

MONTANA MATHEMATICS

A Publication of the Montana Council
of Teachers
of Mathematics

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Issue 4

The What, Why, Where, When and How of MCTM Summer Academies

What does quality professional development look like? MCTM is dedicated to providing professional development with these characteristics:

- Students' learning as the ultimate goal
- Mathematics content the focus
- Good instructional practices modeled
- Teacher collaboration
- Some disequilibrium created for participants

This summer you will not be disappointed!

Repeating this year is the high school academy, *Update – Invigorate – Integrate: Using the Calculator to Enhance Student Learning*. Returning is Todd Morstein who has taken a year off from Glacier High School in Kalispell to work full time for Texas Instruments. He will have many new and exciting things to share as well as activities that integrate the calculator into the classroom. The mathematics will cover aspects of Algebra 1, Algebra 2, Geometry, and Pre-Calculus. Come ready to collaborate with other teachers. Disequilibrium guaranteed!

The Elementary academy, *Implementing the Algebra Standard K-6*, will be presented by Angel Zickefoose. Participants will be provided with an introduction to algebraic thinking. Content will include geometric patterns, growth patterns, functions and how to represent them with equations and graphs. Variables, solving equations and properties of numbers will also be explored. Participants will look at the NCTM Focal Points and the National

Mathematics Advisory Panel Report for insight into curriculum and instructional practices. This workshop will begin a series of workshops that will be presented over the next 4 years that emphasize algebraic thinking. Next summer's new workshop will be geared to middle school teachers.

So why should you attend this year? Here are some comments from last year's participants:

- "The class was awesome!"
- "This was one of the most worthwhile workshops I have ever taken. Thanks!"
- "Wonderful week! Anytime I attend a workshop or class I look for new ideas to take back to my classroom and use to help me be a better teacher. This class was just what I wanted and needed."
- "I loved the class. It was definitely enjoyable coming to class daily and working together with my peers. The material and knowledge gained is relevant and exciting."
- "This class was so informational. I have so many ideas that I can and will use. It was one of the best workshops I have participated in."
- "Wonderful class – I can't wait to try another one."

See the flyers in this newsletter for registration information.

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MCTM President's Message

Greetings from Billings Montana! Wow! Can you believe how fast the school year is going? Summer will be here before we know it! How was the MCTM Math Contest in your area? It was exciting to see all of those students participating in the contest. A great big thank you to all the people that volunteer their time to make sure that the contest is a success each and every year. Don't forget about the test writing opportunities in the summer! MCTM pays your expenses as well as a stipend to write the tests over a two day time period. Watch for information on the dates for writing on the MCTM website at www.montanamath.org and while you are at it thank our webmaster Tony Riehl for all the time he volunteers making sure the information on the website is current. Thank you Tony!

Please take the time to vote for those members running for the MCTM Board. This is the newsletter that provides information about those people running, who and what region we need to represent us, and the ballot to vote. Please read their biographies (pages 6 & 7), choose those people you would like to have represent you on the board and send the ballot in. Thank you to those people willing to run for the board. If you are interested in being a board member please let one of the current board members know so we can be sure and contact you when it is time once again to nominate people to run for the board.

This summer MCTM is sponsoring two exciting Professional Developments (see pages 1, 13 and 14). "Implementing the Algebra Standard K-6" is being presented by Angel Greenley Zickefoose at the Montana Learning Center at Canyon Ferry on July 13-16. Angel is a math coach with the Billings School District. She is knowledgeable, interesting, and will provide you with much you can use in your classrooms. "Update – Invigorate – Integrate Using the Calculator to Enhance Student Learning" is being presented by Todd Morstein at the Lincoln Center in Billings on July 20-23. Todd is currently working with Texas Instrument as a presenter but resides in Kalispell Montana. He is dynamic, interesting, and knowledgeable in the area of technology. For more information on how to apply to attend these exciting workshops visit our website at www.montanamath.org.

The MEA-MFT conference in October looks to be extraordinary. The conference is in Billings and will be also a T³ conference. We anticipate a larger than normal attendance and so are in need of presenters. We would like presentations that utilize technology as well as presentations that don't. When you register for the MEA-MFT conference, you will also register for the T³ conference. There is no extra

cost to you. As a participant you will be able to pick from workshops that are designated T³ and those that are not. As I have said before, we are in need of presenters. MCTM has always had a large presence as the convention and would like to continue that tradition. If you are not comfortable presenting alone, ask a colleague to present with you. To register as a presenter at the conference you find a link on the MCTM website. You must register as a presenter by May 8th. (See page 3 for more information).

Be thinking of people that you would like to nominate for the Dean Preble Award again this year. Nominations are due in June but can be sent in any time. Nominate now while you are thinking about it. All the pertinent information is on page 12 of this newsletter, and also on the MCTM website. Please honor Dean by seriously considering your colleagues and nominating a worthy teacher. Thanks for all you do, both inside and outside the classroom and enjoy the rest of the school year!

Lisa Wood
MCTM President

NCTM Position Statements

NCTM position statements define a particular problem, issue, or need and describe its relevance to mathematics education. Each statement defines the Council's position or answers a question central to the issue. The NCTM Board of Directors approves position statements.

The NCTM position statements may come in handy if you are working on making changes in your math curriculum or you are working to close the achievement gap.

You may find the position statements at www.nctm.org. Click on "About NCTM" and the "Position Statements."

NCTM offers position statements on the following topics:

Achievement Gap:

Closing the Achievement Gap (April, 2005)

Algebra:

Algebra: What, When and for Whom (Sept. 2008)

Assessment:

Assessment: High-Stakes Tests (January 2006)

(Continued on page

Lesson Plans

Complete lesson plans are available at www.montanamath.org

K-6

Associative Property Contig

Submitted by Kathy Hill

Students will discuss strategies for adding and multiplying three numbers than play a dice game to practice using the associative property.

Middle School

Math Categories Game

Created by Renee Floyd

During this time of the year, middle school kids are full of energy and it's time for review. This is a Jeopardy-like game to review 7th grade concepts; however, the game can be adapted for any grade level. This game is set up for old-fashioned technology, such as an overhead, that we were using back in the '80s! Yet, I still use the framework because it is easily adaptable to modern day technology, such as PowerPoint and Smart Boards.

High School

Modeling with Parametrics

Submitted by Verne Schlepp

In this lesson, students will use parametrics to model hitting a homerun in baseball, kicking a football and shooting a free throw in basketball.



Friends, Mathematicians, School Teachers – lend us your skills!

Presenters are needed for the 2009 MEA-MFT Convention in Billings, October 18-19. All it takes is a couple of fun ideas that you can share with your fellow math educators. If you aren't sure that you have enough information to fill an hour, plan to co-teach the session with a colleague. We are especially interested in workshops that use TI technology (we will request the equipment from TI for your use) or apply specifically to the K-8 level, but a huge variety of ages and interests is needed!

Applications can be submitted on-line to MEA-MFT by the deadline of May 8, 2009 – we've included a link at montanamath.org to get you there quickly. If you need more information, please contact Kerry Gruizenga, program co-chair at gruizengak@billings.k12.mt.us



Aunt Sally

Dear Reader,

In the last issue I posed a question to the readers submitted by Will Factor and said I would print the best explanation in this issue. Thank you for all of the replies. I know there can't be two best explanations but I liked these two for different reasons. I have included Will's question, followed by the two best explanations. Thank you Margaret and Otis!

Signed,

Your Dear Aunt Sally

Dear Aunt Sally,

My Algebra 2 students have been factoring polynomials and I have been emphasizing that they need to "factor completely". We have noticed that when we factor the sum (or difference) of two cubes, such as " $a^3 + 8^3$ " or " $a^3 - 8^3$ ", we get a binomial and a trinomial factor. The trinomial we get is never factorable. Is this always true and why?

Signed,

Will Factor

Dear Aunt Sally,

In the January newsletter, you asked your readers to answer Will Factor's question. Last week, I was able to participate in the NCTM E-workshop "Implementing the Algebra Standard in Grades 9-12". One of the topics from the workshop was exposing students to multiple representations in the classroom. So I hope you will allow me to explain whether the trinomial factor in a sum or difference of cubes is factorable using multiple representations.

SUM/DIFFERENCE OF CUBES

$$x^3 \pm y^3 = (x \pm y)(x^2 \pm xy + y^2)$$

Algebraically

Since your students are in Algebra 2, they probably know that solutions to an algebraic equation show up as x -intercepts on its graph. They also know the Factor Theorem that tells us linear factors produce zeros or x -intercepts. So let's find the zeros to help us find the factors...

$$\begin{aligned} x^3 \pm y^3 &= 0 \\ x^3 &= \pm y^3 \\ \sqrt[3]{x^3} &= \sqrt[3]{\pm y^3} \\ x &= \pm y \end{aligned}$$

Since a cube root is unique, you will only have one root. You will only have one x -intercept. You will only have one linear factor and that's the binomial $(x \pm y)$. So the trinomial $(x^2 \pm xy + y^2)$ doesn't factor further.

Numerically

Let's look at this with a special number—the discriminant! In order to factor a quadratic further, the discriminant has to be a perfect square.

Expression	Binomial Factor	Trinomial Factor	Discriminant of Trinomial
$x^3 + 8$	$(x + 2)$	$(x^2 - 2x + 4)$	$(-2)^2 - 4(1)(4) = -12$
$64x^3 - 125$	$(8x - 5)$	$(64x^2 + 40x + 25)$	$(40)^2 - 4(64)(25) = -4800$
$27x^3 + 1$	$(3x + 1)$	$(9x^2 - 3x + 1)$	$(-3)^2 - 4(9)(1) = -27$

Continued on page 5

In general, the trinomial expression is a quadratic with $a = 1$, $b = \pm y$, and $c = y^2$. Its discriminant would be:

$$b^2 - 4ac = (\pm y)^2 - 4(1)(y^2) = y^2 - 4y^2 = -3y^2$$

Since the discriminant is negative, the trinomial cannot factor further.

Graphically

Let's look at the trinomial factor $(x^2 \pm xy + y^2)$. It's a quadratic with a positive leading coefficient so we know its graph is a parabola that opens upward. Let's look at the graphs of some trinomial factors.

Expression	Binomial Factor	Trinomial Factor	Graph of Trinomial
$x^3 + 8$	$(x + 2)$	$(x^2 - 2x + 4)$	<p>$y = x^2 - 2x + 4$</p>
$64x^3 - 125$	$(8x - 5)$	$(64x^2 + 40x + 25)$	<p>$y = 64x^2 + 40x + 25$</p>
$27x^3 + 1$	$(3x + 1)$	$(9x^2 - 3x + 1)$	<p>$y = 9x^2 - 3x + 1$</p>

We know that, in general, the vertex of a parabola $ax^2 + bx + c$ is located at $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$. For our

trinomial factor, the vertex would be at:

$$\left(\frac{- (\pm y)}{2(1)}, \left(\frac{- (\pm y)}{2(1)}\right)^2 \mp \left(\frac{- (\pm y)}{2(1)}\right)y + y^2\right) = \left(\frac{\pm y}{2}, \frac{y^2}{4} - \frac{y^2}{2} + y^2\right) = \left(\frac{\pm y}{2}, \frac{3y^2}{4}\right)$$

The y-value of the vertex would be positive. So our parabola that opens upward with a positive y-coordinate on its vertex would never cross the x-axis. Without zeros, we could not produce further factors.

Concrete or Pictorial Representation

Use 3-D Algebra tiles to represent the expression $x^3 + y^3$ by combining two cubes of different sizes. When we factor cubics by tiles, we are looking for the dimensions of the rectangular solid with the volume that matches our expression. We know that one factor is $(x + y)$ so this would become one of the dimensions of the rectangular solid. I hope that students would be able to visualize that you wouldn't be able to complete the rectangular solid so it would match the volume of $x^3 + y^3$. Hence, the trinomial must not be able to factor.

Verbal

I might be stretching this one a bit, but I wave my hands and tell my students "If the trinomial factored further, they would have built it into the rule."

MCTM President Candidate

David Erickson



Region: One

School: The University of Montana

City: Missoula

Present Teaching Assignment:

Secondary Mathematics Methods

Curriculum Design

Authentic Assessment

Education Background:

BS Chemistry, The Ohio State University

MS Mathematics & Science Education, Oregon State University

PhD Mathematics Education, The Ohio State University

Teaching Experience:

Middle School Science: 3 years

High School Mathematics, Computer Science, and Chemistry: 15 years

College/University: 18 years

Activities in MCTM:

Vision and Reality Conference; Presentation at annual MCTM conferences; participation in annual mathematics and science leader's conferences; Director Region One

Other information (activities, awards, organizational memberships, etc.)

MCTM, member since 1994

Montana Learning Center at Canyon Ferry Lake, Executive Board member since 2004

National Council of Supervisors of Mathematics (NCSM) 2006 Iris Carl Mathematics Leadership Award

NCSM, member since 1993

NCTM, member since 1977

What positive traits you will bring to the board.

Dedication, hard work, and a hope for *all* students' success in mathematics

What role MCTM should take in Montana mathematics.

"Change" is one of the big ideas in mathematics. We are constantly in a process of changing, with more than half the mathematics known today an unknown just 20 years ago. The planned revisions to the No Child Left Behind Act will bring more change, and we need leaders able to guide these changes in productive ways. MCTM is the organization of mathematics leaders in

Montana, and we must step up and provide direction by implementing the NCTM *Standards* (2000) pK-16, providing future teachers of mathematics for Montana classrooms through partnerships between K-12 schools and higher education, and working to improve state funding for education, specifically, teacher pay. MCTM must continue to provide this statewide leadership, just as in the past, but increasingly important to our changing world.

Jim Hirstein

Region #1

School: University of Montana

City: Missoula

Present Teaching Assignment:

College Mathematics Department

Education Background:

BA Illinois State University (1967)

MA Illinois State University (1968)

EdD University of Georgia (1978)

Teaching Experience:

University of Illinois (1976-84)

Slippery Rock University, PA (1984-89)

University of Montana (1989-date)

Activities in MCTM:

Member of MCTM since 1989

Co-Director for Assessment, SIMMS Project (1992-1998)

Member of MCTM Board (1996-99)

Dean Preble Award (2008)

Other Information (activities, awards, organizational memberships, etc.)

Member of NCTM since 1970

UM Faculty Service Award (2007)

Chair of UM Mathematical Sciences Department (1999-2005)

Numerous grants for teacher workshops on mathematics and/or assessment

Co-chair of the OPI Writing Team for MT Mathematics Standards (1998)

Member of the Mathematics Proficiency Steering Committee, OCHE (2002)

What positive traits you will bring to the board?

I usually stay fairly calm. I work for significant change in ways that do not cause too much disruption. My first priority is always the student as learner of mathematics. I try to set high standards for teachers of mathematics (because I think that's what students deserve) but I also work hard to help the teachers reach those high standards.

What role MCTM should take in Montana mathematics?

MCTM should have a primary role in the mathematics curriculum. We are closer to the student than any other educational entity and we know best what students can and cannot do. The state of Montana has a strong history of cooperation with MCTM and we need to work hard to keep our input respected.

Beth Burroughs

Region #3

I am currently an Assistant Professor of Mathematics Education at Montana State University in Bozeman. I have 14 years of mathematics teaching experience at the high school and university levels: 1995-1997 Marietta and Osborne High Schools (Atlanta, GA); 1997-2003 University of New Mexico; 2003-2007 Humboldt State University; 2007-present Montana State University. My educational background consists of my B.A. in Mathematics & English, earned at the University of North Carolina at Chapel Hill; my teaching credential, in Secondary Mathematics, earned at Kennesaw State University (Atlanta, GA); and my M.A. and Ph.D., in Mathematics, earned at the University of New Mexico.

I am looking for ways to be more involved in MCTM, which is why I am pleased to be nominated for the MCTM board. Before moving to Montana a year and a half ago I was very involved in my local NCTM affiliate in California, especially in organizing their annual conference and recruiting early-career teachers to become members. I am also a member of NCTM and am active in the educational activities of the Mathematical Association of America.

MCTM should be a resource for Montana's mathematics teachers and, ultimately, positively impact Montana's schoolchildren. I can offer the MCTM board my perspective on the mathematical education of Montana's students and of future mathematics teachers. My perspective is influenced by both my high school teaching experience and my university experience, which is focused on pre-service mathematics teacher education. I have also been active in providing professional development to mathematics teachers.

Rex Sonsteng

Region #: 2

School: CM Russell High School
City: Great Falls, MT

Present Teaching Assignment:

Algebra I, Honors Algebra I

Education Background:

BS Mathematics/Statistics, Montana State University, 1991

BS Mathematics Education, Montana State University, 1997

MS Mathematics Education, 2008

Teaching Experience: 11 years

Activities in MCTM: Math Contest Test Writing, Professional Development, Leadership Conference

Other Information (activities, awards, organizational memberships, etc.):

I like sports, bowling, working out, watching movies, and listening to music. Before I was a teacher, I was an Air Force acquisition officer in Dayton, OH.

What positive traits you will bring to the board:

I am a hard worker, energetic, organized, and motivated. I have experience teaching at smaller schools and larger schools in Montana. I have taught all levels of mathematics through Pre-Calculus.

What role MCTM should take in Montana mathematics:

I think MCTM should continue to take the lead in providing strong professional development for Montana teachers. I would be happy to help the board accomplish this goal in any way that I can.

MCTM Membership Form

New Member Renewal
 Elementary MS HS
 College Other
 Name _____
 Address _____

 Phone Number: _____
 Email: _____

Annual Dues (September- August)	
<input type="checkbox"/> Regular (1 yr)	\$15
<input type="checkbox"/> Regular (2 yrs)	\$25
<input type="checkbox"/> Regular (10 yrs)	\$100
<input type="checkbox"/> Life Time	\$150
<input type="checkbox"/> Student	\$8
<input type="checkbox"/> Retired Educator	FREE
<input type="checkbox"/> MCTM & MSTA	\$30
<input type="checkbox"/> Contribution to Scholarship Fund \$5 to \$ 8	

Send Form with correct amount to:
 Pam Koterba, MCTM Membership Chair
 101 Turquoise Drive
 Lewistown, MT 59457
 pkoterba@winifred.k12.mt.us

Mission Possible

Do you remember those old *Mission Impossible* television shows? If you are from a younger generation you probably have seen the *Mission Impossible* movies. In both the television show and movie there was always a task to be accomplished that, until that point in time, had been impossible. An elite force of special agents had been chosen for their skills and expertise. These agents faced very difficult and dangerous circumstances that stretched them to the limits intellectually, physically and emotionally. Their job was to do whatever was necessary in order to complete the impossible mission.

At the recent MCTM/MSTA Leadership Conference, Bill Hayne reminded us that, as teachers, we are also special agents. We have a mission that is more than just imparting content for the purpose of completing a course. We have a mission of being agents of social change. We are working with students that come from widely diverse social settings and we have the challenge of teaching them far more than just content.

This can feel like an impossible mission. This is why some teachers fall back into just teaching content and moving students forward according to the district pacing guide.

The mission of being a social change agent is very difficult and many feel that they are ill equipped for this role. Bill helped to equip us by providing information on Fetal Alcohol Syndrome and the theory of Multiple Intelligences.

Teaching is one of the most challenging professions. Bill reminded us that the mission of being a teacher or a social change agent truly is a calling. I want to leave a legacy in my classroom – student’s lives that have been changed for the good. The 2009 MSTA/MCTM Leadership conference was a great encouragement and challenge to pursue this calling to the best of my ability. I came away energized and committed to accept this calling as a “Mission Possible” rather than *Mission Impossible*.

You are part of an elite force of special agents chosen for your skills and expertise. You face very difficult and challenging circumstances that stretch you to the limits intellectually, physically and emotionally. Your calling is to do whatever is necessary in order to complete the mission of a social change agent. You have what it takes and you can do it!

“Your mission, should you choose to accept it...”

Submitted by Jesse Sauskojus

Montana Learning Center at Canyon Ferry Lake - Student and Professional Development Programs

Student Programs

There are many exciting youth camps available this summer including a NEW Outdoor Adventures experience for students entering grades 9 - 11. See the descriptions below, then move to the MLC website for more details, registration and teacher recommendation forms: www.montanalearning.org. From a **teacher nomination of one or more students**, MLC will send a letter to the home indicating that you have nominated the student for a MLC camp. This **recognition is an honor** in itself. There will be no arm-twisting, just information shared from which parents and student may make an informed decision. E-mail nominations to Carol Brock: cbock@MontanaLearning.org

Outdoor Adventures in Math and Science

Students entering grades 9-11
Campers will explore, discuss and seek answers to water and wildlife management problems in Montana. Other hands-on learning includes investigations in earth science. One overnight hike, water sports, problem solving and mental games.
Date: Session 1: July 5th – 11th 2009
Session 2: July 26th – Aug 1st 2009

Innovations in Math & Science

Students entering grades 8-10
Campers will explore and discuss concepts from the world of physical sciences, life sciences, and mathematics as well as hike, swim and canoe.
Date: July 19th-25th, 2009

Young Naturalist Adventures

Students entering grades 4-7
Campers investigate water habitats, animals, and subjects in earth science including astronomy; participate in a float trip and other recreation.
Dates: July 20th-23rd -Students entering 4th & 5th
July 27th-30th -Students entering 6th & 7th

Camp Discovery

Students Entering Grades 1-3
Campers are picked up and delivered back to Helena each day for this 3-day camp where they participate in science experiments, create crafts, and listen to fun stories.
Date: July 20th-23rd, 2009

Teacher Professional Development Opportunities

A number of mathematics and science teacher professional development programs are sponsored or hosted by MLC. Selected examples are:

Spring Time in the Rockies

What: A working conference at which participants will develop a model curriculum for using technology as a tool in learning science and mathematics.

Who: District and school lead teachers in science and mathematics grades 7 to 10.

When: March 27 - 29, 2009

For more details and registration form, go to: www.montanalearning.org. First, click on Programs, then Spring Time in the Rockies.

MCTM Professional Development Academy?

What: Implementing the Algebra Standard

Who: K-6 classroom teachers, curriculum directors and instructional coaches

When: July 13 - 16, 2009

For more details and registration form, go to: www.montanalearning.org. Click on the link for Montana Council of Teachers of Mathematics or go directly to: www.montanamath.org

(continued from Page 5)

Thank you my Dear Aunt Sally for posing the question to your readers. With multiple representations, I was able to explore the problem deeply and I could share and embrace my math nerdiness! Margaret Aukshun

Dear Aunt Sally,

I have heard math teachers say, "When we factor the difference of two cubes, we get a binomial and a trinomial factor and the trinomial we get is never factorable." This is not necessarily true. Consider $a^6 - b^6$

Is this not the difference of two cubes, namely: $(a^2)^3 - (b^2)^3$

Now factor this as the difference of two cubes and we get:

$$(a^2 - b^2)(a^4 + a^2b^2 + b^4)$$

Now the first factor will factor as the difference of two squares and the trinomial will factor as follows: add in and subtract out an a^2b^2 term so the trinomial now is the quadrinomial $(a^4 + 2a^2b^2 + b^4 - a^2b^2)$. This can be factored by grouping the first three terms which make a perfect square and the last term is a perfect square, namely: $((a^2 + b^2)^2 - (ab)^2)$. Now this factors as the difference of two squares, so the original difference of two cubes factors into:

$$(a-b)(a+b)(a^2 + b^2 + ab)(a^2 + b^2 - ab)$$

Note: this original difference of two cubes could be thought of as the difference of two squares and factored as follows:

$$(a^3)^2 - (b^3)^2 = (a^3 + b^3)(a^3 - b^3) = (a + b)(a^2 - ab + b^2)(a - b)(a^2 + ab + b^2)$$

which is the same thing we obtained when we factored it as the difference of two cubes.

Sincerely yours,

Otis Thompson, Ed. D. (retired)

Dear Aunt Sally,

I was asking my students to find an equation (square root function) that hit two specific points (Ex: (0,0) and (1,1)). Is the square root function graph that goes through two given points such as (0,0) and (1,1) unique and why?

Signed,

MA

Dear Readers,

I am going to pose this question to you. I will publish the answer with the best explanation in the next MCTM issue. Email Aunt Sally at: auntsally@bresnan.net with your best explanation.

Signed,

Your Dear Aunt Sally

Please email questions or comments to Aunt Sally at: auntsally@bresnan.net. Check out her website at www.montanamath.org/auntsally/

MCTM MEA/MFT Conference Hotel Rooms Available

The following motels have rooms reserved under MCTM for the fall MEA/MFT conference and the T³ conference to be held at Skyview HS in Billings Heights:

Super 8

5400 Southgate Dr. (west end)
\$46 double/ \$41 single

Country Inn Suites

231 Main St. (heights) – includes
breakfast & newspaper
\$81 double or single

Boothill Inn

Main & Airport Rd. (heights) - includes
breakfast and shuttle service
\$98 double/\$91 single

NCTM Position Statements

(continued from page 3)

Early Childhood

What is Important in Early Childhood Mathematics? (September, 2007)

Equity:

Teaching Mathematics to English Language Learners (September 2008)
Equity in Mathematics Education (January 2008)

Teacher Quality:

Teaching the Metric System for America's Future (October 2006)
Math Takes Time (August 2006)
Teacher Evaluation and Effectiveness (November 2005)
Highly Qualified Teachers (July 2005)

Teacher Shortage & Retention:

Mentoring New Teachers (September 2007)

Technology:

The Role of Technology in the Teaching and Learning of Mathematics (March 2008)
Computation, Calculators, and Common Sense (May 2005)

Lisa Scott, NCTM Representative



**Kathie Daviau is the Winner of the
Trip to Washington, D.C. for the NCTM Convention!**

MCTM hosted a membership drive. Every member that recruited a new member was entered twice into a drawing for a trip to the NCTM Conference in Washington, D.C. on April 22, 2009 through April 25, 2009. (See <http://www.nctm.org> for more details about the conference.) Kathie is an adult education teacher in Billings.

Kathie will receive paid registration at the NCTM member rate of \$245, four nights at a hotel at approximately \$250/night and food expenses of \$25/day for four days. The total prize is not to exceed \$1500.

The winner of the trip to Washington D.C. was drawn at the Leadership Conference in Bozeman on January 31, 2009. Kathie was selected by generating a random number on a TI-92 calculator after it has been randomly seeded.

There will be another chance to win a trip to a NCTM Conference. The contest will begin in September of 2009. This trip will be to San Diego, CA on April 21-24, 2010. So, get ready to recruit new members!

Congratulations Kathie!

M C T M M e m b e r s h i p F o r m

Please complete this form and mail it (with an enclosed check, cash, or money order payable to M C T M) to:

Lisa Scott

1102 Anchor Street

Billings, M T 59105

scottl@billings.k12.mt.us

P E R S O N A L I N F O R M A T I O N

Name: _____

Address: _____

New Membership _____ Renewal _____

Phone: _____ E-mail: _____

Elementary ____ Middle Grades ____ High School ____

College ____ Other _____

M E M B E R S H I P O P T I O N S :

One year, Regular (\$15) _____ One year, Student (\$8) _____
 Two years, Regular (\$25) _____ Retired (No Charge) _____
 Ten Year, Regular (\$100) _____
 Lifetime, Regular (\$150) _____

Annual Dues Period: September 1 through August 31

Contribution to the Student Scholarship Fund: \$ _____

Referred by MCTM Member _____

Nominations Sought for the 2009 Dean Preble Memorial Award for an Outstanding Teacher of Mathematics

The Dean Preble Memorial is awarded annually to a Montana educator who has made significant contributions to the teaching and learning of mathematics and who has consistently assumed a leadership role among math educators. Teacher-leaders at all levels, kindergarten through university, are eligible.

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 for all were unparalleled.

One of Dean's wishes was to establish an annual award to recognize outstanding teachers and leaders of mathematics in Montana. In keeping with his wish, MCTM created the Dean Preble Memorial Award. The award consists of an inscribed plaque, a \$300 stipend, and a lifetime membership in MCTM. The award is presented at the MCTM annual meeting in October.

Award Criteria

- Any member of MCTM may submit a nomination. Current members of the MCTM Board of Directors 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 have a substantial record of participation and leadership in professional activities involving mathematics education.

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 2009 Dean Preble Memorial Award is June 15. Nominations may be sent or e-mailed to:

Cliff Bara
Box 610
Troy - MT - 59935
cliffbara@hotmail.com



Professional Development Academy
Sponsored by
Montana Council of Teachers of Mathematics



Implementing the Algebra Standard K-6

Who dares to teach must never cease to learn. John Cotton Dana

Presenter: Angel Greenley Zickefoose
Billings Public Schools Math Coach

Designed to enhance K-6 Math Education

July 13-16, 2009 at Montana Learning Center, Canyon Ferry, Helena, MT
Monday – Wednesday 8a.m. to 4 p.m.; Thursday 8a.m. until noon

This workshop will ALSO be offered in Billings, July, 2010

Gain an interactive overview of the algebra expectations as defined in NCTM’s Principles and Standards for School Mathematics. This workshop will offer approaches and techniques for integrating algebraic concepts in the classroom and provide activities for classroom implementation. In this workshop patterns, representations, modeling, and analysis of change will be explored using a variety of formats including utilization of virtual manipulatives.

Updates regarding the workshop and **scholarship applications** will be available in upcoming MCTM newsletters or at the MCTM website: <http://www.montanamath.org>.

The \$585 registration fee includes:

- A 1-year MCTM membership or a 1-year MCTM membership renewal
- Meals and lodging at Montana Learning Center (Individuals who do **not** plan to stay at MLC can deduct \$150 for lodging.)

Also offered:

- 30 OPI Renewal Units **or** 2 semester credits (P/F) through MSU-Bozeman (Estimated tuition cost is an additional \$220)

Registration is due by **May 27, 2009** with your **non-refundable** \$100 deposit made payable to **MCTM**. The balance must be paid by check or PO before the workshop.

Return or email your registration:

Kathy Hill
301 Kelly Rd #15 OR Email: kathymarie56@hotmail.com
Kalispell, MT 59901

Name _____ Grade Level _____
 School District _____ School _____
 School Address _____ Phone _____
 Home Address _____ Phone _____
 Email _____ (Updates thru the year and summer.)

Deposit: Date _____
Check or PO # _____
Balance Paid Date: _____
Check or PO # _____

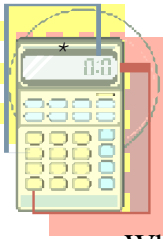
Professional Development Academy
 Sponsored by Montana Council of Teachers of Mathematics

Update - Invigorate – Integrate
Using the Calculator to Enhance Student Learning

Designed to enhance 7–12 Math Education

July 20-23, 2009 in Billings, MT

Monday – Wednesday 8a.m. to 4 p.m.; Thursday 8a.m. until noon



Whether you are new to the classroom or thinking forward to retirement days, this workshop promises to be challenging and invigorating. Exploration of cutting-edge developments and the interface of technology and student learning will be the focus of the three and a half day workshop. Join Todd Morstein, Texas Instrument certified instructor, in exploring these latest developments and a variety of lessons developed by Texas Instruments; he will share activities and calculator integration tips from Pre-Algebra through Calculus. While the workshop will focus on the use of TI 84’s in the classroom and will introduce you to the new Inspire technology, feel free to bring the calculator your students are most apt to use. If you have questions, Todd can provide assistance with all TI equipment. Also, if you have a favorite activity, please bring it along.

Updates regarding the workshop and **scholarship applications** will be available in upcoming MCTM newsletters or at the MCTM website: <http://www.montanamath.org>.

The \$325 registration fee includes:

- A 1-year MCTM membership or a 1-year MCTM membership renewal
- Three and one-half days of quality in-service

Also offered:

- 30 OPI Renewal Units

OR

- 2 semester credits (P/F) through MSU-Bozeman (Estimated tuition cost is an additional \$220)

Registration is due by **May 27, 2009** with your **non-refundable** \$100 deposit made payable to **MCTM**. The balance must be paid by check or PO before the workshop.

Return or email your registration:

Kathy Hill
 301 Kelly Rd #15 OR Email: kathymarie56@hotmail.com
 Kalispell, MT 59901

Name _____ Grade Level _____

School District _____ School _____

School Address _____ Phone _____

Home Address _____ Phone _____

Email _____ (Updates thru the year and summer.)

Deposit: Date _____ Check or PO # _____ Balance Paid Date: _____ Check or PO # _____

Teaching to the Test

Continue teaching a rich, standards-based curriculum.

Stick to a balanced, comprehensive program that combines understanding for a foundation for learning facts and procedures, and uses the math in applications and problem solving situations. Help students develop proficiency in skills and procedures by integrating test preparation into a well-articulated curriculum instead of separating test preparation from routine learning

Become involved in writing state standards and developing state tests.

You have a direct voice in shaping the high-stakes tests for which your student preparation is held accountable. Help ensure that the tests measure the important mathematics content and processes that you and other teachers value.

Help students become acquainted with the format and grading schemes of tests by using them in your classroom on a regular basis.

Have students turn in writing activities, and score them as they would be scored on the upcoming tests. Give them detailed feedback so that they know exactly what they could have written to gain a higher mark.

Review content every day

Use problems from past chapters and even from past state tests as Daily Problems for students to work on for the first 5 minutes of each class. Also, include review problems in homework assignments. This gives students the opportunity to review, refresh, and practice skills that they may otherwise forget.

Involve students in creating questions for the review.

Assign each student to a specific date, and make him or her responsible in selecting a problem for review. As time progresses, give the student who selected the problem also the opportunity to display the solution to the class.

Use a variety of approaches when teaching new content.

Each student has a unique preferred learning style, so to best benefit your students, be sure to show several ways of solving related problems. Include manipulatives and multiple representations. It is easy to forget procedures, but being able to "see" how a problem works out is memorable.

Focus on solutions, not answers.

Foster number and operation sense over developing computational skills. We don't want our students to

believe that math is a subject of static rules and procedures, so we shouldn't teach it that way. Ask students to estimate an answer before doing any computations. Force student explanations, and make them really think about if their answers make sense. Ask them questions like, "How are you sure that your answer is correct?"

Celebrate Improvement.

When you notice that your students are engaged and have been successfully reviewing or when they have made improvements on test scores comparatively, find a way to reward them. When you show that you care about their progress, students will tend to also have a better attitude about continuing to practice and work for you.

Be creative in how you are assessing understanding.

Encourage students to talk in collaborative groups about the mathematics. Assign writing activities often. Take the time to observe, interview, and respond to students' work. This will not only let you know whether or not the students are "getting it" but it will also show the students that you care about their learning, a crucial motivator to get students to increase effort. Review the tips on assessment for more ideas.

What's on the test?

Find out! What math content is being assessed? How much of the test is comprised of computation, word problems, and open-response? Look at copies of released items to get an understanding of what is needed to be successful. Share them with your students so that they can get a sense of the time constraint.

This article was originally distributed as an update for elementary school teachers that are members of NCTM. Join today to get the most out of your membership.

MCTM MEMBERSHIP

Our membership continues to grow, due in great part to the wonderful workshop and conference opportunities that MCTM offers. Since the first of the year, we have added 27 new members from the Leadership Conference, 7 from the Math Coach's retreat, and 4 teachers who have just heard what a wonderful professional organization we have! Keep spreading the word!

Submitted by Pam Koterba – Membership Chair

MCTM TEACHER SCHOLARSHIP

The MCTM teacher scholarship was established by the MCTM board in 1992 to award teacher scholarships, \$100 for instate conferences or \$250 for out of state conferences, to help defray the costs of attending conferences and workshops. The amounts were increased to \$200 for instate, and \$400 for out of state conferences by the MCTM board in 2006. The intent is to encourage our membership to participate in conferences and to help defray some of the expenses in attending conferences.

Any teacher who is an MCTM member is eligible to receive the scholarship except for current MCTM Board members. The application for a scholarship must be submitted at least **thirty** calendar days prior to the starting date of the conference. The recipient(s) must also write an article for the newsletter on a useful idea acquired at the conference. This article should be mailed to the Chairperson of the Scholarship Committee within **thirty** calendar days of the end of the conference. The chair will then submit the article to the newsletter and authorize the issuance of a check to the scholarship recipient. Scholarships will be limited to the applicants each calendar year that:

1. Submit a completed application to Jim Hamling, scholarship chairman.
2. Receive confirmation that the scholarship has been awarded.
2. Attend the conference.
3. Submit an article to the scholarship chair for the newsletter.

The scholarship chairperson / committee will screen the applications as necessary. Incomplete or late applications will not be considered. After the chairperson / committee has approved an application, a letter should be sent out to the applicant restating the above requirements and timelines. When the newsletter article is received by the scholarship chair, it will be submitted it to the newsletter editor. The chair will then authorize the treasurer to issue a check for the appropriate amount.

The Chairperson may obligate up to \$2000 per calendar year.

So far this year only \$600 of the \$2000 has been allocated. This is basically “free” money. There is very little commitment on the recipient’s part. If you are interested, please fill out the application that appears in this newsletter or log onto : montanamath.org for an app. You may either send a completed application to Jim Hamling 1110 W Water Lewistown MT 59457 or email at hamling.midrivers.com

Jim’s phone is 406-535-3263

Scholarship Application

Name: _____

Email: _____

Mailing Address: _____

City: _____ State: _____ Zip Code: _____

Home Phone: _____

School: _____

School Address: _____

City: _____ State: _____ Zip Code: _____

Work Phone: _____

Grade level(s) taught: _____ Subjects: _____

Have you been a recipient of this scholarship before? _____

If so when? _____

What conference or class are you planning to attend? _____

Location: _____

Date(s): _____

Why do you want to attend this conference or class?

What other conferences have you attended in the last five years?

How will you share the information gained from this conference or class?

MCTM Early Career Scholarship

MCTM is offering an “Early Career” scholarship worth \$500. This scholarship will be given to one K-12 Montana teacher each year to attend either the K-6 or the 7-12 MCTM Professional Development Academy (PDA) during the summer. This scholarship may not be used for any other convention or conference.

To be eligible for this scholarship you must

- 1) have taught math in Montana for at least one (1) year and not more than five (5).
- 2) be contracted to teach math this coming year in Montana.
- 3) be a current member of MCTM

You must also fill at least one of the following criteria:

- 1) an elementary teacher who teaches at least one section of math during the day or
- 2) a secondary teacher who teaches at least 3 sections of math each day or
- 4) special education teacher who has at least one period of math each day or
- 5) a Title 1 math teacher who teaches at least 2 periods of math each day

The deadline for a completed and submitted application is April 30th of the year of the PDA.

In the event that the original winner is unable to attend, an alternate will be chosen.

The \$500 will be paid to the scholarship recipient if they:

- 1) write and submit an article about the PDA to Jim Hamling (scholarship committee chair) for the MCTM newsletter. This article must be submitted within one month of the completion of the PDA and
- 2) enclose a letter, written by the facilitator of the PDA, indicating that the awardee successfully completed the PDA.

Send applications and the newsletter article to:

Jim Hamling
Early Career Scholarship
1110 W Water
Lewistown MT 59457
hamling@midrivers.com

MCTM Early Career Scholarship Application

Name _____

Mailing address _____

City _____ MT Zip _____

Email _____ phone _____

School Name _____

Address _____

City _____ MT Zip _____

Grade level(s) taught 1) last year _____ 2) this next year _____

Which PDA do you plan to attend? _____

Please enclose :

- 1) A letter from your administrator verifying that you did teach last year,
- 2) A letter from your administrator for the coming year verifying that you are going to teach math next year,
- 3) A written essay less than 200 words (give or take a few) concerning your philosophy concerning math education in Montana.
- 4) A letter of support from a colleague or administrator.

MCTM NEWSLETTER
c/o Angel Zickefoose
18 S. Santa Fe Drive
Billings, MT 59102

Non-Profit Organization

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2008-2009 MCTM Board of Directors

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Lisa Scott	Billings			Past-President	scottl@billings.k12.mt.us	05-09
Terri Dahl	Great Falls	9-12	II	Director	terri_dahl@gfps.k12.mt.us	06-09
David Erickson	U of M	13-16	I	Director	David.Erickson@mso.umt.edu	06-09
Carl Anderberg	Helena	9-12	III	Director	canderberg@helena.k12.mt.us	07-09
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Marcia Welliever	Billings	9-12	IV	Director	wellieverm@billings.k12.mt.us	08-11
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Cliff Bara	Troy			Treasurer	cliffbara@hotmail.com	

Editor: Angel Zickefoose

Montana Mathematics is a newsletter published for all members of the Montana Council of Teachers of Mathematics. The publication comes out 5 times/ year and is free to all members of the MCTM. Any information pertaining to MCTM can be sent to Angel Zickefoose at 18 S. Santa Fe Drive; Billings, MT 59102 or e-mailed to zickefoosea@billings.k12.mt.us. All entries will be reviewed.