

# NEWS JOURNAL



**A publication of the Montana Science Teachers Association**

**February 2018**

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- **Teacher Lessons on the NGSS Practice Developing and Using Models**
- **Summer Employment Opportunity**
- **Professional Development**

**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.

**Judy Boyle, Editor Tentative Submission/Publication Dates**

sagemountaintrail@gmail.com August/September (Fall Issue)  
November/December (Winter Issue)  
February/March (Early Spring Issue)  
April /May (Late Spring Issue)

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This News Journal's focus is on the NGSS Science and Engineering Practice- Developing and Using Models. If you would like to submit an activity or lesson, our next practice will be Mathematics and Computational Thinking. Please submit your article by March 1, 2018 to sagemountaintrail@gmail.com.

It was wonderful seeing all of you at the MEA-MFT Conference last October. MSTA President Jessica Anderson attended the Educators' Conference Organizational Meeting in Billings in January to help plan this year's conference in Billings, MT. Please consider being a presenter at the October 2018 Educators' Conference. All of you have so much to share with other teachers.

Thank you for providing exceptional science education to our Montana children.

Judy Boyle  
MSTA President-elect

## Defining Landforms and Bodies of Water By Kristi Gaines

One great feature of our new Montana Science standards--and the NGSS--is the Science and Engineering Practices (SEPs) we should use to teach the science concept are often rolled right into the wording of the standard. One such standard is ***2-ESS2-2: Develop a model to represent the shapes and kinds of land and bodies of water in an area.***

While this is a science concept that I'd taught about in the past, I'd always used paper, 2-dimensional models to have students demonstrate their understanding & recall of the different types of bodies of water. In order to take this lesson to a new level, I changed up my supplies and the overall scope of the lesson. I utilized the [5E's method](#) to redesign this learning opportunity.

**Engage:** To engage students, we looked at pictures of local bodies of water. Students shared noticings about the surrounding landforms. We talked about observations we've made to provide evidence as to the common characteristics of the different bodies of water. This information was added to the [KLEWS chart](#) we'd been building throughout the unit.

**Explore:** Next, pairs of students were given clay and a shallow pan to build in. The challenge was to use the clay to build a model of a local area that included at least one body of water. Students could refer back to the pictures provided during the *Engage* portion of the lesson, or they could work from memory of a favorite location. They also had access to small funnels and water in order to test out if their model indeed created the body of water that they expected. (Most students quickly realized that one body of water usually turned into a water system!)

**Explain:** Students then met in small, strategic groups to demonstrate and explain their model to others. My strategy for grouping was to find 2-3 pairs of students who'd attempted different model types in order to create rich discussion.

**Elaborate:** The elaborate phase of this lesson provided time for students to go back and revise their models based on their conversations and learning during their peer groups. I



When dry, the student paints the whole mountain white. When the paint dries, the student uses a pencil to mark high mountain lakes, streams, and waterfalls where they would naturally occur. A lesson on raised relief maps may be needed guide students. The students may name their lakes and streams with fictions names. Use thin black Sharpie markers to enable students to make their names permanent.

Depending upon the number of students in the class, break the class into groups of five or six students. Ask the students to arrange their mountains to form the beginning of a watershed. They should look at the altitude of their mountains and the tributaries on the group members' maps. You may want to use Google Maps to study the closest watershed to your school for the students to use to develop their watershed. Pass out four or five pieces of blue construction paper to each group and ask them to cut out the shape of the beginning of a river in proportion to their watershed.

In their science notebooks, they should illustrate the watershed and explain their reasoning behind their watershed design. For a whole class activity, arrange the watersheds to form tributaries to a larger water system. For example, use all the mountains in the class to form the various tributaries of their local river.

A topic of discussion for this lesson is to highlight all the sciences involved in a watershed system such as hydrology, biology, botany, geology, meteorology, astronomy, and entomology.

NGSS Practices- Developing and Using Models, Engaging In Argument, Obtaining, Evaluating, and Communicating, and Constructing Explanations and Designing Explanations.

NGSS Crosscutting Concepts- System and System Models, Energy and Matter: Flows, Cycles and Conservation, and Structure and Function.

Common Core: Math- M7-Look for and make use of structure, M3-Construct viable arguments and critique the reasoning of others. ELA- E2 They build strong content knowledge, E4 They comprehend as well as critique. E5-They value evidence, E6-They use technology and digital media strategically and capably.



## SUMMER EMPLOYMENT OPPORTUNITIES

**The Montana Learning Center at Canyon Ferry Lake is hiring highly-qualified teachers to work as camp instructors and camp counselors**

The Montana Learning Center at Canyon Ferry Lake is hiring certified teachers to work as camp instructors and camp counselors during their '2018 Summer Learning Camps for Kids.'

<https://goo.gl/forms/DIuUOEdeFBa4QB3ne2>

We offer competitive pay, room and board at the MLC during camps, a beautiful place to work, and a great staff of highly-qualified educators to work with.

Please direct any questions to [MontanaLearningCenter@gmail.com](mailto:MontanaLearningCenter@gmail.com).

Apply today!

## EVENTS

March 5 – High School Science Fair Montana Tech

March 8 – Middle School Science Fair Montana Tech

March 13 – Great Falls K-5 Science fair

March 15 – Great Falls middle and high school science fair

March 16-17 – DNA Bootcamp – Flathead Community College

March 15-18 – NSTA National – Atlanta, GE

March 19 – State Science Fair – U of M, Missoula

April 25 – NCTM National – Washington, DC

Don't forget to sign up for OPI's 3 Big Ideas for professional development activities, and check out their Teacher's Hub for online professional development opportunities.



Montana Science Teachers' Association

# MSTA Regions

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