



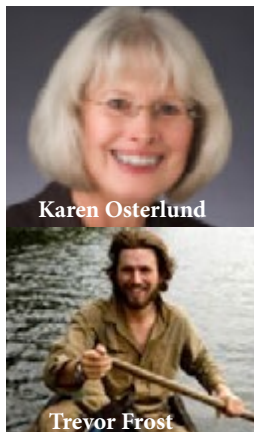
The Science Educator

Spring 2016

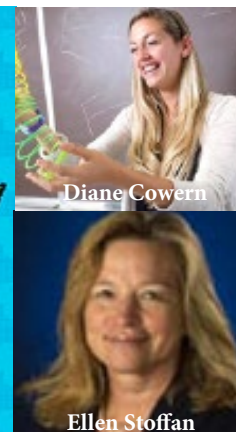
A Publication of VAST, The Virginia Association of Science Teachers

Vol. 64, No. 4

These faces surrounding the new logo for VAST PDI 2016 are the speakers who will present in November. See more on the Schedule-at-a-Glance on [page 4](#). Aiden Coleman is a new scientist who will be at the PDI. Read more about him on [page 3](#).



Karen Osterlund



Diane Cowern

Ellen Stofan

Science is alive and well all over Virginia. Chemists, astronauts, physicians, students, ecologists, museum researchers, and so many more solve problems and create new inventions and new ways of doing things. This year we, celebrate the many careers and ways that science serves society by advancing and improving what we know, create, and understand.

As you teach tomorrow, imagine what your students will know, create, build and invent during their lifetimes. How will they use the science skills and techniques they learn today is beyond our imagination, but what we can be sure of is that more is learned when a people are prepared to use science to interpret the natural world.

The real goal is to transfer your interest in science to your students. Real world examples may from right here in Virginia will inspire them.

Get Your Team Together and Plan to Come for the PDI Pre-Con • 1 Team = 3 Teachers + 1 Administrator

Now is the time to convince colleagues and your administrator to come to the PDI in November to attend the VAST PDI Pre-Con on November 17th. Learn together and apply what you learn as a team. Register by yourself or as part of a team.

Thanks to the Donna Sterling Institute, there will be a morning session by author and science educator, Christine Anne Royce who has investigated and used children's literature in the classroom for more than fifteen years and understands the importance of integrating subjects at the elementary level. Royce is the coauthor of *Teaching Science Through Trade Books* and the coauthor for the column *Teaching Through Trade Books* which appears in



Aiden Coleman

Mr. Coleman

NSTA's elementary journal *Science and Children*.

Thursday afternoon, there will be three different short courses that are geared to the interest of science educators at all levels and curricula areas.

Another benefit of Thursday attendance is that you will be there for the 1st General Session and the official opening of the PDI.

Ellen Stofan, NASA Chief Scientist, will be the **The Keynote Speaker** at **General Session I** (5:30 p.m.-6:45 p.m.).

Pre-Conference: Science & Literature: A Creative Interface for All Students

Donna R. Sterling Institute

Thursday November 17 • 8:30 am to 5:00 PM

Session 1: Two concurrent sessions

8:30 a.m. -3:00 p.m.

- **Elementary** - Engage Students, Create Opportunities, and Design Lessons with Children's Trade Books for Science Learning - **Christine Royce**
- **Secondary** Engaging Your Student Experts: Practical Strategies to Support Reading, Writing and Vocabulary Learning in the Secondary Science Classroom - **Stephanie Blackburn**



Christine Royce



Stephanie Blackburn

Session 2: Three Concurrent Short Courses

3:30 p.m.-5:00 p.m.

- **Short Course 1:** Inquiry for All: Stop Teaching to the Test and Start Teaching Students! - K-12 teachers.
- **Short Course 2:** Let's Talk Science - K-5 teachers.
- **Short Course 3:** Faces of Environmental Education from the Past to the Present. - Everyone!

[More details Page 5.](#)

From the Executive Director



Here We Go Again!

Here we go again.....
getting ready for the PDI....so check your list...

- send in a proposal
- update your membership
- encourage a friend to join
- support a friend's proposal
- get a hotel room
- ask for professional leave
- register for the Pre-Con
- register for the PDI



Susan Booth, EdS

Executive Director

OH how exciting!!!!

ALERT!

End of the year monies in April from your school division may get you to the PDI. So ask now!

For up-to-date information on the PDI please go to the VAST web page: [Click](#)

Submit a proposal to present at the PDI: [Click](#)

[Go to the PDI page on the VAST website to submit an online proposal to present a concurrent session. The deadline is May 1.](#)

Register a room at the Doubletree by Hilton on Kings Mill Road, Williamsburg: [Click](#)



2016 Annual PDI: The Faces of Science in Virginia

November 17-19, 2016

DoubleTree by Hilton, 50 Kings Mill Road, Williamsburg, VA

Don't wait! Make your reservation online or call: (800) 222-TREE (8733).

Hotel Registration Information - Go to [Click](#)

Hotel Registration on-line - Go to [Click](#)

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President's Corner



Kathy Frame M.S.
VAST President

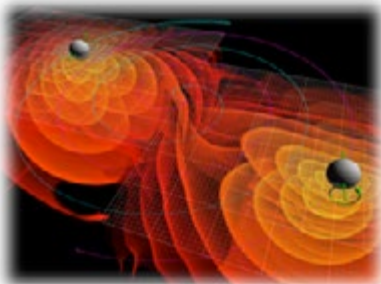
Dear VAST Members,

Welcome to the March issue of
The Science Educator!

Spring is just around the corner. Be sure to mark March 20, the first day of spring, on your calendar. Take time to explore the VAST website and see all of the recent news, resources, and opportunities for you and your teaching. We welcome contributors. So if you have something you would like to share, please send it to the VAST Newsletter Editor Jean Foss at [Link](#).

Amazing Scientific Discovery

The year 2016 has already begun with an amazing scientific discovery—the detection of gravitational waves, “Einstein’s ripples in time” that were predicted over 100 years ago. *Science* has a well written piece on this discovery. [Click](#) Another source is the American Physical Society. [Click](#)



Gravitation: C. Henze/NASA Ames
Research Center

On March 29, the book *Black Hole Blues and Other Songs from Outer Space*, by Janna Levin, an accomplished astrophysicist and author at Barnard College, will be released by Knopf Press. In her latest book, she details the 50-year search for the elusive waves dubbed the “holy grail of modern cosmology and the soundtrack of the universe”. Be sure to include this on your 2016 reading list!

Virginia Students

March is “Youth Art Month”. Be sure your students submit their art poster for the 2016 VAST PDI Art Poster Contest. The theme is the Faces of Science in Virginia. For rules and submission information, please [CLICK](#) For questions regarding the contest, please contact Susan Bardenhagen at [LINK](#).

Speaking of our Virginia youth, consider the 11-year-old Aidan Coleman front and center. Aidan is a sixth-grader from Berkeley Middle School in Williamsburg who introduced House Bill 335 sponsored by Delegate



State tree of Virginia: *Cornus florida* in spring

BrendaL. Pogge, R-James City to establish *Thamnophis sirtalis* (eastern gartersnake) as the state reptile. Aiden has accepted our invitation to be recognized at the 2016 VAST PDI Awards Ceremony in Williamsburg. To learn more about Aiden plan to attend the VAST PDI 2016.



Thamnophis sirtalis sirtalis
Eastern Garter Snake

2016 VAST PDI: The Faces of Science in Virginia



For all information related to the 2016 VAST PDI: The Faces of Science in Virginia, look for the PDI logo. Registration for the VAST PDI opens March 15. Be sure to check out the 2016 VAST [PDI Schedule-at-a-Glance](#) and the [2016 VAST PDI Booklet](#) with key information about prices, speakers, and other opportunities. If you have not already submitted a proposal, please be sure to do so at the [PDI presenter's page](#).

Principals, be sure to take advantage of the special opportunity for you and your teachers to participate at a special rate in the Preconference. For preliminary details, please see [page 5](#).

Wishing each of you a very Happy Spring!

[Download the PDI 2016 Booklet soon at VAST.org](#)

Always the best,

Kathy
2016 VAST President

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Schedule-at-a-Glance

Virginia Association of Science
Teachers
VAST PDI 2016
Williamsburg, 2016



Wednesday November 16, 2016

5:30 p.m.-8:30 p.m.

VAST Board Meeting & Dinner

Thursday, November 17, 2016

8:00 a.m.-8:30 a.m.

8:30 a.m.-5:00 p.m.

Registration Desk for Pre-Conference/Short Courses Open

Donna R. Sterling Institute Elementary and Secondary Courses run concurrently)

Session 1: Elementary - Engage Students, Create Opportunities, and Design Lessons with Children's Trade Books for Science Learning

Session 1: Secondary - Engaging Your Student Experts: Practical Strategies to Support Reading, Writing and Vocabulary Learning in the Secondary Science Classroom

Registration Desk Open for Short Courses/Conference Registration

Session 2: Short Courses 1, 2, 3 ****Pre-Registration and tickets required.**

VAST Professional Development Institute Opening

General Session I, Keynote Speaker: **Ellen Stofan**, Chief Scientist NASA

Night with the Exhibitors

3:00 p.m.-7:30 p.m.

3:15 p.m.-5:15 p.m.

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

7:00 p.m.-8:30 p.m.

Regional Directors' Meeting

Friday, November 18, 2016

7:00 a.m.

7:30 a.m.-6:00 p.m.

8:00 a.m.-9:30 a.m.

Continental Breakfast

Registration Desk Open

General Session II- Business Meeting: Presentation of the 2017 VAST Candidates for Office and Vote by Ballot

General Session II Speaker: **Richard Louv** (To be confirmed)

Exhibit Hall Open. Pick up Raffle ticket for Friday's Exhibitor Raffle

Concurrent Session 1

Concurrent Session 2

Ticketed Lunch I (Orange Ticket)

Ticketed Lunch II (Green Ticket)

Exhibitor Lunch (Blue Ticket)

Concurrent Session 3

Exhibit Hall Raffle

Concurrent Session 4

Concurrent Session 5

Ticketed Dinner

Awards Ceremony. Guest Speaker: **Karen Ostulund**, UTeach, Past NSTA President

Auction and DJ

9:00 a.m.-6:00 pm

10:00 a.m.-11:00 a.m.

11:15 a.m.-12:15 p.m.

12:30 p.m.-1:00 p.m.

1:15 p.m.-1:45 p.m.

1:30 p.m.-2:00 p.m.

1:45 p.m.-2:45 p.m.

2:45 p.m.-3:15 p.m.

3:15 p.m.-4:15 p.m.

4:30 p.m.-5:30 p.m.

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

7:30 p.m.-8:30 p.m.

8:45 p.m.-10:30 p.m.

Saturday November 19, 2016

7:00 a.m.

7:30 a.m.-10:00 a.m.

8:00 a.m.-10:00 a.m.

Continental Breakfast

Registration Desk Open

General Session III-VAST Membership Meeting: Meet Your New Officers

General Session III Speaker: **Trevor Frost**, National Geographic Explorer.

Exhibits

Concurrent Session 6

Concurrent Session 7

Ticketed Lunch (Yellow Ticket)

Concurrent Session 8

General Session IV Speaker: Physics Girl: **Diana Cowern**

8:30 a.m.-12:00 p.m.

10:05 a.m.-11:05 a.m.

11:20 a.m.-12:10 p.m.

12:15 p.m.-1:00 p.m.

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

2:15 p.m.-3:30 p.m.





2016 PDI Pre-Conference

Thursday November 17, 2016
Pre-Conference: Science & Literature:
A Creative Interface for All Students
Donna R. Sterling Institute

Session 1: Elementary **Engage Students, Create Opportunities, and Design Lessons with** **Children's Trade Books for Science Learning**

8:30 a.m. -3:00 p.m.

Christine Royce

Description:

If a picture speaks a 1000 words, then a book speaks volumes! If we hold that to be true, then just imagine how many worlds can be opened up to children in the classroom through the use of trade books. Trade books bring together the ability to engage students on many different levels – visual, auditory, imaginative, creative, factual, aesthetic and informative. Each of these levels helps to contribute to the understanding of science concepts, constructs, and core ideas and serves as a springboard for engaging in the practices and connections across concepts.

Participants in this workshop will engage in model lessons that utilize children's trade books - both fictional and nonfictional - to teach science and enhance reading, writing and speaking skills. The workshop will provide supporting research for integration; and participants will be actively engaged in lessons that cover the life, physical and earth/space sciences as well as hitting on crosscutting concepts and practices. A list of all suggested books, references and materials are included in the workshop.

Author and science educator, Christine Anne Royce has investigated and used children's literature in the classroom for more than fifteen years and understands the importance of integrating subjects at the elementary level to maximize instruction, learning and time. Royce, the co-author of *Teaching Science Through Trade Books* and the coauthor for the column *Teaching Through Trade Books* which appears in NSTA's elementary journal *Science and Children* will select some of her favorite and some of the more popular topics that have been included in each.

Session 1: Secondary **Engaging Your Student Experts: Practical Strategies to Support Reading, Writing and** **Vocabulary Learning in the Secondary Science Classroom**

8:30 a.m. -3:00 p.m.

Stephanie Blackburn

Description:

In this highly interactive session, you will learn 12-15 learning strategies that engage and support reading, writing, and vocabulary development across the science curriculum, and can be implemented immediately with your students!

Session 2: Short Courses

3:30 p.m.-5:00 p.m.

•Short Course 1: Inquiry for All: Stop Teaching to the Test and Start Teaching Students!

There has been quite a bit of attention given to inquiry learning in science classes, but in practice, it often is only found in advanced or honors level classes. The reasons include concerns about classroom management, student motivation, and the pressures of state testing. In reality, it is the struggling students, and those with learning disabilities, those who have not traditionally been successful or motivated in science classes, who most need a non-traditional approach to learning science. At risk students can thrive and learn with access to a student centered, intellectually challenging, and interactive learning environment. The same concerns that may lead some teachers to avoid these methods are often solved when students are excited and engaged. Suitable for **K-12** teachers.

•Short Course 2: Let's Talk Science

3:30 p.m.-5:00 p.m.

Are you using discourse/talk strategies effectively? Explore, share, and communicate science thinking using practiced steps. This interactive session will model a discourse/talk session using non-fiction literature. Suitable for **K-5** teachers.

•Short Course 3: Faces of Environmental EDUCATION from the Past to the Present

3:30 p.m.-5:00 p.m.

The classroom and local community are ideal places for helping students understand their connection to the environment. Participants will gain an understanding of environmental education from the past and how it relates to environmental literacy in 2016. Current environmental challenges and opportunities for teachers and schools in Virginia will be discussed and resources provided to help teachers develop environmentally literate students ready to face the challenges of the 21st century. [All Science educators.](#)

2016 PDI Strands



To help you make the most of the professional development opportunities available at the Williamsburg PDI, the Conference Committee has planned the conference around four strands that expand the theme, The Faces of Science in Virginia. Strands explore topics of current significance and enable you to focus on a specific area of interest or need.

Virginia Science in the Community

Virginia Science in the Community involves the whole community—students, families, educators, and the public—through science education programs that provide multiple pathways for student learning. Presenters showcase K-12 activities in the all areas of science and related STEM disciplines that unite science curriculum at the local level and are adaptable as core components of the curriculum. Examples include programs for schools, families and the public and exhibitions for museums and science centers. Initiatives are meant to provide a window on the nature of science and the lives of modern-day science in Virginia, with special emphasis on not just what is known about science but how it has come to be known.

Goals: To provide sessions that:

- Provide activities that encourage student interest in the natural world such as zoos, farms, planetariums, and museums.
- Provide science activities developed by local colleges and universities and groups such as the Boy Scouts, Girl Scouts YMCAs and YWCAs, 4-H Audubon and other groups.

Virginia Science in the Environment

Virginia Science in the Environment places emphasis not only the science of the environment, but also on Environmental Literacy as stated in the Virginia Environmental Literacy Plan “Having the knowledge, skills and dispositions to solve problems and resolve issues individually and collectively that sustain ecological, economic and social stability.” Virginia’s rich array of unique environments have drawn scientists from around the world to study conservation biology, ecosystem restoration, earth science, biogeochemistry, environmental policy, law, and economics in the state. Organizations such as the Chesapeake Bay Foundation, Smithsonian Conservation Center, National Science Foundation, and others have adapted their findings for the students and teachers K-12.

(Virginia Science in the Environment continued)

Goals: To provide sessions that:

- Provide scientifically based research on the effective integration of environmental literacy and environmental science in the science curriculum.
- Model effective environmental programs science and literacy connections at the elementary, middle, and high school levels.

Virginia Science in Industry

Session proposals within this strand focus on showcasing how the industries in Virginia provide state-of-the art research in areas such as poultry science, wine, medicine, ship building, aerospace, cybersecurity, energy, data centers, food processing, IT, and understanding of scientific concepts in automobiles. These industries have provided education outreach opportunities for students and teachers through curriculum, training programs, internships, and job shadowing.

Goals: To provide sessions that:

- Showcase the ways that industry has brought science to the classroom.
- Showcase the use of applications and other technology tools to help students make connections between industrial science, their daily lives, safety, and future opportunities in the workforce.
- Model how chemists, doctors, science teachers, computer technicians, and engineers use science to do their jobs.

Virginia Science in Research

Session proposals within this strand focus on showcasing the use of researched based practices and how they have impacted the science classroom through research experiences for teachers and students in leading universities, government research facilities, commercial companies, and not-for profit research groups.

Goal: To provide sessions that:

- Model the use of research based practices in science.
- Present ideas or research that illustrates how best practices impact student achievement and future employment.

VAST S_CCESS

All that is missing is “U”

How Can VAST Better Serve Its Members ?

How can VAST, **your** organization, provide you with the ideas, resources, representation and professional development that you can actually use and value?

VAST has a diverse membership of teachers, supervisors, administrators, pre-k to grade 16, informal educators, STEM, environment, life science, physical science, earth and space science How can it serve everyone?

As a secondary teacher, would you be able to identify a new lesson idea easily for a first grade teacher? As a secondary teacher would you be able to identify a new lesson idea for a pre-k teacher? As an AP Chemistry teacher would you be able to identify a new lesson idea for a middle school earth and space teacher?

VAST needs **“U”** to share your expertise to make the science teachers of Virginia even better. Wouldn't it be wonderful if each VAST educator was able to attend concurrent sessions that were exactly what they wanted to learn more about? How can we do that? We need **“U”** to help us serve everyone!

Be a presenter at the PDI. Be a newsletter or VAST Journal contributor. What were **“U”** successful doing in your class, team or school that others would be interested in learning about? Tell about that interdisciplinary unit you did in partnership with the art, math, or drama teacher. What about a successful activity outside the classroom? Do you do demos that are particularly successful? Did your students enter a contest, go on a field trip, or complete a project? How about the new technology that you are using? Could you share how you use it and why it is successful?

VAST S_ccess as an organization is **“U”** .. You are invited to send in questions, ideas, and suggestions for articles, presentations and speaker topics to the editor. Let's all contribute. Every session or article can't be significant for every VAST member, but if more members contribute there will be more gems for everyone.

SUCCESS

Newsletter Editor: Newsletter@VAST.org

Presenter Proposals: <http://vast.org/presenters.html>

Publication page (The Journal is at the bottom of the page) : <http://vast.org/publications.html>

Guidelines for submissions to the VAST Journal:

http://vast.org/docs/submission_guidelines.pdf

Journal Editor: journal@vast.org

Communications Committee Chair: webmaster@vast.org

VAST PDI 2016 Registration

Online at www.vast.org

Payment Methods:

Secure credit card, check payable to VAST, or purchase order.

Important dates:

August 1 to September 5, 2016. Presenter (Member, Nonmember, Commercial) PDI

Registration:

April 30 to October 18, 2016. Early Bird Registration.
October 19 to October 28, 2016. Standard Registration.

Fee Structure

VAST Membership (Due on the anniversary of your subscription) \$25

Thursday Preconference Registration Fees

\$100 With paid registration to the VAST PDI; \$120 Preconference Only (Thursday); \$350 Team Registration
(3 Teachers + 1 Administrator -Thursday Only)

Professional Development Institute

Presenter (Member, Nonmember, Commercial) Registration. **Deadline: September 5, 2016**

Member Presenter Registration: \$155; Nonmember Presenter Registration: \$200; Commercial Presenter Registration: \$150/hour

Early bird-Registration. Deadline: October 18, 2016

Member Registration (this includes Life Members and Retired Members): \$170; Nonmember Registration \$220
Student Registration: \$100

Standard-Registration. Deadline: October 28, 2016

Member Registration:\$205; Nonmember Registration:\$250; Student Registration:\$130; Spouse/Guest: \$100

Saturday Only: \$100



Hotel Registration Information - Go to [Click](#)
Hotel Registration on-line - Go to [Click](#)

Impact the World Through a Career in Teaching

Altina Suber calls her first teaching environment a vibrant "United Nations" of sorts, serving students from 40+ countries. To strengthen her skills teaching English to speakers of other languages, she chose Regent University — the highest-ranked school in Virginia for Faculty Credentials & Training.* Regent showed her how to effectively apply theory and research in her classroom. Now, Altina brings the best in education to her nations of students. We'll prepare you too.

VDOE-Approved Endorsement in:
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* U.S. News & World Report, 2015 | EDU150631

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DNA DAY April 25, 2016

Cheryl Coronado, VAST Biology/Life Science Chair
Woodrow Wilson High School
Portsmouth, Virginia

It's time for "DNA" Day. Like me, you probably have missed it in the past, but now is our chance. Mark Monday, April 25, 2016, on your calendar. This will be a great opportunity to refresh our lesson plans with more meaningful activities and instruction. Our growing knowledge of how DNA interacts in the genome will increase the influence of biotechnology in our daily life. DNA Day allows an opportunity to reflect on the discovery of the Double Helix (1953) and the completion of the Human Genome Project (2003).

There are a variety of simple quick activities such as "Strawberry DNA Extraction". We've probably already done it with our students, but why not repeat it for DNA Day in our classrooms? Perhaps this time as we focus on the significance of DNA, we can remind our students of the chemistry of the process that allows us to do the extraction. For example, we can discuss the role of the soapy solution in disrupting the cell membrane or give a reminder about solutions and solubility when the alcohol is used. These ideas are supported by our Virginia State Standards of Learning as well as the Advanced Placement Biology Curriculum Framework.

Have you tried "Molecule World DNA", an iPad application created by Digital World Biology? This is a fairly new and highly intuitive authentic interactive

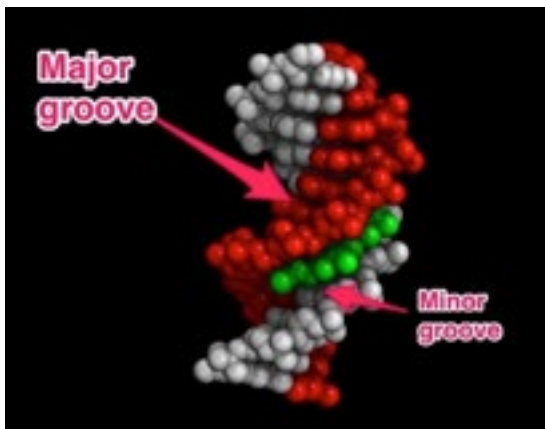


Students using the *Molecule World DNA* application. scientific experience available for a small cost at the iTunes Store. The creator of this amazing research tool is working hard to raise funds to make this application also available to users of Windows or Chrome Book systems. In addition, they have developed another powerful tool, "Molecule World DNA", for viewing other authentic molecular structures. "Molecule World DNA" comes with activities for teachers and students, and it supports teachers with an online Blog and Newsletter. The DNA Binding Lab is one such activity that is perfect for demonstrating how much our knowledge and use of DNA technology has grown over the years.

Reference Material:

<http://www.genome.gov/DNAday/>
<http://digitalworldbiology.com/dwb/blog/making-dna-art-dna-day-2015>
<http://digitalworldbiology.com/dwb/DNA-binding-lab>

Celebrating Genomics Through Awareness
<http://www.genome.gov/26525485>



Students interactively learn how molecules bind to DNA. This image as created by a student using the Molecule World DNA application and the photo editor application Skitch, December 2016.

Chemistry Lab:



New Resources for Chemistry Teachers: **The Mystery of Matter Search for the Elements**

Jill Barker, VAST Board Chemistry Chair

Last summer, PBS broadcast a three-hour series examining the roles various scientists played in the discovery of elements over a period of 200 years. Six separate element discoveries are examined by looking at the work of seven different scientists. Funded by the National Science Foundation, the episodes examined element discoveries in the mid 1700s (Out of Thin Air), mid 1800s (Unruly Elements), and the early 1900s (Into the Atom). These videos are available for purchase on DVD and free online at <http://www.pbs.org/program/mystery-matter/>.

Additional resources were developed with remaining grant funds and are free for teachers to use in their classrooms. It is located at http://www.mysteryofmatter.net/for_teachers.html. There is a teacher's guide that divides the series into six 30-minute segments and includes student questions and connections to everyday applications. A video library is available at this site as well. This library of 32 videos includes over five hours of material not included in the series, 22 of which apply specifically to chemistry teachers. If you would prefer to use shorter forms of the videos in your classes, there is a clip collection containing 60 short clips from the series that range from one to four minutes.

Jill Barker teaches chemistry at Millbrook High School in Winchester, VA. She has been teaching since 2000 and can be reached at barkerj@fcpsk12.net.



Virginia Outstanding Biology Teacher Award Deadline May 1, 2016

Every year, the Virginia Outstanding Biology Teacher Award (OBTA) program recognizes an outstanding biology educator (grades 7-12 only) from Virginia. Candidates for this award do not have to be National Association of Biology Teachers (NABT) 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 Virginia OBTA recipient is invited to the Virginia Association of Science Teachers (VAST) Awards

Dinner as a guest of the Virginia Association of Biology Teachers (VABT) to receive recognition by their peers during the Awards Ceremony and a plaque for themselves and their school. At the NABT Professional Development Conference, the awardee is special guest of Carolina Biology Supply Company at the Honors Luncheon and receives gift certificates from Carolina Biological Supply Company, resources from other sponsors, and award certificate and complimentary one-year membership from NABT. Contact Kathy Frame (chuckframe@aol.com) for an application or for further information.



Commonwealth of Virginia
Office of Governor Terry McAuliffe

Governor McAuliffe Announces Virginia's Outstanding STEM Awards

RICHMOND - Governor Terry McAuliffe and Science Museum of Virginia Chief Wonder Officer Richard C. Conti are pleased to announce the 2016 Outstanding STEM Awards recipients for Virginia. The honorees received their awards at the Science Museum of Virginia on Thursday, February 25. Award categories include Virginia's Outstanding Scientists and the Governor's Award for Science Innovation, alongside two new award categories introduced to the program this year: STEM Catalyst and STEM Phenom.

"The innovations and discoveries by these outstanding individuals and companies are essential to our work as we build a new Virginia economy," said Governor McAuliffe. "As we continue the tradition of honoring professionals and businesses that make significant contributions to science, it is fitting that we also recognize students and individual citizens who are using STEM to make Virginia a better place."

"The Museum's mission is to inspire, and this year's honorees accomplish this on many levels," said Conti.

Virginia's Outstanding Scientists Supriyo Bandyopadhyay, Ph.D.

Dr. Supriyo Bandyopadhyay is Commonwealth Professor in the Department of Electrical and Computer Engineering at Virginia Commonwealth University. Recently, Dr. Bandyopadhyay has been applying his ideas to make electronic gadgets out of tiny magnets roughly one thousand times smaller than the thickness of human hair. These magnets consume so little energy they can work without a battery by harvesting energy from 4G networks, TV signals and even vibrations from wind.

He is an international leader in the field of spintronics, the science of using the quantum mechanical spin properties of electrons to store, process and communicate information. He is also a pioneer in the field of straintronics, which involves manipulating the magnetization states of tiny nanomagnets with electrically generated mechanical strain for ultralow energy computing and signal processing. His work extends into nanostructured devices, in which he made seminal contributions to the electrochemical self-assembly of nanostructures and co-holds three patents related to this invention.

Jerry L. Nadler, M.D., M.A.C.P., F.A.H.A.

Dr. Jerry Nadler is Professor, the Harry H. Mansbach Endowed Chair in Internal Medicine and Vice Dean of Research at Eastern Virginia Medical School. Dr. Nadler's work focuses on better understanding and preventing the cardiovascular complications caused by diabetes and obesity.

Dr. Nadler is a physician-scientist who is internationally recognized for identifying inflammatory pathways leading to pancreatic beta cell damage, insulin resistance and atherosclerosis. His research of diabetes has led

to the development of preventative therapies and the identification of new small molecules blocking 12-Lipoxygenase activity. Dr. Nadler has authored more than 200 peer-reviewed publications and given numerous invited talks at international conferences. He holds 15 patents for biomarkers and novel therapeutics. He is part of a major international project to help identify whether a virus could be a trigger for Type 1 diabetes.

Governor's Award for Science Innovation ivWatch

ivWatch has developed a medical device that detects when a patient's IV is leaking, referred to as an infiltration. With an IV failure rate in the U.S. of nearly 23 percent due to infiltrations, this device continuously monitors the IV site and notifies caregivers if conditions indicate a possible issue.

ivWatch emerged from the ingenuity of a small, Virginia-based medical research and development company. With a focus on improving patient safety, a team of vascular access leaders, biomedical engineers, nurses and doctors invented the ivWatch Model 400 – a device that provides early detection of infiltrations by continuously monitoring peripheral IV sites. An optical sensor uses visible and near-infrared light to detect slight changes in the optical properties of the tissue, and the patient monitor processes the returning light using a proprietary algorithm. The device notifies caregivers if conditions suggest an infiltration, allowing them to address the issue before it causes patient harm. The ivWatch Model 400 represents a new option for medical professionals prescribing IV therapy – a continuously monitored peripheral IV. This allows for less intrusive infusion therapy methods that can reduce costs, risk, patient harm and medication dosing errors.

Nominations Open for the 2016 VAST RISE Awards

Know someone who should be recognized for their work in science education?

The Virginia Association of Science Teachers is now seeking nominations for the 2016 VAST Recognition In Science Education (RISE) awards.

VAST recognizes excellence in the following 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 classroom) Examples Science Supervisor, Information Education, Principal, Etc.)
- University/College Faculty
- Community Partnership (example: Local Business, Government, Non-profit Organizations, Etc.)

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

Awardees will be recognized at the November 2016 VAST PDI and will be reimbursed up to \$150 to attend the conference.

The deadline for nominations is August 20, 2016. The nomination forms are available on the VAST website:

<http://www.vast.org/vast-awards.html>

Help us celebrate individuals who deserved to be recognized for the wonderful work they do in our schools.

Join me in acknowledging their contributions to the greater good.

Timothy Couillard

VAST Awards and Grants Committee Chair

VAST Mini-grant Program Accepting Applications for 2016

Got an innovative idea that needs some seed money? Need support for an innovative professional development activity?

The VAST Awards and Grants committee is now taking applications for the 2016 Mini-grant program.

The VAST grant program includes the VAST Education Mini-grant, the **Tidewater Alliance of Chemistry Teachers' (TACT) Chemistry Education Mini-grant**, and the **American Institute of Professional Geologists (AIPG) Mini-grant**.

Team applications are welcome, however one person must be designated as the Project Director. To qualify for the Mini-grant program, the Project Director must a) be a current member of VAST (dues paid for 2016), b) have a minimum of three years of experience as an elementary or secondary science classroom teacher, and c) be currently employed as a classroom teacher in the Commonwealth of Virginia.

The Awards and Grants committee is looking for projects that will directly impact student learning in the science classroom. Proposals will be evaluated 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.

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.

The deadline for submissions is June 1, 2016. The applications are available on the VAST website:

<http://www.vast.org/grants.html>

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

Timothy Couillard

Awards and Grants Committee Chair

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2016 Donna Sterling Exemplary Science Teaching Award Middle/Secondary (Grades 6-12)

Donna Sterling was a visionary science educator with a passion for working with science teachers and developing habits of inquiry-based teaching. Most recently, her leadership in the Virginia Initiative for Science Teaching and Achievement (VISTA) focused on elementary and secondary teacher professional development. This award recognizes that exemplary teachers engage in continuous improvement, and is designed to support a professional development plan for the improvement of science teaching. In 2016, the award will be given to an exemplary middle/secondary teacher. The award alternates between elementary and middle/secondary.

The awardee will receive a total of **\$4000**. In addition, travel costs will be reimbursed to attend the 2016 VAST PDI to receive the award and to the 2017 VAST PDI to present a session on the professional development experience and outcomes. The awardee will receive \$3000 at the VAST PDI in 2016. The remainder will be awarded after the awardee presents at the next VAST PDI and also submits an article to either the newsletter *The Science Educator* or the *Journal of Virginia Science Education*.

Deadline for applications: July 15, 2016

To apply:

(1) In no more than two pages, single-spaced, **describe an inquiry-based science unit** that you have taught. Give evidence that the unit was **effective**. Evidence documents such as student work can be submitted separately, and will not count toward the two-page limit.

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



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

All materials must be submitted by **5 p.m. on July 15, 2016**.

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

Local Teacher Receives Statewide Award for Science Teaching



2015 Winner

Mrs. Jaclyn Claytor, is a fourth grade teacher at Nuckols Farm Elementary School in Henrico County, and the Donna Sterling Awardee, 2015.



Regional News

Diane C. Tomlinson, Ed.S./Ph.D. Candidate (CTE)
Science Specialist - VAST Region 7 Director

A six-student team and their teacher at Lebanon High School are the pride of Region VII and the state of Virginia. The Real World Design Challenge team received word that they are the Virginia 2016 winners. The team will represent Virginia in the National Challenge in April in Washington, DC. The student team is mentored by Jani Purtee, Engineering and Project Lead the Way teacher, at Lebanon High School.

The annual competition presents a new engineering challenge for high school students each year. Challenges address a real issue that the nation's leading industries face. Using professional engineering software students develop their project. They present their results and are asked to demonstrate that their work has a reasonable chance of success and has real world value.

This year's challenge was to design an unmanned aerial vehicle (UAV) and an associated unmanned aircraft system (UAS) that uses current technology to detect moisture levels around a food producing crop. The issue addresses that in future years farmers in the region will have to produce more food per acre to feed our growing population.

The Lebanon team surveyed farmers in their area and selected corn as the food crop they would target. As the students prepare for the National Challenge, they will be required to expand to an additional crop. In addition, the challenge looks at all areas of a business case related to their design. The following linked describes the challenge in more detail: [CLICK](#) and the link to the Real World Design Challenge home page is: [CLICK](#)

The article that appeared in the Bristol Herald Courier on February 7, 2016, describes how the team worked together to develop their project. You will note the partnership of science, technology, engineering and mathematics in the students' work. A perfect example of STEM!

The entire region is so proud of this team and their teacher for the outstanding work that they have done so far. We look forward to the competition in Washington.

Read the Bristol Herald Courier article about this winning team: [CLICK](#)

Question From Members:

Can I Still Get a Certificate for Attending Last Year's PDI?



Yes. You need to go to this site: [CLICK](#)

Login with your email and password with which you originally signed up. If you forgot your password, click the link to reset it. If the original email is no longer functional, you may email [membership](#) to change your email address.

After logging in, there is a gray **INFORMATION** tab on the top left. Hover over this to access the menu with **My Profile** and **My Events**.

To print certificate, **click on My Events**. Click on the **2015 PDI**. Click on **My registration tab**. Click on **Certificate button**.

How do I change my personal data for VAST?

Do you have a new address, email, schools or teaching assignment? Use the same directions but after logging in choose My Profile instead of My Events and edit your personal information.



Dominion's **Project Plant It!** Celebrates 10 Years of Teaching About Trees

By Suyapa Marquez,
Communications Specialist

For the past decade, elementary school students throughout the Commonwealth of Virginia have been digging into Mother Nature thanks to Dominion's **Project Plant It!** A hallmark of this educational program is the distribution of a free redbud tree seedling to all children who are registered for the program. The seedlings are shipped to arrive in time for Arbor Day, which is April 29 in 2016.

This year, for the first time since the program began in 2007, enrollment was open to all grade levels instead of just to third graders as in the past. Also, scout troops, civic organizations, preschools, homeschools and other entities that work with children—even parents and grandparents—could register to participate.

In 2016, up to 50,000 redbud tree seedlings will be distributed to children in 10 states where Dominion conducts business. This means **Project Plant It!** has provided a grand total of about 350,000 tree seedlings over the past ten years, representing almost 875 acres of new forest if all of the seedlings are planted and grow to maturity. [Source: Virginia Department of Forestry]

All of the instructional materials – including lesson plans in math, science, language arts and social studies, as well as posters, certificates and other teaching tools

– can be downloaded at no charge from the website, www.projectplantit.com. Teachers and parents can easily adapt these materials to different grade and age levels. The website also includes educational games, instructional videos, outdoor activities for children and families to enjoy together, and much more!

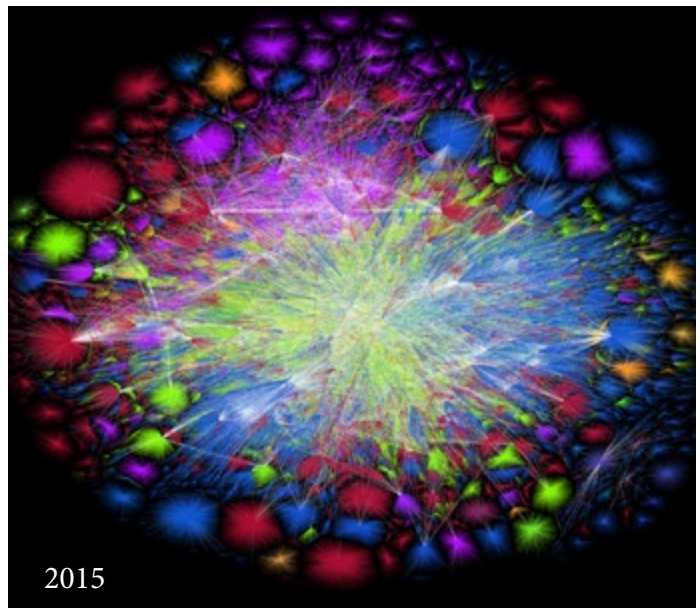
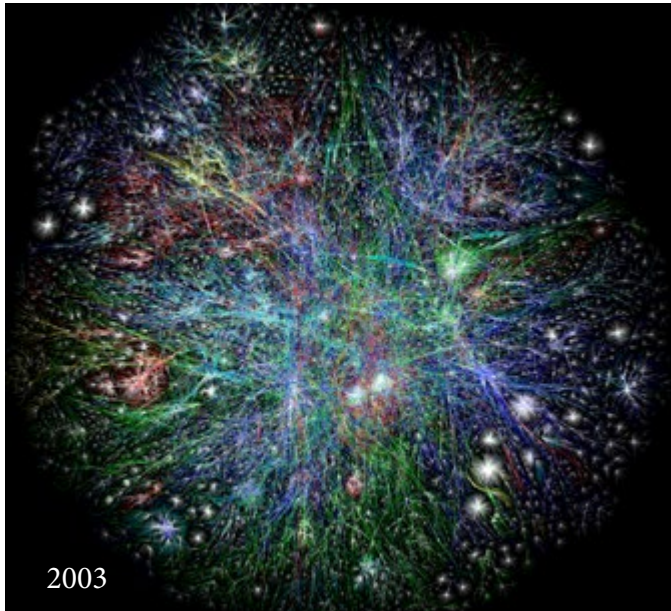
Many school systems in the Commonwealth plan events in April to celebrate trees. In Petersburg, Va., for example, students from five public schools gather at an historic park to plant trees and engage in activities to support STEM learning with Dominion volunteers, soldiers from Fort Lee, and community leaders from the Virginia Department of Forestry, the Willcox Watershed Conservancy and Petersburg Parks & Leisure. Third-graders in Goochland Public Schools will plant trees with help



from a Dominion forester and play educational games, eat snacks that come from a tree, and identify products that come from trees.

Project Plant It! was created by Dominion to teach children about the benefits of trees to the ecosystem and to inspire a new generation of tree-planters to protect the environment. For more information, visit www.projectplantit.com.

Making Sense from Nonsense: The Songs of Children



CC by Barrett Lyon / The Opte Project

The Opte Project: a visualization of programs that collectively output an image of every relationship of every network on the Internet.

Whan that aprill with his shoures soote
 The droghte of march hath perced to the roote,
 And bathed every veyne in swich licour
 Of which vertu engendred is the flour;
 Whan zephirus eek with his sweete breeth
 Inspired hath in every holt and heeth
 Tendre croppes, and the yonge sonne
 Hath in the ram his halve cours yronne,
 And smale foweles maken melodye,
 That slepen al the nyght with open ye
 (so priketh hem nature in hir corages);
 Thanne longen folk to goon on pilgrimages,
 And palmeres for to seken straunge strondes,
 To ferne halwes, kowthe in sondry londes;
 And specially from every shires ende
 Of engelond to caunterbury they wende,
 The hooly blisful martir for to seke,
 That hem hath holpen whan that they were seeke.

– *Canterbury Tales, Prologue*
 Geoffrey Chaucer (1390)

‘Twas brillig, and the slithy toves
 Did gyre and gimble in the wabe;
 All mimsy were the borogoves,
 And the mome raths outrabe.

“Beware the Jabberwock, my son!
 The jaws that bite, the claws that catch!
 Beware the Jubjub bird, and shun
 The frumious Bandersnatch!”

He took his vorpal sword in hand:
 Long time the manxome foe he sought--
 So rested he by the Tumtum tree,
 And stood awhile in thought.

And as in uffish thought he stood,
 The Jabberwock, with eyes of flame,
 Came whiffing through the tulgey wood,
 And burbled as it came!

– *Alice in Wonderland*
 Lewis Carroll (1865)

What was the Lorax
 And why was it there?
 And why was it lifted and taken somewhere
 from the far end of town where the Grickle-grass grows?
 The old Once-ler still lives here.
 Ask him. *He* knows...
 He stays in his Lerkim on top of his store.
 He lurks in his Lerkim, cold under the roof,

where he makes his own clothes
 out of miff-muffered moof...
 And under the trees, I saw Brown Bar-ba-loots
 frisking about in their Bar-ba-loot suits
 as they played in the shade and ate Truffula Fruits.

– *The Lorax*
 Theodor Geisel, Dr. Seuss (1971)

Things were going smoothly in my class concerning force diagrams associated with Newton's First and Third Laws, and students seemed well prepared for their quiz. They were engaged with their free-body diagram questions, including identification and calculation of vector components. Anticipating a physics concept problem, I approached Zong Yi, one of my Chinese students who had raised her hand. She pointed to the question, "Label all forces involved in this situation," with her finger on one word and asked, "What does this [*involved*] mean?" Having moved from the textbook use of the word *impinge* to *involve* I suddenly realized I had not simplified for her at all. Perhaps, "Label all the forces acting on the object," might have been clearer. My thoughts jumped to the whole issue of language use, acquisition, and development. What follows is an expansion on my earlier comments on childhood and the importance of language invention and evolution. It is a fascinating topic for a teacher with such a diversity of students and student backgrounds: Indian, Ghanaian, Turkish, Pakistani, Bolivian, Peruvian, Salvadorian, Guatemalan, Korean, Vietnamese, Filipino, Chinese, Nepalese.

How might text by Chaucer, Carroll, and Geisel over nearly 600 years relate to my Zong Yi today? The web-like interconnections illustrated so beautifully on the map of the visualization of Internet relationships [the Opte Project] which begins this piece offer a clue, especially in the proliferation of the relationships in the space only 12 years. It is significant that the Opte Project is the creation of a dyslexic person because it is as though Barrett Lyon was able to create his own syntax through the language of the Internet. Although the Middle English of Geoffrey Chaucer might appear incomprehensible to us today, like the nonsense verses of Lewis Carroll or Dr. Seuss, children's delight in new words, pitches, and rhythms together with their proclivity for inventing language might suggest an answer.

In 1981 Derek Bickerton, professor of linguistics at University of Hawaii, wrote his *Roots of Language*, based in large part upon his studies of Hawaiian Creole English which arose from Hawaiian Pidgin English in a very short time, only 20-30 years. Physician and author, Lewis Thomas, interprets this to suggest that when thousands of immigrant workers arrived to support the new sugar cane industry around 1880, there was something of a communication crisis among Chinese, Japanese, Korean, Filipino, Portuguese and Spanish speakers. Within a generation there appeared an Hawaiian Creole in place of the skeletal Hawaiian Pidgin English, which was not really a language, but rather a set of rather isolated nouns and verbs, lacking any grammar to express thoughts or ideas. Because of the short time between arrival of the different language speakers and the appearance of Hawaiian Creole, Bickerton made the case for his Language Bioprogram Hypothesis, the proposal that language is an innate, biological, and genetically determined property of the human brain. He has proposed that many young children are able to construct whole new languages simply by working at it, playing with it together.

Bickerton's theory is not without its supporters and critics, of course. Some would maintain that at some time in the evolution

of the human skull speech became possible in a few mutant individuals. As the need for communication increased among settled communities or among hominin hunters and gatherers, these speakers out-competed their speechless contemporaries, naturally selecting toward *Homo sapiens*. However, this would have required the same mutation to have occurred in several individuals in close proximity or the ability to travel, as Thomas wrote, "with remarkable agility everywhere on earth, leaving their novel genes behind." Bickerton and others would explain the development of language as an expression of a latent property in all human brains given the right circumstances. One could imagine a critical mass of children gathered together, babbling and playing together...talking, forever talking. Because of the universality of language amid all cultures and Bickerton's own cross-disciplinary influence (anthropology, linguistics, creole studies, psychology, and neurology), one might look elsewhere for supporting evidence.

Rather than searching for a specific "language acquisition device" or "universal grammar" proposed by some to explain why children seem to possess an innate ability to acquire language versus the camp which would insist that language is learned, perhaps the answer, as is often the case, lies in seeking input from other fields. Michael Tomasello has pointed out that language is one of the best examples of the ultimate cooperative behavior, requiring a set of norms arising from the human instinct for cooperation, clear back to our hominin ancestors.

Another fascinating idea comes from Steven Mithen's book, *The Singing Neanderthals*, where he points out that environmental and dietary changes created pressures for enhanced vocalization and communication toward language and music, rather than the more utilitarian non-human primate calls. We have a shared musical and linguistic heritage where music may be encoded in the human genome, where perhaps humanity even developed music first, then language as the evolutionary tapestry unrolled. In fact, there is a carpet weaving tradition in India where the master weaver sits behind the row of workers seated with their various threads, reading the instructions in a chanting voice from note-like marks on his paper.

Mithen has persuasive evidence for holistic phrases with unique meaning occurring first as opposed to isolated words, pidgin style, with grammar coming later. As bipedalism evolved, along with it came a sense of rhythm and dance and the reasonable inference that a sense of pitch and melody followed as well. The "motherese" used to communicate with babies is certainly musical; and does not the childlike fascination with the rhymes and rhythms of verses like Lewis Carroll's "Jabberwocky" or Dr. Seuss provide additional evidence for a child's innate capacity for language? Additionally, I doubt I am alone in being conscious of a rhythm to my own thoughts, meditations, or melodies which arise as an integral part of my daily walks to and from work. There are musical tempi like "andante" which arise from a contemplative walking pace, and I wonder if the frequent gathering of members of my university's mathematics department for chamber music gigs arose from their innate sense of regularity and rhythm.

Mithen goes on to explain that language defines the capacity for metaphor as commonly – and essentially – utilized in art, science, and religion. In the language of poetry, Theodor Geisel as Dr. Seuss employs an anapestic tetrameter as a poetic meter having four anapestic feet per line. There is a definite ambulatory connotation in explaining that the “poetic foot” is to poetry what the measure is to music.

Looking again at the Opte Project images above, there is a suggestiveness in the similarity of the arrangement of Internet channels and that of neurological connections in the ontogenesis of the human brain. In an article, “Neural Connections: Some You Use, Some You Lose,” John Bruer (President, James S. McDonnell Foundation) addresses the physiology of neural synaptic formation in the human brain, basing his conclusions on both human PET scan data and examination of brain development in rhesus monkeys. What he explains is the inverted-U pattern of synaptic densities over our lifetime. At birth we have about the same synaptic density as in adulthood; beginning at puberty there occurs a synaptic “paring back” from rapid synapse formation during childhood. Contrary to the popular First-Three-Years Myth [viz. 1996 *Newsweek* “zap” and “pop” article on inducing growth of neurons through early childhood stimulations], the rate of synapse formation seems under genetic, not environmental control. The developmental accumulation of synapses seems impervious to either environmental over- or under-stimulation. It appears that it is the quality rather than the quantity of stimulation that matters most. The pruning process at puberty where synaptic densities decrease leads to progressive improvement in working memory capacity, essential to achieving what neuroscientist David Lewis calls mature levels of cognitive ability. This puts a new twist on Dr. Seuss’ definition of a grownup as being an obsolete child.

Dependent upon these ideas of the growth of children and the evolution of music and language, plus the neurological development of the pre-frontal cortex is the current emphasis upon communication and conversation in our schools and classrooms. Beginning in late 2014, several issues of ASCD’s *Educational Leadership* publication have been devoted to the importance of speaking, reading and writing especially for English language learners (ELLs). When oral language development is emphasized, ELLs become significantly better at reading and writing, hence the crucial role of highly qualified teachers for these children. Debates and conversations (as opposed to the deadly drone of teacher dominance) are the keys to student understanding. It was the comment of physicist and Nobel Laureate Richard Feynman which strikes to the heart of the matter: **“What I cannot create, I do not understand.”** This is as true in daily classroom routine as it is in science project or assessment. As one article has it, students like discussion routines which present a challenge they must meet by working together.

The book, *Academic Conversations*, by Jeff Zwiers and Marie Crawford is full of illustrations of the value of energizing students in creative conversations where their understanding is increased. From a 5th grader: “Science wasn’t very interesting until we

started talking about it.” Or, as a 7th grade girl put it, “I didn’t know what I knew until I talked about it.” Students need to know how to talk about scientific imagery and experimentation, not merely memorize what *hypothesis* or *dependent variable* mean. The authors reinforce the point in *Educational Leadership* about ELLs and academic fluency that communication skills need to be practiced in social situations outside of school, particularly in low-income homes – that these skills, for all our students, are gatekeepers for academic or professional success, to say nothing about feelings of personal self-worth. Facts are readily available on the Internet; what matters most is what we **do** with our knowledge. As Zwiers and Crawford emphasize, bricks are certainly necessary materials, but they must be transported and arranged by skillfully assembling them **over time** [emphasis mine]. They make a revealing challenge: look over a listing of academic standards and circle the words which ask students to actually **do** something. As we see in the language instinct debate, where richness of the environment and learning opportunities play a crucial role in language acquisition, so also with Zwiers and Crawford: “People, especially children, internalize and develop language when they are immersed in it and when they use it for real purposes. Three processes are vital: listening, talking, and negotiating meaning.” All of these are essential in conversation.

We need to encourage the songs of children in making sense from nonsense.

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

Congratulations John Kowalski, Ph.D

For 29 years, John Kowalski has been at the Roanoke Valley Governor’s School for Science and Technology where seven different school districts pool their resources and send their gifted students. For the past seven years, John has served as the Director of the Governor’s School.

John started his career as a biology teacher, became a science department chair and also taught at George Mason University.

John has been a VAST member and a board member for many years and serves as the PDI committee chair.



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

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Join the VAST community on line. "LIKE" the Virginia Association of Science Teachers so that the latest science educational news will appear on your page. Region 2 has a new Facebook page. Please visit and join our community at: <https://www.facebook.com/Region2VAST>.

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

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



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

Please send articles, letters to the editor, or labs by the submission deadline, **May 1, 2016**, for inclusion in the next digital VAST Newsletter.

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