MAST
MARYLAND ASSOCIATION OF SCIENCE TEACHERS
e-RAPPER
February 2012

Editor's Note

Hello again,

We are deep into winter now and very little snow, but we have had some cold days and enough cloudy days to make me ready for spring. In the woods behind my house, I see that the daffodils are also ready for spring as the leaves are already above ground level and in some cases 4-5" tall. I believe I heard robins the other day as well.

In this issue of the e-Rapper, you are invited to look ahead to the Next Generation Science Standards and STEM education and think about what that will mean for your classroom. An exciting demonstration and an engineering app are two ways to engage students. Finally there are multiple opportunities for teachers and students – from on-line science fairs and design contests to summer professional development opportunities.

Take inspiration from my flower bed, get energized and bloom!

Charlotte

Charlotte Trout, Washington County
troutcha@wcps.k12.md.us

Table of Contents

President's Message

I hope all of you have had or will have a smooth and exciting transition to the spring semester and a relaxing and enjoyable winter holiday! The spring brings with it promise of many exciting opportunities for professional growth, as well as some great events around our state and our region.

Last summer brought the release of the National Framework for Science Education. It precedes the Next Generation Science Standards that are currently under development by Achieve. In my own science teaching practice, as I launch a few set of classes to fresh and exciting faces this week I am considering two parts of that document and how they can reflected in my own classroom. They are the scientific and engineering practices and the crosscutting concepts. I can say that I do each of these things at some point during the semester, but now I am thoughtfully considering them as I write my lesson plans. To obtain a pdf version of the framework, go to the National Academies at this site:

http://www7.nationalacademies.org/bose/Standards_Framework_Homepage.html

A release date has not yet been announced for the standards, but when a public comment period is announced I encourage each of you to participate and offer feedback particularly on the grade band in which you have experience. Its an exciting opportunity for us as science educators! I will be sure to send out an email announcement when I know of such an opportunity.

This spring also offers an opportunity to explore fun, hands-on science in the Washington D.C. Convention Center at the USA Science and Engineering Festival on April 27th to 29th. Its a great event for all ages, consider bringing your classes on a field trip, your family, or just coming with a few teacher friends. Either way you are sure to learn some great science, find some great opportunities for your classroom and just have a great time.

Start getting your spring mini-grant applications ready! In these years of tight school budget this is a great opportunity to get some new and exciting resources for your classroom. We are working on fine tuning some additional events for this spring, stay tuned for more details. As always, I welcome your feedback and suggestions for ways that MAST can help you as an educator. May all of your students master the concepts of science easily and with enthusiasm!

Alison Hapka
Lead Science Teacher
Elkton High School
President Maryland Association of Science Teachers

Return to Table of Contents

MISSION STATEMENT

The Maryland Association of Science Teachers (MAST), a local affiliate of the National Science Teachers Association, is a professional, non-profit organization dedicated to science education in the state of Maryland. It strives to make science accessible and enjoyable to the citizens of Maryland by promoting and supporting career education in science and technology, instruction for general science literacy, and science outreach programs in all geographic regions of Maryland.

MAST PHILOSOPHY AND GOALS

The Maryland Association of Science Teachers, dedicated to scientific literacy, cares deeply about its mission and members engaged in science education. Its members believe that science is a human endeavor employing careful observation and reasoning necessary for professional and personal problem solving and decision making in our increasingly more technological society. To support this MAST promotes science research, applied science, and science education as professional careers. It also understands that science literacy opens doors for all Marylanders to pursue alternative technology careers, and to understand and enjoy the world they live in.

To these ends, MAST has the following goals:

1) provide science educators at all academic levels in the state of Maryland with the opportunities for professional development through the presentation and exchange of knowledge, strategies, and resources;
2) acknowledge the accomplishments of exemplary science teachers, students, and administrators;
3) encourage and utilize partnerships with business, professional organizations, and science resource centers;
4) broaden the base of support in MAST through increased membership throughout the five designated regions;
5) provide financial support for outstanding science-related educational programs.

Return to Table of Contents

Each month E-rapper will feature a site for you to bookmark for future use in your instruction. Bookmark it even if you can't explore it right away.

This month let's look at the website, Succeeding With Science. It is a great resource for games, videos, and other activities for teaching and learning science.

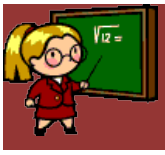
The site Succeeding With Science is organized by age. Within each age range there is a selection of games and activities for students to use on his or her own. It offers some great extension opportunities for your curriculum. I love it when I can tell students to play video games!

The site is well organized for age groups 4-7, 7-11, 11-14, 14-16 and 16 plus. You'll find that quite a few of the activities are suitable for use on touch screen computers and interactive whiteboards.

http://www.succeedingwithscience.com

Jackie Geer, Montgomery County

Return to Table of Contents



The Challenge of the Rubric

Every time my county mentions STEM initiatives I can't help but think, "It sounds like authentic assessment is coming back to the classroom!" I expect we will soon be using rubrics to evaluate student projects in science on a regular basis. More than a science fair checklist, a good rubric can help teachers gauge student understanding in a deep way. Here are some pointers from ***Andrew Miller, National Faculty member for the Buck Institute for Education****, on how to make rubrics that are meaningful.*

1. Make sure that the language from column to column is similar, that syntax and wording correspond. The words will change for each section or assignment, as will the expectations. **In terms of readability, you need to make sure that the rubric can be easily read from left to right or vice versa.** In addition, if you have an indicator described in one category, then it needs to be described in the next category, whether it is about "having" or "not having" something.

2. If the students can't understand the rubric, then how do you expect it to guide instruction, reflection and assessment? **Make sure the language is learning-level appropriate**. If you use academic language or concepts, then you'll need time to teach students those meanings and concepts.

3. You have to use the rubric with the students or it means nothing. We've all had that time when we gave students the rubric and they threw it away, or the papers lay across the room like snow at the end of class. In order for students to keep a rubric, and more importantly to find it useful in terms of their learning, they must see a reason for using it. **Students should understand that the rubric is there to help them reflect, self-assess, unpack, critique and more.** If students and stakeholders use a rubric, they will understand the expectations and their relevancy to learning.

4. You want the rubric to be **comprehensible and organized**. Pick the right amount so that the criteria flow logically and naturally across levels.

5. Avoid rubric fatigue, as in creating rubrics to the point where you just can't do it anymore. This can be done with **common rubrics** that students see across multiple classroom activities, and through creating templates that you can alter slightly as needed. Students feel more confident when they go into different classrooms with the knowledge that expectations are the same. The easiest rubrics I have seen are used commonly for practices that all teachers work on, such as reading, writing and 21st century skills. Figure out your common practices and create a single rubric your team can use.

6. The most effective descriptions you can use are specific descriptions. That means avoiding words like "good" and "excellent." At the same time, don't rely on numbers, such as number of resources, as your crutch. Instead of saying "find excellent sources" or "use three sources," focus your rubric language on the quality use of whatever sources students find, and on the best possible way of aligning that data to the work. It isn't about the number of sources, and "excellent" is too vague for students. Be specific and descriptive.

Save yourself some time – here are two free rubric generator websites. Please let us know if you find other useful tools.

http://school.discoveryeducation.com/schrockguide/assess.html
http://rubistar.4teachers.org/index.php

Vikki Bol, Calvert County

Return to Table of Contents

Liquid Carbon Dioxide?

Science teachers know that when we bring dry ice into the classroom, students get excited. We all love to teach that dry ice (solid carbon dioxide) is one of the few substances that "sublimes" – that is, it goes from a solid state to a gaseous state. What we tend to forget is that carbon dioxide does have a liquid state; its just that it exists only at a relatively high pressure – about 5.0 atmospheres of pressure.

I finally came across a demo that shows dry ice going into the liquid phase before it goes into the gaseous stage and students absolutely love it.

Materials needed

Dry ice
A wide stemmed Beral pipet
2-L empty bottle, cut in half (you will use the bottom half)
Paper plate
Hammer
Tap water
Pliers
A towel

Procedure

1. Absolutely essential to wear safety goggles. A lab apron is a good idea too.
2. Cut off the tip of the pipet. The remaining stem should have an open diameter of about ¼ inch.
3. Place a 2 inch piece of dry ice on the paper plate.
4. Crush the dry ice into a fine powder with the hammer.
5. Carefully scoop through the dry ice powder with the open end of the pipet. Tap the bulb of the pipet every each scoop so the powder goes into the bulb.
6. Continue until you have half of the bulb filled with the crushed dry ice.
7. Fill the bottom half of the 2-L bottle about two-thirds full with regular tap water.
8. I recommend you use a table or desk with a minimum of three feet of clearance from students.
9. Grasp the top of the stem of the pipet tightly with the pliers and place the pipet, bulb end down, into the water in the bottom half of the bottle.
10. Position the pipet so it is along the front wall of the bottle. This tends to magnify the size of the bulb to the observers.
11. This only works if you have pinched the stem tightly enough that no gas is being released. To check it, lower the top of the stem into the water. If you see bubbles being produced, you know you have to squeeze the pliers tighter.
12. Within about 30 seconds, you will see the crushed dry ice disappearing and a quantity of liquid appearing in the bulb. This is liquid carbon dioxide.
13. At the same time, the wall of the pipet bulb will suddenly burst from the pressure, sending water flying several feet into the air. This is why we use a plastic cup rather than glassware in demo.
14. Use the towel to clean up the spilled water and pass around the pipet bulb to the students to see the point of failure. It normally occurs on the seam of the bulb.

Classroom discussion

This is a great demo to talk about phase diagrams. You can easily find the phase diagram for carbon dioxide online to explain the need for significant pressure to have the dry ice transition into liquid. I always tell my students after they witness this demo that they fall into the category of less than 1% of all human beings that have ever seen liquid carbon dioxide.

NOTE: This demo is adapted from a demonstration available from ***Flinn Scientific***.

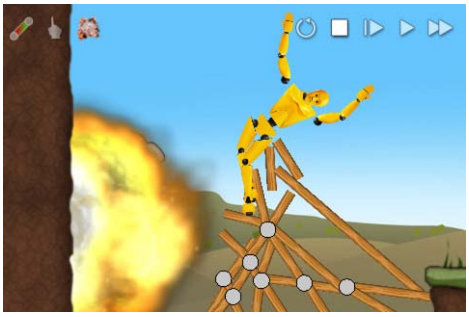
Gary Fuhrman, Carroll County

Return to Table of Contents

Apps for your classroom

Using "Simple Physics" in your classroom

When I was asked to write an article on my favorite app for the eRapper, I knew exactly what I would write about. It's an app called, SimplePhysics and it allows students to test their engineering design skills without a lot of expense and mess to clean up.



The app begins with a short tutorial that teaches students how to use it by making a tree house that must hold 4 kids for at least 10 seconds. The basics of the game are given and then students are left to use what knowledge of the design process they have to build their first structure. Students are given a budget with which to build. If they can build a successful structure under budget they will be rewarded with a better rating for that level. Once their structure is completed it must pass a certification test, and then the design is tested to find out how well the structure would hold up.

Other designs that students can try their hand at include a snowy roof, which must hold 50,000 lbs of snow without collapsing, and a river dam that must hold back an initial blast of water and continue holding for ten additional seconds. There are ten challenges in all.

There's also a 5 design extension app for SimplePhysics called Santa's Engineer. The premise of this app is the same, but with a Christmas theme. The five design options in this app include things such as Santa's sleigh, which requires you to build a support system for the skids of the sleigh that will withstand a horizontal force of a rocket powered sleigh as well as the impact of a landing at almost 80 miles per hour, and a toy train bridge, which is over 15 feet long and must withstand being passed over by three different trains.

The different challenges and multiple levels for each challenge allow for easy differentiation. With students working in groups, this is an engaging way to introduce the design process and engineering practices as well as help students see the applications of physics. Try it out!

Chris Kopco, Planetarium and STEM Resource Teacher, Washington County

Return to Table of Contents

MAST ANNOUNCES 2011 EXCELLENCE IN SCIENCE TEACHING AWARD WINNERS

The Maryland Association of Science Teachers is proud to announce the MAST Excellence Awards for Science Teaching in Maryland. This year's awards were selected from a collection of many outstanding science teachers in our state. MAST is honored to present these award recipients with a one-year membership to MAST along with a monetary gift and plaque.

Our selection for middle school is **Kathleen Damonte** of Julius West Middle School in Montgomery County. Kathleen is an 18 year veteran teacher. Currently she is a Science Resource Teacher, teaching seventh grade science classes to all levels of students. During her teaching career she has presented at local, state, and national science conferences. She has also worked as a curriculum writer and reviewer of the new STEM based middle school curriculum for Montgomery County Public Schools. Kathleen has a passion for science and finding real life application to the content she teaches. She is often scouring through newspapers and magazines to find articles that will be useful in her science classes. On a number of occasions she has found such articles, including one about the incidental rate of bacterial contamination in bagged salad as compared to regular leaf lettuce. This article was used during a biotechnology unit focused around food poisoning epidemics. Kathleen is a hard working, well deserving teacher that always puts the students learning first.

Sharon Steger, a 31 year teaching veteran at Middletown High School in Frederick County, is our selection for this year's High School Excellence Award. Serving science education as a teacher and mentor for years, Sharon has been an excellent participant and contributor to her school, county and our state. This year, she was named a Service Learning Fellow by the Maryland State Department of Education for her project Frederecyle, which instilled habits of recycling in youth for the city of Frederick. In addition, Sharon gets her students motivated through a variety of hands on labs and real life application experiences. One particular simulation is done where students populate "continents" drawn to scale with yarn on the classroom floor and discuss how people and resources and distributed worldwide. Sharon has also served in many leadership roles over the years. She has been department chair for the last 12 years, served as a mentor teacher for student teachers from various colleges and universities around the area. She also serves as the staff development trainer. Her work with students goes far beyond the walls of their high school. Reaching out with Service Learning and providing a variety of opportunities for students to interact with science, nature, and each other is why it is our honor to present Sharon with this excellence in teaching award.

MAST Excellence Awards hope to continue to recognize Excellence in science teaching. Please consider applying for this award or nominating a colleague. Applications for next years' awards, due in May, will be available from our website www.emast.org. Thank you.

Carl Bilotta, Frederick County

Return to Table of Contents

Opportunities for Students (and Teachers)

The Google Science Fair 2012 has launched!

We are pleased to announce that the Google Science Fair 2012 in partnership with CERN, The LEGO Group, National Geographic and Scientific American, is now LIVE! Students aged 13 - 18 from around the world are invited to ask questions and answer them through science experiments with a chance to win once-in-a-lifetime experiences, scholarships and real-life work opportunities.

Check the Official Rules for details:
<https://static.googleusercontent.com/external_content/untrusted_dlcp/www.google.com/en//events/sciencefair/downloads/rules_en.pdf>.

Go to Google Science Fair<www.google.com/sciencefair> to find out more information, and follow us on Google+<https://plus.google.com/108818810955465968635/>, Facebook<https://www.facebook.com/GoogleScienceFair> and Twitter<http://twitter.com/googlescifair> to stay up-to-date.

Register now or tell your kids about it …..

Everyone has a question. What's yours?

The Google Science Fair Team

Maryland Science Olympiad:

The website for the Maryland Science Olympiad (http://www.marylandscienceolympiad.org) is a good starting point for parents and coaches who are interested in having a MSO team at their school. Initial competitions are regional and have different competition dates so check the website for the competition closest to you. There are two divisions and problems in many different science content areas. There is a registration fee.

American Chemical Society Division of Chemical Education
Middle Atlantic Regional Award for Excellence in Science Teaching

Purpose: to recognize, encourage and stimulate outstanding teachers of high school chemistry in the Middle Atlantic Region

The Maryland Chapter of the ACS is hosting a meeting of the MARM at the University of Maryland Baltimore County, May 31 – June 2, 2012. The Award consists of a cash award and a plaque. We invite you to nominate a candidate from your school(s).
Submission Deadline March 20, 2012.
Award information is available from the 2012 Award Chair: meiss32@comcast.net

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West Point Bridge Design Contest:

Design a virtual bridge and test it. Try to design a bridge for the minimum cost and maximum load. Get a team together and participate in the national contest, or create a local contest. Information at:
http://bridgecontest.usma.edu/

Return to Table of Contents

MEMBERSHIP FORM

Welcome to MAST! Please print, complete, and mail this form to the address below or use the Member Application link at http://emast.org

Type of Membership – Please check one space in each column.

___ 1 year – $15.00
___ 3 year – $40.00
___ Student – $5.00 (1 year)

___ New
___ Renewal

Member Information – Please fill this out completely!

Last Name	First Name		Level – please check all that apply: ___ Pre-K ___ Elementary ___ Student ___ Supervisory ___ Middle/Jr. High ___ High School ___ College/University ___ Organization (please specify) ___ Other (please specify)
Street Address			
City	State	Zip	
Local School System	School		
Home Phone	Work Phone	Cell Phone	
Email Address	Alternate Email Address		

I would like to donate $ _____ to support:

___ the MAST Awards for Excellence in Science Education Program
___ the MAST Mini-Grants Program

Please make your check payable to the Maryland Association of Science Teachers (MAST) and send it with this completed application to:

MAST
P.O. Box 368
Finksburg, MD 21048

For Office Use: Date Received _____ Amt Paid _____ Membership to: _____

Cash _____ Check Number _____ Check date_____ MER 6.11

Return to Table of Contents

REGISTRATION IS NOW OPEN for Students, Adults and Volunteers for the *High School CyberSecurity Fair and Expo* in conjunction with the *7th Annual Mid-Atlantic Collegiate Cyber Defense Competition*

The first 200 students who register and attend will receive complimentary t-shirts and giveaways, and the high school that has the largest attendance will be honored with a plaque of outstanding participation!

WHO: All high school students are encouraged to attend. Middle and elementary school students are also invited. Parents, teachers and community members are invited to attend or volunteer.

WHAT: Through interactive sessions, discussions, speakers and demonstrations, participants will be immersed in an exciting learning environment with the goal of igniting interest in cybersecurity. CyberWatch partners, to include 2 and 4 year institutions with cybersecurity/information assurance programs and student organizations, and our sponsors will participate in an information fair for attendees to enjoy throughout the day.

WHEN: Saturday, March 17, 2012 from 10:00 AM - 3:30 PM

WHERE: John Hopkins Applied Physics Lab, Kossiakoff Center

BACKGROUND: While similar to other cyber defense competitions in many aspects, the CyberWatch Mid-Atlantic Regional CCDC, as part of the National CCDC, is unique in that it focuses on the operational aspects of managing and protecting an existing network infrastructure. The teams are physically co-located in the same building. Each team is given physically identical computer configurations at the start of the competition. Throughout the competition, the teams have to ensure the systems supply the specified services while under attack from a volunteer Red Team. In addition, the teams have to satisfy periodic "injects" that simulate business activities IT staff must deal with in the real world.

The *High School CyberSecurity Fair and Expo*, will allow students to see the CCDC in action, and will enable students to learn more about careers in cybersecurity, certificate and college options, scholarships, and admission processes.

This event is **FREE** and open to the public.

For more information and to REGISTER, please visit: http://www.midatlanticccdc.org/CCDC/

We hope to see you at this exciting event on March 17th!

NIST Summer Institute
for Middle School Science Teachers

Part of the NIST program **Translating Research Into the Classroom**

NIST **National Institute of Standards and Technology** • U.S. Department of Commerce

Connecting scientists and engineers in the laboratory with teachers and students in the classroom.

The National Institute of Standards and Technology (NIST) Summer Institute for Middle School Science Teachers is a two-week workshop designed to immerse teachers in the excitement of measurement science research at NIST. Led entirely by NIST scientists and engineers, the NIST Summer Institute translates the cutting-edge scientific research done in the laboratory into activities intended to be carried out in the classroom and features hands-on activities, lectures, tours, and visits with NIST scientists and engineers in their laboratories.

Teachers who participate in the NIST Summer Institute gain

- Increased understanding of the subjects they teach,
- Increased enthusiasm for science,
- Materials and resources to implement what they learned at NIST in their classrooms,
- Increased understanding of how scientific research is performed, and
- A network of scientists and engineers at NIST with whom to consult.

Teachers finish the NIST Summer Institute with a wealth of new knowledge about core topics such as forensics and materials science, and materials to integrate these topics into their classrooms while meeting curriculum standards.



For information about the upcoming
NIST Summer Institute contact

Dr. Mary Satterfield, Director
301/975-5364
summerinstitute@nist.gov

http://www.nist.gov/iaao/teachlearn/

2012 Green Eggs & Sand Workshops

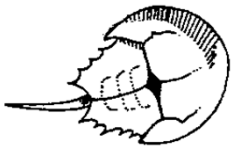
Looking to infuse a globally-significant ecological phenomenon and current real-world resource management controversy into your classroom?

Interested in learning firsthand from a select and diverse group of experts and stakeholders offering a wealth of knowledge and experience with the issues?

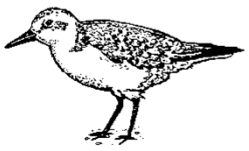
The Green Eggs & Sand team is offering three full weekend workshops along the Atlantic coast for spring of 2011

Participants take home the middle/high school-targeted, national-standards-keyed, video-and-activity-rich, GE&S curriculum package

Workshop Date & Location	Who to Contact/Where to Register
Friday - Sunday May 4-6, 2012 University of Georgia Marine Education Center & Aquarium, Savannah, GA	Dodie Sanders, sandersd@.uga.edu (912) 598-2302 (FAX) (912) 598-2340 (phone)
Friday – Sunday May 18-20, 2012, DE Aquatic Resources Education Center & St. Jones Reserve, Smyrna, DE	Gary Kreamer, gary.kreamer@state.de.us (302) 653-3431 (FAX) (302) 735-8665 (phone)
Friday - Sunday June 1-3, 2012 Mass. Audubon Wellfleet Bay Wildlife Sanctuary, Wellfleet, Cape Cod, MA	Amy Fleischer, afleischer@massaudubon.org (508) 349-2615 x114 (phone)



A modest fee will be charged for these workshops, the amounts varying with venue, depending on workshop length, lodging, food and field trip costs



Teacher in Residence Program 2012-2013:
A Program of Independent Research and Professional Development in Ecology for Teachers of Grades 6-12

Baltimore Ecosystem Study ● Towson University ● Cary Institute of Ecosystem Studies

www.beslter.org

Starting in summer of 2012, a Teacher in Residence (TIR) Fellow will join the unique Baltimore Ecosystem Study (BES) research and education community for a year of research, educational leadership and professional growth. The TIR Fellow will be an integral part of the Pathways to Environmental Science Literacy (ESL) Project funded by the National Science Foundation and taking place at BES and three other Long Term Ecological Research (LTER) sites around the nation. The TIR Fellow will acquire strong skills and a deeper understanding of cutting edge ecology and education research, contribute to the development of environmental science literacy frameworks and teaching resources for teachers and students in grades 6-12, and provide leadership and support to other teachers in the project.

Each TIR Fellow will:

- Spend one full year as a participant in the project, starting full-time in late summer of 2012. The TIR will also be expected to participate in an 7 day summer institute for science teachers from June 25th-June 29th and July 2-3, 2012. Additional orientation days or partial days will take place as scheduling permits, prior to official start date. This is a full time, one year position, ideally suited for sabbatical leaves from teaching positions in the Baltimore area.
- Carry out a year-long project of her/his own design, working closely with project staff and/or a mentor researcher. This could be an ecological investigation, a study of student learning or a school or community based education program. TIR applicants can explore potential research areas within the Baltimore Ecosystem Study (http://www.beslter.org/frame4-stuff.html) and Towson University (http://www2.towson.edu/research/default.asp) and indicate one or more areas of interest in their application, or propose a program of their own design to be carried out during the TIR tenure.
- Develop a classroom application of their research project or program to use in their teaching.
- Carry out research into student thinking in an aspect of environmental science literacy most closely associated with the Fellow's ecological research interests. This will be done as a member of the ESL Project's Research Team.
- Become an ESL Project Master Teacher, taking a leadership role in providing professional development and support to fellow teachers. TIR Fellows will receive specific training and support in leadership development.
- Receive on-going support from Project scientists and educators as they implement new teaching approaches in their classrooms and schoolyards.

In addition, TIR Fellows will have the following options:

- Enroll for graduate credit at Towson University for up to 8 courses (4 per semester) free of charge.
- Participate in an exchange with RET and TIR Fellows from one of the other sites in the national ESL Project (Santa Barbara Coastal LTER, Short Grass Steppe LTER in Colorado, or Kellogg Biological Station LTER site in Michigan).

TIR Fellows will have work space in the ESL Project offices at the Center for Science and Mathematics Education at Towson University, the overall center of the ESL project in Baltimore.

TIR Program Details:

Dates:	Start: August 15, 2012 (To be confirmed) End: July 31st, 2013
Eligibility:	Science teachers of grades 6-12 that are able to work in the Baltimore region for the given time period of the position. Applicants must be citizens or permanent residents of the U.S. or its possessions. The Fellow must arrange for a sabbatical or other form of leave from their school, with the clear expectation of returning upon completion of the year-long Fellowship. We will select Fellows for whom we think a research experience will be most valuable, both for their own professional development and for their students. Fellows need the strong endorsement and support of their school's administration, and must demonstrate that she or he will be able to provide in-school support to other teachers during their Fellowship, and implement new ecology lessons during the following school year. Applicants with prior coursework in environmental science will be given preference.
Payment and other benefits to Fellow:	• The Fellow will receive their full time equivalent salary and benefits up to a limit set by our available funds. Details will be finalized with the selected teacher. • $1,000 allowance for supplies, travel or other expenses to support research in 2012-13 and implementation with students in the following school year. • Up to 24 graduate credits from Towson University. • Ongoing professional support.
To apply:	Send the following to Dr. Sarah Haines (email preferred): 1) A letter of interest explaining how the experience will benefit your teaching, your students and other teachers in your school or district. 2) A statement of which research areas most interest you or a description of a community or school based program you are interested in pursuing. 3) A description of your teaching background and projected teaching activities in the 2012-2013 school year. 4) Names and contact information for three references. 5) A signed agreement/letter of support for your participation from the appropriate administrator at your school (department chair, principal).
For more information:	Dr. Sarah Haines Center for Science and Math Education Towson University 8000 York Road Towson, MD 21252 shaines@towson.edu 410-704-2532 (p), 410-704-2405 (f)
Deadline:	Consideration of applications will begin immediately and continue until a suitable Fellow is selected.

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

Engage your students with our STEM Resources!

STEM Classroom Libraries for K-8

Breakthrough Inventions Library, grades 3-5

Inventors' biographies, stimulating facts and historical photographs engage students. Inventing the Automobile, Inventing the Camera, Inventing the Computer, Inventing the Electric Light, Inventing the Printing Press, Inventing the Radio, Inventing the Telephone and Inventing the Television.

8 books, 32 pages, paperback #1015143 $71.60

My Science Investigations, grades 2-4

Learn the scientific method while engaging in fun, exciting experiments! Titles include: *Experiments with Liquids*; *Experiments with Magnets and Metals*; *Experiments with Plants*; *Experiments with Rocks*; *Experiments with Soil*.

5 books, 32 pages each, paperback #1392524 $47.94

Interactive Whiteboard Resources, K-8

Delta Education has interactive whiteboard resources to help you incorporate instructional technology into your science lessons. Our interactive whiteboard resources help students grasp key science concepts, conduct virtual labs, perform simulations and read about science at their own pace. Visit the STEM Technology section of the Delta Education website.

Visit www.deltaeducation.com to view more classroom libraries and technology resources to bring STEM to your classrooms and students!

STEM Schools and Extended Learning Programs

Delta Education can help you select resources and create an Elementary STEM School or Extended Learning program. Delta carries a vast array of inquiry-based science kits, like Models and Designs and Flight and Rocketry, interactive whiteboard and instructional technology resources, and informational text materials. Contact one of your Delta Education Sales Representatives to see what we can do for you and your students!

Kip Bisignano, M.Ed., NBCT
Sales Representative
Kip.bisignano@schoolspecialty.com
(410) 878-1080 (office)

Holly Choquette
Inside Sales Specialist
holly.choquette@schoolspecialty.com
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