

# MSTA Newsletter



A publication of the Michigan Science Teachers Association • Volume 65.3 • Summer 2013

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## From the Desk of the MSTAPresident - Michael Sampson A Few Things to Share

The theme of my articles over the past year has been a reflection on using the modeling tools that I learned last summer at various workshops and how they relate to the Next Generation Science Standards (NGSS). The modeling units in biology went very well. The last unit I used was on natural selection and evolution. This unit focused on the problem of landmines in Laos. Students are asked to assist Engineers without Borders to develop an inexpensive and reliable method for landmine detection. In the scenario, the students have access to a special firefly that can detect the presence of explosives and they glow red instead of yellow. The problem is to introduce a selection pressure that will eliminate the yellow flies while not harming the special red flies. Like the gecko challenge, the students had to develop mathematical models and use them to develop a final solution to the problem.

Assessment of the unit consisted of a poster session and a post-test. The poster session allowed the students to present their proposal to Laotian government as a better method than the ones currently available.

*continued on page 2*

## From the Desk of the Executive Director

*By Robby Cramer, MSTA Executive Director*

The leadership of the Michigan Science Teachers Association continues to collaborate with leaders from the Michigan Department of Education and the Michigan Math and Science Center Network to support the adoption of the Next Generation Science Standards by the Michigan State Board of Education. Currently, we are actively supporting work requested by the State Board of Education that included a detailed alignment of the Grade Level Content Expectations and the High School Content Expectations with the Next Generation Science Standards. MSTA members who are actively teaching in Michigan classrooms completed the first alignment. Teams of educators are now reviewing this work. The goal is to have this project completed by the end of August.

At the end of May, the Introduction to the Next Generation Science Standards (NGSS) was held by Michigan State University's CREATE for STEM Institute. Over 750 Educators attended! The message given by MDE at the Institute was: this is the "time that we have to begin focusing on the Engineering

and Scientific Practices and the Crosscutting Concepts".

The CREATE for STEM Institute is led by Dr. Joseph Krajcik. All the materials used at this conference are available for your use. Go to the Create for STEM web site: [www.create4stem.msu.edu](http://www.create4stem.msu.edu)

At this time, additional resources known as the appendices at the national NGSS web site have been posted. These resources include: Model Course Mapping in Middle and High School, Disciplinary Core Ideas Progressions, Science & Engineering Practices, Cross Cutting Concepts, and nine more! These resources can be located at the Next Generations Science Standards site: [www.nextgenscience.org](http://www.nextgenscience.org) Please take time to read and understand the appendices!

The NGSS are the new national standards based upon the current research on best practice in the teaching and learning of science. It is essential for you to focus on the Science and Engineering Practices

*continued on page 2*

Your students could win custom lab coats, medals and more!

The school with the most science fair entries will win a special Explore Lab Science Day along with promotional items for teachers and students!

# VIRTUAL SCIENCE FAIR

Registration starts September 4, 2013 and ends October 4, 2013  
Register at <http://fall2013fair.questionpro.com>

Students should explore a science topic and then create a video displaying their project while providing an explanation during the video.

Participation is **ABSOLUTELY FREE!**

For more information visit [www.michigan.gov/explorelabscience](http://www.michigan.gov/explorelabscience)

The first 20 students to register will receive an Explore Lab Science promotional item.

From your Executive Director -  
*continued from front page*

with your students in mind. Consider where to focus your change in your professional practice. These sites contain many resources to help you to deepen the scientific thinking of your students.

The Michigan's Next Generation Science Standards are continuing to be reviewed by the Michigan State Board of Education. When there is a change in the status we will update our members by email.

From the President - *continued from front page*

In a slightly related note, while I did not attend a slew of workshops this summer, I did have the opportunity of representing the MSTA at the National Congress on Science Education (NSCE) in San Juan, Puerto Rico. Serving on the MSTA Board of Directors, I have had the pleasure of working with some great people and learning the inner workings of a professional organization. Attending Congress opened my eyes to how the national organization runs. At Congress, our president-elect, Charles Buciencki and I worked with 130 representatives from the United States, Canada and Puerto Rico to plan how the NSTA will move forward with the implementation of the NGSS. We attended sessions on Science and Engineering Practices and Inquiry, Literacy and the Common Core, Using Social Media and sessions on Crosscutting Concepts. While these sessions were informative, we really enjoyed interacting and networking with the leadership of other state organizations (and Ontario, Canada) in our region and across the country. We will be bringing this information back to the membership and use it as we plan our future MSTA conferences.

## SAVE THE DATE!!

Michigan Science Teachers Associations' 61st Annual Conference - Pure Michigan Science Bridges to the Next Generation

March 6-8, 2014

Radisson Hotel & Lansing Center, Lansing, MI

Pure Michigan *Science*  
**THE NEXT GENERATION**



# Intentional Instructional Practices - Closing the Achievement Gap

by Megan Schrauben, Michigan Department of Education

“The achievement gap” is affected by instruction, students and teachers. The Michigan Department of Education (MDE) has embarked on a project designed to help schools close the achievement gap by focusing in on “Intentional Instructional Strategies.” We know that attending to the grade level standards and using carefully-designed lesson plans that incorporate students’ background knowledge is essential to increasing student achievement and student engagement. Providing intentional teaching to all students is the focus of a Tier 1 research-based, comprehensive core curriculum.

Let’s take a closer look at what happens when **standards**, **instruction**, and **culture** intersect. When the grade level standards intersect with instruction, a curriculum that promotes higher cognitive demand and increased rigor for students will emerge. The curriculum will allow students to demonstrate career and college ready characteristics such as; communication and collaboration, problem solving, technology and tools as well as argument and reasoning.

**Standards** and **culture** intersect when teachers develop lessons that address appropriate grade level standards AND use content relative to student lives.



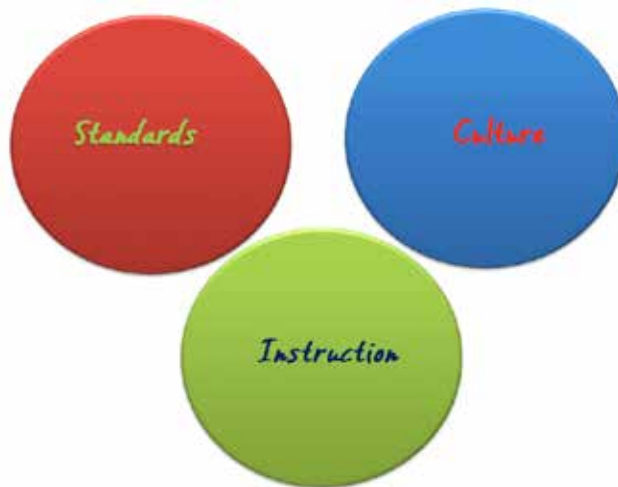
Bringing the lesson to life through experiential learning, teaching that is engaging and culturally responsive to the learner is the result of **instruction** and **culture** intersecting.

Finally, at the heart of **standards**, **instruction**, and **culture** is increased student engagement and

achievement, which is the art of intentional instruction.

In an effort to provide little to no cost, easy to implement, solid Tier 1 “intentional instructional practices”, MDE is piloting the following four professional development models that schools may choose to implement during their professional learning sessions.

Explicit instruction in Academic Vocabulary increases understanding and comprehension for students. A strong foundation of vocabulary will assist students who may not be able to read independently on grade level as well as those with limited background knowledge.



Flexible Grouping strategies assist teachers in engaging students with deep thinking tasks as well as enhance student’s willingness to work cooperatively and productively with others.

Increasing the Depth of Knowledge of learning tasks will stretch students to deeper levels of understanding of content as well as increase their ability to justify and reason their thinking.

Quality Questioning strategies foster students’ abilities to communicate their understanding of content through structured and/or scaffolded questions. By formulating questions, learners connect new information to old and thereby experience learning as understanding. These are not all inclusive of strong Tier 1 intentional instructional practices that would be seen in a classroom. However, when teachers implement intentional instructional strategies with fidelity, there will be significant impact on student achievement and engagement.



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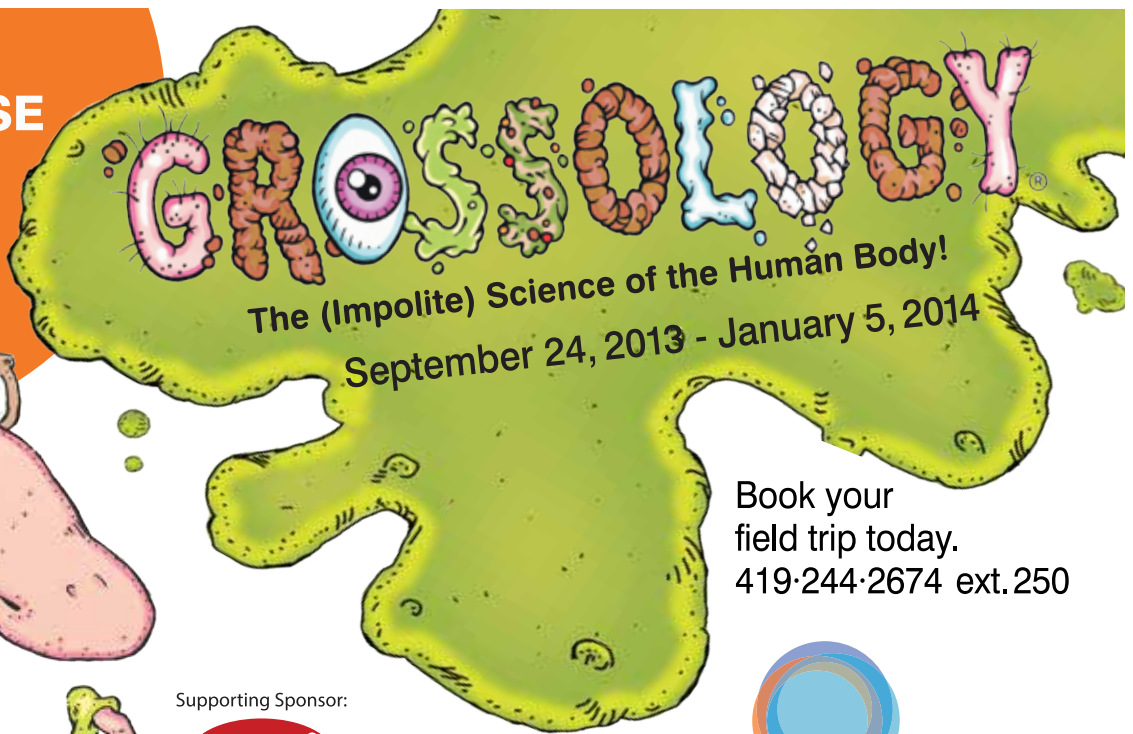
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# EDUCATOR OPEN HOUSE

September, 28, 2013

10am - 5pm

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#ScienceOfRock



# Why belong to a Science Teacher Organization?

by Tim Neason, MESTA Liaison

Let's take the **Michigan Earth Science Teacher Association (MESTA)**

MESTA has been a Science Teachers Organization since the 1970s, started under the leadership of the late Harold "Stoney" Stonehouse. The **National Earth Science Teacher's Association (NESTA)** was formed in the 1980s out of the MESTA Organization.

MESTA is an organization that prides itself in "Teachers Helping Teachers".

The **MESTA / NESTA Summer Conference** was held, **August 15-19, 2013** in Houghton Michigan. It was hosted by MTU (Michigan Tech University), located on the Keweenaw Peninsula. Nearly 150 educators from schools, universities and USGS Service were in attendance from far away locations that included Michigan, Wisconsin, Ohio, Indiana, New Mexico, Arizona, California, Colorado, Oregon, Canada and more.

The Summer Conference Program was designed with three full days of field studies. They included a Friday Night Honors banquet, a Saturday filled with classroom presentations and time to take part in the *MESTA Famous Rock Shop and Raffle*.

Let's look at some of the field studies you could have participated in if you were a MESTA Member: All sessions were lead by highly qualified leaders sharing their expertise.

**The Keweenaw Copper Company (Centennial Mine), Red Metals, Ontonagon and Porcupine Mountain Field Trip.** Leader: Richard Whiteman

Focus: Looking at the copper mining sites and the rock formation from Calumet to the Porcupine Mountains.

**Paleomagnetism Field / Lab Experience.** Leader: Aleksey Smirno and MTU Grad staff.  
Focus: Hands -on exploration into paleomagnetism of the local keweenawan basalts for their magnetic signature and magnetic mineralogy.

**Keweenaw Gem and Gift Mineral Preparations.** Leader: Ken Flood  
Focus: Copper pours, Lapidary / Stone Polishing, and Copper Cleaning.

**Caledonial Mine.** Leader: Richard Whiteman  
Focus: Tour of the mining operations and get specimens in certain areas of the mine. Get help with identification and composition of samples collected.

**Copper Harbor Field Trip.** Leader: Dr. Bill Rose  
Focus: Explain the history of geological phenomena found on the Keweenaw Peninsula Lava flows to the Lake Superior's Formation and more.

**Lake Superior.** Aboard the Agassiz Research Ship. Leader: Dr. Marty Auer  
Focus: Explore the physical and biological phenomena know as the Deep Chlorophyll Maximum (DCM) in Lake Superior.

**Special Evening Event: Quincy Mine and Shaft House Tour.**  
Focus: Tour of the enormous and complex Nordberg Hoist Steam Engine and the Quincy Mine.

Just imagine what the participants learned and were able to take back to their respective classrooms. But there is time and expense in participating in a science conference. Yes, there must be a commitment to free up time for conferences, cost of travel and expenses but the rewards you will take away will excite you as an educator!

So why join a Science Association? You can see the obvious reason!

**Let's Look at MSTA.** Our Annual MSTA Conference is coming up in March. Many experts in the field of science are volunteering their time to share their knowledge with you.

**Get fired up! Clear your calendar for March 6-8, 2014. Plan on registering for the 61st Annual MSTA Conference in Lansing.** You will be glad you did!



# Are You Prepared... to Teach in the 21st-Century Classroom?



## Lawrence Technological University Can Help!

### Master of Science Education

- \$1,320 per course scholarships for all K-12 educators (DI or non-DI endorsement).
- Most courses offered online and asynchronous, with a science experiment component to be completed using science kits and activities.
- Science content developed by Lawrence Tech in partnership with the Detroit Zoological Institute, Cranbrook Institute of Science, Aquinas College, and the University of Detroit Mercy.
- Courses aligned with the Michigan Department of Education requirements for Science and the DI (Integrated Science) Endorsement.

### Master of Educational Technology

- \$1,320 per course scholarships for all participants.
- 100 percent online and asynchronous format.
- This practice-oriented program is offered by Lawrence Tech in partnership with Marygrove College. Courses cover up-to-date technologies in instruction, Web-based learning tools, streaming video, electronic communication, and software and hardware options.
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Waive your application fee at [www.ltu.edu/applyfree](http://www.ltu.edu/applyfree)



# Dan Wolz Clean Water Education Grant

The Michigan Water Environment Association (MWEA) is pleased to announce the “Dan Wolz Clean Water Education Grant” for this year. The Dan Wolz Clean Water Education Grant was established seven years ago to heighten public awareness of the career opportunities the industry has to offer and to improve the quality and quantity of Clean Water community education in Michigan’s public schools. Dan Wolz was a true environmental steward of the earth. Thus, in recognition of the passion Dan had for education, this award continues to reach hundreds of Michigan students.



The MWEA partners with the Michigan Science Teachers Association to identify those teachers who have a great program and are in need of financial assistance to execute a project within a curriculum focused on water environment issues.

As a grant recipient, a teacher will be provided with:

- Complimentary conference registration and one night stay in a hotel for both the MSTA Annual Conferences (to accept the award in the year given and to attend/present at the following year’s conference).
- Your school employer’s cost for substitute pay will be covered both years.
- Complimentary conference registration and one night stay in a hotel for attendance at the Michigan Water Environment Association’s Annual Conference, the year following award. Mileage for travel to this conference is reimbursed.
- \$1000.00 cash award for purchase of classroom and project supplies.

Following the use of the Dan Wolz Education Funds and implementation of classroom projects the following school year, the recipient is expected to:

- Give a 30-40 minute presentation as a featured speaker at the MSTA Annual Conference.
- Give a 15-20 minute presentation at the MWEA Annual Conference.
- Write an article for both the MSTA newsletter and the MWEA magazine describing your experiences implementing the classroom project.

Grant applications are published in the fall issue of the MSTA newsletter, with an October 31, 2013 submission deadline. Determination of the award recipient will be made in November. The award will be presented at the MSTA conference in March 2014 at the awards banquet. This award will be given to a middle/high school MSTA science teacher.

### ***Process and Procedures for Applying:***

1. The Dan Wolz Clean Water Education Grant application is available in this newsletter.
2. Submit the application by October 31, 2013 to the MSTA offices at: [scampbell@managedbyamr.com](mailto:scampbell@managedbyamr.com) with “Dan Wolz Award” in the subject line.
3. The MSTA Awards Committee and MWEA will make the determination jointly.
4. Determination of the award winner will be made by December 1, 2013. Applicants will be informed of the selection decision. Applications can be considered for at least two years.
5. The Award recipient will be introduced at the MSTA Conference at the awards banquet in March 2014.

### ***Expectations of the award recipient:***

- Be available to accept this award at the MSTA State Conference Award’s Banquet in March 2014
- Write an article for both the MSTA and MWEA newsletters
- Give presentations at both the MSTA (March) and MWEA (June) state conferences in 2015

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### ***Past Recipients of the Dan Wolz Education Grant:***

- |  |  |
|--|--|
| 2007 - Mary Lindow, Battle Creek                 | 2012 - Chris Groenhout, Grandville High School |
| 2008 - Emily Curry, Jackson Public Schools       | 2013—Dave Chapman, Okemos High School          |
| 2009 - John Martin, Waterford School District    |  |
| - Randy Cook, TriCounty Schools                  |  |
| 2010 - Gary Cousino, Rochester Community Schools |  |
| - Douglas Morrison, Manistique Middle School     |  |
| 2011 - Susan Tate, Whitehall Middle School       |  |

### ***Need more Information?***

- For more information about the award go to: <http://www.mi-wea.org/danwolz.asp>
- For more details regarding the grant itself , contact MWEA representative Joe Keefe at United Water at 734-675-2190.
- For more information about the Michigan Water Environment Association go to <http://www.mi-wea.org/main.asp>
- Questions about your applications? Contact Susan Tate at [susan\\_tate@msta-mich.org](mailto:susan_tate@msta-mich.org)

# Dan Wolz Clean Water Education Grant Application

The mission of the Michigan Water Environment Association:

**Michigan Water Environment Association will be a recognized authority on and advocate for preserving, restoring, and enhancing Michigan's water resources**

## Grant Narrative:

- Describe your project and share how this project relates to your curriculum and teaching practice with students and or science teachers (Maximum one page.)
- Purpose of Grant: Give your statement of how you can share with others in your community as well as other educators in the state of Michigan what you have implemented with your students. (Maximum one page.)
- Provide a summary of why you are interested in Michigan's water resources Identify the locations and contact information for the nearest water treatment plant(s) in the school district where you teach. Do these facilities offer tours? (Maximum one page.)
- Rubric used in the selection process will be available on the MSTA web site <http://www.msta-mich.org/>



## Contact Information:

Name: \_\_\_\_\_

Home Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email Address: \_\_\_\_\_

School District: \_\_\_\_\_

School Name: \_\_\_\_\_

School Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_ Zip: \_\_\_\_\_

Position/Title: \_\_\_\_\_ Grade Level (s): \_\_\_\_\_

**Completed Applications must be received by MSTA by October 31, 2013.**

Email completed applications to: [scampbell@managedbyamr.com](mailto:scampbell@managedbyamr.com) with "Dan Wolz Award" in the subject line. Questions regarding the application process or your grant proposal should be emailed to Susan Tate at [susan\\_tate@msta-mich.org](mailto:susan_tate@msta-mich.org).



## Dan Wolz Clean Water Education Grant Rubric

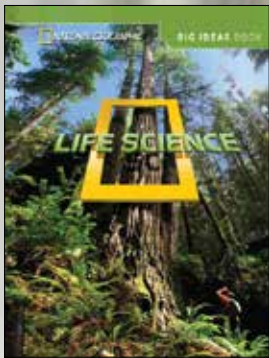
Criteria	Unsatisfactory (0 - 9 points)	Basic (10 - 14 points)	Average (15 - 19 points)	Above Average (20 - 25 points)	Distinguished (26 - 30 points)
Project Description	Project not clearly defined	Project description is marginal.	Adequate project description.	Proficient project description.	Superior description of project
Connection to GLCES and/or HSCES	No Connection to GLCES and/or HSCES	Marginal reference to GLCES and/or HSCES	Adequate reference to GLCES and/or HSCES	Reference to GLCES and/or HSCES is proficient.	Detailed connection to GLCES and/or HSCES
Dissemination Plan	Does not articulate a dissemination plan	Marginal evidence of dissemination plan	Adequate evidence of dissemination plan	Proficient evidence of dissemination plan	Detailed dissemination Plan
Sustainability	No evidence of sustainability	Marginal evidence of sustainability	Adequate evidence of sustainability	Evidence of sustainability is proficient	Details evidence of Sustainability
Links to Grant Goals and Results	Application does not have a link to the stated goal and intended results of the grant	Poor attempt to link to the goal and intended results of grant	Adequate attempt to link to the stated goal or intended results of the grant.	Application is linked to the stated goal and intended results of grant.	Distinguished link to the stated goal and intended results of grant.

**The goal** is to enable Michigan teachers to be aware and promote careers in water environment, water quality, and wastewater management not only to their students but also to the science community.

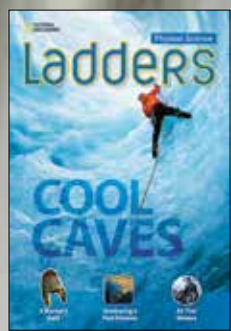
**The results** we are seeking would be students throughout Michigan who will have a much greater awareness and appreciation of the contribution this great industry makes to our society and maybe even become inspired to choose a career path that would make them a part of that contribution.

# Bring the world into your science classroom with National Geographic Learning.

- Engaging content from National Geographic
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- Effective programs support Next Generation Science Standards and Common Core State Standards



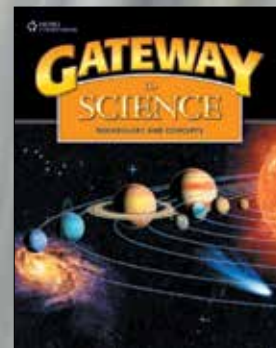
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# Exploring Watersheds with a GIS!

by Lisa Winger, Plainwell Schools, MSTA Region 1 Director

I wanted to teach my students about the importance of the Kalamazoo River watershed in their lives. The river lies about a half mile from our classroom windows. I asked what they knew about the river and their only response was “we shouldn’t eat the fish that we catch there.” As they knew it, the river, as it runs through their community, was polluted and so were the fish. No one could explain how the river was polluted or how fish were affected. So I dug further. Where does the river begin? Where does it end? How big an area does it drain? What communities does it run through? Why are so many towns located along its banks?


We found some maps and published information, but struggled with answering these questions and many others. What we needed was a way to integrate and understand the geographic, hydrologic, and historical components of the watershed to help us answer new questions. “Why did the EPA remove the dam in our town? Did any of the oil spilled in Marshall affect our water? Will climate change cause more frequent flooding in the future?”

A geographic information system (GIS) is a computer tool to link databases with maps to create displays that help answer higher-level questions. To learn about using a GIS for science education, I attended the Teachers Teaching Teachers GIS (T3G) Institute hosted by ESRI in Redlands, California. T3G is a weeklong professional development event for educators who help other educators learn why and how to use GIS. Through modeling, practice, and discussion, participants boost their skills in teaching with computers, in problem-based learning, in conducting professional development, and in using the Arc Info GIS system.

In Michigan, Eastern Michigan University’s ESRI K-12 GIS website (<http://esrik-12gis.emich.edu/k12/>) is the gateway for educators who want to understand geospatial technologies (GIS, GPS & RS) and learn new ways of teaching grade level content in Social Studies, Geography, Science, Technology, Engineering and Math. EMU provides members of the Michigan K-12 GIS community (teachers, students, parents, youth group organizers, administrators, schools and school districts) free GIS software and training to those who agree to the permitted uses listed in the Licensing Agreement. This allows administrators, educators and students alike to access, visualize, and analyze a wealth of information from and about their own communities and the world. Arc GIS Online and the Arc GIS app for smartphones and iPads allow students to access this technology in the classroom and in the field, not just in computer labs.

What’s next for my students? Currently, I am creating a model watershed unit utilizing Arc GIS for middle school students. They will not only learn how to go about answering their important questions with guided research, but will also learn how to create maps, integrate data, and make informed decisions about their world. Should more dams be removed? Is it OK to swim or even eat some kinds of fish? Should floodplain boundaries be reevaluated? With the right information, students will be able to accurately evaluate these and other questions about their region. With their new GIS skills, they will be able to do a lot more than that!

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# Passport to Science

by Bethany Swartz

Have you ever handled a fossil at the location where Louis Leaky made his great discovery and had access to millions of years of geology at your fingertips? Experienced six distinct biomes as you climb over 19,000 ft., pushing yourself mentally and physically to its limits while being face-to-face with glaciers? What about seeing the smile on a student's face as you teach with passion in a classroom thousands of miles away from your home?

This summer, fifteen science teachers from across Michigan had the opportunity of a lifetime—to do all of this and more! They were part of a 20-day Passport to Science Teacher Professional Development trip to Tanzania. “Send someone on an adventure of a lifetime and they will be inspired. Send a teacher, and they will inspire others,” stated Teresa Bell McLain, part of the Africa 2013 leadership team for XSci.

A partnership between University of Colorado, Michigan Tech, and the Merck Company Foundation made this trip possible in order to improve STEM education and help teachers redefine their science identities. “This experience was more than professional development, it was personal development as well. This was the most amazing experience of my life and I can't wait to share my findings with my students!” exclaimed Autumn Blaesser, MSTA member.

“The XSci methodology caused us to think more deeply about our experiences and will hopefully provide useful data for the study of the impacts of experiential education,” commented James Emmerling, leadership team and MSTA member. Beginning six months prior to the trip, Dr. Brad McClain, from the University of Colorado, held regular online meetings to prepare teachers for the experiences in Tanzania. Some of the meetings included speaking with experts in the field, such as a wildlife veterinarian studying lions on the Serengeti, while other meetings required teams to research and present the science they would be witnessing.

In the field, teachers were surrounded with hands-on experiences and activities as they traveled across Tanzania. From spotting their first pride of lions on Safari in the Serengeti, catching the sunset over lake Victoria in Mwanza, visiting Maasi villages, dancing with the Sukuma tribe,



exploring the geological gem Olduvai Gorge, climbing Mt. Kilimanjaro, or teaching at St. Timothy's Primary School—everyday improved on the day prior. Being exposed to the rich science and cultural background of Africa this form of first-hand experiential science evoked emotions and lifelong memories that help define (and redefine) each individual teacher.

So, as they return from this trip the question has been posed: How have you changed? Changes may take place instantly, or develop slowly over time. Either way, each teacher returning is in every way improved both personally and professionally. MSTA member Rebecca Heckmann added, “As a teacher, putting yourself in an unfamiliar situations with new people will allow you to grow emotionally, physically and intellectually. A stronger teacher makes a stronger student.”

In the coming year, XSci hopes to establish a hub here in Michigan to continue opportunities like this, for other teachers in our state. So if you ever find yourself presented with any experiential learning professional development opportunity go for it—don't miss the chance of a lifetime. Besides, you never know how you may become a stronger teacher and a more passionate human being!



# The Fledgeling



The Fledgeling flies! MSTA science lessons for elementary teachers is published as a recurring feature in the MSTA Newsletter. Establishing good science practices are essential for a solid science program. This is true for all age groups. Through hands-on, Inquiry based science, special needs students are achievers too! The Fledgeling is provided by Sally DeRoo, MSTA.

**Start the year with a solid INQUIRY BASED Activity. INTRODUCE PROCESS SCIENCE INQUIRY SKILLS.**

## PROPAGATE AIR CLEANING PLANTS

Get your students involved in growing! Propagating plants from cuttings and off-shoots (clones) is a good science project. The MDE and National Science benchmarks are easily addressed. Think of the environment and air quality.

A cutting is a vegetative portion of a plant used for reproduction of a new plant. The new plant will be a copy of the parent (a clone). A cutting may be a whole or part of a stem, a leaf, or a piece of root. A stem or lead cutting has no portion of a root. Some plants root easier than others, not all cuttings grow into new plants. Snake Plants (*Sanseveria*) are easily grown from cuttings. Spider Plants produce “off-spring” at the ends of long stems which can be “rooted” easily. A few plants are required to produce enough cuttings for an entire class.

### YOU WILL NEED:

- A Snake plant with several strong leaves. A Spider Plant with long stems with tiny plants hanging from each end.
- Plastic cups (small drinking cups).
- A baking tray (or suitable tray for holding sand).
- Play sand.
- Potting soil.
- Water.
- Sharp scissors (knife).
- Toweling or coffee filters.
- Small pots for planting (use plastic cups if there is a hole poked in the bottom)



*Sanseveria*

*continued on page 14*

## DIRECTIONS:

### SNAKE PLANT

1. Select a strong leaf and cut it into two inch sections. Gently push the “root-end”, bottom of the cutting, one inch down into the tray of WET sand. Place the tray of cuttings into strong (bright) light and keep sand moist. Roots should appear in a couple of weeks.
2. Prepare pot. Cut paper toweling or coffee filter to fit inside the bottom of the container. Covering the hole prevents soil from leaving the pot when watered. It acts as a filter.
3. Fill the pot half full of soil. Gently hold the new plant in the middle of the pot close to the rim. Spoon soil around the plant until all the roots are covered. Water to secure soil and release air trapped in the soil. Add additional soil after watering to cover any exposed roots.
4. Water the new plants when the soil feels dry. The “Finger-Test” is suitable. Water when soil does not cling to a dry finger water the plant. Do not over water as the new plant will rot. Snake Plants do not like wet roots. Let the plants “dry-out” before watering.

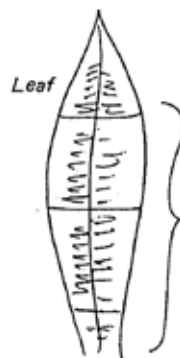


Fig. 1:  
Sections of  
new plant

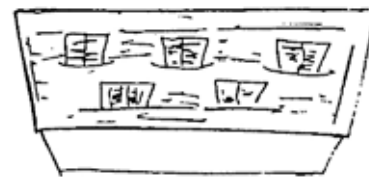
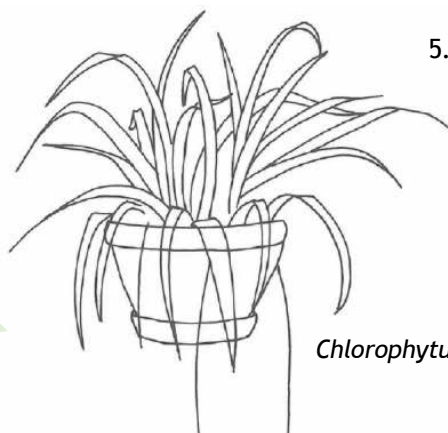


Fig. 2:  
Cuttings in sand

### SPIDER PLANT

1. Spider Plant “Plant lets” can be started in water or soil.
2. Fill each cup with water or soil depending on the “medium” you choose.
3. Carefully remove the “plant-lets” from the stem. Cut at the base or snap it off. You should see tiny root “buds” at the base of each plant.
4. Water: Suspend the new plant so the root buds are in the water.  
Soil: Gently push the new plant into the soil to cover the root buds and water.
5. When rooted, Spider Plants are wonderful for hanging baskets.



*Chlorophytum comosum*



### SUGGESTIONS:

Do consider plants for Holiday Gifts. Not only will the plants improve the air quality by circulating and purifying the air, they warm the heart as a gift. Send out a call for plastic hanging baskets. These are often discarded. Use markers or paint to decorate. In the classroom, check for any restrictions regarding hanging objects (baskets). A clothing rack near windows works great!

Make a vocabulary list of “planting terms”. Record planting events illustrations in a science journal.

Establish a room library of gardening and planting books. Get students reading, researching, recording data, and using data to improve the quality of their projects!

Log into websites to learn more about clean air.

NOTE: Michigan Science Teachers Association, FLEDGELING, Issue 11, January-February, 1993, is all about Cuttings.

# CURRICULUM IDEAS

## Of Course Science Can Be Fun!... Even If It Is Required!

*Lu Anne Clark, Lansing Community College Academic Advisor, Biology Program Chair and Biology Professor*

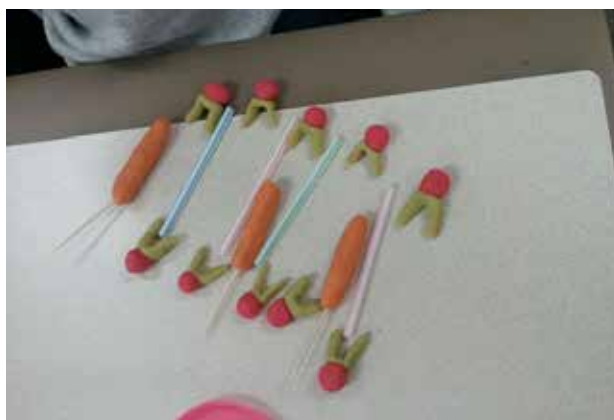
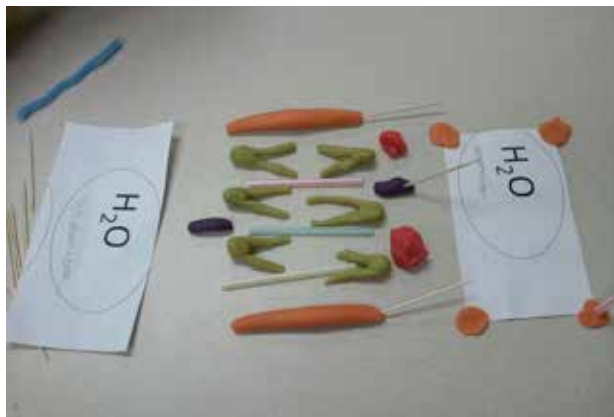
I can't begin to count the times I've heard student in advising say with a sigh, "I have to take science?" Somewhere in their academic careers, they've perceived that science is tedious, something to be memorized, dissected and endured. This article is about several college or secondary education level activities designed to help students both learn AND to have fun learning science.

### Play Doh cell membranes

I do this activity at the beginning of a class section. In the previous section we've discussed the terms phospholipid, hydrophilic and hydrophobic. They also have previously learned some simple biochemistry. I pass out three colors of doh (I love the dollar store stuff! It is colorful, cheap and lasts a long time if kept in the container and then placed in a ziplock bag. I've been able to use the same doh for several years that way.) Include a pipe cleaner, a piece of paper labeled "water", one labeled "intracellular" and one "extracellular", small pieces of plastic straw and some toothpicks. Students work in pairs or groups of three.

I start by asking them to make several phospholipids using the playdoh. I walk around making sure it somewhat resembles the structure we discussed in the previous class. Then, I ask them mold it as it might arrange itself in water. A few groups make a micelle but some go right into making the bilayer. I wander around making suggestions or comments. We discuss the structures: advantages, disadvantages, and also the terms hydrophilic and hydrophobic. Eventually, they form the bilayer using the extracellular/intracellular labels.

Next we add in the other various molecules using the other items I've given them. For instance, where would the cholesterol be knowing that it is hydrophobic? What is its purpose? Bending the pipe cleaner pieces helps form this. Where would the proteins be? (Students can use other play doh colors; some use pieces of straw or toothpicks.) How does a molecule's location help us identify their possible functions? I often take pictures and most of the students take pictures, too. One of my exam questions asks them to draw the cell membrane structure and I've seem quite an improvement on how much they remember since doing this hands-on/kinesthetic activity. I learned early on to let them keep the playdoh for the rest of the class period. It keeps them awake and they still seem to be playing attention even though they are rolling out the doh and creating other interesting "art work".



# CURRICULUM IDEAS

## Of Course Science Can Be Fun (continued)

### Cleaning the Garage

My friend and co-course coordinator, Meg Elias designed this one. It works in both an online and a face-to-face class. Both of us admit our garages don't look this good!

Names: \_\_\_\_\_

[http://www.capitolbilliards.com/\\_images//Garage\\_Boxes\\_and\\_Bags.jpg](http://www.capitolbilliards.com/_images//Garage_Boxes_and_Bags.jpg)

**Directions:** Clean the garage! Draw arrows from each box to different objects and explain how you would dispose of the objects using good Integrated Waste Management techniques.



### Build a Food Web

This one was "invented" by my friend Erica Staton. She splurged and bought sets of small plastic animals. I am much more frugal (aka "cheap") and so scrounged around the church rummage sale and in my kid's old toy boxes for various plastic animals. And then I supplemented with my handy playdoh. Each group gets a variety of animals that might exist in a particular ecosystem. The objective is to design a food web using the animals and supplementing with items they make with the playdoh (such as producers or decomposers, I don't have any plastic plants but am looking for some insects and worms!) Students like the hand on component, working with classmates (this activity is early in the semester) and the ability to visualize a food web in 3D versus a picture. Of course, you get the occasional smart aleck who has the predators attacking the prey in a vicious fight, but heck, part of learning, right?



# CURRICULUM IDEAS

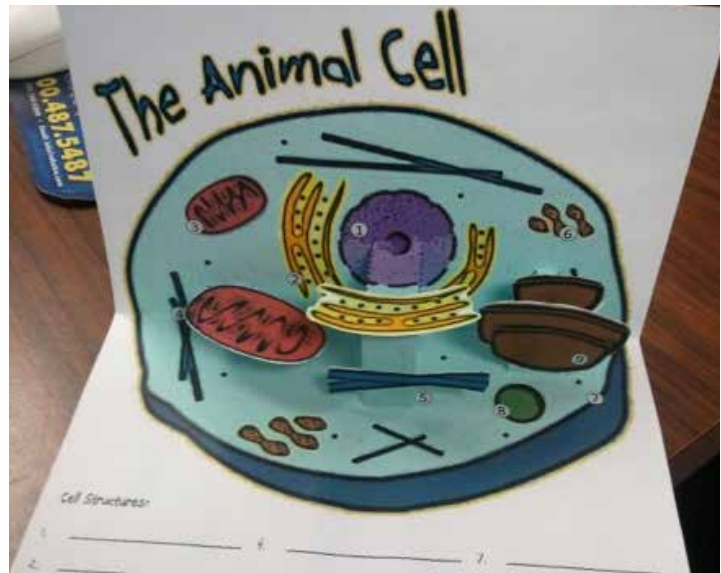
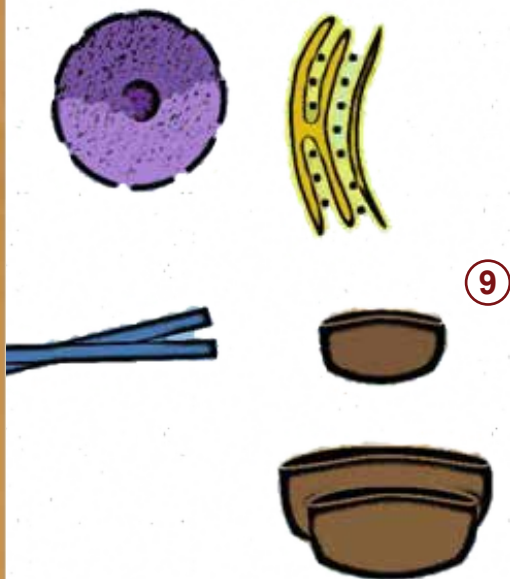
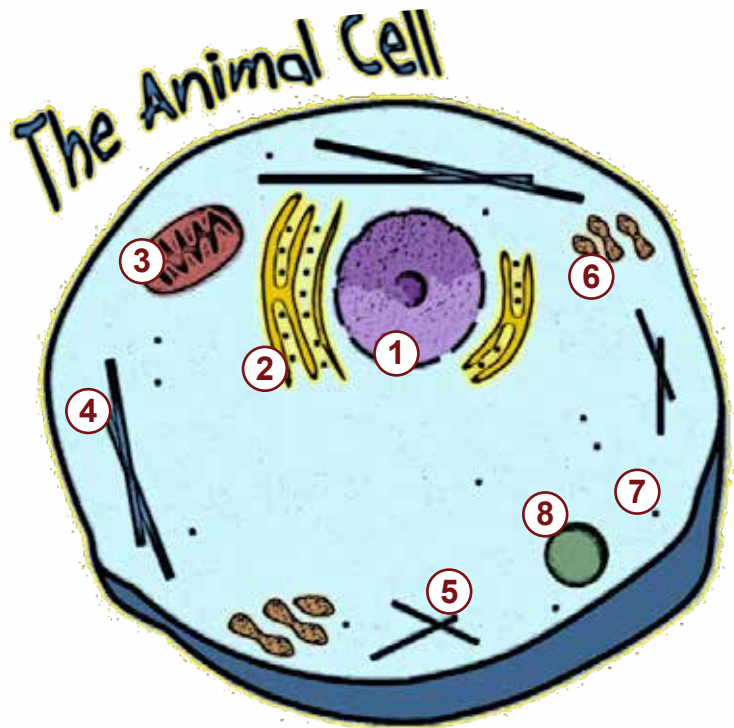
## Of Course Science Can Be Fun (continued)

### 3D Cell Model

Meg Elias also developed this one. It is very cute and students should have fun with it. She hasn't written any directions yet but it's pretty simple. Students fold the sheet and devise a way to "lift" various structures to appear 3-D.

#### Cell Structures

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_



Here is what the finished project looks like.

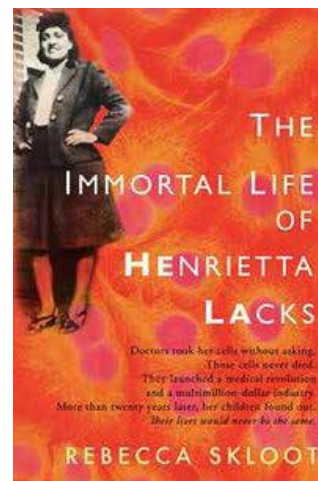
# CURRICULUM IDEAS

## Targeted 8th Grade Book Study: *The Immortal Life of Henrietta Lacks*

Susan Tate, Region 4 Director, [susantate@whitehallschools.net](mailto:susantate@whitehallschools.net)

When I discovered that Rebecca Skloot, author of *The Immortal Life of Henrietta Lacks* (Crown, 2010), would be speaking at Calvin College as part of their esteemed January Speaker Series for 2013, I was quite excited because I really enjoyed the book when I read it a couple of years ago. For those of you unfamiliar with the story, this non-fiction book begins with the early life of Henrietta Lacks, a poor, black woman who grew up on a tobacco farm in Virginia and then moved to Baltimore to raise her own family. While her children were still very young Henrietta was diagnosed with cancer, and during her treatment at Johns Hopkins Hospital, a doctor took cells from her tumor and sent them to the lab to be cultured. The year was 1951 and doctors were racing to create the first immortal cell line to use in medical study. Henrietta's cells—known in “lab speak” simply as HeLa cells—were the first to grow successfully and have been used ever since by researchers in some of the biggest discoveries in medicine.

This would be a nice, tidy little story were it not for the fact that Henrietta and her family had no knowledge of her “donation” and the manner in which her cells were used for decades. The book tackles issues of race, social justice, and medical ethics.



While I was personally looking forward to hearing what Ms. Skloot had to say about Henrietta and the process of telling her story, I kept thinking about sharing this book with my students. Since the story has nothing to do with 8th grade Earth Science, I knew it would have to be in some extracurricular format. I recruited our middle school counselor and one of our 8th grade English teachers to help run a book study group. Students were invited to participate if they had either selected or been matched to a career in medicine based on the interest inventories on the Explore test and the Career Cruising website ([careercruising.com](http://careercruising.com)). We sent a letter home to parents explaining the purpose of our book study, and letting them know that there were some mature themes in the book should they wish to preview a copy. Participating students received their own copy of the book, and we devoted the weeks before and after winter break to reading and discussing the book. Students were asked to read a chapter or two each night, and we used the discussion questions provided for teachers on Rebecca Skloot's website ([rebeccaskloot.com/the-immortal-life](http://rebeccaskloot.com/the-immortal-life)) during our 45-minute long daily meetings. The students really seemed to enjoy the book, and several parents decided to purchase the book and read along too. Our book study culminated in a field trip to a remote-viewing site at the Beardsley Theatre in Muskegon to watch Ms. Skloot's live lecture at Calvin. Because we had contacted her ahead of time through her publicist, Ms. Skloot even gave our group a little shout-out during her presentation.

I really enjoyed this experience because I was able to spend some relaxing time with my students having some deep, thoughtful conversations about topics I don't normally cover in class. Some of us really got into the medical details in the book, while others enjoyed reading about the social complexities of Henrietta's story. We formed such a tight knit group during our time together that the students voluntarily met during their lunchtime once per week throughout the spring to plan a fundraising dance in honor of Henrietta's contribution to medicine and society. It was their way of paying it forward, and since Henrietta loved to dance it was particularly fitting. We raised \$1,200 that was split equally between The Henrietta Lacks Foundation, and Harbor Hospice's Camp Courage—a grief camp for children.

If you would like to recreate this experience for your students, there are several recorded interviews with Rebecca Skloot that can be found online, including one on NPR. Unfortunately, due to contractual issues, Calvin College was unable to record and archive her lecture last January. We also used a clip about Henrietta Lacks from CBS's Sunday Morning show to kick-off our book study. This can be found at <http://rebeccaskloot.com/2010/03/cbs-sunday-morning-segment-on-the-immortal-life-of-henrietta-lacks>. If you have any logistical questions not addressed here, simply send me an email.

# Students Zoom in on Zebra Mussels

Submitted by Liz Larwa, Elementary Director

If NASA offered you the chance to borrow a remotely operated submersible and a hexacopter to use with your class, what would you do? Teachers Meg Foley and Liz Larwa from Spencer Elementary in Brighton, MI, took the challenge. Using the fourth grade state objective to “Explain how environmental changes can cause a change in the food web,” Ms. Foley and Mrs. Larwa designed a science club for students that would look at invasive species in local lakes.

The club was comprised of 16 fourth grade students who met January through June of 2013. The goal of the club was to learn about invasive species, how they affect local lakes, and learn how to use scientific equipment to collect and record data.

After studying invasive species in general, the students narrowed their focus to zebra mussels which are commonly found in Michigan inland lakes. They read articles, listened to a guest speaker, learned about water quality testing, and practiced with the remotely operated vehicles on loan from NASA.

Full of their new knowledge, the science club headed out to two local lakes in May: Brighton High School Lake, which has no mussels and Silver Fox Lake which is infested. There the students collected and tested water samples and viewed the lakes from the air through the use of the hexacopter and from below the water through the use of a submersible. They discovered marked differences between the two lakes.

The BHS lake, which did not have zebra mussels, had a lot of visible plant material and the water was very murky. Silver Fox Lake, which did have zebra mussels, was very clear and had little to no plant material. From their experiments and observations the club members saw directly how the zebra mussels are destroying parts of the natural environment by eating zooplankton and phytoplankton interrupting the local food chain. The



students also found through the water testing results that the level of dissolved oxygen was much higher in the lake without zebra mussels.

Thanks to the NASA mission, the Spencer Science Club members and their teachers have become passionate about helping to prevent the spread of invasive species.



Zebra mussel. Photo courtesy of USGS.

# ALL “KIDS” ENJOY PLAYING IN THE “DIRT”!

by Sally A. DeRoo: Flower Lady - Kids Garden Helper!

Gardening, watching plants grow to maturity, is enjoyed by all. The fascination of the “magic bundle”, the seed, is one of Nature’s mysteries. Introduced to cultivating plants inside or out is, not only productive, but rewarding. Those who are willing to engage and interact with the greenery enter a marvelous world of discovery.

The Teen Group at St. Vladimir Russian Orthodox Church, Ann Arbor, needed a project. Why not a growing project? Rev. Fr. Gregory Joyce and Sally DeRoo, (the Flower Lady), planned an introduction to plants. The first meeting reviewed the Plant Kingdom. The teens focused on making plant cuttings and dividing plants with offshoots. It was decided these plants would be sold to the congregation as a fund raiser. The teens agreed the project was a success. The second meeting was planned. Bulbs were selected as the planting project. Narcissus bulbs were purchased and stored in a cool area.

The second meeting took place outdoors. The teens brought their younger siblings to help. Narek Verdiyan brought his 10 year old sister, Narine.

Narine, a future columnist, chose to record the activities of the event. Clip board and pencil in hand, she set to work. Recording as follows:

Days later Narine wrote:

“We made it through. The new plants appeared healthy. The leaves are tall and the flowering shoots are filled with beautiful flowers. If we would have stored the bulbs too long, the leaves would have developed slowly and there is a chance the bulbs would not produce flowers.

So, I just finished the article and recording the information about the planting project. Our teen group worked as a team with the help of our little brothers and sisters. I have recorded all you need to know about easy to grow narcissus. So, I guess this whole thing just leads down to beautiful plants and gorgeous smiles. Oh yes, narcissus bulbs are the favorite bulb to “force” for early spring blooms. When planted in soil, they can be enjoyed for a long time.”



## PLANTING NARCISSUS BULBS

Narine Verdiyan – Junior Planter

How to plant narcissus bulbs? Good Question! Wow, what a beautiful day to plant! We junior planters take advantage of that. Read on to see the steps of the planting process.

1. First, we need to get ready, unload soil, get the flower pots ready, get water, newspaper, pine needles and of course, the narcissus bulbs.
2. Time to plant.
3. We “smash” a sheet of newspaper down into the bottom of a flower pot. (We do this so the water can still keep the roots of the plants wet after it has soaked down.)
4. We add a layer of pine needles or leaves on top of the newspaper. This layer acts as a filter. It keeps the fine particles of potting soil from washing out the bottom of the pot.
5. We fill the planting pot half full of soil.
6. At last we add three, four or five narcissus bulbs.
7. We gently cover the bulbs, almost to their very top with soil.
8. Then we water until water comes out of the bottom of the pot.
9. Take the pots home and place in a comfortable spot, not too warm or too hot.
10. Wait for the bulbs to grow.

### A LITTLE ABOUT ME!

I am a 10 year old Armenian American. I love to write and garden. I go to school in Ann Arbor. My brother told me about the Teen Group’s Planting Project at St. Vladimir. I wanted to help. There was a lot of gardening going on, so I thought I should take a shot at it. Personally, my favorite thing to do is play outside!



# Keeping Our Environment Healthy - The Green Way!

## PLANTS HELP FRESHEN THE AIR WE BREATHE

By Sally DeRoo

Bringing a variety of plants into the classroom is a beginning. A wonderful introduction to a relationship between plants and people. Air freshening plants provide students with an opportunity to observe, collect and record data. They can practice hands-on science while learning content and process. The fascination of “growing” is the process observed in all living things. Gardening is a love of watching plants and the other organisms in the garden ecosystem fulfill the cycle of life: a beginning and an end!

House plants are indoor gardening. Plants, people and pets share the indoor environment. One form of life assists the other to establish a clean, healthy habitat.

Children become gardeners early. A hobby that can give a life time of joy. Refresh the air in your classroom and building using a variety of plants. Many “Air Freshening “plants require little care.

Something about plants and air quality to keep in mind. Indoor air in homes and buildings, often contains a variety of chemical toxins.

Pollutants leach from synthetic building materials, cleaning agents and a variety of other products. As people and pets breathe, they use oxygen and give off gases such as carbon dioxide and methane. During the process of photosynthesis, plants use the carbon dioxide and give off oxygen as a by-product while storing food (starch and sugar). Plants help circulate the air during photosynthesis. Plants also use oxygen, as they are living organisms, that use and burn energy. Photosynthesis takes place when light energy is present. During cold, dry winter months, house plants add much needed humidity to the air.

Plants are marvelous. We could not live without them. They not only help clean air and soil, they provide the necessities for life within our environment.

Research done by NASA tested a variety of houseplants. Dr. Wolverton, a former NASA research scientist, tested plants to determine what specific chemical pollutants they could “eliminate”. It was noted that plants did reduce the pollutant levels up to 87%. All houseplants are beneficial to a degree. When plants are present indoor air quality is measurably freer of toxic gases. Plants have a natural “filtering” ability.

**Plants Can Significantly Improve Air Quality...  
They Are Decorative and May Require Minimal Care!**

**KEEP IN MIND:** Plants do help filter the air and circulate it. Large leaf plants have a greater surface to take in and “treat” polluted air. Carefully wipe dust off the leaves of plants with a damp cloth. Dust can plug-up stomata (holes) in the leaf necessary for gas exchange. Classrooms are generally very dry in the winter months. Plants help by adding much needed moisture.

### POSSIBLE PROJECTS

1. Chart the humidity in the room before and after plants are added. Record changes in humidity levels with students, without students, with and without plants.
2. Did adding plants affect the room temperature?
3. Consider a grant to record environmental changes when plants are present.
4. Science fair presentations?

Excellent website to consider: [www.O2for you.org](http://www.O2for you.org). The current *Fledgeling* also contains some plant growing ideas.

### POPULAR PLANT VARIETIES TO CONSIDER

Read the plant label for care and basic information before purchasing. Plant tags give light, temperature, water and soil requirements. Plants known for reducing air pollution may have a VOC label (Volatile Organic Compounds), which gives toxic removal information.

There are many plants that can be added to the specific list of VOC removers. Several “conditions” have been related to air pollutants in buildings. Symptoms associated with Sick Building Syndrome, SBS are: allergies, eye, ear and nose irritation, fatigue, headache, congestion and others to name a few.

**SPIDER PLANT:** Spider plants are recommended to remove Formaldehyde! Spider plants are easy to grow. They produce off-shoots. Good plant for student projects.

**PHILODENDRON:** This common house plant is also known to reduce Formaldehyde and Xylene

**PALMS:** Remove measurable amounts of Formaldehyde, Benzene, and Carbon Monoxide.

**PEACE LILIES:** Peace lilies remove many VOCs. They include: Acetone, Ammonia, Benzene, Ethyl Acetate, Formaldehyde, Methyl Alcohol, Xylene, Trichloroethylene

**SNAKE PLANT:** (Sansevieria), remove Alcohol, Acetone, Benzene, Formaldehyde, Xylene

**SCHIEFFLERA:** Eliminates Benzene Formaldehyde, Toluene

**DRACAENA:** Many varieties are very specific in VOC removal.

**DIEFFENBACHIA:** Removes Formaldehyde, Toluene, Xylene

**FERN:** Eliminates Toluene, Xylene

**NOTE:** Snake plants are wonderful to propagate from cuttings. There are several varieties that produce “off-shoots” that transplant easily. Good project plant.



## Book Review:

### The Violinist's Thumb by Sam Kean

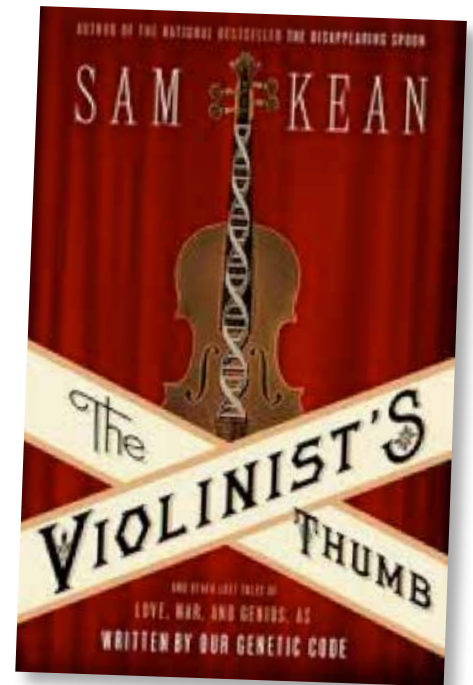
The Violinist's Thumb by Sam Kean is a delightful storybook of the history of DNA and genetics. Both biology and chemistry teachers will find plenty of tales worth recounting in the classroom. The technical minutiae are related in easily accessible language. For example, "Cells commonly turn DNA off by dotting it with small bumps called methyl groups, or turn DNA on by using acetyl groups to uncoil it from protein spools."

So many of the vivid personalities of research are lost in textbooks when only the name and the discovery are listed. The Violinist's Thumb colors in the missing characters and describes the particulars of the research from Nobel prize winners to forgotten assistants.

With a good measure of evolutionary theory, Kean illuminates the dominance of reproduction and the control it wields over creatures great and small. Toxoplasmosis becomes a villain of immense proportion. And, Kean recounts scandalously unethical experiments done nearly 100 years ago in attempts to breed human - ape hybrids.

Sam Kean is able to capture the mystery of the genetic code and he relates how new tools of science have been rigorously applied to reveal the magical workings of mere amino acids. The result of the research has led to dead ends and uncanny serendipity. And, he throws in a few salacious details to keep the pages turning. The book never drags and is an entertaining read. As a bonus, I learned something new on every page.

— Amy Zitzelberger



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# Fulton Elementary Science Night: An Opportunity Presents Itself

*Sarah Fox, Fulton Elementary Teacher, Middleton, MI*

## A Need, a Desire, and an Avenue

In 2012 the seeds for a great tradition were planted in the minds of teachers from a small, rural district in Gratiot County. It is here you can find Fulton Elementary, quaintly situated in an array of fields and nestled between the towns that support it. “Pure Michigan Science” was the theme of the 2012 Michigan Science Teachers’ Association annual conference that I attended. As always, the conference was full of amazing ideas and sessions. During the course of that weekend, I chose to attend two sessions on coordinating science nights, one presented by two high school teachers and another by a science curriculum director. As the MSTA sessions always do, these two sessions inspired me. I was ready to make science night a reality at my district, but the ideas lay dormant for months as my day to day responsibilities took over.

It wasn’t until the school year had wrapped up that the seeds sown at the science conference were nurtured. It was then that I finally had the time to fully reflect on the school year, on our School Improvement Team discussions, and on the many Science Department Meetings that I was involved in over the course of the year. An accumulation of the thoughts of many from the district brought me to the conclusion that we needed to find a way to get our community and families more involved in our elementary school. At that time, there were already a variety of events each year that took place after school hours that allow families to come into the school, and all of these events were well supported and well loved, but we needed more. As I contemplated, I realized the one thing that was lacking was an event in the elementary school that focused on the sciences. What better way to get parents, staff, community members, and middle school student volunteers involved in the education and enrichment of our elementary students than with a science night?

Again, the thoughts were pushed to the back of my mind as the summer kicked off, but fortunately the seeds sprouted when I came across the MSTA mini-grant later in the summer. It was then that I discovered that the same organization that allowed the seed to be planted at the annual conference earlier that year was going to be my avenue with which to make this science night happen. The seedling grew when the mini-grant proposal was chosen, and it thrived into the most beautiful flower when science night occurred. The need, desire, and avenue for a science night were present, and with a few important foundations, science night was no longer a thought, but a reality.

## Bridging Curriculum, Classroom, and Community

There were a few important elements to the science night that helped to make it so successful. Organization, community involvement, family participation and classroom connections were all considered in the planning. These components can act as a guide for planning future science nights.

Community involvement was one of the most essential components of science night. A number of potential organizations were contacted. The DNR, which provides free educational programming for Michigan schools, was contacted and they sent Gratiot County’s Wildlife Biologist to the event to set up a station with pelts and skulls for the students to observe. The Gratiot County Conservation District also provided each family that attended the night a white pine seedling to take home and plant. This was an amazing addition to our evening. Another huge draw to our science night festivities was Pruess Pets’ live organisms. What a buzz they created in the building! In addition, we had STARLAB, a portable, inflatable planetarium system, which put on 20 minute presentations throughout the night on the moon and stars. Seeking out these community resources and inviting them into our school was a great addition to our night. The smaller school community also helped out. Our generous PTO donated money to purchase science books to raffle off. We gave away a total of 21 science books that night in an attempt to foster a love for reading about science concepts at home. Finally, many middle school students in the district pitched in and offered their time to run various stations. They did an outstanding job working with the younger students on science activities. Science night was a great way to utilize the resources in our community.

Organization was also integral to the success of the evening. Teachers in the school were surveyed on the types of activities they would like to see at science night FOUR months before the occasion. All materials needed for the stations were ordered in advance, and contacts to the community were made months before the scheduled event. Each station had a tub full of the supplies necessary to run the station, as well as instructions for set up and clean up, and directions on how to run the station. This allowed teachers and eighth grade volunteers to run their station efficiently without much guidance from coordinators. For the families, a map and directions for the evening were distributed at the sign-in table when families entered the gym. Seedlings could be picked up from the Tree Station at the exit, and a survey was also located near the exit for feedback.

After months of preparations, the evening’s events ran from 6-8 pm on a Wednesday night in April. All preschool through sixth grade students and their parents were invited to attend science night. About 1/3 of our students and their families participated in the event. Family participation was fundamental to science night. Families were able to move freely through the school to the various 20 stations that were set up. They enjoyed dissecting owl pellets, designing a container together to protect their egg during the egg drop, identifying jelly beans using a dichotomous key, and testing whirlycopter designs to find which design was the best for flight. They also enjoyed getting messy with Oobleck and slime, and exploring trees, rocks, life cycles,

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## Fulton Elementary Science Night *(continued)*

magnets, and electric circuits. Families also had the chance to plant seeds to take home, compete in a recycle relay, explore science apps with iPads, get creative with chromatography, and see demonstrations with dry ice. Testing whether items would sink or float and the pH of different fluids was also a big hit. There were so many stations that some families were still finishing up activities as clean up started. What a phenomenal turnout!

The upcoming Next Generation Science Standards reminded me of the importance of science application in the classroom, as well as the need for our students to gain an interest in the sciences through inquiry and investigations. There is a need for exposure to different science areas in an exciting way, so that they want to ask, explore, inquire, and investigate, preparing them for a future where they are required to use the science process skills and think for themselves in order to solve problems around them. For this reason, I also wanted to continue science night beyond the actual event. To accomplish this goal, an at home science activity was sent home with instructions on how to use it. Additionally, I also asked teachers in the elementary school to give me a request of materials they desired to bring science to their classrooms. Each classroom received supplies for a hands-on activity of the teacher's choice ranging from prisms to magnets to catapult design materials.

The goal of bringing science night alive was to allow our school another avenue with which to bridge the classroom, curriculum, and the community in our small district. I hoped it would allow a science tradition to begin with a solid foundation and prospects of a prosperous new event to anticipate each year, like many of the other events that are already in place. I was determined to make this science night a success, and without a doubt, it was one of the most exciting things that I have imagined and seen through to fruition. The hard work and countless hours that went into the event paid off as comments from the evening were positive and students are already looking forward to next year. A science night is a low cost, priceless event that unifies the school, community members, and families and ensures all involved will reap the benefits. Fulton Elementary's motto is "No Better Place to Learn." This evening was a model of this motto in action.

### Science, Technology, Engineering, Art, and Math

## STEAM-Powered Teaching and Learning

*June Teisan, National Board Certified Educator - Early Adolescent Science; MSTA Board member*

The idea began at a summer PD in Harlem, NYC: How can students engage in the renewal of their community and what meaningful role can science and art play in a project-based approach to learning?

Inspiration struck when Diego Rivera's "Detroit Industry" murals came to mind and soon the "Detroit 1933/2033" Project came to life.

During the 2012-2013 school year I collaborated with the Detroit Institute of Arts (DIA) staff to use art to connect my urban students with the history, politics, social issues, technology, scientific and engineering successes of yesteryear of Detroit. My classes soaked in the artistic themes of Rivera's incredible murals related to the Ford Rouge plant, first through virtual tours, a docent visit in the classroom, and then on three successive visits to the DIA. During this 'arc of discovery' DIA staff delivered targeted guidance to the student tour groups and the talented DIA studio staff designed three separate art projects connected to the learning. From exploring the past to connecting students' present passions and skills, and finally looking at their possible role for building Detroit's future, my students viewed their city through the empowering lens of science magnified by art.

While experiencing the success of this deeply meaningful and robust "pilot" year with my students, the next logical step was to share this same STEAM-powered unit with other educators. Again the Detroit Institute of Arts joined in partnership to support a four-day workshop along with

Pearson's Model Classroom staff. Twenty educators from Detroit and the tri-county area worked to design projects that would challenge students to action. Throughout the four days, teachers themselves participated in active and collaborative problem-solving activities centered in the heart of Detroit, including deep dives into the inspiring Rivera murals. These educators designed STEAM learning experiences tailored to their grade level, subject area, and neighborhood that will immerse young people into work that can positively impact their schools, community, and the metro-Detroit area. The 2013-2014 school year promises great impact through STEAM-powered teaching and learning in southeast Michigan!

