

Montana Science Teachers Association



News Journal
A publication of the Montana Science
Teachers Association

From the President



Dear K-12 Science Educators,

We know our nation's competitiveness and economic future relies on science education. In this message, are some suggestions for you to promote excellence in science teaching and learning for all so that we might help produce scientifically literate citizens.

"Today, more than ever, Science holds the key to our survival as a planet and our security and prosperity as a nation." ~ Barack Obama

The purpose of MSTA is:

The purpose of the Montana Science Teachers Association shall be the advancement, stimulation, extension, improvement and coordination of science education in all fields of science at all educational levels. ~

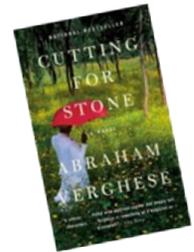
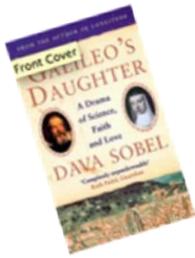
MSTA Bylaws, Article 2

Below are some ways we might work towards fulfilling this purpose before and during the summer:

In this issue....

- From the President
- MSTA Information
- Lesson Ideas
- Book Reviews
- Mark Your Calendars

1. [Tips for Busy Parents](#) – Share this link to help their child learn science. The family experiences that students bring to school are some of the biggest predictors of their success according to research (Hazen and Trefil 1991).



2. Great books (children's and adult) to consider reading this summer, which might inspire and enlighten you:

Goldilocks and the Three Dinosaurs by Mo Willems

Summer Birds: The Butterflies of Maria Merian by Margarita Engle

Wump World by Bill Peet

The Evolution of Calpurnia Tate by Jacqueline Kelly

The Georgian Star by Michael D. Lemonick

The Immortal Life of Henrietta Lacks by Rebecca Skloot

The Courage to Teach: Exploring the Inner Landscape of a Teacher by Parker J. Palmer

Cutting for Stone by Abraham Verghese

Galileo's Daughter by Dava Sobel

Silent Spring by Rachel Carson

3. Participate in a professional development opportunity. This can be such a refreshing and much needed breath of fresh air. Check this newsletter or the e-blasts for updates on these opportunities. You may even check with your regional representative for local happenings.

4. Read and review the newly released NGSS. Whether Montana adopts the standards fully or partially, there is no question they will be changing the way teachers approach teaching of science. There has been a lot of conversation about the development of the Next Generation Science Standards (NGSS) and they were finally released in April. Rather than focusing on one specific content area, the new standards are designed to develop deep sustained learning for students to become better decision makers about scientific and technical issues to understand the world around them and become successful. Here is the link: <http://www.nextgenscience.org/next-generation-science-standards>

Right here in Montana, each and every one of you make a difference in your students' lives day in and day out. **YOU ARE APPRECIATED!** Enjoy your last month of school and I hope you have a relaxing and enjoyable summer.

Respectfully,
Beth Thomas, MSTA President

MSTA Information



The URL for the MSTA webpage is

<http://montanascience.org>

If you have trouble with that address, try

<http://www.ivymerriot.com/montanascience/index.html>

The page has many new listings and links, be sure to visit it often.

Update your membership information on the MSTA web page

MSTA E-blast Listserv

To sign up, visit the MSTA website and follow the E-blast link

To Flip or Not to Flip: by John Graves

Have you considered flipping your classroom or do you have colleagues who have? Flipping the Classroom is the concept of creating an active learning classroom by moving some of the material to an online format, usually a podcast, that students watch outside of class. This frees class time for more active learning strategies such as labs, working collaboratively on problems, working one-on-one or in small groups with the teacher. The teacher is more available to students since the majority of class time is now NOT devoted to the delivery of content.

While there are many models of the Flipped approach, one example may look like the following. The teacher prepares a short podcast, no more than 10 minutes on the concept, let's say mineral identification. The students watch the podcast outside of class, taking notes on the characteristics of minerals, how to identify minerals, etc. The next day they come to class and immediately begin working on identifying mineral samples since they have the background information from the podcast. The teacher has freed time by moving the lecture/content out of the classroom, allowing more time for student work while in class. The teacher is free to assist students as they work.

When first starting to create a podcast, consider the options. One is to use a simple video camera, even a phone works, to capture you presenting information for your students. Many teachers do this using a set of small whiteboards or posters. The information is written on the whiteboards and you talk through each board.

An example of that is demonstrated at this site: <https://www.fi.ncsu.edu/project/fizz/>

The next step up from that approach is to use a screen capture program. I use one on my Mac called Screenflow, which records both what's on the computer screen and my image and voice. I create a presentation on PowerPoint or Keynote and drive it when I'm talking to the points of the presentation. With the screen capture software, I then have the ability to edit the recording, move and resize items for final production, etc. If you are interested in how this is done, there's a YouTube by Paul Andersen, a Bozeman High School biology teacher and Montana Teacher of the Year here: <http://www.youtube.com/watch?v=qySegNxtiNg> Paul was also named as one of YouTube's Education Guru's of 2012, so he's more than qualified to discuss the process of screen capturing.

Once a screencast or podcast has been created, it will need to be housed somewhere on the web. Over the years I have used various sites for hosting my materials including YouTube, TeacherTube, wikis and personal web space. For work I do with the Home School Coop students I teach every week, I host the recordings on YouTube. I often post the recordings as public, which allows access by anyone. You can view some of my podcasts here: http://www.youtube.com/user/hyalitepeakscied?guided_help_flow=1 If you are interested in how a teacher like Paul uses YouTube for his recordings, check out his Bozeman Biology channel: <http://www.bozemanscience.com/>



Montana Google Geo Teachers Institute:

In collaboration with the Montana Geographic Alliance, Beyond the Chalk LP, and the PJW College of Education and Human Sciences, Google is coming to Missoula on July 17th and 18th to present a two-day professional development workshop for teachers.

The Missoula Google Geo Teachers Institute is a free event designed to foster innovative teaching strategies that bring the latest in geographic information and technology to the classroom. Participants in this intensive, two-day event will get hands-on experience with Google's Geo products including Google Earth, Google Mapping Tools, Google Maps Engine Lite, and Fusion Tables.

To be a part of this event, participants must apply and receive notice from Google that they have been accepted to attend. Google will select 50 – 75 educators to attend. Below is the link to the online application process:

<https://sites.google.com/site/montanagti2013/home>

Lesson Ideas



Genetic Disease Report Project by Tom Cabbage

This activity has the students do research and present in front of their class as well as turn in a typed well written report with proper documentation. It involves researching and scientific literacy, as well as the communication and informational practice in a scientific arena that are part of the NGSS roll out. I really like this activity once we have spent time studying genetics and the students have a working knowledge of the causes and results of mutation and the different types of heredity so they can use and understand the proper vocabulary. I also think it is good to have high standards for the presentation and the papers and I hand out examples from previous years students to show what I expect from them. Finally I think that for many students, until they have to talk about the modes of inheritance and explain how a mutation in a specific gene causes a disease they don't have an opportunity to find out if they really understand these concepts.

My expectation for the report is a minimum of 3 minutes and a maximum of 7 minutes. I have the expectation that they cite their sources correctly using APA citations and that they reference a minimum of 2 published sources. I offer extra credit if they do a Power Point, or show images, diagrams etc, but ask that the images help them explain the information (a Punnett square for instance) and that they use good public speaking skills and methods.

Genetic Disease Report Rubric

Name _____ Period _____ Topic _____

Yours	Possible	Category	PRESENTATION
	5	Length of speech	
	10	Clear, eye contact, not read	
	10	Organization, logical, easy to follow	
	10	Accurate and interesting information including cause, genetics, and treatment(s)	
<hr/>			
			REPORT
	5	Typed and Neat	
	10	Factual, clear, understandable	
	10	Two references with proper documentation	
	0	Visual Aid +5?	
	60	Total points(grade)	

List of genetic diseases at : <http://www.mriteacherresources.org/biology-labs.html>

Mr G Science Show

The Mr G Science Show made its international debut in March. The creator of Geogebra, Markus Hohenwarter, arranged for Glenn Govertsen (aka Mr G) to present a day of workshops to physics teachers at Johannes Kepler University in Linz, Austria and then the next day do 4 presentations of the Mr G Science Show for 13-17 year old students. The event for students, similar to the Montana science fair, was called EXE (Experimentale) which takes place every two years in a modern art/science museum called Ars Electronica. The whole experience was fantastic. Of course spending two weeks with Markus and family and skiing in the Austrian Alps was also pretty special.

During the past school year Mr G has presented in about 20 different schools in Montana and South Florida, as well as to several cub scout troops and camps for kids.

The near future holds some great experiences both in Florida and Montana. In May the Florida Atlantic University math department is hosting 150 4th grade students for a day and the finale is the Mr G Science Show. Also in May Mr G will be at Kennedy ES in Butte, a return to Hedges ES in Kalispell and a presentation for the gifted ed program in Missoula. In June the Mr G Show returns to Disney World for the national winners of the Christopher Columbus Awards for middle school students.

At the moment plans are being finalized for a Mr G trip to Warsaw, Poland in September and probably a return to Austria. It's interesting to find ways to travel to Europe with all the necessary science equipment and figure out what the host nation needs to provide.

Catch Mr G as he presents his show at the MEA-MFT convention in Belgrade for his 28th straight year. And, for information about cost and scheduling a Mr G Science Show at your school, Glenn Govertsen can be reached at: govertg@aol.com.



Summer Reading Recommendations

by Cynde Jacobsen



If you haven't had an opportunity to peruse any of Page Keeley's assessment probes, *Uncovering Student Ideas in Science*, you may want to consider one or more of them for your summer reading. Each book contains at least 25 assessments that help teachers uncover misconceptions that students may have about specific science topics and trace back to where the gap in student learning occurred. These books are easily adapted and used in elementary, middle level, or high school classes and helps teachers develop more effective ways of teaching.

The probes begin with a prompt that is followed by a question and a selection of responses for a student to choose from. Common ideas that emerge through field testing along with misconceptions are included in the responses that students may select. The second part of the probe asks students to describe their thinking and **explain** why they selected a particular answer in part one. In short, they must choose from the response that most closely matches their thinking and then justify their reason for choosing it.

Each probe contains detailed teacher notes that are tiered for specific grade levels and include a scientific explanation of the science content along with information of which answer is the most acceptable choice. In the sample probe below, teachers may find that middle school students have been using the words evaporation and condensation for years without understanding that water is in the air all around them. Students may understand that water evaporates, but may mistakenly believe that it immediately goes up to a cloud in the form of vapor. Listening to my students and understanding their misconceptions has been invaluable in my teaching. After analyzing the responses of my students, I am able to decide on appropriate interventions and plan my instruction.

FIGURE 1 Example of a two-tiered assessment probe

The wet jeans
Sam washed his favorite pair of jeans. He hung the wet jeans on a clothesline outside. An hour later the jeans were dry. Circle the answer that best describes *what happened to the water* that was in the wet jeans.

- A. It soaked into the ground.
- B. It disappeared and no longer exists.
- C. It is in the air in an invisible form.
- D. It moved upward and formed clouds.
- E. It chemically changed into a new substance.
- F. It went up to the Sun.

Explain your thinking. What ideas do you have to support your answer?

There are many different assessment probe books available through NSTA ranging in cost from \$29 to \$35. I hope you enjoy some of these books this summer and find them as useful in your classroom as I have.

References

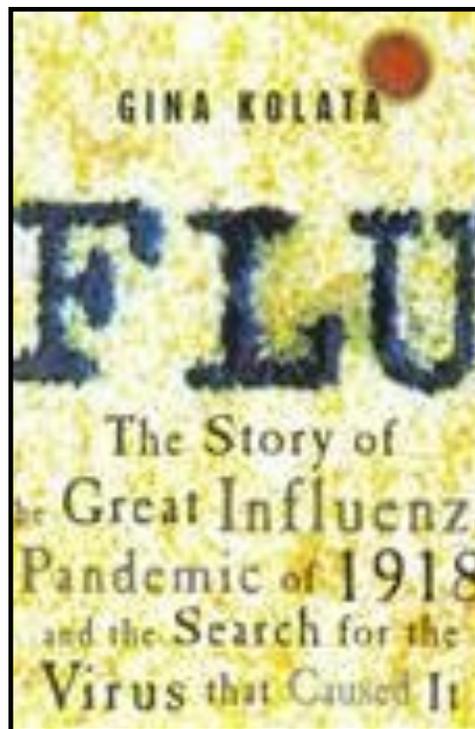
Keeley, Page, Francis Eberle, and Lynn Farrin. "Formative Assessment Probe Uncovering Students' Ideas in Science." *Science Scope* 1. January (2005): 18-21. learningcenter.nsta.org. Web. 29 Apr. 2013.

**Book Review: Flu (Gina Kolata, 2005)
by Shirley Greene**

Though this book is 8 years old, it is very pertinent to today's news: the flu virus. Most of the book is spent trying to find the virus that caused the great flu epidemic of 1918, in which it has been estimated that 40 million people died worldwide.

Ms. Kolata takes us back in time and all over the world in this book. You'll get a much better idea of what we know about the flu virus, how it mutates, how we look for new mutations, and what we are doing to do to avoid another great flu epidemic.

With the new H7N9 flu recently found in China, this book is especially topical. I give this book four stars out of five, for the fascinating information you'll gain. It certainly will make my virus unit more accurate next year!



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Submitting Articles to the MSTA News Journal

When submitting articles, please adhere to the following criteria:

- Electronic submissions are preferred in Microsoft Word format. These can be attached to your email message
- If in doubt about format, submit your work in .rtf format.
- If truly in doubt, paste your submission in the body of the email message.
- Lab activities may be mailed. Please cite any references and also state which National Science Standards your activity meets.

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 Bozeman, Montana 59718
 graves@montana.edu

Tentative Submission/Publication Dates:
 August 15/September
 November 15/December
 February 15/March
 April 15/May

<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 80%;"> Montana Science Teachers Association Membership Application </div>																			
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Address _____		Phone (____) _____																	
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___ K-6	___ All sciences	___ Physics																	
___ 6-9 MS or JH	___ Life Science	___ Chem																	
___ 9-12	___ Phys Science	___ Other																	
___ College/Univ.	___ Earth Science																		
___ Sup/Admin.	___ Biology																		
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2013 MEA-MFT Educators' Conference October 17-18, Belgrade

The MEA-MFT Educators' Conference is dedicated to bringing top-quality professional development to Montana teachers. Each year, teachers from all over Montana come to our conference for inspiration, information, and renewal units.

MARK YOUR CALENDAR!



June 17-18: Google Geo Teachers
Institute, Missoula

October 17-18: MEA-MFT
Educators' Conference, Belgrade



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Montana Science Teachers Assoc

MSTA

Dedicated to Quality Ed

Montana Science Teachers Association (MSTA)

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Education

The Montana Science Teachers Association exists to promote the advancement of science education to all students in Montana. Members include teachers of science from pre-K through university.

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