

Montana Science Teachers Association



# NEWS JOURNAL

A publication of the Montana Science Teachers Association

**September 2015**



## **In this Issue:**

**• From the President • MSTA Conference Information • Opportunities for Teachers • Opportunities for Students • NSTA • NGSS • Teacher Awards • and more...**

## Submitting Articles to the MSTA News Journal

When submitting articles, please adhere to the following criteria:

- Electronic submissions are preferred in Microsoft Word format. These can be attached to your email message.
- If in doubt about format, submit your work in .rtf format.
- If truly in doubt, paste your submission in the body of the email message.
- Lab activities may be mailed. Please cite any references.

**John Graves, Editor**  
graves@montana.edu

**Tentative Submission/Publication Dates**  
August 15/September  
November 15/December  
February 15/March  
April 15/May

### Montana Science Teachers Association Membership Application

Name \_\_\_\_\_ Date \_\_\_\_\_  
Last First

Address \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_

City \_\_\_\_\_ County \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

School/Affiliation \_\_\_\_\_

School Phone(\_\_\_\_) \_\_\_\_\_

Email \_\_\_\_\_

Grade Level	Subject	
<input type="checkbox"/> K-6	<input type="checkbox"/> All sciences	<input type="checkbox"/> Physics
<input type="checkbox"/> 6-9 MS or JH	<input type="checkbox"/> Life Science	<input type="checkbox"/> Chem
<input type="checkbox"/> 9-12	<input type="checkbox"/> Phys Science	<input type="checkbox"/> Other
<input type="checkbox"/> College/Univ.	<input type="checkbox"/> Earth Science	
<input type="checkbox"/> Sup/Admin.	<input type="checkbox"/> Biology	

#### Dues Category

1 year	\$20.00	_____
MSTA/MCTM	\$30.00	_____
MSTA/MEEA	\$30.00	_____
3 years	\$50.00	_____
Life	\$150.00	_____
Student	\$5.00	_____
Retired	\$5.00	_____

Make checks payable to MSTA

Return to Carol Pleninger  
360 73<sup>rd</sup> Avenue W  
Havre, MT 59501

## FROM THE PRESIDENT

Welcome back!

It sure seemed like a short summer to me, but I am hearing that from a lot of people. I hope that you had a chance to do some rest, rejuvenation, and reflection this summer. Speaking of rejuvenation and reflection, the MEA-MFT convention is just around the corner and is a great opportunity to do just that. MSTA has 70 sessions planned as well as our hospitality room as a place to take a rest and connect with fellow science teachers. We will also have our keynote speaker Thursday at 1 pm; Dr. Mark Cracolice from U of M who has some great information about how to make our teaching even more effective and that critical thinking indeed can be taught in the sciences! Our annual luncheon and meeting will be Thursday at noon so make plans to schedule both of these important sessions into your Thursday plans for the annual gathering of Montana teachers this October 15-16 at Skyview High School in Billings. This summer I had the opportunity to attend the NSTA Congress on Science Education and learned that we are very fortunate to have two days built into our year for professional development where the state's teachers have an opportunity to meet and collaborate and learn from each other. In many states these meetings just do not happen and when I shared our state's convention the delegates at the meeting were impressed and jealous! So let's not take this opportunity lightly and take advantage of the opportunity to meet and share our successes and learning opportunities with each other! We have some great things to share and I am so thankful for the opportunity to learn what you all are doing! Go register today at [http://www.mea-mft.org/educators\\_conference.aspx](http://www.mea-mft.org/educators_conference.aspx) I hope to see you in Billings in a few short weeks!

Tom Cabbage



MSTA President  
Opportunities for Teachers

The MSTA Conference will be held at the MEA-MFT Conference, October 15-16 in Billings.

The **ONLY** schedule you'll get is **ONLINE**, so get it before the conference:

[http://www.mea-mft.org/educators\\_conference.aspx](http://www.mea-mft.org/educators_conference.aspx)

Highlights of the Conference include...

- New Teachers Breakfast both days
- MSTA Annual Meeting and Luncheon
- Keynote Speaker Mark Cracolice
- Over 70 sectionals in ALL areas of science

**KEYNOTE SPEAKER**

**MSTA (Science)**  
**Mark Cracolice**

**Critical Thinking in Science and Beyond**

Thursday, October 15, 2015 1:00 PM - 1:50 PM

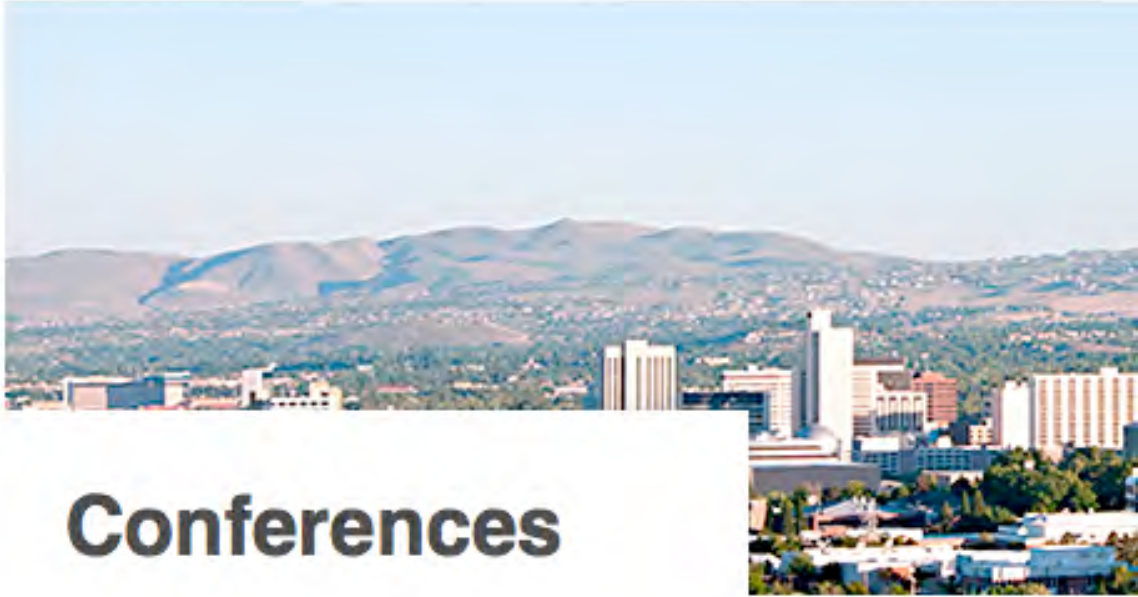
*Skyview High School Theatre*

*Renewal Units: 1*

In today's world, it is imperative that students have the ability to reason rather than simply memorize information. The need to provide students with the skills needed to succeed in processing information, making choices, and justifying and defending those choices has never been more essential. We will learn how its done.



# NSTA Regional Conference Reno, NV October 22-24



## Conferences

Area Conference in Reno: October 22–24, 2015  
*Science and Literacy: Creating Connections!*

Register here:

<https://secure.nsta.org/conferences/registration/>

# Interested in NGSS?

Want to engage in conceptual change around the 3 Dimensions of NGSS?

Check out the Toolkit for Conceptual Change:

[www.mtscienceducation.org](http://www.mtscienceducation.org)

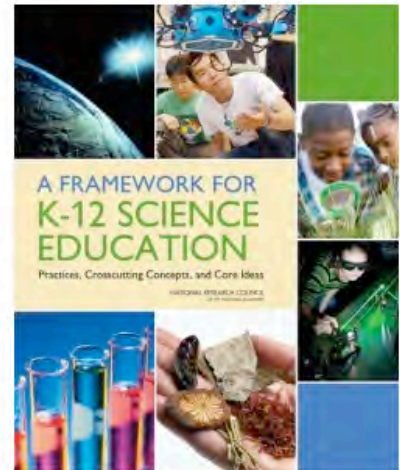
## Welcome to the Montana Partnership with Regions for Excellence in STEM (MPRES)



The National Research Council's (NRC) [Framework for K-12 Science Education](#) describes a vision of what it means to be proficient in science; it rests on a view of science as both a body of knowledge and an evidence-based, model and theory building enterprise that continually

extends, refines, and revises knowledge. The **Montana Partnership with Regions for Excellence in STEM (MPRES)** project is designed to help teachers implement the Framework, and teachers who engage in [MPRES Professional Development](#) will be on the cutting-edge of science education.

[Read more about the three dimensions and download the complete NRC Framework online from the National Academies Press.](#)



## Classroom Activities



Looking for NGSS classroom activities/lessons?  
Check out this resource at [ngss@nsta](http://ngss@nsta)


### Elementary

#### Light Your Way

**Contributor:** Virginia Children's Engineering Council VCEC

**Type Category:** Instructional Materials

**Types:** Lesson/Lesson Plan , Activity , Rubric

[View this Resource](#) 

[Back](#)

#### Description

Using the engineering design process, students will be designing and building a lantern that they will hypothetically be taking with them as they explore a newly discovered cave. The criteria of the completed lantern will include: hands need to be free for climbing, the lantern must have an on/off switch, it must point ahead when they are walking so they can see in the dark, and the lantern must be able to stay lit for at least 15 minutes. The constraints of the activity will be limited materials with which to build. At the completion of the activity, the students will present their final lantern to the class explaining how they revised and adapted the lantern to meet the criteria of the project. Students will include in the presentation the sketch of the model they created prior to building showing the labeled circuit they designed. This activity was one of numerous engineering lessons from the Virginia Children's Engineering Council geared towards Grades 1-5. <http://www.childrengineering.org/technology/designbriefs.php>

**Intended Audience:**

Educator

**Educational Level:**

- Grade 5
- Grade 4

**Language:** English

**Access Restrictions:**

Free access - The right to view and/or download material without financial, registration, or excessive advertising barriers.

From <http://ngss.nsta.org/Resource.aspx?ResourceID=262>

## Upper Elementary/Middle

# The Life of Environments

**Contributor:** Mind My Education  
**Type Category:** Instructional Materials  
**Types:** Unit

View this  
Resource ↓

Back

### Description

This 4th grade unit is designed to address the concept that organisms sense the environment in order to live. It is a far-ranging and comprehensive unit that is designed to address multiple NGSS performance expectations (4-LS1-2, 4-LS1-2, 4-PS3-2, 4-PS4-2) in seven explorative sections, with an additional summative assessment step. STEP 1 - the structure of the unit is introduced and students complete a KWL-type activity. STEP 2 - students make observations outdoors and explore the meaning of alive, eventually developing a model of an environment for seeds, creating it and monitoring the growth of plants over the course of the unit. STEP 3 - students learn about the types of energy organisms perceive through a Reader's Theater activity with material at three differentiated reading levels. STEP 4 - students read about and construct 3-D models of how humans perceive sense information from the environment and convert that energy into a different form that the brain can process to make sense of and respond to stimuli. STEP 5 - students use text and math skills to develop an understanding of the brain's structure and function. STEP 6 - students explore environmental change and the interactions between those changes and the organisms within the environment, and then investigate the effects of varying the environment of the seeds they've been monitoring since being planted in Step 2. STEP 7 - students synthesize their understandings of the unit. They create a model of an imagined environment in small groups, and then construct and write a viable argument as to how their senses could help them survive within this imagined environment. STEP 8 (summative assessment) - students synthesize many of the ideas and practices they have explored during the unit. It is estimated to take at least 11 hours of instruction, although individual steps could be adapted, extended, or done separately to address specific standards.

**Intended Audience:**

Educator

**Educational Level:**

- Grade 6
- Grade 5
- Grade 4

**Language:** English

**Access Restrictions:**


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From <http://ngss.nsta.org/Resource.aspx?ResourceID=189>



## High School

# Physics 250 Laboratory: Conservation of Energy

View this Resource 

Back

**Contributor:** Penn State University

**Type Category:** Assessment Materials

**Types:** Experiment/Lab Activity

### Description

This is a lab activity involving transformations between the gravitational potential energy, elastic potential energy, and kinetic energy of a system. An air track with a glider and a photo gate timer are needed to perform the lab. The lab is divided into three separate but related parts. The first part involves using a spring to launch the glider horizontally, measuring the velocity of the glider, and then relating elastic potential energy to kinetic energy. The second activity involves adjusting the air track so that when the glider is launched, it goes up an incline. This set up allows students to relate elastic potential energy to gravitational potential energy. The third and final activity ties elastic potential, gravitational, and kinetic energy together. Using the knowledge they acquired from the first two activities, the students need to use Conservation of Energy to predict the velocity of the glider as it is launched up the incline and then compare their prediction to the experimental value.

**Intended Audience:**

Learner

**Educational Level:**

- Grade 12

**Language:** English

**Access Restrictions:**

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From <http://ngss.nsta.org/Resource.aspx?ResourceID=27>

## Opportunities for Students



The Science and Math Resource Center at MSU and the Montana Science Olympiad are very excited to announce that the 31<sup>th</sup> Annual Montana Science Olympiad will take place on Tuesday, November 24, 2015 on the MSU-Bozeman campus. More than 1000 middle and high school students from all across Montana are expected to participate!

Montana Science Olympiad gives an opportunity for Montana's middle and high school students interested in science, technology, engineering and mathematics be a part of competition, see research labs and state of the art facilities, communicate with MSU researchers and graduate students, and participate in talks & tours at MSU. Furthermore, winners of the competition have a chance to participate in the National Science Olympiad.

For more information on registration, list of competition events and other related information please visit the Montana Science Olympiad website  
<http://www.montana.edu/ehhd/sciencemathresourcecenter/mtso/index.html>

Please feel free to contact Elena Turner, a coordinator for the 2015 Montana Science Olympiad by email [mtscioly@gmail.com](mailto:mtscioly@gmail.com) or phone (406) 994-7476

**Your school team is invited to participate! We hope to see you November 24, 2015!**

Check out this site:

Atomic Kids

www.atomickids.org

**Atomic Kids** Search

Contact | Login | Create Profile

Discovering Atoms early in life Tuesday, September 8, 2015

⊕ ATOMIC THEORY  
⊕ PHYSICS

*"Us primary kidz are much brighter than grown ups think! We hear about atoms all the time on the Big Bang Theory and The Simpsons, so why have they decided to keep atoms a secret in primary school? Duhhhh!*

*Atomic Theory is at the key to all the other cool sciences like genetics, nanotechnology and rocket science. Give us a chance to invent new theories and save the world by teaching us about atoms in primary school, and while we are still keen about science?"*

**Girl Professor**  
Girls can do anything.

## MSTA E-blast Listserv

to sign up, visit the website and  
follow the E-blast link

Be sure to sign up for the  
MSTA E-blast



Montana Science Teachers' Association

# Teacher Award Opportunities

For information on awards, visit  
<http://www.nsta.org/about/awards.aspx>

**Click on an item in the list below to read a description of the award.**

- [Angela Award](#)
- [Distinguished Informal Science Education Awards](#)
- [Distinguished Service to Science Education Awards](#)
- [Distinguished Teaching Awards](#)
- [DuPont Pioneer Excellence in Agricultural Science Education Award](#)
- [Faraday Science Communicator Award](#)
- [Maitland P. Simmons Memorial Award for New Teachers](#)
- [Ron Mardigian Memorial Biotechnology Explorer Award](#)
- [Northrop Grumman Foundation Excellence in Engineering Education Award](#)
- [NSTA Fellow Award](#)
- [NSTA Legacy Award](#)
- [PASCO STEM Educator Awards](#)
- [Robert E. Yager Foundation Excellence in Teaching Award](#)
- [Robert H. Carleton Award](#)
- [SeaWorld Parks and Entertainment Outstanding Environmental Educator of the Year](#)
- [Shell Science Teaching Award](#)
- [Shell Urban Science Educators Development Award](#)
- [Sylvia Shugrue Award for Elementary School Teachers](#)
- [Vernier Technology Awards](#)
- [Wendell G. Mohling Outstanding Aerospace Educator Award](#)

# Mark Your Calendars

Oct. 15 & 16: MEA, Billings

Oct. 22-24: Regional NSTA conference in Reno

Nov. 24: Science Olympiad – MSU, Bozeman

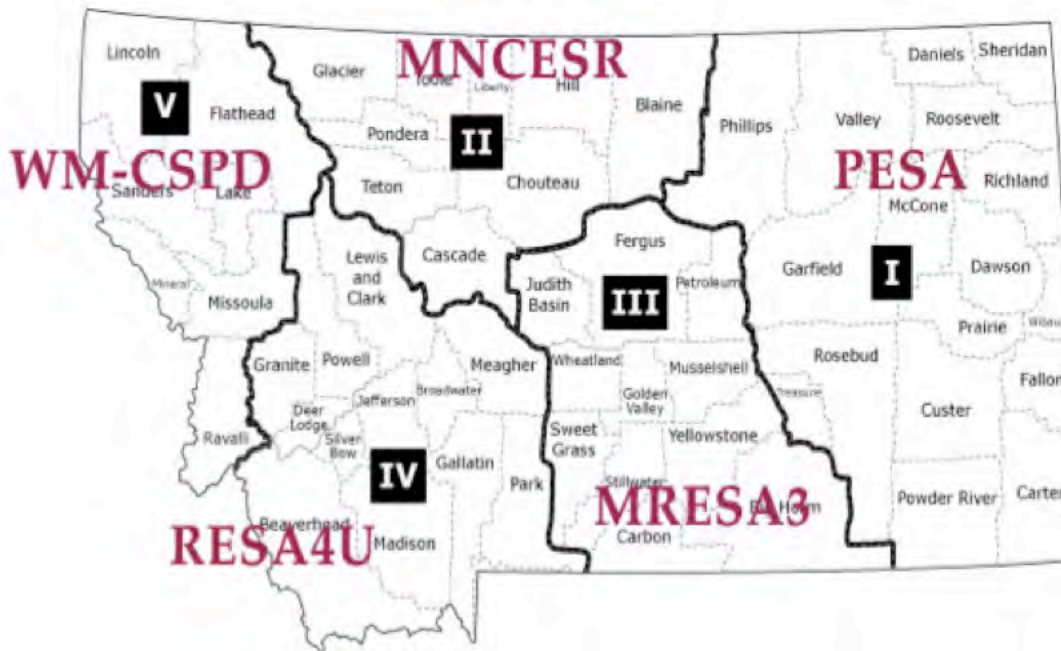
March 31- April 3: NSTA National Conference – Nashville, TN

April 13-16: NCTM National Conference – San Francisco, CA



## MSTA Regions

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Numerous representative and board positions are currently available. If interested in running for an MSTA office, please contact Tom Cubbage:

[tom\\_cubbage@gfps.k12.mt.us](mailto:tom_cubbage@gfps.k12.mt.us)

See the MSTA website for a list of Board positions: follow the Board Members link

[www.montanascience.org](http://www.montanascience.org)