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VAST's Vision:
Excellence in Science Education Through Innovation

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The Science Educator

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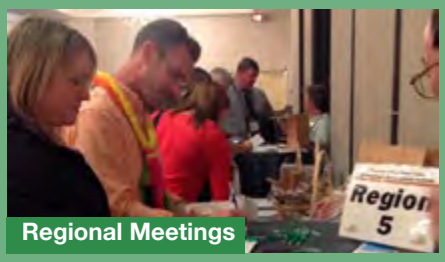
Play-Dough Circuit


NASA Astronaut

Carolyn Hayes & Denny Casey


Eric Pyle Auctioneer

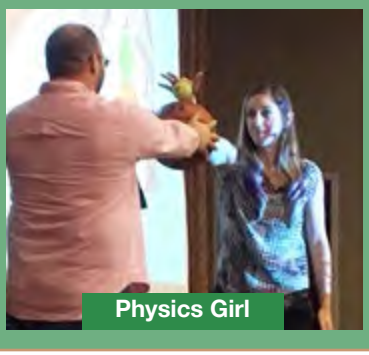

Ellen Stofan Speaker



Regional Meetings


Auction Excitement


Trevor Frost & Pres. Kathy Frame


Physics Girl

VAST Professional Development Institute
November 2016, Williamsburg

The Double Tree hotel buzzed with excitement as science educators hurried to the next session, investigated the exhibit hall or attended a general session. Groups gathered wherever seating was available and conversations were heard in the hall ways and even in the elevators.

In this issue, you will find photos and information about the PDI. If you were there, you may find a photo of yourself or one of a colleague, or someone you met at the PDI.

If you weren't there, hopefully, you will discover why you should plan to attend VAST PDI 2017 next November in Roanoke. (See page 9) Dozens of outstanding educators were recognized with awards and dozens more won prizes at the general sessions or at the exhibits.

During the VAST annual meeting new officers were elected and Kathy Frame became VAST Past-President; Shirley Sypolt became the VAST President; and Dr. Jackie McDonnough became our new President-elect.

A quick summary of the highlights:

- Donna R. Sterling Institute held on Thursday offered more in depth learning opportunities for both elementary and secondary educators.
- Over 150 Concurrent Sessions
- Four General Sessions with nationally known speakers:
  Ellen Stofan, Chief Scientist NASA
  Tamra Willis, Environmental Based Learning
  Mary Baldwin
  Trevor Frost, National Geographic Explorer
  Dianna Cowern - *Physics Girl*
- Award Ceremony honoring outstanding Virginia Educators
- Guest Speaker: Carolyn Hayes, NSTA Past-President
- More than 65 Exhibitors displayed their wares or described their services and enthusiastically shared their resources.
- Prizes and raffles
- Auction and Dancing

From the Executive Director

Takeaways from the PDI for the New Year

What does your VAST Board do for you? They set the organizational goals. There is a rotation every two years of Regional Directors and every three years the positions of secretary, treasurer and vice-president rotate as well. So, you might ask yourself how do you get involved?

Involvement can vary. It can be as easy as getting a friend to join. As members, we are all inclusive. We celebrate member strength and diversity. One voice-one vote per member, no tiers. We see everyone as a leader.

When one registers as a member they can join a group in which committee chairs recruit members. If you have not been reached out to and want to be involved then look to the VAST Board on the website or in the newsletter to see who you need to contact.

Don't be left out. Go back and check your membership status and details to make sure everything is current. It is important that the VAST board know what is important to you so that they meet the needs of their membership.

As your Executive Director, I look at the takeaways from the newsletter, journal, website, regional meetings and the professional development institute to include the precon. We want to continue to keep your interest and stay creative. As your science teachers association, we are a 501c3 nonprofit business looking for members but also donations and sponsorships that can be tax deductible.

To be all that we can be, we have a strategic plan that helps to sustain us. We continue to focus on the things we do well such as science education and professional development. We want to make sure that we have a "wow" factor that will not only get first-timer participation but repeat business. We look to you to attend but also to mentor and offer your expertise to educate as well. We want to incite and excite.

We look to your expertise to assist us in developing the best program. By offering your services as a concurrent session speaker, a greeter at registration, just to name a few things. We need your support to maintain the consistency and quality of our PDI.

So, we are asking you, to consider your involvement of volunteering to make the most of your membership and our organization. Let's figure out where we can partner, what other organizations are you involved in that can add to ours. We need you to be involved from the ground floor through the planning process.

Welcome to the New …New Year. WE look forward to your work in the trenches in reaching out because members make the Association. We will continue to listen to your voice your concerns and be proactive.

Susan Booth, **EdS**

Executive Director

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From the desk of the VAST President

Shirley Sypolt
VAST President
2017

Happy New Year from VAST (Virginia Association of Science Teachers)!

It is with great pleasure that I have the opportunity to serve as your Virginia Association of Science Teachers (VAST) president, for the second time. I grew up in rural Virginia, Charlotte County, and learned about science naturally by exploring the neighboring fields and woods with my brother, two sisters, and best friends. The love of learning and teaching science has always been my passion.

I have now been an elementary school teacher in Hampton, Virginia for almost 25 years (teaching fifth, third and second grades). After earning a Master of Arts in Teaching degree from Christopher Newport University, I had the pleasure of teaching the "elementary science methods" course at CNU for about 10 years as an adjunct professor. I love teaching science to students of all ages and it's very rewarding to hear from both former elementary and college students.

The mission of the Virginia Association of Science Teachers (VAST) is to: inspire students, provide professional learning opportunities, build partnerships, and advocate for excellence at the school, local, state and national level. VAST has a legacy of 65 years and this year we will be "celebrating science" throughout our great state of Virginia and we want to hear from you.

2017 VAST Presidential Challenges:

I challenge you to help VAST with "**Celebrating Science**" in Virginia:

- by **taking a few moments to share** with us, what "we can do" to help you, as "our Virginia science educators." How can we use our web site to better support you with science education and/or resources, at all levels?
- by **checking out our web site** vast.org and contacting your VAST regional director to see what event(s) are being planned, or can be planned, for your state VAST region.
- by **finding the time to share your thoughts** and/or great science lessons, stories, and/or adventures with our newsletter editor Jean Foss at newsletter@vast.org .
- by **showcasing your "awesome science"** at our November 2017 PDI (Professional Development Institute) in Roanoke; what are you currently doing that fosters students' and adults' love of "learning and doing science?"
- by **giving a "gift VAST membership"** ($25) to a friend or a colleague in 2017. To do this, contact our treasurer Matt Scott at treasurer@vast.org .

Shirley Sypolt, **Vast President 2017**

As an organization, VAST is always stronger and better with your support!

2018 Annual Nominations for VAST Board of Directors


Past President
Kathy Frame

Are you looking for a challenging leadership position that impacts local, state, and national science education? Would you like to serve the association that serves you? The VAST Nominating Committee is currently accepting nominations from the VAST Membership who are in good standing for the following positions on the 2018 VAST Board: President-elect, Secretary, Regional I (Central) Director, Regional III (Northern Neck) Director, Regional V (Valley) Director, and Regional VII (Southwest) Director. Submission deadline is **May 1, 2017,** but why wait? Complete the nomination form below and email to nominations@vast.org.

What is the VAST 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.***

Who is Eligible?

All VAST Members in good standing.

Please note that all officers and directors serve on a volunteer basis. Please ascertain that the colleague(s) you nominate do not express serious concerns regarding service or have conflicting priorities.

Who May Nominate?

Nominations are welcome from all VAST members. Self-nominations are encouraged!

What Are the Responsibilities of the Positions?

President-elect, President, and Past-President is a three-year commitment beginning in January 2018 through December 2020 as President-elect, Year 1; President, Year 2; and Immediate Past-President, Year 3.

President-elect, elected for a one-year term, shall

- Serve as the Co-Chairperson of the standing Conference Committee (working closely with the PDI Chair) for the purpose of planning, scheduling, and execution of the conference scheduled for the year of his/her term in office.

President, for a one-year term following the year serving as President-Elect, shall:

a.) Maintain general oversight of the interests and activities of VAST, representing VAST to the public;
b.) Preside over all business meetings of the general membership of VAST, of the Executive Committee, and of the Board of Directors;

- Prior to the first Executive Committee meeting in January, nominate committee chairs, editors, Web Master, and VAST representatives to other groups, which require approval of the Executive Committee followed by Board approval;
- Prior to the first Board meeting in January, develop the annual budget in cooperation with the Treasurer and Executive Director, and develop the calendar for VAST Board meetings;
- Represent VAST at conferences of other professional organizations such as NSTA (national and regional);
- Serve on the Standing Conference Committee; and
- Perform other duties incidental to the office.

Immediate Past-President, for a one term following the year serving as President, shall:

- Be available for advice and counsel to see that programs and projects are continued under the new leadership;
- Chair the nominating committee for elected offices of VAST; and
- Attend (or appoint a designee to attend) the National Congress on Science Education.

Secretary, for a term of three years (January 2018 through December 2020) shall:

- Keep a permanent record of all business transacted by VAST;
- Keep the minutes of meetings for the general membership, Executive Committee, and Board of Directors;
- Distribute copies of the minutes to members of each group in a timely manner; and,
- Perform such duties as are usually incidental to the office.

Regional Director, elected for two years, shall: (See the Regional map next page)

- Each Director represents one of eight geographic regions established by the Virginia Department of Education (see map above).
- Be elected in even years if their region number is an even number and on odd years if their region number is an odd number;
- Promote membership in VAST in their region;
- Promote professional development activities in their region; and
- Participate actively in VAST functions, including Professional Development Institutes, publications, and awards.

If you have questions or need additional information, please nominations@vast.org.

Virginia Association of Science Teachers
Board of Directors Nomination Form

Only members in good standing may apply.

Name of Nominee _____ VAST Membership Number _____

Nomination for the Office of

- ❑ President-Elect (Three year term (one year each as President-Elect, President, and Immediate Past President).
- ❑ Secretary (Three year term: 2018 through 2020)

Nomination for Regional Director *(Two-year Term: Regions II, IV, VI and VIII elected in even years. Regions I, III, V, and VII elected in odd years)*

❑ Region I ❑ Region III ❑ Region V ❑ Region VII

Nominator (*self-nominations are permitted and encouraged*)_____

Nominator's Email: _____

The information below is for the Nominee to complete.

School/Institution _____

Position/Title _____

School/Institution Address _____

School/Institution Telephone Number (_____) _____

School/Institution E-Mail _____

Home Address _____

Home/Cell Phone (_____) _____ Home E-Mail _____

Years as a Science Educator _____ Years as a VAST Member _____

Provide the names & e-mails of two individuals that have agreed to support your nomination:

(1) _____ E-mail _____

(2) _____ E-mail _____

Please attach a statement of 150-200 words detailing your experiences to include the bullets below.

- Leadership in VAST or other science organizations;
- Membership in other science-related organizations;
- Any additional activities, honors, and awards;
- Any science or educational publications you may have authored; and,
- The position(s) in VAST for which you would like to be considered.

By signing this form, I attest that I am a member in good standing of the Virginia Association of Science Teachers and am willing to have my name submitted as a Nominee for the office of _____ to the Nominations Committee.

SIGNATURE_____ **DATE** _____

Submit this Nomination Form and your paragraph by email to: nominations@vast.org by May 1, 2017.

Getting Down at the PDI!

Applications are open for the 2017 CDC Science Ambassador Fellowship

Centers for Disease Control and Prevention (CDC)
Website:
www.cdc.gov/careerpaths/scienceambassador/

Applications are due February 15, 2017

The CDC Science Ambassador Fellowship is for teachers and educational leaders interested in bringing public health into middle and high school classrooms. It includes a 5-day summer course (July 10-14, 2017) at CDC headquarters in Atlanta, GA and a 1-year distance-based professional development opportunity. Applications are due February 15, 2017.

For more information, please watch our video and visit our website. We look forward to your application. Please share these materials with other teachers and educational leaders in your network who may be interested.

CDC Science Ambassador Fellowship
Career Paths to Public Health (CPP)
Epidemiology Workforce Branch
Division of Scientific Education and Professional Development
Center for Surveillance, Epidemiology and Laboratory Services
Office of Public Health Scientific Services

CDC Science Ambassador Fellowship
Centers for Disease Control and Prevention (CDC)
1600 Clifton Road MS E92 | Atlanta, GA 30333
E-mail: scienceambassador@cdc.gov
Website: www.cdc.gov/careerpaths/scienceambassador/

President-Elect Message January 2017

Dr. Jackie McDonnough

As we begin 2017 with anticipation and excitement for what the new year will bring let us reflect on the successes and challenges of 2016. VAST like many professional serving organizations continue to strive to anticipate and fill the needs of its members through its many programs. We delivered a successful professional development institute last November, coordinated a revealing retreat for its board in June and instituted several timesaving changes to our operational procedures. Through the efforts of various working committees the online membership process was streamlined and regional director training was put in place to name a few actions.

As the new president-elect I will focus my efforts on executing a successful PDI in 2017. With the theme of "Celebrating Science" I will build on the work of our current president Shirley Sypolt and past-president Kathy Frame to make 2017 PDI event well worth attending. I would like to call on all current VAST members to reach out to novice teachers and non-VAST members in your building and invite them to experience the many benefits VAST has to offer. I remember how invigorating attending VAST was for me as a new teacher. The workshops helped me introduce cutting edge pedagogies in my classroom and jumpstarted my efforts at grant writing. Attending VAST also exposed me to a community of dedicated teachers of science who have profoundly impacted my career. Over the next few months as we continue planning for 2017 PDI I urge you to contact your VAST officers and regional directors if you have suggestions to make this PDI the best ever.

Dr. Jackie McDonnough,
VAST President-Elect 2017

Dr. Anne Peterson, VDOE Science Specialist; Julia Young, Melonie L. Yielding, Carol Harlow, Jerome Peck, (not in picture); Eric Rhoades, VDOE Director Science and Health Education.

2016 Virginia State Finalist for the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)

Julia Young, Deep Creek Elementary School

Melonie L. Yielding, Ellis Elementary School

Carol Harlow, Clover Hill Elementary School

Jerome Peck, Seneca Ridge Middle School

VAST 2017 PROFESSIONAL DEVELOPMENT INSTITUTE

"CELEBRATING SCIENCE"

Hotel Roanoke and Conference Center
November 16-18, 2017

The 65th Virginia Association of Science Teachers (VAST) PDI (Professional Development Institute) PDI theme 2017 is ***Celebrating Science***. Once again we will be at the Hotel Roanoke. The ***Celebrating Science*** theme builds on the two previous themes: ***Faces of Science in Virginia and Designing Inquiring Minds***. The upcoming PDI will be a celebration of the rich science resources that are available throughout the state of Virginia. Please consider coming and helping us celebrate awesome science teaching and learning across our state.

Science teachers can be defined as people who use their imagination, experience, curiosity, instincts and relationships to develop and implement ideas that create value for students. Increasing the ability for students to be innovative begins with our educators and we'd like you to join us and share your "favorite science experiences" with your peers. Consider signing up as a VAST presenter so that you can share your awesome science ideas with others. What better way to develop a community of science educators who engage in effective science practices than to experience science first hand in the mountains of Virginia!

This year we have decided to not have specific PDI science strands, so that we are not limiting the creativity of our teachers; both formal and informal educators. The 2017 VAST PDI is being designed so that all teachers of science can share their best practices, celebrate their accomplishments, and discuss learning and teaching practices that have enriched "student learning of science." Come help us celebrate all that we value about science education.

The first "Elementary Extravaganza" was a huge success at the 2016 VAST PDI and we plan to do this event again in 2017.

Announcements and due dates for the 2017 PDI will be posted on the VAST website PDI page and through e-notes sent to all members.

John Kowalski, PDI Committee Chair

VAST 2016 PROFESSIONAL DEVELOPMENT INSTITUTE
"Faces of Science in Virginia"
Award Winners


Dr. Carolyn Hayes

VAST President Kathy Frame introduced Dr. Carolyn Hayes, Retiring President of the National Science Teachers Association (NSTA), who was the speaker during the Awards Ceremony. Dr. Hayes brings years of leadership and teaching experience to NSTA through her work as a classroom teacher, college professor, science coordinator, author, and science consultant and has presented several sessions at NSTA national and area conferences. Dr. Hayes urged educators to "Teach where your students will be and not where they were yesterday." Her vision for science teaching includes the integration of content, knowledge and doing; planning science lessons by focusing on guiding questions and phenomenon; and sequencing core ideas over multiple years.

The Faces of Science Recognition Awards

2016 National and Virginia Project Learning Tree Outstanding Educator

Anne Mannarino, is a Project Director at the Martinson Center for Science & Mathematics of Regent University. She has been VAST's Journal Managing Editor since 2011. She is also was a VISTA Science Curriculum Specialist for the College of William & Mary. Prior to her work with VISTA, she served as the Secondary Science Coordinator at Virginia Beach City Public Schools.


Anne Mannarino

2016 VAST Board Recognizes Lisa Deaton on Her Retirement as Project Learning Tree State Coordinator

Lisa Deaton is a Forest Education Specialist at Virginia Department of Forestry. She has been the Project Learning Tree coordinator for nearly 16 years, teaching school children, teachers, master gardeners, and the public about the benefits forestry and other natural resources. She also coordinated hundreds of PLT workshops and worked to secure grant funding to run the program. Her new role will include working with landowners to better manage their forests, inspecting logging jobs, and coordinating contractors for the Forest Management Act.


Shirley Sypolt congratulates **Lisa Deaton**

2016 VAST Board Recognizes the Underground State Coordinator For Her Service and Commitment to Virginia Science Education

Congratulations to **Carol Zokaites** on her retirement. She may be best known her role coordinating Project Underground, an environmental education program and curriculum focused on karst and caves. We thank Carol for her service to the program and wish her well in her new life phase! (Not pictured)

Passage of HB335 Designating *Thamnophis sirtalis sirtalis* the Virginia State Reptile

Aiden Coleman who attends Berkeley Middle School convinced the Virginia General Assembly into naming the Eastern Garter Snake as Virginia's official snake after bring his idea to Del. Brenda Pogge, who carried House Bill 335. Delegate Pogge and Aiden's parents also attended the ceremony. Delegate Pogge presented Aiden with the 2016 VAST Award for ***Faces of Science in Virginia.***


Aiden Coleman


Delegate Pogge Introduces Aiden Coleman

VABT OBTA Award Virginia Outstanding Biology Teacher Award

Cynthia Kube is in her 11th year teaching for Salem High School, Virginia Beach City Public Schools. She has served as a middle school science teacher, high school gifted resource teacher, and currently teaches 9th/10th grade Biology at Salem High School. Cynthia is an advocate for environmental stewardship, and with her students, volunteers for Lynnhaven River NOW.


Cynthia Kube & Kathy Frame


Julia Cothron & Daniel Daglish

E.C.L. MILLER SCIENCE TEACHER OF THE YEAR AWARD

Award by VJAS and presented by Julia Cothron

The E.C.L. Miller Science Teacher of the Year Award is given to an outstanding science teacher or sponsor of Grades 7-12. The awardee, **Daniel Daglish,** receives a trip to the next Virginia Association of Science Teachers (VAST) Professional Development Institute with paid expenses for registration and hotel.

Recognition In Science Education (RISE) Awards

Elementary (K-5): Kala Vallies, Rural Point Elementary School

Middle School: Jane Meadows, Virginia Middle School

Earth Science: Caitlin Unterman, Forest Middle School

Biology: Lauren Kern, Armstrong High School

Chemistry: Stephanie D. Harry, Kecoughtan High School

Physics: Greg Jacobs, Woodberry Forest School

Environmental Science: Sherrye Pollard, Waters Middle School

Resource Teacher: Sarah Donnelly (Kaiser), Bettie F. Williams Elementary School

University/College Faculty: Eric Pyle, James Madison University

Non K-12 Science Educator: Daniel Bowling, Jones Middle School

Photos by Matt Scott

VAST RISE Awards were presented to spotlight the excellent work done by science educators across the Commonwealth during the 2016 PDI. VAST recognize service to science education in the individual's school, school system, and the VAST region in which each award winner works. The awards are grouped in twelve distinct categories:

Elementary (preK-5)
Middle school (6-8)
Biology
Chemistry
Earth Science
Physics
Environmental Science
At-Risk Students (K-12)
Resource Teacher (examples: Technology, Science Resource, Etc.)
Science Educator (non K-12-Examples Science Supervisor, Information Education, Principal, Etc.)
University/College Faculty
Community Partnership (example: Businesses, Politicians, Other Organizations, Etc.)

The number of awards to be given each year is determined by the Awards Selection Committee based on the qualifications of the nominees. This year ten awards were presented to ten outstanding educators.

R.I.S.E. award winners are invited to attend the VAST PDI and are recognized at the annual VAST PDI banquet. The Award Nomination deadline is August 20, 2017 for the next PDI to be held in Roanoke. Applicants do not need to be a VAST members. Nominations can be made on-line or by hard copy. On the VAST website click on Forms and the then the Awards Form to print out hard copy to submit. Hard copy nominations should be mailed to: **Timothy Couillard,** 3700 James River Road, Midlothian, VA 23113 or you may email them to Tim at awards@vast.org Click here to submit your nomination online. http://goo.gl/forms/2egqZe5wD4

News from Year Two of the Donna R. Sterling Exemplary Science Teaching Award

Dr. Jackie McDonnough, Ms. Jaclyn Claytor, Major Norman Marshall, and Dr. Juanita Jo Matkins.

Students at Franklin Military Academy, a public military school in Richmond City, have a lot to look forward to. One of their teachers, **Major Norman Marshall** (the title is honorary yet customary at Franklin Military) just won the 2016 Donna R. Sterling Exemplary Science Teaching Award. In 2016 the award goes to a secondary teacher who exhibits outstanding skill in designing lessons and leading students in experiences that engage students in scientific behavior in pursuit of understanding. The purpose of the award is to support the continuous improvement of an already exemplary teacher. Applicants submit a plan for professional development and also tell about an inquiry-based unit they have taught.

Major Marshall's plan for continuous improvement involves an investigation that is almost certain to boldly go where no Franklin Military Academy investigation has gone before – not quite to infinity and beyond, but at least into the stratosphere! He will use the funds provided by the award to acquire training in programming and use of a specialized computer system. He will purchase materials and equipment and guide his students in putting together what is needed to launch a balloon that will travel to a high altitude and record the scene from on high. The record of the balloon's journey will be used for many investigations, including calculations of the curvature of the Earth. Marshall expects the balloon launch to occur in early June 2017.

Maj. Marshall will gather information from other teachers at the NSTA national conference in Los Angeles in 2017, supported by the Sterling Award. In a serendipitous turn of events, Marshall has already discovered that there are at least four sessions specifically focused on high altitude ballooning scheduled at the conference!

Since the award alternates between elementary and secondary, the 2015 award went to an elementary teacher, **Jaclyn Claytor** at Nuckols Farm Elementary School in Henrico County. At the 2016 VAST PDI Ms. Claytor received the second and final installment of her award, and attendees enjoyed her presentation on how she had used the award money to enrich the experiences of her students. She used the first installment of the award ($3000) to attend conferences, including the NSTA national conference in Nashville, TN, where she learned about a wide range of topics including pill bugs and building light sabers, and, she said ***"I have never been given so many materials and new, cutting-edge lessons in such a short amount of time".*** She also spent a week on the Rappahannock River with Chesapeake Bay Foundation. Claytor's ideas for using the second installment of the award include starting an afterschool science and engineering program at her school and also initiating a shared outdoor classroom space. In the upcoming VAST Newsletter, members can read about the "Dolphins Ashore" problem-based learning investigation that her student scientists completed, discovering possible causes for the stranding of dolphins.

In 2017 the Donna R. Sterling Exemplary Science Teaching Award will again be given to an elementary teacher. Details about the application process and about the award itself can be found on the VAST Website under "Awards" and in the VAST newsletters. As you can tell from the stories of Norman Marshall and Jaclyn Claytor, this award has the potential not only to benefit teachers, but also their students AND VAST members. Please encourage a friend to apply, OR apply yourself!

Elementary Teachers (K-6): Apply for the 2017 Donna Sterling Exemplary Science Teaching Award

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 continuous 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.

Jackie McDonnough and Donna Sterling talking about science teaching

Deadline for applications: July 15, 2017

To apply:

1. In your cover letter, include information on yourself, including your preferred name, your home and school addresses, and phone numbers and email address(es) where you can be reached. Tell us how many years you have taught, where, and what grade levels. If you are teaching in a departmentalized setting, tell us what subjects you teach.

2. In no more than two pages, single-spaced, describe an inquiry-based science unit that you taught. Describe how your unit is student-centered and includes community engagement. Give evidence that the unit was effective. Evidence documents such as student work can be submitted separately, and will not count toward the two-page limit.

3. In no more than two pages, single-spaced, describe your plan for professional development, using the funds received through the Sterling award. These plans may include summer courses, attendance at workshops, study abroad opportunities, instructional materials development under the guidance of experts on-site, etc. Feel free to be creative in your plan. Submit the professional development description with anticipated outcomes, including plans for a presentation at the 2017 VAST PDI. Tell how this award will help you become a better teacher of science and will support the development of leadership skills. Tell about your plans for writing an article for publication about your experiences.

4. Submit three letters of recommendation based on direct observations of teaching. One letter must be from the science supervisor or someone serving in that capacity, a second letter must be from the principal, assistant principal, or instructional leader, and a third letter must be from a fellow teacher or a parent. Letters should address the following: Why is this teacher a good candidate for this award? What qualities do they exhibit as teachers that make the recommender think they will use the funds from the award to improve their practice as teachers of science?

All materials must be submitted by 5 pm on July 15, 2017.

Submit applications and letters of recommendation to Dr. Juanita Jo Matkins, jjmatk@wm.edu

See the next page to see the **2015 and 2016 Donna Sterling Exemplary Science Teaching Awardees.**

VAST Professional Development Institute
Sterling PreCon 2016

Robin Curtis, VAST Recording Secretary

At the Pre-Conference: "Science & Literature: A Creative Interface for All Students Donna R. Sterling Institute," VAST honored Dr. Donna R. Sterling 's legacy of "challenging the status quo" with sessions focused on teaching practices to develop the next generation of scientifically literate citizens and scientists!

Two sessions ran concurrently from 8:30 am-3:00 pm. **Christine Royce** presented the elementary session to 60 attendees. Participants were engaged in model lessons that utilize children's trade books (both fiction and non-fiction), and also incorporated science inquiry and the nature of science as well as enhancing reading, writing, and speaking skills. In addition, lessons modeled integration of content. Each participant received a copy of the book ***Teaching Science Through Trade Books*** by **Christine Anne Royce, Emily Morgan, and Karen Ansberry**. Participants also received a packet of handouts and an email follow up from Christine.

Stephanie Blackburn presented secondary learning strategies that engage and support reading, writing, and vocabulary development across the science curriculum to 23 participants. Participants also received a copy of ***Inside Words*** by Janet Allen.

From 3:15-5:15, there were three concurrent short courses; "Inquiry for All: Stop Teaching to the Test and Start Teaching Students!" presented by **Elizabeth Edmondson**, "Let's Talk Science" presented by **Donia Spott,** and "Faces of Environmental Education from the Past to the Present" presented by **Cindy Duncan**.

Plans are already underway for the 2017 Sterling Pre-Conference that will be held in Roanoke at the Hotel Roanoke on November 16, 2017 under the theme "Celebrating Science". Additional information will be in the next newsletter, so put the date on your calendar. You don't want to miss out on this exciting opportunity!





Meet Your Region!

At the 2016 PDI, our members of the superintendent's eight regions of Virginia had an integral part with regional events, door prizes, election of regional directors, and gathering regional information. The regions were well-represented as shown by the map pins on the poster at the hall entrance.

Current regional directors, nominated 2017-2019 directors, and VAST board members greeted attendees at the Exhibitors Hall following the opening session on November 17th. Attendees brought a variety of items highlighting the tourism, geography, and highlights of their region for the baskets for the auction event. VAST sponsored yummy snacks and cider while we visited exhibitors and completed entry forms for the regional door prizes- field trip ideas, colleges and universities, and tourist spots information will help your regional directors plan professional development.

At the second general session, the even-numbered regional directors' election was held. An entry from each region was chosen for the two-volume set of Kendall-Hunt published Science teaching books., ***STEM Research for Students*** is a vital resource for K-12 teachers, higher education faculty, and their students with Volume One, Understanding Scientific Experimentation, Engineering Design, and Mathematical Relationships, and Volume Two, Creating Effective Science Experiments, Engineering Designs, and Mathematical Investigations.
Our "inaugural" basket of regional items netted over 1000 VAST bucks at the auction. We are already planning on eight wonderful, full baskets for this year's PDI in Roanoke, so please consider collecting items unique to your region for November.

Your regional directors whose terms go through 2017 include:
Region I- Laura Casdorph and Carolyn Elliott. Laura is the secondary science specialist for Henrico County Public Schools; works as an adjunct professor in the physics department at Reynolds Community College; taught high school chemistry and physics for 10 years; and served as the Co-Director of Science for Virginia Advanced Study Strategies for two years prior to becoming the science specialist. Carolyn is a 7th grade Science teacher at Goochland Middle School and previously taught biology, journalism, and photojournalism. She also worked for the State Council of Higher Education where she hosted and produced the public radio program "With Good Reason," which features professors from Virginia's colleges and universities. She is currently pursuing a master's degree in gifted education.

Region III- Michael Pratte and Randy Vann. Michael has taught in Stafford County Public Schools since 1995 and is in his fourth year as the K-12 Science Coordinator. He is National Board Certified; Vista-NCA trained, and was the recipient of the 2013 Earth Science Award for Outstanding Science Teaching. Craig is also a Stafford County teacher and has worked at Rodney Thompson Middle School since 2001. He teaches 7th grade Life Science, is in his twelfth year as Department Chair, and is also the Lead Science Teacher.

Region V- Dr. John Almarode and Tammy Stone. John is a former high school science teacher in Augusta County where he also worked with a STEM outreach program for students in grades PreK-8. As a faculty member at JMU, he now teaches science methods courses in the inclusive early childhood and elementary education programs- his research focuses on interest and engagement in classrooms. **Tammy** is the Pre-K-12 science coordinator for Rockingham County Public Schools, an adjunct instructor in the chemistry department at James Madison University; and taught high school chemistry for sixteen years prior to becoming the science coordinator. She was the recipient of the 2005 VAST Chemistry Award for Outstanding Science Teaching and the 2013 Virginia American Chemical Society's Franklin D. Kizer Distinguished High School Chemistry Teacher Award

Region VII- Diane Tomlinson is an adjunct professor in the Education Department at Emory & Henry College where she teaches science and mathematics methods courses. She retired from Russell County Schools where she was a science specialist, grant writer, and program director for the school division and was a VISTA instructional coach. She continues to write grants and work as a program evaluator for state-funded grants in education; is the Corresponding Secretary for the Virginia Math Science Coalition; and a Ph.D. candidate at Virginia Tech.

Continued....

Your regional directors whose new terms go through 2018 include:

Region II- Dr. Anne Mannarino is a Project Director at the Martinson Center for Science & Mathematics of Regent University. She has been VAST's Journal Managing Editor since 2011. Anne also was a VISTA Science Curriculum Specialist for the College of William & Mary. Prior to her work with VISTA, Dr. Mannarino served as the Secondary Science Coordinator at Virginia Beach City Public Schools.

Region IV- Susan Bardenhagen has taught grades 2-5 and Math and Science in grades 6-8. She has been the Region IV Director since 2011 and is also the Regional Director Coordinator since 2014. Susan is a founding member of BNVCTM, a regional Math council affiliate of NCTM. A presenter for regional, state, and national Math, Science, Social Studies, and special needs conferences, Susan is also a musician and VP-Program of the PW Arts Council.

Region VI- Tom Fitzpatrick the K-12 Science Supervisor of Roanoke City Schools, has been the Region VI Director since 2015. He is a certified trainer with the Jason Project and also a trainer for Project Learning Tree and Project WILD. Tom is veteran of 29 years of science education and taught middle school science for 21 years.

Region VIII- TBA

Susan Bardenhagen,
VAST Regional Director

Authors of the ***Stem Research for Students*** are pictured from left to right: Paula Klonowski Leach, Virginia Vimpeny Lewis, Julia H. Cothron. Authors Richard Rezba and Ronald N. Giese are not pictured. The next eight educators pictured are the lucky book winners, one from each region.

The regional book winners were:
Region 1: **Kim Dye,** Hanover County Public Schools;
Region 2: **Ginger Davenport,** Franklin City Public Schools;
Region 3: **William Simpkins,** Spotsylvania County Public Schools;
Region 4: **Anne L. Bryant,** Fauquier County Public School;
Region 5: **Alex Drumheller,** Lynchburg City Public Schools;
Region 6: **Ashley Ring,** Roanoke County Public Schools;
Region 7: **Donna Rowlett,** Scott County Public Schools; and
Region 8: **Katherine Bowen**, Nottoway County Public Schools.

by Julia H. Cothron, Giese, Ronald N., Rezba Richard J, Paula Klonowski Leach, Virginia Vimpeny Lewis.

STEM Research for Students is a vital resource for K-12 teachers, higher education faculty, and their students with Volume One, Understanding Scientific Experimentation, Engineering Design, and Mathematical Relationships, and Volume Two, Creating Effective Science Experiments, Engineering Designs, and Mathematical Investigations.

Many thanks to Julia Cothron, Ron Geise, Richard Rezba, Paula Leach, and Virginia Vimpeny Lewis for donating the prizes for the Regional winners. VAST is proud of this team of outstanding science educators and authors who are true "***Faces of Science in Virginia***".

Reflections on the VAST PDI 2016

Dr. Jackie McDonnough and VCU Class of 2017 Pre-service Secondary Science Teachers

2016 marks the 13th year that I have brought students to the VAST PDI. Initially funding to attend VAST was provided for pre-service teachers by a technology grant, but since 2009 I have been able to fund their attendance with my Noyce funds. Noyce is a National Science Foundation program with the goal of increasing the numbers of highly qualified science and math teachers in high needs schools. VAST PDI is an ideal venue to expose pre-service teachers to classroom strategies, instructional resources and a community of energized teachers of science. My students also have an opportunity to share lessons they developed and tested with their future science teacher peers. The following are some of my pre-service teachers' impressions of their first VAST PDI.

Michael Clark (Earth Science): This conference inspired, encouraged, and challenged me on a personal level to open up my mind to renewed ways of thinking and teaching. Virtual reality. The concept was captivating enough just by reading the words. Intrigued, I walked into my first VAST session Friday morning. Two lenses, an iPhone, and a cardboard box the size of a standard brick: These are the ingredients to the potion of virtual reality. The presenter for this session was able to take us virtually anywhere in the world (I love puns) with the press of a few buttons on the Google 360 application. Adjust the lenses, slide in your iPhone, and gaze into the cardboard boxing to discover that you're immersed in the valley of the Grand Canyon. Perhaps you want to take a vacation and see the warm waters and hot volcanoes of Hawaii or stand atop Mount Everest. All of this is possible with virtual reality. Virtual reality takes the limitations of field trips and rips them out of their braces like Forest Gump. Now you can take your students all around the world with the implementation of their favorite tool, their own cell phone.

This is just a small view of the vast breadth of the conference (had to finish with one last pun). There's a special kind of feeling you get when you're surrounded by stimulating ideas, influential people, and incredible new discoveries. This kind of feeling can only be discovered at a VAST conference.

Shannon Fasing (Biology): VAST was an amazing experience. Being at a conference with like-minded people, where everyone has the same goals as well as equal sincerity and generosity. I met so many people, from veteran teachers [to] novice. I was overwhelmed by how friendly everyone was. When walking through the exhibits, I loved learning of the different products, field trip experiences, and partnerships available to teachers. Stacey, from National Geographic, told me that if my classroom ever needed new books that she would love to send them, for free! In regards to the workshops, where do I start? I felt like a kid on Christmas morning in every one. I met this super awesome life science teacher from Chesterfield County schools, Cindy. She gave me some first year teacher tips as well as her email and told me to contact her if I ever needed. When presenting our lesson plans in our workshop I was nervous that my lesson may not be as complex as one would think a typical inquiry-based lesson would be. I was so surprised by the positive feedback I received! Three different teachers said that my activity would be such a wonderful addition to their classrooms and made sure to take a green sheet with them. One woman I met, Katherine, stood with me and gave me some awesome advice. She gave me her email and told me not to hesitate if I had any questions.

McLane Grow (Earth Science): VAST was a great opportunity for me to recharge my batteries and return to my classroom with a wealth of instructional information. The new instructional material I will be incorporating in my class ranges from virtual reality to problem based learning. These new strategies will help improve my classroom instruction and assist in my evolving pedagogy. In addition to the diverse sessions offered at this year's VAST, I was inspired by messages shared by the guest speakers. From the first night I was in awe of the sense of wonder and adventure that shined through in Ellen Stofan's keynote address. Her knowledge on space and space exploration was impressive, but it was her message about inspiring our youth to become the future of space exploration that stuck. As teachers it is our job to not only teach our students science, but it is also our responsibility to provide them with real life applications like professions in the field of science. By incorporating real world applications into daily activities students can see professions that they may aspire to obtain later in life.

Morgan Hargrave (Chemistry): This past weekend, my classmates and I had the pleasure of joining the Virginia Association of Science Teachers for their annual conference. Though I've attended many conferences in my lifetime, this one in particular stood out because I had the dual role of an attendee and presenter. I've never presented anything at a conference before, so I was extremely nervous in addition to being excited. A part of the VAST conference that stuck out to me was the keynote address given by Dr. Tamra Willis. My big take away from her presentation was that engaged students learn best. Though it is something that has been stressed throughout this entire semester, she really put it into perspective. Overall, attending this conference was a great experience. It was a big opportunity to grow as a professional, but to also network and exchange ideas with others. I gained information on strategies that I can implement once I start my own career in the classroom (or even with student teaching next semester) and I have also met some wonderful, passionate, and inspiring individuals. Thank you VAST 2016!

John Ryan Nunez (Biology): VAST was filled with so much information, bright minds, and ideas that created an atmosphere for learning and growth in its eventful three days. From the

Continued

Reflections Continued:

John Ryan Nunez (Biology) continued:

From the variety of booths ranging from the NSTA information table to the Virginia Aquarium & Marine Science Center booth, which both had great tools and opportunities presented for us to dive into, to the amazing workshops and presentations shelled out for teachers to explore, the conference was extraordinary with their content and activities. The sessions and workshops were more than enough for me to sit in and feel a rush of information in every one that I went to. There were three that I went to that stood out to me, "Take the Day Off! Field Trip Delivered!", "Exploring with Virtual Reality in the Classroom", and "Using Case-Based Learning in Science Classrooms." All of these sessions connected to me in a way that opened my eyes to giving my students a different, more lively and hands-on experience when it comes to learning. The VAST conference provided a plethora of information and great ideas. I felt immersed in most of what it had to offer. I could not get that full spectrum because the conference was just huge and boundless when it came to the different types of sessions and content that I wish I could have been a part of.

As you can see from my students' words attending the VAST PDI is a seminal experience for pre-service teachers. You the members of VAST make their experiences memorable!

Dr. Jackie McDonnough,
VAST President-Elect 2017

Did You Win a Prize!
You had a really good Chance to win!

Did you enter the Raffle? VAST invited you in an e-note to enter a drawing for a full registration to the VAST Professional Development Institute (PDI) 2016 plus a one year VAST membership. Sponsorships by the Virginia Lottery that has contributed nearly $8 billion to Virginia's K-12 public schools since 1999. Dorinda B. Trumbauer and Alexander M. Drumheller won the raffle and received their prize in time to register for the Early Bird registration for the PDI.

Attendees who were at their first VAST PDI, were given a "First Timer Ribbon" at the Registration Table and were recognized during General Session III. One lucky person was the winner of the Bill Stevens' First Timer Scholarship. The scholarship will provide free registration for the 2017 VAST PDI in Roanoke, VA.

If you had met with your regional group you would have been eligible for one of 8 drawings for 2-book sets of books, ***STEM Research for Students***, Volumes 1 and 2. One set was awarded to someone in each region. (See page 15 to see the winners).

All who attended General Session II had a chance to win a Registration for the 2017 VAST PDI in Roanoke, VA.
Exhibitors also offered their own raffles and prizes which were held at their booths in the exhibit hall.

Students and pre-service teachers attended a program designed just for them where they received information about the teaching profession, networked with other students, found resources to give them a great start, and may have won a door prize such as a chance to win a $50 dollar PDI scholarship and other goodies.

The drawing for the newly released board game "DNA Ahead" developed by Dorothy Semenow, was won by Nsama P. Okeowo, Prince William County. To learn more about the board game, visit http://www.dnaahead.com/.

Finally, all who attended General Session IV on Saturday, were automatically given a chance to win the PDI Grand Prize of a two-night stay for two, including breakfast, at the Williamsburg, DoubleTree by Hilton, valid for one year.

by Julia H. Cothron, Giese, Ronald N., Rezba Richard J, Paula Klonowski Leach, Lewis Virginia Vimpeny

"DNA Ahead" developed by Dorothy Semenow

First Timer Winner

VAST in Review 2016

Kathy Frame, Past- President

It is New Year's Day 2017 and I will attempt to capture some 2016 VAST Highlights. The theme for 2016 was ***The Faces of Science in Virginia*** and that it was! Thank your 2016 VAST Board of Directors for the numerous volunteer hours to achieve the highlights below and more for VAST and the VAST Membership —YOU! When you read the highlights below, see where you can be an ACTIVE member of VAST! VAST needs your expertise!

In addition to PDI planning, e-blasts, Facebook notices, and the publications ***Science Educator*** and ***Journal of Virginia Science Education***, let's look at just a few of the 2016 highlights!

January

- Initial steps made to revitalize the VAST website
- VAST BoD supports HB335 recognizing the Eastern Garter Snake as official Virginia Reptile and restoring the Cardinal and Dogwood as the state bird and tree, respectively.
- In response to the VA legislature the reduction of the number of SoL tests, the following statement was issued by the BoD:
  - *The VAST Board supports the maintenance of high standards for K-12 science education in Virginia. We believe that all students should receive high quality science instruction and assessment in Earth Science, Biology, Chemistry, and Physics at the high school level.*
- VAST BoD establishes a committee to review the SoLs and curriculum framework.

March

- Member Survey of SoLs and Curriculum Framework conducted and provided to VDOE.
- VAST Strategic Plan work continues
- Appointment of Interim Treasurer.
- VAST BoD approves letter requesting Governor McAuliffe to veto of HB516.

May

- Governor McAuliffe sends official statement that he has vetoed HB516.
- Ad Hoc Media Marketing Planning Committee appointed to prepare for new web site.
- SOL Science Revision Committee Survey overview
- Bylaws Change:
  Any member of the Executive Committee may negotiate a contract(s) that is within the VAST budget and bring the proposed contract to the EC for approval by a simple majority. Thereby, authorizing the Executive Director and/or Treasurer, as signatories of VAST's funds to sign the contract(s).
- Introduction of proposed Middle School Science Position Paper

June and August

- Eight VAST Volunteers read VAST Statements regarding Profile of a Graduate at the four statewide VDOE Public Hearings and Town Hall Meetings

July

- Retreat: VAST Partnerships: Goals, Formation and Communication.

September

- Nominating Committee formed to examine operating procedures of said committee.
- 2017 Slate of VAST Elected Board Members presented.

October

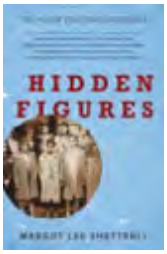
- Wild Apricot platform for VAST Website in trial form.
- Outreach to VCU to seek *pro bono* Media & Outreach Plan
- Regions 5 and 7 present plans for March 2017 Workshops
- Nominations Committee changes the composition of the Nominating committee and develops a nomination form and formal nomination procedure.
- VAST signs MOU with ***Science Matters***

November

- Media and Marketing initiative Contact established at VCU
- Annual VAST Donna Sterling Institute and PDI: ***The Faces of Science in Virginia:*** Ellen Stofan, NASA Chief Scientist, Trevor Frost, Aiden Coleman, student advocate, Tamra Willis, Outdoor Educator

December

- Preparing to move the VAST website to Wild Apricot in January.
- Release of the film ***Hidden Figures*** highlighting three more ***The Faces of Science in Virginia***: **Katherine Johnson, Dorothy Vaughn and Mary Jackson** from Hampton who were part of the NASA Computers who calculated the math to take John Glenn into space. See the film, read the book by Virginia Author **Margot Lee Shetterly** (University of Virgnia) and listen to Katherine Johnson's interview at 92 years of age on *YouTube*.



Source: http://www.blackfilm.com/read/wp-content/uploads/2016/08/Hidden-Figures-poster.jpg

Photo Credit: NASA https://www.nasa.gov/sites/default/files/styles/full_width/public/thumbnails/image/johnson_and_leland.jpg?itok=XS-91V6D3

Katherine Johnson with Virginia Born astronaut Leland Melvin.

- Looking forward to ***Celebrating Science*** in 2017!

Dolphins Ashore: How a Real World Project Influenced a Classroom's Outlook on Science

By: Jaclyn Claytor, Donna R. Sterling Exemplary Science Teaching Award Winner

Inflatable dolphins, gelatin, Crisco, caution tape, and so much more! The first time I watched the Dolphins Ashore inquiry-based project take place, I was a young student teacher, completing my internship with one of the most humble, amazing mentors I have ever met, Mrs. Brown. She flawlessly set out to inspire not only her students, but everyone around her; often-times without even realizing it. Mrs. Brown had originally taught in Virginia Beach, and when she moved to Richmond to teach 4th and 5th grade gifted students, she took her Dolphins Ashore project with her. I was lucky enough to see this project in action. I observed as her 4th grade students were completely speechless, eyes wide, walking into a room full of inflatable "stranded" dolphins. Science completely came to life as they took on the role of an Animal Stranding Team, collecting data, working together, and collaborating with one another to solve the mystery of the stranded Bottlenose Dolphins! Projects like Dolphins Ashore truly inspire young children and allow them to realize how simple it can be to make a difference in this world.

A few years after watching my own mentor teacher execute this Dolphins Ashore project, I participated in a training funded by Dominion Power and Henrico County Schools, in which Mrs. Brown led interested teachers in the steps to make this project come alive. The training was intense! We were put in the shoes of what a student would go through to complete this project and see how every single detail came together to make this such a meaningful learning experience. This training gave me the tools to execute this inquiry-based unit in my own classroom.

After careful planning, I prepared for my classroom stranding day. I spent an evening cooking gelatin, boiling noodles, and preparing each and every portion of the lesson so that I was ready to share this experience with my students. The entire stranding day was involved and took a lot of preparation on my part to be sure student teams had been organized, and that transitions from one event to the next would flow with ease. I also tried not to reveal too much to the students the day before the stranding because I wanted the students to have the element of surprise.

The morning of what we called "Dolphin Stranding Day", students walked into the classroom, which had transformed into our very own Animal Stranding lab. Each student had their own measuring tape, lab coat, and gloves ready to go at a moment's notice. On each desk was a clipboard with an examination chart ready to be filled in with any information

we might receive. Moments later, we "got the call." The call came from a willing colleague who Skyped with our classroom. The chosen adult played the part of a bystander on the beach who happened to find the stranded dolphins. The caller contacted us to alert our stranding center of the problem. One student was chosen to take the call from the guest at the scene. As the caller explains their story of how they found the stranded dolphins, students recorded the information we would need to make our way to the site. Students learned about where the dolphins were located, what time they were found, and whether or not they were dead or alive. Once the class had taken down important information from our caller, we were ready to make our way to the stranding area. Down the hall, not too far from the outside courtyard, students traveled in teams and found six bottlenose dolphins in need of examination.

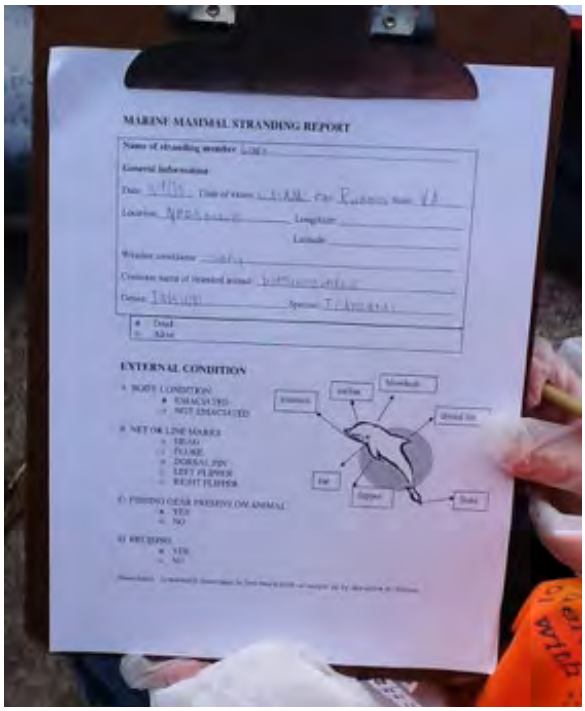
Each team examined their dolphin by taking measurements, collecting data and notes on the animal's external condition, and snapping pictures of what they had found.

Once each dolphin had been carefully examined by the assigned team, the entire class then traveled to our school lab to perform a necropsy on their animal, where more data was taken on the dolphins' internal conditions. Using gelatin for the stomach, Crisco for blubber, and Play-doh for the teeth, students then took on the role of a pathologist. Through hands-on examinations, they discovered what could've happened to their dolphin and where irregularities had taken place that may have led to their dolphin's demise.

After our stranding day, students continued their journeys with the Dolphins Ashore project by conducting research with their groups. Each team needed to come up with a conclusion of what could've possibly happened to their stranded dolphin. With my guidance, each group used a variety of websites to learn about parasites, diseases, and other factors that are fatal to dolphins and could cause them to strand. Students gathered their research along with the data they had previously collected to collaborate on what exactly they believe happened to their stranded dolphin. The project culminated in a 5 paragraph pathology report and a slide show prepared by the students to present their experience and conclusions to the class. Last year, our students held a Dolphin Conference. We invited each child's parents to attend a special presentation in the library where each group presented their findings and conclusions along with their experience of being part of an animal stranding team for a day. Parents were able to see exactly what Stranding Day was all about and appreciate the hard work their child had been involved in over the past few weeks.

The Dolphins Ashore project has become an annual tradition in my classroom. Participating in the entire experience has been meaningful to my students' understandings of real-world issues, while allowing them to explore ways they can help their local community. This project can be a valuable addition for the many educators who are looking for new ways to inspire young minds that care about our world and want to make a difference.

Jaclyn E. Claytor
4th Grade Teacher
Nuckols Farm Elementary School



A Bird's Eye View ~ STEM Integration

Anne Moore ~ Goochland Middle School
Goochland, Virginia

The prothonotary warbler, a brilliant dash of gold that inhabits America's wooded swamps and river bottom forests, is being threatened. This migratory songbird nests in cavities or constructed birdhouses for their breeding needs after their long journey from Central and South America each spring. While the warbler's numbers in the breeding areas of the tidal James River are increasing, their survival also depends on their summer mangrove habitats, which are vanishing in Central and South America due to coastal development.

Students in Anne Moore's technology and STEM classes have formed a partnership with Virginia Commonwealth University professors, instructors, and students to help them understand the science behind the natural world. They are Team Warbler. Through the study of the prothonotary warbler, the middle school students have focused on population genetics, disease and migrations ecology, as well as understanding man's influences on the survival of the warbler. Over several years, her students have designed and constructed hundreds of birdhouses that have been donated to support VCU's long-term study sites on the tidal James River.

Dr. Ed Crawford, VCU assistant professor, begins the study with a presentation on the importance of wetlands. Species survival, coastal preservation, habitats, food production, and flood control are all dependent on the preservation of our coastal wetlands, which is the prothonotary warblers' breeding habitat. Dr. Leslie Bullock and Dr. Cathy Viverette, VCU assistant professors, teach students about the migratory patterns, nesting sites, predators, and criteria for the nesting boxes.

The students' excitement is peaked when they are challenged to "design a better birdhouse". After conducting research, studying previous nesting box models, and talking to VCU experts, teams design a model nesting box. Following the engineering design process, students create their unique prototypes to be judged on specific criteria. The model that best addresses the needs of the nest building warbler and the data collectors will be mass-produced and placed on the tidal James River. Integrating Science, Technology, Engineering, and Math, students are addressing, solving, and supporting real world environmental issues.
Each year, the program changes to address current issues or to include additional disciplines. For 2017, students are challenged to design and engineer RFID's (Radio Frequency Identification Devices) that will monitor females entering nesting boxes. Scientists would like to collect additional data to support DNA testing results indicating some females enter multiple boxes to lay eggs. Females will be outfitted with small tracking devices that will trigger the RFID to track their movements.

Team Warbler has expanded their partnerships over eight years to include the Virginia Department of Environmental Quality, the Audubon Societies of Virginia and Panama, and the Chesapeake Bay Foundation. Students gain a broader understanding of the mitigating factors affecting the warbler's survival through the extended community of partnerships. The culminating activity each year is a one-day canoe expedition to nesting sites on the James River so students can observe the banding process of the warbler as well as observing the natural habitat dotted with the engineered nesting boxes. And, catching the attention of top EPA administrators as well as President Barack Obama, Moore was one of 15 environmental educators to receive the 2015 Presidential Innovation Award for Environmental Educators.

Anne Moore teaches Technology and STEM at Goochland Middle School in Goochland, Virginia. Her contact information is ahmoore76@gmail.com if you would like additional information.

News from VTech:

Geospatial education project works to bring drone technology to Virginia's community colleges

December 8, 2016 -- Thanks to a grant from the National Science Foundation's Advanced Technological Education program, the Geospatial Technician Education-Unmanned Aircraft Systems project is one step closer to offering Virginia's community college students training on operating small unmanned aircraft, commonly referred to as drones.

John McGee, professor in Virginia Tech's College of Natural Resources and Environment and Virginia Cooperative Extension geospatial specialist, has worked alongside the Virginia Space Grant Consortium and the Virginia Community College System on expanding geospatial technician education at the community college level for almost nine years. Emerging technology has led to changing goals for the organization.

"Unmanned aircraft are facilitating data acquisition efforts. These aircraft are transforming how industries do business," McGee said. "There's a lot of activity in this field in Virginia already. We want to make sure that Virginia's workforce is well poised to meet emerging industry needs."

Small unmanned aircraft systems (sUAS) can be outfitted with a variety of cameras and sensors depending on the specific data researchers seek to collect. In addition to providing incredibly diverse sets of data, these aircraft can cover hundreds of acres in a 45-minute flight.

According to McGee, the possible industrial uses for drones are practically endless.

"They can be used for wildlife habitat mapping, for public safety, to support land-use management, or to aid in precision farming," he said. "They could even be used to inspect bridges and transmission lines and take away the human risk from those types of inspections."

To ensure that Virginia's community college students have the knowledge and skills necessary to utilize this expanding technology, McGee and the Virginia Space Grant Consortium have partnered with faculty from Thomas Nelson, Mountain Empire, and John Tyler community colleges to develop a curriculum chart that will help community college instructors establish courses that will benefit students.

McGee said the project seeks to provide students with a range of options, from individual courses to various levels of certificate programs.

McGee recently led the effort to develop a curriculum chart by bringing together a focus group of professional sUAS technicians and technician managers. McGee and his colleagues learned about their day-to-day responsibilities and developed a list of their crucial tasks and duties, which will inform the development

Cherie Aukland, left, associate professor of information technology at Thomas Nelson Community College, and two students examine a DJI Phantom small unmanned aircraft system (sUAS), commonly referred to as a drone. Aukland is one of several partners involved in developing the sUAS curriculum chart for Virginia's community colleges.

of components for a successful curriculum.

The curriculum chart maps the skills and knowledge that students will need into categories like flight planning, maintenance, and safety. Based on the chart, educators can begin to develop course objectives and goals that will shape how various courses are organized.

"We're providing educators with a curriculum roadmap that they can use to enhance existing courses, create new courses, and support sUAS certificate programs," McGee explained. "These courses and programs will be a natural fit for students entering an array of industries, including natural resources conservation, agricultural technology, engineering, public safety, computer programming, and information technology."

McGee expects that students could see sUAS courses in Virginia's community college system within the next year.

According to Cherie Aukland, associate professor of information technology at Thomas Nelson Community College, courses will focus on helping the students develop the skills necessary to maintain and pilot devices safely, use and analyze data from a variety of sensors, and pass the Federal Aviation Administration's remote pilot certificate exam.

"There is a lot going on with drones in Virginia right now, and more jobs are on the way," Aukland explained. "We want to be able to train technicians who can finish their training and

VaTech Drones continued:

transition immediately into the workforce."

Until late August, the Federal Aviation Administration required that sUAS operators have a pilot's license, but new regulations have paved the way for others to pilot the aircrafts. That makes now the ideal time to introduce the technology into Virginia's community colleges, McGee said.

According to Chris Carter, deputy director of the Virginia Space Grant Consortium, the sUAS curriculum chart is only the first step in the latest Geospatial Technician Education initiative.

During summer 2017, Virginia Tech will host a weeklong professional development session for community college faculty who are interested in teaching sUAS courses. These faculty will team up with mentors from the Geospatial Technician Education project to learn the best ways to teach sUAS courses to their students.

"The Virginia Community College System serves as a pipeline for the workforce and for universities. It's in everyone's best interest to support these community colleges," Carter said.

Contact: Lynn Davis - davisl@vt.edu - 540-231-6157
Link: http://vtnews.vt.edu/articles/2016/12/cnre-droneeducation.html

A Resource for Studying Invasive Species

The just-released ***Mid-Atlantic Field Guide to Aquatic Invasive Species*** is designed to aid interested field professionals and others in learning general information about AIS, identifying problem species, collecting specimens for verification, and reporting new infestations. The 99 species included in the field guide were selected by MAPAIS members and other experts from the Mid-Atlantic region to reflect species of greatest concern within the region.

The lower link is over 200 MB, so it takes a while to download, but it's worth it if you want to print the book yourself. The upper link is greatly reduced and appropriate for viewing or reading online, but I probably would not print it as it is over 200 pages.

http://seagrant.psu.edu/topics/new-mid-atlantic-field-guide-ais-here

http://seagrant.psu.edu/sites/default/files/MAP%20AIS%20Aquatic%20Invasive%20Species%20Guide%20Proof_reduced.pdf

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Vera Ruben, Astronomer
(1928 to 2016)
Leading Lady of Astronomy!

Image by NASA - These pictures of posed groups from the NASA Sponsors Women in Astronomy and Space Science 2009 Conference, Public Domain, https://commons.wikimedia.org/w/index.php?curid=46457221

Quotes by Vera Ruben:
Science is competitive, aggressive, demanding. It is also imaginative, inspiring, uplifting. Science progresses best when observations force us to alter our preconceptions."

To read about the life of Vera Rubin, please for the link below for the Science article: The Bright Face Behind the Dark Sides of Galaxies, Irion, R (2002). Science 08 Feb 2002: Vol. 295, Issue 5557, pp. 960-961. DOI: 10.1126/science.295.5557.960.
http://science.sciencemag.org/content/295/5557/960.full

The Power of Data (POD)

The Power of Data s a professional development program that enables secondary teachers to increase students' content knowledge, 21st Century Skills and awareness of geospatial technology careers through Geospatial Inquiry and data analysis.
We are seeking 15 exceptional professional development coordinators, science/STEM curriculum coordinators, college faculty, and any individuals who support practicing 6-12 grade teachers on a regular basis to apply to attend our POD Facilitation Academy to learn to replicate POD Teacher Workshops across the nation. Teams are especially encouraged to apply.
Facilitators will receive: 1) $500 for completion of the Facilitation Academy 2) $900 to offset cost of travel to Flagstaff; 3) $500 after each of two POD Teacher Workshops delivered ($1000 total); 4) $250 after submitting data from POD Teacher Workshop participants and their students for each of the two POD Teacher Workshops implemented ($500 total). Teacher Workshop participants will also be compensated for participating.
To find out more and to apply, visit www.pod-stem.org
This work is supported by a grant from the National Science Foundation - DRL #1513287

Lori Rubino-Hare, Professional Development Coordinator,
Northern Arizona University
Center for Science Teaching and Learning

2016 TEAM USA RECEIVES 3 GOLD MEDALS and 1 SILVER MEDAL AT THE 27TH IBO, Hanoi, Vietnam!

From left to right:
Twenty-sixth Place: Thomas Xiong (Seven Lakes HS., Katy, TX)
Seventh Place: Boyang (Peter) Dun (Canterbury School, IN)
Thirty-fifth Place: Varkey Alumootil (Canyon Crest HS, CA)
Tenth Place: Bowen Jing (West Lafayette HS IN)

USA BIOlympiad 2017

USA Biology Olympiad (USABO) Registration is Open!

As the premiere biology competition for high school students in the United States, the USA Biology Olympiad (USABO) enriches the life science education of nearly 10,000 talented students annually. It provides the motivation, curricular resources, and skills training to take them beyond their classroom experience to the level of international competitiveness. You and your students are invited to participate in the 2017 USA Biology Olympiad (USABO). Registration is open. To register, please visit the USABO website https://www.usabo-trc.org/.

Registration closes January 16, 2017. For more information on how your school can participate, contact Kathy Frame, USABO

Fitting In

https://en.wikipedia.org/wiki/File:Janus-Vatican.JPG
{{PD-user|LoudonDodd }}

The world is too much with us; late and soon,
Getting and spending, we lay waste our powers; --
Little we see in Nature that is ours;
We have given our hearts away, a sordid boon!
This Sea that bares her bosom to the moon;
The winds that will be howling at all hours,
And are up-gathered now like sleeping flowers;
For this, for everything, we are out of tune;
It moves us not. Great God! I'd rather be
A Pagan suckled in a creed outworn;
So might I, standing on this pleasant lea,
Have glimpses that would make me less forlorn;
Have sight of Proteus rising from the sea;
Or hear old Triton blow his wreathèd horn.
-- William Wordsworth

In this month which incorporates the two-faced image of the ancient Roman god, Janus, we are reminded of endings, beginnings and transitions. Except for a calendar change, there would seem little which is remarkable for even the weather continues so far more as an extension of fall than winter. Yet, everywhere else we turn, there remain reminders of change and our heightened anxiety: in our technology, in our global and domestic economics, education, human rights, and politics.

Along with Wordsworth, in his lament over the misuse of our powers in the early industrialization of European society, we, too, over 200 years later could echo the same concerns in the continuing industrial-technological revolution. In many quarters where our anxiety over beginnings and transitions has resulted in unprecedented exploitation and greed, so much is the world with us and our powers wasted in getting and spending, that we have lost sight of our physiological and emotional bonds to nature. We have leveled mountains and poisoned our planet in the name of progress and becoming first to obtain resources, we have changed forests and grasslands to deserts, "out of tune" to the harmonies of sea and wind and lea. The poet reminds us of the need for sensitivity to Triton's message from the sea and Proteus' rising to evoke in our minds and hearts the elusive changeability of the ocean's constant motion. However, especially as we are immersed in transitions in our seasonal almanac, Wordsworth reminds us as well of the protean nature of the human psyche, for the god of the sea also symbolizes flexibility, adaptability, and versatility.

Just how can we fit in?

During a recent seminar on "Music and Cultural Politics of 20th Century Latin America," a small group of us became absorbed in our free time by the allures and frustrations of a large music-themed jig-saw puzzle. Hours passed in perplexity over colors, shapes, rotations, and design of the numerous pieces, all cleverly cut to mislead and disorient both novice and expert. It had been decades since I had even contemplated becoming involved in puzzles like these. At casual glance (with only three pieces left to fit in) it might seem so obvious. But with all disconnected parts spread out initially, even the conventional wisdom of "corners first, then edges" seemed insufficient. However, the challenge and the picture were addictive as each small move yielded its own reward and hidden suggestions for the next steps. The number of puzzle pieces was several times the number of students a public secondary school teacher might have in any given year. Yet, in classroom as in puzzle \we are constantly bewildered by the daunting variety of thinking styles, backgrounds or nationalities of our students. We hope for a harmonious combination of shapes and styles after a few months of interaction, despite students who are disoriented, or, like puzzle pieces, seem missing because they have fallen on the floor beneath the table, dislodged by the exuberance of the puzzle-person and hidden against the patterns on the carpet beneath the table.

How like science and education this is; and how like music. For, although the picture puzzle has but one final "correct" solution, it is the process of confusion, pattern, discovery, and reward which is the important thing. We would like to assume that science,

or at least a fruitful empirical approach, would yield a single unambiguous glimpse of one of nature's truths. However, like the notion of the irreducible atom or proton, or a single-step chemical reaction, earlier ideas or hypotheses (even theories) often need revision or replacement. In education and in music, the final configuration is much less obvious due to the near infinite number of variables which can influence the assembly of component children or notes. So, it can be argued, it is the process and not the final product which is the most telling. Humans seem drawn and determined to discover a fixed and final pattern in a quantifiable manner. Although limited by constraints of budget or resources or current technologies, there are deeper levels of accomplishment which call to us regardless of our age, either individually or culturally.

Let me tell you about El Sistema. Called a Venezuelan beacon, it is a set of guiding principles and ideals that seek to inspire youth leadership in that country through its program of musical excellence. It focuses on children of poverty where "El Sistma-inspired work is not great music education; it is holistic youth development through great music education," according to Eric Booth[1]. Its core values include:

- Every human being has the right to a life of dignity, contribution, and rich personal access to the experience of beauty.
- Every child can learn to experience and express music and art deeply, can receive its many benefits and can make different critical life choices as a result of this learning.
- Overcoming the damages of poverty and adversity is best accomplished by first creating a deep personal sense of inclusion and value, and thus strengthening the spirit, creating "an affluence of the spirit."
- Effective education is based on love, approval, joy, and experience within a high-functioning, ambitiously aspiring, nurturing community. Every child has limitless possibilities and the ability to strive for excellence. "Trust the young" informs every aspect of the work.
- Learning organizations never arrive but are always becoming – striving to include more students, deeper impact, greater musical excellence, better teaching, improved tools, more widespread community connectedness. Thus flexibility, experimentation, risk taking, and collegial exchange are inherent aspects of every El Sistema-inspired program.[1]

Is this not like what teacher-learners strive for every day in our classrooms? In addition, as one of their mentors put it: if you know four notes and your neighbor knows only three, you have the responsibility to teach your friend. That could go for classroom teachers as well. Instead of one-on-one mentoring, students are put in a group with others. Part of this approach is also what is called the CATS model: Citizen / Artist / Teacher / Scholar.

One of the principal conductors of the several orchestras in El Sistema, Gustavo Dudamel (also principal conductor of the Los Angeles Philharmonic), is very open about the terrible burden financing this program imposes upon Venezuela's tottering economy, perhaps an extreme case of what the arts and education face globally. As the current political regime in Venezuela has succeeded in dragging much of its population to disaster through political corruption and economic mismanagement, the thought cannot be avoided as to how long (except for propaganda purposes) the country can afford to subsidize El Sistema as completely as it does. *The New York Times* has been critical not only of the quality of the performance in Carnegie Hall last October, but also of the appropriateness of sending Venezuela's Simón Bolivar Symphony Orchestra to the United States in the first place.

Dudamel addressed this paradoxical situation in remarks at the White House last September where he was one of the recipients of the National Medal of Arts and Humanities medal. In quoting his mentor, José Antonio Abreu, he said "the worst crime committed in the modern world has been to take away from children the access to beauty and inspiration." Rather than cutting back on the arts in times of financial crisis, "people must understand that precisely during times of crisis the unforgivable sin is to cut access to art." One may question the relevancy of this to science education, or larger issues of the environment in which we live and teach, but with the anticipated political climate changes even in the US, we need increased vigilance toward the quality of life for our children. As a wise person has said, "borders do not stop dreams."

Dudamel included an anecdote about Adam, a 12-year-old from South Central Los Angeles, who auditioned for percussionist with Dudamel's Youth Orchestra of Los Angeles (YOLA). Adam's dream was to become the percussionist of the LA Philaharmonic. Several months later YOLA's and Adam's first concert in the Hollywood Bowl resulted in Adam and his drumsticks setting out "on a one-way trip toward hope." He concluded by reminding his audience that we must support and nourish the soul as well as the mind. From the caves at Altamira to Los Angeles, we humans are hard-wired for expression.

In closing, I have a couple of personal examples to illustrate what the poet and artist, Joan Walsh Anglund once wrote: *We speak / of the same Sea / …though we stand on separate Shores.*

Our recent musical-political seminar, under the leadership of Philadelphia musician / conductor, Karl Middleman, concluded with a performance by a Philadelphia ensemble called Latin Fiesta. Founder and director, Maria del Pico Taylor, and her husband, Ray, along with Vania Taylor-Watson, Liliana Ruiz, Steve Kramer, Tom Lowery, Mickey Rivera, and Junior Sanchez entertained us with songs and dances from Mexico (Danza Azteca), Cuba (La Bella Cubana), Puerto Rico (El Cumbanchero), Brasil (Pau de Chura, or rainstick, Samba), and Spain (Andaluza). Actually, "entertained" is not quite accurate since audience participation was encouraged and cheered. The important point for me was the message this group (from Cuba, England, Mexico, United States, Puerto Rico, and Denmark) conveyed as I watched audience dancers from Japan, England, and US join in the performance. Music is truthfully and universally a language shared by all humans. As we watched videos of South American orchestras and dancers, the performers clearly represented Asian, South and Central American, and European nations, a mix of ages, and not a few women. Although music as a language has been used and abused politically, militarily, and psychologically, one cannot escape thinking of the deep and far-reaching benefit for individuals as for nations which comes from making music together, vocal as well as instrumental.

 continued....

According to Steven Mithen (*The Singing Neanderthals*), music is encoded in the human genome and perhaps music evolved before language with its vocabulary and grammar. The rhythms to bipedalism and dance became further expressions of this genetic proclivity. He points out the musical communications between mother and infant, and that eventually language delivered the capacity for metaphor as exhibited in art, science, and religion.

My final example of the challenge and rewards of "fitting in" comes from an unusual class I have been pioneering this year: an ESOL class in physics, teamed with a language-based ESOL specialist. There are 10 different countries and 7 different languages represented in this class of 23 level two through four students, many of whom have been in this country less than two years. Some are here with only one parent and for many this is their first experience in a school and classroom. We begin every class with a short journal-writing assignment followed by a "class meeting" where we all sit in a circle, then later in tables of three or four. What is noteworthy is how purpose-driven they are about their work, together with significant cross-cultural harmony among Afera, Hai, Jenny, Juan, Carlos Anthony, José, Sami, Przha, Francisco and others. They are quick to pick up the strangeness of our language, listen to each other, often spontaneously applauding when a friend completes a verbal response, and they are very quick to assemble equipment and build simple circuits.

The world may be too much with us, but at least in this class, there is an underlying harmony which helps us all recover our hearts and listen to the sea and winds, whether howling or sleeping like flowers. We are helping each other to be less forlorn. William Wordsworth would be pleased.

It is helpful to be reminded of Emma Lazarus' (herself the Jewish descendant of German and Portuguese immigrants) famous lines from her poem, "The New Colossus," written as a donation for the building of the pedestal for the Statue of Liberty, placed in 1903:

> …From her beacon-hand
> Glows world-wide welcome…cries she
> With silent lips. "Give me your tired, your poor,
> Your huddled masses yearning to breathe free,
> The wretched refuse of your teeming shore.
> Send these, the homeless, tempest-tost to me,
> I lift my lamp beside the golden door!"

[1] Booth, Eric. *El Sistema: Music for Social Change*, Ed. Christine Witkowski, Omnibus Press. 2015.

George

A VAST Life Member, George Dewey is a former VAST President and former NSTA District VIII Director. He teaches physics in Fairfax County, NBCT since 1999. He can be reached at george.dewey@fcps.edu

Virginia Junior Academy of Science

The 76th Annual Meeting of the Virginia Junior Academy of Science (VJAS) will be held on May 16-18, 2017, at Virginia Commonwealth University. Student research projects will focus on computer science, engineering, and mathematics, as well as the traditional scientific disciplines. The student presentations on May 17 are open to participating students, sponsors, and parents as well as those who want to learn about VJAS by seeing approximately 750 student researchers, grades 7-8 and 9-12, in action.

Because of the diversity of student projects submitted, the criteria for accepting projects for presentation and for judging presented projects have been revised. The new evaluation forms focus on accepted practices within the STEM discipline and place greater emphasis on the quality of the project. Quality projects address problems which are important to the STEM discipline, solve a problem whose solution is unknown to the student, show ingenuity, and provide strong evidence that the student did the work and understands the project.

Volunteers enable the VJAS to operate. In March, **readers** review submitted papers and score them; these scores determine which papers are accepted for presentation. In May, **judges** read submitted papers, listen to student presentations, question students, and score papers within a designated category. On the night of May 17, **special judges** review award-winning papers and determine which projects receive special recognition and/or scholarship awards. Other volunteers assist with registration, putting together packets, the awards ceremony, and communications. To volunteer, complete the judge's form at http://goo.gl/forms/wafNpG7nwj's

VJAS's revised website provides comprehensive information for students, sponsors, and judges. To learn more about the event, visit the 2016 VJAS Highlights which shows images of participants at work and at play. Visit http://www.vjas.org to learn how you and/or your students can participate in the 76th Annual VJAS Meeting.

Dr. Julia H. Cothron, VJAS Representative to VAST

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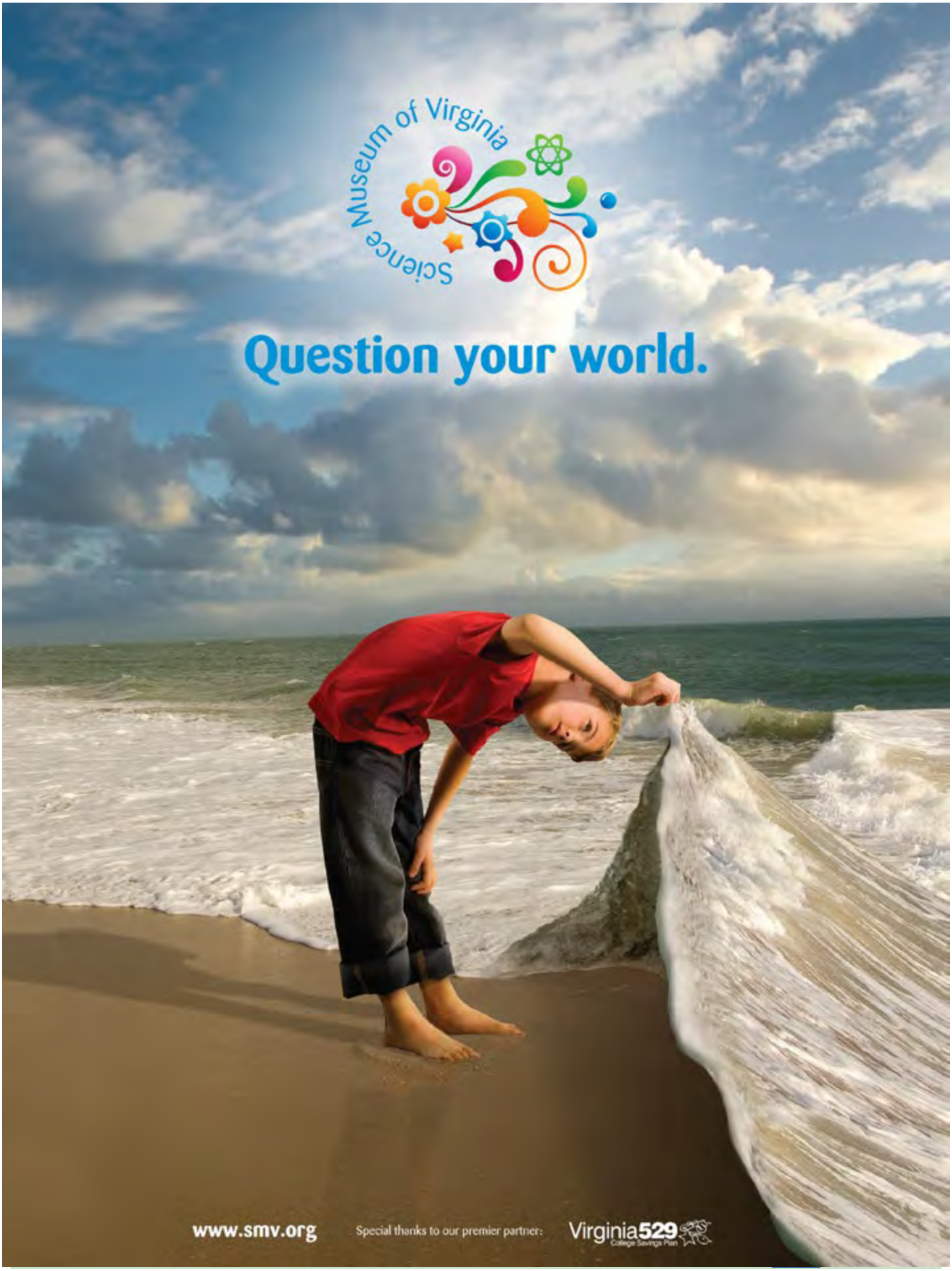
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Please consult the website for up to date information, VAST forms for awards and mini-grants, advertising and current PDI information: www.vast.org

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, March. 1, 2017, for inclusion in the next paper PDI VAST Newsletter.

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