major 4th and 5th grade standards. STEM extensions and embedded technology skills will be modeled. Sample Performance based assessments for 4th and 5th science will be shared.

How Physical Science Can Prepare ALL Students for HS Rigor

MS, Physics/Physical Science, Math in Science

Michael Pratte, Stafford County Public Schools

Nick Kinger, Shirley Heim Middle School

Kerlin Doss, North Stafford High School

A dynamic student experience in Physical science can set the stage for success in rigorous high school science courses. Join us as we explore the materials, methods, and investigations needed for all Middle school students to acquire and develop the appropriate vocabulary, skills, and science mindset.

Pairing Content and Skills for Instruction and Assessment

ALL GRADES, Biology/Life Science

Mitch Price, Educational Testing Services

Writing assessment questions that explicitly combine a scientific skill with content is a powerful way to examine what students can do to better infer what they know and understand. This session will focus on techniques for using questions as instructional tools, as well as writing questions to measure learning outcomes. Development of items for multi-dimensional standards will be discussed and emphasis will be placed on active participation.

What are these Rocks, Anyway?

MS-COL, Earth/Space Science

Eric Pyle, James Madison University

Virginia is endowed with a rich range of geologic resources, the most important of which are stone and mineral sands used to produce the most mundane of foundation material to the most advanced materials, such as zirconium and titanium. Samples provided by the Virginia Transportation Construction Alliance will be discussed in relation to what they are in terms of rocks and minerals, Virginia geologic history, and Virginia geologic provinces. (Not-for-Profit exhibitor presentation)

Surveying and Geodesy in Colonial America: 18th Century STEM

HS-COL, Earth/Space Science, Math in Science

Eric Pyle, James Madison University

Colonial America, especially Virginia, represented a chance for immigrants from Europe to actually own property. Land had to be measured, and when many maps were inaccurate, the work of surveyors, astronomers, and mathematicians defined the “shape” of the Earth leading to a precision of measurement unseen before. This demonstrative session will share how this work was done and how the instruments of scientific measurement relied on the elegance of classical mathematics. (Not-for-Profit exhibitor presentation)

It's Happening! Learning the Flora of Virginia

ALL GRADES, Biology/Life Science, Environmental Science

Ann Regn, VA Department of Environmental Quality

Bland Crowder, Flora of Virginia

Suzie Gilley, DGIF/VRUEC

Bring the latest smart technology to field investigations! Learn how to use & integrate the new Flora of Virginia App with traditional data sheets, field guides & journals for botany & ecological surveys. Identification keys to all 3,200 plants of VA, their habitat & status described in the 7.5# text is in this app. A must for meaningful outdoor experiences, habitat restoration or schoolyard planting. Hands-on practice & drawing for free Apps. Tablet or smart phone suggested, but not required. (Not-for-Profit exhibitor presentation)

Get Your Game On with Legends of Learning!

ELEM-MS, Earth/Space Science, Biology/Life Science, Physical Science

Sean Reidy, Legends of Learning

Legends of Learning creates SOL-aligned digital games that increase subject mastery and engagement. Teachers use our platform to supplement and enhance their lessons. In our study with Vanderbilt University, students had higher levels of engagement, increased test scores and faster comprehension of the given content. Experience Legends of Learning and see how you can integrate an exciting game-based learning platform into your SOL curriculum to give your students the superpower of knowledge! (Commercial exhibitor presentation)

Full STEAM Ahead!

ELEM, Environmental Science, General

Ashley Ring, Roanoke City Public Schools

Kit Richards, Roanoke City Public Schools

Fishburn Park Elementary is a unique (focus for STEAM) school in Roanoke City. Our teachers understand the importance of educating young scholars in the areas of science, technology, engineering, the arts, and mathematics. In this session, we will allow approximately 10 minutes to address each subject. There will be opportunities for hands-on play with innovative technology. Relevant lessons, which are aligned with Virginia SOLS, will be shared with participants.

Wakanda: STEM Forever!

HS, Engineering, General

Tysha Sanford, Virginia Space Grant Consortium

Joyce Kuberek, Virginia Space Grant Consortium

In the movie, Black Panther, five African tribes war over a meteorite containing vibranium. In this session, you will learn how to combine environmental science, chemistry, mathematics, and engineering design to bring STEM alive for your students. You will also learn how to incorporate some Google classroom components and other technology to bring this lesson to life. In order to keep this momentum going, Virginia Space Grant Consortium will also share the components of our pre-college programs. (Not-for-Profit exhibitor presentation)

Project-Based Science Instruction in K-12 Classrooms

ALL GRADES, Biology/Life Science, Physics/Physical Science

Vidhya Sankaranarayanan, University of Virginia

Catherine Gamboa, University of Virginia

Frackson Mumba, University of Virginia

Project-based science instruction (PBSI) approach enhance student learning. Is PBSI the same as Problem-Based learning (PBL)? Participants will learn about the main characteristics of PBSI. We will demonstrate how to develop PBSI activities using templates we have developed. Participants will receive example PBSI units, activities, and assessments.

Virtual Reality Field Trips Using 360 Cameras

MS-HS, Earth/Space Science, Environmental Science

Paul Sarandria, Woodrow Wilson High School

Jenny Garcell, Woodrow Wilson High School

Take your students on a virtual field trip! Participants will learn how to engage their students with curriculum content by using 360 cameras to take pictures & videos then use those images to create lessons with a web-based program (similar to a Google Expedition). Students can then experience locations beyond the classroom which may be otherwise inaccessible due to time, budget, or weather constraints. With the right technology, students can even view the images in 3-D.

NSTA Press K-12 by Debra Sawyer, Ph.D.

ALL GRADES, General

Debra Sawyer, NSTA

NSTA offers two core programs integrating science and literacy. Picture Perfect Science and STEM K-5 brings science lessons with Read-Alouds as well as hands on activities with manipulatives together. Argument Driven Inquiry 6-12 has hands on labs with literacy infused. Please come join me for an overview of NSTA Press resources! (Not-for-Profit exhibitor presentation)

National Geographic Teacher Certification

ALL GRADES, General

Becky Schnekser, Cape Henry Collegiate

Do you believe in empowering students to think like explorers? In inspiring students to be global thinkers who can change the world? If so, you are invited to become a National Geographic Certified Teacher! We seek to inspire educators to teach students about the world in innovative and interdisciplinary ways. Come join the community of National Geographic Explorers, Educators, and Innovators! This session will provide you with Phase 1 of the certification process.

Thermal Systems in the Peruvian Amazon--How Can You Connect?

ALL GRADES, Biology/Life Science, Environmental Science

Becky Schnekser, Cape Henry Collegiate

As the Donna Sterling Awardee for 2017, Becky traveled to the Amazon rainforest with Andres Ruzo of National Geographic. Come learn about the expedition, field science experience, data collected, and how you can use it in your classroom. Also learn about the process of becoming the next Donna Sterling Award winner!

Flowdown: Watershed Modeling from Simple to High-Tech!

ALL GRADES, Earth/Space Science, Environmental Science

Matthew Scott, Freeman High School

Have you struggled with teaching the concept of a watershed in your Earth Science/Environmental classroom? Join us to learn hands-on strategies to teach basic watershed mapping skills and concepts to students. Demonstrations will range from simple, free options that you can make in your own classroom, to high-technology simulations and computer-aided 3D models. Take home 4 ways to help students understand the relationships between topography, watersheds, and pollution!

Any Device, Every Virginia Student and Teacher - eMediaVA

ALL GRADES, General

Elmer Seward, WHRO Education - eMediaVA

Annie Gilstrap, WHRO Education - eMediaVA

Jane James, WHRO Education - eMediaVA

With over 129,000 learning objects like interactivities, simulations, videos, and lesson plans, eMediaVA offers every Virginia student and teacher free access to high-quality resources. Designed to work on cell phones, laptops, and desktop computers, eMediaVA is flexible enough to meet any student's needs. eMediaVA also makes it possible for students to download most items anywhere there is internet connectivity and access offline at a later time if needed. And the best part? It's free. (Not-for-Profit exhibitor presentation)

Specifically for Preservice Teachers: What You Need to Know!

HS-COL, General

Alex Shafer, James Madison University

Jennifer Maeng, University of Virginia

Calling all pre-service teachers! Join us for lunch and learn how VAST can launch you into your career as a science teacher. Whether this is your first time attending VAST or your third, this session has something for you! Make connections with fellow preservice teachers and others that can support your career whether just you're beginning a teacher preparation program or graduating in May!

Liquids are Tricky: Addressing Misconceptions in Science

ALL GRADES, General

Alex Shafer, James Madison University

Robbie Higdon, James Madison University

Do trees get food from soil? Are seasons caused by Earth's orbit? Can you see in a totally dark room? All of these, and many more, are common misconceptions that students may have when entering a classroom. Join the JMU student chapter of the NSTA to discuss how we can best address these misconceptions by examining one of our lessons, "Liquids are Tricky" as a case study. There will be many hands-on and brainstorming activities, as well as take-home copies of the liquids lesson plan.

Interactive Notebooking for High Schoolers

HS-COL, Chemistry, Environmental Science

Jen Sharp-Knott, Floyd County High School

Interactive Notebooking is NOT just for little kids! See examples of Chemistry, Ecology, and Biology interactive notebooks that have been successfully used in the high school setting, learn about classroom management and supply management options, learn about peer-reviewed research that supports this education practice, peruse notebooking resource books, and see options and schedules for grading interactive notebooks.

Three Ways to Integrate History of Science in Science Teaching

MS-COL, Biology/Life Science, Physics/Physical Science

Sydney Shelton, University of Virginia

Sarah Smith, University of Virginia

Frackson Mumba, University of Virginia

Integrating history of science (HS) in science lessons can increase students' interest in science, understanding science content knowledge, and evolution of science disciplines. But how can history of science be integrated in science lessons? We will demonstrate how to integrate history of science in science lessons through three approaches- Argumentation, Recurrent and Storyline. We will share activities, lessons, assessments, and templates.

Donna Sterling Institute Preconference Short Course and afternoon workshops registration deadline Oct.31.

Our Wet Footprint: Teaching About Human Impacts on the Ocean

MS-HS, Environmental Science

Dawn Sherwood, Henrico County Public Schools

In this hands-on/minds-on workshop, engage in interdisciplinary activities to explore global population trends and human interactions with our blue planet over the past 500 years and the future challenges for sustainable marine stewardship. Our journey will take us from the early days of whale hunting through the Industrial Revolution, the advent of modern agriculture and off-shore oil drilling to fish depletions and ocean warming. Engage in simulations, labs and discussion supporting SOLs.

Mystery Powders

HS, Chemistry

Suzanne Smith, Harrisonburg High School

Erich Sneller, Harrisonburg High School

Kasey Fisher, Harrisonburg High School

Come join this session and participate in a hands-on, guided inquiry investigation of five "Mystery Powders". Take on the role of a chemistry student as you explore the changes and properties of matter along with collaboration and lab safety. Leave with valuable experience and plan to engage your students' scientific creativity and collaboration. Materials provided will allow a teacher to incorporate this lab in the classroom in either a more open ended or scaffolded manner.

Effective Teacher Behaviors Promote Robust Student Learning

HS, General

Erich Sneller, Harrisonburg City Public Schools

Seth Shantz, Harrisonburg City Public Schools

When we teachers are keenly aware of our behaviors with students and choose interactions to consistently promote student engagement, students will develop a sense of belonging and invest themselves in their education. In this session, we will discern what effective and ineffective teacher behaviors look like, how we might enhance our practice, and how these changes can rejuvenate our passion for teaching. Please join us to share your ideas and to encourage our collective growth as teachers.

Engineering Design Integrated Science Activities

ALL GRADES, Biology/Life Science, Physics/Physical Science

William Squires, University of Virginia

Alexa Dostart, University of Virginia

Frackson Mumba, University of Virginia

Integrating engineering design in science classrooms can be challenging. We have developed user friendly teacher guide manuals for developing engineering design integrated science units, lessons, activities, and assessments. We will present teacher guide manuals, and illustrative engineering design integrated science units and activities. We will share teacher guide manuals, engineering integrated science units, and assessments.

Engaging ELL's in the Sheltered Secondary Classroom

HS, Earth/Space Science

Eryn Sutliff, Harrisonburg High School

Laura Nelson, Harrisonburg High School

This presentation will showcase some effective instructional strategies and activities for engaging ELLs. These best practices aim to improve literacy by: increasing vocabulary acquisition, interpreting graphs and diagrams, supporting academic talk, and classifying content.

Discovering New Species with Students via Research

High School, Advanced High School/College, Biology/Life Science, Environmental Science

Scott Sveiven, Operation Wallacea

Operation Wallacea is an organization that has been running a series of biological and conservation management research programs around the world since 1995. These expeditions are designed with specific wildlife conservation aims in mind. The uniqueness of Operation Wallacea is that large teams of ecologists- ranging from ornithologists to ichthyologists- are concentrated at these target sites thus allowing our volunteers the opportunity to work with experts out in the field. (Commercial Exhibitor Presentation)

Hands On: Real World Lessons for Middle School Classrooms

MS, Biology/Life Science, General

James Swart, GMA Science and Education Foundation

Integrating topics across disciplines develops higher-order thinking and encourages active student engagement. Incorporating hands-on, inquiry-based activities rooted in real-world applications allows students to see connection between what they learn in school and life outside the school walls. This workshop allows participants to engage with a ready-to-use curriculum that is aligned to Virginia content standards in science, math, social studies, and language arts. (Not-for-Profit exhibitor presentation)

Culturally Responsive Teaching in Phenomenon-Based Learning

ALL GRADES, Environmental Science, General

Kianga Thomas, Norfolk State University

Arthur Bowman, Norfolk State University

Culturally Responsive Teaching (CRT) and Phenomenon-Based Learning (PBL) get students from culturally diverse backgrounds into the mainstream STEM, while helping to broaden their societal perspective. STEM delivered without a "real-world" content causes students to ask what STEM has to do with them. This is true of students from culturally diverse backgrounds. PBL relating to students and to trending news phenomena can provide concrete examples of STEM having specific cultural implications.

Measuring Sea Level: Using Data to Predict the Future

MS-HS, Earth/Space Science, Environmental Science

Sandra Thornton, Broadwater Academy

We hear about rising sea levels and see their effects on coastal communities, but how do scientists use data from the past to make predictions about the future? This session will utilize data from the American Meteorological Society's Maury Project to provide opportunities for teachers to try out lesson activities that are classroom ready. Focus of the session will be on factors that influence sea level in bays, harbors, and along beaches. Activities are designed for students in grades 6-12.

Uncovering Students' Thinking Through Formative Assessment (6-12)

MS-HS, General

Joyce Tugel, McGraw Hill Education

Grades 6-12 students come to the classroom with preconceptions about how the world works. 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 to uncover student thinking about key concepts; practice formative assessment strategies that inform teaching and deepen ALL students' understanding of science content; and apply techniques that integrate assessment with the practices of science. (commercial exhibitor presentation)

Uncovering Students' Thinking Through Formative Assessment (K-5)

ELEM, General

Joyce Tugel, McGraw Hill Education

Grades K-5 students come to the classroom with preconceptions about how the world works. 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 to uncover student thinking about key concepts; practice formative assessment strategies that inform teaching and deepen ALL students' understanding of science content; and apply techniques that integrate assessment with the practices of science. (Commercial exhibitor presentation)

Digitizing Interactive Notebooks-Taking Content OFF the Page

ALL GRADES, Earth/Space Science, General

Caitlin Unterman, Forest Middle School

Take your interactive notebooks OFF of the page and make them digital! Create higher level thinking digital interactive notebooks to demonstrate content mastery. Digital Interactive Notebooks (DISNs) allow for technology-enhanced questions aligned with the Virginia Science SOLs while students have creative freedom over their final product. Come create a notebook and see how you can benefit from DISN's in your classroom!

Quantitative Research Skills for the Science Classroom

ALL GRADES, General/Math in Science

Scott B. Watson, Liberty University School of Education

This activity-based presentation will focus on science research skills as a basis for research in all STEM disciplines. It will include suggestions that teachers can use to conduct studies in classrooms and schools for the purpose of determining the effectiveness of instructional techniques and curricula. In addition, there will be application of these same skills for teaching students in K-12 settings.

Using Engineering Design Challenges to Reach Unique Learners

MS, Engineering

Erin Watson, Newport News Public Schools

Craig Doolittle, Newport News Public Schools

Engineering Design Challenges allow students to learn in a hands-on way, with personal differentiated instruction for every unique learner. Gifted students can push their own knowledge to further explore their world, while special education learners get excited to see they can be just as successful in learning as other students. This session will present you with numerous Engineering Design Challenges that can be implemented to help students explore 6th, 7th, and 8th grade science concepts.

Dizzy Physics: Messing 'round with Rotational Motion

HS, Physics/Physical Science

Meghan Waymire, Prince William County Schools

Kirsten White, Prince William County Schools

Turn fidget spinners into a learning opportunity! This session will take a hands-on approach to introducing tricky rotational motion concepts. We will demonstrate several low-cost activities that you can easily replicate with your students as you dizzy their minds and dazzle them with whirling experiences that are sure to stick. This session is appropriate for first-year and AP high school physics courses. Bring a phone/tablet with a free audio spectrum analyzer app downloaded for max fun.

Physics Idea Share

MS-HS, Physics/Physical Science

Tony Wayne, Albemarle High School

Drop in any time during the presentation period and walk around between many stations in a casual atmosphere while multiple teachers share labs, activities, and ideas relating to physics education. Presented by V.I.P., (The Virginia Instructors of Physics.)

Dive in: Linking Ocean Exploration to Your Class

ALL GRADES, Earth/Space Science, Environmental Science

Cassandra Weathersbee, Patriot High School

Sarah Cureton, Patriot High School

Mel Nichols, Patriot High School

95% of our world is unexplored and looking to inspire the next generation of scientists, engineers, and creative thinkers. Learn how the Ocean Exploration Trust's EV Nautilus explores the world below the waves and how you can connect your students with onboard scientists in real time. Discover the Nautilus's rich digital and hands-on resources; adaptable to different grade levels and curricula. Learn about the exciting professional development opportunities for educators on board the Nautilus!

Science and Literacy Connections for High School

HS, General

Angela Webb, James Madison University

From making predictions and drawing on previous experiences to using evidence to draw conclusions, make inferences, and evaluate claims, the connections between science and literacy abound. In this session, preservice secondary science teachers from James Madison University will share ideas for connecting science practices and concepts to literacy practices related to reading, writing, and research.

Personalizing Science Through Annotated Photos

MS-HS, General

Carrie Weber, WorldStrides

In this workshop, participants will explore instructional models that merge students' passion for photography apps with their appreciation for complex science concepts. Teachers will enjoy seeing the visual expression of students' perceptions (and misconceptions!) of abstract and concrete theories, processes, and models. The provided instructional materials will guide science teachers through an interdisciplinary lesson to capture and reflect student thinking. (Not-for-Profit exhibitor presentation)

NASA Online Professional Development Resources

ALL GRADES, General

Anne Weiss, NASA Langley Research Center

NASA Langley Research Center oversees the management of a digital badging system that includes a professional learning community (PLC), a popular method for delivering PD. PLCs support long-term collaborations for exchanging STEM resources. Meanwhile, digital badging are online certifications of an educator's learning experiences and skills. All told, NASA seeks to connect teachers with high-quality resources that leverage the agency's unique assets and inspire the next generation of explorers.

Biology and Health: A Year of Cross Curricular Collaboration

MS-HS, Biology/Life Science, General

Jessica White, Syms Middle School

Jodi Richmond, DC Public Schools

Some students may find cellular organization too abstract, but all students can connect to human health. A Biology and Health and P.E. teacher will share how they collaborated throughout the school year for a cross curricular experience. Presenters will provide participants with a planning template, co teaching strategies, field trip, and guest speaker ideas to help with their planning. Participants will also engage in hands on activities that they can use during their year of collaboration.

Evolution for Middle School Educators

MS-HS, Biology/Life Science

Therese Whitehurst, Kempsville High School

Christopher Moran, Lake Braddock Secondary School

A middle school science teacher covers many areas of science within his/her annual curriculum. It's not easy to be an expert in all of them. The purpose of our presentation is to inform interested middle school science teachers about the most up-to-date concepts of natural selection and evolution in order for them to confidently cover the topics in their classrooms. We also have ready-to-use online resources for the classroom, including presentation slides, labs, and an exam.

STEM Majors in Sustainability, Environment, and Conservation

HS-COL, General

John Gray Williams, Virginia Tech - College of Natural Resources and Environment

Natural resources rarely come to mind when students hear the term STEM. But when you stop and think, virtually all consumer products, from the most basic to the most innovative, use materials that can ultimately be tied back to a natural resource. Come learn about the "other" STEM majors at Virginia Tech and how you can connect students interested in biology, chemistry, physics, technology, and engineering to career options in the environment, sustainability, and conservation. (Not-for-Profit exhibitor presentation)

Integrating Technology into Project Based Learning

MS-HS, General

Luke Williams, Rocky Run Middle School

Joy Pryde-Haskins, Rocky Run Middle School

During this session, we will give real-world examples of how a PBL delivery can be facilitated through the use of technology, with a focus on 1:1 learning. Participants will be shown a range of digital tools which can enhance each step of the PBL process, from the entry event and creation of the Need to Know List, through student research, and creation of the final product.

Home Run! Aligning Reviews & Assessments for Student Success

MS-HS, Chemistry, General

Isabella Yearwood, Prince William County Schools

Writing appropriate learning targets can help with student success, however, ensuring your curriculum is aligned with the standards is key to student learning. In baseball, the player must hit all of the bases before getting a home run, similarly, in the classroom, daily activities, reviews, and assessments should be aligned to guide student comprehension and ensure achievement and learning. Learn how to adjust your reviews and assessments to increase student success and content retention.

Inquiry First

ELEM, General

Melonie Yielding, Ellis Elementary School

In schools with high ESL populations, teachers are often told it is best to front-load vocabulary before hand-on lessons. However, that strategy often prevents science students from grasping the vocabulary because they have no real life experiences to anchor their learning. This session will focus on how to structure a unit using the Five E's of Science so that the inquiry comes before the note-taking and vocabulary instruction.

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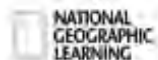


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