Montana Science Teachers Association

MSTA

Dedicated to Quality Education

NEWS JOURNAL

A publication of the Montana Science Teachers Association

January 2008

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
1112 Hunters Way
Bozeman, Montana 59718
graves@montana.edu

Tentative Submission/Publication Dates
August 15/September
November 15/December
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	
___K-6	___All sciences	___Physics
___6-9 MS or JH	___Life Science	___Chem
___9-12	___Phys Science	___Other
___College/Univ.	___Earth Science	
___Sup/Admin.	___Biology	

Dues Category

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

Make checks payable to MSTA

Return to LeAnne Yenny
3880 Equestrian Lane
Bozeman, MT 59718

From the President

I hope your school year continues to be a good one and that you are impacting students with an interest in science. The recent MSTA Convention, held in conjunction with the MEA-MFT Teacher's Conference in Belgrade in late October was a huge success. MSTA offered nearly 75 sectionals, including our Keynote Speaker, Brad Bebout from NASA Ames who spoke on microbial life and why NASA is interested in life at the extremes. If you missed Brad's presentations, be sure to check his website at http://microbes.arc.nasa.gov/ and follow the FOR ECDUCATORS link. He is truly a friend of MSTA and LOVES to work with teachers. Brad also joined a group of teachers on a Saturday field trip to Yellowstone National Park sponsored by the Thermal Biology Institute at MSU. You check see the TBI website at http://www.tbi.montana.edu. Susan Kelly has done an outstanding job of connecting research scientists and teachers through educational outreach.

Other highlights of the conference included the presence of Sharla Dowding, NSTA's Region XV Director from Wyoming. You can contact her at sharla@tribcsp.com. On Thursday night of the conference we held the President's Banquet to honor past presidents of MSTA. We were pleased to have Kristi Bick, Rick Jones, Rich Micheletto and John Miller in attendance. The annual meeting was well attended and Jeff Grom presented a new outreach approach by MSTA that provides science lesson plans on TeacherTube.com. Be sure to visit that site and also submit your lesson videos for posting.

Thanks for taking some time out of your busy schedule to preview the opportunities available to you in the rest of the journal.

Thanks,

John Graves, MSTA President and Newsletter Letter Editor

graves@montana.edu

MSTA Webpage Information

The URL for the MSTA webpage is

http://montanascience.org

If you have trouble with that address, try

http://www.abaetern.com/montanascience/

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

NEW PROJECT

Under the direction of Jeff Grom, MSTA is reaching out to science teachers using the web through TeacherTube.com We have posted several science activities/demonstrations on TeacherTube with a link to our website for a complete lesson plan of the activity. We invite YOU to send us a digital video clip of a favorite science activity/demonstration and a lesson plan. Jeff will format the video for posting and the lesson plan will be placed on the MSTA website. To view an example, go to teachertube.com and search for "old flaskful" or "hail in a test"

Jeff's email: jgrom25@msn.com

Be Watching…the call for MSTA sectionals for the 2008 Fall Conference will be soon. Check mea-mft.org for the link when it comes available.

MSTA 2007 KEYNOTE SPEAKER

Brad Bebout

Missed his sectionals or need more information? Visit Brad's website at http://microbes.arc.nasa.gov Follow the For Educator's link.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Resources from Flinn Scientific

There are ALWAYS great ideas here… www.flinnsci.com/

Have you checked out the National Science Teachers Association website lately? It's at nsta.org

Make plans NOW to attend the National Science Teachers Association 2008 National Conference in Boston
March 27–30, 2008

Visit nsta.org for more information.

Sign up for *NSTA Express*

NSTA Express is a weekly e-newsletter that delivers the latest news and information about science education, including legislative updates, member news, resources, and much more.

http://www.nsta.org/publications/enewsletters.aspx

You do not have to be a member of NSTA to sign-up for NSTA Express, although membership has other advantage…

http://www.nsta.org/membership/benefits.aspx

Toshiba America Foundation Offering Grants for Science and Math Projects: **A TAF Grant is a great way to get a science or math project off the ground that you've been wanting to do but just haven't had the time or resources. The program is very easy to access for science and math teachers. You can find out all about the program, and how to apply for a grant by visiting www.taf.toshiba.com. You'll also find all kinds of information to help you through the quick and easy application process. Teachers in Grades 7-12 may apply for grants up to $5,000 at any time during the calendar year. Grant requests of more than $5,000 are reviewed twice a year. Deadlines: February 1st or August 1st.**

MSTA Awards

Each year, at the Bob Makela Memorial Luncheon and general business meeting, MSTA recognizes outstanding science educators in Montana. The following received awards in 2007:

Mary Jo Gardner, Kalispell, MSTA Award of Recognition of Superior Achievement in Science Education—Elementary

Gene Reckin, Libby, MSTA Award of Recognition of Superior Achievement in Science Education—Biology

Lee Silliman, Deer Lodge, MSTA Award of Recognition of Superior Achievement in Science Education—Physics

Walt Woolbaugh, Manhattan, MSTA Award of Recognition of Superior Achievement in Science Education—Distinguished Service

Montana Environmental Education Association, MSTA Group Award of Recognition of Superior Achievement in Science Education

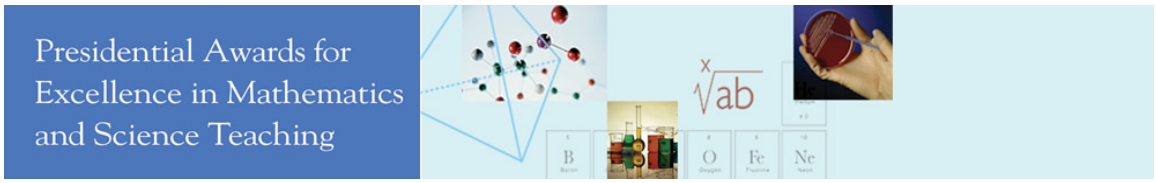
Carol Thoresen, Montana State University, MSTA Award of Recognition of Superior Achievement in Science Education—University

Diana Paterson, Montana State University, MSTA Award of Recognition of Superior Achievement in Science Education—University

Susan Kelly, Thermal Biology Institute, MSTA Group Award of Recognition of Superior Achievement in Science Education

Hank Bechard, Bozeman, Stacia L. Micheletto, M.D. Early Career Scholarship

Tanya Brist, Region 1 Director, past



Do you know a great Montana elementary teacher (K-6) who excels in teaching science and math with 5 or more years of professional teaching experience?

Do you think that person should get some special recognition for their expertise and dedication to student learning?

Would that person mind receiving a $10,000 award from the National Science Foundation, along with an expenses-paid trip to DC to meet with other awardees and attend math and science professional development opportunities?

If your answer is yes to the questions above, please consider taking a few minutes to nominate that person for the 2008 Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST).

The Montana Professional Teaching Foundation has recently become the administrator of this great teacher recognition program and we certainly hope that Montana teachers will continue their enthusiastic support of the PAEMST awards!

To nominate a great Montana teacher, go the following website (nominations are all to be completed on-line):

www.paemst.org

Click on the "Nomination" button on the left side of the screen and you'll be ready to go! All you'll need is the teacher's name, e-mail address, their school name, school address, and school phone number.

or for more information, visit our MPTF website at www.mea-mft.org/paemst.htm

Those nominated will be contacted and asked to put together a formal application. Remember, regardless of whether a teacher pursues the award or not, it is always a nice recognition in and of itself to be nominated!

The new NSTA District XV Director is Sharla Dowding from Wyoming. She was one of the presenters at the Conference in Belgrade. Her email is sharla@tribcsp.com

Science Netlinks for K-12 Teachers: **This is a source list with explanations and plans for Internet-based activities for the classroom. There are interactive activities, lists of Web sites, and K-12 science literacy goals outlined by the AAAS's Project 2061. Resources are listed by topic and grade. Topics vary from "Where are the dinosaurs?", to explore the concept of extinction, to, "Building a better pencil" to learn the nature of technology. The resources are listed at http://www.sciencenetlinks.com/.**

Educator Scholarship Program: **The Horace Mann Companies are offering $30,000 in scholarships for public and private school K-12 educators to take college courses. One recipient will receive $5,000 in scholarship funds payable over four years, and 15 other recipients will receive $1,000 each in scholarship funds payable over two years. Twenty additional recipients will each receive one-time $500 awards.** The deadline for application is February 29, 2008. **For details, go to https://www.horacemann.com/educator-resources/educator-scholarship-program.html.**

Educational Film on the Plight of Sharks

Oceanic Research Group, in its continuing effort to educate people about the world's marine ecosystems, has produced a 17-minute educational film about the plight of sharks. It is available to view free on its Web site http://www.oceanicresearch.org/education/films/predators.html.

Toyota Tapestry Grant Application Available

On-line

A partnership between Toyota Motor Sales, U.S.A. , Inc. and the National Science Teachers Association, the Toyota TAPESTRY Grants for Science Teachers program offers grants to K–12 science teachers for innovative projects that enhance science education in the school and/or school district. 50 large grants and a minimum of 20 mini-grants, totaling $550,000 in all, will be awarded this year. To apply for funding, qualified teachers must write a Toyota TAPESTRY proposal according to the proposal requirements. The deadline for the completion of the online application is 11:59 p.m., Eastern Standard Time, Monday, January 28, 2008. Recipients of Toyota TAPESTRY grants will be notified by March 4, 2008. Non-recipients will be notified by May 31, 2008. Awardees will be honored at a special ceremony on March 27, 2008 at the NSTA National Conference in Boston. All travel expenses for Project Directors of the large grants will be covered by Toyota .

Toyota Tapestry Grants are one of the many award programs sponsored by NSTA. For more information check out:
http://www.nsta.org/pd/tapestry/

Remember the deadline of the online application is 11:59 p.m., Eastern Standard Time, Monday, January 28, 2008.

Have you seen Steve Spangler's Science page? He has some INCREDIBLE videos of science demonstrations available…REALLY, they are good! Check it out:

http://www.stevespanglerscience.com

The Montana Natural History Center, based in Missoula, offers a variety of nature education programs and resources for schools and the general public. For teachers, MNHC has

- nineteen different traveling educational resource trunks that offer K-12 teachers a way to bring topics in science and natural history to life through hands-on materials, curriculum guides, audio and video materials, books, maps, posters and more;
- our Visiting Naturalist in the Schools program, which brings instructors into 4th and 5th grade classrooms once a month throughout the school year to lead students in outdoor exploration, understanding scientific processes and building naturalist skills, supplemented by two all-day field trips in the fall and spring;
- the annual Clark Fork Watershed Festival, in which hundreds of 6th graders and their teachers participate in classroom activities and an all-day field trip in the spring to learn about the geography, ecology and cultural history of the Clark Fork watershed;
- Center Tours and special programs, in which naturalists host school groups for programs at the Montana Natural History Center, and are available to come to classrooms to lead activities on a wide range of topics;
- periodic teacher trainings and other outdoor, nature-based programs for OPI credit.

Our magazine, *Montana Naturalist*, is published three times a year and contains articles on the wildlife, habitats and ecology of Montana, plus features about individuals and organizations in the state that are engaged in connecting people with the environment. Our fall 2007 issue concerns climate change and how it may impact, or be impacting, the Montana landscape**. [Alyson, can you include a line about the link to the pdf here? Not sure how to word it.]**

To learn more about any of our programs, please visit our website at www.MontanaNaturalist.org. If you would like to receive a copy of Montana Naturalist in the mail, please call (406) 327-0405 or email editor@montananaturalist.org.

2008 PAPER CAR CHALLENGE

The challenge: To design and build a device which rolls down a 6.2 meter track. The starting block of the track is approximately 1.5 meters off the floor. The device must be made exclusively from paper, glue, and brazing rod or coat hanger-type material. In addition, each car may carry erasers for added ballast. YOU include the erasers on your car and they should be able to be seen by our judges. It's ok to glue them in. The fastest car is the winner!

Parameters of the Challenge: The device must not exceed 6 cm at it widest point, including wheels. The maximum weight, including erasers is 60 grams. Each device must have at least two rolling parts on the track. The rod for the axles may be of any diameter you choose. Any type of rod may be used, but that's the only non-paper item, besides the glue, allowed on the car. Each car must have a flat surface (5cm X 3 cm) to which a card will be taped to trigger the laser timing device. The final entry should resemble a car in appearance! The spirit of the race is to design a PAPER CAR. Cars may be painted, stenciled, decorated as students wish. There are awards for creative designs and painting.

Restrictions: Only three sheets of 20 bond typing (Xerox-type) paper may be used. Only a total of 12 cm of rod may be used. Unlimited glue is allowed. No other materials of any kind: no cardboard, no straws, or tape!

The Track and Timing: The track is made of continuous aluminum rain gutter. It is 6.2 meters from the starting line to the finish line. We have two tracks, each with a photogate timer. The timer records the ending speed of each car by timing the 5 cm wide card that is taped to the top of each car. The results are measured in meters per second.

Classes: There will be a class for each grade level 4th-8th. An open class is available for high school students and adults (teachers, parents, etc). Please hold a "race-off" at your school and send us only your top winners. You decide how many to send. We'll race all that we receive.

All cars must be received by us no later than Wednesday, February 6. The "race-off" will be held Friday, February 8, 2008 by the 8th grade class at Monforton School. Pack your cars in a box and put them in the mail. If you'd like them returned, send enough money to cover postage and we'll get them back to you. Be sure to include your name, your grade and the name of the school on each car. The event will be video-taped. If you'd like a copy of the student-made tape, send a blank tape along and we'll dub it for you. Announcements of winning cars will be sent to the school and designers. There will be 1st-3rd awards at each grade level (4-8), plus the open class. If you have any questions, don't hesitate to ask. However, the decision of the 8th grade judges is final. The intent is to present a challenge, incorporate some problem solving with some science, and have a whole lot of fun. To that extent, good luck!

Mail to 6001 Monforton School Road
Bozeman, MT 59718

Hail in a Test Tube

Overview: Students are introduced to supercooled water. The activity is available in video format at
http://www.teachertube.com/view_video.php?viewkey=f70cd15d83085b000dbd

Essential Questions: What conditions must exist for hail to form?

National Science Standards:
Content Standard A: Science as Inquiry Abilities necessary to do science inquiry.
Content Standard B: Students should develop an understanding of properties and changes of properties in matter.
Content Standard D: Students should develop an understanding of the structure of the earth's system

Materials: large, clean test tube, water, crushed ice, salt, beaker, alcohol, thermometers

Vocabulary: supercooled, seed crystal, nucleus

Safety Reminders: freezing water

Procedure:

Engage: Discuss students' experiences with hail. Ask if they know how hail forms.

Explore: Direct the students to set up the investigation. Each group of students need the following:

- Clean test tube. TEACHER HINT: Thoroughly wash the test tube and then rise and dry with rubbing alcohol.
- Fill the test tube ½ to ¾ full of water
- Prepare an ice bath in the beaker using the crushed ice, water and salt
- Insert the test tube of water into the ice bath and leave it for 10 minutes
- Measure the temperature of the ice bath
- At the end of 10 minutes, remove the test tube and drop a small piece of crushed ice into the test tube
- Students should see the crystallization of water/ice occur in the test tube.

Explain: Lead a discussion of the observations the students made. The discussion should include the following:

- the relative temperature of the water in the ice bath
- the relative temperature of the water in the test tube
- the reason the water remained liquid BEFORE the chuck of ice was added
- supercooled water
- how hail needs a crystal seed of nucleus in order to form
- that supercooled water exists in clouds

Use websites such as these to familiarize yourself with the concepts before introducing them to students:

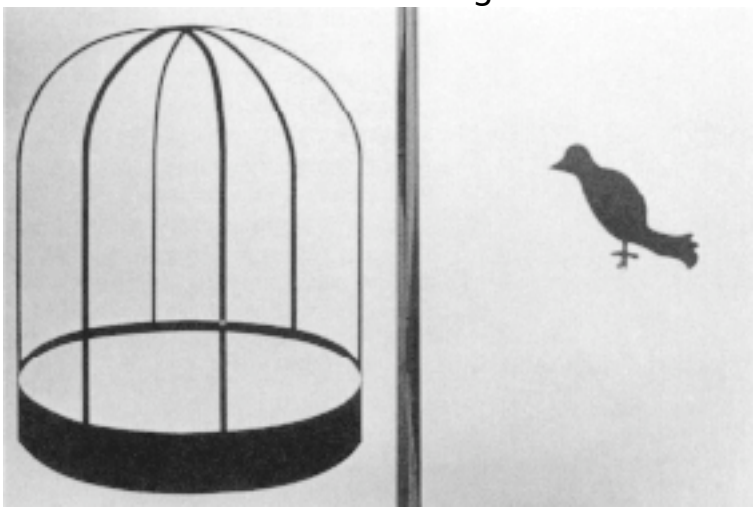
http://www.nssl.noaa.gov/primer/hail/hail_basics.html
http://www.lsbu.ac.uk/water/explan.html
There are also some great clips on YouTube showing other supercooling investigations

Extend: Encourage students to continue using their observations skills by repeating the investigation or further researching hail and other precipitation forms

Evaluate: Assess students' ability and accuracy in recording observations, sharing results, and/or writing a conclusion.

John Graves, 2007

Bird in the Cage



SNACKS EXPLORATORIUM SNACKS

Have you seen these? They are GREAT science activities available from The Science Exploratorium at this address:
http://www.exploratorium.edu/snacks/bird_in_cage.html

Stare at color and see it change.

You see color when receptor cells (called cones) on your eye's retina are stimulated by light. There are three types of cones, each sensitive to a particular color range. If one or more of the three types of cones becomes fatigued to the point where it responds less strongly than it normally would, the color you perceive from a given object will change.

Materials:
4 white posterboards or pieces of paper
Bright red, green, and blue construction or contact paper
Small piece of black construction or contact paper, or black marking pen
Scissors
Glue or glue stick (if you are using construction paper)
Adult help

Assembly: (30 minutes or less)
Cut the same simple shape, such a bird or a fish, from each of the three colored papers. Glue each shape on its own white board. Leave one white board blank. Cut a small black eye for each bird or fish or draw one in with the marking pen. If you choose a bird as the shape, draw the outline of a birdcage on the blank board; if you choose a fish, draw a fishbowl, etc. (Be creative!)

To do: (15 minutes or more)
Place the boards in a well-lit area. (Bright lighting is a significant factor in making this Snack work well.)
Stare at the eye of the red bird for 15 to 20 seconds and then quickly stare at the birdcage. You should see a bluish-green (cyan) bird in the cage. Now repeat the process, staring at the green bird. You should see a reddish-blue (magenta) bird in the cage. Finally, stare at the blue bird. You should see a yellow bird in the cage. (If you used a fish, try the same procedure with the fish and the bowl.)

The Science Behind It:
The ghostly fishes and birds that you see here are called afterimages. An afterimage is an image that stays with you even after you have stopped looking at the object.

The back of your eye is lined with light-sensitive cells called rods and cones. Cones are sensitive to colored light, and each of the three types of cones is sensitive to a particular range of color.

When you stare at the red bird, the image falls on one region of your retina. The red-sensitive cells in that region start to grow tired and stop responding strongly to red light. The white board reflects red, blue, and green light to your eyes (since white light is made up of all these colors). When you suddenly shift your gaze to the blank white board, the fatigued red-sensitive cells don't respond to the

reflected red light, but the blue-sensitive and green-sensitive cones respond strongly to the reflected blue and green light. As a result, where the red-sensitive cells don't respond you see a bluish-green bird. This bluish-green color is called cyan.

When you stare at the green bird, your green-sensitive cones become fatigued. Then, when you look at the white board, your eyes respond only to the reflected red and blue light, and you see a red-blue, or magenta, bird. Similarly, when you stare at a blue object, the blue-sensitive cones become fatigued, and the reflected red and green light combine to form yellow.

Extension:

You can design other objects with different colored paper and predict the results. Try a blue banana! For smaller versions, you can use brightly colored stickers (from stationery, card, or gift stores) on index cards.

One classic variation of this experiment uses an afterimage to make the American flag. Draw a flag, but substitute alternating green and black stripes for the familiar red and white stripes, and black stars on a yellow field for the white stars on a blue field. For simplicity, you can idealize the flag with a few thick stripes and a few large stars. When you stare at the flag and then stare at a blank white background, the flag's afterimage will appear in the correct colors.

You may also want to experiment with changing the distance between your eyes and the completely white board while you are observing the afterimage. Notice that the perceived size of the image changes, even though the size of the fatigued region on your retina remains the same. The perceived size of an image depends on both the size of the image on your retina and the perceived distance to the object.

Online Courses available:

Interested in professional development. Check out the following sites:

http://www.montana.edu/msse/
http://btc.montana.edu/courses/aspx/ntenindex.aspx

The Master's of Science in Science Education Program at MSU has a new director. Dr. Peggy Taylor assumed the position as of January 1, 2008. Congratulations, Peggy…MSTA looks forward to working with you.

Professional Development for Environmental Science Teachers

The GEODE Initiative at Northwestern University is pleased to offer a free professional development opportunity to a limited number of high school environmental science teachers. This opportunity is available to schools that adopt Investigations in Environmental Science, a new inquiry-based environmental science textbook, and will be implementing it for the first time in 2008-09. The professional development is being offered as part of a research study on professional development sponsored by the National Science Foundation and led by researchers at the University of Michigan.

Teachers selected for the study will receive 48 hours of professional development (valued at $2000) and a stipend at the completion of each year of the study (total of $1500 over two years). Accepted teachers and their principals must have purchased (or commit to purchasing) the instructional materials, must commit to participating fully in the summer and academic year professional development workshops, and must commit to participating in the study, including classroom data collection, for two years.

* For more information about this opportunity, visit:
http://www.geode.northwestern.edu/investigations/

* Or contact: Beth Kubitskey, Eastern Michigan University: 734-487-8798
or
e-mail iopd-info@umich.edu

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

John Graves
1112 Hunters Way
Bozeman, MT 59718
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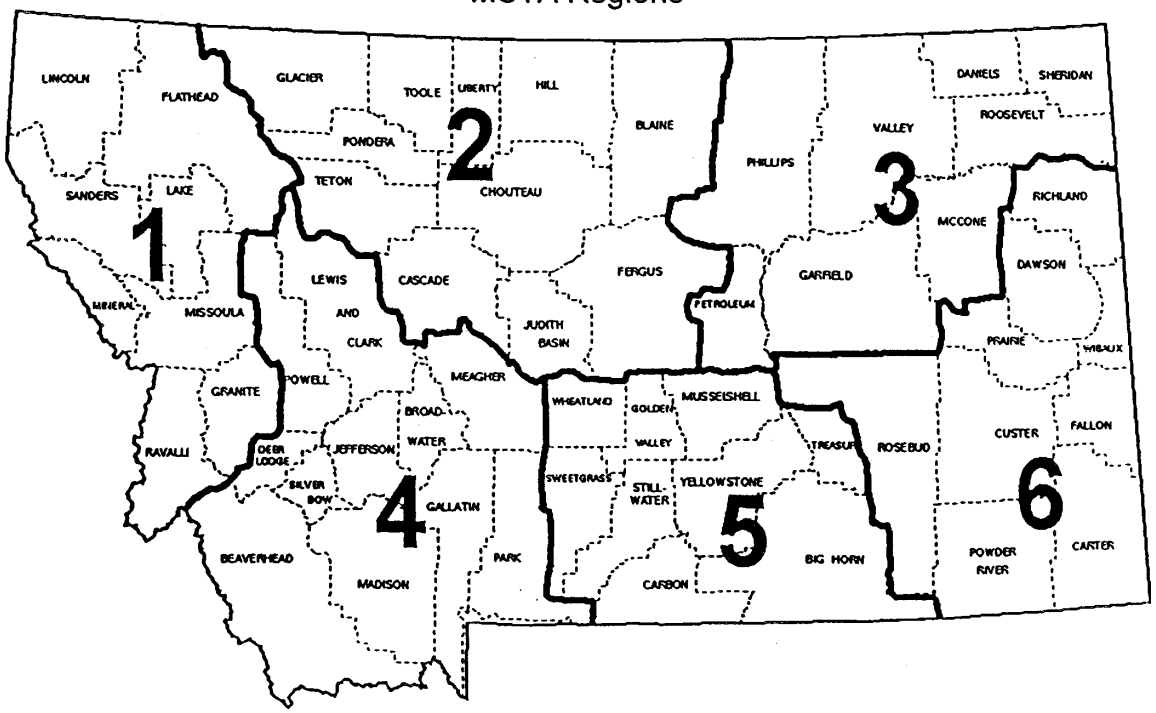

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