

MSTA Newsletter

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A publication of the Michigan Science Teachers Association • Volume 71.1 • Winter 2019

From the President's Desk

Message from the MSTa President, Brian Peterson:



From the Desk of Your Executive Director

Betty Crowder and Robby Cramer, MSTa Co-Executive Directors

Winter 2019

The turn of the New Year is a time to reflect and consider new opportunities. Sometimes one sets a goal that persists beyond the first week of the new year! Often as educators we set our teaching goals at the beginning of the school year or during our professional evaluations. MSTa would like to encourage you to consider setting a new professional goal during the beginning of the New Year of 2019.

Looking for new ideas for your goal or willing to share something that worked for your students to help someone with their goals? The MSTa State Conference is a fast, effective way to network; share your ideas; and gather new ones from colleagues across our state!

The MSTa Leadership would like to encourage you to attend the MSTa State Conference March 1 and 2 and the Pre-conference on February 28, 2019. Over 250 plus sessions from classroom teachers and specialists coupled with the latest vendor resources will be at your finger tips! See you in Grand Rapids: <https://www.mstaevents.org> or <https://www.msta-mich.org>



2019 MSTA Conference F.A.Q.

Holly McGoran, MSTA Conference Chair

Michigan teachers will celebrate science and engineering at the 2019 Michigan Science Teachers Association Conference on March 1-2 at the Amway Grand Plaza Hotel in Grand Rapids.

How do I register for the 2019 conference?

Go to www.mstaevents.org to register online. Register before February 11, 2019 to receive early bird registration rates.

How many sessions are there to choose from?

Over 150 sessions will be offered on Friday, and over 100 additional sessions will be presented on Saturday. Check out the schedule at www.mstaevents.org today!

Where do I park for the conference?

Self parking is available in the Amway Grand Plaza Ramp for \$16.00 per day. Valet parking is available for \$25.00 per day with unlimited in and out privileges. Other city parking ramps may be available for a fee as well.

What are my options for lunch?

- A list of dining options inside of the Amway Grand Plaza Hotel can be found at <https://amwaygrand.com/dining>
- There are also several nearby eateries. Visit the Experience Grand Rapids website (<https://www.experiencegr.com/restaurants/>) for a map and listing of these options.

Can I earn SCECHs for attending conference sessions?

Yes, SCECHs will be available for a cost of \$20.00. Attendees can pay for SCECHs ahead of time with registration, or onsite at the SCECHs booth in the Central Concourse. Be sure to pick up a form first thing in the morning, so it can be filled out at the conclusion of each session throughout the day.

What if I am from out-of-town and need a hotel room?

If attendees are in need of accommodations during the conference, information is available at www.mstaevents.org for booking a hotel room at the Amway Grand Plaza Hotel. Do so by January 28, 2019 to receive a special rate.

Who will be the keynote speaker?

Jim Clark and Samantha Johnson, master classroom teachers from Next Gen Science Innovators in California, will be presenting “Transformative Teaching: Teachers as Agents of Change” on Friday, March 1 at 9:00 a.m. in the Pantlind Ballroom. Jim and Samantha will be presenting three additional sessions throughout the day on Friday in the Imperial Ballroom.

When will the exhibit hall be open?

Friday, March 1, 2019 - 9:00 a.m. to 5:00 p.m.
Saturday, March 2, 2019 - 9:00 a.m. to 1:00 p.m.
Ambassador Ballroom, West Concourse, & Central Concourse

Are there any special events after the conference sessions on Friday, March 1, 2019?

There are a couple of options for our conference attendees after general sessions conclude on Friday.

- Night at the Movies - Come see a movie presentation featuring BioInteractive videos from the Howard Hughes Medical Institute at 5:00 p.m.
- Awards Reception & Banquet - Join us at 5:00 p.m. & 6:00 p.m. respectively for these ticketed events as we congratulate our award winners for their contributions to science education in Michigan

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Will there be any offsite field trips during the conference?

We are pleased to offer four field trips on Friday, March 1.

- *Tour of Van Andel Educational Institute and Van Andel Research Institute (advanced registration will be required at www.mstaevents.org)*
- *Admission to the Grand Rapids Public Museum as well as a planetarium show and an educator open house (more details coming soon!)*
- *Human Cadaver Workshop at Grand Rapids Community College (advance registration will be required at www.mstaevents.org)*
- *John Ball Zoo Tour (advanced registration required at www.mstaevents.org)*

Is there a Pre-Conference Institute this year?

Yes, the Pre-Conference Institute will be held on Thursday, February 28, 2019. These longer sessions will offer a more

in-depth look at a variety of topics for all educators. This year's sessions include:

- *Assessment in a Three-Dimensional Classroom*
- *Three-Dimensional Learning....What does it look like in my classroom?*
- *K-8 Engineering in Science? How, What, When?*
- *Introducing ML-PBL: NGSS- and CCSS- Focused Elementary Project-Based Learning Units*
- *The Michigan Modeling Instruction Symposium*

A separate registration is required for the pre-conference. Go to www.mstaevents.org to register today!

How can I receive conference updates before and during the conference?

If you are a MSTA member, watch your email for e-blasts containing updates before the conference. You can also follow us on Facebook and Twitter (@MSTAMich). We will be using #MSTA19 to tweet all conference updates and highlights.

The MSTA Board is proud to announce the 2019 Award winners.

by: Marlenn Maicki, Awards Chair

Science Teacher of Promise: *Emily Cizmas, Lincoln Park High School, Lincoln Park*

Elementary Science Teacher of the Year: *Katie Stevenson, Fisher Elementary, Redford*

Middle School Science Teacher of the Year: *Jeff Bouwman, Shumate Middle School, Gibraltar*

High School Science Teacher of the Year: *Holly Hereau, Lee M. Thurston High School, Redford*

College Science Teacher of the Year: *Dr. Stephen Rybczynski, Grand Valley State University, Allendale*

Science Administrator of the Year: *Dr. Adam Spina, Williamston Community Schools, Williamston*

Informal Science Educator of the Year: *Claire Lannoye-Hall, Detroit Zoological Society*

In addition, the Distinguished Service award will be presented to *Jeff Conn, Wayne State University*. The Mallinson Award will be awarded to *Dr. Jacqueline Huntoon, Michigan Technological University*,

Awardees will be honored at an Awards Ceremony during a special dinner at the 2019 MSTA Conference. The Awards Banquet will be held in the Pantlind Ballroom of the Amway Hotel, Grand Rapids at 6:00 PM on Friday, March 1, 2019. Please join us to celebrate these remarkable educators! Purchase tickets for the banquet as you register for the MSTA Annual Conference at www.mstaevents.org. You can meet and congratulate this year's winners at the Awards Reception which will be held prior to the dinner at 5:00 PM in the Gerald R Ford Room of the Amway Hotel. Tickets for the reception are available during the registration process. Contact Angela Richardson at arichardson@managedbyamr.com if you have any questions or visit www.mstaevents.org for more information.





BOOK YOUR STEM EXPERIENCE

FIELD TRIPS. Interact with 250+ hands-on exhibits that explore Space, Health, Physical Science, Engineering and more. With live stage shows, a 4D theater, and a planetarium, there's always something new to discover and learn at MiSci. Our programs are designed to support Michigan's Science Standards.



DISTANCE LEARNING. Bring MiSci to you! Our educators bring engaging science workshops, group presentations and experiences to your school or event that will inspire learners to explore and appreciate science.

Visit [Mi-Sci.org/Educators/](https://www.mi-sci.org/Educators/) for more details.



The Michigan Science Center is a 501(c)(3) Nonprofit organization.



CLASSROOM ACTIVITIES

Secret Message Activities in Middle School Science

By Larry Kolopajlo, Eastern Michigan University

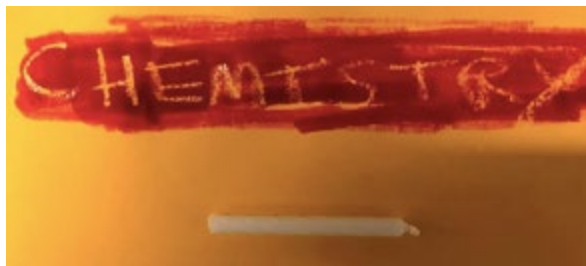
In my middle school outreach programs, among the activities that I have done are secret messages. This activity is often used as part of a larger CSI Mystery. Generally speaking, students write a secret message, and pass it to their neighbor, who then decodes it using one or more of the chemical techniques described below. Teachers should discuss with students the chemistry relevant to each technique.

Safety Precautions

Goggles, maybe aprons and gloves as well. Candles can burn skin. Isopropyl alcohol (ipa) can not be used when candles and matches are on the benches because ipa is very flammable.

Activities

1. Using the non-wick end of a birthday candle, write a message on golden rod paper. It can be decoded by brushing over with a cotton swab dipped in dilute sodium hydroxide (0.05 M or a washing soda Na_2CO_3 solution). An example result is shown below:



2. On white paper, write a message using phenolphthalein indicator. Let it dry. Decode by brushing over with a Q-tip dipped in dilute base. An alternate method is to write the message with dilute base, and after drying, decode it with a Q-tip wet with phenolphthalein.



3. Write a message with a Q-tip or brush wet with fluorescein indicator (a solution so dilute that it appears colorless). Then use a black (uv) light to decode it.



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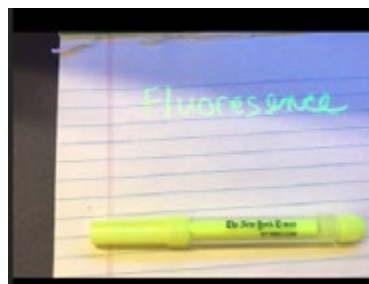
CLASSROOM ACTIVITIES

Secret Message Activities in Middle School Science *continued from page 5*

4. Write a message with a uv pen, and decode it with a black light.



5. On yellow paper, write a message with a yellow highlighter pen, so that the message is initially invisible. Decode with a black light.



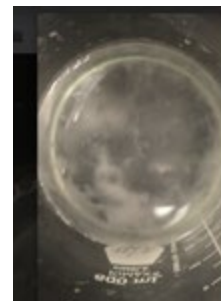
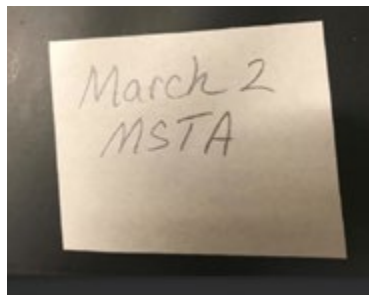
6. Use 100% lemon juice to write a note on yellow paper. After drying, carefully hold the paper over a candle, passing it back and forth so that it does not catch fire.



7. Using a 0.05 M Ni²⁺ solution in water (chloride or nitrate anion best), write a message, on blue paper, and after drying, paint it with a DMG solution (dimethylglyoxime).



8. Pencil a message on a small strip of water dissolving paper (carboxyl methyl cellulose). After passing it to a neighbor, destroy it by dissolving it in water. After removing all matches and candles from the lab benches, try dissolving a message in isopropyl alcohol or mineral oil. To explain, use "like dissolves like."





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SEED OF CONSERVATION,
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CLASSROOM ACTIVITIES

Modeling and Mathematics: How to Make Motion on a Motionless Medium

By: Andrew Frisch, Farwell Schools

Modeling and mathematics are both load-stones of the Next Generation Science Standards and S.T.E.M education. However, achieving these two tasks can prove to be challenging. There are modeling kits, but they tend to be expensive and subject matter specific. Computer animations are available, but they are not student-created and lack human-to-human communication. Plain paper and a pencil (*Opportunity* and *Respect* in my classroom) are all that will be needed to complete these modeling activities and are easily modifiable for many science disciplines. “Action lines!” Comic books have used them for years to show power, strength and speed. Action lines are a simple, versatile, and highly effective technique to model movement and/or action. They allow models to have variation in frequency, speed, intensity, along with others.

Modeling Lesson Plan: Thermal Energy. Heating Up and Cooling Down, Background:

In many ninth grade Physical Science classes, the five forms of energy (PS3.A) and energy transfers (PS3.B) are covered within the Disciplinary Core Ideas.

- What are atoms doing differently within a hot rock, room-temperature rock, and a cold rock?
- What happens to the atomic movement and thermal energy, both kinetic to potential, as the hot rock cools down and the cold rock heats up? What happens to the room-temperature rock?

Materials:

- Three nearly same size and shaped rocks, about the size of a soft ball.
- Hot Plate with a 3-quart pot full of water.
- Cooler or tray full of ice.

Set up:

- Use a hot plate to heat water and one rock: *Hot Rock*
- Use the tray of ice to keep the pre-frozen rock cold: *Cold Rock*
- Leave one rock sitting in the room: *Room-temperature Rock*

Begin class by placing all three, dried rocks on to the countertop next to each other. Have the students come up and touch each rock. Allow them to have a tactical experience with the various thermal energies.

As the students return their seats, encourage them to communicate with each other about what they felt. Provide them time to share their ideas about each rock, as they focus their discussion on driving question, “What will happen to the hot, cold, and room-temperature rocks heat energy as class period goes on?”

The cold rock will get warmer; and the hot rock will get cooler.

Modeling and Mathematics:

Create the following models together using paper and pencil. (See Figure 1).

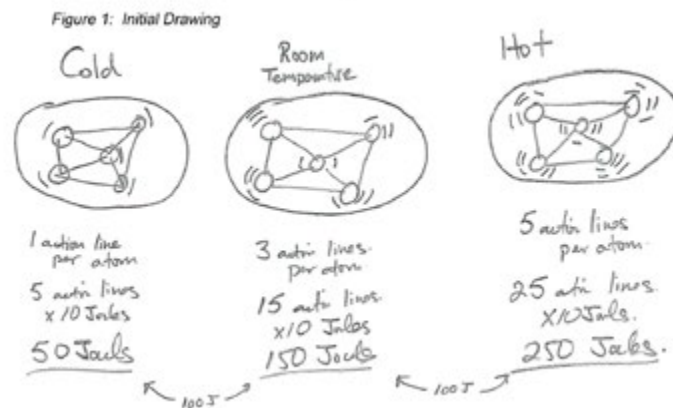
- Draw three large circles to represent the cold, room temperature, and hot rocks.
- Draw five small circles within each rock. Each circle represents one kilogram. (This is not accurate, but it provides the connection between mass and its unit.)

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CLASSROOM ACTIVITIES

EModeling and Mathematics: *continued from page 8*

- Draw lines between the atoms. All atoms must be connected to make it a solid. (Inquire how the models would be different as a liquid or gas?)
- Draw one action line (I use parenthesis as the symbol) around each cold atom, for a total of 5 action lines.
- Draw three action lines (parenthesis symbols) around each room temp atom, for a total of 15 action lines.
- Draw five action lines (parenthesis symbols) around each hot atom, for a total of 25 action lines



Action lines “() or))” represent various levels of atomic vibration; more action lines mean more energy, fewer lines mean less energy. The law of conservation of energy requires that energy is not to be created or destroyed. Where do the action lines or energy come from and where do they go?

In this model, the atomic structure is not as important as the atomic vibrations. In addition, depending on the level of your students’ mathematics the exactness of the values is less important than the conceptual thinking and patterns found within the phenomena. For example, in this model there are only five atoms randomly bonded together and each action line represents 10 Joules. This is not exactly correct, but it does provide the conceptualization of adding or removing a specific number of units of energy every time and that there is a specific number of atoms. Later these concepts would be modeled as *specific heat* and *mass*.

- Calculate the thermal energy of each rock.
Energy (number of action lines times 10) per atom times the number of atoms equals the total energy.

$$\text{Specific Heat} \times \text{Mass} = \text{Thermal Energy}$$

- Redraw the hot and cold rocks, modeling how their thermal energies will spontaneously transfer from the hotter substance to the colder as class time progresses. The models must provide an explanation of where the energy to make or remove action lines comes from and goes. (See Figures 2 and 3).
- In the redraw, add arrows “ \leftarrow ” to represent kinetic energy being added or removed from the environment. Each arrow will also represent 10 joules.
- In the *Cold Rock* model, ten arrows (100 Joules) must be drawn going into the rock, kinetic energy, to equal the ten action lines (100 Joules; two per atom) that have been added to the rock, potential energy.
- In the *Hot Rock model*, ten arrows (100 Joules) must be drawn going out of the rock, kinetic energy, to equal the ten action lines (100 Joules; two per atom) that have been removed from the rock, potential energy.

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CLASSROOM ACTIVITIES

EModeling and Mathematics: *continued from page 9*

Figure 2: Action of Atoms in the Cold Rock

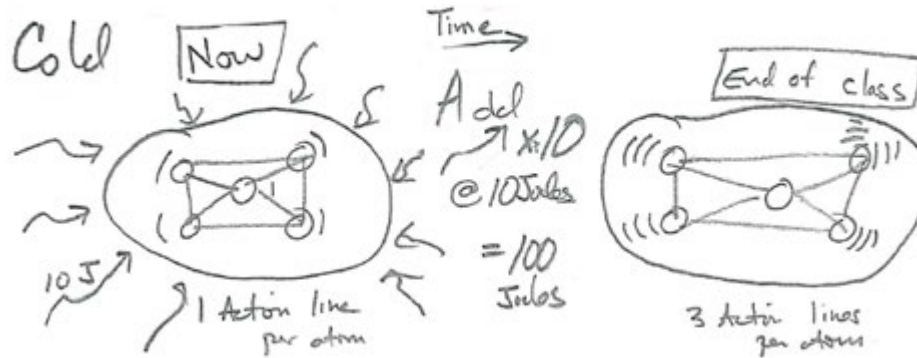


Figure 3: Action of Atoms in the Hot Rock



Extensions:

Additional examples should be redrawn to verify modeling and mathematic conceptualization.

- Where did the hot rock get its energy from to become hot? How was the cold rock cooled; what about previous thermal energies?
- How would making the rocks smaller change the model? Would they release as much energy?
- How would making the rock hotter change the model? Would it require more energy to get hotter?
- What if it was a different material? How would that change the action lines?

Use timers and thermometer to measure rate and temperature changes.

My favorite - Show a video clip of "a lava burp" at the exact moment when the lava boils and splashes like boiling water. Then have the students draw a model based on the one we created in class that would illustrate the "lava burp."

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CLASSROOM ACTIVITIES

EModeling and Mathematics:

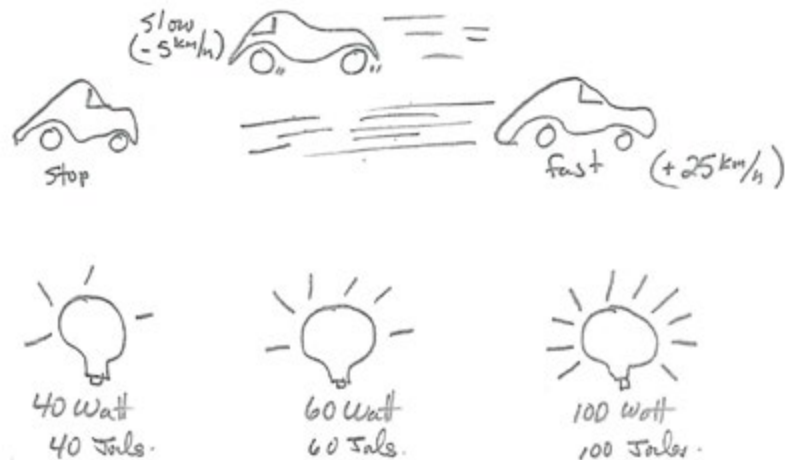
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Other Applications:

There are other opportunities to use actions lines as a modeling tool. (See Figure 4). As in motion, speed can easily be modeled as horizontal lines drawn trailing the moving object, variations in length and number could represent changes in energy and speed. Light intensity is another example of using action lines as a modeling tool in physics; it is called a “star burst”. The number of lines in the star represents its brightness. Brightness is measured in lumens.

When we are modeling, we have to put our comic book artist hat on. Think how great comic books show action and strength. These are simple but effective techniques to show movement and intensity. Talk to your art teacher friends for more ideas. Use your cross-curriculum connections to help students better understand energy and make motion on a motionless medium.

Figure 4: Other Applications





CMU Biological Station ON BEAVER ISLAND

Explore the natural environment while earning college credit at the CMU Biological Station on Beaver Island in northern Lake Michigan.

Opportunities for high school students and science teachers:

Students: BIO 100z Introduction to Field Biology July 8-19, 2019

High School students, get an introduction to the techniques and methods for field studies in biology. Learn about sampling procedures, interpretation and data analysis that emphasize basic ecological relationships between organisms and their environments.

Teachers: Many workshops offered including Water Quality for Educators, Bird Diversity, Great Lakes Plant Communities and more. See se.cmich.edu/CMUBS for more information.

Start your learning adventure with us.

CMU Biological Station on Beaver Island
Central Michigan University
John Gordon, CMUBS Station Manager
cmubs@cmich.edu
(989)-774-4400
se.cmich.edu/CMUBS



CMU is an AA/EEO institution, providing equal opportunity to all persons, including minorities, females, veterans and individuals with disabilities (see cmich.edu/ocrie).



Human Cadaver Workshop

Participants will be able to review their knowledge of human anatomy and physiology while learning new details as they study and manipulate actual human cadavers in the cadaver lab at Grand Rapids Community College. Participants will also learn how to use virtual reality cadaver dissection software that can be used in their classrooms at minimal cost.

Note: Participants must be current teachers of human anatomy and/or physiology or expect to teach it in the next academic year. *Preregistration is required at the MSTA conference website.*

Friday March 1, 6-8:30 p.m. Calkins Science Center building, Grand Rapids Community College

Workshop Leader: Dr. Greg Forbes, GRCC Biological Sciences, gforbes@grcc.edu

Resources, Ideas & News

A Short Note from MDE

By Joseph Baynesan (WDA), Higher Ed Consultant

Hello Colleagues,

As colleges are integrated technology in classrooms, some students might not have Internet service at home. I discussed the matter with Comcast employee whom I met at a conference, and he offered me a possible solution for students who might be struggling financially. I want to share a link from Comcast that offers significantly discounted Internet plans for families who qualify due to their current financial situation.

Comcast offers the “Affordable Internet at Home for Eligible Households Plan,” for qualified families. The

rate for this plan is \$9.95 a month plus tax. All what the students need to do is fill out the application to see if he/she are qualified: <https://apply.internetessentials.com/>

Please let the students visit <https://internetessentials.com/> to find out more about the program and I encourage you all to share this information with your students, colleagues and friends in the community.

DMAPT Hosts Second EASE Conference Focusing on Engineering Practices

On Saturday October 27th, the Detroit Metropolitan Area Physics Teachers (DMAPT) held their second EASE (Energizing All Science Educators) Conference at Royal Oak High School, in Royal Oak, Michigan. The focus of this year’s conference was on the Engineering Practices that are part of the Michigan Science Standards. Elementary, High School, University, and pre-service teachers from the greater metropolitan Detroit area participated in activities that they can take right back to their classrooms. One of the objectives of this year’s conference was to show how engineering practices can be integrated into existing curriculum and not become just one more thing that teachers have to make time for in an already crowded schedule. Additionally, the activities required very low-cost hands-on activities as well as paper-and-pencil tasks so that these are accessible for any teacher’s classroom budget. Follow the DMAPT on Twitter @DMAPTPhysics or on the web at www.dmapt.org for upcoming meetings and information.



MSTA: Celebrate engineering in Amplify Science!

Challenge your students to think, read, write, and argue like scientists and engineers. Amplify Science is a breakthrough K-8 curriculum that empowers students to make the leap from “learning about” to “figuring out.” In each Amplify Science unit, students inhabit the roles of scientists or engineers in order to investigate a real-world problem.

Learn more about Amplify Science at one of our MSTA sessions.

When:

Friday, March 1

Where:

Room Berkey

Time:

9-11 a.m.

Event:

What’s so phenomenal about phenomena? UC Berkeley Lawrence Hall of Science

1-2 p.m.

Think like an engineer with phenomenal science instruction!

2-3 p.m.

Unpack 3-dimensional standards with phenomenal science instruction

3-5 p.m.

Amplify Science: Wine and cheese reception

Hosted by your Amplify account executives:

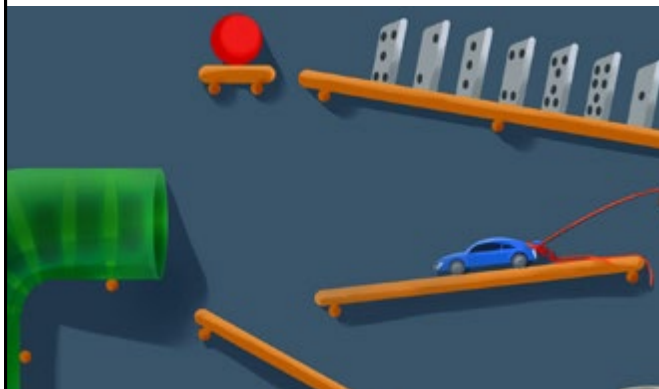
Jackie Roper

jroper@amplify.com
(312) 202-2598

Matt Paupore

mpaupore@amplify.com
(734) 740-2169

authored by



Connect Your Students to Science!

At the GRPM.

K-12 STEAM programs

- Water Quality Lab
- Design with littleBits

Science-themed exhibits on

- Ecosystems
- Electricity
- Environmental stewardship

Chaffee Planetarium shows

Archives tours

General field trips



Be curious. GRAND RAPIDS PUBLIC MUSEUM

Resources, Ideas & News

AMS Education Programs: Weather, Oceans, Climate Science

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

Three on-line courses for teachers are currently available. In each case the courses run about 13 weeks: once in fall (September - early December) and repeated in spring (end of January - April). Each week a different topic is addressed (through readings, on-line presentations, and activities). The amount of time varies from teacher to teacher due to different levels of prior knowledge. But participants say you should expect to put in 4 to 6 hours a week. Textbook, lab activities, extensive web site, some supplies, and three graduate credits are provided for a minimal fee of \$105 for the spring 2019 courses. But there are a limited number of slots for teachers each semester. Interested teachers are encouraged to apply early. [Note that starting in the fall of 2019 the cost will be \$350 to \$450.]

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

Climate Course

(Climate in the Earth System): This course identifies the factors that determine and define climate. The connections are made between climate and solar input, temperature, humidity, precipitation, and severe storms. Methods of measurement and modeling of climate, both recent and ancient, are discussed. The question of global climate change is discussed in the context of science research. The Climate web site is: <http://www.ametsoc.org/amstedu/ecs/home.html> and more information about the course at <https://www.ametsoc.org/index.cfm/ams/education-careers/education-program/k-12-teachers/datastreme-program/> . The application form can be found at: <https://www.ametsoc.org/ams/index.cfm/education-careers/education-program/k-12-teachers/datastreme-program/datastreme-program-application-form/>

You can submit your applications for the Climate course to:

Dave Chapman

2637 Raphael

East Lansing, MI 48823

Voice: (w) 517- 706-4886; (h) 332-8123

Fax: 517-351-9786

Email: dave.chapman@okemosk12.net ; chapmad@comcast.net

Ocean Course

(DataStreme Ocean): This is primarily a physical oceanography course which includes, among other things, physical and chemical properties of water, ocean plate tectonics, currents, tides, ocean-atmosphere interactions, Great Lakes, basic marine ecology, and the role of the ocean in climate. The DataStreme Ocean web site is: <http://www.ametsoc.org/amstedu/ds-ocean/home.html> and more details about the course at <https://www.ametsoc.org/index.cfm/ams/education-careers/education-program/k-12-teachers/datastreme-program/> .

An application form is found at <https://www.ametsoc.org/ams/index.cfm/education-careers/education-program/k-12-teachers/datastreme-program/datastreme-program-application-form/>

You can submit your applications to:

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Fax: 517-351-9786

Email: dave.chapman@okemosk12.net ; chapmad@comcast.net

Weather Course

(DataStreme Atmosphere): Basic concepts of meteorology are the focus of this course. They include separate chapters on weather measurements and tools, composition of the atmosphere, heat and temperature, air pressure, humidity, clouds and precipitation, wind, air circulation, air masses and fronts, hazardous storms, and weather forecasting. The DataStreme web site is: <http://www.ametsoc.org/amstedu/dstreme> . To find out more about his course, go to <https://www.ametsoc.org/index.cfm/ams/education-careers/education-program/k-12-teachers/datastreme-program/> .

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Resources, Ideas & News

AMS Education Programs: Weather, Oceans, Climate Science *continued from page 15*

An application form is found at: <https://www.ametsoc.org/ams/index.cfm/education-careers/education-program/k-12-teachers/datastreme-program/datastreme-program-application-form/>.

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

Dave Chapman

2637 Raphael

East Lansing, MI 48823

Voice: (w) 517- 706-4886; (h) 332-8123

Fax: 517-351-9786

Email: dave.chapman@okemosk12.net ; chapmad@comcast.net

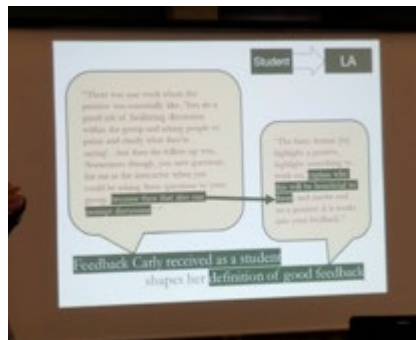
There Also are two comprehensive **summer courses**: one about weather (Project Atmosphere) at the National Weather Service Training Center in Kansas City and the other about Oceanography (The Maury Project) at the U.S. Naval Academy in Annapolis. For more information about these programs go to: <http://www.ametsoc.org/AMSedu>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

MiAAPT Fall 2018 Meeting at Interlochen

The Michigan chapter of the American Association of Physics Teachers (MiAAPT) gathered at Interlochen Center for the Arts for the annual fall conference on October 13th. The MiAAPT were hosted by Taoufic Nadji, a teacher of physics and astronomy at Interlochen. Attendees at the conference included high school teachers, university physics professors and researchers, pre-service teachers, and high school students from Interlochen. Presentations were given on topics ranging from the use of writing and reflection as important tools for learning, the use of computer programming to build simulations in the physics classroom to an interesting

look at some of the current thinking about the Drake Equation.

The keynote speaker for the event was Dr. Brian McNamara from the University of Waterloo, Ontario. Dr. McNamara presented evidence for the existence of supermassive black holes at the center of galaxies and the role they play in controlling the growth of galaxies. The MiAAPT Spring Meeting is scheduled for March 16th at the University of Michigan in Ann Arbor. For more information about the MiAAPT go to www.miaapt.org.





THE BEST SIDE JOB YOU'LL EVER HAVE!

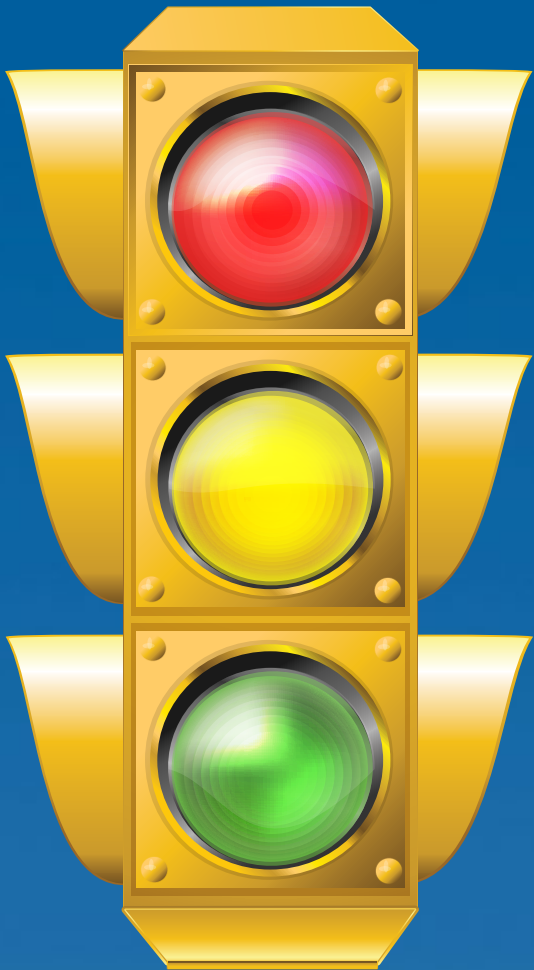
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Avoiding Teacher Burnout

By: Jennifer Richmond, Region 9 Director

As a science teacher who has transitioned to the “dark side” (administration), one of my biggest daily concerns is the health of my teachers. Not just physical health, but psychological health as well. Let’s face it. Teaching is not for the weak of heart, mind, or spirit. Teaching is a **tough** job. (And I can also attest that **leading** teachers, as a principal, is a tough job as well!)

I am beyond proud of the staff at my building. They each eagerly care about their students and they selflessly strive to improve their practice. However, being eager and selfless are also the traits that I worry about most in them. They put others first so often, that they sometimes neglect themselves. I am constantly concerned about their self-care and their own health.

To this end, I share tidbits I find online with helpful tricks for relaxing. We have staff workouts after school on certain weekdays. I give them time on Friday mornings to work together as a staff while I take care of the students. We find humor in our jobs and we encourage one another to keep trying and keep going.

One of the best things I have done this year for myself and my own psychological health was to attend the MEMSPA conference. (Michigan Elementary & Middle School Principals’ Association) At this conference I was able to connect with local administrators to talk about our county-wide issues, but I was also able to network with administrators from all over Michigan. We were able to share our struggles but also our achievements and the great things we are seeing/doing. I was able to learn from some amazing presentations and I can honestly say I’ve never been to a conference that impacted me as much as this one did.

Here are a few of the speakers, in particular, who really resonated with me.

1. **Sean Covey**. He discussed goal setting and finding the “genius in everyone”. I’ve applied his ideas to not just my school, but also to my personal life. I am setting a few “WIGS” (wildly important goals) and will not stray from those!

2. **Allyson Apsey**. She actually is the principal of a school in Zeeland where my 2 nieces attend. Small world! She focused on the idea of “serendipity” and the idea that you get to choose every day what kind of a day you will have. Her positivity and enthusiasm is contagious and I enjoyed meeting her very much.

3. **Kim Campbell**. She was a keynote speaker one of the mornings of the conference. If you’ve ever presented, you know how tough being the first presentation of the day can

be. She spoke as we were finishing breakfast and she was hilarious. She taught me that our jobs are FUN and that it is ok to find the humor in every day; to not take ourselves so seriously.

4. **Ben Gilpin and Erin Kreger**. These speakers touched on mindfulness and how to incorporate a few mindful behaviors into your day to keep you grounded. After listening to them present, I transformed a corner of our office at school into a “mindfulness” area. There is a comfy bean-bag chair, some squishy toys, a calm-down jar, and more. Students who need a break for a few minutes can come and get themselves centered in this area. So far, it has worked great!

5. **Jimmy Casas**. Jimmy was the closing keynote and, again, that is a tough job. He was engaging and so inspiring. The part of his message that stuck with me most was the question “Why doesn’t every month look like September and May in schools”? Think about it. Think about how excited you are in September to meet your new students and get back into your classroom. Think about May and how excited you are to see the sunshine and how sad you are to be sending your students off at the end of the year. (There are a few we might be kind of excited to see go, but mostly we are sad to lose our “kids”.) Now think about the months in between. Do you have the same enthusiasm for your classroom in November, February, March, etc. as you do in September or May? If you’re like me, the answer is “definitely not”. That is something I will be trying to change for myself.

So, in short, this conference came at a perfect time for me. It was in the early part of December and I was feeling burnt out and tired. This conference, in particular its speakers and networking opportunities, was amazing.

If you are feeling the burn out and are in need of some rejuvenation, you are in luck. The MSTA’s 66th annual conference is coming up soon (March 1-2, 2019) in Grand Rapids. This could be the conference that changes your life as an educator. This could be the conference that reinvigorates you and reminds you why you took on the important task of educating our children.

If you attend, I’d love to meet you! Look me up. I am the Region 9 Director and I would love to hear about all of the great things you do in your school. If you attend, I hope you take advantage of the networking opportunities as well as the getting to as many sessions as possible. Until then, I hope you can find the humor in your classroom by choosing to have a great day **every** day, that you can focus on a **few** wildly important things, and that you can find ways to make every month feel like September!

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Resources, Ideas & News

Michigan Alliance for Environmental and Outdoor Education (MAEOE)

The mission of the Michigan Alliance for Environmental and Outdoor Education (MAEOE) is to serve as the statewide network and advocate for professionals who are educating Michigan citizens toward environmental literacy, stewardship and outdoor recreation.

Annual Conference

MAEOE's annual conference was held October 4 -7, 2018 in Port Huron at the Blue Water Convention Center. Formal and non-formal educators from around the state and Canada joined experts in the fields of environmental and outdoor education for a weekend filled with presentations, hands-on activities, field trips and networking. MAEOE recorded its largest attendance, in a decade, during this year's conference.

During the conference eleven educators, from around the state, graduated from the Environmental Education Certification (EEC) Program. The formal and non-formal educators completed 5 strands of requirements including professional development, writing a research paper on a current EE topic, and completing an action project within their community. The EEC is a nationally recognized certification.

Mark your calendars for MAEOE's 2019 conference being held September 26-29 at the Kettunen Center in beautiful Tustin, MI. Check out maeoe.com for more details!

MAEOE EE Grants

MAEOE offers Environmental Education (EE) Grants to members to help broaden the horizon of students, educators, and families to bring them closer to the natural world. The grant must be used for an EE program for the public that incorporates outdoor activities.

MAEOE awarded its 2018 fall grant of \$500 to Whitney Vanoost, special education teacher in Detroit Public Schools Community District. Whitney will be purchasing outdoor exploration kits, as well as organizing a study trip for her students to Belle Isle this spring. Congratulations Whitney!

Grants are considered twice a year in March and October. The next upcoming deadline to apply for a MAEOE grant is March 1, 2019!

For the full list of grant criteria and the application, please visit maeoe.com

MAEOE Environmental Education Certification (EEC)

The environmental educator certification (EEC) program allows new educators, both formal and non-formal, and career professionals the opportunity to invigorate and align their program objectives and set personal and professional goals to improve Michigan's environmental education. The EEC is internationally recognized by and aligns with the requirements of the North American Association of Environmental Education (NAAEE).

Candidates are required to complete 5 Strands including professional development, EE research paper, teaching EE lessons, and completing an action project within his/her community. For more information concerning MAEOE's EEC certification program please visit maeoe.com. Look for a Strand 1 workshop coming soon to begin your EEC journey!

Wildlife Weekend!

MAEOE will be hosting a Wildlife Weekend, February 1-3, at the beautiful Ralph A. MacMullan Conference Center on the north shore of Higgins Lake. This weekend will include engaging and fun instruction about Michigan's natural resources where you will become the neighborhood expert! Choose from *Mammal Mania* or *Michigan, My Michigan* sessions. For more information on sessions and how to register, please visit maeoe.com.

Become a Member

MAEOE is a professional organization for formal and non-formal educators interested in environmental and outdoor education. Membership benefits include networking with experts around the state, EE and outdoor education resources, annual conference, MAEOE meetups, (more networking) throughout the year, grant opportunities, MAEOEgram journal, and more! Get involved and become a member today at maeoe.com!

Resources, Ideas & News

Preparing for the new M-STEP? Mi-STAR is here to help!

By Amanda Gonczi, Marcia Goodrich, Stephanie Tubman, Chris Wojick, Jackie Huntoon (Michigan Technological University)

The Michigan Science Teaching and Assessment Reform (Mi-STAR) project is well on its way to completing a full curriculum for grades 6-8 that is designed to align with the new Michigan Science Standards (and the Next Generation Science Standards; NGSS). These standards emphasize all three dimensions of science and engineering: the crosscutting concepts, science and engineering practices, and disciplinary core ideas. Because the Mi-STAR curriculum aligns with the Michigan Science Standards, teachers who use Mi-STAR units are helping their students prepare for success on the new science portion of the Michigan Student Test of Educational Progress (M-STEP), which will be rolled out statewide in spring 2020.

Mi-STAR recognizes that schools and teachers try to prepare students for success on standardized tests such as the M-STEP. To support their efforts, Mi-STAR's assessment team collaborates with Mi-STAR's curriculum development team to ensure that Mi-STAR's curriculum and assessments address all three dimensions of science and engineering. In addition, the assessment team has reviewed the M-STEP sample test questions released by the Michigan Department of Education and determined that Mi-STAR assessment items are very similar to M-STEP questions in terms of complexity, length, and three-dimensionality. This means that Mi-STAR students have the opportunity to practice taking assessments, throughout a unit, that are similar to those that will be part of Michigan's new three-dimensional science assessments.

Opportunities for assessment in Mi-STAR units include pre/post assessments, Check Your Progress phases, embedded assessments, and Unit Challenge tasks. All of the assessments have been piloted by teachers and fine-tuned based on their feedback. The pilot testing and refining process help to ensure that teachers can feel confident that the assessments will work. To learn more, read the [Mi-STAR Assessment Overview for Teachers](#)¹.

Mi-STAR's assessment activities and associated answer keys and rubrics are all optional tools that teachers can choose to use to assess student learning. The assessments can be used by teachers in whatever way works best for them. Teachers are also free to decide the degree to which the results of assessment influence students' grades. While assessment results typically play some role in determining a student's grade, other factors, such as completing assignments and classroom participation, are commonly also considered by teachers.

Pre/Post Assessments: These tests are given to students at the beginning and end of each unit and are a formal opportunity for students to show growth in knowledge, skills, and abilities related to the disciplinary core ideas, science and engineering practices, and crosscutting concepts targeted in a unit. Each pre/post assessment is designed to be comprehensive and includes three-dimensional assessment of the primary performance expectations assigned to the unit.

Check Your Progress: Every lesson contains a "Check Your Progress" phase that teachers can use to determine how well students have learned the material. Check Your Progress tasks can also be used by parents and caregivers who want to help their children at home. Caregivers who use the Check Your Progress tasks can help students gain more practice in all three of the dimensions of science learning including the use of science and engineering practices and crosscutting concepts.

Embedded Assessments: Embedded assessments are used in the Check Your Progress phase at key points in each unit. The embedded assessments are three dimensional, meaning they require students to put their knowledge (disciplinary core ideas and crosscutting concepts) to work while simultaneously engaging in a science and engineering practice. Embedded assessment materials include an answer key or grading rubric that can be used by teachers to gauge the degree of mastery of content knowledge and/or skills, to guide the focus of future instruction, or as a basis for assigning grades.

Unit Challenge: Each Mi-STAR unit centers on a real-world, Michigan-relevant problem. At the end of each unit, students summarize and document their findings in some way. Teachers can use this culminating task as an opportunity for formative or summative assessment, and Mi-STAR has developed a checklist or rubric for some Unit Challenge student products. The results of end-of-unit assessments can be used to guide future instruction and/or to assess students' learning of the material included within the unit.

Of course, preparing students for high-stakes tests is only one reason why assessments are integral to any curriculum. Assessments help teachers and their students identify areas in which students' are able to demonstrate competence and areas in which additional practice is needed. Mi-STAR's suite of assessments provides teachers, students, and parents with information that can identify areas of students' proficiency or need, gauge the impact of instruction, and inform planning for future instruction.

1. <https://docs.google.com/document/d/1jPAxxswdt0-Wn7VQ5fJ9QVHaXyzEeRcsnTGKBOC3GXg/edit>

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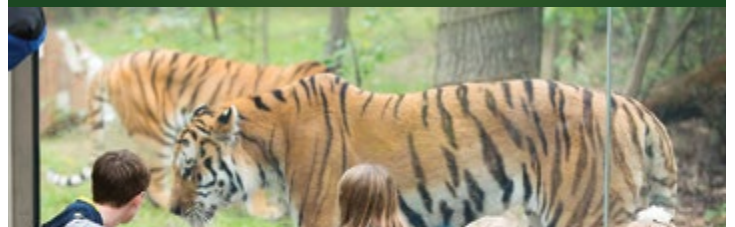
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Resources, Ideas & News

Students Bring Their Science Ideas to Life with Seesaw

By Crystal Brown, Elementary STEM Teacher, Gibraltar School District, MSTA Elementary Director

As a busy classroom teacher of almost 30, I hardly ever had time to sit with a student as they explained their thinking about their electrical circuit model. Who has time for that when you have reading assessments and math inventories to do for all of them multiple times a year!? With so many assessments to give and not enough time to give them, teachers often let go of one on one time during Science time in the elementary school. Unfortunately, this individual time is when we hear student explanations of phenomena, their reasoning about their evidence, or the workings of their model.

When I started using Seesaw, it gave my students the freedom to share their work on their own time, while I was able to hear their ideas on my own time! I started using Seesaw in math to capture a student's math work in action. After a few days, I quickly saw it as an incredible formative assessment tool!



If you're not familiar with Seesaw... do a quick search and watch an informational video. Students can post a photo, drawing, video, file, or text. Students can add a text caption, draw on a photo, record a voice caption, and add art. You'll be hooked. You'll be obsessed. Your teaching life will be changed. All of a sudden, Science Journaling has a very vivid digitized life. All of a sudden, our students' thoughts and ideas not only become visible, they become audible and accessible to peers and families for immediate feedback.

In first grade, we work at asking questions about phenomena. Curiosity drives exploration and provides the opportunity for modeling instruction. Just recently I was inspired to give students a warm bowl of water

and have them drop in a few M&M's and just watch. Because students have been using Seesaw as a student journal, they were easily able to take a before picture and comment with their predictions. As soon as they dropped the M&M's in, they grabbed their iPads and took many more pictures as the phenomena occurred. Throughout the activity, I was able to record students talking and interacting as they giggled and talked about what they could see. This video is easily posted as a teacher to Seesaw so parents have a context for the images they are about to see. When the M&M's were done, students were brought up front for a first grade modeling mini-lesson. Following their lesson, students were able to use their iPads, post a picture of the M&M's, adding arrows and labels about what they could see, and a voice caption with their questions about what happened.

With my phone plugged in to my speakers after school, I'm able to quickly see images and hear the thoughts of my first graders about their experiences. The possibilities of Seesaw as a Digital Science Journal are endless!

Follow @Seesaw on Twitter, join free PD in Pajamas webinars. You'll be amazed at how many ways Seesaw can be applied to elementary science. As always, contact me if you have any questions or would like to hear more about Elementary Science/STEM implementation!

