



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

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# The Science Educator

Spring 2018

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**VAST PDI 2018**

## **Diversify and Strengthen Science for All**

**November 15-17, Williamsburg, VA**

The Virginia Association of Science Teachers Professional Development Institute theme for 2018 is **Diversify and Strengthen Science for All**. We will be returning to historic Williamsburg. The theme calls on us to celebrate the ever-increasing diversity in our student population across the commonwealth. The upcoming PDI will offer a wealth of information about science resources that are available throughout the state of Virginia. Please consider attending to share and gather information on how to better serve the rich tapestry of students we serve across the state.

We have an exciting array of speakers to motivate, inspire and expand your knowledge base. Astronaut Scot "Scooter" Altman and Dr. Jeff D. Jordan will share effective approaches for cultivating science and teacher leaders. Internationally respected science educator and researcher Dr. Okhee Lee will discuss and present a concurrent session science and language assessment. Astronomer Munazza Alam will wow us with her adventures as a National Geographic Young Explorer.

The 2018 VAST PDI is being designed so that all teachers of science and their resource teams can share their best practices, celebrate their accomplishments, and discuss learning and teaching practices that "Diversify and Strengthen Science for All."

- **In addition to sessions related to our theme there will be concurrent sessions in all subject areas for grades k-12.**
- **Learn about new online strategies, how to access low-budget instructional materials or sharpen your understanding of climate change.**
- **Interact with vendors in our Exhibit Hall as you collect samples of new instructional materials and explore cutting-edge technologies.**
- **As an added bonus you can shop for cool science themed stuff.**
- **Our vendors love science teachers!**

### **Be a Presenter in 2018!**

The online proposal form for concurrent session presentations at the 2018 PDI is now open at [VAST.org](http://VAST.org). Click on "annual PDI" in the top bar on the home page and then go to "[Concurrent Session Presenter Information and Online Proposal Submission Form](#)" on the PDI page. The deadline for submitting proposals is May 1.



## Science “Look Fors” – What are the Students Doing?

### Students are:

Actively engaged in the learning process

*Answering open-ended questions, real-life scenarios, group problem-solving, investigations*

Formulate new knowledge by modifying and refining their current concepts and by adding new concepts to what they already know

*Concept mapping, KWL charts, modeling*

Reasoning and making conjectures during activities and/or investigations

*Elaborating, hypothesizing, analyzing, evaluating*

Communicating their scientific thinking orally and in writing using the language of science

*Graphic organizers, journals, presentations*

Listening and reacting to others’ thinking and solutions

*Pose questions and tasks that elicit, engage, and challenge thinking; ask students to clarify and justify issues, elaboration during discussions*

Engaging inquiry-based activities (4 levels)

*Confirmation-verification, structured inquiry, guided inquiry, open inquiry*

Using scientific and technological tools, such as physical materials, calculators, and computers, along with textbooks and other instructional materials

*Manipulatives; measuring tools – rulers, balance scales, thermometers; technology-based activities; hands-on activities*

Building new scientific knowledge through problem-solving and investigation

*Authentic problems to solve, real life scenarios, applications*

*Susan Booth, EdS*  
**Executive Director**

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**Dr. Jackie McDonnough**  
VAST President 2018



## **An Earth Day Challenge**

A few nights ago, at my gym I was faced with a decision- should I use a new plastic bag to store my wet swimsuit or just wrap it in my swim cap? Now this may seem like an inconsequential decision but I beg to differ. Currently we facing a major issue of solid waste pollution in our oceans. A recent Science article by University of Georgia scientist Jenna Jambeck, states that based on her study 8 million metric tons of plastics went into the ocean in 2010. "That is five plastic bags filled with plastic for every foot of coastline in the world." Sometimes I ask myself if we as teachers are doing our due diligence to keep environmental issues such as solid waste pollution, energy conservation and climate change at the forefront of our instruction. Have we allowed those issues to become lost as we confront accountability measures and the latest assessment mandates? Are we conscious of how decisions we make in our daily lives impact the ecosystems we interact with? Do we design instruction to make our students aware of how their actions can impact their world?

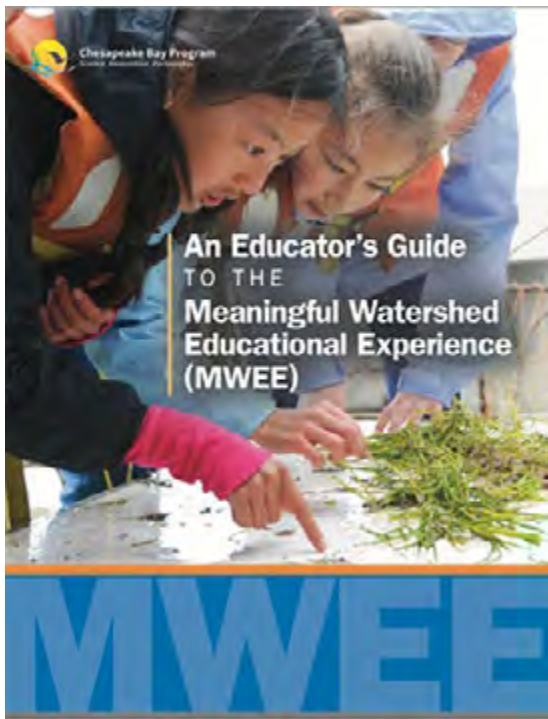
April 22 will mark the 48th celebration of Earth Day. Preparation for Earth Day in our classrooms is an ideal time to revisit our dedication to reduction of solid waste pollution with a special focus on plastics. On the National Earth Day website an effort has been launched to End Plastic Pollution. Teachers can download a Plastic Pollution Primer to learn more about this problem and act to help End Plastic Pollution! This toolkit includes information about plastic pollution, a Plastic Pollution Footprint Calculator, a tool you can use to help your students create a Personal Plastics Plan and to track their progress. Use this link- <https://www.earthday.org/yourjourney2018/>.

I would like to challenge teachers of science from elementary through secondary levels to add at least one instructional unit related to environmental issues between now and Earth Day. This is one area where we can have a profound impact on our students' behaviors and we should all rise to the challenge.

*Jackie*

**Dr. Jackie McDonnough**

**VAST President**



## What is a Meaningful Watershed Educational Experience (MWEE)

### Environmental Literacy in Virginia

There is a lot of talk in the education world about students and Environmental Literacy these days. The need for environmental education has never been greater. Every day, the country seems to be facing new and difficult choices touching on environmental issues, ranging from how to meet energy needs to how to deal with toxic materials that might pollute our air, water or soil. “Global Warming”, “Climate Change”, and “Loss of Biodiversity” are words that populate the headlines daily. The next generation will only face more difficult decisions as the Earth’s population grows from 7.2 billion today to 8.1 billion in 2025, but its natural resources do not. As an advocate for Environmental Literacy, involved in the education system for over 30 years, I have opportunities to mingle in the formal and non-formal worlds of educational leadership. I believe there is positive celestial movement in the Commonwealth, as the Environmental Literacy stars align.

The Virginia Department of Education defines Environmental Literacy as, “Having the knowledge, skills and dispositions to solve problems and resolve issues individually and collectively that sustain ecological, economic and social stability.” The

Standards of Learning (SOL) for Virginia Public Schools establish expectations of what students should know and be able to do at the end of each grade or course in English, mathematics, science, history/ social science and other subjects. The SOL in certain disciplines support Environmental Literacy explicitly and in others implicitly. Governor McAuliffe signed Executive Order #42 on Earth Day 2015, to establish the Virginia Environmental Literacy Challenge, which encourages schools at the classroom and school-level to engage students in meaningful science and environmental education efforts. All the above information comes from the Virginia Department of Education website [www.vdoe.edu](http://www.vdoe.edu). Providing teachers with the resources to help their students become Environmentally Literate would not have been found on the VDOE website 10 years ago. Now a plethora of resources fill the page when you “Search” *Environmental Literacy*” on the site.

A tool recently developed by the Chesapeake Bay Program, “**An Educators Guide to a Meaningful Watershed Education Experience**” is providing educators across the Commonwealth and the Chesapeake Bay Watershed states with the skills to help nurture environmentally literate students. The Meaningful Watershed Educational Experience (MWEE) is the bedrock upon which the region’s environmental literacy efforts are being built.

### Recognizing the MWEE as a Powerful Educational Tool

Excerpt from An Educator’s Guide to a Meaningful Watershed Educational Experience

The 2014 Chesapeake Bay Watershed Agreement includes an Environmental Literacy Goal that commits states in the region to prepare every student with the knowledge and skills necessary to responsibly protect and restore their local watershed. The cornerstone of this goal is providing teacher-supported MWEEs in elementary, middle, and high school. Each state or local education agency is responsible for establishing locally relevant approaches to environmental literacy that include MWEEs. Many districts are working to incorporate these experiences into the curriculum to set the expectation that they are provided for all students in a grade or a course. This is often referred to as systemic implementation. Though the Watershed



Agreement applies only to school districts in the watershed, states are encouraged to support these opportunities for all students in their jurisdiction. MWEEs support high-quality teaching and learning by actively engaging students in building knowledge and meaning through hands-on experiences. In these experiences, the core ideas and practices of multiple disciplines are applied to make sense of the relationships between the natural world and society. The MWEE definition has been designed to support state science and social studies standards and align with standards-based initiatives, including STEM education; the Common Core State Standards; Next Generation Science Standards; and the College, Career, and Civic Life (C3) Framework for Social Studies. The MWEE definition also reflects research based instructional models, including place-based education, the NAAEE Guidelines for Excellence, and Investigating and Evaluating Environmental Issues and Actions (IEEIA).

### **MWEE as a Powerful Educational Tool**

• **MWEEs Increase Student Engagement and Enthusiasm for Learning.** By involving students in research about local issues that affect their schools, neighborhoods, and communities, MWEEs reach beyond textbooks and connect more authentically to the lives of students. Conducting hands-on, outdoor investigations and meaningful action projects related to real-world issues fully engages students as active learners.

• **MWEEs Support Student Achievement.** MWEEs provide the opportunity for students to engage in problem-solving situations that place learning in the context of their daily lives. When this sort of life-relevant, student-centered learning is integrated into the curriculum or used to connect and organize themes across the curriculum, students are better equipped to meet academic standards.

• **MWEEs Advance 21st Century Skills.** MWEEs ask students to think critically, solve problems, employ analytical skills and higher-order thinking, and communicate effectively. These skills are essential to prepare a workforce ready for the innovation and challenges of the 21st century. In addition, today's economy offers tremendous opportunities for careers

directly related to the environment. MWEEs can help prepare students for these jobs.

• **MWEEs Promote Environmental Stewardship and Civic Responsibility.** A student's years in school provide a unique opportunity to build the knowledge, skills, and motivation to make informed decisions regarding complex and evolving environmental issues. MWEEs prepare students for this civic responsibility by having them examine local issues and take action to help their community.

Implementing MWEEs with your students provides you with a powerful educational tool that can be implemented across the disciplines to help students have academic success, enjoy learning and become stewards of the ever growing and changing environment.

Professional Learning opportunities for teachers and administrators interested in learning how to implement a MWEE are occurring across Virginia this summer. For more information on training you can visit the VDOE website or contact Cindy Duncan @ [cduncan@cbf.org](mailto:cduncan@cbf.org).

For more information on the development of the guide please contact the Chesapeake Bay Program Education Workgroup at [bit.ly/cbf-workgroup](http://bit.ly/cbf-workgroup)



**Cindy Duncan**

- **Chair of Environmental Literacy Committee – Virginia Association of Science Teachers (VAST)**
- **Chair of Virginia Association of Environmental Educators (VAEE)**
- **Professional Learning Coordinator VA & DC – Chesapeake Bay Foundation**

# Environmental Science Institutes

Dr. Anne Peterson, Science Coordinator VDOE



The Virginia Department of Education (VDOE) is pleased to announce four professional development opportunities to support the instruction of the new Environmental Science Course. These professional development Institutes, designed to support the Environmental Science course that was recently added to the Board of Education Approved Courses to Satisfy Graduation Requirements for the Standard, Advanced Studies, and Modified Standard Diplomas in Virginia Public Schools, are intended to prepare teachers to teach the Environmental Science Content Guidelines and to provide support strategies, including field experiences, to be used in the instruction of the course. Four two-day Environmental Science Institutes will be held throughout the Commonwealth.

- New College Institute, 191 Fayette Street, Martinsville, VA 24112, July 11-12, 2018
- Charlottesville High School, 1400 Melbourne Road, Charlottesville, VA 22901, July 18-19, 2018
- Battlefield High School, 15000 Graduation Drive, Haymarket, VA 20169, July 25-26, 2018
- Sandy Bottom Nature Park, 1255 Big Bethel Road, Hampton, VA 23666; August 15-16, 2018

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## MEMO 031-18 Virginia Environmental Literacy Professional Development Opportunities

This PD is a sustained PD developed for K-12 science teachers and administrators. The focus is on increasing environmental literacy and the successful integration of MWEEs. All sessions are very hands-on. The cooperating agencies are VIMS, CBF, DGIF, and DOF.

Each Environmental Science Institute will:

- Provide content support for the implementation of the Environmental Science Course Content Guidelines;
- Provide strategies and lessons that can support classroom instruction;
- Provide resources that teachers may use to facilitate the planning and instruction of Environmental Science;
- Support the teaching of the Environmental Science through both classroom and field activities;
- Provide strategies to assess student knowledge and skills both in the field and in the classroom through teacher designed performance-based assessments.

Virginia Department of Education funding will cover the cost of registration and meals for all participants. The cost

of lodging for participants living more than 50 miles from the Institute site will also be covered. School divisions are encouraged to cover mileage expenses for participants as this cost is not assumed by the Virginia Department of Education; however, this is not a requirement of the program. Enrollment in each Institute is limited to 30 teachers. Participant selection will provide representation from each Superintendents' region.

Registration can be completed online at [Environmental Science Institute](#) through March 30, 2018. Notification of acceptance will be provided to applicants and the applicants' school principals by email on or before April 15, 2018.

For more information about the Environmental Science Institute or about the new Environmental Science Course, please contact Anne Petersen, Science Coordinator, Office of Science, Technology, Engineering, and Mathematics, by email at [anne.petersen@doe.virginia.gov](mailto:anne.petersen@doe.virginia.gov) or by telephone at (804) 225-2676.

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## MEMO 031-18 Virginia Environmental Literacy Professional Development Opportunities

This PD is a sustained PD developed for K-12 science teachers and administrators. The focus is on increasing environmental literacy and the successful integration of MWEEs. All sessions are very hands-on. The cooperating agencies are VIMS, CBF, DGIF, and DOF.

**Environmental Literacy Professional Development**  
The Virginia Department of Education (VDOE) in partnership with the Chesapeake Bay Foundation, Chesapeake Bay National Estuarine Research Reserve, Department of Game and Inland Fisheries, and Department of Forestry, is pleased to announce three sustained professional development opportunities for K-12 teachers and administrators. These professional development opportunities support the 2014 Chesapeake Bay Agreement commitment of engaging students in meaningful outdoor education by supporting teacher and administrator professional learning.

Teachers and administrators who apply and are accepted into cohorts are expected to attend a 2018 summer professional development workshop, four webinars through the 2018-2019 academic year, and a two-day culminating workshop in Richmond in the summer of 2019.

Continued..

Upon completion of all portions of the sustained professional development, teachers and administrators will receive a stipend of \$225. The 2018 summer professional development workshops are outlined below.

- Investigating an Aquatic Mountain Ecosystem; Judge Matthews State Forest, 106 Matthews Lane, Galax, VA 24333, June 25-28, 2018
- Promoting Environmental Literacy: Professional Development for Science Leaders and Administrators; New Kent Forestry Center, 11301 Pocahontas Trail, Providence Forge, VA 23140, & Port Isobel Island, Tangier Island, Tangier VA, 23440, June 25-29, 2018
- TOTE: Teachers on the Estuary; Virginia Institute of Marine Science, 1375 Greate Road, Gloucester Point, VA 23062, August 7-9, 2018

Although the cohort audiences are different; the general outcomes of each cohort are similar. Each cohort is designed to allow teachers and administrators to:

- Support the teaching of basic estuary science through both classroom and field activities;
- Explain the current environmental impacts on the Chesapeake Bay and other bodies of water;
- Lead teachers and students in learning activities that improve the students' ability to become stewards of the environment;
- Integrate content and science skills in the field through Meaningful Watershed Educational Experience with the goal of increasing student environmental literacy;

- Design and implement Meaningful Watershed Educational Experience that are applicable to the regions they teach; and
- Assess student performance in the field and related content Standards of Learning through a teacher designed performance-based assessment.

Funding provided by a National Oceanic and Atmospheric Administration Bay Watershed Education and Training capacity grant will cover the cost of registration, lodging, and meals for all participants. School divisions are encouraged to cover mileage expenses for the sessions for division participants as this cost is not assumed by the VDOE; however, this is not a requirement of the program. Enrollment in each cohort is limited to 25 teachers and administrators from across the state. Priority will be given to teachers and administrators from schools not meeting the state benchmark for accreditation in science. Participation selection will provide representation from each Superintendents' region and will be based on the order in which applications are received.

Registration can be completed online at [Environmental Literacy Professional Development Registration](#) from February 9 - March 15, 2018. Notification of acceptance will be provided to applicants and the applicants' school principals by email on or before April 15, 2018. Questions regarding the Environmental Literacy Professional Development opportunities should be directed to Anne Petersen, Science Coordinator, by email at [anne.petersen@doe.virginia.gov](mailto:anne.petersen@doe.virginia.gov) or by telephone at (804) 225-2676.

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## VAST Awards at the PDI



I know that November seems a long time in the future, but now is the time to begin your plan to nominate someone for the RISE Award, the TACT mini-grant in Chemistry, or the VAST mini-grants. The forms for these nominations are on the VAST web site. The deadline for submission is August 20, 2018.

**Sandy Pace, VAST Awards Chairman**

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# Donna Sterling Outstanding Teacher Award

Dr. Juanita Jo Matkins

*From left to right Dr. Juanita Jo Matkins, Jaclyn Claytor, Becky Schnekser, and Robin Curtis.*



On February 16, 2018, Becky Schnekser was presented the Plaque for receiving the Donna Sterling Outstanding Teacher 2017 Award at Cape Henry Collegiate School during a full lower school assembly. The plaque was presented by Juanita Jo Matkins along with Head of School; Christopher S. Garran, Supervisor; William G. Fluharty, and Sterling Committee members; Jaclyn Claytor and Robin Curtis. Donna Sterling was a visionary science educator with a passion for working with science teachers and developing habits of inquiry-based teaching. Most recently, her leadership in the Virginia Initiative for Science Teaching and Achievement (VISTA) focused on elementary and secondary teacher professional development. This award recognizes that exemplary teachers engage in continual improvement and is designed to support a professional development plan

for the improvement of science teaching. In 2017, the award will be given to an exemplary elementary teacher. The award alternates between elementary and middle/secondary.

The awardee will receive a total of **\$4000**. In addition, travel costs will be reimbursed to attend the 2017 VAST PDI to receive the award and to the 2018 VAST PDI to present a session on the professional development experience and outcomes. The awardee will receive \$3000 at the VAST PDI in 2017. The remainder will be awarded after the awardee presents at the next VAST PDI and also submits an article to either the newsletter *The Science Educator* or the *Journal of Virginia Science Education*.

Becky plans use the funds she has received to travel to the Boiling River of the Amazon to continue work there with National Geographic and Andres Ruzo.

## Progress of the Donna Sterling Award Winners, 2016 and 2017

I am honored to represent the Sterling committee in telling you about the progress of the 2016 awardee and the plans of the 2017 awardee. First, I want to be sure to recognize the members of the committee, whose hard work has really paid off! Please stand: Jackie McDonnough, Eric Pyle, Robin Curtis, and myself. I believe I speak for the committee when I say that it's not hard to imagine that Donna Sterling is looking down with a big smile on her face, knowing what we know about the 2016 and 2017 awardees. Now let me tell you about them.

### Comments about 2016 Sterling Awardee, Major Norman Marshall

The Donna Sterling Award for Exemplary Science Teaching is aimed at, yes, recognizing exemplary

science teaching. This includes teaching that promotes inquiry-based, student-centered and problem-based learning that incorporates the school community. The 2016 awardee, Major Norman Marshall, has given us an extraordinary example of how this can play out.



# A Chemistry Simulation Lab Activity

Adapted by Stephanie Harry, VAST Chemistry Chair  
Kecoughtan High School, Hampton City School District

## Metals in Aqueous Solution Simulation Lab

### Background:

To determine the activity of metals you can compare the reactions of metals with different metal ions.

Consider equations 1 and 2 below:



The reaction of aluminum with copper (II) chloride (Equation 1) is classified as a single replacement reaction – aluminum reacts with and “replaces” copper ions in copper (II) chloride. Single replacement reactions will occur spontaneously in one direction only (compare Equations 1 and 2). A more active metal always replaces the ion of a less active metal. In general, the activity of a metal may be defined as follows:

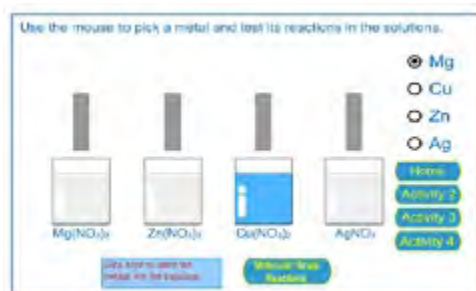
*An active metal will react with a compound of a less active metal, which is converted to its “free element” form. The more active metal forms a new compound containing metal cations. Based on Equation 1, aluminum is more active than copper and therefore replaces the copper (this is called a single replacement reaction).*

The following simulation by **Tom Greenbowe** allows you to test several metals with different aqueous solutions. You will choose a single metal to place in the solutions and observe in which solutions a reaction occurs. If the single metal is stronger than the metal in the compound in solution, the metal in the compound will be displaced and the metal strip of the single metal that you insert will become coated with the displaced metal.

**CH.3eSj** Classify types of chemical reactions as synthesis, decomposition, single replacement, double replacement, neutralization, and/or combustion.

### Procedure:

1. Click on the link below or copy and paste it into your browser.  
<http://intro.chem.okstate.edu/1515F01/Laboratory/ActivityofMetals/home.html>
2. Click START. (For this simulation Do Not click the back button on the browser or you will quit the simulation and have to start over!!!!) CLICK OK.
3. Click Activity 1.
4. Using your mouse click on the first metal (Mg) then click on the box that says [click here to place the metals in the solutions].
5. After a few seconds the reactions will be complete and it will say **now you can remove the metals from the solutions and record your observations**. Click on the box that says: **click here to remove the metals from the solutions**.
6. Once the metals are removed from the solutions record your observations (any changes in color, size, texture, solution appearance) in data table 1. If no reaction occurs write no reaction (NR) in the box.
7. Now repeat steps 4-6 for the next three metals (Cu, Zn and Ag).
8. **In the space provided**, answers conclusion questions 1-3, **in complete sentences**.
9. **In the space provided**, write balanced chemical equations only for those reactions that occurred.
10. Repeat steps 2-9 for Activities 2, 3, and 4 (**Skip # 8 for Activity #4**).



*The copyright for these simulations and animations is credited to the Chemical Education Research Group at Iowa State University.*

Continued...

**Conclusion Questions:** (Write your answers in complete sentences)

1. Which metal reacted with the most solutions?
2. Which metal reacted with the fewest solutions?
3. List the 4 Metals in order from the most reactive to the least reactive.

Stephanie Harry adapted this lesson using a web simulation created by Tom Greenbowe and lesson information from the Chemical Education Research Group at Iowa State University. You may contact Stephanie by email at:

[sdharry@hampton.k12.va.us](mailto:sdharry@hampton.k12.va.us)

**[To download the complete five page lesson that includes four more student activities as a pdf document click here.](#)**

**Other resources from the Chemical Education Research Group lessons.**

**Virtual Lab: Activity Series and Redox Reactions**

[http://mmstcchemistry.weebly.com/uploads/2/4/1/2/24121933/redox\\_virtual\\_lab.docx](http://mmstcchemistry.weebly.com/uploads/2/4/1/2/24121933/redox_virtual_lab.docx)

**Metal Activity Series Simulation Lab (Paste this link into your browser)**

<http://www.peaster.net/cms/lib/TX01000798/Centricity/Domain/198/Metal%20Activity%20Series%20Simulation%20Lab.docx>

# Hello, Marvelous Middle School Science Teachers

## Come share your wonderful activities!

I am Janet Lundin and I am your representative on the VAST board. I teach eighth grade physical science at Mary Ellen Henderson Middle School in Falls Church city. I have taught eighth grade science for sixteen years and I am still excited about teaching this subject. There is always so much more to learn as a teacher, which is why being a member of VAST and attending the Professional Development Institute (PDI) provided by VAST is so important to me. After attending a PDI, I always come back to my classroom with new ideas and renewed enthusiasm.

This year at the VAST PDI in Williamsburg we would like to organize a middle/elementary make and take share. I don't know about you, but I love the share sessions because I get so many great ideas. This would be a walk through session where teachers could come by and pick up ideas to take back to their classrooms. Do you have an activity that works really well that you would like to share with your peers, but you don't want to plan an entire session on your own? Come present with your peers, make new friends, get new ideas - all in a single session!

**Contact me if you are interested in participating in the activity share: [lundinj@fccps.org](mailto:lundinj@fccps.org)**



**Made you look!** So to answer the first question; yes that is really Bill Nye. That is me (Janet Lundin) your middle school VAST representative in the picture with him. How the picture happened: a couple of years ago I was invited to the NSTA/Toshiba Exploravison awards ceremony, where Bill Nye was the guest speaker. I happened to be in the same room with him and I told the person next to me how I would love to have my picture taken with Bill Nye for my "brag wall" at school. It so happened that the Director of NSTA, David Evans was standing behind me and overheard my wish. He called Bill Nye over and took the picture. A big thank you to David Evans for fulfilling my science teacher wish.

## EPA Environmental Education Grant Submitted by Laura Casdorff, Region 1



EPA's office of Environmental Education (EE) is currently accepting applications for the EE Local Grants Program at EPA until March 15th, 2018. Projects in agriculture are eligible in this year's grant solicitation, including projects on water quality, conservation, food sustainability and integrated pest management best practices— among other traditional topics.

- Slides are available at <https://www.epa.gov/education/environmental-education-ee-grants-webinar-and-tele-conference-materials>

- To apply for the EE Local Grants Program, [visit:https://www.epa.gov/education/environmental-education-ee-grant-solicitation-notice](https://www.epa.gov/education/environmental-education-ee-grant-solicitation-notice)
- Applications for the EE Local Grants Program are due March 15th 2018
- Virginia is in Region 3

***Shannon Sprague***

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# **VAST PDI 2018**

## **Diversify & Strengthen Science for All**

**November 15 - 17,  
Williamsburg, VA**

### **Doubletree by Hilton Williamsburg**

50 Kingsmill Rd. Williamsburg, VA 23185

[Williamsburg.DoubleTree.com](http://Williamsburg.DoubleTree.com)

TEL: +1-757-220-2500

Have you gone to the PDI and had to stay at a different hotel? It is easier to attend more sessions, events and to have time to network and socialize when you stay in the conference hotel. Consider making your reservations early to insure that you have a room.

Complete information about the 2018 VAST hotel can be found on the “annual PDI” page ([VAST.org](http://VAST.org)). Click on [Hotel Information](#), [Prices](#), [Online Reservation Form](#), [WiFi](#), [Menus](#), and [Parking](#). The link to access the 2018 VAST PDI Double Tree reservation page will be active beginning in

late March.

**Hotel Room rate:** \$101.00 + 11% tax + \$2.00 fee per night = \$114.11 (per diem government rate) (This rate may increase for reservations made beginning on October 1)

Make your reservations online or by phoning the hotel and be sure to get the lower conference rate by using the code, **TEA**. The cut off date for using this code is 30 days prior to arrival. All reservations need to be booked before **October 13, 2018**.



# 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. **Ticketed Donna Sterling Institute Short Course**

8:00 a.m. - 3:00 p.m. Short Course Continental Breakfast and check in

Short Course Presentations and Lunch

Title: *Collaborative Teaching in Science Content Areas*

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

**PDI Registration Desk Open**

3:15 - 4:45 p.m.

**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, NASA

Title: TBA

*(door prize giveaway at the end of the session)*

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

**Meetings with regional directors** (general session room)

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

**Night with the Exhibitors** (Cash Bar)

## 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)*

11:45 a.m. - 1:00 p.m.

**Ticketed 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. - 7:15 p.m.

**Ticketed Dinner** (Cash Bar)

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

**Awards Ceremony**

8:30 p.m. - 10:00 p.m.

**Auction and DJ** (Cash Bar)

## 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. - 11:15pm

**Last Chance to Visit the Exhibit Hall**

*(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)*

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**

*(\$50.00 gift card giveaway at the end of each concurrent session presentation)*



## Virginia Association of Science Teachers



# STUDENT ART POSTER CONTEST 2018

**VAST** invites all K -12 artists/young scientists to showcase their talents by creating original artwork that reflects our **2018 Professional Development Institute** theme, “**Diversify & Strengthen Science for All.**” Posters will be judged in the following four categories: **Kindergarten - 2nd Grade, 3rd - 5th Grade, 6th - 8th Grade, and 9th - 12th Grade**- by a panel of artists, scientists, and educators.

### Judging

- The poster will be judged on: its clear message of the theme, “**Diversify & Strengthen Science for All,**” the clarity of the entry’s text and art with correct spelling and grammar; and creativity.
- Posters may be submitted on plain paper or poster paper. Do not frame or mat. The completed poster size should be 8.5 x 8.5 inches, square.
- Any medium may be used by the student to create a completely original, two-dimensional entry, with the exception of glitter. Copyrighted characters, such as Superman, or copyrighted clip art, or copyright-free clip art will not be accepted. Artwork must be submitted in original media format, not as a pdf, jpeg, or color print.
- On the back of the artwork, the entrant must include all of the following information, printed legibly:

**Artist’s Full Name, Grade, Age**  
**Parent’s/Guardian’s name, email address, and phone number**  
**Science Teacher’s Full Name and email, School name and address**

### Submitting the Poster

All submissions must be postmarked by: **Wednesday, April 11<sup>th</sup>** to be received by April 16<sup>th</sup>. We expect to complete judging before the end of the school year. Decision of the judges is FINAL. All posters will become the property of the Virginia Association of Science Teachers.

**Mail submissions to:**  
**Kathy Frame, VAST**  
**13112 Nestlewood Court, Oak Hill, VA 20171-3904**

### Winners

First, second, and third places will be awarded in each category and displayed at the VAST PDI in Williamsburg in November. The winners will also be featured in a VAST newsletter and on the VAST website [www.vast.org](http://www.vast.org). The grand prize winner’s work may become the PDI program front cover with the winner, parents/guardians (up to two), and Science teacher invited as VAST’s guests at the PDI Awards Dinner and Ceremony, in Williamsburg, on November 16<sup>th</sup>. The Science teachers of the first place winners in **each** category will receive a free one-year membership in VAST.

### Questions or Additional Information?

**Susan Bardenhagen, Art Contest Coordinator** [region4@vast.org](mailto:region4@vast.org)

## VDOE Opportunities from the *Teacher Direct*



### John Marshall Foundation Teacher Awards

One high school and one middle school teacher will be selected for this award based on their demonstrated knowledge and enthusiasm for the United States Constitution.

[Applications must be postmarked by March 30.](#)

### Monticello Archaeology Teacher Workshops

Educators are invited to join Monticello Archaeologists for a one-day workshop on July 17 or July 18 to engage in archaeological field excavations. Participants will learn about artifact processing in the archaeology lab as well as classroom application of methods and data analysis. Space is limited to 12 participants per session so [reserve your spot today!](#)

### Virginia Council for Learning Disabilities

#### Symposium - April 21

Join your peers at Marymount University to network and learn strategies for improving instruction at the [VCLD](#) Symposium. The theme is “Supporting Culturally Diverse Learners,” and presentations will focus on effective classroom strategies. Register [today!](#)

## Sterling Preconference



Do you teach a collaborative section of your science classes? Do you co-teach with a Special Education (SPED) teacher or are you a SPED teacher who teaches science? Do you know someone who does? In keeping with the 2018 theme “Diversify and Strengthen Science for All”, VAST and the Sterling Committee are pleased to offer a pre-conference on Collaborative Teaching in Science Content Areas - “Powerful Collaborations: Science and SPED Instructors working together for students’ success” The full day pre-conference (8am to 3pm) will focus on maximizing the power of collaborative partnerships. Featured speakers in the morning will lead the group in examining current best practices in science and collaborative teaching while also addressing the challenges collaborative teams face in teaching the range of students in collaborative classrooms. Afternoon break-out sessions will be Upper Elementary (3-5) Middle School (6-8) and Biology and Earth Science. Each break-out session will be lead by a collaborative teaching team and will include effective teaching approaches and test taking strategies that can be used for both SPED and general populations. Breakfast and lunch are included as well as all materials. All for \$100 registration fee!

Please note: the pre-conference does not include the registration for the full VAST PDI conference, nor does the VAST PDI registration include the pre-conference.

Make your plans now to attend the 2018 pre-conference at Double Tree by Hilton in Williamsburg, VA on November 15, 2018. The Annual VAST PDI will begin at 5 pm on November 15, 2018 and run through November 17, 2018 to mid-afternoon. More information can be found at [www.VAST.org](http://www.VAST.org).

## Region IV News Region IV Director Susan Bardenhagen



Region IV’s 2017 Professional Development opportunities have continued into 2018. With a grant from VRUEC, we began with an introduction to Meaningful Watershed Experiences at the July 12th STEAM 4.0 Conference. Next, we had a Project WET workshop on watersheds at the EAGLES Center in Prince William County on October 14th and another in Fauquier County on January 20th at their Outdoor Education Lab. The final workshop to meet the 30 school administrators and leaders roster will be held in Fauquier at an after-school 2-day event on March 21st and 22nd. Participants have attended the workshops from all over Virginia.

This summer our conference is entitled, “STEAM 5.0 – Retooling TEAMS”. STEAM is a newer acronym, and as TEAMS, is an anagram which proactively encourages collaboration. Our plan is for a keynote speaker from the Americans for the Arts, a future workforce panel on STEM (2nd M for Medicine) careers, a student artist majoring in STEM careers panel, special artist and scientist performances, a vertical alignment teams and cross

subject areas “working lunch”, and workshops on collaboration and inclusion of the arts with Science, Math, Technology, and Engineering. Initial confirmations are scheduled for Thursday, July 12th with the venue TBA. We hope our regional sponsors again will include the regional Math council, electric cooperative, Micron Technology, and Lockheed Martin, with others.

Since region IV’s 2012 environmental science and STEM conference, “Air, Earth, Water, and the Fire Within,” we have encouraged school teams at discounted rates. In 2014, “Teaching Science with a T.E.A.M. Approach”; in 2015 on Valentine’s Day- “Inspiring a Love of Science”; and in 2016 we began the STEAM “upgrades”.

Please “save the date” – July 12th and be on the lookout for announcements of the location and flyers on the VAST site. Plan to attend with a school team! Ideas and suggestions, or questions- contact Region IV Director Susan Bardenhagen, [region4@vast.org](mailto:region4@vast.org).

## Book Review

by Anne Mannarino amannarino@regent.edu

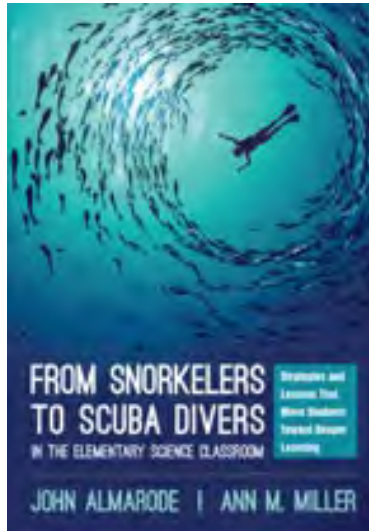
### *From Snorkelers to Scuba Divers*

Come check out the newest book, *From Snorkelers to Scuba Divers*, from current VAST member John Almarode, and Ann Miller. You will find an easy to read book that walks you through strategies and lessons to enhance deeper learning and understanding for elementary K-5 students.

Each chapter has several components that include: Learning Intentions and Success Criteria -basically the goal of the chapter and if you reach that goal); Do-Nows -small checkpoints to see how you are progressing); Here's How – activities that walk you through how

to implement the ideas and strategies; and Closure – a summary of what you've learned throughout the chapter and even has exit tickets for you.

The key to this book is the way you are taught to recognize how students learn and how to get them to understand. You will recognize several of the techniques and strategies in the book. Nothing really new here except the way it is presented. You build your instructional framework through several steps and decision making, based on evidence based strategies and your students' needs. The book models ways to achieve this and how to apply learning to different and new contexts. So take the plunge and see if you will sink or swim. You will begin as a novice snorkeler and end up as a scuba diver in the deep ocean of student thinking and learning.





# Enhancing Your Authentic Research Skills

Dr. Julia H. Cothron, VJAS Representative to VAST Board



Did you engage in STEM research as a K-12 student? As part of your undergraduate or graduate work? If so, you are unusual. When I ask workshop participants about their research experiences, over half of teachers report they did not design, implement, and report an original STEM project. For many, posters, models (think volcanoes), and topical reports were the expectation.

Fortunately, increased emphasis on authentic research is occurring at all levels. Schools are implementing problem-based units, culminating in a major project. Specialty schools and programs (such as IB and AP) are requiring authentic research related to personal interests. Virginia's new graduation requirements, *Profile of a Graduate*, include demonstrated evidence of critical thinking, creative thinking, collaboration, communication, and citizenship skills. Beginning with the 2018-19 freshman class, students will be eligible for *The Board of Education's Seal for Excellence in Science and the Environment*, which will require research and its presentation in a formal, juried setting.

What if you are one of the teachers who never had an authentic research experience? How can you create a research-oriented environment and provide the scaffolding that students need? Begin by attending events where you can see authentic research, by K-12 students, undergraduate and graduate students, and STEM professionals. Annually, the Virginia Academy of Science and its Virginia Junior Academy of Science meet at a different university. This year, Longwood University will host the events on May 23 and 24, 2018. Consider attending one or both of the following days:

**Virginia Junior Academy of Science.** On **May 23**, observe over 600 students, grades 7-8 and 9-12, present research papers on various natural and applied sciences, mathematics, engineering, and computer science. Learn how the VJAS Symposium develops important educational outcomes: workplace skills (the 5Cs), career and civic responsibility, and understanding of Virginia's SOL. Throughout the day, interact with participating students, teachers, and VAS members. For information, go to [www.vjas.org](http://www.vjas.org). Registration will open by April 1. You can register for one-day.

**Virginia Academy of Science.** On **May 24**, interact with VAS members through concurrent presentations, poster sessions, and discussions about research conducted by Virginia's STEM professionals and their undergraduate or graduate students. Build relationships with Academy members who are involved with research. Attend the Negus Memorial Lecture (open to public). For information, go to [www.vacadsci.org/](http://www.vacadsci.org/). Registration will open by April 1. You can register for one day.

Even though it is the end-of-the-school year, this experience will invigorate you and remind you why you chose the STEM disciplines. You will have an increased repertoire of authentic examples to share with your students. Also, certificate renewal credits can be earned.



**Question your world.**



[www.smv.org](http://www.smv.org)

Special thanks to our premier partners:



**Virginia529**



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*Many thanks for the support of science education by our Corporate Benefactors and Corporate Members.*

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[www.associatedmicroscope.com](http://www.associatedmicroscope.com)

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1000 Regent University Drive  
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[www.regent.edu](http://www.regent.edu)



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### **Science Museum of Virginia**

2500 West Broad Street  
Richmond, VA 23220

[www.smv.org](http://www.smv.org)



### **Delta Education** 80 Northwest Boulevard

Nashua, NH 03063

[www.delta-education.com](http://www.delta-education.com)

### **Virginia Space Grant Consortium**

600 Butler Farm Rd. S-200  
Hampton, VA, 23666

[www.vsgc.odu.edu](http://www.vsgc.odu.edu)



### **Vernier Software & Technology**

13979 SW Millikan Way  
Beaverton, OR 97005

[www.vernier.com](http://www.vernier.com)

### **National Geographic**

20 Channel Center Street  
Boston, MA 02210



### **Cengage Learning**

10650 Toebben Drive  
Independence, KY 41051

[ngl.cengage.com](http://ngl.cengage.com)



### **Science Matters Community Idea Stations**

23 Sesame Street

Richmond, Virginia 23235

[www.ideastations.org/sciencematters](http://www.ideastations.org/sciencematters)  
[www.facebook.com/sciencemattersva](http://www.facebook.com/sciencemattersva)

### **Dinah-Might Adventures, LP**

PO Box 690328

San Antonio TX 78269

[www.dinah.com](http://www.dinah.com)

[www.dinah.com/about/dinah-zike-academy/](http://www.dinah.com/about/dinah-zike-academy/)



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## 2018 VAST Leadership



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### Is Your Address Changing?

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



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Please consult the website for up to date information, VAST forms for awards and mini-grants, advertising and current PDI information: [vast.org](http://vast.org) or <https://vast.wildapricot.org>

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



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

Please send articles, letters to the [editor](#), or labs by the submission deadline, **May 1, 2018**, for inclusion in the next digital PDI VAST Newsletter.

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