

# MSTA Newsletter



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## We are so lucky to have ChemEd 2011, July 24-28 in Michigan!

Bringing chemistry educators from around the world to enrich, motivate and energize for the coming academic year.

Western Michigan University is proud to host ChemEd 2011, a conference where chemistry educators share their teaching experiences, classroom innovations, and laboratory experiments. It's a place to learn valuable insights from a few outstanding educators, and a place where participants engage in hands-on workshops and view chemical demonstrations.

- **Participant & College Student Registration: \$280/\$125**, (includes entrance to all sessions and no-fee workshops, Sunday evening barbeque, Wednesday Air Zoo and banquet
- **Presenters: \$280**, If you plan to attend the conference in addition to presenting a session/workshop, please register.

**Make it a Family Affair!** There will be many great tours and side trips, plus a Chemistry Kids Camp for all school aged children to attend!

The ChemEd 2011 planning committee invites you to attend and participate as an attendee, a speaker, a vendor, or a family member, and learn how Michigan Makes Chemistry Grow professionally. Please find more information at <http://www.wmich.edu/chemed/index.php>

## From the President's Desk: 2011 Annual MSTA Conference - You Spoke and We are Listening!!

*By Michael Klein, MSTA President & Robby Cramer, MSTA Executive Director*

We are now several months past the 2011 annual conference and have had an opportunity to pour over the generous feedback we received from the educators that attended. Thank you for providing such important information, it is critical to our ability to be more successful in meeting your needs at future conferences. While there were a lot of positive comments and information, we also heard from many (nearly all maybe) that our new schedule was not as effective as we had hoped. We want to explain our thinking on why we went to this schedule and how we intend to make it better for next year.

Back in the spring of 2010, as we planned for the conference, we were very aware of the current academic and economic environment and were concerned about teacher's ability to get out of the classroom and travel Thursday or Friday to Grand Rapids in order to attend the full conference as scheduled in past years. Our intent was to shift the conference session to begin in the afternoon on

Friday to support those who could come after school and then to run longer on Saturday so that attendees would still receive a complete conference experience. We would offer a few short courses in the morning on Friday to support the few who could arrive early. Sounds like a good plan, right? We thought so...

However, what we have learned is that you, our members, were willing and able to find the time to get to the conference on Friday, even in difficult financial times. We also heard in your surveys that for most of you, the Friday evening offerings still required you to take at least half a day from your classrooms and did not really provide the opportunity we were seeking. Regardless of our intentions, we definitely heard that the change left many people confused, frustrated and looking for more on Friday morning.

Please accept our apologies for this change in schedule. We have learned much and will return to a schedule next year that will feel more familiar and will offer a full day of sessions on Friday and Saturday.

As for other aspects of the conference, our Thursday pre-conference sessions received very positive feedback in the evaluations and we will again offer

*continued on page 2*

## Movie and Book Reviews

### Musicophilia

The book *Musicophilia* by Oliver Sacks is about how music affects the brain. It not only described the effects on the brain, but also proposed theories on why they happened. One of the most interesting parts of the book was a chapter about a man named Clive. He had amnesia, and couldn't remember anything from his past except for music he had known. Every time he blinked, he felt as though he had just regained consciousness after being dead. But when given music, he could sing it or play it on a piano with seemingly no effort. Music had a similar affect on people with Alzheimer's disease. They had no memory of things they had known for their entire life, but music would stay in their mind. Their relatives felt that they were only themselves while playing or singing music.



He also writes about a strange case where a man was struck by lightning, causing his taste of music to change completely. After the incident, he took a sudden interest in classical piano, where before he hadn't particularly enjoyed classical music. At forty, this man spent months mastering his new favorite instrument, the piano. It is truly amazing how a seemingly random event could alter a person's whole life with music.

I suggest this book to anyone interested in music or strange cases of the brain. It was interesting to see how music, such a big part of our culture, affects people. Not only did I learn how music can help standard people, but also people with diseases. It was amazing to learn about music and the brain, which I encounter each day in my personal life as a cellist. We come across music every day in our normal lives, and it has a huge affect on our mind, which Oliver Sacks so tactfully explains in his book. *Musicophilia* is an informing book perfect for curious readers of all ages and interests.

### Who Is Fourier?: A Mathematical Adventure

- Written by: Transnational College of LEX, Translated from Japanese by Alan Gleason
- Reviewed by Modhi Alshehri, Kalamazoo Area Mathematics and Science Center



This book was originally written in Japanese in 1995 by a group of faculty at the College of LEX for the purpose of introducing students to Fourier analysis. The original goal was to analyze the physics of sound using the mathematics of Fourier analysis. The book is written in an informal, non-traditional form of a dialogue among students about the mathematical concepts involved in Fourier analysis. I found the dialogue about the mathematical concepts to be refreshingly novel; comprehensible by a student that is taking a precalculus course; a good reinforcer of the trigonometric concepts; and an enrichment tool for the students. The book takes the reader on a journey that begins by establishing a motive for the need for Fourier analysis to understand the behavior of waves and using it to analyze sound. They begin with introducing Fourier series, analyzing the significance of the Fourier coefficients as the amplitude of the waves, using it to look at the spectrum of sound. They then take the reader on an intuitive and non-rigorous introduction to differential and integral Calculus, introducing the idea of projection and orthogonally using several creative graphs. Complex form of Fourier series was established followed by an introduction to the Fourier transform as a way to analyze non-periodic waves and the uncertainty of waves. The book is concluded by an introduction to the "FFT" method: Fast Fourier Transform as a quick calculational tool to analyze voice waves.

If you are looking for a novel book to introduce complex mathematical concepts in a novel, intuitive, non-rigorous, and simplified way, this book is for you. I would recommend it for math and physics teachers as a valuable resource.

## 2011 Garage Sale Report

Submitted by Michele Svoboda (Region 4 Director)

This year marked the second MSTA Garage Sale. Last year's sale was such a huge success that the Conference Committee elected to offer it once again. Planning began in January with a request for items sent out to MSTA Board Members. Many scoured their shelves and closets to find gently used science/educational materials. It is amazing to see the quality of items that people find to donate. A request for items was also sent to the general membership this year. We were thrilled that several members chose to help.

The response from the MSTA board and the membership was wonderful. They generously donated many, many items to the sale. Most were new or gently used. They included lab ware, microscopes, kits, books, resources, etc. Enough items were brought in to cover ten large tables. Pricing was done Friday morning, based on what we thought teachers were willing to pay. Prices are kept low because we know many teachers spend their own money on supplies and equipment. We were also able to offer several tables of FREE items which included reference materials, posters, lesson plans, etc.

The sale began on Friday evening and ran through Saturday afternoon. We were pleased by the response and how smoothly everything went. Only four boxes of items remained at the end of Saturday, which will be used as a springboard for next year's sale. Thanks to everyone who purchased items which allowed us to raise over \$900. It was great to hear the stories of how the items would be used to help new programs being established or provide equipment for districts with very few resources. The money raised will provide scholarships for new attendees for next year's conference.

Please consider donating items for next year's sale. It's never too early to start cleaning those closets.

### President's Letter - continued from front page

a significant variety of short and long courses to complete that day's experience. You also seemed to appreciate the diversity and quality of sessions offered and we feel confident that we will be able to offer an even better line-up for next year. To make some of your decisions easier, we are looking at designing several conference strands that will enable you to target your professional development around specific needs identified by many educators from around the state. There were many other valuable suggestions for improving the conference experience and we are looking forward to incorporating many of them as we return to Lansing in 2012.

So... mark your calendars for March 8-10, 2012 to join us in Lansing! We will soon be putting out the call for presenters and volunteers. If you are a frequent presenter we hope you will come back and if you have never presented perhaps you will think about sharing your love and knowledge of science education with your colleagues next year. Either way, we look forward to working with you as, together, we strive to improve science teaching and learning for all students across the state of Michigan.

# 2011 MSTA Award Winners

Thanks to Marlenn Maicki, Connie Crittenden and the rest of the Awards Committee



**Travis Williams** the winner of the Informal Science Educator award.



**Bal Barot**, winner of the College Teacher of the Year....his son *Pawan* accepted for him since he was in India.



**Mary Jordan**, McMaster High School winner.



**Gary Cousino** the Middle School Teacher of the Year.



**Brian Peterson**, Elementary Teacher of the Year.



**Marty Couretas** with **Robby Crammer**, Distinguished Service Award.



**Marty Couretas** giving her acceptance speech.



**Robby Crammer**, **Dwight Seiggren**, **Paul Drummond**...the George C. Mallinson award....or is it Mallison?



**Deborah Peek-Brown** doing Elementary Science on a Dime.

# Are You Prepared...

to Teach in the 21st-Century Classroom?



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*\*Also offered online*

### > MASTER OF SCIENCE EDUCATION

- This graduate program in science education includes \$1218 per course scholarships for all K-12 educators (DI or non-DI endorsement).
- Complete two courses by attending classes just one night per week, with a second meeting online and two new 100 percent online classes starting summer 2011.
- 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 Curriculum Frameworks and Benchmarks for Science and the DI (Integrated Science Endorsement).



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## Why Things Get Tippy

By Bernie Horvath, [bgrizwald@aol.com](mailto:bgrizwald@aol.com)

Bernie Horvath is the author of *The Home and School Science Activity Books, Volume I and II*.

Did you know that in my teachings with students and workshops for teachers, I find that students and adults answer many of the same science questions wrong? Here is something to think about. We have all heard about famous scientists like Thomas Edison and Alexander Graham Bell inventing things and how long they had to try to find ways that would work. If you think about that, many ways they tried did not work. Thomas Edison did over 10,000 incorrect experiments before he invented the light bulb. In other words he was wrong many times! It wasn't the fact that he was wrong many times that was important to him but that he kept trying to succeed until he did.

Here is an experiment from *The Home and School Science Activity Books, Volume I* that you can do at home or at school. In fact all the experiments in the book can be done at home or school because you probably have all the materials you need at home or you have something that can substitute for them. The main idea today is that many things in everyday life work on the same scientific principles. Many times we don't realize that because someone hasn't told us or we don't think that way.

### Experiment 1: Tied To The Chair

**What to do:**

1. Sit in a chair and extend your feet forward so your legs make a 90-degree angle when your feet are on the floor.
2. Keeping your feet flat on the floor move your feet 6 inches away from you.
3. Now try to stand up without pulling your feet backwards or swinging your arms.

### Experiment 2: Face To The Wall

**What to do:**

1. Stand facing a wall with your toes touching the wall.
2. See how long you can stand on your tiptoes.

### Experiment 3: Pencil Balancing

**What to do:**

1. Lay a pencil across your finger and get it to balance. What part of the pencil is balancing on your finger?
2. Using the same pencil, stand it up and try to balance it on the same finger. Which way is easier? Why?

### Experiment 4: Meter Stick Balancing

**What to do:**

1. Place your index finger at the ends of a meter stick. Then start to move them toward the middle of the meter stick. When you do this it will seem weird you will notice that your fingers do not move at the same time and when they meet you will be at the balance point.

The explanation for all three experiments is related to the same idea. In everyday life we call it the balance point but in science it is called the center of gravity. It was easy to find the center of gravity when we laid the pencil across our finger. If you put a dot on that part of the pencil and then tried to balance it by standing it up, do you notice how high the dot (center of gravity) was from your finger? That is why it is more difficult to balance it by standing it up.

Keeping in mind what you have learned from the pencil, where is the center of gravity on our body? In other words where would we put the dot? It should be easy to figure that the dot would be near our waist. A spot that would be very close is your belly button. Do you see why you had a difficult time standing up from the chair? Your waist was further away from the place where you were trying to balance, which were your feet.

When you stood facing the wall, think of where the dot on your waist would be. Do you realize it would be above your heels? To stand on your tiptoes that dot must move forward because your weight moves forward when you stand on your tiptoes so you can stay in balance. Since your weight can't move forward to balance because of the wall, you can't get up on your tiptoes there.

We'll close this column with some things you've seen that work on the same scientific principles we have seen here. Think about an Indy racing car or a NASCAR, did you ever notice how they rarely will tip over. They will spin out pretty easy though. That is because they have a low center of gravity like the pencil laying across your finger. "Bigfoot" trucks however, have that dot much higher like the standing pencil. Do you now see why they tip over so easily? Bet you never thought that balancing a pencil across your finger, standing on your tiptoes and why an Indy car or NASCAR rarely tips over all work because of the same scientific idea. See if you can figure some other things that work the same way. Check out our web site at <http://www.homeandschoolscience.com>

Volume 1: Astronomy, Chemistry and Physics. Volume 2 is a unit on Atoms and Molecules.

Also see all the extras included in each volume besides the 65 hands on activities that are based on the real world and you can do them at home or at school.

## Taste of Poetry

Submitted by Lynn Thomas, Region 14 Director, Escanaba High School

As summer approaches, students tend to be restless and lacking focus. I have found that anything with food motivates my chemistry class! When studying acids and bases, learners tend to skim over the properties of acids and bases without appreciation. An activity that makes them stop and take notice is a class sampling for the properties of taste. Surprisingly, when students read that bases are bitter, they really don't know what bitter means. They tend to think "sour" and "bitter" are synonymous, which implies they don't recognize the difference in the taste properties distinguishing acids from bases.

For acids (sour), I fill small cups with lemon juice. For bases (bitter), I place a small piece of unsweetened baking chocolate in a cup. Students are "required" to taste both samples and they enjoy watching the faces made by their friends and lab partners as they sample the flavors of acids and bases. Following the tasting,

students write a cinquain to describe the taste. They present the resulting poem in a colorful and artistic manner. The creativity is up to them and the resulting poetry presentations are imaginative. Writing a cinquain is a simple activity that is easy enough for elementary students yet is still fun for high school students. This has the added benefit of incorporating writing into the science curriculum. The rules for writing a cinquain are:

- Line 1: one word (subject or noun)
- Line 2: two words (adjectives that describe line 1)
- Line 3: three words (verbs that relate to line 1)
- Line 4: four words (feelings or a complete sentence that relate to line 1)
- Line 5: one word (synonym of line 1 or a word that sums it up)

A student's reaction to the taste of unsweetened baking chocolate follows:

Lump  
Ruthless, bitter  
Choke, retch, gag  
Scrape drool from tongue  
Harsh

## Can Concept Cartoons be Used as Formative Assessment?

By Mark Schlaudt, Pre-service Teacher

As my student teaching experience is drawing to an end, I am becoming more anxious about how I will assess my students. At this point in my career, my perspective of the educational landscape may be very narrow, but nevertheless, I am under the impression that assessments of my students will be at the forefront of my mind with alarming frequency. After all, how will I know when the lesson is successful without assessment? I am somewhat hesitant to rely only on pencil and paper assessment. I can almost hear the disappointed sighs from my students as I pass out yet another multiple choice test. Although my pedagogy is still evolving, the feeling remains that assessing by way of multiple choice cannot represent a student's total knowledge towards any one content area. I understand and support the argument that multiple choice assessment allows for teacher information, such as frequently missed foils and knowledge versus comprehension, but I am in search of something more. One creative aspect of alternate assessments, such as concept cartoons, calls to a profound craving that resonates within me. It speaks to the type of teacher that I strive to be.

As an assignment in a recent methods class, I was asked to review an article on active research done in a classroom. The research involved a researcher, an

intervention and a classroom of students. My professor provided us with a pile of various professional journals. Luckily, I chose an article which really captured my interest and hit that creative spot while offering an option on formative assessment. Below is my summary of the article as well as its citation. The article originally was printed in the International Journal of Science Education on July 1st 2009. The article's title is "Using Concept Cartoons in Formative Assessment: Scaffolding students' argumentation".

In this article researchers sought to answer the following questions: How can concept cartoons be used in formative assessment, peer- assessment and self - assessment, and how can they be used to provide diagnostic feedback about students' misconceptions to the teacher for teaching towards conceptual change? They also examined whether the use of concept cartoons was improved when paired with instructional strategies such as paper dialogue, discussion templates, and students' drawings. To answer these question researchers in Singapore studied two classes of Primary 5 and 6 students. Each group underwent two or three one-hour sessions where they worked as both a whole class and small groups to discuss and conclude on one of four concept cartoons (Photosynthesis, Heredity traits, and two involving Heat transfer) used in the study. During the session, students were asked to fill out discussion template sheets, record their conversations, provide an illustration to represent their stance, and record their dialogue on paper. Upon reviewing the students' work the researchers found that using the concept cartoons

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## Adopt-A-Stream: A West Michigan Journey Little Black Creek, Johnny O. Harris Park, Muskegon Heights, Michigan

By Paulla VanOeveren, Edgewood Math and Science  
Academy of Muskegon Heights Public Schools

### Muskegon Heights Public Schools Adopts Little Black Creek

- From 1996 to 2011 a teacher from Muskegon Heights Public School (MHPS), Paulla VanOeveren, adopted Little Black Creek to teach students to care for their environment and integrate science and math.
- Students have worked on Little Black Creek from three MHPS Schools: Dr. King Elementary School, Roosevelt Elementary and Edgewood Elementary Math and Science Academy is just.
- The tremendous support and guidance of Kathy Evans, from the Muskegon Conservation District, was invaluable. Kathy trained Paulla to do:
  - water quality testing,
  - provided test kits of dissolved oxygen,
  - provided tallying sheets to sort and classify trash and describe Little Black Creek's condition,
  - and a place to report our findings.

### Grand Opening At Johnny O. Harris Park

- Johnny O. Harris was a special Muskegon Heights police officer who was shot in the line of duty. So the City of Muskegon Heights named this Park after him.
- We invited his family to honor them at our opening ceremony, as well as the M.H. Police Chief, M.H. Mayor, Walmart Manager, Muskegon Conservation District and King School Principal, Mrs. Joy West.
- The Mayor made a short speech and performed the ribbon cutting to acknowledge the beginning of our work at Johnny O. Harris Park.
- Students presented Johnny's family with gifts,
- M. H. Parks Dept. provided an Adopt-A-Stream sign.
- Walmart provided 47 pine trees and 25 native bushes which the students planted.
- In 1999 we joined the United Way Day of Caring, along with concerned citizens, government and

business representatives. They gave \$20,000 to fix up the Johnny O. Harris Park.

- In 2001 the Muskegon County Health Dept. invited students to do an art contest to prevent young children from going in the Creek. Two students won the contest from King Elementary School. "It's good to play outdoors, but don't go in the Creek."

### GLOBE: Global Learning and Observations to Benefit the Environment

- In 2003 Paulla VanOeveren became a certified GLOBE teacher. This program started in 1995 by Al Gore, and is sponsored by NASA and the National Science Foundation. They train teachers how to do scientific protocols and then enter the data to real scientists to use in 110 countries. (see [www.GLOBE.gov](http://www.GLOBE.gov)).
- In 2004 another certified GLOBE teacher, Christine Webster from Hudsonville High School and 2009 runner up for the MSTA best science teacher in Michigan formed a partnership with King School Science Coordinator, Paulla VanOeveren. The partnership involved students comparing and contrasting water quality from two creeks (see GLOBE Stars article on [www.GLOBE.gov](http://www.GLOBE.gov)).

### Mona Shores Watershed Council Clean Up

- In 2005 educators from MHPS and Mona Shores joined the Mona Lake Watershed Council, who networked and connected with many area agencies and scientists.
- They coordinated efforts from concerned citizens, businesses and local, state and federal government officials to work on cleaning up Little Black Creek and Mona Lake.
- The chemists found that the creek had more cadmium than any other great lake and all their tributaries.
- After a tremendous number of meetings and huge effort, the Michigan State Senate pledged one quarter million dollars to clean up the toxic waste in Little Black Creek by the Peerless Plating facility on Sherman and Getty Streets.
- In 2007 The Michigan Dept. of Environmental Quality dug many wells in Little Black Creek and started cleaning up the toxic waste. Students went on a fieldtrip to see the actual clean up of Little Black Creek. The Creek is slowly recovering.

## Can Concept Cartoons be Used as Formative Assessment?

*continued from page 6*

along with other instructional strategies allowed students to: provide elicited explanations, ponder questions that puzzled them, counter arguments based on evidence, stimulate dialogue and focus the students' thoughts. Conceptual cartoons, as used in this study, gave teachers important feedback on students' current understanding of concept, revealed misconceptions and helped scaffold students' prior knowledge. From the students' perspective, they were able to reaffirm and revoice their ideas. The research demonstrated the positive outcomes of using concept cartoons; it also provided teachers with a template and a check list of important strategies to incorporate into their use of concept cartoons.

The authors in this article describe concept cartoons as "represent(ing) both the scientifically acceptable viewpoints as well as common misconceptions held by students in familiar, everyday contexts. They use minimal text to make the ideas accessible to learners with limited literacy skills and are visually appealing." (pg.1308) I relate concept cartoons to a comic strip. Characters are paired with very brief dialogue to tell a story. By altering the characters and the content within the dialogue the traditional comic becomes a concept cartoon based on science content.

The next assignment in the methods class asked for us to provide a lesson plan which incorporates the 6Es (Engage, Explore, E-Research, Explain, Evaluate and Elaborate) of the learning cycle and to include a controlled variable experiment. That assignment prompted me to think of how I might want to assess or evaluate my future students. Having just read and summarized the above mentioned article, I saw this assignment as an opportunity to implement the information I had just learned by integrating a conceptual cartoon as my assessment. The paragraphs that follow reveal my potential lesson plan as it relates to assessment, using a concept cartoon. The cartoon is shown in the image to the right.

"After completing the lesson and controlled experiment that taught students about natural selection, I will present the students with a concept cartoon. The cartoon will illustrate a misconception about the effects of physical traits on an organism's chance of survival. Students will be asked to agree or disagree with the cartoon and explain why. This will show who is still holding on to their prior thinking and who has grasped the concept. Students will present their argument using paper dialogue, discussion templates, or drawings. "

As I mentioned before, my pedagogy is not completely evolved. I feel as though my use of the concept cartoons is both practical and beneficial. However, I am basing this idea on a limited source of knowledge. Before I put

this unit into action, I would like to seek the guidance of my peers. My question as a pre-service teacher is to ask members of MSTA for comments on this idea.

*Is anyone in Michigan using concept cartoons?*

*Are they effective in assessing and revealing misconceptions?*

*How are concept cartoons used in your classroom?*

*What rules and restrictions do you place on the use of concept cartoons?*

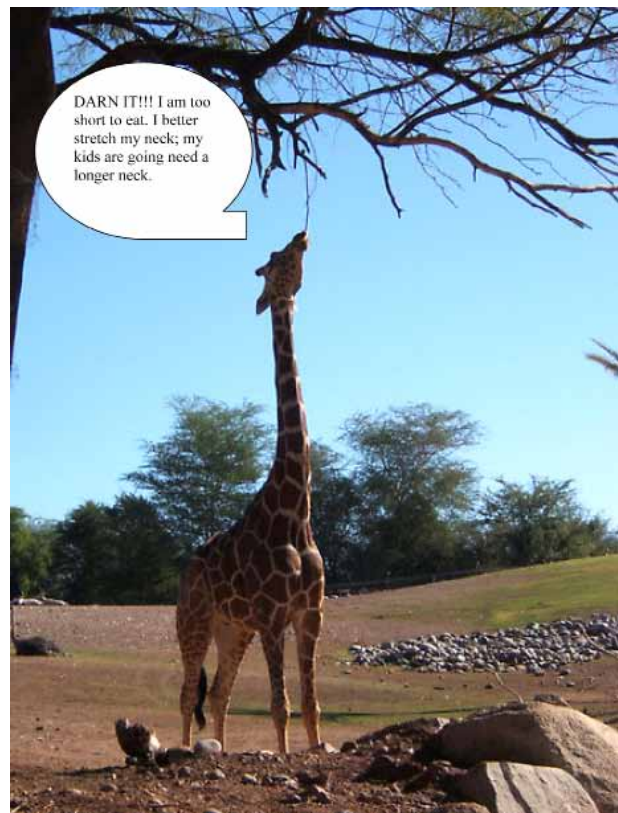
*Are concept cartoons useful for engaging students in scientific dialog and argumentation?*

*How have your students responded to concept cartoons?*

I'm hoping that you can help by writing some responses for the MSTA newsletter or by contacting me directly: [schla1mt@cmich.edu](mailto:schla1mt@cmich.edu). I would greatly appreciate some assistance from my future colleagues, the science teachers of Michigan, on the topic of conceptual cartoons.

## References

Chin, C., & Teou, L. (2009, July 1). Using Concept Cartoons in Formative Assessment: Scaffolding students' argumentation. *International Journal of Science Education*, 31(10), 1307-1332.



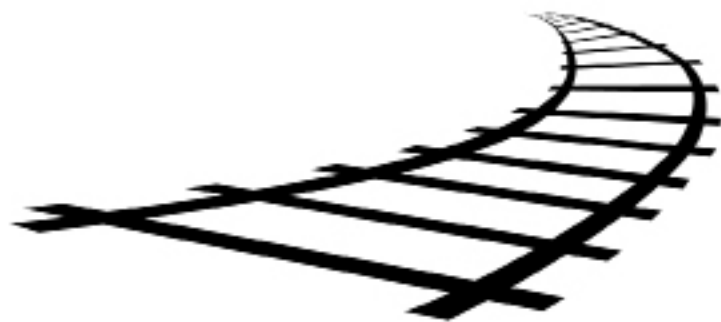


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# CURRICULUM IDEAS

## Teaching Innovation Thru Invention

By Amy Clarke, Education Director @Inventerrific™  
aclarke@inventerrific.com

Innovate, innovate, innovate, it's what Americans do best. What does innovation really look like? How do you actually do it? The Michigan Department of Education has a content expectations summary (10/06) that speaks to these questions.

*"...Students who have useful and connected knowledge should be able to apply knowledge in new situations; to solve problems by generating; to make connections among what they read and hear in class, the world around, and the future; and through their work, to develop leadership qualities while still in... school..."*

This quote is from the high school expectations. However, they reference the content knowledge for K-8: English Language Arts, Mathematics, Science and Social Studies. It all weaves together into an interdisciplinary core - you can't have one without the other.

A high school student might say, "Why do I have to study history, I'm going to be a scientist." My response is, "Well, think about what you'll be doing as a scientist- working inside a social studies framework. You won't be able to write your thesis statements, results of your work or operate effectively in a team unless you have good communication skills. That's your 'job' now and, assuming you want to be successful, learning goes on for a lifetime."

The process of invention is an ideal path to learn about innovation by investigating how successful inventors did it. At Inventerrific™, we research the stories behind inventors and their patents. Many of the most enlightening examples are the unknown inventors who demonstrate the characteristics of success equal to the

## What are Your Elementary Students Really Thinking?

A free article from Science Companion

We're delighted to offer a free article on how to facilitate good science talks with your students for a rich inquiry science experience. This article will help teachers model active listening throughout the school year to find out what exciting and original scientific theories their students have.

Please [click here](#) to download a PDF of the article, or contact us at [leigh@sciencecompanion.com](mailto:leigh@sciencecompanion.com) to have a Word document sent to you.

About Science Companion  
Science Companion is a Pre K-Grade 6 science curriculum on the forefront of best practices in science education. Created by the founding authors of Everyday Mathematics, Science Companion is guided by content expectations and pedagogical strategies outlined in the AAAS Benchmarks for Science Literacy and the NRC National Science Education Standards. The curriculum includes printed teacher and student materials, hands-on classroom science kits, assessment tools, and online resources, along with integrated mathematics, social studies, and literacy links. Science notebooks for each child are a core component, reinforcing a deeper understanding of science processes while fostering both language arts and science literacy. [www.sciencecompanion.com](http://www.sciencecompanion.com)

more publicized people like Ford and Edison.

What about women and minority inventors? It's only been since the late 1980's that qualitative research has been published. For example, Eli Whitney did not exactly invent the cotton gin. The primary source research sites a wealthy plantation owner, Catherine Little Green, and an unnamed slave who apparently created the original design. Whitney's name is on the patent due to the social values of time. ( Email me if you would like a bibliography list of the sources I been using on this topic.)

Education Week (10.7.2009) published a commentary by Sam Wineburg & Jack Scheider titled, "Inverting Bloom's Taxonomy". They see the order of the triangle from bottom to top as: Evaluation, Synthesis, Analysis, Application, Comprehension and, finally, Knowledge. "In...disciplines, the aim is not merely to collect what is known, but to learn how to think about problems in a new way."

For me, this is an excellent way to visualize the invention/innovation process. If you would like hear/ see concrete examples, visit a new free site [www.OnInnovation.com](http://www.OnInnovation.com). Successful entrepreneurs share what they do and how they do it. The content is interdisciplinary and the lesson plans are superior. The creator of the content is The Henry Ford Education Division and you can connect to it via PBS. Please, the staff would appreciate your feedback. They will develop phase 102 & 103 based on the responses from teachers who are using "OnInnovation 101" in their classroom. Email me with your comments and I'll pass them along to the Henry Ford Education Director.

## New Resource for Teachers

From Colin Witherill, Co-Founder, Canopy In The Clouds

I wanted to take a moment to make the MSTA and its membership aware of a new and free science educational media project, Canopy In The Clouds ([www.canopyinthecLOUDS.com](http://www.canopyinthecLOUDS.com)). The project uses innovative and immersive media from the perspective of a tropical montane cloud forest to serve as a platform for inquiry-based, K-12 earth and life science education. We are particularly excited to offer over 25 lesson plans on themes such as water, weather, soils, ecology and the process of science focused on 6-8th grades. All materials are normed to national science education standards, peer-reviewed by a team of scientists and educators, and made available free of cost via our website. Funding is provided by the National Geographic Society, National Science Foundation and the Tropical Science Center of Costa Rica.

We hope that you will be able to pass the message along to MSTA members and come explore the canopy with us! Please don't hesitate to be in touch if we can provide any further information.

# CURRICULUM IDEAS

## Teaching with Great Lakes Data: Linking the Classroom to Real World Science

By Laura Florence, Education Specialist, Michigan Sea Grant

Often scientific data can be too... well, scientific, to use in a classroom. Teaching with Great Lakes Data ([greatlakeslessons.com](http://greatlakeslessons.com)) connects educators and



students to data collected throughout the Great Lakes and presents it in an easy-to-use format. The website provides Great Lakes data sets, an overview of teaching methods, and ready-to-go lessons and activities. Any of these resources may be easily incorporated into your curriculum and are multidisciplinary. All the materials on the website are free.

*Teaching with Great Lakes Data* enables educators to:

- Encourage students to develop higher-level thinking skills using real data.
- Explore dead zones, climate, weather and fish habitat in the Great Lakes.
- Enhance teaching skills through guided inquiry methods.

### Great Lakes Water Data Sets

Many agencies and websites provide access to scientific data. However, it is often in a form that only a knowledgeable scientist can use. Data for this website has been:

- Compiled from buoys, satellites and other monitoring devices.
- Customized for use in the classroom with fewer data and decimal points.
- Compiled into a usable spreadsheet format and is provided alongside a guide on how to use it.

### Guided Inquiry Tools

The online lessons also include guided inquiry tools to assist 5-12th grade teachers in targeting higher-level thinking and science process skills for their students. The website provides a step-by-step explanation of the guided inquiry methodology and includes the tools needed to implement in a classroom.



### Lessons Using Great Lakes Data

Fully developed and ready-to-use lessons and activities make it easier to teach about dead zones, climate and weather and fish habitat in the Great Lakes region. The lessons:

- Include background information on broad scientific concepts like water density and specific information on Great Lakes science such as seasonal turnover.
- Are complete with hands-on learning activities.
- Have been aligned to content expectations, national standards and Great Lakes Literacy Principles



## Overview of an Example Lesson: Climate and Weather, Lesson 2 Activity—Growing Fruit

### Lesson Summary

If you can go to your neighborhood farmer's market and find locally grown peaches, apples, pears, plums, grapes and berries, you probably live near a few special areas in Michigan, Ohio or New York. Delicate, early-blooming fruits, typically only grown in the south, can thrive in a narrow band of land (30 miles/24 kilometers wide) along the east shore of Lakes Michigan, and the south and east shores of Lakes Erie and Ontario.

### Lesson Objectives

- Develop a hypothesis about the relationship between the Great Lakes and fruit growing in the region.
- Graph coastal and inland temperatures.
- Analyze data in graphs and tables to support or reject hypotheses.

### What You Will Need

- Map of the Great Lakes region
- Downloads:
  - o Lesson 2 Average Daily Temperatures .xls (Average daily temperatures for April-May and September-October 2008 as tables and graphs)
  - o Lesson 2 Hourly Temperatures .xls (Hourly temperatures for April-May and September-October 2008 in tabular form)
  - o Data Sheet
  - o Data Sheet Key

### Procedure

- Detailed instructions for completing the lesson, including background information, glossary terms and downloadable files, are found on-line at [greatlakeslessons.com](http://greatlakeslessons.com).

*This website is part of a research and education effort supported by Michigan Sea Grant (University of Michigan and Michigan State University), Eastern Michigan University, the National Oceanic and Atmospheric Administration (NOAA), the Great Lakes Observing System, the Center for Ocean Sciences Education Excellence-Great Lakes and the NOAA-Great Lakes Environmental Research Laboratory.*

# CURRICULUM IDEAS



**Energy Works Michigan**

*Sustainable - Equitable - Prosperous - Future*

**FOR IMMEDIATE RELEASE**

February 22, 2011

**CONTACT:**

Laura Holladay

Education Director, Energy Works Michigan

734.369.9699; [Laura@energyworksmichigan.org](mailto:Laura@energyworksmichigan.org)

## Free Energy Lesson Plans Available at [energyworksmichigan.org](http://energyworksmichigan.org)

Teachers interested in energy efficiency and renewable energy have a new resource

Ann Arbor, MI - Energy Works Michigan, a nonprofit affiliate of the Ecology Center, announced today that school teachers across the country can now access FREE downloads of new energy lesson plans by visiting [www.EnergyWorksMichigan.org/Educational-Resources](http://www.EnergyWorksMichigan.org/Educational-Resources).

The detailed lesson plans, which will be presented this Friday, February 25th at the Michigan Science Teachers Association (MSTA) annual conference in Grand Rapids, were developed as part of the Michigan Renewable Schools Program (MRSP). The MRSP, which provides energy efficiency audits and solar and wind power installations, is a 5-year \$8M program partnering with over 150 schools and districts across the State of Michigan.

Barbara Wilson teaches 3rd grade at Jefferson Elementary School in Redford, and she was one of the first teachers to try out the Energy Works lessons in her classroom in fall 2010. "I loved everything! The lessons were wonderful and engaging," says Wilson. "The Energy Posters lesson was great -- the students loved making posters and sharing their thoughts. We are also going to display the posters around the school."

Laura Holladay, Energy Works Michigan Education Director, is thrilled with responses from teachers. "One of our main goals is to educate the next generation about energy efficiency and renewable energy. While our teacher training sessions are currently only available to selected schools, we are excited about the impact that these free lesson plans will have at schools across the state," says Holladay.

The new lessons include units on energy efficiency, solar photovoltaics, and wind energy. Lessons are targeted at three different grade levels:

- Twelve lesson plans of approximately 45 to 60 minutes each are available for upper elementary;
- Twelve lesson plans are available for middle school,
- Eight lesson plans are available at the high school level.

The detailed lesson plans, which include PowerPoint notes and other support material, were developed in consultation with classroom teachers and science

educators. The lesson plans and supporting materials are aligned with Michigan Grade Level Content Expectations (GLCEs) and High School Content Expectations (HSCEs), and are also available for use in other states.

The Energy Works Michigan lesson plans, designed to be hands-on and engaging for students while providing an easy-to-use resource for teachers, were developed in order to make renewable energy and energy efficiency an integral part of classroom learning. The lessons were originally provided for teachers at MRSP partner schools in the form of teacher training workshops. Now, all of the lessons are freely available via download for anyone who would like to use them.

Michigan teachers have played an important role in the development of these materials, working with Energy Works Michigan Education Director Laura Holladay and Education Associate Courtney Peterson. Dozens of teachers volunteered their time to review and edit drafts of the lessons, and many tested out the activities in their own classrooms in order to get feedback from their students. Over 100 Michigan teachers have been introduced to the completed lesson plans through teacher training workshops with MRSP partner schools, and many teachers report that they plan to use the materials in their classrooms.

*For more information or to download the energy lessons, visit [www.EnergyWorksMichigan.org](http://www.EnergyWorksMichigan.org).*

### About Energy Works Michigan

Energy Works Michigan is a non-profit affiliate of the Ecology Center, and a technical resource helping to build foundational capacities for a sustainable, equitable and prosperous energy future in Michigan. Energy Works currently administers the Michigan Renewable Schools Program (MRSP), a 5-year \$8M program funded by the Michigan Public Service Commission. The MRSP includes a coordinated set of programs for Michigan public and private K-12 schools designed to demonstrate energy technologies, raise public awareness, and educate the next generation so that they can fully contribute to meeting and exceeding the carbon reduction targets of The 2030 Challenge. These programs include solar power and wind turbine installations at 24 Michigan schools; energy engineering and planning services at 40 schools; curriculum development and teacher training; and partnerships between K-12 schools and post-secondary institutions to make students aware of training and job opportunities in green industries. Learn more at [www.EnergyWorksMichigan.org](http://www.EnergyWorksMichigan.org)

# Call for 2012 MSTA Awards Nominations



Look around you! Are you working with someone whom you consider an excellent science educator? Does this person do an excellent job in the classroom and/or in your school district? Does this person contribute to the profession by taking leadership roles within the educational community and show a willingness to share ideas with colleagues by presenting seminars and workshops, publishing science related articles in professional journals, etc.?

If you know someone who exhibits these attributes, then please NOMINATE HIM/HER for one of the following categories:

- ▶ Teacher of the Year (Elementary, Middle Level, High School or College)
- ▶ Teacher of Promise
- ▶ Administrator of the Year
- ▶ Informal Science Educator

**Nomination deadline: July 1, 2011**

PLEASE NOTE: There has been some confusion in the past regarding grade level designation for Teacher of the Year- Elementary or Middle Level. Please nominate someone for the Elementary Level category if s/he teaches *in an elementary school* or the Middle Level if s/he teaches 5-8 *in a Middle School or Junior High*. Teacher of Promise nominees should have less than four years of teaching experience. Please be advised that no member of the current MSTA Board of Directors, is eligible to receive one of these awards while serving on the Board.

*Once the nomination is received the nominee will be contacted and sent the appropriate material. If you have any questions, please contact Sue Campbell at the MSTA office at 734-973-0433.*

## Award: (select one)

q Teacher of the Year (select one): q *Elementary* q *Middle Level* q *High School* q *College*  
q Teacher of Promise q Administrator of the Year q Informal Science Educator

## Nominee Information

Name of Nominee(s): \_\_\_\_\_

Name of Nominee's School: \_\_\_\_\_

Name of School District: \_\_\_\_\_

Complete Address of School: \_\_\_\_\_

School Phone: \_\_\_\_\_

Nominee's Home Phone: \_\_\_\_\_

Nominee's Home Address: \_\_\_\_\_

Nominee's e-mail: \_\_\_\_\_

## Nominator Information

Name of Nominator: \_\_\_\_\_

Your Complete Address: \_\_\_\_\_

Your E-mail Address: \_\_\_\_\_

Daytime Phone: \_\_\_\_\_ Evening Phone: \_\_\_\_\_

Your professional relationship to nominee: \_\_\_\_\_

## A Unique Opportunity for High School Students to Explore and Discover the Inner Mysteries of the Human Brain: Annual Brain Bee Competition at MSU

Brain Bee at MSU is a chance for high school students to dive into neuroscience and get answers to such questions as what makes them who they are, and why spinning around makes them dizzy. This competition enables students to learn about the brain and career opportunities in the neurosciences.

What is the Brain Bee? The Brain Bee @ 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 can study this material by using “Brain Facts” (a pdf is available free from our website <http://www.brainbeemsu.com/>). In addition, MSU

will offer several on-campus coaching sessions, taught by working neuroscientists, open to all interested teachers and students. Coaching sessions and a practice Brain Bee will be held on campus starting in the fall, 2011 with the final Brain Bee competition slated for early February, 2012. Students will also have a chance for some hands-on lab experiences including getting to examine and handle real brains.

The winner of the Brain Bee @ 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, which happens annually in March (for details see: <http://www.internationalbrainbee.com/>), plus a paid summer internship to work in the laboratory of an MSU Neuroscientist. Second and third place winners will be awarded a cash prize of \$200 and \$100, respectively.

Check out our web site for more information on Brain Bee competitions and what it was like for our Brain Bee participants this past year. Registration is free for all interested students. The main goal of the Brain Bee is to allow all interested students to be exposed to the field of neuroscience and the opportunity to compete for a chance to win a spot at the US National Brain Bee.

## Dinosaur Science – Dinosaur Collecting Expedition in South Dakota

Sponsored by The Children’s Museum of Indianapolis

Submitted by Educational Opportunity from Jennifer Busenbark, School Programs Assistant

Teachers are invited to join expedition leader and teacher Rick Crosslin on this dinosaur expedition for teachers designed to do the science that normally you only read about in textbooks. Spend two days collecting fossils for The Children’s Museum at the Ruth Mason Quarry – the largest fossil bed of duckbilled dinosaurs in the world. Participants will visit the Black Hills Institute of Geological Research and other sites.

<b>Dates:</b>	Monday-Saturday, July 11-16
<b>Special Orientation:</b>	May 28, 2011
<b>Times:</b>	Off-site times vary
<b>Location:</b>	South Dakota
<b>Fee:</b>	\$795 per person based on double occupancy \$995 per person based on single occupancy

**Registration and Full Payment Deadline:** May 27

\*Fees do not include transportation cost to South Dakota. Hotel cost and lunches on the days out at the dig site are included. While in South Dakota, transportation will be provided by museum staff.

To register, contact Valerie Wells at 317-334-3317. A \$100 nonrefundable down payment is required at the time of registration. For more information, contact Becky Wolfe at 317-334-4618 or [beckyw@childrensmuseum.org](mailto:beckyw@childrensmuseum.org).

# The Fledgeling



## THE WEATHER SCIENTIST

### Weather Reporter

Reporting daily weather conditions were always a very important job for my second grade students. The student reporter wore a badge: WEATHER REPORTER (see below).

Weather observations were taken daily and recorded on a wall chart. The ups and downs of precipitation, cloud cover, temperature and weather conditions were always a topic of interesting discussion. After the morning weather report, we proudly recorded the conditions on the classroom charts and in our individual Weather Journals.

Special Education student weather reporter gave daily reports during the morning announcements. This was truly the highlight of the student's day.

Try inquiry, process-based good science and address the science requirements for your grade level. Read and write in the science content area when possible.

- Record weather observations
- Report the date collected
- Use graphs and charts to record weather observations
- Construct a Weather Journal (Write, illustrate, record, graph and chart)



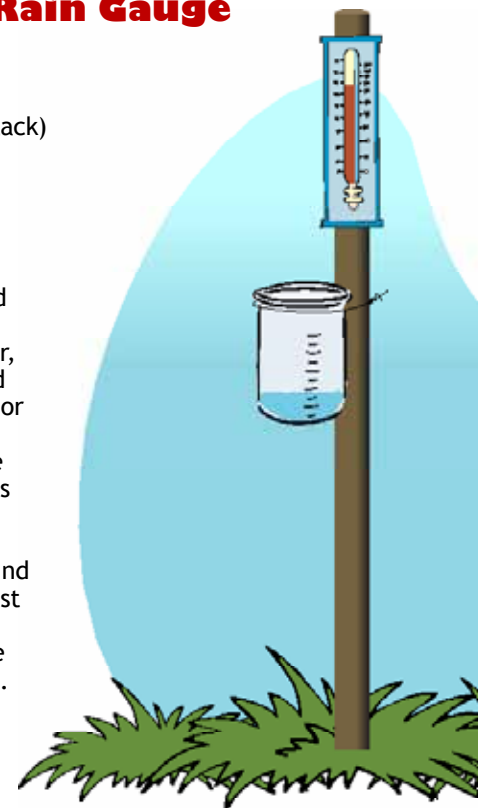
cut out badge

### Construct a Rain Gauge

- Materials**
- Pint plastic jar
  - wire
  - permanent marker (black)
  - ruler
  - pole (shovel handle)

**Directions:**

- If your jar does not come with pre-printed measurements, place the ruler inside the jar, and mark with desired measurement (inches or centimeters).
- Secure the pole in the ground where students can easily collect precipitation.
- Form a wire loop around the top of the jar, twist and fasten with an additional twist to the pole ( see illustration).



Commercial rain gauges are inexpensive, but making a collection devise is an interesting project. Students can make their own gauge. Collecting weather data from different areas within the school district is a challenge and very informative.

A court yard is the best spot for a “ Weather Station” as it needs some protection from curious students.

*More information on the following pages!*

**References for Early Grades:**

- Our Sun, Our Weather, Newbridge: ISBN 1-4007-3214-X
- Weather Watch, Go Facts, Newbridge, ISBN 1-4007-3942-X
- Stormy Weather, Go Facts, Newbridge, ISBN 1-4007-3941-X
- Scholastic Children's Dictionary, ISBN 0-590-25271-2 (Teacher/Student)
- Science Is. Source Book, Scholastic, ISBN: 0-590-74070-9

**We would like to hear from you!**

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



# Weekly Rain Precipitation Chart

Construct a bar graph of daily rainfall from your weather station.

Month: \_\_\_\_\_ Week #: \_\_\_\_\_

**Unit of Measure**

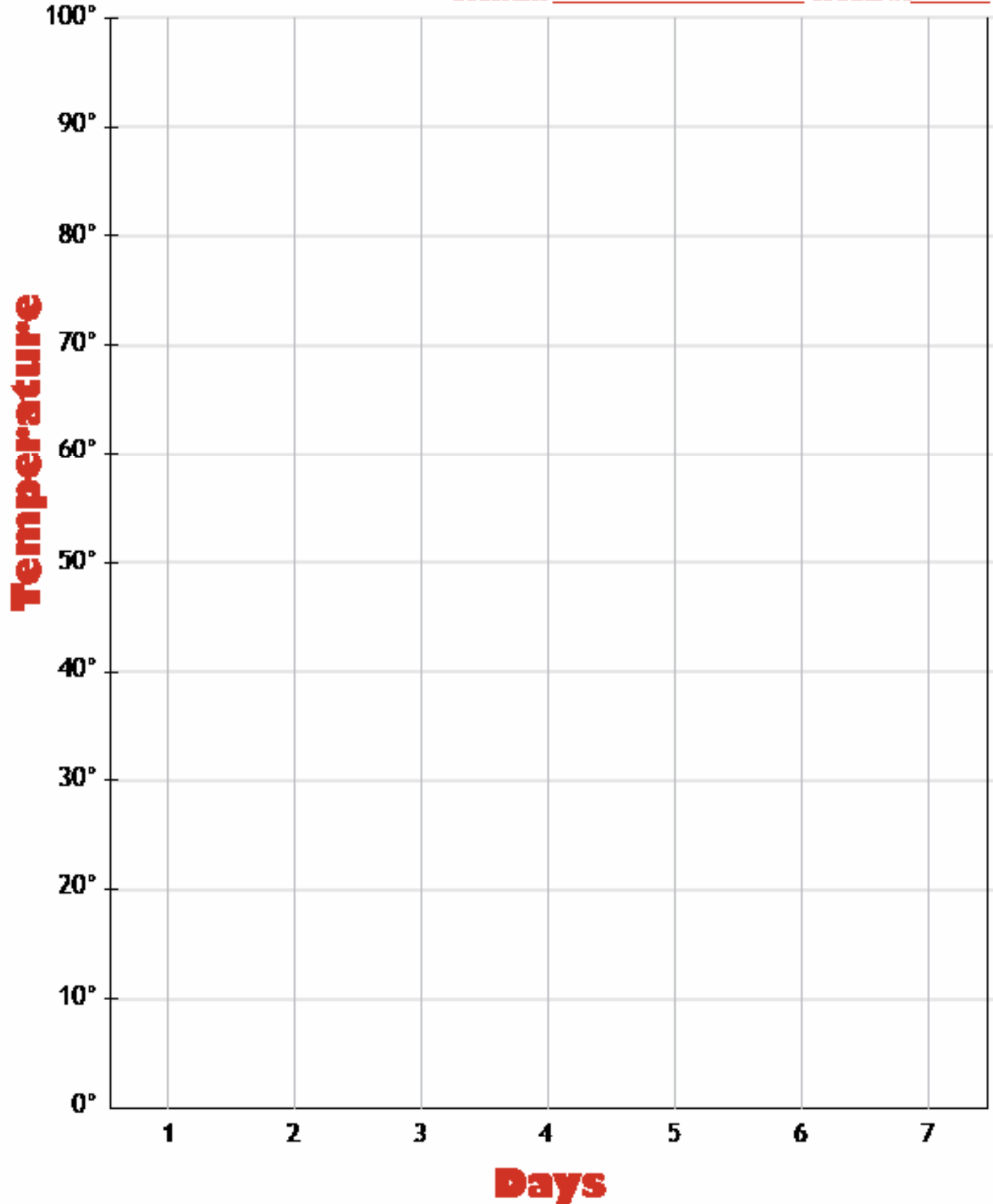




# Weekly Temperature Chart

Temperature can easily be read and reported. Place a thermometer outside the rain gauge pole (use a screw in hook)

Month: \_\_\_\_\_ Week #: \_\_\_\_\_



# Cloud Observation Chart

Record cloud observations using this chart. Indicate if the clouds are high, middle, or low and write the name of the cloud in the space provided.

**Sunday**

**Monday**

**Tuesday**

**Wednesday**

**Thursday**

**Friday**

**Saturday**

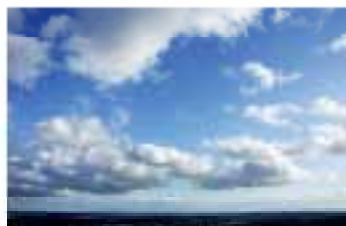
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## Types of Clouds

**High Clouds:**  
Cirrus



**Middle Clouds:**  
Cumulus



**Low Clouds:**  
Stratus



**Thunderstorm Clouds:**  
Cumulonimbus



## MAKE A TRIBUTE TO MSTA

Has a special science educator touched your life? Do you have fond memories of a special teacher or student? Is a colleague getting ready to retire? Please consider a tax-deductible donation in their honor to support the mission and values of the Michigan Science Teachers Association.

Would you like to express your sympathy to a grieving family? A donation made to the Michigan Science Teachers Association in memory of an educator or family member would be a lasting and valued tribute that will link the past to the future.

A tax-deductible donation (minimum of \$10) may be made to MSTA by printing and completing the form below. The honoree or family member of the deceased will receive notification of your gift.

## MAKE A TRIBUTE TO MSTA

I WOULD LIKE TO MAKE THE FOLLOWING DONATION TO THE MICHIGAN SCIENCE TEACHERS ASSOCIATION:

IN MEMORY OF: \_\_\_\_\_

IN HONOR OF: \_\_\_\_\_

Birthday  Anniversary  Speedy  Recovery  Retirement  Appreciation

Other: \_\_\_\_\_

AMOUNT OF CONTRIBUTION ENCLOSED: \_\_\_\_\_

*(Please make checks payable to MSTA)*

HERE IS A LIST OF FUNDS TO WHICH CONTRIBUTIONS MAY BE MADE:

- Mini-grant Fund – Support special member projects
- Outstanding Teacher Awards – Grant monies for awardees
- Membership Fund – To sponsor new members
- Conference Stipend Fund – To sponsor conference attendees
- MSTA Board Discretionary Fund

Fund to which you would like contribution made: \_\_\_\_\_

SEND ACKNOWLEDGEMENT TO:

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

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

Donor's Name: \_\_\_\_\_

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

PLEASE SEND TO: MSTA OFFICE, 1390 EISENHOWER PLACE, ANN ARBOR, MI 48108.

# MSTA Mini-Grant Application



The Michigan Science Teachers Association announces a \$1000.00 mini-grant for its current MSTA members.

- Up to 4 awards of \$1000.00 each will be given to current MSTA members.
- The grant deadline is May 13, 2011
- As part of the Grant process, award winners are required to write a narrative of their project to be published in the MSTA Newsletter or Journal.
- Award winners will be notified by September, 2011.
- Projects MUST be completed by June 10, 2012.
- Grant money is released upon demonstration of expenses.
- A final report must be submitted that includes evaluation of outcomes.

## Grant Narrative:

- Begin with a summary of your project. (Maximum one page).
- Describe how this project relates to the MSTA mission statement, (“...to stimulate, support, and provide leadership for the improvement of science education throughout Michigan.”) the Michigan Curriculum Framework and authentic assessment in Science. (Maximum one page).
- Purpose of Grant: Give your statement of needs or problem to be addressed. Describe the target audience and how they will benefit. (Maximum one page).
- Describe the Project: Include a description of project goals, expected outcomes and how they will be evaluated. Indicate timelines when appropriate. (Maximum one page).
- Budget Details: Describe costs involved with the project. Give complete item descriptions and costs of purchases to be made. Indicate in-kind support.
- Payment: Winners will receive \$900 of the \$1,000 grant up front. Winners MUST submit an article for publication in one of MSTA’s 4 Newsletters or 2 Journals. The last publication is the May Newsletter and is the final publication with which an article must be submitted. Once the article and receipts of expenses has been received, the final \$100 will be paid to winner(s). Request for payment of the \$100 must be received no later than June 10, 2012.

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 application MUST be postmarked by May 13, 2011.**

Mail to: Mr. Thomas P. Waclawski, 5975 Donna Court, Traverse City, MI 49684,

Phone: 231-943-4804, Email: [ka8ylktom@chartermi.net](mailto:ka8ylktom@chartermi.net)