Montana Science Teachers Association

MSTA

Dedicated to Quality Education

NEWS JOURNAL

A publication of the Montana Science Teachers Association

December 2009

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 and also state which National Science Standards your activity meets.

John Graves, Editor
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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
___K-6
___6-9 MS or JH
___9-12
___College/Univ.
___Sup/Admin.

Subject
___All sciences
___Life Science
___Phys Science
___Earth Science
___Biology
___Physics
___Chem
___Other

Dues Category

1 year	$20.00 ____
MSTA/MCTM	$30.00____
MSTA/MEEA	$30.00____
3 years	$50.00____
Life	$150.00___
Student	$5.00_____
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Montana Science Teachers' Association

From the President

It is hard to believe it has been two months since the annual educator's conference. It was a terrific conference. John Moir, our keynote speaker, discussed the California condor recovery and the hope that saving a species can create. I would like to thank the 70 plus presenters of MSTA sectionals. Your contribution to the conference is what makes it a great event. A shout out to all of the MSTA board members who presented sectionals, worked a shift or two at the MSTA booth, and pitched in at the luncheon. This year we hosted the first New Science Teacher breakfast sponsored by Shop Anatomical. We had several new teachers at both times and then walked away with a "goodie" bag, breakfast, and a one year's membership to MSTA. ShopAnatomical also donated a full size skeleton as one of the many door prizes given away at the luncheon [thanks, Shirley for rounding up door prizes].

The next official gathering of math and science teachers will be at the Math-Science Leadership conference February 5-6 in Bozeman. More details can be found on the MSTA website.

I recently had the opportunity to attend the National Staff Development Conference. The conference is designed for professional developers of all content areas. There are a multitude of sessions offered over five days. When choosing sessions to attend, there was an abundance of sessions engaging students with web 2.0 technology. Each session I attended, made my head spin with all applications and tools that can augment instruction. As I reflected on the sessions, integrating technology is challenging for many reasons. Time to learn how to use it seamlessly, access can also be a barrier, ensuring the technology doesn't drive the process, but enhances it, etc. While the challenges can be overwhelming, our students come to the classroom with these technological experiences they have discovered on their own. If we don't embrace technology in our classroom, it will be the teachers who are left behind.

As we near the end of 2009, it seems almost humorous how we were in such heightened anticipation of the year 2000 because of Y2K. How things change! I wish you all a joyful and relaxing holiday season and I hope to see many of you at the leadership conference!

All the best!

Alyson Mike
MSTA President
alyson.mike@gmail.com

MSTA Information

The URL for the MSTA webpage is

http://montanascience.org

If you have trouble with that address, try
http://www.ivymerriot.com/montanascience/index.html

The page has many new listings and links, be sure to visit it often.

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

Leadership Conference
February 4 & 5
Information:
montanamath.org

NSTA National Conference
March 18-21, 2010
Philadelphia, PA
Info: nsta.org

CONSTRUCTIVISM AND THE SCIENCE CURRICULUM

CONSTRUCTIVISM IS A PSYCHOLOGICAL TERM EMPHASIZED IN THE SCHOOL CURRICULUM. It stresses pupils, individually or collectively, to be central or at the heart in ongoing learning activities. Science objectives, learning activities, and evaluation techniques are pupil centered. This presents a unique paradigm and role for the science teacher. He/she no longer is the central actor in the classroom, but provides opportunities for pupils to be dominant members in ongoing lessons and units in the science curriculum. The pupil is the learner and must be encouraged to achieve, learn, and grow.

Which beliefs and educational philosophies do constructivist teachers adhere to? They tend to emphasize student autonomy. Lecturing to students during class time in diverse academic areas fails to stress learner initiative. Rather, teacher/pupil planning of science objectives, learning experiences, and appraisal procedures involve engagement of pupils in making curricular decisions. Students are encouraged to be actively involved in determining their curriculum, rather than being passive recipients of knowledge and skills. Being able to accept students who are actively involved as decision makers in the curriculum may be difficult for some teachers, but for the constructivist teacher this is an ideal (See Padmanabhan, 2007).

Thus, within a peer mediated discussion group, students accept full responsibility for decisions made during discussions. They may make decisions, for example, on a peer project which involves doing a mural/chart on Prehistoric Life including the Paleozoic Era, the Mesozoic Era, and the Cenozoic Era. Drawings of animal life during each era should be made neatly, clearly showing the major kinds which existed. For example, during the Mesozoic Era, the Age of Dinosaurs was very much in existence and should be shown on the mural. These drawings and their respective history are fascinating to many pupils. Selected dinosaurs were plant eaters, others were meat eaters, while still others may be classified as plant and animal eaters. The kinds of vegetation as it existed in the Mesozoic Era may be shown as background information. Careful planning and accurate drawings must be made (See National Research Council (NRC), 1996).

With involvement of students in individual/committee endeavors, the constructivist teacher is able to secure learner interest in an ongoing science unit of study. Learner planning of the project brings to bear, criteria, which need to be incorporated to assess the completed project as well as of the processes involved. The planning of

the project is open ended and provides numerous opportunities in decision making (Ediger and Rao, 2007).

A model learning community formed on the local level will be discussed along with how it can assist in improving the curriculum. A learning community represents a powerful way of obtaining cooperation among diverse levels of participation such as students and faculty; school administrators and parents; the lay public; leaders from business and industry; as well as labor and union representatives. Each of these groups needs a chair person and a secretary. Which curriculum area needs emphasis for a given school year? Assuming that science receives priority for the ensuing school year. Science was omitted in statewide testing under the No Child Left Behind Law until the 2007-2008 school year. Thus, an innovative approach such as a learning community may well help in working closely together and raise student achievement levels in science. This is a major effort in planning, implementing, and assessing quality in the curriculum. Each group needs to choose an area of interest and develop that facet of science achievement harmoniously. Thus, a large group session may be held to ascertain the direction of its goals. Areas of interest from which community members might well choose maybe the following:

* volunteering one's services in the regular classroom by reading loud to children during story time, listening to pupil read alouds and assisting in word recognition techniques, checking pupil papers and going over the errors with the involved pupil. This might also emphasize assisting pupils on the playground and in the lunchroom. Making room for the needs of children is salient.

* objectives for student achievement in the science curriculum. The set of objectives chosen for learners to achieve needs to represent the concept of excellence. Here, volunteers may survey different sets of objectives put out by the national Science Teachers Association, the Association for Supervision and Curriculum Development, and the National Association of Elementary School Principals, among other national organizations in education. Statewide affiliates of each may also bring to bear objectives of instruction written for pupil achievement. Each state has a science teachers affiliate of the parent organization. Objectives gleaned and summarized and might then be compared with the local statement of science teaching objectives. A discussion of objectives in science teaching makes for a problem solving situation when the best are selected from among alternatives.

* providing for individual differences among learners. There are a plethora of differences among children in any classroom. Pupils individually need assistance in the learning activities provided. Word recognition problems in reading may well account for several volunteers to

help pupils. Understanding subject matter read may cause problems to some unless aid is available. Higher levels of cognition raises the bar in comprehension of content. Inferential reading as well as critical and creative reading involve comprehension, but are at different levels of complexity. The science teacher may work with pupils in these skills while a volunteer is assisting a set of pupils in word recognition in independent reading of library books directly related to the unit being taught in science. The latter group also will have equivalent time for higher levels of thinking activities within a small group.

* the separate subjects versus the integrated science curriculum. This continues to be an issue. Holism in the curriculum stresses science subject matter be integrated with social studies, literature, and mathematics, where feasible. But integration of content should not be stressed for the sake of doing so, but rather that it serves a useful purpose. For example, in cases of natural disasters including earthquakes, tornados, and mud slides, pupils need to explain the causes of each scientifically and objectively. To remedy human suffering from these natural disasters, social services are involved. The vast array of organizations and groups which provide these services need to be studied. Thus, science and the social studies become integrated entities.

* learning activities to achieve objectives. These need to be varied and provide for indepth learning. Concrete experiences are one category. These consist of using real objects in teaching and learning such as in conducting science experiments. This might well branch out to semi-concrete activities, such as seeing and discussing a power point presentation related directly to the science experiment. Each slide in the experience needs to expand indepth from the previous activity. The third category of learning experiences emphasizes the abstract phase of learning and includes reading to secure more information pertaining to the ongoing experiment, as well as to write up its findings in approved form (Ediger, 2002).

* constructivism in the science curriculum. Here, committee members may study explicit, direct teaching of subject matter as compared to constructivism with considerable input into ongoing science units. For example, the science teacher may perform the science experiment as compared to pupils being more involved in, or completely doing the experiment with teacher guidance (See Mansilla and Gardner, 2008)

. * project methods in the science curriculum. This procedure may involve much of constructivism in science whereby pupils in a small group decide upon a project within the ongoing science unit of study. Thus, a purpose is established in a construction activity. The purpose may be to make models of a volcano, soil erosion, as well as folding and faulting. Careful plans must be in the offing to make each

model. Accuracy, proper proportion, and realism is important. The plans made need to be carried out, with modifications made as needed. The completed projects need evaluation in terms of definite criteria, such as in a rubric. The completed projects may be displayed for other classrooms to observe (See Burton, 2005).

* assessment of student processes. Here, the students' participation skills need assessment such as all in the small group need to participate with no one dominating. Quality group dynamics are salient. Ideas from participants need to be respected. Ideas presented must circulate within the committee. Clarity of ideas must be meaningful to participants. Assessment must inform instruction. Thus, results from the assessment provide information for sequential instruction.

For each of the above named areas, seven to eight community members may volunteer/choose on which committee to serve. The first category, volunteering one's services in the classroom, a somewhat endless number might well serve in different capacities.These would center around helping the science teacher to provide for each pupil in the classroom. Each committee needs to report on their endeavors to keep other groups informed. Questions will arise on clarity of ideas presented and also on how specific strategies will be implemented.

There are specifics which need to be worked out pertaining to meetings for the small groups. These include the time and place of meeting dates. Input from participants should focus on the most appropriate time for all, realizing there will be conflicts. Should refreshments be served? It would be good to do so, but this decision needs to be left up to the participants.

Two Schools of Thought Pertaining to Constructivism

There are basically two schools of thought which stress constructivist philosophy of education. Jean Piaget, educated as a biologist, studied children for over fifty years in Geveva, Switzerland and wrote, in his research, about four stages which children go through to reach adulthood. From birth through two years of age, the child is in the sensori- motor stage of development. The child in this stage uses the five senses and motor skills in learning. From ages two to seven, the child is in the stage of preoperational development. The child focuses upon one variable such seeing the height or width, only, of an object. Biological maturation on an individual basis is involved in growing from one stage to the next and this cannot be hastened. The child basically selects what to learn and what to interact with in sequence. This is not based on group norms or standards.

The stage of concrete operations begins at age seven years of age and here the child learns from objects and items in the

environment, as was done previously, but the use of the abstract such as reading, writing, listening, and speaking, are becoming increasingly stronger and supplement/clarify the real objects and situations observed. Highly meaningful learnings accrue when words (the abstract), illuminate the related items observed and studied.

Piaget's fourth stage is represented, in maturation, by the stage of formal thought. There is much less of a need, here, to focus upon the concrete. The pupil now may focus discussion and thought upon the abstract only. Adults tend to use the abstract only while interacting, and yet meaningful transcriptions occur.

Piaget's theory of maturation stresses individual stages of growth regardless of peers growth levels.

In comparison to Piaget, Vygotsky (1933/1978) came out with a social theory of constructivism. Here, pupils work together collectively in ensuing lesson(s) to realize facts, concepts, and generalizations. As pupils interact, their ideas modify and change. As thoughts circulate within the small group, they emphasize sequential progress. It is pupils then within a committee, who generate subject matter within a lesson or unit of study. The small group rather than the individual come up with content to realize objectives of instruction (See Hoy and Miskel, 2006).

With reflection, the science teacher reviews mentally what has just transpired in teaching and learning in the classroom. He/she now has opportunities to think about how well learners were engaged in the ensuing lesson. Were there pupil questions which might have been a springboard for indepth learning? Was each child enthused for learning? If not, what might have been emphasized to include all in actively engaged learning? Were the learning experiences appropriate when providing for individual differences? These, among other questions, require reflective thinking.

Pupils, too, need to reflect upon what was achieved during an ongoing science lesson. They need to reflect upon the following:

* Did I pay attention to the ongoing science experiment?
* What was not clear in the presentation?
* Which questions do I need to have answered?
* Which subject matter possessed clarity and meaning?

By reflecting upon what was taught, the learner is able to pinpoint vague facts, concepts, and generalizations. Then too, the pupil is able to focus upon faulty processes used in learning. These learnings might well improve sequence in pupil achieving. Thus, better order of content acquired might well increase overall achievement and progress in science (Savithiri, 2006).

The Reflective Teaching must stay

abreast of current trends in teaching. This is true for professional reasons as well as fro assisting pupils to achieve. He/she may update knowledge an skills through the following means:

* taking graduate course work in science content and science education. The science teacher who has a good command of subject matter knowledge is better able to assist pupils in indepth learning about any topic being studied in an ongoing lesson or unit of study. Also, with an increase in knowledge and skill pertaining to science education, the teacher may assist the learner more proficiently where questions and problems arise within a specific learning activity. Today's pupils are more knowledgeable than learners previously. It behooves the science teacher to remain updated in teaching and learning strategies.

* read information on teaching science from reputable journals. A professional area in school for stocking materials on science instruction is a must for classroom teachers.

* taking courses online is a definite possibility for science teachers. They may then budget their time appropriately and keep possibilities open for engagement in learning when it is convenient to do so

* doing an independent study on induction in science teaching is a further possibility. The independent study online or on campus from an accredited university must take into consideration depth and breadth. A quality science teacher should be an end result.

* observing good teachers teach science. Before and after the observational visit, the visiting teacher needs to have a detailed conference with the one exhibiting excellence in teaching (See also Horejsi, 2003)

The goal involved in each of the above named inservice education programs is to strengthen science teaching. The science teacher is then better able to help pupils to achieve, grow, and learn. Instead of providing a direct answer to a problem, the science teacher is able to ask further questions leading the leaner to find his/her own answer. Constructivism emphasizes the use of learner input into the curriculum. In this way, pupils may assist in determining the science curriculum.

Burton, Kimberly Smith (2005), "Using Student Peer Evaluations to Examine Team Taught Lessons," Journal of Instructional Psychology, 32 (2), 136-138.

Ediger, Marlow (2002), "The Supervisor of the School," Education, 122 (3), 602- 604.

Ediger, Marlow, and D. Bhaskara Rao (2007), School Science Education. New Delhi, India: Discovery Publishing House.

Horejsi, Martin (2003), "Making Technology Inclusive," Science and Children, 41 (3), 20-24. Published by the National Science Teachers Association (NSTA).

Hoy, Wayne K., and Cecil G. Miskel (2006), Educational Administration, Theory, Research, and Practice. New York: Mc Graw Hill, Inc. Chapter Two.

Mansilla, Veronica Boix, and Howard Gardner (2008), "Disciplining the Mind," Educational Leadership, 65 (5), 14-19.

National Research Council (NRC). 1996. National Science Education Standards (1996), Connecting to the Standards. Washington, DC: National Academy Press

Padmanabhan, Vasundhara (2007), "Constructivism and Reflective Teaching in Teacher Education, Edutracks, 7 (4),14-16. Published in India.

Savithiri, V. (2006), Impact of Metacognitive Strategies in Enhancing Perceptual Skills Among High School Students on Learning Geometry. Ph D thesis evaluated by the writer for Alagappa University, India.

Montana's Math/Science Partnership Grants

OPI Mathematics & Science Partnerships

SILC Blended Model for Professional Development in Science

Science Inquiry Learning in Classrooms (SILC) is a 3-year professional development program initiated in June 2008 for which Montana Learning Center at Canyon Ferry Lake is the fiscal agent. SILC is funded through an ESEA Title II Part B Mathematics and Science Partnership (MSP) Grant awarded by the Montana Office of Public Education (OPI). The program involves two cohorts of 30 elementary school teachers from Bozeman and Helena areas: Cohort #1 began August 2008 and Cohort #2 began in August 2009.

The focus is on science content (physical sciences and life sciences) and inquiry learning based on the Montana Standards. Integrated into the curriculum and pedagogy are elements of the Native American culture. Educational components include: 2 ½ days of August orientation, 3 ½- hour Inquiry Academy each month, and National Science Teacher Association SciPacks accessed via Internet. Connecting this geographically diverse group of teachers (Livingston to Phillipsburg) is content and pedagogical on-line questions and discussions using D2L technology hosted by the MSU Burns Center. The ultimate SILC goal is to make a positive impact on the classroom environment and student achievement.

Two instructional coaches funded by SILC, Bozeman School District (Jennifer Stadum) and Helena School District (Mary Larsen) work to assist implementation by SILC teachers on a daily basis. Other key instructional leadership includes: Elisabeth Swanson (Director, MSU Science-Mathematics Resource Center), Walter Fleming (Head, MSU Native American Studies Dept.), Greg Francis (Physics Dept.), Irene Grimberg (MSU Physics and SMRC), Moncia Brelsford and Tracy Dougher (MSU Thermal Biology Institute). Glenn Allinger (Montana Learning Center Board Chair) is the grant PI with Elisabeth Swanson, Co-PI.

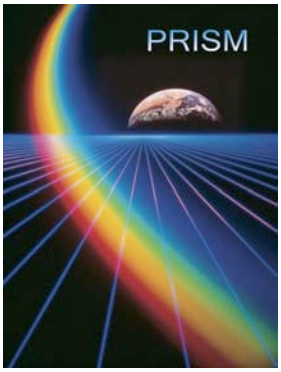
The **Southwest Montana Science Partnership** between Montana Tech, Montana State University, the Montana Educational Consortium, WM-CSP, and Education Northwest provides a blended learning model of professional development for sixty 3rd–6th grade teachers primarily from rural schools in southwest Montana. This project utilizes the environment as an integrating context for teaching inquiry-based science content correlated to Montana standards. The project team incorporates a highly interactive online learning community and face-to-face workshops, connecting teachers, STEM faculty, and Education faculty to improve student achievement in math and science.

Two cohorts of 30 teachers participate in 10 one- to two-day workshops over the grant life. To date, the project has completed four of ten modules and workshops with the first cohort. The second cohort will also come online in January with the first module, "mapping".

Three themes – an overarching emphasis on inquiry, interactive online learning, and the integrating context of environment – provide continuity between workshops. The ten modules focus science content through site study, utilizing the immediate playground environment for site selection. Teachers learn essential tools for completing a site study including: mapping, earth forms, soils, water quality assessment, snow study, plants and trees, flowers, birds, human impacts, and a final capstone study that brings all previous components together. By the project end, teachers will be able to lead their students through a comprehensive site study culminating in a final report and recommendation to the school community for improvement or preservation of the study site. Content knowledge assessment tools embedded within online modules provide immediate data for project evaluation. Interactivity in online learning is ensured through the use of images, videos, blogs, discussion areas, podcasts and other multimedia technology. This facilitated, community structure is integral to the project, enabling an ongoing professional and social connection between teachers, scientists and faculty.

The collective expertise of STEM and Education faculty, scientists as content specialists and outreach education specialists guarantees a high-quality program that supports teachers in (1) enhancing science content knowledge; (2) implementing science inquiry utilizing existing materials; (3) meeting state and national science and mathematics standards; and (4) developing increased leadership skills.

For more information, please contact Rayelynn Connole at rconnole@mtech.edu or 406-496-4898.



The **PRISM (Partnership to Reform Inquiry Science in Montana) Grant** Project is now in its second year of providing inquiry science professional development to partner teachers in Region III of Montana. The grant is a three year project directed by Dr. Ken Miller from MSU-Billings. The PRISM project seeks to develop and strengthen the pedagogical and content understandings in science of Grade 3-6 teachers. It provides two cohorts of teachers with professional development that has significant and meaningful science content that will enhance the understanding and implementation of inquiry science techniques into the classroom. The PRISM project provides instructional strategies of inquiry that enable teachers to teach in a manner that will improve student achievement in science and further develop the ability of teachers to understand and use the New Montana Standards for Science.

The PRISM project is a blended learning model that combines face-to-face workshops with online learning. Partner teachers meet three times a year for science inquiry workshops facilitated by Dr. Miller, coordinated by Jeanie Kalotay, and the project team that includes STEM faculty and evaluators. Teachers are given opportunities to personalize their understanding of inquiry by exploring and performing science inquiry activities, learning questioning strategies, and creating innovative lesson plans. Workshops provide a format for teachers to learn from each other and to develop a professional learning community.

Online learning is also a major component of the PRISM project. Teachers are empowered to expand their content learning by participating in online threaded discussions and completing SciPacks through the National Science Teachers Association Learning Center. The online discussions provide teachers the opportunity to reflect on science inquiry and content questions and interact with peers. Instructors monitor learning and provide feedback to teachers in the field. A continuation of the professional learning community established in the workshop setting is a huge benefit of the online discussions.

The other component of online learning is the NSTA SciPacks. Teachers complete three SciPacks a year. SciPacks are online science content learning experiences that employ an inquiry based approach with engaging simulations, embedded questions, and pedagogical implications. An example of the SciPacks is the Force and Motion SciPack with the learning objectives focusing on understanding and explaining the concepts of speed, velocity, and acceleration. A comprehension of mass and inertia, the nature of forces, and the meaning and significance of Newton's Laws of Motion and Newton's Law of Gravity must also be demonstrated. SciPacks help teachers better understand the science content they teach and are a useful resource and tool for teachers to utilize in their classrooms.

The PRISM project strives to assist teachers to find new innovative ways to implement science inquiry lessons into their classrooms. It is an exciting project with potential for amazing science inquiry learning not only for teachers but also for students! Continued involvement in PRISM will help teachers to work with other teachers in their schools, districts, and region.

Jeanie Kalotay is the Project Coordinator for PRISM at jkalotay@msubillings.edu

Professional Development Opportunities for Teachers

The 2nd Annual Energy Summit is looking for Montana schools that have effectively implemented Green Clubs into their school and would be willing to present their work to other school districts. The Energy Summit will be held in Helena on January 20, 2010. If you are interested in sharing the story of your Green Club with other schools please contact Katie Burke, OPI Science Curriculum Specialist, kburke@mt.gov.

The 2010 Presidential Awards for Excellence in Mathematics and Science Teaching is now taking applications for ELEMENTARY teachers of math and science. You may nominate a colleague at www.paemst.org

Montana Learning Center
at Canyon Ferry Lake

LEARNING AT THE LAKE
Learning enhanced with mathematics and science –
exploring the beauty of the world

Special Invitation to Mathematics and Science Teachers

We are pleased to announce that the Montana Learning Center has received funding for a Title II grant, entitled Mathematical Modeling for Montana Green Technology Projects (M^3GTP), from the Office of the Commissioner of Higher Education in Montana. In the first stage of our project, we are inviting teams of high school and college science and mathematics teachers from throughout Montana to come to the MLC for a workshop (April 9 – 11, 2010), conducted by two nationally recognized specialists in the field (Frank Giordano and Bill Fox), where participating teachers will learn about and experience mathematical modeling related to environmental issues. Participants will then return to their homes and explore environmental issues of regional concern with local companies or organizations. After studying specific local problems, these teachers will reconvene (October 1 – 3. 2010) to formulate the regional issues into well-stated, open-ended problems that can be used in their classrooms.

An electronic copy of the flyer describing this project and the application form can be found at www.montanalearning.org . Please share this information with individuals at your school who might be interested in participating in our project. Note that applications must be from teams of high school and college mathematics and science teachers (one from each level in either or both disciplines) and the deadline for applications is December 20, 2009. For additional information on M^3GTP, email or call the grant director, Marie Vanisko at mvanisko@carroll.edu or 406-422-5842.

The Montana Learning Center at Canyon Ferry Lake
7653 Canyon Ferry Road • Helena, MT 59602-9788
(406) 475-3638 • fax 475-3871
executivedirector@MontanaLearning.org

Other Opportunities at the Montana Learning Center

Spring Time in the Rockies Conference - Math, Science, Technology
Save March 26 - 28, 2010, for the annual math and science technology conference at MLC. In what ways can we extend student learning within and outside of the classroom? What resources are untapped? These and other technology related questions will be addressed during this conference for Grade 7 - 10 science and mathematics teachers. Ideas discussed will not only help visionary curriculum programs but also assist in creating more time on task for programs attempting to meet NCLB standards. Paul Andersen (Science/Technology, Bozeman HS) is organizing the program. Further information will be available at the MLC website (montanalearning.org) and in the next MSTA NewsJournal.

Exciting "Kids Camps" Scheduled for Su'10.
Beth Thomas (North MS - Great Falls) has organized a variety of learning opportunities for students entering Gr. 1 - 10 this coming summer:

- Camp Discovery: July 19 -22 (Day camp for Gr. 1 - 3)
- Young Naturalists Adventures: July 19 - 22 OR July 26 - 29 (Gr. 4 - 7)
- Innovation is Math and Science: July 18 - 24 OR July 25 - 31 (Gr. 8 - 10)

Request an informational brochure and/or check details at the MLC website: montanalearning.org. ***Honor one of your students by nominating her/him*** to attend a camp. Go to: **www.montanalearning.org**.

An Online Course for High School Science Teachers
National Teachers Enhancement Network—Montana State University

Oregon Public Broadcasting (OPB) and Biological Sciences Curriculum Study (BSCS) in cooperation with the National Teachers Enhancement Network (NTEN) have produced an online course for Grade 9 and Grade 10 science teachers. NTEN is a program of Montana State University, a world-class public research university. The course is designed for high school science teachers who are or will be teaching out of field of endorsement. The course is an intensive 16 week online course. All participating teachers will be required to complete 7 or 10 content units in 16 weeks, including:

Unit 1. *Teaching Science as Inquiry*; and the units that comprise at least two of the following content areas:
2. *Physical Sciences*
3. *Life Sciences*
4. *Earth/Space Sciences*

Specifically, we are looking for teachers to complete content units for which they *are not certified*. We plan to field test the course and are currently seeking teachers to take the course for 3 graduate credits. We will ask all selected teachers to provide a $200 registration fee to enroll. The registration fee will be returned when all coursework requirements have been met. If a teacher is selected to participate but does *not* complete the course and all requirements, the registration fee will *not* be refunded. We will offer the course 3 times: fall 2009; spring 2010; and summer 2010.

To participate in the field test, you must meet the following requirements:

1. You have or will have received a *high school science* teaching license by fall 2009 or by spring or summer 2010.

2. You are under contract to teach a *high school* science course that is *not* in your certification area. This includes:
    a. Teachers certified in one of the major science areas (physical, life, or Earth/space) but who are teaching a high school multi-disciplinary science course that incorporates all 3 major areas.

    b. Teachers certified to teach high school in one of the major science areas (physical, life, or Earth/space), and are teaching a high school science course not in their certification area (e.g. a teacher licensed to teach biology, who is contracted to teach chemistry or physics).

    c. Pre-service teachers who will have received a high school science teaching license by fall 2009, or by spring or summer 2010, who have been hired by a district to teach a high school science course not in their certification area (e.g., a student who will be certified to teach high school in fall 2009 or in spring/summer 2010, licensed to teach biology, but who has signed a contract to teach Grade 9 physical science in the 2009–2010 school year).

3. You can provide a $200 registration fee for the course. The registration fee will be returned when all coursework requirements have been met. If a teacher does *not* complete the course and all requirements, the registration fee will *not* be refunded.

4. You have 9–12 *hours per week* to devote to the online course.

If you are interested in participating in the course, please go to https://www.rmccorp.com/ats to complete an application. Space is limited to 30 students per section. Applications will be accepted while space is available. You will be notified by The National Teachers' Enhancement Network if you are selected to be a participant.

RESOURCES for Teachers & Students

Montana PBS is exploring the idea of producing a television show about climate change for students. We are especially interested in the educator's perspective, and we would love some input from Montana's science teachers. Although climate change, specifically, is addressed in the standards for high school students, we realize science teachers in many grade levels integrate climate change science in their classrooms. We would love to hear what you are doing, what you would be interested in doing, what interesting inquiries you may have developed, and how you might see a television program integrated into your classroom. To provide input on this project please visit http://www.surveygizmo.com/s/197499/climate-change-for-kids and complete a brief survey.

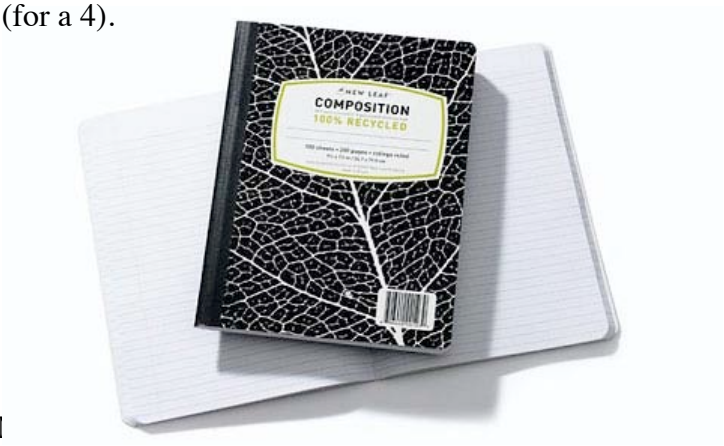
Thanks so much for your help!

Please feel free to contact John Twiggs or Alison Perkins directly at 406-243-4565 if you have questions or additional comments.

Lesson Ideas

How to Write a Lab Report

1. **Cover Page**
   -make sure your cover page includes an image (sketch or clipart), your name and core, the title of the lab, and the date.
2. **Problem Statement**
   -make sure this is not a "Yes"/"No" question – it should start with How or What
3. **Observations/Research**
   -make sure you give both qualitative as well as quantitative observations when necessary AND be as specific as possible
4. **Hypothesis**
   -make sure this is in "If……., then……" form. If (what you will do), then (the changes you expect). Do NOT write, "I think…."
5. **Variables**
   -make sure you clearly indicate your Independent variable (what you vary), Dependent variable (changes you measure), and all Control variables.
6. **Materials**
   -make sure you include all the materials needed in order to recreate this experiment
7. **Procedures**
   -make sure you are clear and specific and write your steps in the order that they occurred in your experiment (in order to recreate this experiment)
8. **Data**
   -make sure you have a table and a graph (when appropriate) for displaying and analyzing your data. Remember to find a mean of the quantitative measurements when necessary.
9. **Conclusion**
   -make sure your conclusion states the following: 1) was your hypothesis supported or unsupported 2) what problems did you encounter in your experiment 3) what did you learn by doing this experiment 4) what further extensions can you think of for this particular experiment (further experimentation) 5) what explanations can you give for the results you found in your experiment
10. **Presentation**
    -make sure to type your lab report (for a 4), check for spelling errors (for a 4), write in complete sentences (for a 4), include any lab materials that can be attached to your report (termite drawing paper for example), and include as much detail and extra information in order to "paint a picture" of the experiment for your reader (for a 4).



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Teacher Tip: Make Your Own Artificial Blood

Submitted by
Susan A. Bender, Jim Hill High School, Jackson, MS

Forensics teachers take note. Here's how to make realistic artificial blood for blood spatter labs:

- Pour one liter of water into a suitable container.
- Add 8 oz red food coloring and one 16-oz bottle of Karo® Light Corn Syrup.
- Mix thoroughly.

You must use Karo® Light Corn Syrup; imitations don't work. For more realistic color, add a pinch of Congo red indicator powder. If you want to examine the artificial blood under a microscope, add a tablespoon of dry yeast. The spheres that form around the yeast granules look just like erythrocytes.

Teacher Award Opportunities

For information on awards, visit nsta.org

NSTA Awards

AWARD	WHO CAN APPLY	BRIEF DESCRIPTION
Robert H. Carleton Award–Dow	NSTA member	$5000/citation/all expense paid trip
Ciba Middle/HS Teaching Awards	middle/high school science teachers	$2000 prize/$500 expenses
Ciba Middle/HS Principal Awards	middle/high school principals	$2000 prize/$500 expenses
DCAT Making a Difference Award	grades 6-12 science teachers	$2500 prize to school/flight & 2 nights-principal and teacher
Delta Ed/Frey-Neo/CPO Science Award	preK-12 science teachers	$1500 prize/$500 expenses
Distinguished Informal Science Award	NSTA member	citation/3 nights hotel/$500
Distinguished Service to Science Education Award	NSTA member	citation/3 nights hotel/$500
Distinguished Teaching Award	NSTA member	citation/3 nights hotel/$500
Faraday Science Communicator Award	not a science teacher/ but an individual or organization which promotes science	$2500 expenses
Fellow Award	NSTA member	citation & pin
Legacy Award	NSTA member	$500 expenses-family member/ 2 nights lodging
Maitland P. Simmons-Memorial Award for New Teachers	NSTA member	$1000 expenses/certificate
Wendell G. Mohling Outstanding Aerospace Educator Award	K–12 science teachers	$3000 prize/$2000 expenses
SeaWorld/Busch Gardens Environmental Educator of the Year	K-12 science teachers	$5000/all expense paid trip Deadline: November 28
Shell Oil Company	K-12 science teachers	$10,000 prize/all expense paid trip/ finalists all expense paid trip
Sylvia Shugrue Award	elementary science teachers	$1000 prize/$500 expenses/citation
Vernier Technology Awards	K-12 science teachers	$1000 prize/$1000 products/$1000 expenses
Zula International Awards	preK–2 science teachers with memberships in either NSTA, CESI, NAEYP, or NHSA	$400 prize/$1000 expenses

All award deadlines are November 30, except for Shell Oil Company which is October 15 and SeaWorld/Busch Gardens which is November 28.

Toyota TAPESTRY Grants for Science Teachers

Toyota Motor Sales, U.S.A., Inc. and NSTA are pleased to announce the 19th annual Toyota TAPESTRY Grants for Science Teachers program. This year Toyota will award $550,000 in grants to K-12 teachers of science. A total of 50 large grants of up to $10,000 each, along with 20-30 mini-grants of up to $2,500 each will be awarded. Categories include environmental science, integrating literacy and science and physical science. Toyota has awarded 986 grants totaling over $8 million in this premiere nationwide grant program.

For further information and to begin the application process online, please visit http://www.nsta.org/pd/tapestry. The online applications are now available! The deadline for submission of online entries is January 18, 2010.

Mark Your Calendars

Dec. 3 – 5 – Regional NSTA – Phoenix, AZ
Feb. 4-5 – Leadership Conference 2010 – Comfort Inn, Bozeman
March 9 – Hi-Line Science Fair - Havre
March 9-11 – MT Tech Science Fair – Butte
March 11 – Great Falls Science Fair – Great Falls
March 12 – Flathead County Science Fair – Kalispell
March 20-21 – Billings Science Expo - Billings
March 18-21 – NSTA National Conference – Philadelphia, PA
March 21-23 – MT State Science Fair – Missoula,
April 21-24 – NCTM National Conference – San Diego, CA

Nomination for MSTA Recognition Awards

If you know of a science teacher, university person, administrator or organization in Montana who deserves recognition for contributing to science education in Montana and beyond, please consider nominating them for an MSTA Award in one of the following areas:

Elementary	Earth Science	Chemistry
University member	Middle School Science	Biology
Distinguished Service	Physics	Administrator
Organization or Group		

Criteria for selection is based in part, but not limited to, the following: longevity or service, contribution to topic area, participation in MSTA and/or NSTA, presentation of workshops, improvement of fellow teachers and community service.

Nomination Form

Name_____ Award Area_____

Address_____

Current Position _____

Name and address of the person making the nomination:

Email address: _____

Attach a 500 word or less statement of why you are making the nomination. This statement may include the nominee's resume, educational background, teaching positions, awards and honors, leadership positions and professional activities.
Nominations may be emailed.

Send to

Alyson Mike
3778 Fox Crossing Road
Helena, MT 59602
alyson.mike@gmail.com

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MSTA Regions