



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

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

# The Science Educator

Spring 2017

A Publication of VAST, The Virginia Association of Science Teachers

Vol. 65, No. 4

## VAST Professional Development Institute November 16-18, 2017, Roanoke

**Celebrating 65  
years of fostering  
excellence in  
science education  
in Virginia.  
1952-2017**

# CELEBRATING SCIENCE



Spring has arrived and all anticipate new beginnings as the world around comes alive with new growth.

VAST is renewed as well with a new President, new officers, new board members and a sure sign of spring: the PDI committee has announced plans for the 2017 PDI. Plan now to meet colleagues in Roanoke to participate in professional development designed *“to inspire students, to provide professional learning opportunities, to build partnerships, and finally, to advocate for excellence at the school, local, state and national level.”*

John Kowalski, PDI committee chair, presents the preliminary plans for PDI 2017. In this issue and on the VAST website you will find the general session speakers, the schedule-at-a-glance, and information about the exciting PreCon.

### PreCon:

During the PreCon learn new teaching techniques that make the abstract more concrete for students, give you techniques to encourage students to organize their learning and to spend quality time manipulating new information with Dinah Zike's methods.



**Andrés Ruzo**

**Callan Bentley**

**Kaleela Thompson**

### General Sessions Speakers

During the afternoon of the PreCon, there will be workshops designed for elementary, middle school and secondary levels.

VAST needs you! Share your good ideas with your fellow educators. Submit a concurrent session proposal for the 2017 PDI. Complete information and the on-line session proposal form can be found on the PDI page of the VAST website. The deadline for submitting a proposal is May 1.

[Presenter Proposal Form](#)

John Kowalski

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### VAST Website:

[VAST.Org](http://VAST.Org) or  
<https://vast.wildapricot.org>

## Takeaways from the PDI for the New Year



Welcome to our New Website!  
Check it out if you have not!  
Congratulations to our Communications  
Committee!

[VAST WEB](#)

Now it is your turn, to join a committee.  
Look at the board members and reach out to them  
and get involved.

What is your interest?

What is your expertise?

Our members are the strength around us that  
enables us to grow as a fruitful organization. Help  
plant and sow the seeds. We want to be fresh and  
not stagnant, but you are the one that can make  
that happen.

Until the organization grows from one member  
committees to build strength within our scientific  
community, where people choose to lead. One way  
to do this is for members to recruit new members.  
We want you to send in a presenter proposal,  
and to encourage someone join VAST as a new  
member.

“Original: Until the organization grows from one  
member committees to build strength within our  
scientific community, were people choose to lead.  
One way to do this is recruit your membership to  
send a proposal in or have someone join VAST as a  
new member. “

Be visible and make your involvement one of a  
life-time.

Join! Join! Join!

*Susan Booth, Eds*

**Executive Director**

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*Shirley Sypolt*  
VAST President 2017



## **We are Celebrating Science!** **at the** **2017 VAST PDI** *(Professional Development Institute)*

The mission of the Virginia Association of Science Teachers (VAST) is to: inspire students, provide professional learning opportunities, build partnerships, and advocate for excellence at the school, local, state and national level.

VAST has a legacy of 65 years and this year we will be “celebrating science” throughout our great state of Virginia and we want you to come celebrate with us.

What do you plan to be doing November 16-18, 2017? Plan to join us at the Hotel Roanoke!

We have fantastic speakers lined up, we will be celebrating the Centennial of the NASA Langley Research Center, and we will be holding our 2nd ***Elementary Extravaganza!***

1. **Check out our new web site: [vast.org](http://vast.org)** and have your students participate in our statewide student art contest. The winning entry may be featured on the cover of our PDI Booklet.
2. Sign-up now for a **Pre-Conference Short Course** and/or a **Pre-Conference Workshop**.
3. **Showcase your “most awesome science lesson or activity”** at our November 2017 PDI (Professional Development Institute) by registering as a concurrent session presenter.
4. **Find the time to share your thoughts** and/or great science lessons, stories, and/or adventures with our newsletter editor Jean Foss at [newsletter@vast.org](mailto:newsletter@vast.org).
5. **Consider giving a “gift VAST membership” (\$25)** to a friend or a colleague in 2017. To do this, contact our treasurer Matt Scott at [treasurer@vast.org](mailto:treasurer@vast.org).

***Come celebrate science with us!***

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

*Shirley Sypolt*, Vast President 2017

**PreCon**



**Sponsored  
by Donna  
Sterling  
Institute.**

## **Celebrating Science Success for All with Dinah Zike Strategies!!**

**Hotel Roanoke and Conference Center  
THURSDAY, November 16, PRE-CONFERENCE  
8:00 am - 3:00 pm**

Preregistration is required. Register online at [www.VAST.org](http://www.VAST.org).

The Sterling Committee is excited to announce the Pre-Conference at the 2017 VAST PDI in Roanoke Virginia, on November 16, 2017 will feature the Dinah Zike strategies for successful science teaching. Please join us at the Hotel Roanoke from 8:30-3. You may register at VAST.org to reserve your place. The cost is \$125 and includes the professional development workshop, book, breakfast and lunch plus a materials packet.

Participants will make three-dimensional interactive graphic organizers that can be used to teach Virginia science curriculum standards. Attention will be paid to vocabulary development, as that is a major hurdle for understanding science concepts for struggling learners, including ELL. The activities presented are appropriate for use before, during, and after science instruction, and they are appropriate for recording basic concepts, observations, investigations, experiments, and assessment. Both independent graphic organizers (manipulatives) and dependent graphic organizers (note-booking strategies) will be featured. Teachers will leave the session with inexpensive activities that can be used immediately with their students.

### **Celebrate Science: Strengthening the 4Cs Using 3-D Interactive Graphic Organizers for Elementary Grades (K-5)**

Join a Dinah Zike Certified Trainer in this fast-paced, hands-on presentation as s/he shares methods for strengthening Critical Thinking, Communication, and Collaboration Skills, while encouraging Creativity. This session will focus on 3-D graphic organizers, Visual Kinesthetic Vocabulary (VKVs) and interactive note booking that can be used for daily grades, group work, projects, and/or study guides. Participants will leave the session with inexpensive, easy to develop strategies that can be incorporated into any science curriculum. Materials packets provided, *Dinah Zike's Big Book of Science*.

### **Celebrate Science: Strengthening the 4 Cs Using 3-D Interactive Graphic Organizers for Middle/High School (6-12)**

Same description as above except the book will be *Notebook Foldables for Spirals, Binders, and Composition Books*.

VAST needs you! Share your good ideas with your fellow educators. Submit a concurrent session proposal for the 2017 PDI. Complete information and the on-line session proposal form can be found on the PDI page of the VAST website. The deadline for submitting a proposal is May 1.

[Presenter Proposal Form](#)

John Kowalski





**Thursday, November 16, 2017**

**Hotel Roanoke and Conference Center**

**THURSDAY PRE-CONFERENCE HANDS-ON WORKSHOPS**

**3:15 pm – 4:45 pm**

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

### **ELEMENTARY WORKSHOP**

#### ***GLOBE Elementary – Making the Science and Literacy Connection with Elementary GLOBE***

Presenters: Tina Harte, Jessica Taylor, NASA

Elementary GLOBE develops literacy through Earth science-based storybooks that engage the natural curiosity of students through a variety of learning activities and science journaling experiences. In the hands-on learning session “Making the Science and Literacy Connection with Elementary GLOBE,” participants will discover how the Elementary GLOBE storybooks can improve student literacy skills while engaging them in science-based learning. The characters within the Elementary GLOBE storybooks actively apply the following science process skills: asking questions, carrying out investigations, and finding answers by collecting, analyzing, and interpreting data about the world around them. The science content within the storybooks introduces students to key science concepts in soil, water, clouds, seasons, aerosols, climate and Earth systems. Participants will be provided with a variety of learning activities, an implementation guide and science journal ideas that they can incorporate within their classrooms to promote the development of literacy skills while tapping into the natural curiosity of their students.

### **MIDDLE SCHOOL WORKSHOP**

#### ***The Role of Reading and Writing in Inquiry-based Middle School Science Instruction***

Presenter: Kip Bisignano, Delta Education

Enhance inquiry in the science classroom through reading and writing activities that complement hands-on science investigations. Scientists use reading and writing to confirm studies, explore applications, and communicate new evidence-based claims. During this session, participants explore energy transfer in a variety of activities and learn a process to embed reading and writing strategies within the context of inquiry-based investigations. Participants will receive resources and materials to begin implementing effective reading and writing strategies during science instruction.

### **HIGH SCHOOL WORKSHOP**

#### ***Environmental Science with Vernier***

Presenter: Jackie Bonneau, Vernier

Learn how to use Vernier technology to study environmental science in the field or in your classroom. Water quality, renewable energy, and other topics from our Investigating Environmental Science through Inquiry and Renewable Energy with Vernier lab books will be performed using LabQuest 2 in this hands-on workshop. Data Sharing with mobile devices and mapping on Logger Pro will be demonstrated. Explore our wide range of tools that promote understanding of environmental science concepts. Vernier will raffle (2) \$50 gift certificates at the end of the workshop. Copies of labs used during the workshop and Vernier catalogs will also be available for attendees to take home.



## JOIN US AT THE DINAH ZIKE ACADEMY!

Explore Our Core Institutes:

- Cross-Curricular Strategies with Foldables
- Notebook Foldables for Differentiation

They both include 22 hours of instruction and leave you prepared to share strategies with others in your district or campus.

**NO PRIOR EXPERIENCE NECESSARY!**

Already familiar with Foldables?



**FOCUS:** Science Interactive Notebooking (EL/MS)

will share strategies and ideas for inferencing; experiments / labs and notebooking; experiences / observations and notebooking.

**There are still open spots for 2017!**

Visit [dinah.com](http://dinah.com) for more information or Call 1-800-99-DINAH to register



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ON THE NEW DINAH.COM!**

**33¢ to 85¢ a page**



**From Early Childhood To High School**

WE HAVE STARTED WITH OUR SCIENCE PRODUCTS AND ARE CURRENTLY UPLOADING MORE SUBJECTS.



**WE ARE A PRE-CONFERENCE AND  
CONFERENCE SPONSOR AT VAST  
SEE YOU THERE!**



# Schedule-at-a-Glance



## Wednesday, November 15, 2017

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

## Thursday, November 16, 2017

Ticketed Dinah Zike Short Courses

7:30 a.m. – 8:00 a.m. Check-in Desk Open  
7:30 a.m. Continental Breakfast  
8:00 a.m.– 3:00 p.m. **Strengthening the 4 Cs Using 3-D Interactive Graphic Organizers for Elementary Grades (K–5)**  
8:00 a.m.– 3:00 p.m. **Strengthening the 4 Cs Using 3-D Interactive Graphic Organizers for Middle/ High School (6–12)**  
12:00 p.m. –1:00 p.m. Lunch  
  
2:30 p.m. – 5:15 p.m. PDI Registration Desk Open

## **Ticketed Pre-Conference Workshops**

3:15 – 4:45 p.m. ***Making the Science and Literacy Connection with Elementary GLOBE (NASA)***  
3:15 – 4:45 p.m. ***The Role of Reading and Writing in Inquiry-based Middle School Science (Delta)***  
3:15 – 4:45 p.m. ***High School Environmental Science with Vernier***

## **PDI Opens**

5:30 p.m. – 6:45 p.m. **General Session I – Welcome to the PDI**  
Keynote Speaker: Andrés Ruza, National Geographic Young Explorer  
***“STEAMY Lessons from the Boiling River of the Amazon”***  
(Door prize giveaway at the end of the session)  
  
7:00 p.m. – 9:00 p.m. Night with the Exhibitors and Meet Your Regional Director  
(Complimentary Snacks) (Cash Bar) (Winners of Exhibitor drawings posted at 8:30 pm)

## Friday, November 17, 2017

7:15 a.m. – 5:15 p.m. Registration Desk Open  
7:30 a.m. Continental Breakfast in the Exhibit Hall  
7:30 a.m. – 10:30 a.m. Exhibit Hall Open (Winners of Exhibitor drawings posted at 5:00 pm)  
8:30 a.m. – 9:30 a.m. Concurrent Session 1  
9:45 a.m. – 10:45 a.m. Concurrent Session 2  
11:00 a.m. – 12:30 p.m. **General Session II- Business Meeting**  
Speakers: Andrés Ruza, National Geographic Young Explorer and  
Kaleela Thompson, college student  
***“The Scientific Journey: How Bugs, Volcanoes and Curiosity Can Change the World”***  
(door prize giveaway at the end of the session)  
12:00 p.m. – 1:30 p.m. Ticketed Lunch  
12:30 p.m. – 5:30 p.m. Exhibit Hall Open (Winners of Exhibitor drawings posted at 5:00 pm)  
1:45 p.m. – 2:45 p.m. Concurrent Session 3  
3:00 p.m. – 4:00 p.m. Concurrent Session 4  
4:15 p.m. – 5:15 p.m. Concurrent Session 5  
6:15 p.m. – 8:15 p.m. Ticketed Dinner/Awards Ceremony (Cash Bar)  
8:30 p.m. – 10:00 p.m. Auction and DJ (Cash Bar)

## Saturday, November 18, 2017

7:30 a.m. – 10:00 a.m. Registration Desk Open  
7:30 a.m. Continental Breakfast in the Exhibit Hall  
7:30 a.m. – 11:30 a.m. Exhibit Hall open (Exhibitor raffle results posted at 8:15 am)  
8:30 a.m. – 9:30 a.m. Concurrent Session 6  
9:45a.m. – 10:45 a.m. Concurrent Session 7  
11:00 a.m. – noon Concurrent Session 8  
noon – 12:30 p.m. Pickup ticketed box lunch on your way into General Session III  
12:30 p.m. – 2:00 p.m. **General Session III – Meet Your New VAST Officers**  
Speaker: Callan Bentley, Northern VA Community College  
***“Astonishing Insights: How Science Helps Us Get Out of Our Heads and See the Real World”***  
(Door prize giveaway at the end of the session)

March 9, 2017

**VAST 2017 Professional Development Institute**  
**“Celebrating Science”**  
**Thursday, November 16, 2017**  
**Thursday Evening General Session Speaker**  
**Andrés Ruzo, National Geographic Young Explorer**



***STEAMy lessons from the Boiling River of the Amazon***

In 2014, National Geographic Explorer Andrés Ruzo gave VAST a sneak-peak into his work at the Boiling River of the Amazon prior to its world-wide release. This year Andrés is back and eager to share exclusive behind-the-scenes updates-- highlighting new experiences and advancements in the scientific work and conservation efforts at this sacred geothermal site. Join us for a journey into the Amazon, that started with a childhood legend, and a spark of curiosity!

Andrés Ruzo is a tri-citizen who grew up among Nicaragua, Peru and Texas -- which helped him see that most of the world's problems are not confined by geographic or cultural borders. While trying to imagine solutions, he realized the way we produce and use energy lies at the root of many of our biggest issues. Combined with his memories of summers on his family's farm on Nicaragua's Casita volcano, playing in the fumarole fields, this prompted him to pursue a PhD in geophysics at SMU, focusing on geothermal studies. He is also a National-Geographic Young Explorer.

Investigating a childhood legend led him to the Shanay-timpishka, the “Boiling River” of the Amazon, and a sacred site to the indigenous tribes, where the water can reach over 95 °C (203 °F). The greatest mystery of this place: How can a “boiling river” exist 700 km (435 miles) from the nearest volcanic center?



**Register for the PDI and  
Your Hotel Room  
Hotel Roanoke, Roanoke, VA**

Online PDI Registration: [Click](#)

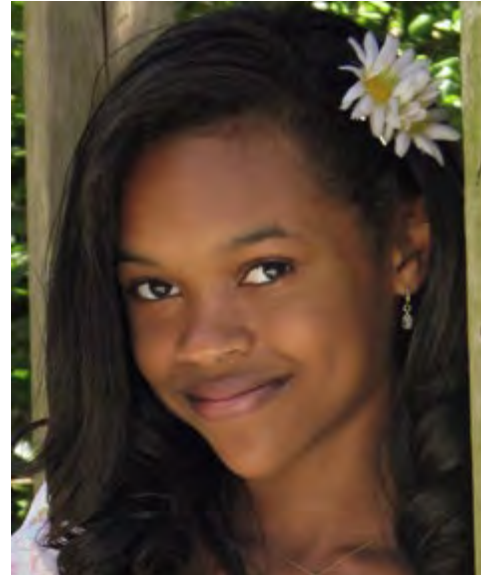
Online Hotel Information: [Click](#)



**VAST 2017 Professional Development Institute**  
**“Celebrating Science”**  
**Friday, November 17, 2017**  
**Friday Evening General Session Speakers**  
**Andrés Ruzo, National Geographic Young Explorer**  
**Kaleela Thompson, Student**



Andrés Ruzo



Kaleela Thompson

***The Scientific Journey:***

***How Bugs, Volcanoes & Curiosity can Change the World***

Truly “Celebrating Science” means acknowledging that there is a personal journey behind every new discovery and research paper. With the goal of exploring how to better connect students and adults to science, this session will explore the “scientific journey” from childhood curiosity to impactful initiatives. This session will open with an interview-style format moderated by National Geographic Explorer, Andrés Ruzo, and featuring budding butterfly expert, Kaleela Thompson. The latter part of the session will be a town hall style discussion where we will learn from each other as VAST educators, identifying tips and tricks that have worked in the classroom to keep students engaged on their scientific journeys.

**Andrés Ruzo** - Geoscientist - A National Geographic Young Explorer, scientist, author, science communicator and educator, who in 2011 became the first geoscientist granted permission to study the sacred Boiling River of the Amazon. He believes that environmental responsibility and economic prosperity can go hand in hand, and uses science to unite both aims.

Read more about Andrés on [page 8](#).

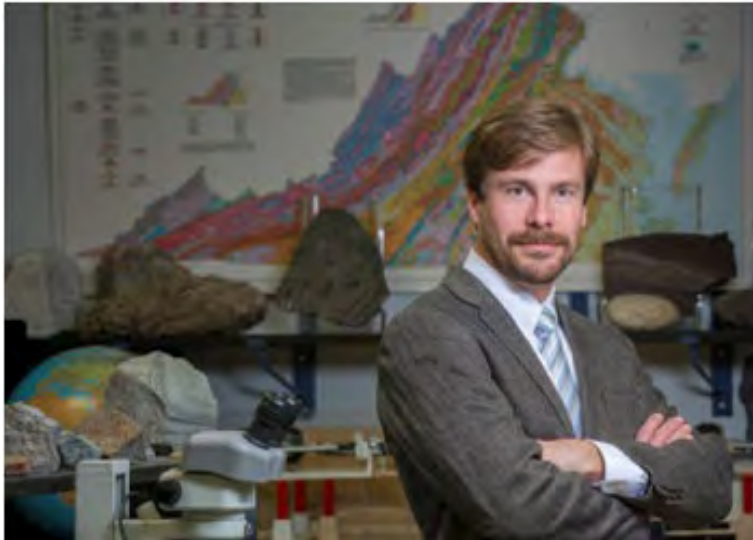
**Kaleela Thompson** is currently a 17-year-old high school senior at Kecoughtan High School in Hampton,

Virginia who plans to attend college this fall. She was the 2013 recipient of the National Science Teachers Association’s Angel Award, which is given annually to honor one female student in grades 5-8, who has a strong connection to science. Kaleela has also won a Prudential President’s Volunteer Service Award and an Office Depot Adopt a Small Business Award (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. As a sixth grader, Kaleela was a published author, with her first book ***Oh Where Oh Where is my Swallowtail***. She won a full scholarship and spent a whole week as a 2013 Teen Ambassador to SeaWorld in San Antonio, Texas.

Kaleela also won a full scholarship to be a 2014 National Geographic Teen Explorer, where she had the opportunity to spend 14 days exploring the rain forests in Brazil. In her free time, Kaleela raises and tags monarch butterflies along with presenting programs at local and state science events; including helping kids make “milkweed seed bombs” and sharing the “***Butterfly Bell***” butterfly habitat that she created (patent pending). She is currently working on a patent for a new way of tagging & tracking migratory species (including butterflies) throughout the United States and Mexico.

**VAST 2017 Professional Development Institute**  
**“Celebrating Science”**  
**Saturday, November 18, 2017**  
**Saturday Afternoon General Session Speaker**

**Callan Bentley, Chancellor’s Commonwealth Professor  
of Geology, Northern Virginia Community College**



***“Astonishing Insights: How Science Helps Us get Out of our Heads and  
See the Real World”***

Science is an unnatural practice with useful results. By following an empirical approach to understanding the natural world, science leads us to conclusions that aren’t intuitively obvious as humans. Our everyday experience is limited: we dwell within a few meters of Earth’s surface, try not to get too cold or too hot, living lives of a few decades’ duration, juggling the responsibilities of keeping ourselves fed, raising our children, and filing our taxes on time. For the average person, it’s hard to find a reason to think about what’s happening fifty kilometers below us, or in another galaxy. It’s difficult to conceive of continents scooting slowly along, or quantum indeterminacy. These aren’t realms our brains evolved to understand. Thank goodness we have science as a way to figure such odd things out! Examples from astronomy, biology, chemistry, Earth science, and physics all show us that we rely on the insights of science to escape the limits of our hunter-gatherer brains and show us the vast, odd, unsettling world as it really is.

Callan Bentley received a BS in geology at the College of William & Mary (1996), an MS in geology from the University of Maryland, College Park (2004), and an MS in Science Education from Montana State University

(2009). He currently is an assistant professor of geology and Chancellor’s Commonwealth Professor of Geology at Northern Virginia Community College’s Annandale campus.

He is a frequent contributor to EARTH magazine and is the author of the geology blog *Mountain Beltway*. Callan was a contributor to five geology and Earth science textbooks published by Pearson and is under contract to write another as lead author. He has become known as an innovator in digital geology, in particular for the use of GigaPan images of outcrops and samples, a technique that allows “virtual field experiences” for distance learners and students with disabilities.

Callan was a 2010 Fellow of the Fine Outreach for Science initiative. The Virginia Community College System named him as the recipient of the 2012 Chancellor’s Award for Teaching Excellence. NOVA honored him with the Presidential Sabbatical Award in 2013. He received the Biggs Award for Geoscience Teaching Excellence from the Geoscience Education Division of the Geological Society of America in 2014. The State Council of Higher Education for Virginia recognized Callan with the Outstanding Faculty Award in 2015.

# Nominations Open for the VAST RISE Awards

VAST RISE Awards are presented to spotlight the excellent work done by science educators across the Commonwealth. They recognize service to science education in the individual's school, school system, and the VAST district in which they work. The awards are grouped in twelve distinct categories:

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

Note: Nominees do NOT need to be a member of VAST.

The number of awards to be given each year will be determined by the Awards Selection Committee based on the qualifications of the nominees. The awardee are invited to attend the VAST PDI and will be recognized at the annual VAST PDI banquet.

Awards Nomination deadline is August 20, 2017.

Applicant does not need to be a VAST member.

Nominations can be made online or by hard copy. Click Awards Form to print out hard copy to submit. Hard copy nominations should be mailed to: **Timothy Couillard, VAST Awards and Grants Committee Chair**

3700 James River Road, Midlothian, VA 23113

or you can email them to him at [awards@vast.org](mailto:awards@vast.org)

Submit your nomination online!

<https://vast.wildapricot.org/Awards>

## VAST Mini-grant Program Accepting Applications

The purpose of the VAST Mini-grant program is to provide seed money for innovative curriculum activities which expand learning opportunities for science students. Team applications are welcome, however one person must be designated as the Project Director. The Project Director must be a member of VAST (dues paid for 2017), must have taught at the elementary or secondary level for a minimum of three years, and must be currently employed as a teacher.

Awardees will be selected by a committee appointed by the VAST President. The committee will be looking for projects that will directly impact student learning in the science classroom. The committee will also evaluate the originality, creativity and cost effectiveness of the proposals. Ideally, the projects that are funded will provide the students with new experiences and make possible new scientific investigations. Preference will be given to persons who have not received prior VAST Mini-grant awards. The selection committee may elect to not make an award if the proposals do not meet the stated criteria. It is anticipated that most awards will be made in the range of \$200-\$500.

Mini-grant funds may be spent for supplies, equipment, printing, and other materials essential to the project. Mini-grant funds are not intended for student travel (field trips) or for the personal remuneration of the grant recipients. All materials will become the property of the school/school system in which the Project Director is employed at the time the grant is awarded.

Due Date: June 1, 2017 The applications are available on the VAST website:

<https://vast.wildapricot.org/Grants>

We look forward to supporting your ideas for enhancing your students' science experience!

**Timothy Couillard, Awards and Grants Committee Chair**



# Notes from Around Virginia

**VAST members are busy across the state providing professional development opportunities for you.**



## **VAST Region V Workshop Performance Based Assessment: A Balanced Approach**

**Date: March 7, 2017**

**Time: 8:30 Am to 3:00 PM**

**Location: James Madison University**



**Keynote Speaker:** John Almarode, Assistant Professor, Early, Elementary & Reading Education, James Madison University.

The event will be held at JMU and will have John Almarode as the keynote presenter. There will be a breakout sessions on how to write rubrics, how to unpack standards, and a DOE update from Anne Peterson. Featuring a lunch session on how VAST can help you professionally. The full schedule may be found at <https://docs.google.com/document/d/1y7qm-kTQId3QCyp9zddbBLQOgoPefuABt6HV4cS6cZ-k/edit?usp=sharing>.

For more information, please contact Tammy Stone ([tstone@rockingham.k12.va.us](mailto:tstone@rockingham.k12.va.us)).



## **Action in VAST Region 4 "Girls + Math + Science = SUCCESS!" Conference**

**Date: Saturday, March 18, 2017**

**Location: Marsteller Middle School in  
Bristow, Virginia.**

The Woodbridge Branch of the American Association of University Women and SPARK, the Education Foundation for Prince William County Public Schools are the co-presenters of this event. This conference will target students in grades 5 through high school, their parents, educators, and our community leaders from both public and private schools in Prince William County, Manassas, and Manassas Park.

For more information, please contact Susan Bardenhagen at [successteamconference@gmail.com](mailto:successteamconference@gmail.com).



## **Action in VAST Region 7 WILD Workshop Saturday, April 22, 2017**

VAST Member Donna Rowlett, Scott County Project WILD facilitator, will hold a day of WILD workshops for educators at Gate City High School on April 22. The day will start at 8AM and end at noon or for those interested, they can stay for lunch speaker (David Kalb, DGIF Elk Biologist) then for a short WILD About Elk workshop. A full agenda is below.

8AM welcome and sign in

8:30 workshops start

Project WILD      Growing Up WILD

Aquatic WILD      Flying WILD

Science and civics

12:00 workshops end. Optional box lunch and keynote on elk restoration

1-3 WILD about Elk workshop for first 35 that sign up

For more information, please contact:

Suzie Gilley at [suzie.gilley@dgif.virginia.gov](mailto:suzie.gilley@dgif.virginia.gov) or

Donna Rowlett [donna.rowlett@scottsschools.com](mailto:donna.rowlett@scottsschools.com).



## **VAST Region 7 Workshop Mark Your Calendar "Wild" Weekend**

**Date: Summer 2017**

**Location: Gate City High School**

**Invited Presenter:** Suzie Gilley Virginia Project WILD Coordinator

Project WILD Educator Trainers will provide Project WILD professional development workshop to educators in their cities and communities in Region 7. During workshops, they will model Project WILD activities and share their extensive knowledge about wildlife and conservation education with a focus on stream activities.

For more information, contact Diane Tomlinson at: [dtomlinso@verizon.net](mailto:dtomlinso@verizon.net)

# GSSV at Alberta's Fairytale Outreach Event

“Wide eyes, big grins and enthusiastic questions” said it best on November 16th, when gifted middle school students from Brunswick, Greenville, Mecklenburg and Nottoway counties visited the Alberta campus of The Governor’s School of Southside Virginia (GSSV) to experience the interdisciplinary focus of melding STEM and humanities disciplines as practiced at GSSV.

**Celeste K. Paynter**  
**Biology/Research Instructor**  
**The Governor’s School of Southside VA**  
**Southside Virginia Community College**  
**Alberta, VA**



On November 16th, gifted middle school students from Brunswick, Greenville, Mecklenburg, and Nottoway visited the Alberta campus of Southside Virginia Community College (SVCC) to enjoy fairy tale adventures. All Governor’s School juniors and seniors banded together to create booths reflecting scientific and mathematical phenomena in their favorite fairy tales.

First, the Science Technology Engineering and Mathematics (STEM) seniors performed an original song and dance entitled “Chem Lab” about chemical reactions and the nature of molecules. Then our guests were invited to roam from booth to booth, participating in the various experiments and activities provided by the Governor’s School of Southside Virginia (GSSV) students. The GSSV Middle School Outreach achieved its goal of providing a leadership opportunity for its students. Teams of students, consisting of both juniors and seniors were tasked with developing an interdisciplinary approach in a theme-based station of their choice. These stations wove math, science, and a fictional character or story into a theme appropriate

for middle school grade-levels. At each theme-based booth, the visiting middle school students engaged in an activity. In developing this activity, the Governor’s School students planned their booth to be attractive and inviting to the visiting middle school guests. The students dressed in costumes relating to their fictional character’s theme and decorated their booths with props, which they constructed. Many middle school students remarked that they enjoyed the activities planned and explored the creative approach to learning experienced at the Governor’s School. A few examples of popular booths include Harry Potter’s Potions Class (experiments with different liquids); How Much Weight Can Your Hair Bear? (Interactive study with actual hair samples to determine if the tale “Rapunzel” is feasible); Run, Cinderella, Run (students solved equations to explore physics behind clock pendulums); It’s Lit (“Hansel and Gretel” themed scavenger hunt to review SOL objectives); “The Wizard of Oz” (students made small-scale rainbows to study their formation by mixing acids and bases); “Tinkerbell” (fluorescent pixie dust); “Guardians of the Galaxy” (students experienced breaking carrots and





marshmallows, the water in which had been frozen by liquid nitrogen; although the students could not handle the liquid nitrogen, they could see its effects); and "Beauty and the Beast" (students participated in Kahoot Quizzes on iPads to explore logic and symbols within the narrative's plot; they observed sodium polyacrylate's effect on water).

The second half of the Fairytale Outreach agenda was the dramatization of a 1904 British literary work, J.M. Barrie's play "Peter Pan". Everyone knows the classic tale of the eternally youthful boy and his adventures in Neverland, but no one had ever seen it performed quite like this! The GSSV seniors dedicated themselves to the challenge of bringing this beloved children's tale to life. Countless hours of hard work were invested by the Humanities seniors in the creation of props and dramatic scenes. STEM seniors also joined in the fun as pirates and Indians in the songs and battles. Some highlights of the production included

musical numbers, magnificent scenery, and "flights" in the Darling nursery. The play opened with an original song "Peter Pan," written by Greenville senior Jalon Bryant. "Lost Boys" (Ruth B) sung by all students concluded the production and was enriched by musical talents of Parkview senior Peyton Brown as pianist and Greenville senior Chris Jones as harp-guitarist. The hand-painted scenery included a Wendy house, the Lost Girls' tree house, waves, and a kite. The largest prop, a 12" x 7" recreation of the pirate ship Jolly Roger, was designed and painted by Blake Jarrett with a little help from classmates. Group effort was the key to a fun and successful performance of Peter Pan for middle school students in the morning and parents and friends that same night. The production proceeds of \$450 were donated to the Virginia Chapter of the Cystic Fibrosis Foundation and St. Jude Children's Research Hospital.

**by Blake Jarrett and Christopher Jones**





# United States Association for Young Physicists Tournaments



Jeff Steele, President, Virginia Instructors of Physics  
Liberty High School  
Physics, AP Physics  
Bedford County Public Schools

On a blustery weekend in February, the United States Association for Young Physicists Tournaments (USAYPT) held the 2016 Young Physicists Tournament at the University of the Sciences in Philadelphia, PA. The tournament has been held annually at rotating locations since 2007 (with the exception of one lost year to a snowpocalypse).

The Virginia connection to USAYPT comes via Greg Jacobs, 2016 VAST R.I.S.E. award winner in physics, who is the President of USAYPT. Greg has invited myself and other Physics educators and professionals in Virginia to be Jurors at the tournament. The tournament is composed of 'Physics Fights', where a teams of students will present solutions to a challenging team from another school on predetermined physics questions that students answer experimentally. This past year's problems, of which there are 4, tasked students with experimentally determining Planck's constant from an LED, determining the phenomena behind and an expression for the frequency of eruption of a geyser, determining the optimal exit velocity for a dart coming out of a blowpipe, and investigating a seemingly impossible phenomenon of beads in a two-sided chamber all jumping over a center wall to one side of the separate chambers (great video of this here: <http://www.sixtysymbols.com/videos/restitution.htm>).

Problems are announced one year in advance, although most teams won't start working on the problems until the new school year begins. Students need to combine experiment with theory in their approach to every problem. The great thing about the whole process is **real science happens**. Students plan and conduct investigations, analyze results, interpret the results within bounds of error (and they do some meaningful error analysis and computations), develop or confirm theory based on the experimental results, and communicate and defend their findings.

The students get the opportunity to interact with their peers from across the globe, as international teams are invited as well. As a juror, I find myself energized by the enthusiasm and passion these young scientists bring to show us and their competing teams. We all have the days where we leave the classroom and worry for the future; go to the tournament and you will be excited for the future instead.

If you teach physics, or sponsor a science club, you should consider competing this next year. The tournament will be at Randolph College, in Lynchburg, in January 2018. Or come as an observer, and be amazed at what these young scientists can do. For more information on the tournament, check out [www.usaypt.org](http://www.usaypt.org).

Jeff Steele, VIP President

## VAST Seeks 2018 Board Nominations



Are you looking for a challenging leadership position that impacts local, state, and national science education? Would you like to serve the association that serves you? The VAST Nominating Committee is currently accepting nominations from the VAST Membership who are in good standing for the following positions on the 2018 VAST Board: President -elect, Secretary, Regional I (Central) Director, Regional III (Northern Neck) Director, Regional V (Valley) Director, and Regional VII (Southwest) Director. Submission deadline is **May 1, 2017**, but why wait? Complete information may be found at <https://vast2016.wildapricot.org/news/4542752> including the link to the nomination form. For more information, please email to [nominations@vast.org](mailto:nominations@vast.org).

Kathy Frame, VAST Past-President



## New Publication Available!

Based on years of experience and prior publications, the NEW two-volume book, ***STEM Research for Students*** is a vital resource for K-12 teachers, higher education faculty, and their students.

In ***Volume One, Understanding Scientific Experimentation, Engineering Design, and Mathematical Relationships***, students acquire the fundamentals and apply them to their coursework:

- Conduct experiments and refine the designs and procedures;
- Construct data tables and graphs, use descriptive statistics, and make sense of an experiment;
- Meet a human need by designing, building, and testing a model;
- Communicate findings through reports and interactions with peers;
- Apply mathematical concepts to data including ratio and proportional relationships, geometry and measurement, algebra, and statistics.

In ***Volume Two, Creating Effective Science Experiments, Engineering Designs, and Mathematical Investigations***, students build upon a strong foundation to create original STEM projects:

- Brainstorm ideas for projects;
- Analyze and address the safety risks involved in a project;
- Use the library and Web to expand understanding and develop a valid idea;
- Conduct a group mini-project which involves readily-available materials in the classroom, on a field site, or at a community location;
- Use algebra to represent patterns and develop mathematical models;
- Use statistics to detect the significance of relationships; and
- Communicate project findings through formal papers, visual presentations, and interactions with peers or judges.

Available in print and eBook formats, ***STEM Research for Students***, may be used:

- As a supplemental text in upper elementary, middle, and senior high classrooms;
- As a core text for introductory research courses and STEM research clubs;
- For pre-service and in-service teachers of science, mathematics, career and technical courses, and gifted students;
- As a resource for all teachers involved with experiments, engineering designs, mathematical investigations, and competitive STEM projects.

For more information or to reserve your copy for adoption consideration, visit:  
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# Pre-Service Teachers Participate in Engineering Design Challenge at the PDI

By Suzanne Donnelly, VAST Colleges & Universities Chair

Forty-two pre-service science teachers gathered at the VAST PDI last November for the annual Colleges and Universities Committee's Specifically for Pre-Service Teachers session. The concurrent session is designed to introduce students to the opportunities available to them through VAST as they launch their teaching careers, as well as give them a space to meet pre-service teachers from other colleges and universities across the state. Students and university supervisors from George Mason University, James Madison University, Longwood University, Lynchburg College, Norfolk State University, University of Virginia, Virginia Commonwealth University, Virginia State University, and The College of William and Mary attended.

Dr. Suzanne Donnelly (Longwood University), Dr. Jenny Sue Flannagan (Regent University), and Dr. Meredith Kier (The College of William and Mary) facilitated the

session. In addition to greetings from several VAST Board members, the students were introduced to the engineering design process through a hands-on Engineering Design Challenge. Working in teams, pre-service teachers were instructed to build a vehicle that is powered exclusively by air. Participants were given 30 minutes to complete their designs, and they only had access to straws, paper clips, paper, and tape, and Life Savers. "Our goal with the engineering task was to model for the students how research in science leads to innovation in engineering. Watching the students use their knowledge of motion to design a car that was moved by air was amazing," Flannagan said.



Each group let its creativity shine through during the challenge, and the spectrum of unique vehicles was impressive! Cultivating high quality science teachers is at the forefront of VAST's mission, and we look forward to seeing our students at the PDI next year.



Using the power of media to inspire our community to value science and understand its importance to our future

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# Growing Trees and Young Minds with Dominion's Project Plant It!

By Suyapa Marquez, Senior Community Affairs Representative



**Goochland Arbor Day Event**



**Online Learning**

Each year, **Dominion's Project Plant It!** finds fresh ways to educate children about the role of trees in the ecosystem. The program, which began in 2007 in the Richmond region, is now available in 13 states where Dominion conducts business. Four new states in the western U.S. were added in 2017 as a result of Dominion's recent merger with Questar Corporation – Colorado, Idaho, Utah and Wyoming.

A hallmark of the program – and its most distinguishing attribute – is the distribution of a free redbud tree seedling to all participants. The seedlings are shipped from the Arbor Day Foundation, a longtime partner with Dominion's Project Plant It!, for arrival prior to Arbor Day. About 50,000 children are enrolled in the program this year.

Dominion expanded enrollment to educators and group leaders who work with children of all ages and grade levels. This enables scout troops, church and civic groups, homeschools, preschools, environment clubs and even college fraternities to sign up for Project Plant It!, along with elementary, middle and high schools.

The Educator's Guide, which is posted at [www.ProjectPlantIt.com](http://www.ProjectPlantIt.com) in the section for educator resources, has more than 50 pages of educational tools such as lesson plans in STEM subjects of math and science, as well as in language arts and social studies. An interactive feature has been added to the Educator's Guide this year. Leaders can click on the lesson plan that they want to view and be taken directly to that page, instead of having to scroll through the entire booklet as in the past.

Along with the Educator's Guide, the website includes educational games, instructional videos and outdoor activities for children and families to enjoy together. Tree reading lists and links to many

other resources about environmental education also can be found on the site.

When the tree seedlings arrive in late April, Dominion offers some tips to ensure that the seedlings are planted promptly and properly:

- For your safety, call 811 before you dig on the spot you have selected. Do not plant trees underneath or within 25 feet of an overhead power line. Do not plant trees on top of underground power, cable, phone or gas lines.
- If planting in the yard at home, select a sunny location with moist, well-drained soil. Follow the outdoor planting instructions on the packaging with the tree seedling.
- If planting in a container, follow the indoor planting instructions on the packaging with the tree seedling.
- Host a tree-planting ceremony for Arbor Day and plant one or more seedlings in a designated area. Suggestions for an Arbor Day event are included in the Educator's Guide.

"Children will always remember the experience of planting a tree, taking care of it and watching it grow over the years," said Suyapa Marquez, Senior Community Affairs Representative at Dominion. "Project Plant It! connects children to the environment in a unique and meaningful way."

Since 2007, Dominion and Project Plant It! have provided more than 400,000 tree seedlings to participating children. This equates to 1,000 acres of new forest if all of the seedlings are planted and grow to maturity. [Source: Virginia Department of Forestry]





## Virginia is for Frogs!

Spring! As the weather warms a lively chorus announces the change in seasons. Do you recognize any of the 28 species of frogs and toads that may be members of the choir on any specific evening? The activity posted on the Department of Game and Inland Fisheries will help you to identify your amphibian neighbors.

The activity “Who’s Calling Tonight?” is on the [next](#) page or you may download the activity directly by [clicking here](#). Additional activities and resource are found on the [Teacher Corner](#) page.

For an article with even more information about amphibians, go to “[Virginia is for Frogs](#)”.

The site’s [Teacher Resources page](#) contains a collection of resources for teaching environmental literacy. Are you teaching graphing? Find data here from our state that may be graphed and analyzed. Life Cycles?

On this same site you will find information about the [Governor’s Conservation Classroom Challenge](#). This program is designed to recognize teachers for their efforts to teach students to be stewards of the environment.

## Peregrine Falcons are Back

The [Peregrine Falcons are back in Richmond](#) and have begun preparing their nest for this year. Watch the nesting season unfold with this live cam. Peregrines disappeared east of the Mississippi in the early 1960s due to pesticide use. The Department of Game and Inland Fisheries began reintroducing falcons to [hacking towers](#) on the eastern shore in the 1980s.



National Oceanic and  
Atmospheric Administration  
U.S. Department of Commerce

## Invasive Species - Lionfish

NOAA scientists are studying the lionfish invasion in our national marine sanctuaries and beyond. In recent years, [Indo-Pacific lionfish](#) have been found in coral reefs throughout the southeast Atlantic, Gulf of Mexico, and Caribbean. Invasive lionfish pose a serious threat to coral reefs, with potential long-term consequences for native fish communities, habitats, and entire ecosystems due to their voracious appetites, rapid reproduction rate, and lack of natural predators.

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# Who is Calling Tonight?

## Objectives:

Students will record and identify species of frogs and toads calling in their neighborhood and compare the time of year against average statewide calling dates.

## Materials needed:

VDGIF Frog and Toad Guide with CD of calls available at [www.shopdgif.com](http://www.shopdgif.com)

Access to ArcView or a map of the community

Recording devices such as smart phones or cassette recorders, optional

## Background:

Each spring the night is filled with the calls of Virginia's twenty eight species of frogs and toads. Although it may sound like *just noise*, the experienced ear can pick out the call of each species the way some individuals can pick out each instrument in a symphony. Virginia's frog and toad symphony begins in January with the Wood Frog and Little Grass Frog. They are followed by the Spring Peeper and several of the Chorus Frog species in February. The night time symphony continues into October with some species calling all summer and other species going quiet.

Only the male of each species call and each species has their own distinctive call recognized by members of the same species. Within each species there are several types of calls including; **advertisement** for mates, **encounter** calls when they meet a rival and are defending their territory, **release** calls when a male is grabbed by another male who mistakes it for a female and a **distress** call that may be designed to startle a predator into releasing it so it can make its escape.

Calling begins as the weather warms and often after a heavy spring rain. Even in the most urban Virginia communities, you may be able to hear American toads or other species calling after a storm. Virginia frog and toad habitats are very diverse from woodlands to small ponds or lakes. Most species are limited to a region of the state; a few species can be found statewide. Statewide species will begin calling in the coastal plain of Virginia earlier than the same species in the Blue Ridge Mountains and valleys.

## Procedure:

Choose 3-4 species common in your region, the Spring Peeper, American Bullfrog, Fowler's Toad and Green Frog are found statewide. Provide information for each species along with range maps and life history from <http://www.dgif.virginia.gov/wildlife/information/?t=1> and listen to the Frog and Toad Call CD provided with the VDGIF Guide to Frogs and Toads. The chart below may help students to hear and learn the different calls.

Spring Peeper	<i>Peep, peep, peep</i>
Carpenter Frog	<i>Pu-tunk, pu-tunk, pu-tunk</i> (like hammering)
Green Frog	<i>Plunk, plunk, plunk</i> (like plucking a guitar string)
Bullfrog	<i>Ba-rum, ba-rum, ba-rum</i>
Wood Frog	<i>k-wack, kwack, k-wack</i> (like ducks)
Pickerel Frog	<i>Zzz...zzz...</i> (like distant snoring)
American Toad	<i>Trillllll...</i> (long uninterrupted trill)
Green Treefrog	<i>Quank, quank, quank</i>
Squirrel Treefrog	<i>waak, waak, waak</i>



Once the students can identify local frogs from their calls the students can listen for each species at home or at a local park or natural area during the evening hours. Don't forget to send home a note to parents explaining what the students are listening for and the need to be outside. Parents may want to join their sons and daughters outside. If the frog cannot be identified, suggest that the student record the call and bring it to the class for possible identification

Students should record an estimated number and each species of frogs heard on a data sheet similar to the one below.

<b>Frog Calling Survey</b>																										
Student Name: _____ Date: _____																										
Location frogs were heard:																										
<input type="checkbox"/> Home <input type="checkbox"/> Park or natural area _____																										
Weather including temperature:																										
Habitat Description:																										
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Time of day</th> <th style="width: 40%;">Species</th> <th style="width: 35%;">Estimated number of calls in 5 minutes</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			Time of day	Species	Estimated number of calls in 5 minutes																					
Time of day	Species	Estimated number of calls in 5 minutes																								

Using ArcView to record the locations or place a colored dot on a community map where each species was heard calling. Record the date a species was first heard noting weather conditions and the latest date the species was heard calling. Data and recordings made of local frog calls can be entered into the Virginia Wildlife Mapping program to help manage local amphibian populations now and later

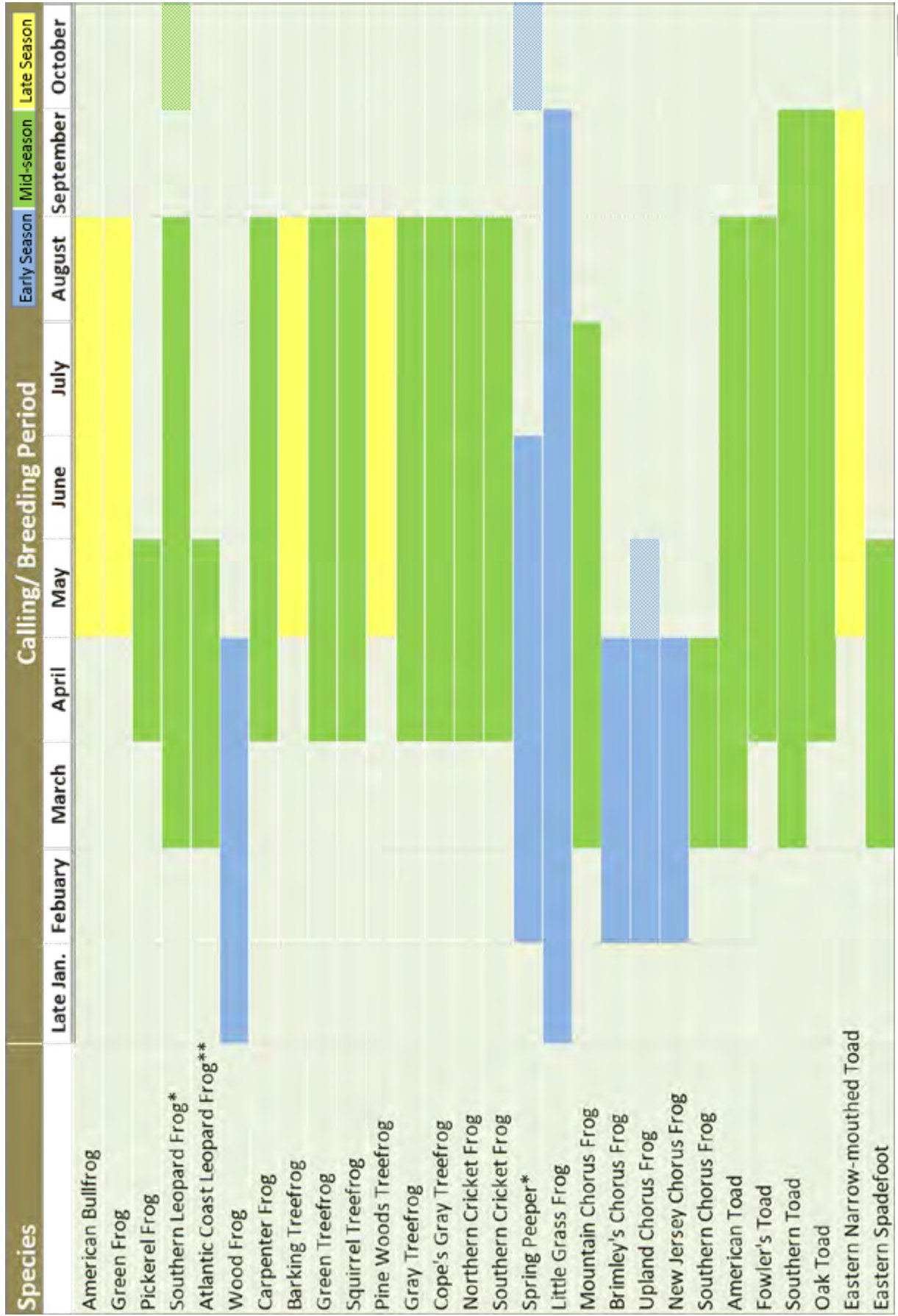
<http://www.inaturalist.org/projects/virginia-wildlife-mapping>. Keeping this information from year to year will provide long term data on the population's status in the area.

Students can also conduct a habitat survey, measuring distance to the nearest body of water from their listening spot and noting if there is evidence of breeding, egg masses or tadpoles.



# What Frogs Are You Hearing?

Virginia Frog Phenology (Calling/ Breeding Periods)



\* Southern Leopard Frogs and Spring Peepers are known to periodically call during warm, rainy evenings in the fall.

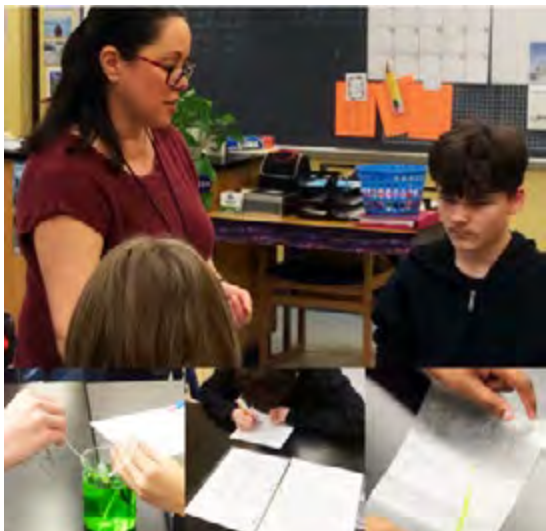
\*\* Recently described species to Virginia and calling/breeding phenology is not fully understood.



# A Classroom Visit

Contributed by: Cheryl Coronado

## Student Engagement



Stephanie Leary teaches 10th Grade Biology at Woodrow Wilson High School in Portsmouth, Virginia a Region 2 School.

Starting the new semester on the 90-minute block schedule often feels like a race for Biology Teacher and VAST Member Stephanie Leary. Perhaps we all feel that way. What makes her day more effective is keeping the lesson plans student centered. The lesson seen at the bottom of the photo, summarizes the properties of water. It combines observation and analysis skills from Biology SOL 1 in the context of the biochemical principles of water chemistry and its impact on life processes (Bio SOL 2a).

Great ideas for student centered lessons were shared at our VAST Professional Development Institute this past, November 17-19, 2016, in Williamsburg, Virginia. Did you pick-up a tip or strategy? Do you have a strategy you'd like to share? Join us this year in Roanoke, November 16 - 18, 2017.

Contributed by: Cheryl Coronado - Membership ([membership@vast.org](mailto:membership@vast.org))

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Virginia Tech's Powell River Project - Research & Education Center  
Virginia Center for Coal & Energy Research - Virginia Coal & Energy Alliance  
United States Energy Association

Present:

## 23rd Annual "Project Coal & Gas: Production & Usage" Energy Education

July 9 through July 15, 2017

The University of Virginia's College at Wise  
Wise, Virginia

A partnership of Virginia Tech and Virginia State University [www.ext.vt.edu](http://www.ext.vt.edu)  
Virginia State University

If your teaching assignment includes natural resources this program is for you. Come visit the Appalachian Plateau in far southwest Virginia for a first hand look at local geology, coal mining, gas production, reclamation, coal and gas utilization, and some local history. This program augments and supports 3rd, 4th, 5th, 6th grade, and Earth Science Standards of Learning relating to non-renewable resources - rock, coal, and natural gas. There is also ample opportunity to discuss issues relating to two of Virginia's natural resources - forests and water.

### FOR MORE INFORMATION:

Virginia Coal & Energy Alliance - P. O. Box 339, Lebanon, VA 24266  
PHONE: 276-889-4001 • FAX: 276-889-3055 • E-MAIL: [vcea@virginiacoalenergy.com](mailto:vcea@virginiacoalenergy.com) or [pmeeks@vt.edu](mailto:pmeeks@vt.edu)  
Website: [www.virginiacoalenergy.com](http://www.virginiacoalenergy.com)



## Summer Opportunity:

# Shenandoah National Park's Education Program



National Park Service  
U.S. Department of the Interior  
Shenandoah National Park

Shenandoah National Park's Education Office is offering two professional development opportunities for area teachers. Detailed information can be found on the park's website <https://www.nps.gov/shen/learn/education/development/index.htm> or by contacting the Education Office if you have any questions or need further information. Email: [shen\\_education@nps.gov](mailto:shen_education@nps.gov) or phone: 540-999-3500, ext. 3489. Thank you."

## 2017 Teacher-Ranger-Teacher

Shenandoah National Park is seeking applicants for the 2017 Teacher-Ranger-Teacher (TRT) program. The selected TRT will work with park staff and a student intern to produce a new unit on endangered species and climate change for the *Exploring Earth Science in Shenandoah National Park curriculum guide* and plan a two-day instructional workshop for August 2017. Applicants should have experience in teaching middle/high school earth or environmental science, knowledge of Virginia learning standards and STEM education, and skill in creating thought-provoking, engaging student activities. The selected teacher must be able to commit to working in Shenandoah National Park for a minimum of 240 hours between June 12 and August 18, 2017. The TRT can earn 3 graduate credits through the University of Colorado Denver. Note: Teacher-Ranger-Teacher position needs to be filled by someone that is within commutable distance of Luray, VA as housing is not available for this position. Application and more information can be found at <https://www.nps.gov/shen/learn/education/development/trt.htm>

**Curriculum Guide for Grades 7-12.** Workshop participants will receive the complete curriculum guide with lesson plans and materials for using the park to study a variety of earth science topics. The workshop will include field-based instruction on two units, *Shenandoah Salamander: Climate Change Casualty or Survivor?* and *Protecting Our Water Resources*, plus an overview of five other lesson plans in the curriculum guide. There is a \$40 registration fee which includes the curriculum guide and workshop materials, overnight lodging, and meals. Reservations are required and space is limited to 25 participants. Register

## Parks As Classrooms Teacher Workshop

Friday, September 29, 2017

Shenandoah National Park will present the annual **2nd – 6th grade Teacher Workshop** on Friday, September 29, 2017 from 9 a.m -3 p.m. Teachers will learn how to incorporate the park's 2nd – 6th grade programs into their classroom lesson plans. Park rangers will familiarize teachers with Shenandoah National Park and the program materials, introduce classroom pre-visit and post-visit activities, demonstrate ranger-led activities planned for the students, and define the responsibilities of teachers, rangers, students, and chaperons on field investigations. Workshop attendance is required before bringing students on a park program. This workshop is offered FREE of charge. Reservations are required. Workshop attendance may satisfy school district requirements for professional development training credit and recertification points. Register starting January 23, 2017 by email or phone: [shen\\_education@nps.gov](mailto:shen_education@nps.gov) or phone: 540-999-3500, ext. 3489.

### ATTENTION SCIENCE TEACHERS! Take a Modeling Workshop this summer.



Modelers are better prepared to transition to NGSS than other teachers, research shows.\*

60 summer Modeling Workshops in high school physics, chemistry, physical science, biology, and middle school science will be offered, in many states. Most are two or three weeks long.

- CEUs; optional graduate credit. Stipends at grant-funded sites
- Modeling Instruction is research-informed, interactive engagement pedagogy
- Ask your school administration to help pay. Mention the research on NGSS readiness

Website: <http://modelinginstruction.org>

Workshop descriptions: <http://www.phystec.org/pd/?set=Modeling>

Modeling Instruction is designated as an Exemplary K-12 science program and a Promising Educational Technology program by the U.S. Department of Education. Modeling Workshops are peer-led. Content is reorganized around basic models to increase its structural coherence. Participants are supplied with a complete set of course materials and work through activities alternately in roles of student or teacher, as they practice techniques of guided inquiry and cooperative learning.

## The Foundation for Advancing Alcohol Responsibility

[The Foundation for Advancing Alcohol Responsibility](#) has recently launched an update to the longest standing program, [Ask, Listen, Learn: Kids and Alcohol Don't Mix](#), which is designed for 5th and 6th grade health and science classrooms. All materials are free and include seven lesson plans, an animated series, classroom activities, worksheets, comprehension questions, and more. Lessons are aligned to Common Core, National Health Education Standards, and Next Gen Science Standards.

**How Alcohol Affects the Brain** is the free animated video series with corresponding lessons for grades 5-6 produced by the as part of the **Ask, Listen, Learn: Kids and Alcohol Don't Mix** campaign. Videos and Lessons examine the effects of alcohol on the brain, central nervous system, cerebellum, cerebral cortex, hippocampus, hypothalamus, and medulla. The content supports National Health Education Standards, Common Core State Standards and NGSS. The website also offers interactive classroom activities, vocabulary exercises, comprehension questions, and a facilitator's guide. Consult [https://responsibility.org/media\\_center](https://responsibility.org/media_center)

### Virginia Tech's Powell River Project Research & Education Center & Virginia Center for Coal & Energy Research

### Virginia Coal & Energy Alliance & United States Energy Association

### Present The 23rd Annual "Project Coal & Gas: Production & Usage" Energy Education

July 9 through July 15, 2017  
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## Development Institute Applications Now Open!

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Join us to examine the role that humans have played in the stability and change of Monterey Bay. You'll explore both our vibrant, local environment through field investigations and ways to make conservation issues and action relevant to students through development of a sense of place. Topics include: climate change science; physics, chemistry and biology of the kelp forest; plastic pollution; and sustainable seafood. [Learn more and apply.](#)

Professional educators are essential and respected partners in fulfilling the Aquarium's conservation, education and science missions. We look forward to welcoming you this summer as you enhance your knowledge and add to your collection of classroom activities.

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Our high school institute is residential this year! This means that we provide room and board as well as a \$50 per day stipend upon completion of our free week-long program in beautiful Monterey!

## Virginia Outstanding Biology Teacher Award

Every year, an outstanding Virginia biology educator (grades 7-12) is recognized with the Virginia Outstanding Biology Teacher Award (VOBTA) and receives the National Association of Biology Teachers Outstanding Biology Teacher Award (OBTB) for Virginia. Candidates for these awards do not have to be NABT or Virginia Association of Biology Teachers (VABT) members, but they must have at least three years of public, private, or parochial school teaching experience. A major portion of the nominee's career must have been devoted to the teaching of biology/life science, and candidates are judged on their teaching ability and experience, cooperativeness in the school and community, and student-teacher relationships. The



Evolution Education is a project organized by the Cox Lab in the Department of Biology at the University of Virginia. They are evolutionary biologists and educators who advocate for real collaborations between scientists and teachers to develop new, inquiry-based models for education in (and out of) the middle- and high-school science classroom. The program is based on three core principles:

- K-12 science education is failing to teach evolution unequivocally as a central principle in biology
- Students learn science best by doing actual science
- Teachers become more effective educators by participating in authentic scientific research

Please visit each of the sites to receive more information about important details [2017-2018 Teacher Fellowship- Experience field based evolutionary biology](#). Application is now open! Apply before April 1, 2017 [2017 Teacher Workshop, July 19-21 - Registration is now open!](#) Register before April 1, 2017

Evolution Education is a partnership of UVA's [Curry School of Education](#), [Mountain Lake Biological Station](#), [Golden Apple Foundation](#), and the [Virginia Department of Education](#) with funding from the [National Science Foundation](#).

Aaron M. Reedy, PhD Candidate, Department of Biology, UVA

<http://www.aaronmreedy.com/>  
<http://www.evolutioned.org/>

VOBTA recipient is the special guest of VABT at the annual Virginia Association of Science Teachers (VAST) Professional Development Institute (PDI) Awards Dinner. Here, the winner is recognized at the VAST Awards Ceremony and receives a plaque for themselves and their school. At the NABT National Convention, they are the guest of Carolina Biology Supply Company at the Honors Luncheon held at the NABT Professional Development Conference, receive gift certificates from Carolina Biological Supply Company, resources from other sponsors, and award certificates and complimentary one-year membership from NABT. For information and/or to nominate or apply, please contact Kathy Frame at [chuckframe@aol.com](mailto:chuckframe@aol.com). Deadline April 28, 2017.





## 2017 Spring Wildflower Symposium Learning to Live in a Changing Ecosystem

May 19-21, 2017

The Nature Foundation at Wintergreen  
3421 Wintergreen Drive  
Wintergreen Mountain Resort  
[info@twnf.net](mailto:info@twnf.net) | [twnf.org](http://twnf.org) | 434-325-8169

The Spring Wildflower Symposium offers opportunities for novices through seasoned naturalists to experience our Blue Ridge Mountain heritage in all its springtime glory. Explore natural wonders through walks guided by experts in identifying wildflowers, edibles, and other native plants; identifying geological formations and the natural history of the Wintergreen area; and discovering unique plant and animal habitats. Attend lectures and hands-on demonstrations on propagating and using native plants in landscaping, controlling exotic and invasive plants, and other walks and talks

exploring the cultural and natural history of the Blue Ridge.

The theme of this year's event is "Learning to Live in a Changing Ecosystem." We are delighted that Dr. Richard Groover, Member of the Governor's Climate Commission, 2014 - 2015, and Assistant Dean of the School of Mathematics and Science at J. Sargeant Reynolds Community College, will be our keynote speaker. Dr. Groover will discuss recent research that indicates the likelihood and potential severity of a major drought occurring in portions of Virginia this century and the increasing demand on the State's available freshwater supply due to a growing population and warmer climate. Other presenters will address how events ranging from increased threats of wildfires to the spread of invasives can be affected by a changing ecosystem.

For further information contact The Nature Foundation at Wintergreen 434-325-8169. Event details and a schedule of activities will be posted on our website by mid-March.



## U.S. Department of Agriculture

### Getting a School Garden Blooming

Jeff Raska, a school garden specialist with the AgraLife Extension in Texas, works with numerous programs and offers practical advice to schools establishing a school garden. Refer to:

<https://goo.gl/R8f4af>



## The Science of Nuclear Energy and Radiation

A 4-Day Science Teacher's  
Workshop

The Virginia Section of the American Nuclear Society together with VCU are organizing, like every summer, a four-day Science Teachers Workshop titled "The Science of Nuclear Energy and Radiation" on July 24-28, 2017 at VCU Engineering in Richmond. More information about the workshop, as well as the registration can be found at:

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# Summer Course Explores the Great Smoky Mountains History and Ecology



Students will spend a week at the Great Smoky Mountains National Park. Photo by Michael Williams.

Virginia Tech's College of Natural Resources and Environment is now offering open enrollment for a summer course where participants can spend a week in the Great Smoky Mountains National Park, the most visited national park in the United States.

The Natural History of the Great Smoky Mountains (course FIW 2984) explores the area's diverse natural history and ecology and runs Aug. 4-12 at the [Great Smoky Mountains Institute](#) at Tremont in Tennessee.

"Anyone interested in the natural history of the Great Smoky Mountains can take the course," said [Donald Linzey](#), instructor in the [Department of Fish and Wildlife Conservation](#) and retired professor of biology at Wytheville Community College.

This is the 12th year he has taught the course.

Elementary and secondary school teachers, Master Naturalists, Virginia Tech employees, and others have joined Virginia Tech graduate and undergraduate students along with students from the University of Georgia and Purdue University. The three-credit course is offered by a consortium of the three universities.

This year's students will have an unusual opportunity to see and learn about the effects of the most significant forest fire in Tennessee in more than a century. The Chimney Tops 2 Fire in November and December 2016 burned more than 17,000 acres in the national park as well as in Gatlinburg, Pigeon Forge, and other areas of Sevier County.

"Our students will be staying in an area not impacted by the fire, but will travel through areas that were damaged," Linzey said.

The group will start at Linzey's home in Gatlinburg, which is just 250 feet from the perimeter of the fire. The course will include discussion of the effect of the fire on wildlife habitat as well as analysis of air quality and its effect on wildlife.

Sessions are taught by National Park Service wildlife biologists, air quality experts, and historians, as well as Linzey and professors from the University of Georgia and Purdue University. Topics include wildlife management, vertebrates of the Smokies, black bear and wild hog research, history of the creation of the park, Cherokee history, high-country ecology, forest ecology, plant identification, freshwater invertebrates, and salamander biology.

Linzey will lead students to the summit of Clingmans Dome, the highest peak in the Smokies at 6,643 feet, where he is adept at finding the rare Jordan's red-cheeked salamander.

Virginia Tech students who have attended in past years highly recommend the course and share what they would tell prospective students:

- "This was an amazing experience with beautiful sights and life-changing experiences."
- "Best class experience I have ever had and has helped facilitate new interest in wildlife conservation."
- "One of the best experiences ever, very educational, fun, great people. Want to come back."
- "If you want to truly experience nature, Tremont is a great place to do so."
- "If [students] don't take this class, they are robbing themselves of an amazing experience. This is a life-changing class."
- "It's amazing . . . I kept forgetting it was a class because it was so much fun."

Linzey has been conducting research in Great Smoky Mountains National Park since 1964. He has written 12 books, including the textbook "Vertebrate Biology," recognized as the most readable on the subject. His book "[A Natural History Guide to Great Smoky Mountains National Park](#)" is used as the text for this course.

He currently works with the National Park Service as the lead researcher investigating reports and evidence of mountain lions in Great Smoky Mountains National Park.

The cost for the course is \$576 for lodging and meals in addition to tuition and fees for students seeking academic credit. Elementary and secondary school teachers are eligible for reduced tuition. Virginia citizens age 60 or older [may be exempt from tuition and fees](#).

Natural History of the Great Smoky Mountains has been approved as a substitute for Wildlife Field Biology (FIW 2324) at Virginia Tech.

For more information on course content and logistics, contact Linzey at [dlinzey@vt.edu](mailto:dlinzey@vt.edu) or 540-231-2290, or stop by his office in room 154 Cheatham Hall on the Virginia Tech campus. For details on course registration, call 540-231-3486 or email [cnre\\_students@vt.edu](mailto:cnre_students@vt.edu).

Contact :Lynn Davis | [davisl@vt.edu](mailto:davisl@vt.edu) | 540-231-6157

Online Link: <http://vtnews.vt.edu/articles/2017/01/cnre-greatsmokiescourse.html>

## The Real World

Fear is the path  
To the dark side.  
Fear leads to anger.  
Anger leads to hate.  
Hate leads to suffering.

—Yoda  
Jedi master,  
*Star Wars*

Let's blame it all on Johannes Gutenberg. Surely in 1452 there must have been a few curmudgeons in the darker corners of local taverns and palaces who grumbled that people would cease to visit friends to share the recent gossip, hand-writing would deteriorate, and, without control of the presses, anyone could print off what he pleased causing no end of trouble, professional scribes would no longer have jobs, forgeries would become rampant. It is significant that the first book printed off his movable type press was the Holy Bible, for, if one knew the language, anyone could read scripture for himself without depending upon authorities to do so for him. Not knowing the intellectual language of the day (Latin) would be less of a problem as translations could be printed in any language. As we all know today, other movements which changed human history unfolded from Gutenberg's achievement: the Renaissance itself, Luther's Reformation, and increased publications leading to a scientific revolution. Galileo would later write his *Dialogue on the Great World Systems* in Italian rather than in Latin, enabling his ideas to be accessible to the average man and woman.

Galileo's trial in 1633, the flood of ideas (scientific and non-scientific) continued despite periodic tides of book-burning and censorship.

From Julius Caesar's initial destruction of the Alexandrian library in 48 BC, to Genghis Khan's Baghdad invasion in 1258 where the Tigris River ran black with the ink from precious medical and astronomical manuscripts, to Counter-Reformation book-burnings in European streets, to Papal and Soviet prohibitions on publishing certain texts, to current attempts to undermine internet neutrality, the advancement of human ideas has proved uncontrollable, though frequently hindered. As Mark Twain once wrote, "What the world is today, good and bad, it comes to Gutenberg. Everything can be traced to this source, but we are bound to bring him homage...for the bad that his colossal invention has brought about is overshadowed a thousand times by the good with which mankind has been favored."

## The Real World

In almost every case where intellectual advancement has been threatened, Twain's remarks seem to hold. Yet it is indeed a struggle, as with life itself, not for the fainthearted. For the twin terrors from Yoda's dark side, fear and greed, have thwarted both the understanding and the technology of our progress. There have been so many ways in which the promise of convenience and "time-saving" features of our technology have captivated and altered what Abraham Lincoln concluded in his first Inaugural



The Real World ?

John Singer Sargent [Public domain], *Gassed*

Of course, the door opened wider into the dark side of fake news and forgeries of documents and paper currency. Anyone with sufficient income or connections could publish his ideas or revolutionary tracts, a decided threat to those in power or authority. Conservative patrons looked down on printed books (as, later, with hardbacks vs. paperbacks vs. Kindles), preferring more desirable hand-production. After the sacking of Mainz in 1462, many printers were driven into exile, as the capital of European printing shifted to Venice. After scientific study and publishing shifted back north into Protestant countries following

Address, "the better angels of our nature." Perhaps beginning with Alva Fisher's 1908 invention of the electric washing machine, our homes have replaced our communities. From riversides to a town's "laundry center," most of us now do our washing at home, hence that pejorative, "airing ones dirty laundry in public." With our 5-foot LCD screens and a TV in every room, along with Netflix, our homes have become entertainment centers. Our libraries have become electronic, so we no longer have to "bother" to walk to our nearest library.

Continued



Did I say “walk”? Of course, the automobile, the penultimate convenience device, has replaced both foot and horse. Intended as a time-saver, there can be so many of us jammed into our daily commutes that traveling 13 miles can take well over an hour, to say nothing of our fouling the air we breathe. This past summer, the turnpike authority was in the process of eliminating the off-the-turnpike toll booths with the hope that this might shave off a few minutes from a traveler’s trip on the Massachusetts Turnpike, to say nothing about the savings in pay for toll operators. Some of us actually avoid EZ Pass for cash at toll booths so we do have the opportunity to greet and thank a toll operator.

phone screens improved their skills with non-verbal emotion cues. This corroborates other findings that excessive screen time with small children results in their having trouble interpreting human facial expressions. The authors conclude “social skills and real-life emotions suffer with digital media use.”

Increasingly I have found over the past several years, my high school students have trouble with eye-contact. Of course, many walk over corridors watching, gaming, and texting on their phones. Unless specifically instructed to do so, discussion answers are fragmentary or mono-syllabic. I had a light conversation with



The Real World

ESA/NASA

Then, there is the ultimate technological triumph, the computer, along with its miniature progeny: pad, cell or smart phone. One is forced to consider whether these are time-savers or time-consumers, or plain entertainment devices. Do we really need Alexa to order groceries for us? And who is asking the key question, “Just what are we saving time for?” To sit for more hours before our lighted screens of dubious physiological benefit, or to spend more time talking with family or friends? Perhaps one reason for the enormous proliferation of local community sports teams for all ages, toddler to adult, is the physiological benefit, not merely to obtain the exercise, but also the association with other persons. [Not, incidentally “people:” “people” are abstract and impersonal, “person” has the tone of familiarity and intimacy.]

The contrast between the computer and the human brain was one of the major themes in the recent powerful book and film, *Hidden Figures*. Besides the calculations involved, the four African American women (Katherine Johnson, Dorothy Vaughan, Mary Jackson, and Christine Darden) featured in the movie were hidden in the customs and racial prejudices of late 1950’s – early ‘60’s NASA work in Virginia during those early days of the space program. After learning about contradictory claims from IBM computer calculations regarding John Glenn’s 1962 Friendship 7 first manned orbit of the earth, it was Glenn who ordered a delay until Katherine Johnson could run a check on the computer’s calculation. In a telling line from the film, Glenn remarked, “It’s hard to trust someone you can’t look in the eyes.”

In an interesting 2014 study published in the journal, *Computers in Human Behavior*, it was found that only five days at an outdoor educational camp for preteens without access to computer or

one of my students over his T-shirt: Darth Vader Emotions – angry, happy, sad, sleepy, confused, cheerful, frustrated, excited, proud – each accompanied by the famous expressionless mask. So many of our children are preoccupied with the self rather than with the other; we praise self-service, self-directed, self-published, self-made man (is there really such a thing?), self-sufficient, selfie, but there is self-centered, self-indulgent, selfish, too.

So, just what IS the real world?

To a physicist, the real world consists of at least 99.999999999% emptiness; if the nucleus of a hydrogen atom were a basketball, the electron would be two miles away. Even what we consider “solid” and “dense” is mostly empty space. To an investor, the real world might be making money; to a weight-lifter, having increased strength; to a painter or dentist, fighting decay; to a sculptor or poet, depicting a clear personal vision of her reality; to a driller, extracting the maximum amount of oil; to a student, earning the highest possible score on his exam; to a refugee, finding a safe home.

We always seem to refer to the world outside our schools as “real life” or the “real world,” as in giving our students “real world experiences.” I would contend, on the other hand, that schools are a real world, or even that schools should not be like the real world. Why do we customarily assert that the goal of our high schools is to help our graduates obtain a good job? [What does “good” mean?] This sounds like the factory or industrial era schools we rail against, be it the arrangement of our furniture or design of our school buildings or curricula. We say we want our kids to be creative and good communicators because employers are looking



for those skills. Yet we pay a terrible price for this by providing them with technology (aka computers by most school staff) which usually encourage monosyllabic responses and entertainment. Why not help our graduates obtain a good life? My school's recently designed logo includes "community," "diversity," "respect" along with a subtle corridor sign reading "niceness is wisdom."

In his 1985 book, *Amusing Ourselves to Death*, Neil Postman refers to Aldous Huxley's classic, *Brave New World* and the point that what we love will ruin us rather than what we hate (as in Orwell's *1984*). Though written in the 1980's (the days of Sesame Street and Voyage of the Mimi) his message remains relevant today in the world of memes, gaming, and transformers. Echoing John Dewey's comments that the content of a lesson is the least important aspect in learning he quotes, "collateral learning in the way of forming enduring attitudes...may be and often is more important than the spelling lesson or lesson in geography or history...For these attitudes are fundamentally what counts in the future." [*Experience and Education*. 1963.] We are entertained by watching TV or a movie, yet, Postman maintains, discerning and critical learning for understanding is not accomplished by entertainment. It is small wonder today's school children are so passive and sometimes claim schooling is so "boring." Our curricula and our testing do not relate to their "real" world of entertainment. Postman imagines a day "when cultural life is redefined as a perpetual round of entertainments, when serious public conversation becomes a form of baby-talk, when, in short, a people becomes an audience, and their public business a vaudeville act." We have only to compare the first televised presidential debate in 1960 with those "debates" of the past election cycle in 2016 to see Postman's point.

We seem mired in a divisive world of 142-character "tweets" which substitute for careful deliberation on major issues, where virtual conferences, Skype, and virtual reality replace face-to-face reality. We have a new lexicon of clever sleazy semantics and empty phrases like "alternative facts," "truthful hyperbole," and "communication error" to cover up misdeeds and lies, where one political party would become the party of fear and the other a party of reconciliation.

## The Real World

Amid all of this has arisen the reality of fake news and fake tweets. Where we once grew accustomed to getting our news from three major commercial sources and one or two public sources, our digital world has given us thousands. More than a hundred sites last fall were identified as originating from one town in the former Yugoslav Republic of Macedonia! A 2006 study cited in the 14 December 2016 *Education Week* provided a test case for the inability of middle schoolers to critically evaluate news they found on social or online media. This was not simple gullibility, but an

inability to evaluate reality, the fake from the legitimate. Lawrence Paska, executive director for the National Council for the Social Studies, makes a strong plea for media literacy in our children and in young adults. Students need to be taught how to distinguish what is verifiable from what is unverifiable, a technique found lacking among high school students in a November 2016 Stanford University study. Though this problem is exacerbated by the ubiquitous reach of the internet, the net is also the "best fact-checking tool ever invented."

In her book *Alone Together*, Sherry Turkle points to the paradox of our current love affair with communication technology – the more we appear to be interconnected, locally as well as globally, the more we feel isolated. All those "likes" on Facebook saying "Notice me. Notice me!;" the sense of isolation and false intimacy which all the tweets and text-messaging seem insufficient to overcome; the inability to make a move without checking or telling someone about it. Our technology has promised to bind us together, yet it is driving us farther apart. On an international level there are those who want to wall out rather than welcome in. We send in unmanned weapons in a vain attempt to settle a dispute, rather than sit down face-to-face to talk and negotiate (as we instruct our children to do). We treat other peoples, within our own country as well as other nations, as though they were businesses to be out-competed, instead of understood or embraced.

Our schools **are** the real world where we each have the power to make a positive difference in the life of a young person. David Gamberg [30 March 2016. *Education Week*.] quotes John Dewey's statement, "**Education is a process of living and not a preparation for future living.**" In his commentary, Gamberg considers the importance of how a community values its children, the search for a place to create, discover, reveal and share in an unending journey. He seeks vigor, not rigor in our curricula. He warns that, though our technology provides many wonderful ways to gather data, we must resist drowning in it. Instead, let us ride the currents in order to "foster a deliberative and thoughtful dialogue regarding the seeds of our problems." We must replace fear with curiosity, to embrace the force for good (the Jedi) and eschew the force in darkness (the Sith).

*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](mailto:george.dewey@fcps.edu)*



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

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



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

Please send articles, letters to the [editor](#), or labs by the submission deadline, **May. 1, 2017**, for inclusion in the next digital PDI VAST Newsletter.

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