

MSTA Newsletter

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MICHIGAN
SCIENCE
TEACHERS
ASSOCIATION



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Welcome Back!

Compiled by Cheryl Hach, MSTA Executive Editor
Several weeks ago I asked MSTA members to share about their summer vacations and hopes for the future. Here are a few of the many replies I received. Thanks for sharing! I wish you all a fruitful and satisfying new school year!

The BEST thing about my summer "vacation" was.....

- ... two-week internship at NASA
- ... the Lake Superior shoreline! Few places as serene.
- ... having our Texas grandchildren here for five weeks WITHOUT their parents!
- ... attending the 2011 National Congress on Science Education in Baltimore.
- ... receiving grandmonies to start a school garden and outdoor classroom.
- ... watching the sunset with my wife on Lake Michigan.
- ... I got to spend time with my new daughter!
- ... I got to see glaciers and stood on the Arctic Circle.
- ... ChemEd 2011 at Western Michigan University.

The one thing I'm most excited to try in my classroom this year is....

- ... getting a classroom.
- ... new lab activities learned from my college courses.
- ... helping students help each other succeed.
- ... virtual field experiences.
- ... new Ipads (Lucky!!)
- ... using more GoogleDocs.
- ... take-home science projects, so that parents and siblings can get excited about science, too!

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From the President's Desk

By Mike Klein, MSTA President

As you prepare for the upcoming school year, I want to make you aware that the board of the Michigan Science Teachers Association has been working diligently to identify ways that we can increase the value of membership in the MSTA. We are very aware that the role of a teacher organization has changed significantly over the past decades and we are committed to adapting to those changes. You receive continuous appeals for your professional time and financial dollars and, while we are convinced that we are a great value in supporting science education, networking and professional development, we know that we can do even better. To this end we are focusing our careful attention on three specific areas this fall.

- 1) Our website is currently undergoing a complete overall. We are working with a new web designer to create a site that will be a vast improvement over our current site. As the work progresses, we are paying special attention to the following key elements:
 - **Usability** - the new site will feature a greatly improved architecture that will make information easier to locate and more efficient to use.

- **Increased Content** - we want the MSTA website to be the "go to" place for all things related to science education in Michigan. You can expect to see increased support for lesson planning, MDE documents, and assessment.
- **Improved Design** - we are working to create a new digital face that is attractive and better represents who we are as an organization.

The changes are coming along nicely and we hope to be able to share the new design, architecture and content with you sometime this coming fall.

- 2) We have increased our commitment to providing better and more frequent professional development opportunities for all science educators throughout Michigan. We know that not everyone can attend the conference and so we are working to establish a well balanced set of professional development opportunities in each MSTA region. Watch for these offerings in upcoming newsletters and on our redesigned website.
- 3) Finally, we feel that perhaps our greatest strength has always been our annual conference and we are already very excited about the experiences we will be offering this coming March. We heard your

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A Framework for K-12 Science Education:

Practices, Crosscutting Concepts, and Core Ideas

On July 19th we started a new and exciting journey for science education. On this day, the National Research Council of the National Academies released “*A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas.*”

This document release finishes the first phase of a two-phase process. The second phase will result with the release of the “Next Generation Science Standards (NGSS),” scheduled for late 2012. These standards follow the path of mathematics and English Language Arts with the release of the Common Core State Standards.

With the release of “*A Framework for K-12 Science Education*”, we can see much of the direction for the future of science education. Besides stating the Disciplinary Core Ideas of physical science, life science, and earth/space science, there are some additional important sections.

One of the new pieces is that there is an additional Dimension with Disciplinary Core Ideas called, “Engineering, Technology, and Application of Science.” While not content driven, important skills vital for productive citizens are embedded through this section and specific grade band standards are provided.

Another important piece to this document is a section called “Scientific and Engineering Practices.” This section identifies practices scientists and engineers actually engage in as part of their work. The 8 practices are:

- 1) Asking questions (science) and defining problems (engineering)
- 2) Developing and using models
- 3) Planning and carrying out investigations
- 4) Analyzing and interpreting data
- 5) Using mathematics, information and computer technology, and computational thinking
- 6) Constructing explanations (science) and designing solutions (engineering)
- 7) Engaging in argument from evidence
- 8) Obtaining, evaluating, and communicating information

For each of these practices, there is an explanation given with the necessary goals listed.

A final important section that will play a part in the NGSS development is a section called “Crosscutting Concepts.” There are seven crosscutting themes interconnecting the various science topics. They are:

- 1) Patterns
- 2) Cause and effect: Mechanism and explanation
- 3) Scale, proportion, and quantity
- 4) Systems and system models
- 5) Energy and matter
- 6) Structure and function
- 7) Stability and change

While these sections were highlighted, there is much more research based discussion on good science instruction. While this document should NOT be used to set science curriculum or direction, it can be used to understand how the NGSS will be delivered. As mentioned in the beginning, this is an exciting time for science education and science educators. Stay tuned for more!

You can download your copy of this document at:

http://www.nap.edu/catalog.php?record_id=13165

For more information, always feel free to contact Kevin Richard at RichardK1@Michigan.gov or 517-373-4223

From the Desk of MSTA's Executive Director

By Robby Cramer, MSTA Executive Director

This time of summer is when I start long range planning. This is also a time of reflection coupled with taking time to consider the possibilities of the new school year. The MSTA Board of Directors has been thinking as well of ways to help support you as science educators in Michigan.

This summer regional directors met to determine how best to meet the needs to teachers at the regional level. Our executive board determined a budget for the coming year. Several of us have been working on a new design of the MSTA web site. We hope to have it up and running early this Fall!

Initial plans have been made for our 59th annual conference. We will be going back to the full day sessions of both Friday and Saturday. Save the date for March 9-10, 2012. We have a logo: Pure Michigan Science. We hope you are able to join your science colleagues at the Lansing Center and Radisson Hotel in Lansing, Michigan.

This spring several of our members participated in a survey to help MDE consider your needs regarding Science, Mathematics, Technology and Engineering teaching and learning. MSTA was also able to add questions to the survey. The information we have gathered will help define conference sessions that need to be offered to meet your needs. The information will also help us to consider new ways to offer professional development to you both regionally and online.

When our Board of Directors meets in September the Survey Results will be one of the pieces of data we use to determine the direction of our work this year. It continues to be a pleasure to work in support of Michigan science teachers!

President's Letter - *continued from front page*

feedback from last year and will be returning to our normal schedule as the conference moves back to the Radisson and Lansing Center. Whether you are a first timer, a seasoned veteran, a vendor or a speaker we welcome you and are looking forward to providing a truly first class conference experience.

As you can see, we have been busy! I hope that you have had a restful summer and are ready to return with a renewed energy and passion for bringing science education to the youth of Michigan. We thank you for your continued membership and look forward to providing you with increased support in the upcoming year.

Welcome Back - *continued from front page*

This year I hope....

- ... to find a new job!
- ... all my labs, demonstrations and activities succeed.
- ... our students will pass the ACT.
- ... to be able to balance work and life.
- ... to improve my skills.
- ... students become as excited about the environment as I am.
- ... to team teach with various staff members.
- ... to actually put up a webpage and keep it current.
- ... to maintain my sense of humor and sanity!
- ... all students will know that they can get smarter.
- ... to find ways to become a paperless (or at least less paper) classroom.
- ... that all my students learn about how exciting science is!

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- Courses aligned with the Michigan Curriculum Frameworks and Benchmarks for Science and the DI (Integrated Science Endorsement).



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THEORY AND PRACTICE
1932
Leaders in the Making

Meet the MSTA Board



Meet the MSTA President-Elect... *Mike Sampson*

Q: Well, Mike, can you tell us a little about your professional background?

A: I've been teaching for 17 years. I have a Master's Degree in Biology from Michigan State University. I have taught at the junior high, high school and community college levels. I'm currently teaching AP Biology, Geophysical Science and Forensic Science at Redford Union High School in the metro Detroit area. I have served on the MSTA Board for five years as the High School Director. As a board member I have worked on the Technology Committee and am very involved in planning the upcoming conference, serving as the conference chair.

Q: What are some of the issues facing science teachers and MSTA that you hope to address?

A: There are three big issues facing science teachers in the near future. They are: 1.) the movement toward a national science curriculum, 2.) changes in teacher evaluation and 3.) increasing the emphasis in evaluating critical thinking skills on state science assessments.

My role as the president will be to assess and implement how the MSTA will meet the needs of the membership as these changes unfold. I believe that the MSTA conference and website will play an integral role in assisting the membership in meeting these and future challenges.

Q: Are there other goals for your presidency?

A: I am on the Technology Committee and we are currently working on improving the website. I would like the MSTA to increase our web presence and offer other opportunities via the web.

Q: What would you like to see MSTA get involved with in the years to come?

A: We have one of the best state science conferences in the United States. Now we need to extend how we offer professional development to include online options like webinars and increasing science content available on our website. I feel we need to offer more opportunities to our members so we are the "go to" place for all science educators in the state.

Q: How do you spend your leisure time, away from your MSTA duties?

A: My "leisure time" is spent with my family. I have been married for nineteen years and we have two children. My son is in high school and is active in marching band. My daughter is in junior high school and is active in dance. I also like to hunt and play golf.

Q: Is there anything else you'd like the membership to know about you?

A: That I will work hard to promote the goals of the MSTA and work towards improving science education in the state. Please take time to email me or stop by and talk to me at the MSTA State Science conference in March. Can't wait to see you there!



Meet the MSTA Treasurer... *Charles Buciencki*

Q: Can you share a little about yourself professionally?

A: My name is Charles Buciencki I am the current treasurer for MSTA. I am an elementary science teacher for grades K-3 at Fern Persons Elementary in Olivet Community Schools. I have been a science specialist for eleven years and have been actively involved in science curriculum writing at the state level. I was also the Michigan elementary science educator of the year in 2008-2009.

Q: Can you tell us a little about your duties as treasurer?

A: As treasurer it is important to set realistic fiscal goals for our organization and to ensure that we remain fiscally responsible for the health and prosperity of our organization. Many organizations have experienced lower than usual funding due to the current financial climate in our country. With that in mind MSTA has made it a priority to operate within our annual budget to insure that we will remain a vibrant and healthy component of science support and development in our state and nation.

Q: What would you most like the MSTA membership to know about our finances?

A: Of course we do greatly appreciate donations and are able to apply these funds to do some outstanding science work throughout our state. One great way to give would be to sponsor a new science teacher's attendance to our annual conference. Our conference is a great educational experience for all teachers and provides new ideas and resources to help any teacher towards more valuable content delivery to their students each year!

Q: Away from the financial ledger, what do you do for fun?

A: The outdoors is a great place to work with students and I enjoy it immensely in the activities I do outside of work. Hiking, biking, mountain climbing and sightseeing are things I enjoy with my family each summer and throughout the year. Living in Michigan does afford us many great chances to enjoy the outside!!! We are lucky to have such diverse seasons and beautiful parks.

If you have any questions on joining or donating to the Michigan Science Teacher's Association please do not hesitate to contact us. We would love to hear from you!

Calendar of Events

Pure Michigan *Science*



For Exhibitor Information and/or to register for the Michigan Science Teachers Conference, go to: www.msta-mich.org
...the Experience starts at www.msta-mich.org

NSTA's Annual National Conference on Science Education March 29 - April 1, 2012 Indianapolis, Indiana

Conference Highlights:

- Nearly 2000 quality professional development workshops, seminars, full-day programs, and renowned featured speakers
- More than 400 exhibitors with the most cutting edge products and freebies for teachers
- Frequent networking opportunities
- Time for renewing connections with old friends and chances to make new ones
- A well-timed boost to your teaching and learning through new content knowledge, techniques, and strategies for better classroom performance
- Coverage of key education issues; ELL, inquiry, assessment, differentiation, and the new Framework for K-12 Science Education Standards



Imagine yourself attending this conference and help make it happen by putting it on your calendar. Begin the process of making arrangements to attend. You won't regret it! - Submitted by Jane Hunn

Detroit Area Council of Teachers of Mathematics & Metropolitan Detroit Science Teachers Association 2011 Fall Conference

Saturday, November 12, 2011
Lamphere High School

610 West 13 Mile Road
Madison Heights, Michigan 48071



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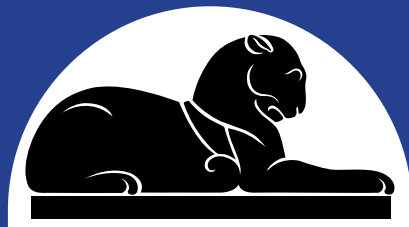


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CURRICULUM IDEAS

Great Lakes Connections: Teaching about Michigan Watersheds

by Laura Florence, Education Specialist, Michigan Sea Grant

Would you like to teach about the Great Lakes in your classroom? Have you been searching for ways to connect your students to the environment, particularly the Great Lakes? A new suite of educational tools from Michigan Sea Grant may be able to help. The tools include: a Michigan Watersheds map, a Great Lakes Basin map, a one-page fact sheet explaining how to use the Watersheds map, and an in-depth teacher's guide that explores earth and water sciences principles.

Your school may be many miles from the Great Lakes, but everyone in Michigan lives within a Great Lakes watershed. And, what we do each day has an impact on the Great Lakes and their waterways. All life depends on water, but clean water is about more than just survival—exceptional lakes and streams are part of what makes Michigan special. Water is connected to our economy, our culture, our history and of course our ecosystems. In Michigan, that is especially true: no point within the state is more than six miles from an inland lake or stream, nor is any point more than 85 miles from one of the Great Lakes. Michigan's abundant freshwater supports a vibrant recreation and tourism industry, supplies clean water for agriculture and manufacturing, and enhances the quality of life for all residents and visitors.

The two maps that Michigan Sea Grant has produced help educators connect their students to water at different scales - from individual watersheds to the Great Lakes Basin. A 14-page teacher's guide to watersheds is also available, free, to complement the use of the Michigan Watersheds map. The guide is aligned to state curriculum standards and covers several Great Lakes Literacy Principles.

The Michigan Watersheds map, the Great Lakes Basin map and accompanying learning guides are great tools for classroom explorations. Here are a few ways they can be used:

- Give students copies of stream flow data shown in Figure 8 of the teacher's guide. What might cause the differences? Encourage students to use the Michigan Watersheds map and the other maps in this guide to develop their own explanations.
- Use the map of groundwater yields in Figure 5 of the teacher's guide. If you were trying to build a new Coca-Cola plant, where could you find reliable groundwater to make Coke? What impacts might this plant have on nearby streams? Why?
- Look at the map of trout habitat in Figure 6 of the teacher's guide. Why are trout abundant in some watersheds but not others? Look at the other maps of Michigan; what do the watersheds with trout have in common?
- What information would you need to develop a management plan for your watershed?



How to Get Your Hands on These Resources

- For a limited time, MSTA members will receive a 30% discount on the Michigan Watersheds map and Great Lakes Basin map. Visit the Michigan Sea Grant bookstore: www.miseagrant.com. Add the maps to your cart and enter **MSTA2** in the coupon code area. Be sure to click "apply" after entering the code. The discount will be reflected immediately. If you need any assistance with ordering or have questions about other products, contact stephaa@umich.edu.
- The one-page learning guide and 14-page teacher's guide can be downloaded, free of charge, from the Michigan Sea Grant bookstore: http://www.miseagrant.com/product_p/michu-10-706.htm.

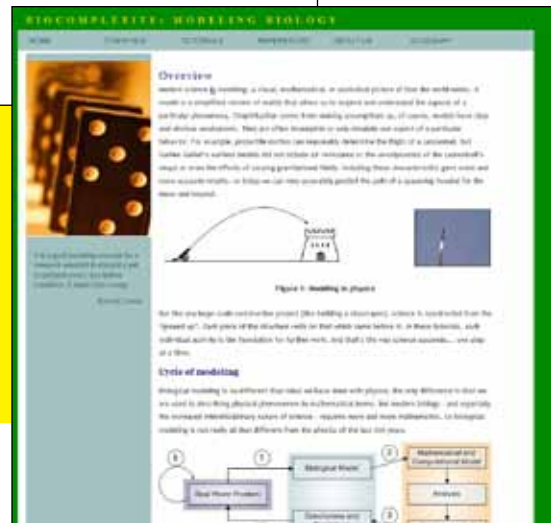
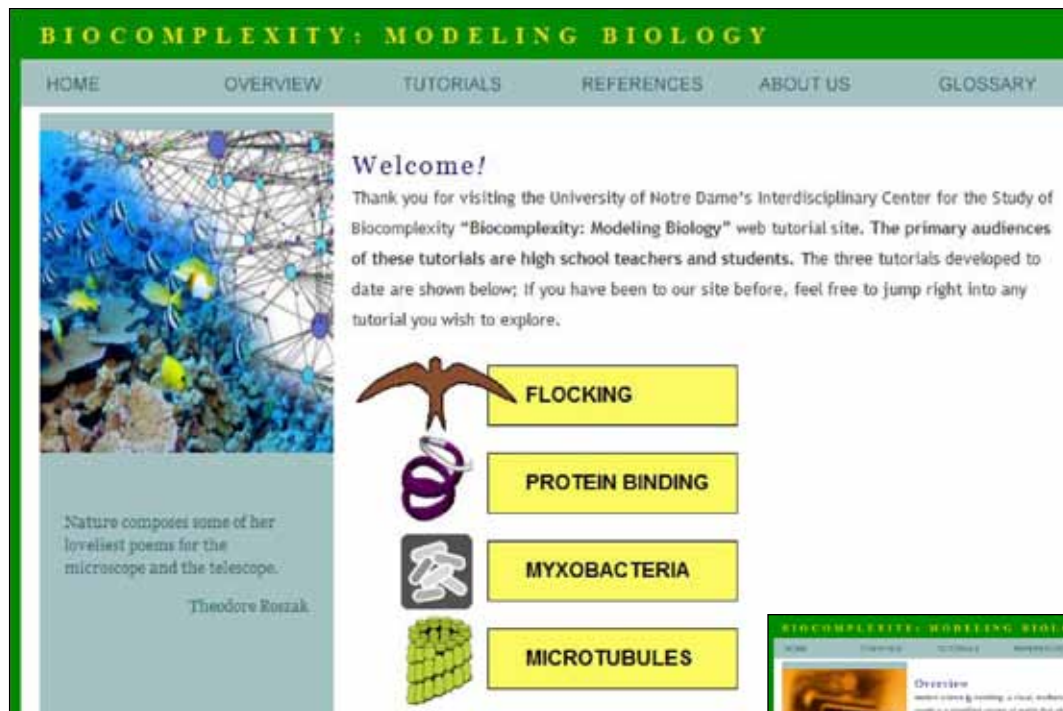
Michigan Sea Grant, a cooperative program of the University of Michigan and Michigan State University, is part of the National Sea Grant College Program. This network of 32 university-based Sea Grant programs in coastal states across the country is administered through the National Oceanic and Atmospheric Administration (NOAA).

CURRICULUM IDEAS

More Links to Biocomplexity

Michael Sinclair, Kalamazoo Area Math & Science Center
Helene Dauerty, Elkhart Central High School
Tom Finke, Trinity School at Greenlawn

Last year, we published a description of the University of Notre Dame's Interdisciplinary Center for the Study of Biocomplexity Understanding Randomness in Biology website. This summer, as part of the National Science Foundation's Research Experience for Teachers program, we created another tutorial website that focuses on four basic biocomplexity "problems": flocking, protein binding, myxobacteria, and microtubules. These are key areas of current research in the field, and the site - located at - is specifically designed to introduce biocomplexity with as little mathematics as possible (unlike the tutorials in the Understanding Randomness in Biology at www.nd.edu/~random which extensively develops the mathematical background for more advanced study in the subject). All of the tutorials either use an embedded NetLogo™ simulation or have a downloadable MatLab™ executable file which will allow students to explore the richness of biocomplexity. Please take a look at this new and growing area of biology.



CURRICULUM IDEAS

Renewable Energy Curriculum Support - Great Lakes Energy Service

By Shannon Norris, Great Lakes Energy Service, Inc.

Great Lakes Energy Service, Inc. (GLES), a non-profit renewable energy education organization, is gearing up for a new fall school season traveling the State of Michigan, offering mobile classroom visits and renewable energy workshops and day camps to thousands of students. Appointments for a free mobile classroom visit to your school are still available for the 2011-2012 school year, though dates are quickly filling up (www.greatlakesenergyservice.org).

The GLES renewable energy mobile classroom features hands-on learning stations and renewable energy education which is customized and delivered to a school's campus by GLES's professional education staff. "We realize that field trips are often not an option for schools struggling with limited budgets, transportation issues, or are just located too far from appropriate facilities, so we are proud to offer authentic learning opportunities in renewable energy by a certified teacher to Michigan schools on their grounds," says Chris Dunkel, Director of GLES.

School teachers, administrators, or other community organizations that are youth development based may simply visit the GLES website to request a free mobile classroom visit. Each of the free visits is covered by grant funding awarded by the Michigan Public Service Commission (MPSC). Visits are best targeted to grades 4th grade and up, as the education provided meets several State of Michigan and national science curriculum standards, but all grades can be accommodated with modified education. Schools may choose to receive a day full of 20-30 minute classroom education visits for several groups of students (optimally 25 or less) or may request a visit that provides a particular energy workshop lesson which targets a particular group of students.

An energy workshop or day camp option, separate from a mobile classroom visit, provides teachers or other organizations (e.g. Parks and Recreation, YMCA, Girl Scouts, Boy Scouts, etc.) with an opportunity to request a particular concept of study and experimentation. For example, students can learn how electricity is generated by solar energy through photovoltaic cells and then work in groups to create a solar powered flashlight or model car (materials provided). Another option is to learn about wind generated electricity and then create miniature wind turbines with a focus on blade design for optimal electrical production. Teachers can choose from various learning experiences among renewable biomass, hydropower, wind energy, or solar energy disciplines. Energy Workshops or Day Camps can be offered singularly or in succession and can be held during the school day or during scheduled school district breaks. There is a fee associated with the energy workshop lessons that is not covered by the MPSC's grant funding.



Wind generated electricity—Summer Camp



Solar powered vehicles—Summer Camp



GLES Mobile Renewabl Energy Classroom

For more information, to inquire about energy workshop fees, to contact GLES, or to schedule your visit, please visit the GLES website <http://www.greatlakesenergyservice.org>.

ABOUT GLES

Great Lakes Energy Service (GLES), founded in 2008, is funded by the Michigan Public Service Commission and serves schools and other learning institutions, youth focused organizations, and community outreach events by providing education about renewable energy and energy efficiency. GLES is a DeWitt based non-profit renewable energy education organization that delivers a mobile classroom and accompanying education to schools throughout the state of Michigan. The mobile classroom, powered by wind and solar energy, boasts hands-on learning stations in solar energy and wind energy and provides models that demonstrate hydropower and energy efficiency.

CURRICULUM IDEAS

“Are You Ready? EarthScope is Coming to Michigan!”

By Carol Engelmann, NBCT, Geology Doctoral Candidate, Michigan Technological University
Dr. Jacqueline E. Huntoon, Ph.D., Dean of the Graduate School, Michigan Technological University
Dr. Gregory P. Waite, Ph.D., Dept. of Geol. & Mining Eng. & Science, Michigan Technological University

The EarthScope transportable array is heading our way. Although the EarthScope project and partners have created many on-line resources to help teachers use the tragic events in Japan as a “teachable moment”, there will soon be an opportunity for teachers to use EarthScope data from sites closer to home. This is an excellent time for Michigan science teachers to help their students learn more about geophysics and how the Earth works. EarthScope is conducting one of the largest geophysical science experiments ever undertaken. It is funded by the National Science Foundation, and is investigating the structure and deformation of the Earth beneath the North American continent.

The EarthScope project has several components which implement a variety of instruments to examine the geologic structure of North America. These instruments are collecting data that can be used understand how the North American continent has changed through geologic time. The transportable array component of EarthScope, called USArray, involves 400 transportable seismic stations placed in a grid to sense, and record ground motions from a wide range of seismic sources, including local and distant earthquakes, artificial explosions, volcanic eruptions, and other natural and human-induced activities. These portable seismic stations began their journey across the United States on the west coast in 2004 and are being rolled over across the entire continent. After being in place two years on the western edge of the array, each seismic station hops over the array to the far eastern edge, where it will remain in the new location for another two years before it is moved again. The transportable array is moving into Michigan’s Upper Peninsula during 2011 and is scheduled to move into the Lower Peninsula in 2012. It is important for Michigan Earth science teachers to pay particular attention to these upcoming deployments because the data collected will provide information about the Earth directly below our state. Teachers who use the data will be able to help their students learn about the structure of the Earth in their local area. Of specific interest is the failed Mid-Continent rift system that runs beneath the Lake Superior Basin,

In order to prepare for using the data, we recommend that Michigan science teachers peruse the resources of EarthScope’s partner, the Incorporated Research Institutions for Seismology (IRIS) Consortium, beginning with the IRIS website at <http://www.iris.edu/>. The site provides information designed specifically for teachers about Earth structure, earthquakes, seismic waves, and



the ways seismologists use seismic data in their research. Topics related to seismic hazards, such as the earthquake and tsunami in Japan on March 11, 2011, receive in-depth coverage.

Another excellent resource we recommend is, “USArray Visualizations Show Seismic Waves Sweeping across the US”, by Robert F. Butler, Christopher D. Hedeon, and Roger Groom, found in the special edition of *The Earth Scientist* magazine focused on geophysics. This article introduces teachers to the EarthScope transportable array, its data, and suggests ways to use the data in classrooms. IRIS and the National Earth Science Teacher Association (NESTA) have collaborated to produce this special issue and the entire special edition is available as a free pdf download from http://www.iris.edu/hq/files/programs/education_and_outreach/lessons_and_resources/docs/TE_Spring11.pdf.

Michigan science teachers have an unprecedented opportunity to inform their communities and teach their students about the nature of science and geophysics through the EarthScope project as the transportable array moves into their own backyard. Dr. Greg Waite at Michigan Tech University and Dr. Kaz Fujita at Michigan State University, along with the Michigan Earth Science Teacher Association (MESTA), have established the Michigan Quakes (MIQuakes) Regional Seismic network. The MIQuakes network consists of eleven schools in Michigan that were selected to participate in the IRIS Seismometers in Schools program (<http://www.iris.edu/hq/sis>). Information about the MIQuakes network can be found at <http://www.iris.edu/hq/ssn/networks/view/MIQ>.

Teacher workshops are being planned to share EarthScope materials and geophysics information at the spring of 2012 MSTA Conference.

The Fledgeling



MOTION AND ENERGY!

Every thing around is moving! Sometimes the movement is so fast or slow it is beyond our comprehension. We continue to question and learn about movement. As we learn through observation, experimentation and research we begin to find the answers to questions. Let's explore some of the early NASA Activities developed at the Aerospace Education Services Project at Oklahoma State University.

- Answer questions by constructing simple models and recording observations!
- Use process skills to record, organize and construct data to interpret the results of observations and activity.

Sample Questions:

- How do things move?
- Why do objects move the way they do?
- Can we control the movement of things?
- Can we control the energy used to move objects?
- Can direction and distance of some objects be controlled?
- Are there sources of energy we can not control?
- What source of energy is used in our models?
- Can you explain how the energy source moves objects?
- What do you know about the laws of motion?

Rocket Pinwheel

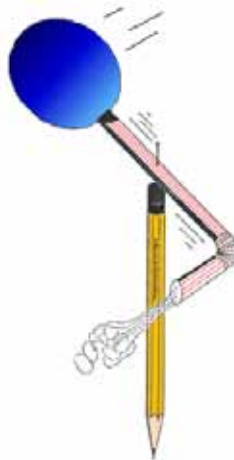
Subject: Rocketry
Topic: Action-Reaction Principle

Suggestions:

1. Use dressmaker pins to attach the straw. The pins are longer and have coated heads.
2. Use very little tape. Tape will change the Center of Balance (Gravity) which will cause the balloon to wobble!
3. Use larger flexible straws which are wax or plastic coated. (Check fast food establishments)

Suggested Additional Materials:

1. Graph paper
 2. Clip boards (hard back for recording surface)
 3. Stop watch.
- How many times did the Pinwheel Rocket Balloon Turn?
 - Did the movement speed up or slow down as it turned?
 - Can the direction of movement be changed?
 - How do Newton's Laws of motion apply to the Pinwheel Rocket?

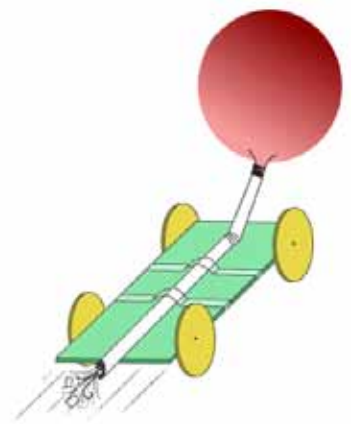


Rocket Car

Subject: Rocketry
Topic: Newton's Third Law of Motion

Suggestions:

1. For wheels, experiment using thicker foam, cardboard and light spoons.
2. To secure, use dressmaker pins (heads are coated and easier to handle).
3. Use round balloons, half dollar size and pre stretch.
4. Masking tape works best. Careful-too much tape acts as a weight.
5. Marvelous project for students to work in Teams.
6. Set the "Track" up outside using chalk on a hard surface. Mark the lanes in Meters with starting lines. (see graph)
7. Establish Official Rules for the race.
8. Appoint students to be Race Officials) Check positions at NASCAR or speedways!!



- Which car traveled a greater distance?
- Which car traveled the fastest? (Time with a stop watch)
- Discuss the results of the "race"!
- Graph and chart the movements of the Car (Meters?)
- Did changes in the car's design slow it down or help it move faster and travel a greater distance?
- Can the direction of movement be controlled or changed?

Additional Resources:

- To view the complete Rocket Pinwheel activity visit: http://exploration.grc.nasa.gov/education/rocket/TRCRocket/rocket_pinwheel.html
- To view the complete Rocket Car activity visit: http://exploration.grc.nasa.gov/education/rocket/TRCRocket/rocket_car.html

We would like to hear from you!

Do you have material/suggestions for The Fledgeling? Send to: Sally DeRoo, Email: scampbell@managedbyamr.com, Fledgeling Editor, c/o MSTA, 1390 Eisenhower Place, Ann Arbor, MI 48108



Pure Michigan Science

MSTA Registration Form

MSTA 59th Annual Conference - March 8-10, 2012
Lansing Center - Lansing, Michigan



Note: Early Bird Deadline Ends February 14, 2011
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)

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)

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

Name on Card _____

Billing Address _____

Billing City/State/Zip _____

Signature _____ Date _____

Member Type:	Member	Non-member	Joint Member	Institutional Member
MSTA Membership Dues*:				
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 MSTA 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†:				
Joint Membership		\$60†		\$ ____
Joint Institutional Membership		\$175†		\$ ____
†By paying Joint Membership dues you automatically become a member of MSTA, MCSS, and MCTM and are eligible to pay member rates for conference registration.				
Member Registration Specials: <i>All registrations MUST be sent in the same envelope.</i>				
1 Day "Team" Registration Class A&B Schools (Must send at least 5 registrations) - Save \$10 per person!		\$80 x ____		\$ ____
1 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:				
Members:				
Registration One Day: Friday or Saturday (* \$105 after February 14, 2011)		\$65*		\$ ____
Registration Two Day (* \$115 after February 14, 2011)		\$90*		\$ ____
Student** and Emeritus Registration One Day: Friday or Saturday (* \$45 after February 14, 2011)		\$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 14, 2011)		\$35*		\$ ____
Non-teaching Spouse		\$35		\$ ____
Non-Members:				
Registration One Day: Friday or Saturday (* \$160 after February 14, 2011)		\$125*		\$ ____
Registration Two Day (* \$185 after February 14, 2011)		\$150*		\$ ____
Student* and Emeritus Registration One Day: Friday or Saturday (* \$85 after February 14, 2011)		\$65*		\$ ____
Student* and Emeritus Registration Two Day: *Must be a FULL time undergrad student. Grad students need to pay regular registration rate. (* \$100 after February 14, 2011)		\$80*		\$ ____
Non-teaching Spouse		\$35		\$ ____
Other Registration Options:				
Friday Luncheon (11am-1pm)		\$25		\$ ____
SB-CEUs		\$15		\$ ____
Total			Grand Total	\$ ____



For early registration rates, registration and payment MUST be received by February 14, 2011. Submit your registration by mail to: MSTA, 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 MSTA website - www.msta-mich.org. Registrations after February 14th 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 10, 2011 (request must be made in writing). Substitutions may be made on or before February 10, 2011. MSTA 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 Friday evening Vendor Open House).