



# MONTANA MATHEMATICS

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of Mathematics

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## Montana Surveys of Enacted Curriculum Project (MSEC) Summarized by Lisa Scott

The Surveys of Enacted Curriculum (SEC) is a research-based tool that collects, reports, and uses data on what content is taught and how it is taught in individual schools and districts in the areas of math, science and language arts/reading. In particular, the SEC provides analyses on the relative “alignment” between standards, curriculum, assessments and instruction. The SEC methodology use surveys administered at the classroom and school levels which are either paper-based or Web-based. The SEC data analysis and reporting tools are intended to assist teachers, administrators, and policy makers with planning for instructional improvement.

Teachers complete a survey on the curriculum content and instructional practices for one of their core classes. The survey items cover the time spent on the subject content areas; the levels of cognitive domain targeted; and the time allocated to the instructional practices used. Teachers also report on their educational preparation, professional development and school/class demographics and context. The survey usually takes one to two hours and can be completed in multiple settings. The survey data is aggregated and can be reported out by a variety of categories and subgroups. State standards and assessments for subject areas covered by the process are coded to allow for across the board comparisons.

There is a rich variety of “maps” and reports that can be generated with SEC depending on the targeted survey area: content alignment, assessment of professional development design and impact, types and use of various instructional practices and assessments, and teacher perceptions on several key components of instructional design and implementation.

The SEC project was initiated in 1998 as a CCSO collaborative working with eleven states and three large urban school districts. The collaborative has since added five more states including Montana, hence MSEC.

The model is research-based and has undergone extensive field testing. Other development partners include the Wisconsin Center for Education Research, TERC Regional Alliance, and Learning Point Associates (the parent organization for NCREL). The collaborative approach allows the development and implementation of SEC to be highly responsive to and cost effective for, member states and districts. More details can be found at the CCSO website: [www.ccsso.org/projects/Surveys\\_of\\_Enacted\\_Curriculum](http://www.ccsso.org/projects/Surveys_of_Enacted_Curriculum) or <http://seconline.wceruw.org/secWebHome.htm>.

Districts and consortia that are currently using MSEC for curriculum alignment include; Billings Public Schools, Prairie View Curriculum Consortium, Montana Small School Alliance, Havre Public Schools, Huntley Project Schools, St Regis K-12 Schools, Libby Public Schools, Poplar Public Schools, and Wolf Point Public Schools.

*Continued on page 6*

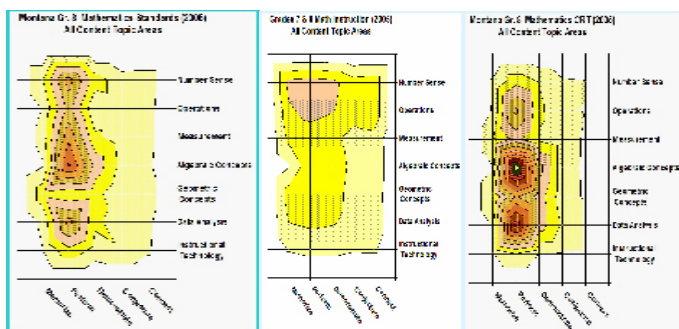


Figure 1

Figure 2

Figure 3

In Figure 2, the color range indicates the amount of emphasis/time the teacher is spending in a given content area and the performance level students are expected to achieve. Green denotes the highest amount of emphasis. Comparable maps, such as the ones shown in Figures 1 & 3, are then generated for state standards and state/district assessments. These maps may be used to create a dialogue among teachers, administrators and/or curriculum directors about curriculum alignment and where the emphasis may be or need to be for state standards, the enacted curriculum and the state assessment.

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## President's Message

This is going to be a series of unrelated thoughts. I was hoping there could be a connection somehow, but as I look over what I wrote, I would not make much of a bet. Bear with me, there may be a common thread turn up somewhere.

I was so impressed when I heard that three MCTM members are helping with the TV series "Numb3rs". Johnny Lott, former NCTM Pres, Terry Souhrada, current SIMMS revision writer, and Karen Longhart, former MCTM pres and current instructor at Flathead Valley Community College are math consultants for the CBS series. Johnny had a nice write up in the Billings Gazette. He explained that he and his colleagues are designing math activities for students based on each episode. These activities are put on the web for teachers to incorporate into their classrooms. You can check these out at [www.cbs.com/prime-time/numb3rs/ti/activities.shtml](http://www.cbs.com/prime-time/numb3rs/ti/activities.shtml). Cool huh?

I am always so impressed with the math teachers of Montana. Their commitment and energy is second to none. Although we rank very low on the pay scale, the level of achievement of our students remains very high. The results of the 2005 NAEP (National Assessment of Educational Progress) have been released. This year's 8<sup>th</sup> graders had a raw score of 286 for the third year in a row. This year's score was beaten only by Massachusetts' 292, Minnesota's 290, Vermont at 287 and our old nemesis's North and South Dakota with 287. WE can feel good about our 6<sup>th</sup> place ranking, but we also need to be wary of our consistency. Other states are seeing an increase in their scores. A noteworthy fact is that we increased our percent of "proficient" students from 29 to 30 percent and lowered our level of "below basic" from 21 to 20 percent (six percent of Montana students remain in the "advanced" ranking). I know this is a small gain, but it is improvement. We need to keep in mind that achievement in any form is great! It is interesting that the girls averaged 287 and the boys averaged 286.

I am also excited to report that our 4<sup>th</sup> graders have made big strides in the last several years. The NAEP divides their rating of students into 4 categories; 1) Below basic, 2) Basic, 3) Proficient, and 4) Advanced. Our 4<sup>th</sup> graders increased from a score of 228 in 1996 to a score of 237 in 2003 to a score of 241 in 2005. These scores ranked higher than 20 jurisdictions, not significantly different than 20, and lower than eight. This appears as if the 4<sup>th</sup> graders seem to be lacking when compared to the 8<sup>th</sup> graders. But as one reads on in the report, only 15% of the 4<sup>th</sup> grade students score in the basic ranking and 35% of the students are "proficient". Not too bad. The percentage of students who performed at or above the basic level was 85% compared to 81% in 2003 compared to 71% in 1996. I am so impressed with the elementary teachers of Montana. Their students have made some nice gains in recent years.

It was interesting to me that in the 4<sup>th</sup> grade the boys outscored the girls 243 to 239 in the 8<sup>th</sup> grade the girls averaged 287 and the boys averaged 286. I was always under the impression that as boys and girls are compared from year to year, the boys

seem to score better than girls on math tests as they get older. This doesn't seem to be true for Montana in 2005.

All of that said, I worry about the direction of education in Montana. Will we be able to keep up this excellent level of student achievement? The Billings Gazette had several articles in their November 6<sup>th</sup> edition concerning the teacher shortage in Montana. It is a "must read". This isn't exactly news to the teachers of Montana, but I hope it opens the eyes of the readers across the state. It points out some sobering facts about the future of education in Montana. A huge point is how tough it is for most schools in Montana to hire and retain qualified teachers. When the average starting salaries for teachers in Montana is low \$20,000's and competing out of state districts at job fairs are advertising \$35,000 as a starting salary, it is tough for Montana districts to compete. One Montana school has even gone so far as to give a \$750 signing bonus to attract new teachers.

I wish I had some great answers to these problems, but alas, I don't. I hope the legislature can come up with some type of funding so our graduates stay in our great state.

Back to a positive note, I hope that many of you reading this were able to attend the fall conference in Missoula. It was great. I absolutely love being around the teachers of Montana. They are the greatest! Another plus is that your organization, MCTM, now has 500 members. Thank you all!

*-Jim Hamling*

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### **Congratulations Dean Preble Award Winners!**

On behalf of the Montana Council of Teachers of Mathematics, I am extremely honored to inform you that Jacquie McDonald, 9-12 mathematics teacher at Senior High School and Nina Miller, K-6 Elementary Mathematics Coach, are this year's recipients of the prestigious Dean Preble Award.

This award is given yearly to an outstanding math educator in Montana in each of three categories, K- 6, 7-12 and at the university level. The teacher must first be nominated for the award by a colleague; a person may not apply for this award. This nomination is then subject to some very selective criteria. A committee, made up of MCTM members, review the nomination. Only the very best and dedicated teachers are considered and accepted. It is not enough that the recipient displays excellence in the classroom; they must also show involvement in activities that improve teaching and learning in the state of Montana.

Please take time to nominate a teacher for the Dean Preble Award.

# Lesson Plans

Complete lesson plans are available at [www.montanamath.org](http://www.montanamath.org)

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## K-6

### Making Tens:

Students use a hands-on, inquiry based method for discovering the combinations that make ten. As a landmark number, students need to have a firm grasp of these combinations. This will aid in their development of mental math strategies and in adding and subtracting two digit numbers.

### Sieve of Eratosthenes:

Students discover prime numbers using a hundreds chart. This method also helps students to discover patterns in multiples, which builds number sense.

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## Middle School

Dumping Number Sets

By Florence Gold

### Introduction

This activity allows students to understand the classification of numbers into their various number sets. This activity can be adapted to other classifications in both math and science such as geometric figures, plants and animal classification systems. Grade level 6<sup>th</sup> – 10<sup>th</sup>

### Materials

Four stacking containers of different sizes labeled rational, integers, whole, counting  
Index cards with various numbers from the following sets: counting or natural numbers, whole numbers, integers, and rational numbers.

### Objectives

Students understand the classification of number sets.

### Activity

1. On the board draw, four containers (varying in size from largest to smallest) labeled as in the above picture.
2. Show how a counting number such as 3 belongs in all four containers, but that the smallest container that it belongs to is the counting number container.
3. Give each student an index card with a number written on it. The cards should have a variety of numbers (determined by the level of student you are presenting this activity to, you might want to include irrational and imaginary numbers) on them including whole numbers, negative integers, whole numbers, and counting numbers.
4. Ask all the students with a counting number to bring their card up and place it in the counting number container. Next, call the students who have a number to place in the whole number container. Only the student with a zero will come forward. Ask the students why this is so. What happened to the other whole numbers? To help demonstrate that the counting numbers are a subset of the whole numbers dump the numbers from the counting number container into the whole number container. Next, call the students with a number to place into the integer container. These students will have negative integers only. Ask the students why all the integers are negative. Then dump the whole numbers into the integer container. Lastly, call the students who have a number to place in the rational number container. These students will have both positive and negative fractions. Finally, as flamboyantly as possible, dump the integers into the rational number container.

### Summary

This activity is summarized by relating number sets to a number line and or flow chart.



Jokes & Quotes by charlie

Three men walked into a bar, the fourth one ducked!

What did zero say to eight? Nice belt.

What do you call fake spaghetti? Impasta.

Donald Rumsfeld is giving the president a daily briefing.... He concludes by saying, "Yesterday, 3 brazilian soldiers died." "OH NO!" The President exclaims. "That's terrible!" His staff sits stunned at this display of emotion, nervously watching as the President sits, head in hands. Finally, the President looks up and asks, "How many is a brazillion?" thanks Jenny Combs

- "to see the sequence and be able to pick the next object.
1. see pattern
  2. pray that you know the next number.
  3. Thank the LORD if you get it right"

A Geometry student's response to a chapter test question on the three steps in inductive reasoning.

If you have a joke or quote to share, please email them to deisher6@midrivers.com.

Greetings from the Montana Learning Center, MLC

The sun is shining as it always does here in this beautiful area. The deer are allowing us to walk to buildings and get the mail. Stop by and visit any-time.

The most exciting event involves families coming to MLC for a Winter Wonderland Open House January 20-21. Families can rent a house for the night and groups of chaperoned students can spend the night in a dorm. History of Hot Chocolate, Hiking, Hibernation, and other sessions will be offered along with a wonderful lunch and time to enjoy the area. Check the website for more details and registration. If you are coming from afar, we can arrange lodging for more than one night.

Speaking of the website [www.MontanaLearning.org](http://www.MontanaLearning.org), we ask for patience while we update and make changes to better inform. This means you need to check the site often.

The T^3 Regional Conference takes place March 23-25. The entire conference will be held at MLC and if you attended last year you know it will be worthwhile. The best part will be staying at MLC so register now for lodging as it will be limited. Please take time to register. The forms are on the website.

Please contact me if you have any questions and/or programs you want scheduled at MLC

**MCTM Membership Form**

<input type="checkbox"/> New Member	<input type="checkbox"/> Renewal		
<input type="checkbox"/> Elementary	<input type="checkbox"/> MS	<input type="checkbox"/> HS	
<input type="checkbox"/> College	<input type="checkbox"/> Other		
Name _____	<input type="checkbox"/> Life Time	\$150	
Address _____	<input type="checkbox"/> Student	\$8	
_____	<input type="checkbox"/> Retired Educator	FREE	
_____	<input type="checkbox"/> MCTM & MSTA	\$30	
Phone Number: _____	<input type="checkbox"/> Contribution to Scholarship		
Email: _____		Fund \$5 to \$ 8	

**Send Form with correct amount to:**  
 Lisa Wood, MCTM Membership Chair  
 1911 Belvedere Drive  
 Billings, MT 59102  
[woodl@billings.k12.mt.us](mailto:woodl@billings.k12.mt.us)

## MCTM History Tidbits

### Publications (Part 2)

In the early 1990s, MCTM produced guidelines for Professional Standards and Practices. Titled Mathematics Matters in Montana, it included expectations for parents, students, teachers, principals, etc. Although we are now teaching in the 21<sup>st</sup> century and Standards has been revised to Standards and Principles, the excerpt below for teachers shows that our role hasn't changed.

### The Role of Teachers

In order to keep education in the classroom meeting the needs of students who will work in the 21<sup>st</sup> century, teachers must strive:

- 1 To support and disseminate information regarding the NCTM Standards to the community as a whole and the educational community in particular.
- 2 To remain current on research and trends in mathematics education relating to student learning, instructional methods, curriculum and materials.
- 3 To maintain active professional memberships in mathematics organizations, including MCTM and NCTM.
- 4 To provide leadership as a primary decision maker in the district for the establishment, implementation and revision of the mathematics curriculum.
- 5 To communicate regularly with fellow mathematics teachers (K-College) in the school, district, and on a state level.
- 6 To value mathematics and to communicate that value and importance of mathematics across the entire curriculum to students and parents.
- 7 To provide a classroom atmosphere that facilitates cooperative learning, written and oral communication and activity based learning.
- 8 To maintain a technologically current classroom that expects and allows all students to have access to calculators and computers.
- 9 To design methods for assessment and assess learning with several forms of evaluation. Evaluation must be an integral part of learning and diagnosis rather than used solely for grade assignment.
- 10 To teach students the applications of mathematics.
- 11 To allow all students to experience the whole range of topics in the Standards regardless of mastery of particular topics.
- 12 To have high expectations for all students in mathematics at all levels (K-College) regardless of race, sex, or social background.

## Montana's Connections to the 2<sup>nd</sup> Year CBS Television Series NUMB3RS

At the NCTM National Convention in Anaheim last fall, a rough cut of the series, NUMB3RS, was shown at a major session and several of the stars of the series sat on a panel to answer questions following the viewing. As a result of the comments by teachers during this panel discussion, NCTM, in collaboration with Texas Instruments and CBS, has decided to post two to four activities relating to each new episode on CBS's website beginning from the week prior to the airing of each new episode. The activities are designed to create interest and to relate how mathematics is continuously being used in our every day lives. What makes these activities even more significant is the fact that two of the nine writers of the activities are from Montana. Johnny Lott and Terry Souhrada have been asked and have agreed to write some of the activities that will be associated with the television series. In addition to Johnny and Terry, Karen Longhart has been asked by NCTM to act as the writing coordinator for the project. It is anticipated that the project will last from this September until the last new episode is to be aired in March of 2006. Be sure to get on-line at and have your students work through the activities and watch NUMB3RS. Visit the site at [cbs.com/primetime/Numb3rs](http://cbs.com/primetime/Numb3rs) and click on the TI/Numb3rs icon to sign up for a free poster and teacher kit. You can also download the activities as a pdf file. The activities each contain a teacher page, student page(s), and an extensions page. "We All Use Math Everyday" is the mantra of the show and the quote on the poster.

Submitted by  
Fred Longhart  
Affiliate Services Committee

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*Continued from page 1.*

Districts and/or consortia that would be interested in taking the next steps to learn more about MSEC and the options for beginning to use it should contact Al McMilin or Margaret Bowles at the OPI.

Al McMilin  
Educator Quality Program Specialist  
Office of Public Instruction  
PO Box 202501  
Helena, MT 59620-2501  
(406) 444-4436  
E-mail: [amcmilin@mt.gov](mailto:amcmilin@mt.gov)

Margaret Bowles  
Accreditation Accountability Specialist  
Office of Public Instruction  
PO Box 202501  
Helena, MT 59620-2501  
(406) 444-0716  
E-mail: [mbowles@mt.gov](mailto:mbowles@mt.gov)



## Leadership Conference 2006

You are invited to attend the 2006 Math and Science Leadership Conference held in Bozeman, Montana January 13-14, 2006. In order to broaden the leadership network that exists in Montana, you are encouraged to invite and bring a fellow educator or administrator.

Registration will begin at 7:45 AM on Friday, January 13, 2006. The conference will start at 8:15 AM and conclude by 12:30 PM on Saturday, January 14. The conference will be held at the Comfort Inn located at 1370 North 7<sup>th</sup> Ave., Bozeman, MT 59715. Rooms have been blocked for Thursday and Friday nights. Please contact the Comfort Inn at (406)587-2322 to reserve a room in your name. The reservations must be made by January 1, 2004 to assure a conference rate of \$60 for a single and \$65 for a double.

The cost of the conference for non-members is \$150 and includes a two-year membership in either MCTM or MSTA. The registration cost is \$125 for MCTM/MSTA members. (MCTM scholarships are available for current MCTM members. Please go to [www.montanamath.org](http://www.montanamath.org) and click on [awards](#) for an application.) The registration price includes meals. Renewal credits through OPI will be offered. You can register by email to Angel Greenley at [greenleva@billings.k12.mt.us](mailto:greenleva@billings.k12.mt.us) or mail it to her on the form provided.

The topic of this year's conference is a continuation of "A Framework for Understanding Poverty". Freta Parkes will be the keynote speaker focusing on the elements of building cognitive capacity for struggling students in a practical seminar. Ms. Parks has been a teacher, educational diagnostician, principal, and school board member and now is a consultant for **aha!** Process, Inc. located Highlands, Texas. The seminar you will learn why students may know information one day but not the next or why they raise their hand for help only to be unable to explain why they need help. Topics include developing cognitive learning structures and emotional resources, building mental models, identifying payoffs for learning, developing question making and labeling and sorting strategies that use patterns.

In addition, members of the Montana math and science community will be presenting on a variety of topics addressing the needs of at-risk populations in addition to sessions about leadership opportunities for Montana educators. The topics will be appropriate for all grade levels. Opportunities will be available for teachers to discuss ideas for presentations at local, state, and national levels. The "State of the State" address for both math and science is always a highlight.

The goals for the 2006 Math and Science Leadership Conference are:

- To encourage leadership by fostering partnerships between math/science teachers, students, and university faculty
- To continue to build a network of colleagues within the K-16 math and science community
- To enhance professionalism by bringing new teachers into math and science leadership roles in Montana.

If you have any questions, please contact Alyson Mike at the address and/or telephone numbers listed below.

Alyson M. Mike  
400 Kalispell/Box 1280  
East Helena, MT 59635  
[amike@initco.net](mailto:amike@initco.net)

*Continued from page 4*

(See [www.nctm.org](http://www.nctm.org) for more details about the conference.)

Anyone who renews their membership, has a ten-year membership or a life-time membership will be entered once.

The winner will receive paid registration at the NCTM member rate of \$195, four nights at a hotel at approximately \$170/night, an airline ticket estimated at \$500 and food expenses of \$25/day for four days. The total prize is not to exceed \$1500.

Members may copy a registration form for membership to MCTM and hand it out to their colleagues. New members need to write your name on the application and

you will be entered into the drawing two times for each new member you recruit. The new member will be entered once for their new membership.

The winner of the trip to St. Louis, MO will be drawn at the Leadership Conference in Bozeman on January 14, 2006. The winner and an alternate winner will be selected at random. If the winner is unable to attend the conference, the alternate winner will attend in their place. The prize is not transferable.

Any questions about the contest may be sent to

## Nominations Sought for the 2006 Dean Preble Memorial Award for Outstanding Teachers of Mathematics

The Dean Preble Memorial Award for Outstanding Teachers of Mathematics is an annual recognition of teachers of mathematics at all levels in mathematics education. MCTM wishes to recognize an elementary (grades K-8), a secondary (grades 5-12), and a collegiate teacher of mathematics who have made significant contributions to the teaching and learning of mathematics.

### The Award

This award is given in memory of our colleague Dean Preble, who passed away from cancer in the fall of 1998. Dean was recognized for his unfailing support for mathematics education in the state of Montana. His dedication to the mathematics teaching profession, his love of his students, his involvement in state and national mathematics organizations, and his devotion to the improvement of mathematics education in Montana were unparalleled.

One of Dean's wishes was to establish an annual award to recognize outstanding teachers of mathematics in Montana. In keeping with his wish, MCTM created the Dean Preble Memorial Award for Outstanding Teachers of Mathematics. The award consists of an inscribed plaque and a \$100 stipend for the recognized teachers, to be awarded at the MCTM annual meeting in October.

### Award Criteria

- Any member of MCTM may submit a nomination. Current members of the MCTM Board may not be nominated for this award.
- The nominee must be a current MCTM member.
- The nominee must have taught mathematics in Montana.
- The nominee must have a record of significant and consistent contributions to the teaching and learning of mathematics.
- The nominee must demonstrate a concern for her/his fellow teachers of mathematics.
- The nominee must demonstrate a willingness to continue to grow and improve as a teacher of mathematics.
- The nominee must demonstrate an extraordinary ability to engage students in the learning of mathematics.
- The nominee must have a record of participation in professional activities involving mathematics.

### Nomination Procedure

Nominations should consist of a maximum of two, double-spaced, typewritten pages and should directly address the criteria outlined above. The name, address, telephone number, and present position of both the nominee and the nominator must be included. Deadline for submissions for the 2006 Dean Preble Memorial Award is June 15, 2006. Nominations may be sent or e-mailed to:

Cliff Bara  
231 Sunrise Lane  
Troy, MT 59935  
cliffbara@hotmail.com

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### Join NCTM

During the past few years the tendency for Montana mathematics teachers has been to become less involved in our professional organizations. I would like to invite you to renew or join NCTM if you do not already belong. Montana has been highly involved in leadership positions and we hope to continue this trend! The advantages of belonging to NCTM are many. As an NCTM member, you'll have opportunities to grow professionally and save up to 35% on nonmember registration rates at NCTM meetings and conferences. In addition to this, NCTM has chosen political advocacy for mathematics education as a key strategic direction for the future so that the classroom mathematics teacher has representation on Capitol Hill. If you are not aware, NCTM offers an E-Membership which includes a printed NCTM News Bulletin, access to the Members Only area of nctm.org website, and 10 school journal article downloads. By joining through the Montana Council of Teachers of Mathematics, MCTM can receive a \$3 rebate for each renewal or a \$5 each new membership! PLEASE JOIN! IT IS YOUR PROFESSIONAL ORGANIZATION!

Fred Longhart  
Affiliate Services Committee



**Montana Mathematics Opportunities — Satinee Lightbourne**

Check out the MCTM web site at [www.montanamath.org](http://www.montanamath.org)

**\*Math Contests.**

Bozeman:	March 2	4:30 pm
Havre:	March 4	9:00 am
Billings:	March 7	4 pm
Miles City:	March 14	2:30 pm
Sidney:	March 14	4:00 pm
Grass Range:	March 13	12:00 pm
Glasgow:	March 14	4:15 pm
Butte:	March 15	9:30 am
Great Falls:	March 18	9 am
Kalispell:	To Be Announced	
Missoula:	We need a director!	

Contact the State Director for more information: [satinee\\_lightbourne@gfps.k12.mt.us](mailto:satinee_lightbourne@gfps.k12.mt.us)

**\*Dean Preble Award.** Nominations are accepted year round! Nominate any MCTM member (board members excluded) who teaches K-college. Nomination procedure found on the MCTM web site. Click on Awards.

**\*MCTM Teacher Scholarships.** Self-nomination form can be found on the MCTM web site. Click on Awards. These scholarships are offered year-round. Teachers can receive \$250 for help with any out of state conference or \$100 for any in state conference.

**\*Presidential Awards.** Nominations for K - 6 teachers are currently being accepted. A teacher must be nominated in order to receive the application. Application deadline is May 1, 2006. Go the Awards page of the MCTM website or directly to [www.ehr.nsf.gov/pa/](http://www.ehr.nsf.gov/pa/).

**\*Membership.** Do you know someone in your school who is not a member of MCTM? Please encourage them to join!

**MCTM Membership Form**

<input type="checkbox"/> New Member	<input type="checkbox"/> Renewal	Annual Dues (September- August)	
<input type="checkbox"/> Elementary	<input type="checkbox"/> MS	<input type="checkbox"/> Regular (1 yr)	\$15
<input type="checkbox"/> College	<input type="checkbox"/> Other	<input type="checkbox"/> Regular (2 yrs)	\$25
		<input type="checkbox"/> Regular (10 yrs)	\$100
Name _____		<input type="checkbox"/> Life Time	\$150
Address _____		<input type="checkbox"/> Student	\$8
_____		<input type="checkbox"/> Retired Educator	FREE
_____		<input type="checkbox"/> MCTM & MSTA	\$30
Phone Number: _____		<input type="checkbox"/> Contribution to Scholarship	
Email: _____		<input type="checkbox"/> Fund \$5 to \$ 8	

**Send Form with correct amount to:**  
 Lisa Wood, MCTM Membership Chair  
 1911 Belvedere Drive  
 Billings, MT 59102  
[wood@billings.k12.mt.us](mailto:wood@billings.k12.mt.us)

## Vocabulary Corner

**Decomposing Numbers:** Breaking numbers apart to make compatible numbers. Numbers are decomposed during the mental math process. For example, when adding  $9 + 6$ ; students may decompose the 6 into  $1 + 5$ ; giving them the equation of  $9+1+5$ . This problem becomes  $10+5$ .

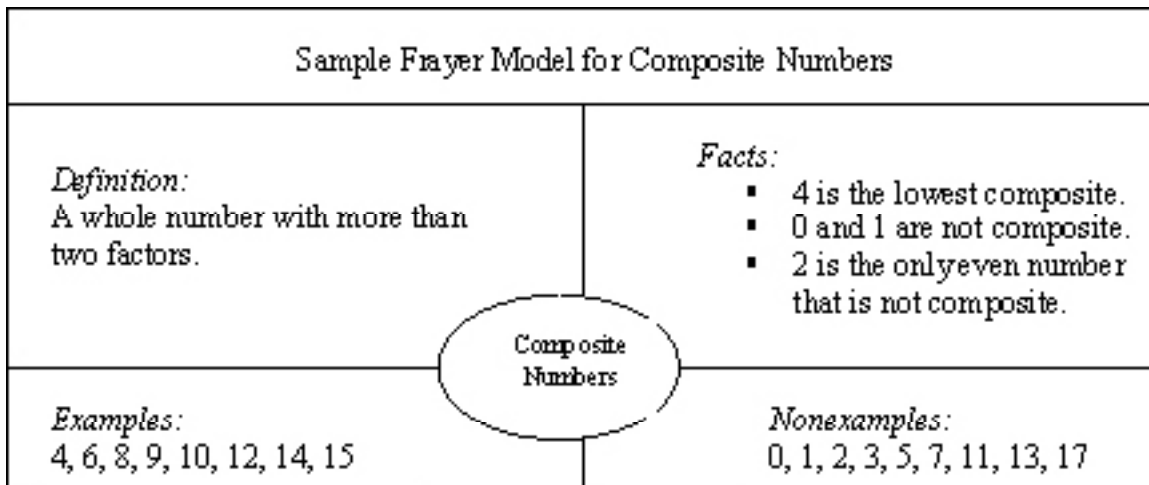
**Inverse Operations:** Addition and subtraction are inverse operations, as are multiplication and division.

**Skip Counting:** Counting by the multiples of a given number.

**Simplest Fraction or Fraction in the Lowest Terms:** Use this vocabulary instead of "reduced fraction" - the fraction is not reduced in size, it is simplified.

**Mathematical Properties** should be introduced and applied in the classroom as much as possible. Students should not be expected to memorize the properties, but instead expected to understand their application. For example, students learning fact families will observe that, " $3 + 2$  is the same as  $2 + 3$ ." You can respond by saying, "That is true because of the Commutative Property of Addition." After being continually exposed to this language and seeing it "in action", students understand the application of the property.

**Technique:** The Frayer Model is a graphic organizer that may be useful in vocabulary development. A sheet is divided into 4 quadrants. Quadrant 1 has students defining the term in their own words. Quadrant 2 lists any facts they know about the word. Quadrant 3 lists examples. Quadrant 4 lists nonexamples.



## SIMMS AD

**Get Ready!!!**

**We are coming back in October 2006  
and there's going to be a PARTY!!!!**

## Earn Your Masters Degree in Mathematics Education

The MSU-Bozeman Master of Science Degree in Mathematics under the Mathematics Education Option (MSMME) is designed for practicing mathematics teachers or science teachers wishing to be endorsed in mathematics. There are currently thirty-five teachers enrolled in the program. In the last five years over 40 teachers have graduated from our program.

The MSMME degree, usually completed in two years, consists of 30 semester hours of courses and individual projects that you select depending on your interests and needs. Most coursework is taken online from your own home or from your school during the academic year. Face-to-face classes are taught each summer in a three-week institute format. A capstone project, completed in the second year of the program, lets you try new ideas for improving mathematics learning in your classroom.

### Some Sample Programs of Study

Even though details about the program can be found at [www.math.montana.edu/mathed/distance](http://www.math.montana.edu/mathed/distance), here are some sample programs of study showing how you can complete the MSMME degree in two years. Online courses are in italics and credit hours are in parentheses.

Dates

Summer 2006

**June 26-July 14**

**(Online courses:**

**June 13-July 28)**

For Middle School Teachers

*Math 518 Statistics for Teachers (2)*

*Math 519 Applications of Statistics (2)*

**Math 424 Algebraic Investigations  
for the Middle Grades (3)**

**or (choose one)**

*Math 526 Discrete Math for Teachers (3)*

For High School Teachers

*Math 518 Statistics for Teachers (2)*

*Math 519 Applications of Statistics (2)*

**Math 524 Linear Algebra for Teachers (3)**

**or (choose one)**

*Math 526 Discrete Math for Teachers (3)*

Fall 2006

For Middle School Teachers

*Math 535 Technology in the Math  
Classroom (3)* or (choose one)

*Math 523 Number Structures (2)*

For High School Teachers

*Math 535 Technology in the Math  
Classroom (3)*

Spring 2007

For Middle School Teachers

*Math 522 Assessment in the math  
Classroom (3)*

For High School Teachers

*Math 517 Mathematical Modeling  
for Teachers (3)*

Summer 2007

For Middle School Teachers

**Math 420 Geometry for the  
Middle Grades (3)**

**Math 500 Capstone Symposium (1)**

*Math 517 Language of Math (3)*

**Math 571 Capstone Seminar (2)**

For High School Teachers

**Math 500 Capstone Symposium (1)**

*Math 517 Language of Math (3)*

**Math 525 Analysis for Teachers (3)**

**Math 571 Capstone Seminar (2)**

Fall 2007

For Middle School Teachers

*Math 521 Applications of Learning  
Theories in Math Class (3)*

For High School Teachers

*Math 533 Historical Topics for the  
Math Classroom (3)*

Spring 2008

For Middle School Teachers

*Math 520 Standards-Based  
Curriculum (3)*

*Math 577 Capstone Project (1-3)*

For High School Teachers

*Math 527 Geometry for Teachers (3)*

*Math 577 Capstone Project (1-3)*

The sample programs shown above require you to be on campus for either one or two 3-week sessions. (Summer 2006 recommendations can be done entirely in distance mode or can include the face-to-face component.) Many teachers plan their programs so that they only attend one 3-week session. The total cost of the above programs at current rates, including dormitory costs, is estimated to be less than \$8000. Note: All course credits may be applied toward teacher recertification.

### How to Apply

If you would like to receive an application packet or more information about the program please contact Dr. Maurice Burke, Department of Mathematical Sciences, Montana State University, Bozeman, MT 59717-2400, Phone (406)994-3601. E-mail is the quickest: [burke@math.montana.edu](mailto:burke@math.montana.edu).

**MCTM NEWSLETTER**  
**Great Falls Public Schools**  
 Great Falls High School  
 1900 2nd Ave. S  
 Great Falls, Montana 59401

Non-Profit Organization

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