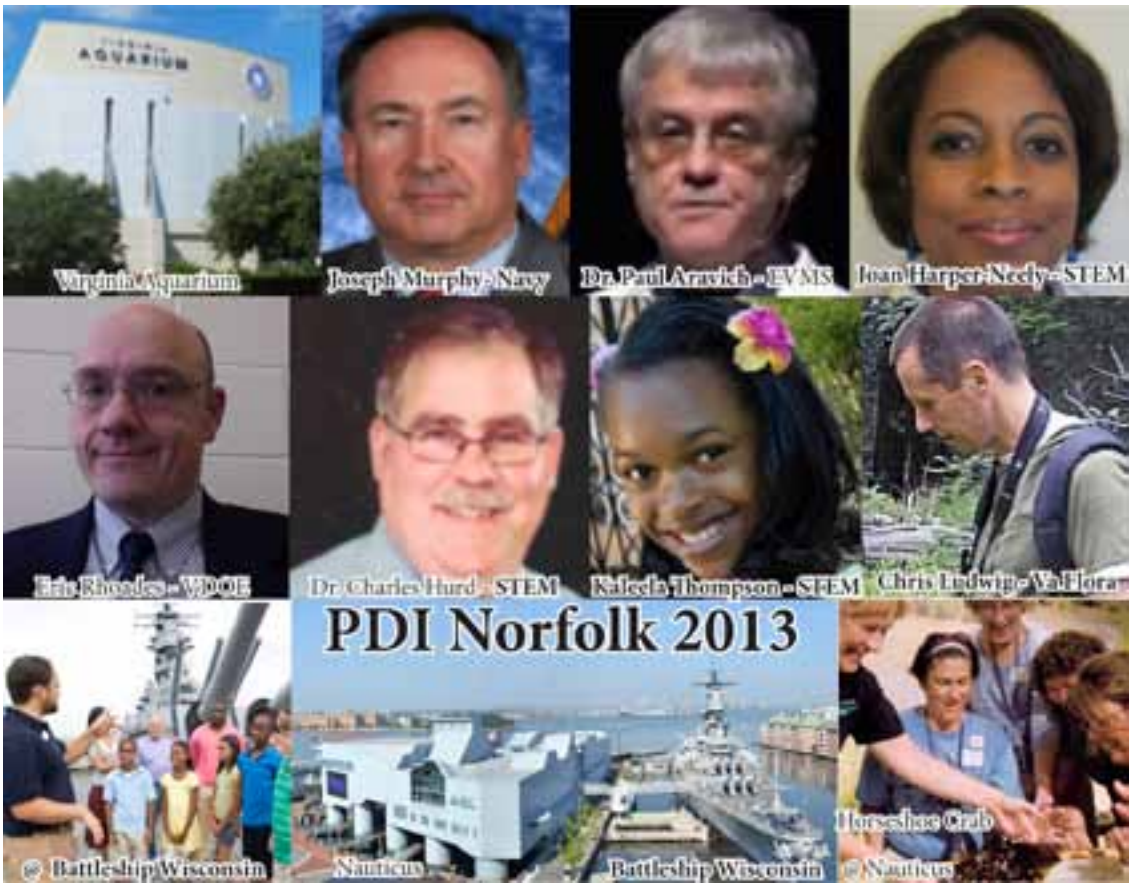
ISSN 1945-7405
http://www.VAST.org
Check the web for news, conference updates, registration, and forms.

The Science Educator

Summer 2013 A publication of VAST, The Virginia Association of Science Teachers Vol. 62, No.1

Great Teachers *Sustain Science* by Engaging in Professional Development: Attend the VAST PDI!



Not Your Average PDI!

It is so exciting that our Annual PDI is right around the corner! Our PDI Committee has been hard at work planning a creative and diverse Professional Development Institute. We have something for everyone:

ESL, Children's Literature, Presidential Awards, Differentiated Instruction, STEM, State Science Standards . . .

the list goes on and on. We promise there is something for you every hour of the PDI!

Like others that have gone before, we are pleased to announce that the four PAEMST Virginia state finalists for grades 7-12 science are **Stephen Biscotte**, a biology teacher at Cave Spring High School in Roanoke County, **Timothy Couillard**, a physics teacher at James River High School in Chesterfield County, **Susanne Dana**, a chemistry teacher at Blacksburg High School in Montgomery County, and **Anne Moore**, a middle school science teacher at Robius Middle School in Chesterfield County are all members of VAST who have been involved as attendees, as well as, presenters. So let us continue to lead in excellence and get engaged.

Don't Delay, Register Today! It's easy, just go to our website, www.vast.org, and follow the directions. You won't be disappointed!

From the Executive Director

Welcome back to a new school year! I hope you are rested and revitalized for an inspired and rewarding school year.

Have you registered for the VAST PDI? Be an early bird and save money!

Did you know that the VAST PDI includes sessions on the following? We are not "just" science.

ESL • **Children's Literature** • **Elementary Presidential Awards**
Differentiated Instruction

Did you Know that when you register for this year's PDI your VAST membership is automatically paid for the next TWO years! What a Deal!

Do you Know who is on the VAST Executive Board?

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Aug. 10, 2013

Susan Booth

VAST PDI 2013

Dates to Remember

September 1, 2013 - Early Bird cut-off date for PDI presenters registration - $140.00

October 18, 2013 - Early Bird cut-off date for professional registration - $160.00

October 18, 2013 - Early bird cut-off date for student registration - $80.00

November 5, 2013 - cut-off date **for standard registration - $190.00**

Contents:

President's Page:

Summer Reflections: Teachers DO Make a Difference

My official day job title is Science Education Administrator at Jefferson Lab in Newport News, Va. I have the honor of running our High School Summer Honors Program and let me tell you, it is one of the best parts of my job!

This summer, I was surrounded by the crème de la crème of Hampton Roads students. Twelve students were selected to work as interns for six weeks here at the Lab. They worked directly for a staff scientist or engineer on a project that significantly impacts the Lab and the science we do here. The goal of our program is to encourage young people in their pursuit of a career in science, mathematics and/or engineering. That goal was achieved this summer!

If anyone ever had a doubt about the teaching of science in the Commonwealth of Virginia, my experience this summer would put those fears to rest! Not only were my kids polite and respectful, they knew their stuff! Their teachers have done an incredible job teaching the curriculum and, better yet, instilling in these young people a love and awe of our natural world. The questions my kids asked this summer were wonderful . . . thoughtful, insightful and a bit unique. All of these blend together to create phenomenal young people with amazing futures.

Teachers really do make a difference! By fostering a love of science, Virginia teachers' impact students more than they will ever see . . . and from where I am sitting, the future looks amazing!

Thank you for all that you do for the students in your classroom. I know it is difficult work. I know the "Pat-On-The-Back" is not always there. But please have faith, your work is important. Your work makes a difference and I have seen it with my own eyes. We know you do not hear it enough . . . but your students, VAST and I appreciate you! Keep up the great work!

Brita Hampton, VAST President

The last day during "The Poster Session."

TeacherDirect: A Web Site Just For Virginia Teachers

In January 2013, the Virginia Department of Education (VDOE) launched a broadcast email service to provide Standards of Learning (SOL) resources and information directly to classroom teachers. Over 18,000 educators have subscribed to receive the free weekly "TeacherDirect" email updates. The updates contain approximately 10 items that are new, have approaching deadlines or are of high interest to teachers.

TeacherDirect is the result of a survey that VDOE conducted during the 2011-2012 school year to learn how best to communicate new and updated instructional information to Virginia's approximately 100,000 K-12 public school educators. More than 11,000 teachers responded to the survey, with more than 96 percent indicating their preference for email notifications over receiving information through social media.

Weekly updates link teachers directly to pertinent content in the TeacherDirect section of the VDOE website. TeacherDirect content is organized for easy and speedy reference:

- SOL News contains weekly updated items of interest to classroom teachers, including new instructional resources and upcoming professional development opportunities;
- SOL Events includes a professional-development calendar of conferences, webinars and institutes that support the SOL program; and
- SOL Library contains links and catalogs of SOL-related VDOE resources available to teachers.

TeacherDirect has, and will continue to share, the various VAST Professional Development Institutes that support the Science Standards of Learning (SOL). The online subscription form is available in the TeacherDirect section of the VDOE website. Additional information is available including:

- A flier promoting the benefits for teachers and other educators of subscribing to ***TeacherDirect*** (flier includes subscription instructions); and
- A two-minute promotional video featuring Virginia teachers discussing how they and their students have benefited from ***TeacherDirect***. Several versions of the video are available for downloading, including a PowerPoint-compatible Windows Media Video file.

2013 Presidential Awards for Excellence in Mathematics and Science Teaching: Science State Finalists

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) Program was established in 1983 by The White House and is sponsored by the National Science Foundation (NSF). The program identifies outstanding mathematics and science teachers, kindergarten through 12th grade, in each state and the four U.S. jurisdictions. These teachers serve as models for their colleagues and will be leaders in the improvement of science and mathematics education. The competition alternates each year between teachers of grades K-6 and teachers of grades 7-12.

The 2013 PAEMST Awardees will be announced in the Spring of 2014. Each state's Presidential Awardee will receive a $10,000 award from the National Science Foundation. Each PAEMST Awardee will also be invited to attend, along with a guest, recognition events in Washington, D.C. during a weeklong recognition in 2014. These events will include an award ceremony, a Presidential Citation, meetings with leaders in government and education, sessions to share ideas and teaching experiences, and receptions and banquets to honor recipients.

The four PAEMST Virginia state finalists for grades 7-12 science are **Stephen Biscotte**, a biology teacher at Cave Spring High School in Roanoke County, **Timothy Couillard**, a physics teacher at James River High School in Chesterfield County, **Susanne Dana**, a chemistry teacher at Blacksburg High School in Montgomery County, and **Anne Moore**, a middle school science teacher at Robius Middle School in Chesterfield County.

"These teachers are national role models for educators to emulate; for students to admire; and for parents, administrators, and communities to nurture," notes Rita Colwell, NSF director. PAEMST Awardees have been shown to devote more time to professional development, to incorporate innovative approaches into their classroom teaching, and to be more likely to use computers and other technologies in their classrooms.

For more information about the PAEMST program or to nominate a teacher, please visit www.paemst.org or contact Eric M. Rhoades (eric.rhoades@doe.virginia.gov).

VAST Professional Development Institute
Norfolk Waterside Marriott
November 14-16, 2013

DRAFT
July 1, 2013

Thursday, Nov. 14

VAST Professional Development Institute
Norfolk Waterside Marriott
November 14-16, 2013

8:30 am - noon	VSELA Program
8:45 am	Fieldtrip departs Hotel
9:00 am-Noon (or 3:00 pm)	Pre-Conference Institutes
9:00 am-Noon	Martinson Center workshop
9:15 am	Fieldtrips departs Hotel
12:00 noon - 1:00 pm	VSELA, Delta, CPO and Martinson Center workshop Lunches
12:30 pm	Fieldtrip departs Hotel
1:00 pm - 4:00 pm	Pre-Conference Institutes, Sponsored by Delta Education and CPO Science
1:00 pm - 4:00 pm	VSELA Program
2:00 pm - 5:15 pm	VAST Registration Desk Open
4:15pm-5:15pm	VSELA Dinner
5:30 pm - 6:30 pm	General Session One (Joseph Murphy-Navy) Sponsored by VSELA
6:30 pm - 8:30 pm	VSELA and VAST Reception (Exhibit Hall Open),
8:45pm – 9:15 pm	VAST Board of Directors Meeting

Friday, Nov. 15

7:00 am - 4:30 pm	VAST Registration Desk Open
6:45-7:45 am-	Continental Breakfast-one hour replenish only buffet
8:00 am - 9:00 am	General Session Two (Dr. Paul Aravich-EVMS) Sponsored by VSELA
9:15 am - 10:05 am	Concurrent Session A
10:00 am - 6:00 pm	Exhibit Hall Open
10:20 am - 11:10 am	Concurrent Session B
11:25 am - 12:15 pm	Concurrent Session C
12:15 pm - 1:15 pm	Visit the Exhibit Hall (It is the only thing open
1:30 pm - 2:20 pm	Concurrent Session D
2:35 pm - 3:25 pm	Concurrent Session E
3:40 pm - 4:30 pm	Concurrent Session F
4:00 pm - 6:00 pm	Celebration of Science in Exhibit Hall, Sponsored by Delta Education
6:00 pm - 6:30 pm	Ticketed dinner
6:30 pm - 7:30 pm	Awards Presentations – PAEMST Awards, VAST Awards, VABT Awards General Session Three -
(Eric Rhoades- VDOE)	
8:00 pm - 10:00 pm	Nauticus – Enjoy the walk!

Saturday, Nov. 16

7:00 am - 12:00 pm	VAST Registration desk open
7:15 am	Continental Breakfast
8:00 am - 9:00 am	Concurrent Session G
8:30 am – 12:00 noon	Exhibit Hall Open
9:15 am – 10:05 am	General Session Four - (Kaleela Thompson, Joan Harper-Neely, Charles Hurd- STEM & VAST Annual General Membership Meeting)
10:20 am - 11:10 am	Concurrent Session H
11:00 am -11:45 am	Visit the Exhibit Hall (It is the only thing open
11:45 am - 12:35 pm	Concurrent Session I
12:50 pm - 1:40 pm	Concurrent Session J
2:00 pm - 3:00 pm	General Session Five (Chris Ludwig- Flora of Virginia) - Door Prizes

Sustaining Science!

Speakers - At this year's PDI we will have five General Sessions and we are thrilled to have the following speakers who will present. *Please join us for our annual PDI at the beautiful Marriott Waterside Hotel in Norfolk.*

General Session One
Thursday, Nov 14, 5:30 - 6:30 PM

Joseph Murphy- United States Navy

Mr. Joseph Murphy was graduated from the United States Naval Academy in May 1981. He subsequently earned a master's of science degree in financial management from the Naval Postgraduate School. During his Navy career, Mr. Murphy served as Machinery & Boilers Officer and as Main Propulsion Assistant in USS Iwo Jima (LPH 2) from1982-1985; as Fire Control Officer in USS Ticonderoga (CG 47) from 1985-1987; as Combat Systems Officer and Operations Officer in USS Chosin (CG 65) from 1989-1993; and as Executive Officer in USS Arleigh Burke (DDG 51) from 1994-1995.

He commanded USS Gonzalez (DDG 66) from 1998-2000, and Destroyer Squadron Twenty Eight from 2002-2003 Ashore, Mr. Murphy served on the staff of the Secretary of the Navy in the Navy's Appropriations Matters Office, where he performed Congressional budget liaison duties from 1995-1996; as Deputy Executive Assistant to the Chief of Naval Operations from 1996-1997, and as Requirements Chief at U.S. Joint Forces Command from 2000-2001; and as Requirements Chief (N80) at U.S. Fleet Forces Command from 2003-2004. Since his 2004 selection as a Senior Executive, Mr. Murphy has served in various SES positions at U.S. Fleet Forces, including Assistant Deputy Chief of Staff, Capabilities and Resources Integration (N8); Assistant Deputy Chief of Staff, Fleet Readiness and Training (N4/N7); Deputy Chief of Staff, Fleet Installations and Environmental Readiness (N46).

General Session Two
Friday, Nov 15, 8:00 - 9:00 AM

Dr. Paul Aravich - Professor at Eastern Virginia Medical School

Dr. Aravich is a behavioral neuroscientist and Professor of Pathology and Anatomy, of Geriatrics, and of Physical Medicine and Rehabilitation at Eastern Virginia Medical School, Norfolk, Virginia. He is a recipient of a Virginia State Council of Higher Education Outstanding Faculty Award, which is the highest honor for faculty given by the Commonwealth of Virginia for excellence in research, teaching and service. He sits on the boards of Alternatives, a nationally recognized youth empowerment organization; the I Need a Lighthouse Foundation for youth depression and suicide awareness; and the Buckley Foundation for brain injured survivors. He has published widely; given numerous statewide, national and international scientific presentations; provided many teacher training presentations; and is actively involved with Eastern Virginia Medical School's global health efforts. Dr. Aravich performs public policy advocacy for brain injury, mental illness & Alzheimer's disease at the local, state and national levels.

Check out his TEDx NASA talk: **http://www.youtube.com/watch?v=-SfJsqnMRVc** and his interview on becoming a neuroscientist at the PBS website for the *Secret Life of the Brain* **http://www.pbs.org/wnet/brain/outreach/episode4.html** .

General Session Three
Friday, Nov 15, 8:00 - 10:00 PM

Eric Rhoades - Director of the Office for Science and Health Education for the Virginia Department of Education

Eric Rhoades - Join your fellow science teachers for the Friday night dinner, which will be followed by speaker, Eric Rhodes, and the award presentations at the hotel. Eric Rhoades will present Setting a New Trendline for Science Education. The festivities will then move to Nauticus for a fun-filled and informative evening.

Teachers and science leaders are working diligently to engage students in exciting and meaningful science education throughout the Commonwealth of Virginia. Eric Rhoades will discuss the current efforts teachers, schools, school divisions, and the Virginia Department of Education is making to encourage the phrase "investigate and understand" come to life for Virginia students and teachers.

Eric Rhoades is the Director of the Office for Science and Health Education for the Virginia Department of Education where he coordinates programs such as the Science Standards of Learning, Mathematics and Science Partnership grant, and Green Ribbon Schools award program. He most recently came from George Mason University where he was the Director of the Virginia Initiative for Science Teaching and Achievement (VISTA). Eric is also the former Supervisor of Mathematics and Science for Stafford County Public Schools and Science Coordinator in Powhatan County Public Schools. He has taught Physical Science, Biology, and Chemistry.

General Session Four

Saturday, Nov 16, 9:15 - 10:05 AM

Kaleela Thompson, Joan Harper-Neely, and Charles Hurd - STEM

Kaleela Thompson is a 14-year-old ninth grade student at Kecoughtan High School in Hampton, Virginia. She recently won the 2013 National Science Teachers Association (NSTA)'s Angela Award, which is given annually to honor one female student in grades 5-8, who has a strong connection to science. She has also won a Prudential President's Volunteer Service Award, a Office Depot Adopt a Small Business Award, and was a distinguished finalist for the Prudential President's Volunteer Award. Kaleela has also received numerous grants to fund her volunteer efforts and has presented at state and national conferences.

Kaleela describes herself as "a budding environmental entomologist of the 21st century" whose love of science began at age four, when her mother bought her a butterfly habitat. She enjoys studying insects, reptiles, and amphibians so much that she decided to write a series of science picture books—interactive green books with read-along CDs and sight-word bookmarks—to motivate kids to go outside and discover the wonder of nature. Her first book ***Oh Where Oh Where is my Swallowtail?*** uses bright and colorful photographs and illustrations to help children solve the mystery of the missing butterfly. The story introduces the beginning reader to the wonderful critters that live in our backyard. So great is her book that she was one of only 12 authors to be invited to the state conference for the Virginia Association of Early Childhood Education in March of 2012. Kaleela is currently working on her second children's book, which will be published in the near future. She is an amazing young entrepreneur, having founded her own organization My Home, My History and Our World, an online site where kids can go to learn about places and their history using green thumbs. She also promotes a Facebook page, a Garden Kids Blog Talk Radio program, and she is a website designer. Her passion has evolved into building partnerships within the community with local garden nurseries, the local natural history museum, butterfly societies and sharing her knowledge with students across the state. The MacDonald Garden Center in Hampton, Virginia has provided her with a temporary butterfly house at the garden center where Kaleela can continue to observe butterflies in various life cycle stages.

Joan Harper-Neely has 23 years of teaching experience and is the Engineering and Technology Specialist at Cooper Elementary Magnet School for Technology in Hampton, Virginia. She is a National Board Certified Teacher and was recently named Pitsco Education Teacher of the Month for her innovative and creative Children's Engineering and STEM curriculum delivery at Cooper.

She is the recipient of the Virginia Technology and Engineering Education Association (VTEEA)'s 2013 Virginia Elementary School Technology Education Teacher of the Year, which makes her eligible for the International Technology and Engineering Educators Association (ITEEA)'s 2013 Technology Education Teacher of the Year Award. She serves on the Virginia Children's Engineering Council (VCEC) and is the editor for their Children's Engineering Journal. "I love helping students discover their talents and strengths. It is very rewarding to observe a student put a great deal of effort into a project and then beam with pride when they succeed."

Dr. Charles Hurd is the coordinator for Engineering and Technology Education in Virginia Beach City Public Schools. His primary areas of responsibility include Engineering and Technology Education programs in the secondary schools. He is a project lead for the STEM Robotics Challenge (SRC). He will discuss the STEM robotics challenge and the role of Technical and Career Education in engaging elementary, middle and high school students in after-school activities. The concepts of the SRC include supporting sustainability, mechatronics and 21st century skills, including collaboration, creative thinking, and team work utilizing the engineering design process. Dr. Hurd has taught technology education in high school and middle school. He has served in various administrative capacities in the Richmond and Tidewater Virginia areas including principal and assistant principal and has recently moved back to the beach. His most recent presentations regarding STEM were at the Association of Career and Technical Administrators conference in Atlanta, Georgia and the Virginia Association of Career and Technical Education Administrators conference in Roanoke, Virginia.

General Session Speakers Continued:

General Session One
Saturday, Nov 16, 2:00 - 3:00 PM

Chris Ludwig - Flora of Virginia

Worth the 250 Year Wait!

Chris Ludwig - Virginia for its landmass has the greatest diversity of vascular plant species of any state in the U.S. The Colony of Virginia has the first flora (a manual describing the plants of an area) the ***Flora Virginica*** of any of the original thirteen colonies. The last edition of the ***Flora Virginica*** was published by John Clayton (an early Virginia botanist) and J. Gronovius in 1762. In December 2012, 250 years after the last publication of the ***Flora Virginica, Virginia's first modern flora, the Flora of Virginia***, was published. In this presentation, Chris Ludwig, co-author of the ***Flora of Virginia*** and director of the Foundation of the Flora of Virginia Project, will share insights on how this modern work was developed and why it is relevant to science educators in Virginia.
For more about the Flora Book visit: http://www.floraofvirginia.org/ and http://ideastations.org/video/virginia-currents-flora-of-virginia/elbert-watson-2013-02-11 to view a Virginia Currents program with Chris Ludwig and Marion Lobstein a member of the Board of Directors of the Flora of Virginia Project.

Online registration for the VAST PDI 2013 on the VAST website at www.vast.org.

Check the VAST website often for updates and more information.

High-Speed Internet
Meeting Rooms & Public Areas: Wireless
Guest Rooms: Wireless
Discounted Daily Group rate $4.95

Norfolk Waterside Marriott • 235 E. Main Street Norfolk,VA 23510 • 757-628-6411 (p)

The 61st Professional Development Institute (PDI) of the Virginia Association of Science Teachers will be held at the Norfolk Waterside Marriott in Norfolk, Virginia on November 14 - 16. Register early for a room at the convention hall. You will enjoy maximum time at the conference, receive the VAST discount and you help support VAST by filling our contracted rooms.

NORFOLK WATERSIDE MARRIOTT

VAST PDI

Earliest Group Check-in: Tue Nov 12, 2013 • Check-out: Sun Nov 17, 2013

Special rate available until: Tue Oct 22, 2013

Book Standard King or Double at Norfolk Waterside Marriott for $109.00 per night

Use this link to make online reservations with the VAST Group Rate:
http://www.marriott.com/hotels/travel/orfws-norfolk-waterside-marriott/?toDate=11/17/13&groupCode=SCTSCTA&stop_mobi=yes&fromDate=11/12/13&app=resvlink

Check-in and Check-out: Check-in: 4:00 PM • Check-out: 11:00 AM

High-Speed Internet: Public Areas: Wireless, Guest Rooms: Wireless or Wired-for-Business
High Speed Internet and Unlimited local phone calls for a daily rate of $4.95 USD, (VAST's Group discount rate)

Parking: **Overnight** Guest park in Main Street Garage - $10 per day rate (You must have ticket stamped upon Check-in) and **Day parking** is $12 per day.

FRIDAY NIGHT @ The VAST Professional Institute

Nauticus and the Battleship Wisconsin

Friday Night Festivities:
You will not want to miss Friday afternoon and evening at the Norfolk PDI. A ***Celebration of Science*** will begin at 4:00 pm. Delta Education is sponsoring a celebration in the exhibit hall with heavy appetizers, science competitions and resources to discover. A ticketed dinner will be served at 6:00 pm followed by the annual awards presentations. Later, Eric Rhoades, **Director of the Office for Science and Health Education for the Virginia Department of Education** will present ***Setting a New Trendline for Science Education***.

Nauticus and Battleship Wisconsin
At 7:30 pm, we will take a short stroll to Nauticus. Doors will open just for VAST PDI attendees from 8:00 - 10:00 pm! Here is a sampling of what you will experience:

- Walk aboard the largest and last Battleship built by the US Navy - Battleship Wisconsin
- Explore exhibits and aquariums including touch tanks and shark tank
- Participate in a sampling of our education programs
- Watch a 3D movie in our large screen theater
- Visit the Banana Pier gift shop

Educator at horseshoe Crab Cove. Shows a horseshoe crab to students.

Door Prizes
Nauticus will be raffling off two door prizes! You have the chance to win a complimentary field trip to Nauticus or an outreach program for your class! Teachers must be present to win.

Discounts during VAST PDI
Throughout the conference, Nauticus will offer their usual complimentary general admission to teachers. If you brought a guest to the conference, they will receive a discounted rate of $12 (adult), $10 (child) for general admission. Just show your PDI badge or Teacher ID at the admissions desk inside Nauticus

Have you ever built an ROV? How powerful are those 16 inch guns on the Wisconsin? Do they really need a weather forecast on board the Battleship?

Join us at Nauticus and the Battleship Wisconsin to experience all that we have to offer you and your students. Explore the exhibits on your own or attend one or more of our exciting programs.

Register early to reserve your spot!

VAST Celebration of Science

If we build it, they will come…

VAST Regions' Design Competition 2013

Sustainable Spaghetti Towers!

Join colleagues from your region and bring together your knowledge of science, innovation, and teamwork for a **FUN-tastic** time designing and building a Sustainable Spaghetti Tower! Each region's team will be provided with materials to artfully create a tower that will sustain an "earthquake" and please the eye of the judges.

The winning region will receive a prize and each member of the team a special gift. See your VAST Regional Director during the PDI to join your team.

VAST Celebration of Science
Friday, November 15
4:00 – 6:00 p.m.
VAST PDI Exhibit Hall

The VAST Regions' Design Competition is sponsored by members of School Specialty Science.

PDI Alerts

WIN! WIN! WIN!

Increase Your Knowledge
Increase Your Chances of Winning!

When you come to General Sessions 1-4 you will receive a ticket each time. You know the kind, it tears in half and you keep one part and we keep the other half with matching numbers. Prizes will be awarded at each General Session. At the last General Session you will use the door prize ticket found in your registration packet to enter for LOTS of prizes.

If you attend all of the General Sessions you will have five chances to win the prizes. Attend more General Sessions and increase your knowledge and chances for winning.

It's a win-win-win-win-win-hope-to-win situation!! **You must be present to win!**

Attention First Time Attendees to a VAST PDI!

WIN! WIN! WIN!

If you are a first time attendee to the VAST PDI , within your first 5 years of teaching, and you checked the box indicating this at registration, you will receive a "first timer ticket" in your attendee packet. The ticket is good for an entry into the drawing for the **First Timer Scholarship** for a registration to attend next year's VAST PDI in Roanoke, VA.

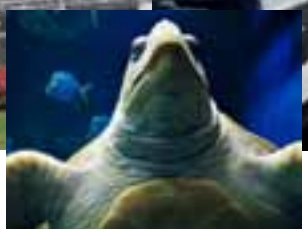
The scholarship is funded by Bill Stevens of Eduware and support continues from VAST membership.

The drawing will take place at the final session. You must be present to win.

Field Trips: VAST PDI

Is there a better way to experience the Virginia shore?


Photo by Bill Portlock



Virginia Aquarium

Maximum number of participants: 30

Join us for a half-day of fun at the Virginia Aquarium and Marine Science Center! You will start your visit with a look at the educational programs offered through the Aquarium. Next you will be wowed as you tour two buildings full of live animal and interactive exhibits. You'll come face to face with sharks, sea turtles, spotted eagle rays, river otters, harbor seals, and much, much more. You'll end your visit with a special look behind the scenes. An educator will walk you above several large aquariums and talk about how we care for all of our animals. $30.00

Norfolk Botanical Garden

Maximum number of participants: 30

Spend an afternoon exploring the Norfolk Botanical Garden. This 155 acre garden is one of the best kept secrets of Hampton Roads with over 20 different themed gardens and many natural areas to highlight the native plants of Virginia. School programs are offered throughout the year and focus on the Virginia Standards of Learning for ages Pre-k - 5th grade, and a special boat tour for students in grade 6 and above. Dress for the weather! $30.00

Naval Station Norfolk Ship Tours

Maximum number of participants: 20

Tour will be of several ships moored at the piers at the world's largest naval base, Naval Station Norfolk. Although specific platforms have not yet been identified, if possible the tour will include a nuclear-powered aircraft carrier (underway home to about 5,000 Sailors – truly a "city at sea"), a guided missile cruiser or destroyer, and an attack submarine. Wear comfortable clothing, appropriate for the weather, and comfortable and practical walking shoes. It can be challenging getting around on Navy ships, as the "ladders" can be steep (or in some cases vertical), so dress accordingly. Photography is encouraged, so bring your camera! Your escort will inform you if there is anything we don't want you to photograph. We will require names of participants in advance of your visit. $30.00

Chesapeake Bay Foundation

Maximum number of participants: 25

The Chesapeake Bay Foundation's (CBF) Hampton Roads Education Program leads participants to exciting new perspectives on Hampton Roads tributaries and their connections to the Bay. CBF's environmental education programs bring life to Chesapeake Bay watershed curricula and field investigations focus on methods incorporating environmental education into the core subject areas of science, reading, math, and social studies. This trip investigates the ecology, natural history, and modern challenges of the region. While aboard the 50' USCG inspected vessel Bea Hayman Clark on the James River, participants examine the relationship between human activities, land use, and water quality. Hands-on activities like trawling and water quality collection and analysis encourage sensitivity and knowledge of local ecosystems, giving relevance and greater understanding to classroom curricula. Our program staff provides opportunities for careful observations and synthesis of information gathered during the field study experience. Participants are encouraged to explore the complexity of the watershed, and to see themselves as part of the solution. Participants will also learn of the many educational offerings CBF staff can provide throughout Virginia.

Participants should wear clothes appropriate for the weather, knowing that it is often 10 degrees colder on the water; wear clothes that can get wet and muddy, bring a water bottle, and enthusiasm! $30.00

Pre-PDI Workshops

On Thursday, November 14, **at the** Norfolk Marriott Waterside four different three hour workshops are being offered, one in the morning and three in the afternoon.

Registration is required at www.vast.org when you register for the PDI.

❖ *Growing Scientists! Differentiating Science for All Learners* presented by: **Jenny Sue Flannagan**

Heard of differentiation but not really sure how to start? Making differentiation practical and manageable is the theme of this preconference session. During this session, teachers will learn what is and what is it is not. We will look at various processes of differentiation and tools that can help support students in learning science. Teachers will leave with strategies and hands-on materials they can use in their classrooms the very next day.

9:00 am -12:00 noon - Thursday, November 14 Grade Levels: - Elementary

❖ *STEM Approach to Teaching Electricity and Magnetism*

Explore how electricity and magnetism are related through hands-on experiences. Apply your knowledge to engineering a wind turbine. Build, test, and revise your model so that it generates as much power as possible. Take away STEM activities and an understanding of how to apply the Engineering Cycle in science classes.

1:00 - 4:00 pm - Thursday, November 14 Grade Levels: Middle and High School

❖ *FOSStering the English and Science Standards of Learning, K-8 Where active science and literacy intersect*

FOSS Institute 2013

Science is an ideal content area for students to develop literacy skills described in the English Standards of Learning. Studies of student achievement on standardized tests show increased achievement across all areas of the curriculum when schools use FOSS™: Full Option Science System to employ a content-focused approach to integrated curriculum. This engaging, interactive workshop outlines a framework for integration beginning with hands-on investigation, models powerful literacy strategies, and explores ways schools can use FOSS to implement the English Standards of Learning through the Science curriculum.

With an integrated instructional design using FOSS, students

- Acquire and use academic and domain specific vocabulary to express their thinking
- Write a variety of text, including informative, narrative, and evidence-based arguments
- Read and comprehend informational text, integrating knowledge and ideas
- Conduct research, using a variety of resources, and present their knowledge clearly

One Participant will win a FOSS kit!

Participants will walk away with resources, materials, and ideas to begin implementing the English Standards of Learning into the Science curriculum. Limited to 30 participants, so register early at www.vast.org.

1:00 – 4:00 p.m., Thursday, November 14, 2013 Grade Levels K-8

❖ *Using Design Briefs to Develop STEM Practices, Grades 4 - 8*

FOSS Institute 2013

STEM investigations should be applications designed and conducted by students in a performance based arena. The focus of this workshop has been crafted to highlight the Design Brief, a first step approach in creating STEM based challenges that dovetail with FOSS Investigations and other problem-based investigations. Design briefs are a blend of science concepts and the instructional strategies used in Engineering and Technology Education. This strategy employs a prescribed format but allows participants great flexibility to differentiate as they craft their own data based solution to a stated problem much in keeping with the philosophy of standards-based science education.

This session has been created for teachers who want to create independent opportunities for their students to apply the content, concepts, and process skills created and nurtured by engineering design processes, inquiry-based science investigations, and FOSS investigations.

During this workshop, participants will experience the complete design brief process as they engage in collaborative group tasks with specific materials and well-defined challenges. Sample CDs and materials will be available for all participants! Limited to 30 participants, so register early at www.vast.org.

1:00 – 4:00 p.m., Thursday, November 14, 2013 Grade Levels 4 - 8

One Participant will win a FOSS kit!

The 2013 FOSS Institutes are sponsored by Delta Education

A proud partner of the Virginia Association of Science Teachers and the 2013 VAST PDI

VAST PDI 2013 Art Contest - *Sustaining Science*!

Thanks to ALL the students that participated in our statewide art contest.
Shirley Sypolt VAST President-Elect & VAST PDI Committee member

We have a WINNER, but it is a secret. The winning entry will appear on the VAST PDI program cover. Congratulations to all the participants!

Entries were Commonwealth wide:

VAST Region 1 (13 art entries)
Henrico County Schools
Fort Lee (2 art entries)
Hanover County Schools
Beaverdam Elementary School (10 art entries)
Chesterfield County Schools
Chesterfield High School (1 art entry)

VAST Region 2 (148 art entries)
Hampton City Schools
Asbury Elementary School (18 art entries)
Cooper Elementary Magnet School (88 art entries)
Hunter B. Andrews PreK-8 School (6 art entries)
Kecoughtan High School (1 art entry)
Norfolk Public Schools
Lake Taylor High School (4 art entries)
Ruffner Academy (11 art entries)
Suffolk Public Schools
Northern Shore Elementary (2 art entries)
Virginia Beach Public Schools
Maury High School (18 art entries)

VAST Region 3 (1 art entry)
Matthews County Schools
Diggs Elementary School (1 art entry)

VAST Region 4 (65 art entries)
Culpeper County Schools
Farmington Elementary School (27 art entries)
Warren County Schools
Warren County High School (3 art entries)
Fauquier County Schools
Taylor Middle School, Warrenton (17 art entries)
Bealeton Elementary School (18 art entries)

VAST Region 5 (44 art entries)
Lynchburg City Schools
Lynchburg High School (1 art entry)
Augusta County Schools
Berkley Glenn Elementary (1 art entry)
Fluvanna County Schools
Fluvanna Middle School (5 art entries)
Rockbridge County Schools
Natural Bridge Elementary School (37 art entries)

VAST Region 6 (no art entries)

VAST Region 7 (no art entries)

Above are the four runner-up winners for the second annual art contest.

VAST Region 8 (3 art entries)
Appomattox County Schools
Appomattox Middle School (1 art entry)
Nottaway County Schools
Crewe Elementary School (1 art entry)
Prince Edward County Schools
Prospect Elementary School (1 art entry)

Total: 274 student art entries Awesome!

Partners in Science

The 2013 VAST PDI is brought to you by the hard work of many people and the generous contributions of individuals and organizations. Our sponsors contribute to the success of VAST by their presence, financial support, and resources.

****

The VAST Board of Directors would like to recognize the organizations listed below for their generous donations and contributions.

Jefferson Lab
Thomas Jefferson National Accelerator Facility

Delta Education
...because children learn by doing.®

Dominion

Vernier

VIRGINIA SPACE GRANT CONSORTIUM

VSELA
Virginia Science Education Leadership Association

Virginia Resource-Use Education Council

eduware

Don Cottingham
Retired VAST
President

Virginia Naturally
www.VaNaturally.com
Virginia's gateway to environmental information, classroom grants and education resources

Please take a few moments to offer a special
"Thank You!"
to the representatives of each of these organizations!

In addition to these organizations, please extend a special thanks to the people who make up the VAST Board of Directors. This group of individuals makes VAST a reality and gives many hours to develop and makes the VAST PDI happen each year.

Climate Science Symposium at VSELA's November Meeting

Climate Science Symposium at VSELA's November Meeting
VSELA, the **Virginia Science Education Leadership Association**, brings together individuals responsible for the leadership of science instruction in the public and private schools of Virginia. Members include science department heads, science curriculum supervisors and coordinators, college and university faculty, and professional employees of state and federal agencies and science resource facilities who are involved with science instruction. Our purpose is to strive for the continued improvement of science instruction and learning within Virginia's schools. To that end, we communicate the importance of science instruction to a wide range of audiences, promote excellence in science curriculum, and nurture and support Virginia science leadership. Our biannual meetings (spring and fall) are the highlight of our annual efforts. The VSELA meeting this fall will focus on climate science research and teaching practices.

- What are the key scientific findings about climate and climate change?
- What do educators need to know to teach climate science effectively?
- What professional development resources are available to deepen understanding about climate?
- What resources are available to help develop climate science lessons and curricula?
- What climate data is accessible for use by classroom teachers?
- Are there on-going scientific investigations that welcome student participation?

These questions will be explored during VSELA's second Climate Science Symposium, November 13 and 14, in Norfolk, Virginia just prior to the VAST PDI.

The VSELA Climate science Symposium will focus on developing skills in using climate science resources created for the education community. We will explore and examine professional development resources designed to deepen educators' understanding about climate change, resources available to help develop climate science curricula and lessons, and we will become familiar with climate data sets accessible for use by classroom teachers and on-going scientific investigations that welcome student participation.

Dr. Kyle Haynes will be the featured speaker for our second Climate Science Symposium. Dr. Haynes is an ecologist whose current research focuses on the population dynamics of herbivorous forest insects. Primarily, he studies species that feed on tree foliage and sometimes reach abundances high enough to cause widespread tree mortality and ecosystem damage. One of his current pursuits is to examine the effects of climate change on the severity and frequency of population outbreaks in these forest defoliating insects. Dr. Haynes is a Research Professor with the University of Virginia Department of Environmental Science and Blandy Experimental Farm, a UVa ecology field research station. In addition to Dr. Haynes, other climate science researchers and

Gypsy moths are invasive forest defoliating insects. Dr. Kyle Haynes is investigating the effects of climate change on these insect populations in the eastern United States.

several climate science education specialists have been invited to share their climate science and education knowledge during the Symposium. We will keep you informed as plans continue to develop!

Climate science is an integrative systems science that embraces STEM; it is a topic that can be incorporated into both natural and physical science curricula. STEM connections are described.

Science. Understanding how Earth's climate changes over time in response to different factors requires an understanding of the entirety of earth's systems: the atmosphere, the oceans, the land and its water, all the living things within the earth's system, and the interactions among them all.
Technology. Various land, ocean and space-based instruments are used for collecting climate data. Computer systems aid in the analysis of the large, complex data sets typical to this science.
Engineering. Knowledge of climate and its effects on earth's systems is important for the design of roads, development of water supply systems, reducing the impacts of avalanches and floods on towns and cities, and many other climate-related challenges that human societies need to solve.
Mathematics. Climate data sets are summarized and analyzed using equations and statistical methods. Mathematical models help scientists understand the linkages among complex climate data sets.

VSELA's Climate Science Symposium is made possible by generous funding from the National Science Foundation and a Virginia Naturally/VRUEC/VAST MWEE Partner Grant.

VSELA members Anne Larrick and Jason Calhoun analyzing data during VSELA's 2011 climate symposium.

On Time and Change

To see a world in a Grain of Sand
And a Heaven in a Wild Flower
Hold Infinity in the palm of your hand
And Eternity in an hour.
— William Blake
From *Auguries of Innocence*

Bluebird

Morning blue and sunrise breast
Flashed across eye's corner view…
No…deathly still on path where I'd walked past –
A winged song no longer heard
In this world – the nest is quieter now.
Time moves on without his song,
Yet free to sing and soar in greater
Glory where eternity of time
Grants posterity a glimpse of past;
Where the spiral code is sung
Again in sky-blue trills by
Other generations, though now
The azure feathers are reincarnate
Under the leaves.

We may sense the inexorable march of time progressing across our modern landscape in our fascination with both the origin and the destiny of the universe. But this immense span of time has not always been our view, not just in terms of duration, but also in terms of vision. We have come a long way from Archbishop James Ussher's precise calculation in 1650 that the universe was created in 4004 BCE. By the mid-20th Century it was known that matter itself has evolved (borrowing a word from biology and geology) in the cores of aging stars, as it became clear earth's age exceeded four billion years and the universe as science describes it at more than three times that figure. The fact we can even supply figures to such a mind-numbing process of creation is one example of how far human culture has come in understanding time itself.

Loren Eiseley in his address for the University of Kansas' centennial in 1966 [*Man, Time, and Prophecy* [4].] contrasts the cyclical view of time in the ancient world with the more linear view in western philosophy. Like the Thessalian king Ixion whom Zeus punished by binding him to an ever-rotating wheel, the maxim was: "what has been is, passes, and will be." The cyclical recurrences of Greek and Roman history were replaced by "an unreturning concept of the past." This would mean that as life spans oscillated between birth and death, progress, innovation, evolution could occur in a more linear fashion. The metaphor was better that of a spiral than a circle. "Life is never fixed and stable. It is always mercurial, rolling and splitting, disappearing and re-emerging in a most unpredictable fashion."

The little bluebird's death takes on a life in another form. Eiseley continues: "We lack the penetration to see the present and the onrushing future contending for the soft feathers of a flying bird, or a beetle's armor, or shaking painfully the frail confines of the human heart. We are in the center of the storm and we have lost our sense of direction…Evolution is far more of a part of the unrolling future than it is of the past, for the past, being past, is determined and done."

In Jacob Bronowski's *Ascent of Man* [2], he also describes the cyclical sense of history as experienced by early nomadic cultures, chained as they are to the endless seasonal migrations of reindeer or sheep. The girls are "little mothers in the making," the boys "little herdsmen." Though halting and at times self-destructive, his ascent of man has progressed – along with a linear view of time – from minority static cultures to dominant expanding cultures only when "the freedom of the imagination of the young" was allowed or even encouraged. This was often a painful and conflicted process as countless examples from history attest: from Socrates to Galileo Galilei to Jonathan Swift to Mahatma Gandhi, to Albert Einstein in refusing the presidency of Israel, to those men and women driving the IT explosion today. For those who push civilization forward are often at odds with the centers of power of the day.

William Blake, son of a hosier, is a good example of a young man caught in the mid-18th Century world of sooty London when inspiration and revelation led him into the life we know as artist, poet, and mystic. To quote James O'Leary, "Blake believed that imagination was a surer guide to truth than reason or common sense." To be able to see a world in a single grain of sand or "infinity in the palm of your hand," or "eternity in an hour" requires an altered sense of time itself, to see time as compressible or expansive.

The way most of us speak of time reveals a lot about our society, probably since the advent of the Industrial Revolution. We spend time and we buy time, we save time and we waste time, we make time and we kill time, we pass time and we keep time, we invest time and we use time, we give time and we take time. How strange! We seem to treat time as though it were a commodity rather than a gift, as though time were an object rather than an opportunity, as though we were controller rather than victim, master rather than slave.

About 300 years ago, the poet Isaac Watts put it like this: "Time like an ever rolling stream, / Bears all its sons away; / They fly forgotten, as a dream / Dies at the opening day."

"Time is of the essence" we say as we take and as we score tests; "time is money" as the old adage puts it; "time has run out." This last image stems from the hourglass. As object and as symbol, Mitch Albom's latest novel, *The Time Keeper* [1.], unfolds the story of man's deep desire to measure and to control time. Father Time (an apt metaphor for our homage to time) interacts with two characters who are obsessed with having control over

time; the distinction between "chronos" time (clock time, or measured time) and "kairos" time (event time, as in "The time has come…") becomes blurred in a gripping way as the story runs toward its surprising resolution. There is a single grain of sand in an hourglass at the end. The hourglass has been tilted in both directions and held horizontally, yet time is endless.

Timing and the freedom of the imagination of the young both lie at the heart of our mission in our schools. Maintaining a healthy flow of events is what makes "the art of teaching," as in Gilbert Highet's book with the same title. It was Einstein himself who once commented that imagination is more important than knowledge. Some see a great chasm between the arts and the sciences, hence the pair of cartoons which accompany this writing. The inscription on the second refers to my long-time mentor and friend, Leon Zirkle, who was also an artist and woodcarver. It was he who supplied the first cartoon to Natalie Lewis, a sculptor, and to me nearly forty years ago. In come the rag-tag children as varied in personality and style as on the first day of school; the grinning teacher's insidious smile and the book press betray the lock-step blockhead marchers who leave, presumably at year's end. In *Hard Times*, Charles Dickens put this into colorful words: "Teach these boys and girls nothing but Facts. Facts alone are wanted in life. Plant nothing else, and root out everything else. You can only form the minds of reasoning animals upon Facts; nothing else will ever be of any service to them…Thomas Gradgrind now presented Thomas Gradgrind to the little pitchers before him, who were to be filled so full of facts…he seemed a sort of cannon loaded to the muzzle with facts, and prepared to blow them clean out of…childhood at one discharge."

be destined to become. How to accomplish this in a classroom of 30 energetic and distractible adolescents is the secret of educating "the whole child" still being examined, explored, and explicated today. Vladimir Nobokov, the Russian-American novelist, put it this way: "There is no science without feeling and no art without facts." I recall my own delightful experiences when I first taught physics at my present school: my classroom was in the art department. Bronowski in his *Ascent of Man* writes about the Long Childhood which was undertaken by human evolution itself. After describing the unique features of the frontal and pre-frontal lobes of the brain which makes us human (the ability to manipulate the thumb, the capacity to learn language, to plan, to postpone), he looks ahead not without some trepidation. "It is not true that we run our lives by any computer scheme of problem solving… Instead we shape our conduct by finding principles to guide it…Knowledge is not a loose-leaf notebook of facts. Above all, it is a responsibility for the integrity of what we are, primarily of what we are as ethical creatures. You cannot possibly maintain that informed integrity if you let other people run the world for you while you yourself continue to live out of a ragbag of morals that come from past beliefs."

In a spirited little book [*I'm Not a Short Adult! – Getting Good at Being a Kid* [3].], by teacher Marilyn Burns, the author addresses the "getting-ready theory of life" as preparation for adulthood in which kids are supposed to imitate grownups. [Note the Dickensian implications in the word "grownup," as in exasperation one might bellow, "Oh, for heaven's sake, grow up!"] The celebration of childhood and its dynamic development are included in kid-terms in chapters like: Confusing You with Some

Courtesy of L. Franklin Zirkle

Then enter Natalie and Leon, mallet and chisel in hand, to let in some air and some hope, one might say. Color – color and freedom to grow themselves into the varied characters each may

Facts, The Scoop on School, Dollars and Sense, The TV Picture, Words Are Not Enough. Even in the TV, pre-smart-phone world the point Burns makes is that the Long Childhood has unique

Continued on page 19

"Science for All " continued from page 18

features and demands which children need to address at their own unique pace. Addressing the special needs of our students is surely complicated by the emphasis on timing as featured in the so-called pacing guides all too prevalent in our schools and districts. Much of this can seem far removed from Reinhold Niebuhr's caution from his "*The Irony of American History*":

Nothing that is worth doing can be achieved in our lifetime;
therefore, we must be saved by hope.
Nothing which is true or beautiful or good makes complete
sense in any immediate context of history;
therefore, we must be saved by faith.
Nothing we do, however virtuous,
can be accomplished alone;
therefore, we are saved by love.

****

Sources:

1. Albom, Mitch. *The Time Keeper*. Hyperion. 2012
2. Bronowski, J. *The Ascent of Man*. Little, Brown and Co. 1973
3. Burns, Marilyn. *I Am Not a Short Adult!* The Yolla Bolly Press. 1977
4. Eiseley, Loren. *Man, Time, and Prophecy*. Harcourt, Brace and World. 1966

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

Opportunities and Resources

Chandra: Loaning UvaS Telescopes to EducatoRs

What is CLUSTER?

The Chandra X-ray Telescope is funding an exciting educational opportunity for teachers and students. The University of Virginia's Department of Astronomy is loaning telescopes to teachers in Virginia and providing training on how to use them.

Teachers can borrow a kit containing one Meade 8-inch Schmidt-Cassegrain telescope, a tripod, and several eyepieces suitable for viewing a variety of celestial objects. Kits are loaned for three months and can be used to host an evening star party at their school, to conduct experiments with their students, and to enjoy other projects.

CLUSTER is managed by Steve Layman, a long time member of the Charlottesville Astronomical Society. Support for this education and outreach program was provided by the National Aeronautics and Space Administration through Chandra award GO0-11097X to Dr. Craig Sarazin of the University of Virginia, issued by the Chandra X-Ray Observatory, which is operated by the Smithsonian Astrophysical Observatory for and on behalf of NASA under contract NAS8-03060.

Additional funding was provided by the Friends of the McCormick Observatory. For information on supporting their education and outreach programs, please visit their webpage.

http://www.astro.virginia.edu/public_outreach/friends.pdf

How To Get Involved

Thank you for your interest in the CLUSTER Telescope Loaner Project. We have 10 telescope kits available for each session. Each instructor checking out a telescope will be required to participate in a six hour orientation session which will be held at the University of Virginia's McCormick Observatory in Charlottesville. The dates and times for these sessions for the 2013 - 2014 academic year are (all dates are Saturdays):

Sep 28, 2013 4 – 10 pm
Jan 25, 2014 3 – 9 pm

The telescope kits can be transported in the trunk and/or back seat of a passenger car. Telescope kits will need to be returned no later than 3 days prior to the date of the next session. If you are interested in participating in the project, please send your first and second choice of session dates to Steve Layman. (Steve Layman slayman2528@comcast.net)

The department web page is:

http://www.astro.virginia.edu/public_outreach/CLUSTER/

Earth Science Calendar Offers More Activities

Educators who obtain an Earth Science Week Toolkit each year know that one of the most valuable components is the Earth Science Activity Calendar. This attractive wall calendar traditionally features an activity for each month of the school year, as well as information on important dates in geoscience history and other fun facts (http://www.earthsciweek.org/calendar/index.html).

The new Earth Science Activity Calendar contains more activities than ever before! Brimming with 20 learning activities, the calendar provides a great way for teachers and students to explore the Earth Science Week 2013 theme of "Mapping Our World" throughout the 2013-14 school year and beyond. To order the Earth Science Week 2013 Toolkit, including the new Earth Science Activity Calendar, please visit **http://www.earthsciweek.org/materials/index.html**

Exploration Design Challenge

In March, NASA launched an exciting new partnership with Lockheed Martin to engage students in America's next phase of human space exploration. The Exploration Design Challenge (EDC) invites students from kindergarten through 12th grade to learn more about one of the biggest challenges NASA faces before sending humans beyond low-Earth orbit: space radiation. Through a series of age-appropriate activities, participants will learn about radiation and its effects on humans and hardware destined for asteroids, Mars or other deep space locations. Orion is the vehicle for these space destinations and will make its maiden test flight in 2014.

The youngest explorers (K-4) will complete NASA education activities related to radiation. Upon completion, a teacher or other adult may submit the students' names to be flown on the 2014 Orion flight as honorary virtual crew members.

The same opportunities are open to students in grades 5-8, but they also will design and develop a radiation shield prototype. Instructions, guidebooks and related content are provided on the EDC website.

High school participants have an even greater challenge . In addition to the activities listed above, teams of students will design a radiation shield prototype that meets established criteria and constraints. Teams will submit their designs, and the top five designs selected will be tested in a virtual radiation simulator. The winning team will travel to Florida for Orion's launch and have its design flown aboard the spacecraft!

This is an exciting, hands-on way to get students inspired and interested in what NASA does, All the details for the EDC are here: http://www.nasa.gov/education/edc

BALLOT

The Nominating Committee presents the following slate of officers for election at the VAST Annual Meeting, Saturday, November 16, 2013 in Norfolk. Elected officers will begin their terms January 1, 2014.

Nominating Committee for 2013: Juanita Jo Matkins, Brita Hampton, Delores Dalton Dunn, and Don Foss

Nominating Committee Chair for 2013: *Juanita jo Matkins*

For President Elect (2014) This officer will become President in 2015
Jenny Sue Flannagan ..... Yes No
Dr. Jenny Sue Flannagan has taught middle/high school science, served as the Middle/Elementary Science Coordinator for Virginia Beach City Public Schools and currently is the Director for the Martinson Center for Mathematics and Science in the School of Education at Regent University where she is also an Associate Professor. Dr. Flannagan currently serves as the Communication Chair for VAST.

For Treasurer (2014-2017)
Jimmy Johnson ..... Yes No
Jimmy has been a classroom teacher for 33 years and currently teaches 5th grade science at Elmont Elementary in Hanover County. He is a former President of VAST and has served as VAST treasurer since 2006.

For Director, Region I (2014-2016)
Kim Dye ..... Yes No
Kim has taught grades 4/5 for 28 years. She has served as the Region I Director for the previous two years while in the position of Science Curriculum Specialist for Hanover County. Her passion is for providing quality professional development to encourage engaging science instruction at all levels.

For Director, Region III (2014-2016)
Sherrie Roland & Leslie Lausten (Codirectors) ..... Yes No
•**Leslie Lausten** has been teaching elementary school science for 23 years in Stafford County, VA. She has presented at the VAST conferences for the past five years as well as served as Codirector for Region III.
•**Sherrie** Roland has taught in elementary school for 25 years grades K-4. She currently teaches fourth grade in Stafford County and is the science lead for her school. Sherrie served as co-director for VAST Region 3 for 2012-2013.

For Director, Region V (2014-2016)
Eric Pyle ..... Yes No
Eric has been a Professor of Geoscience Education at James Madison University for the last 9 years and is currently Coordinator of Science Teacher Preparation in the College of Science & Mathematics at JMU. He has attended VAST professional development institutes since 2003. He is a Past-President of VAST and the chair of the Earth Science committee.

For Director, Region VII (2014-2016)
Diane Tomlinson ..... Yes No
Diane is semi-retired after serving 31 years in various positions in Russell County, VA. She is pursuing her Ph.D. in Career and Technical Education at Virginia Tech. She is currently the Region VII Director.

Proposed addition to VAST's Operating Procedures:

At its November 8, 2012 meeting, the VAST Board approved the formation of a new Standing Committee to be called the Advocacy Committee. This change to the Operating Procedures is to be presented to the membership for approval at the November 16, 2013 Annual Meeting.
The role of the Advocacy Committee will be to work with the Board and membership in support of legislative advocacy in line with VAST Policies.

____Approve ____Do Not Approve

If you will not be present at the Annual Meeting, please cast an absentee ballot.
Deadline for receipt of ballots is November 2, 2013. Return your completed ballot to:
Juanita Jo Matkins, 624 Yanceyville Rd., Louisa, VA 23093

Who is Your VAST Regional Director and What Can She or He Do for You? - A Dichotomous Key

This Dichotomous Key will help you identify who your regional director is. This person can be your liaison to the resources of VAST and can be the conduit for your great ideas to the VAST board of directors. This person may also provide you with information regarding science and professional development opportunities in your region; and perhaps most importantly, is your chance to win free stuff at the PDI!

1. Are you a resident of Virginia? (or teach in VA?) Yes.....Go to 3
2. Not a Virginian? Well, come enjoy the PDI, but we don't have a **Regional Director** for you.
3. Great! Do you know which of the **8 Superintendent's Regions** you live in? Yes.....Go to 5
4. Don't worry, lots don't. Use this map of VA and the 8 regions to

   figure it out. If that still doesn't work, it's time to phone a friend, or check out

   http://www.doe.virginia.gov/directories/schools/school_info_by_regions.shtml

Now that you know .....Go to 5

5. Find the name of your **Regional Director** here:

Region I	Kim Dye	region1@vast.org
Region II	Melissa Brichacek	region2@vast.org
Region III	Sherrie Roland & Leslie Lausten	region3@vast.org
Region IV	Susan Bardenhagen	region4@vast.org
Region V	Andy Jackson	region5@vast.org
Region VI	Sonya Wolen	region6@vast.org
Region VII	Diane Tomlinson	region7@vast.org
Region VIII	Pam Aerni	region8@vast.org

6. Go to the PDI! ..... Go to 7
7. Are you going to attend **General Session Two**? Yes ..... Go to 9
8. WRONG!! Get out of bed and get yourself there, this is important stuff!..... Go to 7
9. Good. Your **Regional Director** will be introduced – get a look at her/him..... Go to 10
10. Find your Regional Director anytime during the PDI to introduce yourself and get a ticket..... Go to 11
11. Are you staying the whole time to attend **General Session Five**? Yes..... Go to 13
12. WRONG!! Shopping and heading home can wait! How can you skip a session titled ***Flora of Virginia*** given by a botanist who helped to photograph and describe all the flowering plants in Virginia!?. *Come on! We we waited 250 years for this edition, you can wait just a little bit longer to leave the PDI!!*..... Go to 11
13. Great, I knew you would. ..... Go to 14
14. Get your ticket out. There will be a drawing for a **LabQuest 2** from **Vernier Software and Technology!!**

Good luck!

(8/10/2013)

TOSHIBA | NSTA

ExploraVision

How can I motivate my students to ♥ science?

the SCIENCE OF A-HA!

The **Toshiba/NSTA ExploraVision** science competition inspires K–12 students to envision the technologies of the future. **ExploraVision** lets your students engage in hands-on learning, problem solving, critical thinking, and working in teams.

GREAT NEWS!

ExploraVision offers young students the scientific learning experience central to the **Next Generation Science Standards**.

PRIZES!

- Up to **$240,000*** in savings bonds and **Toshiba** products are awarded to winning students
- Teachers submitting the most team projects win a **Toshiba Tablet**!
- Schools submitting the most team projects win a **$1000 tech upgrade** from **Toshiba**!

** (at maturity value)*

For more information and to sign up, visit
www.exploravision.org/scienceeducator

1-800-EXPLOR-9
exploravision@nsta.org

www.Facebook.com/ToshibaInnovation

@ToshibaInnovate

TOSHIBA
Leading Innovation >>>

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

NSTA


Field Trips


Friends


Exhibits

Proudly Presents:
The VAST Professional Development Institute
2013
Norfolk
Join Your Colleagues for Ideas, Skills, Empowerment, Enthusiasm.


Fun


Presenters


Presenters


Universaty Students


Exhibits

VAST Professional Development Institute
November 14 - 16, 2013
Sustaining Science!

Concurrent Sessions - Sessions are listed by curriculum areas (Biology - Life Science, Chemistry, Earth and Space Science, Engineering, Environmental Science, Math in Science, Physics and Physical Science, and General Science. Times and locations will be posted in September on the website. Please check http://www.vast.org frequently for the most current information. **Sessions are listed on pages 24 - 32.**

Sample Session Entry:

Session Title	Lead Presenter
Intended Audience	*PDI Strand*

BIOLOGY – LIFE SCIENCE

Monarch Gardens Take Root — Abbie Martin
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

A Fairy Tale Approach to Science Education — Leslie Whiteman
Pre-K - Grade 5 teachers — *Empowering Science Learning Through STEM*

Teaching Kids to Care About the Environment in an Unconventional Setting — Veronica Haynes
Pre-K - Grade 5 teachers — *Understanding Environmental Literacy Across the Disciplines*

Flora of Virginia — **General Session Topic** — Marion Lobstein
Pre-K - College teachers — *Understanding Environmental Literacy Across the Disciplines*

Secret Life of the Brain — **General Session Speaker** — Paul Aravich
Pre-K - College teachers — *What Works in Today's Science Classrooms*

Bridging the Gap: Using Technology to Maximize Potential — Jason Robinson
Grades 3 - 12 teachers — *What Works in Today's Science Classrooms*

A New Web Atlas for Exploring Virginia's Rare Insects — Rene' Hypes
Grades 3 - College teachers — *What Works in Today's Science Classrooms*

Tracking Sturgeon in the Classroom with SCUTES — Anne Wright
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Poochies By Design — Kathy Frame
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Genetics: Crazy Traits and Adaptation Survivor — Nathan Olsson
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Using the Identify and Interpret Strategy (I2) — Melissa Csikari
Grades 6 - College teachers — *What Works in Today's Science Classrooms*

Strengthening Learning and Achievement Through the Consider, Contribute, Consult, Revise Strategy (CCCR) — Sherri Story
Grades 6 - College teachers — *What Works in Today's Science Classrooms*

Helping Students Make Sense of Science Through the Scientific Explanation Tool — Suzanne Sikes
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

Inquiry with PASCO — Tysha Sanford
Grades 6 - College teachers — *What Works in Today's Science Classrooms*

This Workshop Sucks! How Many Bivalves DOES It Take to Clean the Bay? — Wayne Gilchrest
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

Sessions are listed on pages 24 - 32.

BIOLOGY – LIFE SCIENCE continued

Low Cost Hands-on Science: Secondary Science Pre-service Teachers Doing Real Science — Jacqueline McDonnough
Grades 9 - 12 teachers — *What Works in Today's Science Classrooms*

Insights and Skills to Improve Lab Skills Through the USA Biology Olympiad — Kathy Frame
Grades 9 - 12 teachers — *Empowering Science Learning Through STEM*

A River Runs Through It! Shifting to an Inquiry-Based Lab Experience — Sarah Melissa Witiak
Grades 9 - College teachers — *What Works in Today's Science Classrooms*

CHEMISTRY

Playtime with Polymers — Eileen Malick
Grades 3 - 5 teachers — *Understanding Environmental Literacy Across the Disciplines*

ChemDemo: Building Connections Between Science Educators — Casey Rogers
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Using Online Simulations to Improve Conceptual Understanding of Science — Monica Murray
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Introducing "Green Chemistry" and Sustainability Through PBL — John Richardson
Grades 6 - College teachers — *Understanding Environmental Literacy Across the Disciplines*

Are Biofuels Worth It? — Heather Groffy-Smith
Grades 9 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Flipping the Chemistry Classroom for Differentiation — Sandra Bennett
Grades 9 - 12 teachers — *What Works in Today's Science Classrooms*

Captivating Chirality! — Patricia Miller
Grades 9 - College teachers — *What Works in Today's Science Classrooms*

EARTH AND SPACE SCIENCE

Fun with Fossils — Denny Casey
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

The Students' Cloud Observations On-Line Project; it's S'COOL — Bonnie Murray
Pre-K - Grade 12 teachers — *Empowering Science Learning Through STEM*

Semi-annual Membership Meeting for Virginia Earth Science Teachers Association (VESTA) — Gale Bartley
Pre-K - College teachers — *What Works in Today's Science Classrooms*

The Chocolate Rock Cycle — Sharon Ferron
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Visualizing Earth Science Data with the Live Access Server — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Earth and Mars: An Atmospheric Perspective — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

NASA's Unique Contributions in STEM — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Experience NASA's Digital Learning NetworkTM — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

NASA Langley Share-a-thon — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Sessions are listed on pages 24 - 32.

EARTH AND SPACE SCIENCE continued

Launch of the New VMNH Adventure Classroom! — Denny Casey
Grades 3 - College teachers — *What Works in Today's Science Classrooms*

EXPERIENCE Geologic History! — Donna Irish
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

MAVEN - Bringing Mars to Your Classroom — Sandra Thornton
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

How to Be Absolutely Sure About Your Relative — Chris Kaznosky
Grades 6 - College teachers — *What Works in Today's Science Classrooms*

Teaching About STEM Careers — Daniel Dickerson
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

EARTH AND SPACE SCIENCE

Using Student-Guided Inquiry Labs to Increase Science Literacy — Paula Nottingham
Grades 6 - College teachers — *What Works in Today's Science Classrooms*

Planetarium Internship - DomeQUEST — Daniel Borick
Grades 9 - 12 teachers — *Empowering Science Learning Through STEM*

The Geology of Virginia CD-ROM for the Web — Jonathan Tso
Grades 9 - 12 teachers — *What Works in Today's Science Classrooms*

Groundwater Withdrawal and Land Subsidence: An NSF-RET Project — Alice Lee
Grades 9 - College teachers — *Empowering Science Learning Through STEM*

Learning Enhanced Through the Nature of Science (LENS) — Joanna Garner
Grades 9 - College teachers — *Understanding Environmental Literacy Across the Disciplines*

ENGINEERING

Tower of Power! — Bill Metz
Pre-K - Grade 2 teachers — *Empowering Science Learning Through STEM*

Gearing Up for Engineering — Wendy Goldfein
Pre-K - Grade 5 teachers — *Empowering Science Learning Through STEM*

ENGINEERING

Integrated STEM Activity to Teach Design Process — Daniel Dickerson
Pre-K - College teachers — *Empowering Science Learning Through STEM*

Using Inquiry Questioning to Scaffold Creativity in a STEM Activity — Stephanie Hathcock
Pre-K - College teachers — *Empowering Science Learning Through STEM*

Earthquake Proof Structures — ***General Session Speaker*** — Joan Harper-Neely
Grades 3 - 5 teachers — *Empowering Science Learning Through STEM*

Heating it Up with Design Briefs — Bill Metz
Grades 3 - 8 teachers — *Empowering Science Learning Through STEM*

STEM, Yes It Can Be Done in Any Clasroom! — Tasmine Poole
Grades 3 - 8 teachers — *Empowering Science Learning Through STEM*

Infusing STEM Education into the K-12 School Environment — Danielle Morgan
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

USING 3D PRINTERS IN A SCIENCE INQUIRY ACTIVITY: Designing and Building Wind Turbines — George Meadows
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Sessions are listed on pages 24 - 32.

ENGINEERING continued

Using STEM to Bridge Disciplines and Grade Levels — Joseph Mahler
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

STEM Robotics: A Collaborative Approach Toward Innovation — ***General Session Speaker*** — Charles Hurd
Grades 3 - College teachers — *Empowering Science Learning Through STEM*

ENVIRONMENTAL SCIENCE

PLANT THE S.T.E.M — ***General Session Speaker*** — Kaleela Thompson
Pre-K - Grade 2 teachers — *Empowering Science Learning Through STEM*

Outdoor Education — Elizabeth Larson
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

Elementary GLOBE StoryBooks: Combining Literacy and Earth Science Skills — Bonnie Murray
Pre-K - Grade 8 teachers — *Understanding Environmental Literacy Across the Disciplines*

Empowering Students to be Environmentally Literate Through Project WET — Page Hutchinson
Pre-K - Grade 8 teachers — *Understanding Environmental Literacy Across the Disciplines*

I've Been to Paradise! — Daniel Lewandowski
Pre-K - Grade 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Sailor for a Day – Integrating Real-world Navy Environmental Stewardship Initiatives into Effective, Inquiry-based STEM Lesson Plans — Glenn Markwith
Pre-K - Grade 12 teachers — *Empowering Science Learning Through STEM*

Using Your Schoolyard as a Science Classroom — Miriam Rushfinn
Pre-K - Grade 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

To Inner Space and Beyond: Ocean Exploration in Your STEM Classroom — Bethany Smith
Pre-K - College teachers — *Empowering Science Learning Through STEM*

Chesapeake Bay Foundation's Education Programs — Cindy Duncan
Pre-K - College teachers — *Understanding Environmental Literacy Across the Disciplines*

Environmental Advocacy Through Self-Produced Literature — Daniel Dickerson
Pre-K - College teachers — *Understanding Environmental Literacy Across the Disciplines*

What's important About Sustainability? The FEEW Nexus(IMHO)? — Jim Disbrow
Pre-K - College teachers — *Understanding Environmental Literacy Across the Disciplines*

Building a 3-D State of Virginia Garden - An Interdisciplinary Approach — Elaine Tholen
Grades 3 - 5 teachers — *Understanding Environmental Literacy Across the Disciplines*

Outdoor Learning Environments' Influence on Science and Writing — Kate Lively
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

How Much is that Tree? — Mary Van Dyke
Grades 3 - 8 teachers — *Understanding Environmental Literacy Across the Disciplines*

Explore the New VMNH Web-based Watershed Resource: "Follow the Rain" — Denny Casey
Grades 3 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Travel the Bay in Every Class — Kathryn Kelchner
Grades 3 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Oil Spill Cleanup Challenge - Environmental Team-based Inquiry Lab — Michael Pratte
Grades 3 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Sessions are listed on pages 24 - 32.

ENVIRONMENTAL SCIENCE

ENVIRONMENTAL SCIENCE continued

How to Design and Implement a Meaningful Watershed Educational Experience (MWEE) — Page Hutchinson
Grades 3 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

SCHEV 5E Lesson Design — Richard Neefe
Grades 3 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Using Tablet Computers: Integration with Geocaching and EarthCaching — Miriam Rushfinn
Grades 3 - College teachers — *What Works in Today's Science Classrooms*

Where in the World Should You Put a Wind Turbine? — Pangle Remy
Grades 3 - College teachers — *Empowering Science Learning Through STEM*

The Toxic Ooze Mystery — Kathy Applebee
Grades 6 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

It's Time to BWET about Wetlands -Connect Students to the Chesapeake Bay Watershed Through STEM — Kristen Shacochis-Brown
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Hands-on Curriculum for a Crowded Planet — Wendy Scott
Grades 6 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

PERFECT Activities Convey Cutting-edge Science — Carol Hopper Brill
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

Discover the Natural Heritage Data Explorer — Rene' Hypes
Grades 6 - College teachers — *None of the above*

Carbon Awareness Partnership: Carbon Dynamics for High School — Eric Hall
Grades 9 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

MATH IN SCIENCE

Using QR Codes in the Science Classroom: Assisting Teacher Immediacy — Jillian Wendt
Grades 9 - 12 teachers — *What Works in Today's Science Classrooms*

Incredible Isotopes! — Patricia Miller
Grades 9 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

MATH IN SCIENCE

How Do We Sustain Science? - S.T.E.A.M. Power! — Susan Bardenhagen
Pre-K - Grade 5 teachers — *Empowering Science Learning Through STEM*

PHYSICS AND PHYSICAL SCIENCE

STEM Pipeline Plumbing — Megan Healy
Pre-K - College teachers — *Empowering Science Learning Through STEM*

"Real Teaching" in the STEM Classroom: A Study of Instructional Practices of STAR Teachers — Clair Berube
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Using Brain-based Learning and STEM to Increase Student Achievement — Nina Kuhn
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

What's the Relevance? Use the M Lens for a Better Answer — Julia Cothron
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

PHYSICS AND PHYSICAL SCIENCE

Invention Convention for Makers & Engineers — Brena Daniels
Pre-K - College teachers — *Empowering Science Learning Through STEM*

Physics is Elementary with VIP — Andrew Jackson
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Sessions are listed on pages 24 - 32.

PHYSICS AND PHYSICAL SCIENCE continued

Fun and Physics with Rube Goldberg — Kristine Mitchell
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Quick and Easy Experiments for the Physical Science Classroom — Craig Doolittle
Grades 3 - 8 teachers — *What Works in Today's Science Classrooms*

The Science Tech of Football — Eileen Malick
Grades 3 - 8 teachers — *Empowering Science Learning Through STEM*

Rockets 2 Racecars: Connecting the STEM of Racing and Aerospace — Bonnie Murray
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Using the Makey Makey in a Science Classroom — George Meadows
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

VIP Share session — Bill Chamblee
Grades 3 - College teachers — *What Works in Today's Science Classrooms*

Learning Physical Science through Engineering — Dara Brinkman
Grades 6 - 8 teachers — *Empowering Science Learning Through STEM*

The Chesapeake Bay Watershed Experience — Phyllis Shepherd
Grades 6 - 8 teachers — *Understanding Environmental Literacy Across the Disciplines*

UVA-JLab Teacher Presentations — Richard Lindgren
Grades 6 - 8 teachers — *Empowering Science Learning Through STEM*

Using Manipulatives to Visualize the Unseen — Jinx Rasmussen
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Car & Ramp: Predict Speed with the CPO Science Data Collector — Nathan Olsson
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Light and Optics: A Series of EnLIGHTening Experiments! — Nathan Olsson
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Chemistry and the Atom: Fun with Atom Building Games! — Nathan Olsson
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Physics Demo and Lab Share Fest — Tony Wayne
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

PhysTEC: Mentoring the Next Generation of Physics Teachers — Brian Utter
Grades 9 - 12 teachers — *None of the above*

My Time for Study Time — Lydia De Jesus
Grades 9 - 12 teachers — *Empowering Science Learning Through STEM*

LR, LC, and LCR Labs for E&M — Bill Chamblee
Grades 9 - College teachers — *What Works in Today's Science Classrooms*

Using the Modeling Method for Teaching Capacitance — Joseph Mahler
Grades 9 - College teachers — *What Works in Today's Science Classrooms*

GENERAL SCIENCE

"Going Batty" - How Animals Respond to Seasonal Change — Julia Wilshire
Pre-K - Grade 2 teachers — *What Works in Today's Science Classrooms*

Sessions are listed on pages 24 - 32.

GENERAL SCIENCE continued

Using Comparisons to Build Conceptual Understanding — Kip Bisignano
Pre-K - Grade 2 teachers — *What Works in Today's Science Classrooms*

Mission STEM: Incorporating Inquiry into Early Childhood Classrooms — Laurie Michnal
Pre-K - Grade 2 teachers — *Empowering Science Learning Through STEM*

Putting the Wonder Back in the Early Childhood Classroom — Leslie Lausten
Pre-K - Grade 2 teachers — *What Works in Today's Science Classrooms*

Poetry and the Nature of Science for Young Learners — Wendy Frazier
Pre-K - Grade 2 teachers — *What Works in Today's Science Classrooms*

VDOE Elementary Science Instruction and Assessment Update — ***VDOE*** — Barbara Young
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

How to Use Your School Yard to Teach the SOLs! — Barbara Adcock
Pre-K - Grade 5 teachers — *Understanding Environmental Literacy Across the Disciplines*

GENERAL SCIENCE

Discourse, Well of Course! — Diana Yesbeck
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

You Could be the Next Elementary PAEMST Awardee — ***VDOE*** — Eric Rhoades
Pre-K - Grade 5 teachers — *None of the above*

Fostering Curious Minds - STEM in the Early Elementary Classroom — Joel Fravel
Pre-K - Grade 5 teachers — *What Works in Today's Science Classrooms*

Using Children's Literature in the Science Classroom — Leslie Swenson
Pre-K - Grade 5 teachers — *None of the above*

Jump into the Garden — Lynn Black
Pre-K - Grade 5 teachers — *Understanding Environmental Literacy Across the Disciplines*

Grow Food in Your Schoolyard — Mary Van Dyke
Pre-K - Grade 5 teachers — *Empowering Science Learning Through STEM*

Differentiation Counts with STEM — Elizabeth Petry
Pre-K - Grade 8 teachers — *What Works in Today's Science Classrooms*

Identifying Quality Inquiry-Based STEM Lessons — Jill Granger
Pre-K - Grade 8 teachers — *What Works in Today's Science Classrooms*

Children's Engineering & STEM — ***General Session Speaker*** — Joan Harper-Neely
Pre-K - Grade 12 teachers — *Empowering Science Learning Through STEM*

Performance that Informs Practice: Developing the Skills to Assess Science Process Skills — Tony Borash
Pre-K - Grade 12 teachers — *What Works in Today's Science Classrooms*

What Are VAST's Online Resources and How Can I Contribute? — Denny Casey
Pre-K - College teachers — *What Works in Today's Science Classrooms*

'Data' is Not a Four-Letter Word — Kelly Minton
Pre-K - College teachers — *What Works in Today's Science Classrooms*

The Professional Portfolio - What Evidence Do I Need? — Melissa Brichacek
Pre-K - College teachers — *None of the above*

Sessions are listed on pages 24 - 32.

GENERAL SCIENCE continued

Teaching Social Justice in the SOL-based Science Classroom — Michael Bentley
Pre-K - College teachers — *None of the above*

What Is So Critical About Thinking? — Tricia Easterling
Pre-K - College teachers — *What Works in Today's Science Classrooms*

Hands-On Inquiry or BUST! — Christina Wade
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Integrating Science in the Upper Grades — Leslie Lausten
Grades 3 - 5 teachers — *What Works in Today's Science Classrooms*

Black Boxes and Foam Mountains: Unlocking the Power of Models — Bill Metz
Grades 3 - 8 teachers — *What Works in Today's Science Classrooms*

Writing Like a Scientist — Bill Metz
Grades 3 - 8 teachers — *What Works in Today's Science Classrooms*

Chasing Severe Weather Across the Curriculum — Heather Mericle-Sherburne
Grades 3 - 8 teachers — *Understanding Environmental Literacy Across the Disciplines*

Learning and Teaching About Classification in Science — Scott Watson
Grades 3 - 8 teachers — *What Works in Today's Science Classrooms*

Elementary Science the VISTA Way... and PAID Professional Development! — Vicky Reid
Grades 3 - 8 teachers — *What Works in Today's Science Classrooms*

Unlocking Potential for Informal Learning — Chuck English
Grades 3 - 12 teachers — *Empowering Science Learning Through STEM*

Differentiation in the Classroom - While Going Paperless! — John "Coach" Brishcar
Grades 3 - 12 teachers — *What Works in Today's Science Classrooms*

Running a Successful School Science Fair — Scott Deane
Grades 3 - 12 teachers — *What Works in Today's Science Classrooms*

Safety and the Science Teacher: Covering Your Assets — Andrew Jackson
Grades 3 - College teachers — *None of the above*

Integrate iPad® and other Mobile Devices with Vernier Technology — Patty Rourke
Grades 3 - College teachers — *Empowering Science Learning Through STEM*

Integrate iPad® and BYOD with Vernier Technology — Patty Rourke
Grades 3 - College teachers — *Empowering Science Learning Through STEM*

Build Enthusiasm for Science Through Differentiated Instruction — Clint Hubbard
Grades 6 - 8 teachers — *Empowering Science Learning Through STEM*

Using Menus in the classroom — Debra Hicks
Grades 6 - 8 teachers — *What Works in Today's Science Classrooms*

VDOE Science Instruction and Assessment Update - Middle School *VDOE* — Eric Rhoades
Grades 6 - 8 teachers — *None of the above*

Science Songs and Games — Margaret Moberg
Grades 6 - 8 teachers — *What Works in Today's Science Classrooms*

Sessions are listed on pages 24 - 32.

GENERAL SCIENCE continued

STEM 2.0 - Taking It to the Next Level — Rebecca Musso
Grades 6 - 8 teachers — *Empowering Science Learning Through STEM*

Empowering Students to Pose Testable Questions — Todd Anderson
Grades 6 - 8 teachers — *What Works in Today's Science Classrooms*

The World is VAST: Explore with On-line Resources & Data — Anne Mannarino
Grades 6 - 12 teachers — *Understanding Environmental Literacy Across the Disciplines*

Investigating Inquiry: Scaffolding Inquiry Instruction — Brook Whitworth
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Developing a Digital Presence in Your Classroom — Chuck English
Grades 6 - 12 teachers — *Empowering Science Learning Through STEM*

Facilitating Student Centered Learning: What Does It Look Like? — Elizabeth Edmondson
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Using ESL Strategies to Increase Literacy Learning for All Students in the Science Classroom — Jillian Wendt
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

GENERAL SCIENCE

Decreasing Student Misconceptions to Increase Science Literacy — Jillian Wendt
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Direct Versus Constructivist Strategies: Let's Focus on Effectiveness — Julia Cothron
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Classroom Science Research Projects: How About a Brief? — Julia Cothron
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Stop Doing All the Thinking in Your Classroom! — Mollianne Logerwell
Grades 6 - 12 teachers — *What Works in Today's Science Classrooms*

Using Image J in Your classroom — Michele Baird
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

MonarchTeach: An Innovative STEM Teacher Preparation Program — Stephen Burgin
Grades 6 - College teachers — *Empowering Science Learning Through STEM*

Increasing Rigor with Technology — David Slykhuis
Grades 9 - 12 teachers — *Empowering Science Learning Through STEM*

VDOE Science Instruction and Assessment Update - High School *VDOE* — Eric Rhoades
Grades 9 - 12 teachers — *What Works in Today's Science Classrooms*

GEOTREK-12: Teaching Teachers Geospatial Technology, Summer 2013 Workshop Overview — Scott Bellows
Grades 9 - 12 teachers — *Empowering Science Learning Through STEM*

Engaging Your High School Students in Authentic Biofuels Research — Stephen Burgin
Grades 9 - College teachers — *Empowering Science Learning Through STEM*

VAST Colleges and Universities Committee Share Session — Suzanne Donnelly
Grades 9 - College teachers — *What Works in Today's Science Classrooms*

*If a session was submitted after July 15, it will NOT be included in the above listing, but may still be accepted, space permitting.

Sessions are listed on pages 24 - 32.

What Did You Do at the VAST PDI Last Year?

Second Grade Teacher Turns Cooper Cougars into GLOBE Kids

Shirley Sypolt, VAST President-elect

Students here at Cooper Elementary Magnet School in Hampton, Va., are on their way to collecting and sharing science data with other kids around the world. It all started last fall when I discovered one of GLOBE's free educational resources, a series of children's storybooks that introduce Earth system science concepts to elementary students, while attending a concurrent session at last year's Virginia Association of Science Teacher (VAST)'s Professional Development Institute.

2nd grade student group planning & designing

While at the PDI, I walked into a presentation where Elementary GLOBE storybooks were being introduced by Jessica Taylor, a GLOBE coordinator at NASA's Langley Research Center in Hampton Virginia. NASA is an official partner of GLOBE, which is a worldwide hands-on science and education program.

The information Jessica was sharing with us instantly caught my attention. While I was sitting there listening to the presentation, I was quickly writing notes on how I could use these books at my school. I was very impressed with how colorful and "kid friendly" these storybooks were and I especially liked the fact that they had excellent science content presented through literature and that they would be very easy to align with Virginia's SOLs.

These storybooks cover science topics that correlate to National Science Education Standards, National Geography Standards, and the Principles and Standards for School Mathematics for kindergarten through fifth grade. The story plots range from studying soil to studying clouds, and teachers are encouraged to read the story with their students and complete the science activities suggested in the books; the activities provided through this program required no additional resources. This program is a great way to show that literacy and science skills complement each other. For example, it's important to teach students about the idea of cause and effect in terms of reading comprehension and in science we are also looking at cause and effect, just in a different context. In both areas, these storybooks are ideal in order to inspire inquiry and investigation.

I saw the potential in this book series and arranged to have a class set of these science storybooks made available for each grade level at my school. The books were printed by NASA and teacher supplies were funded through a Hampton Education Foundation grant through Hampton City Schools. With full support from our principal, Sean Holleran, we were able to officially introduce our teachers to Elementary GLOBE at a special faculty meeting with help from Jessica Taylor from NASA. We began our introduction of the Elementary GLOBE books into our classrooms near the end of the school year, following our final Benchmark and SOL testing. All of our teachers did an amazing job getting active with this project and the students loved it. Cooper teachers went beyond the storybooks and activities provided, by requiring their students to complete a STEM related project.

I currently teach second grade, and after I read my second graders our storybook about water monitoring (Discoveries at Willow Creek), the students decided they wanted to study a tributary of Tide Mill Creek that borders our school grounds. First, I told the students that their GLOBE activity/ STEM challenge was to design and build water-collecting containers to be used at our school's creek site. To help the students with background information, I took these students on a walking field trip out to explore the creek and to make observations about what they would need to be able to do in order to collect a sample of creek water safely. Once we returned to the classroom, students worked in cooperative groups to design, brainstorm, and build their containers. Various types of recycled containers (plastic, cardboard, etc.) and different types of string and yarn were made available to student teams to select from. After all group containers were completed each group presented their design idea to their classmates. With lots of cheerful banter, the students followed me back out to the creek to "test" their containers. Because we do not have a safe access to this body of water, the students had to figure out how to throw their containers over a chain link fence down into the water and be able to pull it back up; most of the second graders had to stand on their tiptoes to get their container over the fence. During this testing session, some groups realized that their container ropes were too short, others had containers that

Ready to test their water collection container!

floated but did not collect water, but most groups had containers that collected and retained water; the added weight of the water was also a challenge for the second graders. This is where teamwork really helped. Students came back to the classroom, discussed their results, and worked on ways to "improve" their containers. Students collected extra recycling materials to take home to build additional water containers with their parents, with the intent of coming back during the summer to test their new designs.

Other Elementary GLOBE projects included creating a 3-D mural representing the different types of clouds by fourth grade students, designing and constructing scoops for collecting and studying soil by third graders, and even staging a play to act out various processes on Earth by our fifth graders.

Elementary GLOBE Storybooks

K	The Mystery of the Missing Hummingbirds
1st	The Mystery of the Missing Hummingbirds
2nd	Discoveries at Willow Creek
3rd	The Scoop on Soils
4th	Do You Know That Clouds Have Names?
5th	All About Earth/ Our World on Stage

* this is how the GLOBE storybooks were assigned for all of our grade levels

The goal of this project was to use the GLOBE storybooks as a springboard for introducing all teachers at our school to these teacher resources and to ease them into learning about GLOBE. Now that we are all comfortable with the books we plan to work with Jessica at NASA to get our teachers trained in some of the GLOBE protocols. I would like our teachers to become trained in the atmospheric, soil and water protocols.

Students presenting their design to their classmates

Then our teachers will train the students how to follow the protocols for collecting the data and 3rd, 4th, and 5th grade student teams will partner with K, 1st, and 2nd grade student teams to go outside and follow the protocols to collect "real." This data that will be brought back to the classrooms and entered into the GLOBE international data repository, where other students and scientists around the world will have access to this research data.

Shirley Sypolt, Cooper Elementary Magnet School,
Hampton City Schools
2013 President-Elect of VAST, National Board Certified,
and a Presidential Science Awardee

GLOBE storybooks are freely available online in multiple languages, and they are available for print or for digital slideshows. For information on the storybooks and related lessons and activities, visit: http://www.globe.gov/

"How Science Ruined English Class"

Poetry and forensic science two subjects that most people do not associate with one another, but marrying the two was just another day in the classroom for two teachers at Menchville High School.

Ashley Chassard, AP Biology, Forensics and Genetics, Menchville High School in Newport News, VA.
Susan Traner, AP Literature and 11th grade English, Menchville High School in Newport News, VA.

It started with a conversation during a fire drill. Susan Traner, the 12th grade AP English teacher, said to me, "your forensic science class is ruining my life." She explained that her AP classes had read "Between the World and Me" by Richard Wright and had expected the class discussions to be focused on symbolism, imagery, and the author's point of view, but this year students were asking about the crime scene. The students were questioning the validity of the author's account based upon the evidence presented at the crime scene: pristine white bones at fresh crime scene just did not make sense. The student's questions were great, for a science class, but tended to derail the poetic discussion in an English class. We decided to develop a lesson plan for my Forensic Science class using the Richard Wright poem and then co-taught the lesson.

We approached the lesson seeking to accomplish three main objectives. First, we wanted the students to discuss the factors that could influence an eye witness account. Second, the students were to identify inconsistencies and inaccuracies in the crime scene and Wright's interpretation of the events in the poem. Third, the students were to interpret the poem's purpose, point of view, and historical context.

As the students walked into the classroom, they were met with the grisly crime scene described in the poem. Each student was given a sticky note and asked to write one factor that could influence an eye witness' account of an event. To help guide the students, we gave them this example: "you are at a party, a fight breaks out, and a person is stabbed." The students were then asked what could influence their interpretation of the event. Students gave answers such as alcohol and drugs, position in the room and, lighting. Some students identified that their interpretation of the events could depend on their relationship with the victim or assailant. If the victim was their friend, then they were sympathetic with the victim regardless of the victim's participation in the fight. If the assailant was their friend, then the victim was seen as the aggressor and the assailant was just defending himself. They made the connection as to how relationships and personal experiences can create bias in the interpretation of events and evidence.

At this point, we brought the class to front of the room to stand in a large semi-circle around the crime scene while Susan read the first nine lines of the poem with the students. The graphic nature of the scene in front of them made the poem vivid and real to the students. She asked the students, "What is the evidence telling us? What do we know?" We recorded the students' answers on the white board. Then we asked, "From the evidence at the scene, what could have happened." Students gave many answers but it wasn't until they noticed the tar and feathers and the "lingering smell of gasoline" in the poem that the discussion came to life. Susan prompted the students to take into

account the life story of Richard Wright. He was a black writer who grew up in the Deep South during the early 1900's. With this simple information, the students began discussing Jim Crow era treatment of blacks and determined, based on the physical evidence present, that a lynching probably had occurred.

In the next half of the poem, the author places himself in the position of the victim and relives what he deems as the events leading up to the victim's death. The students were asked to compare the crime scene with the author's "eye witness" account. Does the evidence support the author's account? Are there inconsistencies? If so, what are they and why are they inconsistent with the evidence? The students took over the white board and began to record their discussions. Some were very methodical and wanted to process the crime scene. They wanted to know if the blood on the pants was actually blood and if so, was it human blood? They were ready to break out the Kastle-Meyer solution and test for blood. Another group wanted to collect cigarette and cigar butts for DNA testing. Others noticed that there only one shoe, so they knew that there could be a secondary crime scene.

The biggest question the students grappled with was the state of the bones. They were bothered by clean, white bones after a fire that happened the previous night. They did not believe that the fire could burn hot enough and long enough for the bones to be clean, let alone white. They asked questions about the temperatures at which tar melts and boils. They wanted to know how gasoline would act as an accelerant with the body covered in tar. The students speculated that the gasoline would burn off quickly but the tar would continue to burn. They came to the conclusion that the fire would put itself out long before the body was reduced to bones.

Susan once again pulled the discussion back to the poem. She reminded the class about what we had started with: "what influences an eye witness' account." She talked about the connection between the task of a reader and forensic scientist: each is concerned about allowing the evidence to speak. In this case, Wright has an emotional response he wants from the reader. There is symbolic significant that white bones offers the reader that charred remains would not. In both realms, observers have to analyze not just the details but also why they are there. Sometimes they are accidental, but sometimes they are the work of a masterful artist or serial killer.

In the end, the students were sent back to their lab tables to design an experiment to test one of the questions proposed during the class discussion. Most students chose to design an experiment to determine if conditions like the ones presented in the poem could produce clean, white bones. All experimental designs were required to have a problem, hypothesis supported by research, independent variable, dependent variable, control, constants, materials, and an experimental method for executing the controlled experiment.

We didn't wait for another fire drill to start planning other ways we can connect our two subjects. "A Rose for Emily": a gruesome tale of murder and betrayal in a small town? "Rappachini's Daughter": the creation of new poisonous plants and the inoculation of a small child growing up around them? Anything by Poe? Next year's AP English class is in for a treat, as they walk in on the crime scene to see a science and English teacher standing together nearby with mysterious smiles on their faces.

About the authors:

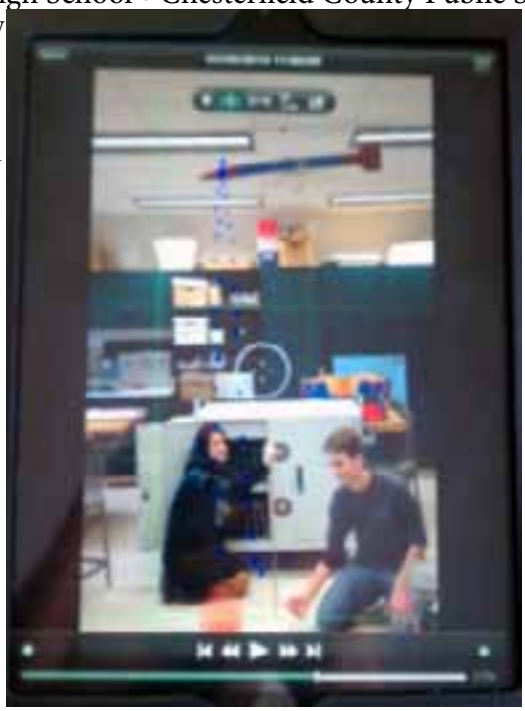
Ashley Chassard teaches AP Biology, Forensics and Genetics at Menchville High School in Newport News, VA. She graduated from the University of Mary Washington with a BS in Biology and Regent University with a Master's in Education. She is currently taking graduate course work in Forensic Science from the University of Florida. She has been teaching for eight years and lives with her husband and two children in Newport News.

Susan Traner teaches AP Literature and eleventh grade English and is the department lead at Menchville High School in Newport News, VA. She graduated from Christopher Newport University with a BA in English and a Master's in Teaching English/Language Arts. She just completed her recertification for her National Board certification and adjuncts at Christopher Newport University occasionally. She has been teaching for fifteen years and lives with her husband and son in Yorktown.

See Poem *Between the World and Me* by Richard Wright on the web: http://www.mun.ca/educ/faculty/hammett/between.htm or http://edhelper.com/poetry/Between_the_World_and_Me_by_Richard_Wright.htm

What Can a Tablet Do in a Physics Classroom:
A VAST Mini-grant Project

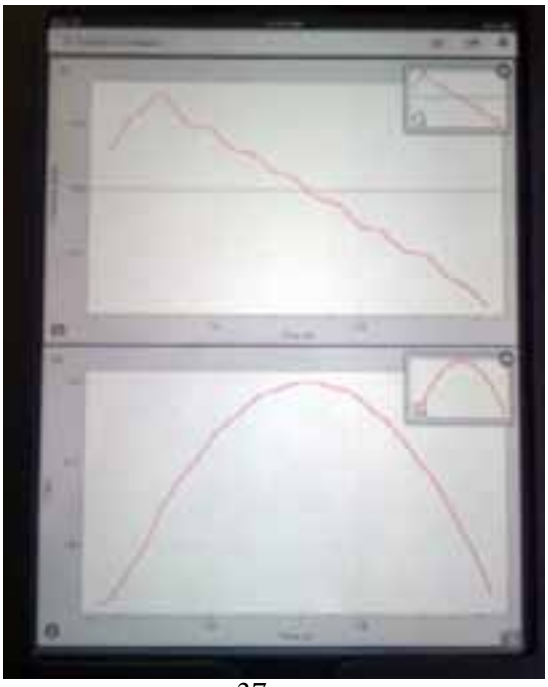
By Timothy Couillard
James River High School • Chesterfield County Public Schools



For the past couple years, I've wondered how the technology of tablet computers could make a difference in my classroom. There has always been much talk about the pros and cons of the next big thing in educational technology. The longer I teach, the more I realize that there is no one gadget is going to be a game changer. But I also think that we owe it to our students and ourselves to continue to tinker, play, and evaluate these tools and to continue to think about what comes next. I think the mindset of play or exploration is fundamental to that of science education and is one that should be nurtured. Thanks to a mini-grant from the Virginia Association of Science Teachers, I have been able to explore tablet use in my classroom and share with you my experiences with tablet computers in physics.

Scope

Before this, I have never used a tablet beyond a few minutes here and there with one I borrowed from a friend. But with so much talk in our school of laptops vs. tablets, tablet labs, and bring-your-own-device (BYOD) programs, I felt that it was important to understand the strengths and limitations of tablet devices. The scope of this project was to see what one could do with a single tablet computer in a classroom and to get a sense for what could be achieved by scaling up to a classroom with multiple tablets. Not being person who travels in the Apple/iOS universe (our school is all PCs, and I don't have an iPhone), I chose an iPad for this experience. For me it did take some time to understand how to navigate the iOS world, but I am now much more comfortable in it.



Favorite Apps

First, let me say that I've been a user of Vernier probeware for years, so naturally I gravitated towards their Video Physics and Graphical Analysis apps. Both have a whole variety of application in physics, some of which I will touch upon later. Wolfram Alpha has been another tool that has allowed us to tackle some types of issues in physics that we would have ignored (like the effects of drag on falling objects) for lack of the tools to analyze. If you like to give your students verbal feedback, there are a variety of simple apps like iTalk, that allow you to make quick voice notes and email them to yourself or directly to students. This year our county implemented a web-based blending learning platform called Edmodo. The Edmodo app on the tablet is yet another tool to help integrate the live classroom experience with the digital one.

One kind of app that I think will make a big impact is the web-based organizational tool; EverNote is one such example. Some teachers have experimented with classwide organizational systems built around it. I have former students back from college reporting that they take all their class notes on a tablet, and EverNote helps them organize, share, and cross-reference all their notes. EverNote has been a huge help to me in bookmarking and collecting all the rich content I find on the web that I can simply tag for later and share with my students.

Video Analysis

The most versatile app in classroom tablet use for me this year was the ability to take video and either analyze it on the fly with Video Physics or download using email or a file sharing program (like DropBox) to share with the class on other computers.

We used this in our annual physics pumpkin drop, our big autumn introduction to accelerated motion. Our pumpkin drop is essentially a supersized egg drop where student must design a container to save a pumpkin as it plunges off the back of our football stadium bleachers. Using the tablet, students were able to video the fall of each of their pumpkin containers and take it back to the lab where they used video analysis software to study the position vs. time and velocity vs. time graphs. Other applications for this type of video capture include modeling projectile motion as well as momentum conservation in collision experiments.

Whiteboard Discussions

The other common classroom use was to capture images of student whiteboarding sessions. Students in my class are asked to present their lab results, experimental design, graphs, etc. on large 2'x3' dry erase boards. The dry erase quality of the medium make it perfect for formative assessment as well as discussing

student mistakes in a nonthreatening discussion we call a "board meeting". The one drawback to whiteboards is their temporary nature. They rarely survive class to class. Using the iPad's camera, it was easy to capture snapshots of student whiteboards and then upload them to Edmodo where we could access them later as part of class recap, further class discussion, other student uses.

Drawbacks

While the use of a tablet has been positive overall, there are some issues of which to be mindful. These are unique to Apple's iOS operating system and may not apply to other tablets. One important issue to be aware of is the lack of support for websites and simulations using Flash. The iPad does not support Flash plug-ins and this may cause certain features to simply not appear on the tablet version of a particular website. The biggest example of this for me was the use of physics simulations done using Flash like those on the Physicsclassroom.com and the University of Colorado's PhET website. There are workaround apps for using flash simulation on iOS, but it is not the seamless process one would hope for.

Networking and Projection

The other issue I found was how well the iPad plays with the rest of your schools' instructional technology infrastructure. Some schools may already be Apple friendly, but for me it was not the case. Our IT department outlined the fact that there are some challenges in integrating Apple's content (iTunesU and the AppStore) with the network safeguards already in place in our county's network.

Also, projecting directly from an iPad screen to a project was not as easy as one would hope since Apple wants you to use their AppleTV box to do this, and, again, it is a question of integration with the rest of your school and school divisions' technology plans. As before, workaround software exists but it is not as integrated as I wish it were.

Overall Impressions

While I think there is a home for tablets in the science classroom, I would think very carefully about what your instructional goals are and about all the available options. (I still think the most important "technology" in my classroom is the $2 poster-sized dry erase boards we use every week.) If you are looking for student to create digital content there may be better solutions. For example, for students or teachers to create any significant of content, a keyboard is almost a necessity. And if you buy a keyboard for a tablet it begs the question why didn't you purchase a laptop instead of a tablet? One interesting thing that crept up on me throughout this is that I still prefer working on a laptop. Tablets' strength lie in the way they can be used to interact/consume digital content on a one-to-one basis. They may not be as relevant in a more interactive classroom. And, while the promise of digitally integrated textbooks is extremely tantalizing, I think that is a promise that has yet to be realized. Like so many other classroom tools, tablets will have their role to play with their strengths and limitations.

Got an idea for a mini-grant?

Thanks again to the Virginia Association of Science Teachers for supporting this project. If you have an idea for a classroom project, VAST supports teacher and student projects every year using their mini-grant program.

For more details, see **http://www.vast.org/grants.html.**

VAST Mini-grant: Outdoor Education Project

By Elizabeth Larson
Morningside Elementary School, Roanoke, VA

With the generous funding provided by the VAST Mini-grant: Outdoor Education Project, I was able to create exploration kits that contained many items that facilitated my students' interaction with and understanding of our natural world. With these kits, students had everything they needed to pursue unique and exciting scientific concepts that they otherwise would not have been able to explore. The kits were essential not just for usage outside the classroom but inside as well, and in the school's Science Club, which I teach, too.

The exploration kits contained tape measurers, thermometers, compasses, petri dishes, various-sized plastic bags for specimen collection, magnifying glasses, clipboards, notebooks, and mechanical pencils. There were also many shared items such as buckets, microscopes, mineral and gem samples, bug boxes, and a number of field guides used to identify plant and insect specimens and other wildlife encountered in the various habitats we were able to explore, including the stream and trails at Fishburn Park in Roanoke, VA. With the items in the kits, the students had the tools with which to interact with their natural surroundings.

Getting outdoors made science come alive for the students. Many of them had never been on a hike or set foot in a stream before. These students were usually the first to gather samples of leaves, soil, and insects, and the first to get into the stream to explore the local aquatic habitat. They had as much interest in identifying and logging their findings as they did locating them. Their enthusiasm was boundless.

The kits proved to be a great resource in the school yard and in the school's neighborhood, too. We conducted cloud-identifying walks, performed experiments with states of matter and paper airplanes, and performed conservation activities. Back in the classroom we were able to examine our findings.

Science is the subject best suited to experiments and applications. The exploration kits I was able to create with the funds from the VAST Mini-grant: Outdoor Education Project afforded students the chance to engage with the natural world through science. Textbooks and classroom activities can only do so much; to get the message of science across to students, hands-on interaction with nature was necessary. The exploration kits were an invaluable tool in this approach.

VAST Mini-grant Project : Online Homework in Physics

By Lydia De Jesus
Stonewall Jackson High School - PWCS

I just completed my 3rd year as a Physics teacher and still have many questions to sort out. What is my homework policy? Should students complete a written report for each lab? How should I deal with students that are frequently absent? Alas, just like a scientist, I should change a single variable at a time.

It became clear at the end of last year that although efforts were made to emphasize inquiry and collaboration by incorporating elements of modeling instruction, there was a gap in individual feedback and support. Tutoring was offered after school, but most of my students pursue other interests within school - such as sports or music - or have work commitments that present a scheduling conflict with tutoring hours. Some of them just need the time to apply concepts at their own pace - with limited or extensive prompts, as needed. Once they started lagging behind, their contributions and participation decrease, limiting the momentum of the course. I needed to find a way for them to have feedback on their homework even if they were not able to attend tutoring.

With support from a VAST teacher grant, I was able to start a project for using online homework and in turn increase the use of our textbook as a reference. The grant covered the cost of account registrations for 2 groups of students. The commercial system selected included problems from our textbook and assignments were formatted to allow up to 3 submissions before the final score was counted. The system also assists with record keeping to determine the need for reinforcement or differentiation. Together we went through the period of learning to use the system and made adjustments along the way. I do say "together" because student passwords had to be tested just as much as I had to reset due dates and omit questions based on changes in the timeline of the lesson. A total of 11 assignments were completed online, in addition to the pre- and post-assessments for Mechanics. Some setbacks were overcome, and others persisted thru the year causing a high incidence of missing assignments. The first obstacle was access, in a broad sense. A number of students did not have internet access at home and could not stay after school. Others did not have time for homework, even if it was accessible. Most students have cellphones with a data plan but they use their phones mainly for social networking; Facebook, texting, or checking email. They would not consider using their phones as an option for the account because of the font size in the small screen.

My interpretation of feedback seemed different than theirs. Some expressed frustration at having a question marked wring but not knowing how to fix it. Their first reaction was to adjust the significant figures or round up the amount and resubmit. Others accessed the assignment but found it too challenging and did not submit a response.

Although the project did not seem to be successful this time, I still consider that it was worth a try. I now have one less question to sort out since deciding that homework is useful only when the student is able to do the work independently. The process of planning instruction must include trying new tools or strategies. Next time we implement the use of online homework I will be ready to train students through all the features in the system before their first assignment and I am able to make seamless adjustments to assignments. I have also found that a critical part of planning is to consider your students; their resources and support structures before implementing technology requirements outside the classroom.

I would like to express my gratitude to VAST for continuously providing teachers opportunities to test new ways to engage students and strive for better understanding of our content areas.

Encourage New Science Teachers by Supporting the Eduware "First Timers" Awards!

Your contribution to the Eduware "First Timers" Awards Endowment for excellence in science education will make a difference. VAST hopes to honor and support those whose accomplishments enhance science education. A donation from Bill Stevens of Eduware, Inc., has made it possible for VAST to award to new teachers the cost of the registration to a VAST PDI. By contributing to these efforts, you are supporting the attendance of new, vibrant members to our professional development institute, (PDI). This fund supports those PDI registrations from teachers who have three years of experience or less.

In order to increase the endowment's principle, we need your support for this program. VAST members and non-members may make a voluntary pledge to the endowment. Together we can all make a difference by helping to support the expenses of the new educators so that they may continue in the field.

Please make a pledge today. This is just one way to support new science educators and quality science education for years to come. VAST is a 501c3 organization and is eligible to receive tax exempt donations.

To make a tax-deductable contribution please send your donation directly to the treasurer, Jimmy Johnson at :
Mr. Jimmy Johnson, • 12141 Winns Church Rd, • Glen Allen, VA, 23059
and make your check payable to VAST. Please let Jimmy know that your check is a contribution for the "First Timers Award Endowment". Thank you!!!

Teachers Across Virginia Experiment with Teaching Science This Summer

Local elementary teachers had a unique opportunity to help shape the future of science education across Virginia … and beyond. In July, nearly 120 elementary teachers gathered on the campuses of four Virginia universities to participate in the VISTA four-week institute designed to shift science instruction from the traditional teacher-led classroom to a hands-on, problem-based learning lab. The VISTA elementary science institute offers teacher professional development to help create a community of best practices for science education from kindergarten through college.

"This project is about taking a systematic approach to improving how science is taught – and learned," says principal investigator Donna R. Sterling, professor of science education at George Mason University, the lead institution on the project. "There is a body of research that shows the inquiry-based, problem-solving approach improves student learning. The VISTA project is intended to validate that research and further inform the national standard of practice."

The institutes, now held at four sites across the state, have served more than 150 teachers since 2011. The implementation sites include George Mason University, William & Mary, Virginia Commonwealth University, and Virginia Tech.

The institutes include a two-week, embedded camp for high-needs students from local schools, allowing teachers to practice the hands-on approach themselves in a supportive environment before implementing it in their classrooms this school year.

ENERGY CAMP

The institutes begin with teaching how to present a specific problem to students and how to offer a scenario to engage students in a process to solve it. This year, the problem focuses on the impacts of energy extraction, production and use, asking such questions as "How can Virginia become energy independent by 2020?"

Teams of teachers created problems for students to investigate and solve throughout a 10-day camp. The students functioned as scientific investigators and explored such topics as regional energy sources, the feasibility and efficiency of each source, and the environmental impact of energy extraction, production and use.

"The camps are models of the inquiry-based learning approach," says co-principal investigator and VCU Department of Teaching and Learning Associate Professor Dr. Jacqueline McDonnough. "We want teachers to experience this method of teaching first-hand, because we know that makes it easier for them to implement it when they return to their own classrooms.

"Plus, it's fun. We want teachers to learn scientific habits of mind and engage students in scientific inquiry," says McDonnough. "This approach supports the science instruction goals of the Virginia Department of Education and also aligns with best practices of the Next Generation Science Standards."

Juanita Jo Matkins is the VISTA co-principal investigator and associate professor of science education at William & Mary. "We created the institutes with the embedded camps to give teachers experience with the inquiry-based learning approach," she said. "We're showing them, not telling them, how to implement problem-based learning in their classrooms.

"We want them to experience the creativity, and fun, of this model of learning," said Matkins.

VISTA coaches support teachers throughout the year, and an evaluation team measures the impact on student achievement with Standards of Learning assessments.

Applications for next year's VISTA Elementary Science Institute will reopen in November. For more information, visit http://vista.gmu.edu/elementary.

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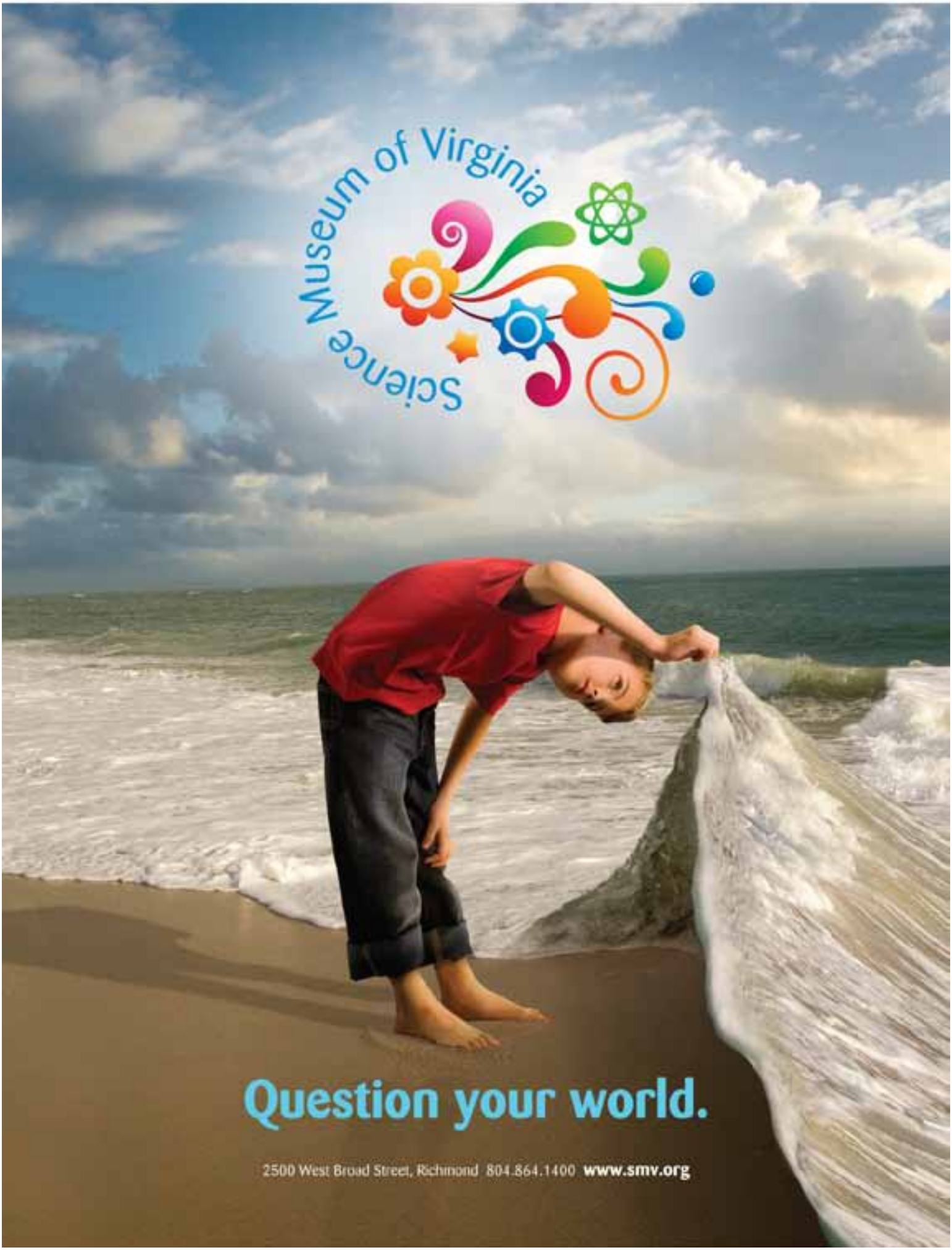
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- A State Chapter of the National Science Teacher's Association

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