

VDOE Science Update November 29, 2013

NEWS

Programs that Work – Virginia Mathematics and Science Coalition – Due December 11, 2013

The Virginia Mathematics & Science Coalition invites you to nominate effective student and teacher educational programs for the VMSC "Programs that Work" Awards. The Coalition is interested in reviewing and recognizing exemplary mathematics, science, and integrated science, technology, engineering, and mathematics (STEM) programs for which there is evidence of a positive impact on student or teacher learning. The application process is designed to be relatively simple. Programs will be recognized in mathematics, science, and integrated STEM in the areas of student programs and teacher education programs.

Programs must be focused on one or more STEM areas. Proposals will be evaluated on the extent to which they:

- Represent innovative, exemplary programs that have proven effective with all students or teachers;
- Demonstrate the important science concepts, skills or processes students and teachers learned as a result of the programs;
- Document impact on teaching and learning of those STEM concepts.

The Virginia Mathematics and Science Coalition will recognize the 2014 Programs That Work Award recipients January 13, 2014 in Richmond. The Coalition will provide support for travel and lodging of award recipients. **Applications are due on December 11, 2013**, and will be evaluated on a competitive basis for programs that have been conducted during the past five years and have demonstrated positive results.

More information and applications may be found on the [VAMSC Programs That Work webpage](#).

VISTA Applications Now Open! Paid professional development for science educators

Did you know that [VISTA](#) will pay YOU to join hundred of educators across Virginia to innovate science education? VISTA is the Virginia Initiative for Science Teaching and Achievement, which is funded by a \$34 million grant from the U.S. Department of Education. Applications for all 2014-15 VISTA professional development programs are now open. Programs are for teams of 4th-6th grade [elementary teachers](#), new [middle and high school teachers](#), [school division science coordinators](#) with five years or less experience, and [science education faculty](#). Benefits include free professional development, paid stipends, money to spend on science supplies, and much more. Applications are also being accepted on a rolling basis for [VISTA coach](#) positions. [Apply](#) today!

2013 Virginia Association of Biology Teachers Conference – December 7, 2013

Take advantage of spending the day with other biology teachers at the Virginia Zoo in Norfolk for the VABT annual conference. An engaging day of local and state resources will be discussed as well as time to discuss what you are doing to excite students about the life sciences.

Where: Virginia Zoo
3500 Granby Street
Norfolk, VA 23504
When: December, 7, 2013 9 am – 3 pm

For more information, please contact:
Kathy Frame at chuckframe@aol.com
Cheryl Coronado at Cheryl.coronado@pps.k12.va.us

Teacher Resources

Over the past couple years the VDOE has offered institutes that resulted in some resources to support effective science instruction and assessment. Science teachers and coordinators have shared their successes (based on the 2012-2013 Science SOL test data) using these resources in the classroom and for professional development. We want to remind you of these resources. We have identified some of the resources from the VDOE below.

We want to share some ways that you could approach an individual concept using these resources. For example, below are a few ways some of the resources could support student learning about matter, forces, motion, and energy. We have addressed these concepts from various grade levels, but any one of these examples could be altered to be used at other grade levels or to support the teaching of other subjects.

1. **Enhanced Scope and Sequence Lessons (ESS)** – Scientific Inquiry and Writing/Journals

The following Grade 4 Enhanced Scope and Sequence Lesson, "[Investigating Motion](#)", provides an opportunity to use a range of science practices/process skills while students investigate and experiment with motion. As part of the assessment approach included in the activity, students are asked to write about the experiences and extend their thinking related to motion (see the assessment portion of the lesson). Here is an example from this lesson that helps students process their thoughts on the science concept and at the same time offers valuable writing practice.

Journal/writing prompts

Your little brother and you are at the beach. When your brother gets in the water, you notice he gets swept far down the beach and doesn't seem to notice. Using what you learned today, write about why he has no idea he is moving away from his place on the beach.

When viewing the sunrise or sunset, it appears that the sun moves. Explain why we see this and where we would have to be to view what is really happening.

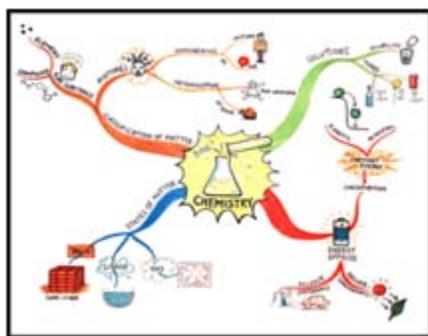
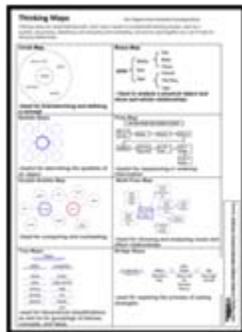
2. **[Models and Simulations](#)** – Models and simulations can be used in many ways. The simulation [The Moving Man](#) by PhET is one of the models correlated to the Science Curriculum Framework that can be found on the [Virginia Science, Activities, Models, and Simulations](#) webpage.

This model could be used for further investigation of forces and motion concepts in Physical Science. The Moving Man model is an example that would support [The Rate of Motion Investigation](#) (PDF) that was shared during the 2012 Science SOL Institute.



For activities, models, and simulations correlated to the Science Standards of Learning, visit the [Virginia Science, Activities, Models, and Simulations](#) webpage.

3. **Thinking Maps** - A thinking map is a diagram used to visually outline information. It can also be considered a concept or a mind map. A thinking map has a concept in the center of a page and has associated concepts that radiate out from the middle with connecting ideas. [Thinking maps](#) were introduced during the 2012 Science SOL Institutes. Information about Mind Maps can be found on the SOL Institute website. A thinking map helps students see the explicit connections amongst the key concepts they are learning and the connection of those key concepts to a central concept or big idea.



This is an example of a thinking map with student drawings included that was shared by Tammy Stone from Rockingham County during her session at the 2013 VMI STEM Conference. This is a great example of a thinking map focused on the concept of matter.

4. **Effective Questioning** – As we know, effective questioning really can elicit academically productive talk. In each of the 2012 SOL Institute sessions, we introduced and discussed

the “Talk Science Primer” by TERC. It can be found on the [2012 Science SOL Institute](#) page listed as “Article – Talk Science Primer” (PDF).

In the Grade 4 Enhanced Scope and Sequence lesson, “Force, Mass, and Demolition Derby”, there are several good examples of effective questioning from the basic clarification by students of their own thinking based on their experiment they conducted to the application of the knowledge they have gained during their experiment to other situations. The following are some of the example questions found in the lesson.



- In

Assessment Questions

- How does mass affect motion?
- what ways can force affect motion?

Extensions and Connections (for all students)

- Have students play a game of marbles with two sizes of marbles to hold a discussion about the transfer of energy, force, mass, and the change of motion.

Project Learning Tree (and more) Resources

Please take note that PLT has created a new webpage to support the Energy & Society Kits, GreenSchools! Energy Investigation, and energy-themed activities at <https://www.plt.org/bonus-energy-resources>. The Branch’s feature article provides more details, <https://www.plt.org/newsletter-new-energy-education-resources>

You may also be interested in the new Southeastern Forests & Climate Change module which is available in draft form at <http://sfrc.ufl.edu/extension/ee/climate/>

[CEED Data Dashboard](#)

The CEED is a learning laboratory where Franklin County students and now students world-wide can explore its green technology and building design through problem-based learning. The building is a PassivHaus-designed, LEED Platinum structure that uses the sun and wind to produce additional energy. It is expected to be a zero net energy building. Other conservation practices are in place, such as a rainwater collection system, to further reduce our impact on the ecosystem.

A new intuitive **interactive dashboard** has been developed to display real-time data from the CEED’s solar and wind energy generation systems and correlate generation to real-time on-site weather data. In addition building sensors monitor rainwater harvesting, solar thermal collection, and geothermal heating and cooling system efficiency.

New **web-based lesson plans** have been written by educators specifically for the CEED. The activity-based plans integrate both Virginia Standards of Learning (SOL) and Next Generation Science Standards. The CEED is a center where students can physically visit and participate in learning activities or through web access virtually explore ways to save and produce energy. The curriculum and building provides teachers with resources to help their students understand energy, and provides exploration opportunities for community members who are looking to improve their response to world-wide energy issues. Built as a school, the center also incorporates

residential elements to show the relevancy of energy-saving practices and energy-producing applications for homes.

Safety Updates



OSHA Resources

OSHA has set a **December 2013 deadline** for all employers--*including schools*--to provide training to ensure that teachers and staff understand how to read new [Globally Harmonized System \(GHS\)](#) chemical labels. OSHA has created a host of resources. Please visit the [OSHA Hazard Communication](#) website to view and download the Hazard Communication Wallet Card, Training Requirement [Fact Sheet](#), and more.

Teacher Opportunities

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) – Nominations now open, Grades K-6

The [PAEMST](#) is the nation's highest honor for teachers of mathematics and science (including computer science). Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education. The 2014 Awards will honor mathematics and science (including computer science) teachers working in grades **K-6**. Nominations close on **April 1, 2014**. Please nominate an excellent teacher or encourage others to nominate their fellow teachers!

Nominations for the 2014 Standards of Learning Item and Test Review Committees – Applications due February 14, 2014

[FULL MEMO](#) The Office of Assessment Development is seeking nominations for the 2014 Standards of Learning (SOL) Item and Test Review Committees. The committee meetings will be held in Richmond, Virginia, according to the attached schedule. Approximately 15 members are needed for each of the 34 committees, and school divisions may nominate one or more representatives for each committee.

Committee members will be chosen based on the following criteria:

- grade-level experience and content area expertise;
- in-depth knowledge of the SOL;
- instructional/supervisory experience with students of varied learning styles, abilities, and aptitudes, including students with disabilities and students with limited English proficiency; and
- balanced regional representation.

Committee members selected for the 2014 SOL Item and Test Review Committees will be expected to:

- examine test items to confirm a match with the SOL;
- review test items for appropriateness and fairness;
- examine test items for equity, bias and sensitivity issues, and stereotyping regarding gender, ethnic, religious, political, age, or socio-economic group;

- examine field test data for potential test items; and
- recommend whether items are to be included in the test item bank.

Shell Lab Challenge competition help requested - Science Matters State Coordinators

The Challenge invites middle and high school science teachers (Grades 6–12) in the United States and Canada (with special attention to urban and underrepresented groups) to illustrate replicable approaches to science lab instruction utilizing limited school and laboratory resources. Teachers and schools submitting top entries will receive additional laboratory tools, resources, and rich professional development opportunities.

Application for 2013–2014

[Download an application](#)

Deadline: December 20, 2013

“Ask NICE”

Educator Professional Development from NASA Innovations in Climate Education (NICE). Online sessions on third Thursdays from 4-5pm ET are offered to all teachers.

Schedule:

November 21: Climate Change Summary: What We Know and How We Know It

January 16: Impacts of Climate Change/The GLOBE Program: Green-Up

Additional Sessions: TBA

Visit the NICE website to connect: <https://nice.larc.nasa.gov/>

Sponsored by Minority University Research and Education Program (MUREP) - NICE

Toshiba/NSTA ExploraVision

ExploraVision is a competition that encourages K-12 students of all interest, skill and ability levels to create and explore a vision of a future technology by combining their imaginations with the tools of science. Teams of two to four students research scientific principles and current technologies as the basis for deigning innovative technologies that could exist in 20 years. Students compete for up to \$240,000 in savings bonds (maturity value) for college and cool gifts from Toshiba. First- and second-place teams also receive an expenses-paid trip with their families, mentor and coach to Washington, D.C. for a gala awards weekend in June 2014.

Student Opportunities

Writers Encouraged to Enter Statewide High School Writing Contest

The Virginia Outdoor Writers Association, Inc. (VOWA) and Bass Pro Shops are sponsoring the 21st Annual High School Writing Competition for 2013-14. The goal of the competition is to reward high school students for excellence in communicating their personal experiences in the outdoors.

The competition is open to all Virginia students in grades 9 through 12. Home-schooled students are welcome to enter. The theme of this year's contest is based on a memorable outdoor experience. Any experience by the writer with hunting, fishing, camping, canoeing, hiking, birding

or other outdoor activity should be the predominant subject matter. No athletic event or competition is an eligible subject matter.

Bass Pro Shops has agreed to again co-sponsor the contest, and is providing gift cards of \$150, \$100, and \$50 for purchasing any merchandise at Bass Pro Shops. There will also be gear from outdoor sports businesses and Supporting Members of VOWA. Winners will be announced and awards presented at the Virginia Outdoor Writers Association annual membership meeting in Charlottesville, VA on February 22, 2014. The winner's parents, a mentor, or a teacher may be guests of VOWA for the presentation event. The students at the awards program will read the winning entries during the Annual Meeting.

Entries should be submitted in a Microsoft Word or text file, since the three top winners will be published on the VOWA Web site, and may be in other publications or on web sites. The article should be written in WORD format and attached to an e-mail. The submissions can be made between now and the February 3rd, 2014, deadline. For more information go to www.vowa.org.

Building Leaders for Advancing Science and Technology (BLAST)

The Building Leaders for Advancing Science and Technology (BLAST) program is designed to attract students who are motivated to learn, but have not yet shown interest in STEM coursework. Please direct students and other colleagues to the website for program information and online application, www.blast.spacegrant.org. The deadline for the application is February 1, 2014.

Physics Video Contest

The Department of Physics and Astronomy at James Madison University is excited to present you and your students with the opportunity to explore and demonstrate their understanding of physics concepts through video. This project is intended to reach across grade levels and disciplines and explore the intersection of the arts with physics. We want science teachers and students to work with teachers and students from the arts and technology to create a video to compete for cash prizes for you and your school!

This contest is open to students in grades K-12 in both public and private schools. Students are free to work individually or in teams of up to 5 people. If more than five people contribute to a project, only 5 will be eligible to receive an award and prize money. In order for an entry to be accepted, all standard lab safety practices must be employed. Furthermore, videos must be free of objectionable content.

For more information and to learn how to enter a team(s) into the contest please visit our website at <http://csma31.csm.jmu.edu/physics/Public/videocontest.html>

Virginia Space Coast Scholars (VSCS)

The ***Virginia Space Coast Scholars*** (VSCS) is a program for **sophomores** focusing on the science, engineering, and technology integral to current missions at NASA Wallops Flight Facility and the Mid-Atlantic Regional Spaceport. This dynamic (and **FREE**) program, designed by the Virginia Space Grant Consortium (VSGC), inspires students who possess technical and/or scientific interests and are motivated to learn about the many different opportunities that NASA offers.

The VSCS program features two key elements: 1.) an on-line science, technology, engineering, and mathematics (STEM) learning experience featuring five modules; and 2.) a seven-day residential Summer Academy at NASA Wallops Flight Facility on Wallops Island, VA where selected scholars will learn first-hand from NASA professionals and their partners about the latest cutting edge technologies and missions.

Program Information:

- FREE Program for **10th Grade Students**
- Online modules covering **NASA aircraft, balloon, and rocket missions** launched or managed at Wallops Flight Facility
- Online course runs from **January through April 2014**
- Selected students will be selected for a week long **Summer Academy at NASA Wallops Flight Facility**
- Application Deadline: **December 6, 2013**
- <http://vscs.spacegrant.org/> for application and more information

Thanks in advance for your support. For more information, please contact Elizabeth Joyner, STEM Education Specialist, at ejoyner@odu.edu.

Youth Rover Challenge

Registration for the Youth Rover Challenge (YRC), a multi-tier robotics education development program, is now open. Sponsored by The Mars Society, YRC is a STEM-related educational effort that is designed for schools and organizations with students or members in grades 5-12 to have the chance to build and compete at a global level with a LEGO Mindstorms NXT 2.0 based robotic rover and competition arena intended to simulate the surface of Mars. The sandbox where the robotic rover operates is intended to be replicated so participants can operate the competition locally. Winners of the best place times will be invited to one of four events held in each [region](#).

The Rover built for the competition is pre-designed accomplish specific experiments (tasks) similar to what Mars Rovers accomplish today on the surface of Mars and other harsh environments on remote places on Earth. The competition is operated on-site at your self-built sandbox and the final operation of the field tasks are then videotaped and sent to YRC for submission. Teams that have submitted videos that show the final operation of the rover completing the tasks under a time limit are then ranked against other teams.

Registration for the competition closes **January 31, 2014**. For more information about YRC, click [here](#).

Highlighted Superintendent's Memos

- MEMO #312-13 [Virginia Junior Academy of Science](#)
- MEMO #306-13 [Reimbursements for Advanced Placement and International Baccalaureate Test Fee Payment Program for 2012-2013](#) 
- MEMO #305-13 ["Programs That Work" Awards for Mathematics, Science, and STEM](#)
- MEMO #304-13 [Nominations for the 2014 Standards of Learning Item and Test Review Committees](#) 
- MEMO #302-13 [Application for 2014 Innovative Learning Teams](#) 

As always, please contact one of us if you have questions.

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