

MSTA Newsletter



A publication of the Michigan Science Teachers Association • Volume 64.3 • Summer 2012

In this Issue

From the Desk of the Executive Director	1
From the President's Desk	1
Brain Bee	2
Food Science Workshop	3
Dan Wolz Grant	4-6
Wood to Wheels	8
AMS Education Programs	10
The Fledgling	15-16
Curriculum Ideas	17-19

From the Desk of the MSTAPresident - Michael Sampson

Changes and Revisions

As I sat down to write this article, I looked back over the last 6 years of the fall editions of the MSTANewsletter and it looks as though the common theme has been about changing or revising our content standards. So where does that leave me? Well, with the unveiling of the Next Generation Science Standards (NGSS) in early 2013, it looks like more change is on the horizon and this change will be the driving force behind my presidency. This article will outline how the MSTA will help science educators make this change to the NGSS.

As our vision statement says, the MSTA, as the state's foremost leadership and advocacy group for science, has played and will continue to play an integral role in the development and revision of the standards now and in the future.

As a way to support our membership here are a few links to information about the NGSS: This link: http://www7.nationalacademies.org/bose/Frameworks_Report_Brief.pdf provides a very brief summary of the NGSS framework. This link: http://www.nap.edu/catalog.php?record_id=13165 provides a look at the entire NGSS curriculum framework. Take

continued on page 2

From the Desk of the Executive Director

By Robby Cramer, MSTA Executive Director

In the spring of this year, the first public review of the Next Generation Science Standards (NGSS), developed from the NRC *Framework for K-12 Science Education*, took place across our nation. Many thanks go out to the MSTA members who were able to participate and express their thoughts on the work so far. We would like you to know that your voices were heard!

The national writing team has been making many modifications and changes during these summer months. Later this fall, there will be a second public review of the amended Next Generation Standards. MSTA will let you know when this second round of public comment will occur. The Math Science Network and other key leaders will hold public review sessions. In addition, you can use your own computer to comment individually and add your own perspectives. The writing team is listening and making changes based upon your recommendations.

We will use the MSTA state conference scheduled for March 8 and 9, 2013 at the Eastern Michigan University campus in Ypsilanti to share many features of the Next Generation Standards work and provide assistance in their

implementation. The 2013 conference is entitled "Pure Michigan Science -- The Next Generation."

We are delighted to be at Eastern Michigan University and are busy building a conference to meet your needs regarding the Next Generation Standards as well as opportunities to gather and socialize with your science education peers state-wide. This will be an opportunity to find out what other districts and leaders are doing to help the teachers of Michigan transition to the next generation of science learning and teaching.

Conference registration forms are available on the MSTA web site: http://www.msta-mich.org/images/pdfs/conference/msta2013_registrationform.pdf

Please consider offering a session on strategies that are working well for your students. Speaker forms are available on line: <http://www.surveymonkey.com/s/LD23S7Q>

2013 will be our 60th state conference! We hope you will join us at Eastern Michigan University!

It's happening...January 12, 2013

Go to www.brainbeemsu.com to register

Dive into Neuroscience: Explore and Discover the Human Brain

Have you ever wondered what makes you who you are? Why there is a blind spot in your vision? Why spinning around makes you dizzy? If so, you may have a growing interest in the field of neuroscience and have the chance to participate in the Brain Bee at MSU!

This competition enables students to learn about the brain and career opportunities in the neurosciences.

What is the Brain Bee?

The Brain Bee at MSU is a live Q & A competition that tests the neuroscience knowledge of high school students. Young men and women compete to determine who is the "best brain" on such topics as intelligence, memory, emotions, sensations, movement, stress, aging, sleep, addiction, Alzheimer's, and stroke. Participants prepare by studying "Brain Facts (new 2012 version)" (available free at www.brainbeemsu.com). MSU will also offer several on-campus workshops for Brain Bee participants, taught by working neuroscientists (check out our web site for details).

All participants will receive a certificate of completion and t-shirt.

The winner of the Brain Bee at MSU competition will receive an all-expenses-paid trip for the student and a guardian to attend the National Brain Bee Competition in Baltimore, Maryland in March (for details see: <http://www.internationalbrainbee.com>) and a copy of Purves' *Neuroscience* (a medical school textbook). Second and third place winners will be awarded a cash prize of \$200 and \$100, respectively.

The winner of the National Brain Bee competition (*which could be our local champion!!*) receives \$1,500, a fellowship to work in the laboratory of a neuroscientist in the US during the summer, and a trip for two to the International Brain Bee competition.

How to Register

Brain Bee is for all interested high school students who are residents of Michigan and want to learn about neuroscience and career opportunities in this field. Interested students can register at www.brainbeemsu.com. Registered students are also eligible for on-campus workshops offered in the fall (see website for details). Registration is free. Contact us at brainbeemsu@gmail.com if you have questions. Also follow us on facebook and twitter for updates!

@BrainBeeMSU



Brain Bee at MSU



From the President - *continued from front page*

a look at these documents to become familiar with the direction of these standards.

The NGSS have already undergone a public review and a second draft should be available this fall for further review. We will, of course, continue to provide more information and opportunities for input as they become available.

Another way we support our vision statement is to provide Michigan teachers, students and parents with resources that promote thinking and reasoning skills in science. These skills are the focus of the 2013 MSTA conference on the NGSS. Although change seems to occur at the state and national level, you can count on the MSTA to be your "go to" organization to help make these changes a bit smoother and more seamless as you implement them at the classroom level.

Questions

"What am I made of?" the child wondered.

The teacher responded, "You are made of skin and bones and muscles and lots of other parts."

"And what are those parts made of?"

"Cells, of course."

"And what are all those cells made of?"

"Why, I think they are made of molecules."
"What are those?"

"Atoms join together to make molecules."

The child thought. "I heard that atoms are held together by energy."
"That's right."

"And rocks and water and air are made of atoms too."

"You've learned that well."

"And cars and houses and sidewalks?"

"Yes."

"So, if everything is made of atoms held together by energy, then what makes some of them alive?"

— Roberta Jacobowitz

Free Workshop Opportunity:

Food Science Workshop

Engaging Students in Scientific Inquiry through Food Science Activities

Hosted by Sandy Erwin, Plainwell High School

Want to learn how to use food to captivate your students' attention and interest in inquiry labs? Here is your chance to explore the science of food and food safety using the FDA/NSTA based curriculum, *Science and Our Food Supply*. Participants will conduct laboratory and related inquiry activities to answer questions such as: What location in school has the most bacteria? What type of milk spoils the fastest? At what temperature should you cook a hamburger to?

Participants will learn how to:

- Prepare agar gel plates, inoculate plates, and dispose of used plates properly.
- Explain how different types of bacteria can cause food-borne illnesses.
- Setup, perform, and differentiate a variety of food science experiments for a wide range of students
- Use current food safety topics to help students generate their own inquiry experiments



Instructor: Sandy Erwin

Date/Time: Saturday, November 3 from 8 am to 3 pm

Location: Harper Creek High School, Battle Creek, MI

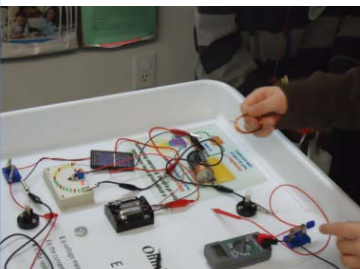
Audience: Grades 6-12 Science, Health, and Family and Consumer Science Teachers

Class Limit: 24 (first come, first served!)

Bonus! You will receive your own *Science and Our Food Supply* kit. **Lunch is provided courtesy of Chartwell's.**



STEM EDUCATION OPPORTUNITIES AWAIT! Let us bring the field trip to you! Great Lakes Energy Service, Inc.'s Renewable Energy Mobile Classroom is packed with hands-on learning stations that are designed to encourage inquiry and develop understanding of the mechanics of renewable energies. For more information, visit www.greatlakesenergyservice.org or call (517) 669-5389.



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 our 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 2013 and 2014 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, 2012 submission deadline. Determination of the award recipient will be in November. The award is presented at the MSTA conference in March 2013 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, 2012 to the MSTA offices at: 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, 2012. 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 2013.

Expectations of the award recipient:

- Be available to accept this award at the MSTA State Conference Award’s Banquet in March 2013
- Write an article for both the MSTA and MWEA newsletters
- Give presentations at both the MSTA (March) and MWEA (June) state conferences in 2014

Past Recipients of the Dan Wolz Education Grant:

- 2007 - Mary Lindow, Battle Creek
- 2008 - Emily Curry, Jackson Public Schools
- 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

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, 2012.

Email completed applications to: 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.

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.

Save
The
Date

Come
Celebrate!

Michigan Science Teachers Association's
60th Annual Conference
March 8-9, 2013

At Eastern Michigan University's
NEW Science Building & Student Center

(Professional Development sessions will be offered on Thursday, March 7, 2013)

Wood to Wheels at Michigan Tech or How I Spent My Summer Vacation

From Lloyd Hilger, Hanover Horton Middle School

I have been involved in many great professional development programs, but “Wood to Wheels” is definitely one of the best. The program runs for six weeks. It is held on the campus of Michigan Tech University, which is only fifteen miles from Lake Superior beaches. I made a Photo Peach slideshow of my first three weeks at Michigan Tech. It is found at: <http://photopeach.com/album/jlgrj2>

The three major goals of the W2W program as it relates to teachers:

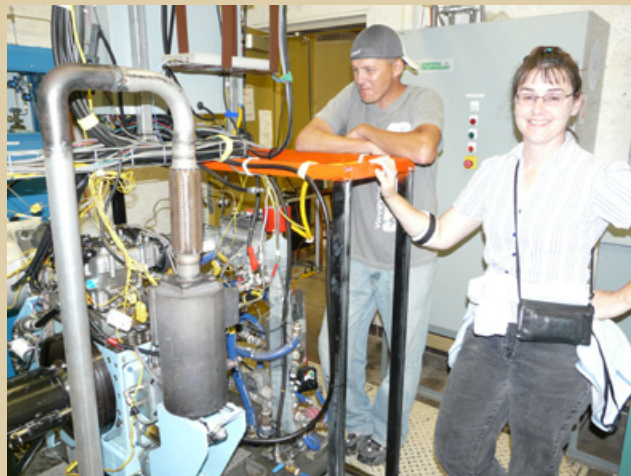
- Give teachers the experience of working directly with bio-fuels researchers who are looking for the best ways to make ethanol from wood materials.
- Give teachers the equipment to run labs that they have designed for their students.
- Provide teachers with tools that give students experiences in the engineering design process with the goal of having them consider engineering as a possible career pathway.

The Woods to Wheels researchers are working on three different, but related areas. All three of these areas are aimed at maximizing energy from wood materials.

One research group is genetically modifying trees so that they can produce the most carbohydrates capable of being converted into ethanol. The group began the research isolating DNA from poplar trees. This DNA was fragmented and amplified utilizing a polymerase chain reaction. Once amplified, the DNA fragment is transformed and inserted into leaf cells of an existing polar tree via agrobacterium. The new transgenic leaf cells are grown in a nutrient medium and treated with various hormones to promote the growth of roots and shoots.

The group that I am working with is trying to find the best conditions to liberate sugars from wood materials. We are using sulfuric acid for chemical hydrolysis at different times and at different temperatures. After the reactions are completed, the products are compared to standards through HPLC analysis. We are also working with enzymatic hydrolysis.

The third group is working on the combustion end. They worked with researchers testing new engine emission technologies as well as fuel injection technologies for more efficient combustion. Bio-ethanol is combusted in an engine in the same way as gasoline, and achieving a higher mile-per-gallon and cleaner byproducts will be just as important with using biofuels in transportation as with traditional fossil fuels.



LEARNING

By Roberta Jacobowitz (with apologies to true poets)

*Why are there calls for better schools?
Are students there just to learn the rules?
Against other countries the U.S. scores aren't high
We want to win; our country needs more than just try.*

*We need to help all students, to give them the will to think
About a vision of a better life, to reach for the moon,
To grow better crops, have fresh water to drink,
We can't wait; changes in our mindset are needed soon.*

*How do your class scores grow?
With chairs all set in a row?
Students read chapters and recite rote phrases
But lack of true understanding amazes.
Is this why their grades are so low?*

*Could their desks be put into groups?
Students collaborate for problems solved
And each of the group is involved
So they won't need to jump through hoops.*

*These groups look across curricular fields
To generate big worldly answers
From energy and climates to cancers.
Who can predict what power that wields?*

*Would other teaching techniques help more?
Can students talk about their work with each other?
High interest and challenges won't be a bore
To stimulate learning between sister and brother.*

*How would more inquiry-based classes work?
Teachers would facilitate, not lecture.
Students would imagine and conjecture
And solutions become the best perk.
From problems students would not shirk.*

*Why not toss out each cookbook lab
So students are free to think big?
Open labs allow them to dig
For answers, new ideas they can grab.*

*Changes bother lots of people but leaders can
the groundwork lay.
Parents and teachers will find fault
But progress they cannot halt.
Leaders must be firm and show that the advantage
of what they say
Will foreshadow the enormous advances which in the future lay.*

Guided Tours Planetarium Learn By Doing Scavenger Hunts Early Childhood

Now
schedule
online!



Topics include: Geology •
Paleontology • Astronomy • Weather •
Archaeology • Ecology • Dinosaurs •
Wildlife

SCHOLARSHIPS AVAILABLE

Call (734) 764-0480
or email UMMNH.Scheduling@umich.edu
to request an Educator's Guide!

Educator's Guide also available online



M UNIVERSITY OF MICHIGAN
Museum of Natural History

1109 Geddes Avenue, Ann Arbor, MI 48109
tel 734.764.0478 fax 734.647.2767
www.ummnh.org

AMS Education Programs

The American Meteorological Society offers a variety of learning experiences for K-12 teachers.

Three on-line courses for teachers are currently available. In each case the courses run about 13 weeks: once in fall (September - early December) and repeated in spring (end of January - April). Each week a different topic is addressed (through readings, on-line presentations, and activities). The amount of time varies from teacher to teacher due to different levels of prior knowledge, but participants say you should expect to put in 4 to 6 hours a week. Textbook, lab activities, extensive web site, some supplies, and three graduate credits are all free for teachers accepted into the class. But there are a limited number of slots for teachers each semester. Interested teachers are encouraged to apply early.

Two things are required of teachers signing up for a course: (1) They are expected to participate fully, doing all they can to finish the course. [Teachers who start the course but drop out early have kept some other teacher from taking the class.] (2) Teachers are also asked to find some way (or several ways) to share some content of the course with other teachers. This may mean informal sharing with colleagues down the hall - all the way to formal workshops at state or national conferences.



Ocean Course (DataStreme Ocean): This is primarily a physical oceanography course which includes, among other things, physical and chemical properties of water, ocean plate tectonics, currents, tides, ocean-atmosphere interactions, basic marine ecology, and the role of the ocean in climate. To find out more go to this web site: <http://www.ametsoc.org/amsedu/DS-Ocean/index.html>
An application form is found at <http://www.ametsoc.org/amsedu/DS-Ocean/BLANKAPP.pdf>

In Michigan, you can submit your applications to the following people:

Catherine Pfeifle
430 W. Ferry St
Berrien Springs, MI 49103
Voice: 269-471-9125
Fax: 269-471-5256
Email: cpfeifle@yahoo.com

Thomas Kelly
3385 Oconto Ct., SW
Grandville, MI 49418
Voice: 616-531-2834
Fax: 616-531-2834
Email: tkelly@gpsk12.net



Climate Course (Climate in the Earth System): This course identifies the factors that determine and define climate. The connections are made between climate and solar input, temperature, humidity, precipitation, and severe storms. Methods of measurement and modeling of climate, both recent and ancient, are discussed. The question of global climate change is discussed in the context of science research. The course web site is: <http://www.ametsoc.org/amsedu/ECS/home.html> . The application form can be found at: http://www.ametsoc.org/amsedu/ECS/download_app.htm .

In Michigan, you can submit your applications for the Climate course to the following people:

Dave Chapman
2637 Raphael
East Lansing, MI 48823
Voice: 517- 706-4886; (h) 332-8123
Fax: 517-351-9786
Email: dave.chapman@okemosschool.net

George Rausch
238 Eloise Drive
Benton Harbor, MI 49022
Voice: 269 - 925-9194
Email: gwrausch@att.net



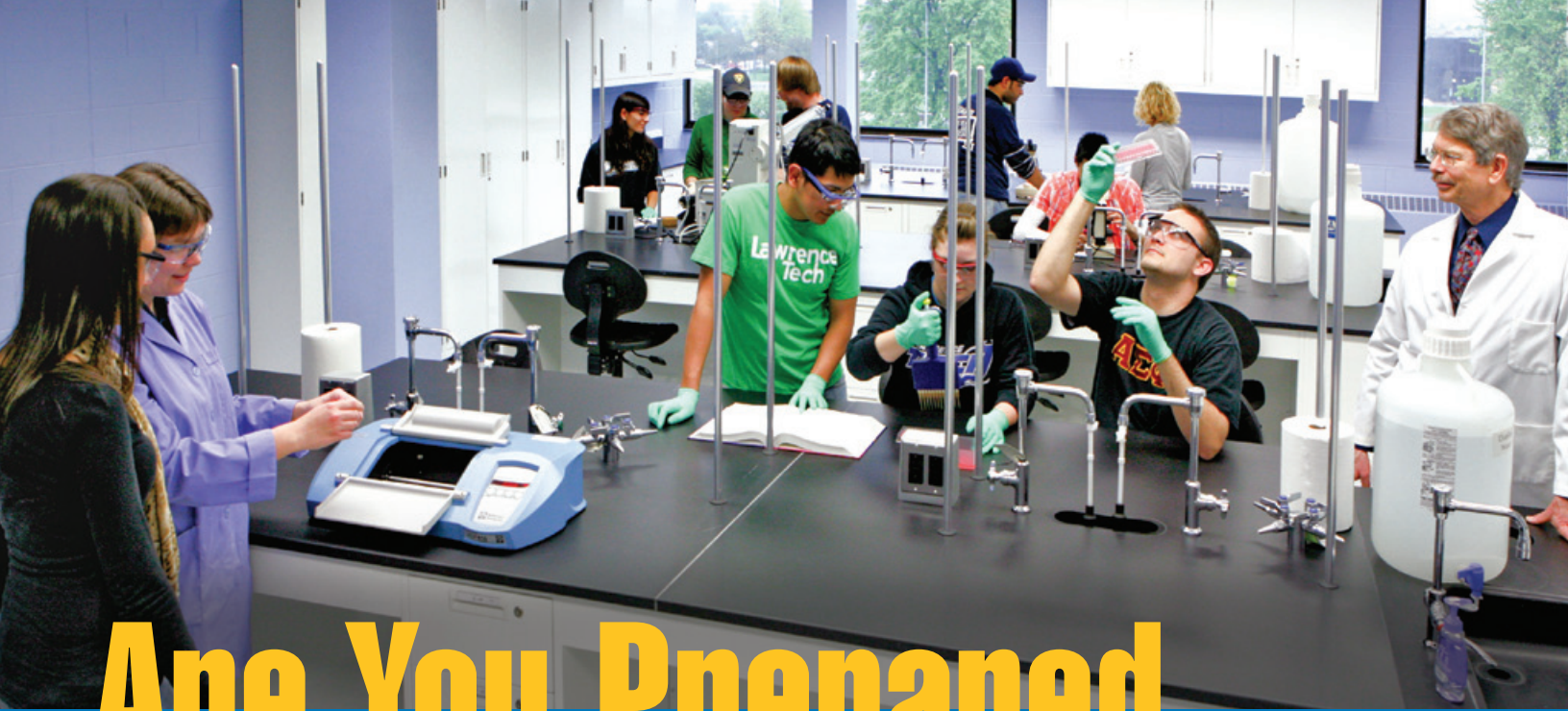
Weather Course (DataStreme Atmosphere): Basic concepts of meteorology are the focus of this course. They include separate chapters on weather measurements and tools, composition of the atmosphere, heat and temperature, air pressure, humidity, clouds and precipitation, wind, air circulation, air masses and fronts, hazardous storms, and weather forecasting.

To find out more about his course, go to: <http://www.ametsoc.org/amsedu/DataStremeFrames.html> .
An application form is found at: <http://www.ametsoc.org/amsedu/dstreme/extras/blankapp2.pdf> .

In Michigan you can submit your applications to the following people for DataStreme Atmosphere:

Thomas Kelly
3385 Oconto Ct., SW
Grandville, MI 49418
Voice: 616-531-2834
Fax: 616-531-2834
Email: tkelly@gpsk12.net

There Also are two comprehensive summer courses: one about weather (Project Atmosphere) at the National Weather Service Training Center in Kansas City and the other about Oceanography (The Maury Project) at the U.S. Naval Academy in Annapolis. For more information about these programs go to: <http://www.ametsoc.org/AMSedu> .



Are You Prepared... to Teach in the 21st-Century Classroom? Lawrence Technological University Can Help!

MASTER OF SCIENCE EDUCATION

- This graduate program in science education includes \$1,218 per course scholarships for all K-12 educators (DI or non-DI endorsement).
- Majority of courses are now offered online, with a science experiment component completed using science kits and activities.
- 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

- Master technologies that are revolutionizing the classroom and online teaching and learning: Web-based learning tools, streaming video, electronic communication, and software and hardware options.
- This practice-oriented program offered by Lawrence Tech in partnership with Marygrove College features \$1,218 per course scholarships for all participants.
- Complete the seven required courses of the Master of Educational Technology degree and be eligible for the NP endorsement on your existing teaching certificate.
- Classes are offered in a 100-percent-online format.
- Training and Performance Improvement track (30 credits) and graduate certificates (12 credits) in Robotics Education, Instructional Technology, Project Management*, Nonprofit Management and Leadership*, and Workplace Technology* are available.

**Also offered online*

Explore over 100 undergraduate, master's, and doctoral programs in Colleges of Architecture and Design, Arts and Sciences, Engineering, and Management.

Waive your application fee at
www.ltu.edu/applyfree



For more information on these and other science programs, visit
www.ltu.edu/sciences

Pure Michigan Science

THE NEXT GENERATION

MSTA Registration Form

MSTA 60th Annual Conference - March 8-9, 2013
Eastern Michigan University, Science Building &
Student Center - Ypsilanti, Michigan



Note: Early Bird Deadline Ends February 11, 2013.

Please use ONE FORM for each registrant (photocopy if necessary).
*All confirmations and communications will be done via e-mail. You
MUST provide a valid e-mail where this information can be sent.



Registration Information:

Print first and last name here as you wish it to appear on your name badge.

First Name _____ Last Name _____

Full Name of School/Institution/Business Name _____

Preferred Address: Home School Business

Street Address _____

City _____ State _____ Zip _____

County _____ Daytime Phone _____

E-mail* _____



Primary Responsibility:

- School District/Central Administration Lower Elementary (K-2)
 Upper Elementary (3-5) Middle/Junior High School (6-8)
 High School (9-12) College

Discipline:

- Biology Chemistry Earth Science Physics
 General Science Other: _____

Payment Information:

No Purchase Orders Accepted! Note: Billing address and name on card has to be as it appears on the credit card billing statement or card will not be processed.

- Credit Card: Visa MasterCard Check/Money Order: _____
Make checks payable to Michigan Science Teachers Association (MSTA)
(Tax ID# 38-2320469)

Name on Card _____

Billing Address _____

Billing City/State/Zip _____

Signature _____ Date _____

Card Number _____ CVV Code* _____ Exp. Date _____
*3 or 4 digit code on back of card

Member Type:
 Member Non-member Joint Member Institutional Member

MSTA Membership Dues*:	Fee	Total
MSTA New Member	\$45**	\$ _____
MSTA Emeritus (Retired) Membership Renewal	\$30**	\$ _____
MSTA College Student Dues (Full-time Undergrad or Graduate)	\$30**	\$ _____
MSTA Individual Membership Renewal	\$45**	\$ _____
MSTA Family Membership Renewal	\$50**	\$ _____

*By paying MST A Dues you are eligible to pay member rates for conference registration.
**You may deduct \$10.00 from the Membership fee if you choose NOT to receive Journals via the mail. You will receive an e-mail when Journals and Newsletter are available on-line.

Joint Membership Dues†:	Fee	Total
Joint Membership	\$60†	\$ _____
Joint Institutional Membership	\$175†	\$ _____

†By paying Joint Membership dues you automatically become a member of MST A, MCSS, and MCTM and are eligible to pay member rates for conference registration.

Member Registration Specials:	Fee	Total
2 Day "Team" Registration Class A&B Schools (must send at least 5 registrations) - Save \$10 per person!	\$80 x _____	\$ _____
2 Day "Team" Registration Class C&D Schools (must send at least 3 registrations) - Save \$10 per person!	\$80 x _____	\$ _____
2 Day Registration 1st Year Teacher OR 1st Time Conference Attendee	\$80 x _____	\$ _____

Registration Options:	Fee	Total
-----------------------	-----	-------

Members:	Fee	Total
Registration One Day: <input type="checkbox"/> Friday or <input type="checkbox"/> Saturday (*\$105 after February 11, 2013)	\$65	\$ _____
Registration Two Day (*\$115 after February 11, 2013)	\$90	\$ _____
Student** and Emeritus Registration One Day: <input type="checkbox"/> Friday or <input type="checkbox"/> Saturday (*\$45 after February 11, 2013)	\$20	\$ _____
Student*** and Emeritus Registration Two Day: **Must be a FULL time undergrad student. Grad students need to pay regular registration rate. (*\$60 after February 11, 2013)	\$35	\$ _____
Non-teaching Spouse	\$35	\$ _____

Non-Members:	Fee	Total
Registration One Day: <input type="checkbox"/> Friday or <input type="checkbox"/> Saturday (*\$160 after February 11, 2013)	\$125	\$ _____
Registration Two Day (*\$185 after February 11, 2013)	\$150	\$ _____
Student* and <input type="checkbox"/> Emeritus Registration One Day: <input type="checkbox"/> Friday or <input type="checkbox"/> Saturday (*\$85 after February 11, 2013)	\$65	\$ _____
Student* and <input type="checkbox"/> Emeritus Registration Two Day: *Must be a FULL time undergrad student. Grad students need to pay regular registration rate. (*\$100 after February 11, 2013)	\$80	\$ _____
Non-teaching Spouse	\$35	\$ _____

Other Registration Options:	Fee	Total
Friday Luncheon (11am-1pm)	\$25	\$ _____
SB-CEUs	\$15	\$ _____

Please consider making a donation to the Michigan Science Teachers Association. Funds collected will be used in the advancement of Science Education throughout Michigan.		Total
<input type="checkbox"/> \$2 <input type="checkbox"/> \$10 <input type="checkbox"/> Other - please indicate amount \$ _____		\$ _____
Total	Grand Total	\$ _____

For early registration rates, registration and payment MUST be received by February 11, 2013. Submit your registration by mail to: MST A, 1390 Eisenhower Place, Ann Arbor, MI 48108 or FAX to (734) 677-3287 when paying by credit card. On-line registration is also available at the MST A website - www.msta-mich.org. **Registrations after February 11th are subject to late registration rates and MUST be done on-site at the conference. Payment must accompany each registration.** No refunds will be made after February 20, 2013 (request must be made in writing). Substitutions may be made on or before February 20, 2013. MST A is a professional conference. Attendance for Friday and Saturday is designed for attendees 18 years and older. No children will be allowed to attend (EXCEPT for Thursday evening Vendor Open House).



NSF Great Lakes Energy Education Forum

Friday October 5 2012
 8:00 AM to 5:00 PM

Mott Community College
 1401 East Court Street
 Flint MI 48503

Registration: \$50.00
No Fee for students

Register Now!

Join Us!

The **NSF Great Lakes Energy Education Forum** will bring top industry and academic experts together to share their knowledge on alternative energy with a focus on the progress of fuel cell development. This forum is designed to engage multiple audiences, including industry leaders, education professionals, and students from both high school and post-secondary institutions.

The Forum will include displays and activities such as a static display of various fuel cell vehicles and a GM Volt hybrid vehicle, fuel cell car and hydrogen bus rides, tour of Swedish Bio Gas Production facility using waste water for gas production and **hands-on activities for students**.

Featured Speakers

Forum Presented By



Registration Special

First 10 HS or MS teachers to register with five (5) to fifteen (15) students will have their registration fee waived.

For More Information

CLICK HERE



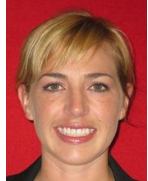
James Warner, Director of Policy
 Fuel Cell and Hydrogen Energy Association
James is an expert on energy, environment, and climate change policy.



Gregory Kleen, Education Manager
 Department Of Energy-NREL
Greg is the Acting Education Team Lead for the Fuel Cell Technology Program.



Jennifer Hamilton, Safety & Education Specialist
 California Fuel Cell Partnership
Jennifer works in hydrogen safety, codes and standards development, education of emergency responders, facility systems safety, and Project Manager for the CaFCP hydrogen fueling station.



Jacquelyn Birdsall, Engineer, Advanced Powertrain
 Toyota Motor Engineering & Manufacturing North America, Inc.
Jacquelyn has experience and interest in automotive industry - specifically in alternative fuel vehicles.

We look forward to seeing you on October 5th!

MSTA 2013 Conference

We are now accepting
Speaker Proposals for
the upcoming Michigan
Science Teachers
Associations' 60th
Annual Conference,
March 8-9, 2013, at
Eastern Michigan
University in
Ypsilanti, MI.

Proposals are accepted
on-line only, via the
following link:

[http://www.
surveymonkey.com/s/
LD23S7Q](http://www.surveymonkey.com/s/LD23S7Q)

Pure Michigan *Science*

THE NEXT GENERATION



SUCCESSION IN MICHIGAN

Science teaches us that nothing is static.
Living things change – or so we are told.
We want the same rivers, mountains, and climates;
We strive to control them – to fit in our mold.

As I walk through the weeds in our country farm lawn,
I wonder how very different it would be
If no one would mow it o'er the next hundred years
How interesting to return and what would we see?

First the small 'weeds' would take over the lawn
The Queen Anne's Lace, burdocks and tall grasses,
Field daisies, goldenrod, and black-eyed Susans,
The milkweed, the mustard – not one of them passes.

The raspberries would creep in and so would wild roses.
They'd shade out many small weeds but not certain trees.
Fast-growing sumac, cottonwoods, willows, and cherries
Would overtake roses, which reach only their knees.

What then, you may ask, is there possibly more?
Oh, yes, my young friend, evergreens will appear.
They started quite small, but soon they grow fast
A layer of branches are added each year.

The pines grow straight and tall as they reach for the sun.
You'd think that's enough changes for our little yard.
But as needles fall and decay under trees
The soil turns acid – for pine seedlings that's hard.

So will anything grow there? The answer is YES!
The pines slowly die, but others are growing.
The patient hardwoods are getting much bigger.
Oaks and hickories are last – so get on with your mowing!

– Roberta Jacobowitz

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 edited by Sally DeRoo, MSTA.

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

EXPLORING OUR ENVIRONMENT

A field study: collect items to OBSERVE, SORT, CLASSIFY, DISCUSS AND RECORD, is a winner. Try a field study each month. Students can observe Seasonal Changes in their collections.

MATERIALS NEEDED FOR EACH PAIR OF STUDENTS

A Field Lab Bag:

- A zip lock bag
- hand lens
- pencil
- small ruler
- clip board and paper
- a Collection bag (any plastic handled bag).



Classroom:

- Newspaper (for Sorting).



Each student needs:

- student notebook (JOURNAL)
- ruler
- hand lens
- pencil
- crayon or colored pencils.



Sample Collection to sort:

- stick
- rock/stone
- pop bottlecap
- weed
- flower



Exploring Our Environment

Team
Work!

DIRECTIONS:

Students work in pairs or small groups. If possible, each student should have a clip board.

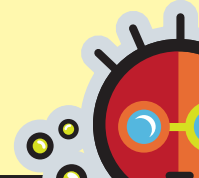
- Instruct the students to collect 10 interesting items. Items that have specific properties they can easily be determined using SIGHT, TOUCH, SMELL, and SOUND.
- **QUESTION - INQUIRE:** COLOR, SIZE, SHAPE, WEIGHT, HARD, SOFT, SMOOTH, ROUGH, SHINY, DULL, SMALL, LARGE, TINY, ALIVE, DEAD, ONCE ALIVE, ETC.
- **Directions can be specific as to live organisms.** If so, the collection jar is not required. *Insects are marvelous, save this collection for another time.*
- **Remind students to discuss the items** with each other.
- **As students collect,** each should record the item they have found using a simple illustration or text if able.

- **In the classroom,** place the collected items on a table for discussion and observation of IDENTIFIABLE CHARACTERISTICS.
- **Students should SORT the items** based upon specific OBSERVABLE PROPERTIES.
- **Depending on the grade level,** list the terms students can select. The terms listed may be those discussed BEFORE the collection process.

WHAT DO YOU SEE? COLOR is generally the first property noted.

Students **RECORD DATE COLLECTED** in their JOURNAL.

- Characteristics
- Shape
- Size of items

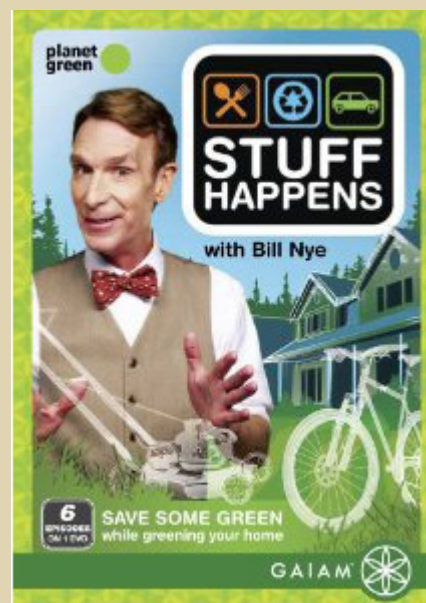


Video Find....

I don't know how many other people were fans of a TV show that aired on the Planet Green channel a few years ago, but I was a huge fan of Bill Nye's Stuff Happens. Now I know that everybody knows Bill Nye, "The Science Guy," as a staple of elementary science content and I love that, too! Stuff Happens, however, was different. The premise of the show was that there are unintended consequences to the stuff we use in our daily lives and he sets out to explain and show us what happens to that stuff, where it came from and where it goes when we're through with it and how it affects the planet.

The episodes are a half hour (probably more like 22-ish minutes, since there were commercials on the channel) and include topics and locales such as: "Stuff Happens" in the Garage, Office, Bedroom, Bathroom, Attic and Closets. The show also looks at meals (Breakfast and Dinner) as well as Pets and Sports. In all there are thirteen episodes.

The bad news is that the show was apparently cancelled after only one season. I recently decided to use some of the footage in my AP Environmental Science classroom and found that purchasing a series DVD was prohibitively expensive. As luck would have it though, all the episodes are available on United Streaming so they are accessible to teachers for their classroom use. Take a look. Whether used for just a short clip or the entire episode, I will share the episodes with my class because the series includes such good science and presents it in a funny, yet informative way!



— Cheryl Hach
Kalamazoo Area Mathematics and Science Center

CURRICULUM IDEAS

The Autopsy Connection: An MSTA Grant Project

By Kathy Mirakovits, Portage Northern High School

A typical science classroom is an individual room or laboratory with one science instructor teaching approximately thirty students. The material for the lesson might be repeated to thirty more students in the next hour or the same materials might be taught in a similar manner by another instructor, who has a different teaching style. Sometimes the material in one course of study is similar to the material in a different course of study. Could both courses do similar activities and have students share ideas with each other?

That was the goal of this MSTA grant project at Portage Northern High School. The International Baccalaureate Higher Level Biology class and the Forensic Science 2 classes both learn about human anatomy as part of the curriculum, but with different goals and to different levels of complexity. The IB Biology classes have a unit on human anatomy and physiology and the Forensic Science students learn some anatomy in forensic anthropology and deal with physiological functions in forensic pathology. One aspect that links the two courses is the human autopsy.

The IB biology instructor, the forensic science instructor and our high school media specialist designed a project around Google Blogger. Blogger was the medium we used to allow pairs or groups of students to share their thoughts, comments and ideas. The project was designed around the common theme of human autopsy. Since taking our students, a total of about 90 of them, to see a live autopsy was impossible, a sequence of activities was planned, culminating in a live virtual autopsy via our distance learning center broadcast by the Center of Science and Industry (COSI) in Columbus, Ohio.

In order to introduce our students to the role that forensic pathologist plays in autopsies, we purchased a variety of paperback books, some fiction and some nonfiction, all having to do with the autopsy in some manner. Some of the titles included: Cause of Death, Forensic Files of a Medical Examiner, by Stephen D. Cohle; Postmortem: Establishing the Cause of Death, by Steven A Koehler; Stiff: The Curious Lives of Human Cadavers, by Mary Roach; Dead Men Do Tell Tales, by William R. Maples; Blood On The Table: The Greatest Cases of New York City's Office of the Chief Medical Examiner, by Colin Evans; and many more. We purchased multiple copies of the same title. The purpose of multiple copies was to have students that were reading the same book compare and discuss the book amongst themselves.

Google Blogger was used by the students to discuss and share their thoughts about their titles. Each book was chosen by at least one student from the Forensic Science class and one student in the IB Biology class. Because students were not in the same class and in many cases did not even know each other personally, their easiest means of sharing book information was Goggle Blogger. Our goal with Blogger was to test its ease of use and efficiency for sharing information remotely. Students were instructed on the use of Blogger and were given a format to follow in order to assess common areas. Briefly, the areas students were asked to discuss were: Setting the Stage (title, author, description of author, the setting of the book, and main characters), Forensic Science Vocabulary (list unfamiliar words and their definition), Investigative Evidence (what topics have and have not been studied in class), Passage Picker (identify a critical passage and elaborate), Sell the Book!, (summarize as if you were trying to sell it), and Reflection (your thoughts on the book and experience with this Blogger project).



Fig. 1: Pickle "victim" with toe tag under the white sheet.



Fig. 2: External exam and Y incision.



Fig. 3: Decedent internal exam.

continued on page 15

CURRICULUM IDEAS

The Autopsy Connection: An MSTA Grant Project

continued from page 17

Laboratory activities were conducted in preparation for the COSI Autopsy experience so that students would be familiar with autopsy purpose, procedure and protocol. The first activity after classroom discussion of the basics of an external and internal exam was to autopsy a dill pickle. The pickles used were large kosher pickles which the instructor had injured or manipulated in some manner. Toothpicks were used for arms and legs and pickles had eyes, noses and mouths, scars and tattoos drawn with permanent marker. Some pickles had amputated or broken limbs and cuts or burns on their "skin". BB's were inserted in the bodies to simulate bullets and plastic toothpicks pieces to simulate broken knife blades. Simulated blood was also added for each wound. Students carried out proper autopsy procedure with these pickles, noting any external wounds, scars, or tattoos on the external exam and did the "Y" incision and carried out the internal exam, looking for anything out of the ordinary. All students enjoyed this activity and exhibited great respect for the "victim".

Following this introductory autopsy, students did an autopsy of a fetal pig, which again had some trauma induced for students to trace and determine if any vital organs could have been compromised. Each pig had been shot three times with a BB gun and stabbed at least once. Autopsy protocol was followed as students did the external and internal exam and reported of the group's findings as to probable cause of death.

The culminating activity for students was the COSI autopsy program (<http://www.cosi.org/educators/educator-ivc/item/autopsy>). In Depth: Autopsy is a 90 minute program in which students are live with the Center of Science and Industry in Columbus, Ohio. Talking live with a forensic pathologist, students from classes in the United States and Canada were given the opportunity to ask questions of the pathologist as he described his job and profession, as well as the role of autopsy in determining cause of death. During the 90 minute broadcast, there was a videotaped autopsy of a gentleman whom the students studied during the week prior to the broadcast. They knew his medical history and the circumstances surrounding his death. During the autopsy they were given statistics and measurements to record. When students returned to the classroom, there were "body fluid" samples to test for the presence of drugs. Combining these tests, the medical history and facts surrounding his death, and the results of the autopsy, students wrote their final report; their determination of the cause of death in this case supported by their findings. All of the pre-autopsy and post-autopsy materials were provided by COSI.

Student evaluations of the project were quite favorable. The blogger project had some technical difficulties which caused some frustration for students, but in general they liked the format and enjoyed learning a new computer tool. Almost all students loved the autopsy of the dill pickle. A few students did not enjoy the pig autopsy due to personal reasons and similarly did not enjoy watching the human autopsy. The majority of students really liked the entire unit and felt it prepared them well to get the most out of the COSI case. Many forensic science students enjoyed it because they had never done dissection before and found it extremely interesting. They definitely felt the experience was necessary because forensic autopsy is so important in forensic science cases. The instructors felt that this is definitely a unit we wish to repeat and also continue to refine each year.



Fig. 4: Students watching COSI program.



Fig. 5: The Y incision.



Fig. 6: Removal of the brain.

CURRICULUM IDEAS

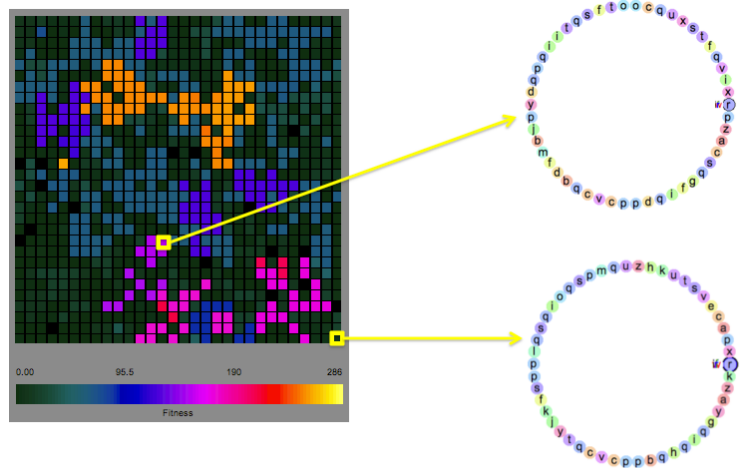
Free Software and Lesson Plans to Bring Evolution in Action into the Classroom

By Wendy Johnson, Lansing Catholic High School

Evolution is my favorite topic of study and discussion, but unfortunately teaching it well has proved elusive. There is a body of enormous and ever-growing literature on evolution education that has uncovered scores of misconceptions and cognitive biases that make understanding evolution challenging for students. There is also the problem that public acceptance of the fact of evolution is relatively low in the United States. Because of these issues, teachers often gloss over the central explanatory framework in biology or feel pressured to teach nonscientific “alternatives” to evolutionary theory. Yet, Dobzhansky’s famous dictum that “Nothing in biology makes sense except in the light of evolution” is as true today as ever. While evolution has long been required by the content standards, its role in the classroom has been easy to marginalize. Thankfully the Next Generation Science Framework and the new AP Biology Curriculum Framework both include evolution as

one of the four core ideas of the discipline and explicitly connect evolutionary theory with all other domains of biology. These documents also seamlessly unite the practices of science with the content, which I believe has been the missing link in evolution education. While many ideas in science can easily be shown in a demonstration or tested in a lab exercise in class, the timescales and methods for studying evolution in real-time have generally put observing evolution out of reach for most high school classrooms. For my master’s thesis project I decided to try to find a way around these obstacles in order to bring my students face to face with evolution in action. I found that through artificial selection experiments with bacteria my students could observe changes in a population over just a few short weeks. Even more exciting, students could actually watch evolution occurring right before their eyes using free software developed at Michigan State University (www.vida-ed.msu.edu). The Avida-ED software is adapted from the Avida research platform, which allows researchers to test questions about evolution that are difficult or impossible to test in biological organisms. With Avida-ED students can watch as digital organisms similar to computer viruses replicate and mutate through random replication errors. The software allows students to grow populations of these organisms within minutes and easily analyze the effects of changes in their environment. It differs from other approaches because Avida-ED provides an actual instance of evolution in a digital environment rather than a predictable simulation. Avida-ED was developed to teach undergraduates about evolution and the nature of scientific inquiry by engaging them in asking questions and developing and testing hypotheses. I immediately saw its potential for use in high school classrooms and developed a tutorial that teaches the concepts of natural selection while preparing students to answer their own questions using Avida-ED. I implemented the lessons last year with juniors in my biology and AP Biology classes. My students showed impressive learning gains in their understanding of the random nature of mutations and the nonrandom process of selection and were better able to put these ideas together to explain how natural selection leads to evolution. While learning new software can be intimidating, they caught on very quickly and feedback from students was overwhelmingly positive. I think even middle school students would thoroughly enjoy the game-like nature of the Avida-ED interface and could learn about evolution just by playing with the program. I know that busy teachers will read this and think, “Avida-ED sounds great, but I don’t have time to learn new software.” You’re in luck! I published my classroom-tested lessons online at www.teachengineering.org (search Avida-ED), and my colleagues and I are currently developing more lessons that will be published there soon. Everything you need including student handouts, answer keys, and teacher support materials are included on the website and ready for use. I am collaborating with the developers of Avida-ED at Michigan State University to get this amazing tool into high school classrooms. I would be like to answer any questions you may have and hear about how you use Avida-ED in your classroom. You can contact me via email at wjohnson@lansingcatholic.org.

observing evolution in real-time have generally put observing evolution out of reach for most high school classrooms. For my master’s thesis project I decided to try to find a way around these obstacles in order to bring my students face to face with evolution in action. I found that through artificial selection experiments with bacteria my students could observe changes in a population over just a few short weeks. Even more exciting, students could actually watch evolution occurring right before their eyes using free software developed at Michigan State University (www.vida-ed.msu.edu). The Avida-ED software is adapted from the Avida research platform, which allows researchers to test questions about evolution that are difficult or impossible to test in biological organisms. With Avida-ED students can watch as digital organisms similar to computer viruses replicate and mutate through random replication errors. The software allows students to grow populations of these organisms within minutes and easily analyze the effects of changes in their environment. It differs from other approaches because Avida-ED provides an actual instance of evolution in a digital environment rather than a predictable simulation. Avida-ED was developed to teach undergraduates about evolution and the nature of scientific inquiry by engaging them in asking questions and developing and testing hypotheses. I immediately saw its potential for use in high school classrooms and developed a tutorial that teaches the concepts of natural selection while preparing students to answer their own questions using Avida-ED. I implemented the lessons last year with juniors in my biology and AP Biology classes. My students showed impressive learning gains in their understanding of the random nature of mutations and the nonrandom process of selection and were better able to put these ideas together to explain how natural selection leads to evolution. While learning new software can be intimidating, they caught on very quickly and feedback from students was overwhelmingly positive. I think even middle school students would thoroughly enjoy the game-like nature of the Avida-ED interface and could learn about evolution just by playing with the program. I know that busy teachers will read this and think, “Avida-ED sounds great, but I don’t have time to learn new software.” You’re in luck! I published my classroom-tested lessons online at www.teachengineering.org (search Avida-ED), and my colleagues and I are currently developing more lessons that will be published there soon. Everything you need including student handouts, answer keys, and teacher support materials are included on the website and ready for use. I am collaborating with the developers of Avida-ED at Michigan State University to get this amazing tool into high school classrooms. I would be like to answer any questions you may have and hear about how you use Avida-ED in your classroom. You can contact me via email at wjohnson@lansingcatholic.org.



A Population of digital organisms on a virtual Petri dish in Avida-ED. Each cell on the grid represents one digital organism.

Each digital organism is defined by its command sequence “genome.”