



MathBits

MCTM Foundation offers financial support

Currently the MCTM Foundation sponsors two different programs offering financial support to Minnesota teachers of mathematics. One of these is the Cutler Scholarship, which supports middle level teachers engaged in the study of mathematics. The next application deadline for a this Scholarship is October 31. Further details and application materials are available on the MCTM website.

The other is a grant program offering support to attend the annual MCTM Spring Conference in Duluth. Thanks to the generosity of donors to the MCTM Foundation and the gradual recovery of the market, this year the Foundation was able to fund nine Minnesota teachers who applied for support for attending the Spring 2013 Conference. Each grantee has written a summary of her/his experience at the conference. Please read these summaries starting on page 11. Several more will appear in the next issue of *MathBits*. The deadline for grants for support at the 2014 Spring Conference is February 15. Forms and further information for this grant are also available on the MCTM website.

Tax deductible donations to the MCTM Foundation are welcome and appreciated at any time. Information on making donations is also available on the MCTM website.



Transitions in service to MCTM

The following MCTM Board Members completed their three-year terms the conclusion of the Spring Conference in April.

- Mary Jo Hughes** VP Jr High/Middle School
- Kathleen Cramer** VP Mathematics Education
- Cheryl Tucker** District 3 Director
- Courtney LaRoche** District 6 Director

New three-year terms of service to the organization began with installation for:

- Courtney LaRoche**, Wayzata Public Schools VP Jr High/Middle School
- Sonja Goerdt**, St. Cloud State University VP Mathematics Education
- Kristin Cayo**, Eden Prairie Public Schools District 3 Director
- Mardi Knudson**, Sauk Rapids-Rice Public Schools District 6 Director

Inside this issue:

President's Message	3
Assessment	4
2013 resolutions	5
Matt Mentor	9
MCTM Foundation	11
CONNECT	14
Math contest opportunities	19

Special points of interest:

- The formative assessment process
- Reflecting on inquiry
- Math jokes
- Thank you from Roger Larson
- MCTM members up for NCTM election
- NCTM elementary RTI resource

Goals of MCTM

- To develop an active interest in the science of mathematics.
- To help provide opportunities for the exchange of ideas and materials regarding instruction in mathematics.
- To further the study of problems relating to the teaching of mathematics at the elementary, secondary, and college levels.
- To work for the improvement of mathematics instruction at the elementary, secondary, and college levels in Minnesota.
- To work for the improvement of employment and service of members of the Council and members of the profession in general.



2013-2014 MCTM Board of Directors

Elected Officers

President

Ellen Delaney
ellendelaney3047@gmail.com

President-elect

Michele Luke
michele.luke@hopkinsschools.org

VP Elementary

Pam Richards
educatering@comcast.net

VP Jr.High/Middle School

Courtney LaRoche
courtney.laroche@wayzata.k12.mn.us

VP High School

Paula Bengtson
pbengtson@rushcity.k12.mn.us

VP Mathematics

Christopher Danielson
mathematics.csd@gmail.com

VP Mathematics Education

Sonja Goerd
slgoerd@stcloudstate.edu

VP at Large

Lisa Conzemius
lconzemius@detlakes.k12.mn.us

District Directors

District 1

Amy Wix
awix22@gmail.com

District 2

Christy Hemp
christy.hemp@swsc.org

District 3

Kristin Cayo
klcayo@gmail.com

District 4

Karen Hyers
khyers@isd622.org

District 5

Tracy Bibelnieks
tracy.bibelnieks@gmail.com

District 6

Mardi Knudson
mardi.knudson@isd47.org

District 7

Sherri Kruger
skruger@badger.k12.mn.us

District 8

Russ Davidson
rdavidson@ncsc.k12.mn.us

Appointed Offices

Executive Director

Tom Muchlinski
mctm@mctm.org

Financial Secretary

Craig Rypkema
crypkema@paulbunyan.net

Recording Secretary

Patty Wallace
patty.wallace@isd181.org

MathBits Editor

Teresa Gonske
tlgonske@unwsp.edu

Webmaster

Rich Enderton
enderton@minnehahaacademy.net

MDE Mathematics Specialist

Sue Wygant
susan.wygant@state.mn.us

NCTM Representative

Abe Schwartz
aschwartz@bemidji.k12.mn.us

MinnMATYC Representative

Becky Groseth
becky.groseth@anokaramsey.edu

"With Aristotle we declare that the ultimate test of understanding rests on the ability to transform one's knowledge into teaching."

(Lee S. Shulman) [From article in the Educational Researcher, February 1986]

President's Message—Learning is the Key

Ellen Delaney, MCTM President

Welcome back to a new year of learning!

Teaching through Collaboration

It is my hope that every student is provided multiple opportunities to learn mathematics in classrooms across Minnesota. In addition, I hope that every teacher recognizes that her/his learning is directly connected to student learning. In many districts, teachers have embedded learning through work in collaborative teams founded in finding the answer to four complex questions, written simply as:

- What do we want students to know and be able to do?
- How will we know they have learned it?
- What will we do if they do not learn?
- What will we do if they know it already?

This work is based on research by Shirley Hord. Rick DuFour also developed these ideas through his work at Adlai Stevenson High School in Lincolnshire, Illinois. Both have written on the topic and teachers may benefit from reading their work.

For decades teachers have worked in isolation to answer these questions. By approaching these questions as a community, we are better able to find answers. The resources of a school far exceed those within each and every classroom. In this case, the whole is truly greater than the sum of its parts. I encourage each of you to work with others to improve teacher learning which will, in turn, make all of the difference for our students.

Leading through Learning

In a speech written for delivery in Dallas on November 22, 1963, John Kennedy was to say, "Leadership and learning are indispensable to each other." Kennedy understood the immense importance of education in all endeavors but particularly in developing strong leaders. As teacher leaders move into leadership roles, each fights an uphill battle that could be made easier by strengthening their learning.

Two levels of learning would benefit all teacher leaders:

- 1) knowledge of group management or facilitation skills and
- 2) knowledge of current research in effective instructional practice; understanding of district, state and federal mandates; recognition of the current state of practice and resulting data for the district; and guidance from state and federal standards.

The first will allow the teacher leader to move the group efficiently and effectively through tasks, with the necessary management skills needed to assist the group in functioning well. The second will enhance the teacher leader's ability to provide the vision necessary for strong leadership. This vision must be founded in effective practice with a full understanding of constraints and opportunities that influence the work of teachers.

Encourage teacher leaders to continue in the development of the critical skills of management and leadership. As Peter Drucker tells us, "Management is doing things right; leadership is doing the right things." Every great leader does both well.

"I have always wished that my computer would be as easy to use as my telephone. My wish has come true. I no longer know how to use my telephone." (Bjarne Stronstrup - inventor of C++)

Statewide Assessment Updates

Rosemary Heinitz, MDE Math Assessment Specialist, Statewide Testing

Formula Sheets

Over the last few years, we have received questions from teachers regarding the formula sheets used on the MCAs and their structure and organization. We want to provide some background and history on their development and the reasons they appear the way they do.

In the formula sheets for the MCA II assessments, the students only needed to identify the shape of the figure and its formula and then substitute numbers into that formula. It was hard to assess whether students understood the formulas as they were only substituting numbers. With so much scaffolding, field test data for problems that required use of a formula looked like data from problems that assessed substituting values for variables in an equation.

In the 2007 Academic Standards the benchmarks for finding area and volume contain the words “develop” or “justify.” In a grade where the student is asked to justify the formula, it is not given on the formula sheet. For example in grade 5, benchmark 5.3.2.1 specifies “develop and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles.” These formulas are provided on the formula sheet. Benchmarks 5.3.2.2 and 5.3.2.3 require the student to demonstrate understanding of the concept of volume. Benchmark 5.3.2.4 mentions using the formula for volume but emphasizes the justification of the formula rather than the substitution of numbers into the formula. For these reasons, the formula for volume is not given in the grade 5 formula sheet.

The formula sheets for the MCA III assessments provide a minimal amount of scaffolding. The formula is provided so that students do not make errors in recall of a formula once they have identified the concept. Once the concept has been identified, the student should be able to recognize the formula needed for the problem. A student who cannot choose the formula without a name or picture attached has not mastered the concept. The formula sheet for each grade supplies the formulas learned at that grade level based on the standard and benchmark.

The formula sheets for MCA-III can be accessed at

<http://mnstateassessments.org/studentResources.html#formulasheets>

Grade 11 MCA-III

The first administration of Grade 11 MCA III is scheduled for spring 2014. The test will be administered online and contains item types similar to the technology enhanced items on the Grades 3-8 tests. There will also be a paper form of the test available.

To help teachers and students become familiar with the new tests, tutorials and item samplers are available online.

<http://www.mnstateassessments.org/resources/?section=3#tuts>

<http://www.mnstateassessments.org/item-samplers/#onlineItem>

We will provide additional information in the November issue of *MathBits*. If you have further questions about statewide testing topics, please contact us.

Margarita Alvarez

Margarita.alvarez@state.mn.us

Rosemary Heinitz

Rosemary.heinitz@state.mn.us

"Know how and also know why."
(Traditional saying among Chinese teachers)

Resolutions Passed by the 2013 MCTM Delegate Assembly

The following resolutions were passed by the 2013 Delegate Assembly on April 26, 2013. The resolutions were brought before the MCTM Board of Directors on April 28, 2013 and subsequently assigned to committees as appropriate for consideration and action. This report presented by the MCTM Board of Directors documents action taken at that time.

Special resolution: Be it resolved that MCTM recognize and thank Bill Eppright for his many years of meritorious service to the council as a facilitator of the delegate assembly. Affirmed by all districts.

- 1) Be it resolved that MCTM advocate for general improvements, better study materials, and longer testing times due to 48 multiple-step, multiple choice items in 60 minutes for the Minnesota Teacher licensure Exam (MTLE).

Action Taken: Assigned to Professional Concerns Committee (4-28-13)

- 2) Be it resolved that MCTM find effective ways to advertise and promote the conference to non-members and members.

Action Taken: Assigned to Publicity Committee working with Membership Committee and the Math Leaders Task Force (4-28-13)

- 3) Be it resolved that MCTM explore options for holding state regional meetings to increase membership and participation.

Action Taken: Assigned to Professional Development Task Force (4-28-13)

- 4) Be it resolved that MCTM connects teacher preparation programs with MCTM members within their district to present to preservice teachers about the organization, to make future teachers aware of benefits, and to increase membership.

Action Taken: Assigned to CONNECT Committee (4-28-13)

- 5) Be it resolved MCTM explore communicating with MDE concerns about the 11th grade MCA III formula sheets lacking diagrams or legends.

Action Taken: Assigned to MDE State Mathematics Consultant (4-28-13)

- 6) Be it resolved that MCTM conference committees explore options for availability of resources shared by presenters to conference attendees through the MCTM website.

Action Taken: Assigned to Spring Conference Committee (4-28-13)

- 7) Be it resolved that MCTM conference committees explores grant and scholarship options for pre-service teachers to defray conference costs such as registration, lodging, &/or travel.

Action Taken: Assigned to CONNECT Committee and MCTM Foundation (4-28-13)

- 8) Be it resolved that MCTM continue to promote and collaborate with MDE's webinar series.

Action Taken: Assigned to Professional Development Task Force & Math Leaders Task Force (4-28-13)

- 9) Be it resolved that MCTM consider using a block of time during the Spring Conference for special interest groups to meet.

Action Taken: Assigned to Spring Conference Committee (4-28-13)

The committees of MCTM are the bodies that carry out the work of the organization. They work on their designated tasks and issues throughout the year. MCTM members are encouraged to consider contributing their talents to the various committees. A broad range of representation on the committees ensures that MCTM remains a strong, member-driven organization.

Working on the formative assessment process

Christy Hemp, District 2 Director

Welcome back to school District 2 members! It's a hectic and thrilling time of the year. You're getting your room and materials ready, thinking of new and exciting ways to engage your students, and (if you're like me) feeling nervous about being able to find the right balance of content and pedagogy so that all of your students get what they need to learn. It can be very overwhelming! One great way to begin addressing student learning is to implement the **Formative Assessment** process. I know that many schools and teachers in District 2 are working on using the Formative Assessment process in their classrooms.

One of the most important steps of the process is sharing **Learning Targets & Criteria for Success** with students. Here is a 3rd grade example using 2007 MN Math Standard 3.1.2—Add and subtract multi-digit whole numbers; represent multiplication and division in various ways; solve real-world and mathematical problems using arithmetic. Let's just focus on the first addition portion of this standard (underlined above).

Learning Target written in student-friendly language:

"I can add multi-digit numbers using two or more strategies."

Criteria for Success—the rubric example is to be used to measure student progress by both the teacher and the student:

Level 1	Level 2	Level 3	Level 4
I can... Add correctly with any two 1-digit whole numbers.	I can... Add correctly with any two 2-digit whole numbers.	I can... Add correctly with any two 3-digit whole numbers.	I can... Add correctly with any three 4-digit whole numbers.

Level 1	Level 2	Level 3	Level 4
I can... Explain my thinking process using one vocabulary term: <ul style="list-style-type: none"> • add or added • addition • addends • digits • result • strategy • place value • ones • tens • hundreds • thousands 	I can... Explain my thinking process using two vocabulary terms: <ul style="list-style-type: none"> • add or added • addition • addends • digits • result • strategy • place value • ones • tens • hundreds • thousands 	I can... Explain my thinking process using three vocabulary terms: <ul style="list-style-type: none"> • add or added • addition • addends • digits • result • strategy • place value • ones • tens • hundreds • thousands 	I can... Explain my thinking process using four or more vocabulary terms: <ul style="list-style-type: none"> • add or added • addition • addends • digits • result • strategy • place value • ones • tens • hundreds • thousands

Level 1	Level 2	Level 3	Level 4
<p>I can...</p> <p>Show my thinking with one of these tools:</p> <ul style="list-style-type: none"> • Numbers • Tally Marks • Number Lines • Manipulatives/ Objects • Pictures/Drawings 	<p>I can...</p> <p>Show my thinking with two of these tools:</p> <ul style="list-style-type: none"> • Numbers • Tally Marks • Number Lines • Manipulatives/ Objects • Pictures/Drawings 	<p>I can...</p> <p>Show my thinking with three of these tools:</p> <ul style="list-style-type: none"> • Numbers • Tally Marks • Number Lines • Manipulatives/ Objects • Pictures/Drawings 	<p>I can...</p> <p>Show my thinking with four or more of these tools:</p> <ul style="list-style-type: none"> • Numbers • Tally Marks • Number Lines • Manipulatives/ Objects • Pictures/Drawings

One of my goals as District 2 Director is to engage more members in sharing the strategies and activities used in their classrooms. If you have a great strategy or activity that should be shared with other math teachers, please contact me at christy.hemp@swsc.org or 507-537-2293. Have a fantastic beginning of the school year!

.....

Questions and ideas

Mardi Knudson, District 6 Director

I am always intrigued with what makes people successful. What is the skill set one needs to be a mathematician? What is it that pushes a student to stick with a problem until they reach a reasonable conclusion? For that matter, what is it that drives us as math educators to be on a path of continuous improvement so we can help students view success in math as a priority?

A fresh start to the school year is upon us. What is one thing you plan on changing in your practice this year to be more effective? I would challenge you to set a goal now. A great video to watch as you think about your “warm up” routine is “My Favorite No” found at <https://www.teachingchannel.org/videos/class-warm-up-routine>.

I would love to be a student in Leah Alcala’s classroom because she has obviously set a climate of viewing mistakes as a learning opportunity!

Dr. Judy Willis presented a strong case for meeting students at their achievable challenge point for student engagement at the MCTM conference in Duluth last spring. How will that look in your classroom this year? Differentiating and providing encouraging feedback is a slippery slope. Taking the time to front load challenges for a variety of learners in your classroom will help your mathematicians stay engaged. Feedback doesn’t always have to come from the teacher. Students could teach a skill to a classmate (with the recipient being required to jot a note of thanks), keep a journal of their math successes, or e-mail a message to their parents containing a snapshot of math work of which they are proud. Have your students put positive affirmations on post-its that they put in their math book when they are working on a frustrating concept.

Have you considered having your students complete a math inventory asking questions about student strengths, challenges, ways they learn best, how they see math applying to their life? (Just have to pass along this website: <http://thefutureschannel.com/videogallery/designing-toy-cars/>) There are many suggestions and templates for inventories on the web depending on the level you teach.

As math educators, we have personnel resources right next door or down the hall. What prevents you from taking an

(Continued on page 8)

What I learned this summer—reflecting on inquiry

Courtney LaRoche, VP Middle School and Junior High

This summer I was able to participate in Jo Boaler’s free online course through Stanford, “How to Learn Math”. https://class.stanford.edu/courses/Education/EDUC115N/How_to_Learn_Math/about

If you also participated, you are probably appreciating the awesome opportunity. If you are just hearing about it, the class is open until September 27th and it would be worth taking a look! One of the sessions that resonated with me, especially starting a new school year, is the necessary components that allow students to create an inquiry relationship with mathematics. Boaler argues that this relationship with math, which is different from math knowledge, is needed to work successfully in today’s world.

The **Inquiry Relationship** she identifies includes these 5 components:

- Being curious
- Making conjectures
- Not worrying about uncertainty/mistakes
- Using intuition
- Exciting inquiry – thinking, “I can solve any problem”

My daughter, who is starting Kindergarten, is filled with curiosity as she makes meaning in the world around her. I can’t seem to fulfill the incessant “why?” that bombards me daily. She makes wild conjectures and seems not to be too concerned about mistakes and uncertainty. She asks questions and thinks she can do anything! I compare that to my eighth graders who are more concerned about asking the question, “is this right?” rather than asking “why?” They are the ones who seem to lose all their common sense in problem solving as they try to memorize a formula, or who do not even try because they are afraid of not knowing and thus making mistakes.

What happens between Kindergarten and 8th grade that suppresses this Inquiry Relationship for some of our students? How can we, as teachers, foster this relationship while still building math knowledge?

Engage in some thinking about ways in which you will support your students’ development of an inquiry relationship with math this year in your classroom. Share what works! Email me your successes stories and we will be sure to showcase them in the next *MathBits*. Courtney.laroche@wayzata.k12.mn.us or email your district director.

(Continued from page 7)

hour and visiting another math classroom or sitting down with a colleague and working on a lesson together? Building staff development funds or math department money could be used.

In *Learning to Love Math* (2010), Dr. Judy Willis quotes Mark Twain:

The secret of getting started is breaking your complex overwhelming tasks into small manageable tasks, and then starting on the first one.

I see one of the strengths in belonging to a math organization, like MCTM, as a resource to collaboratively share ideas and challenges. No one should walk their math journey alone. When the bell rings this fall, how will you scaffold a pathway for your students’ success in math ?

Reference:s

Willis, J. (2010). *Learning to love math: teaching strategies that change student attitudes and get results*. Alexandria, VA: ASCD.

Ask Matt Mentor!



Dear Matt:

I read your column in which you addressed reading in the math class (April 2013). While you gave a lot of good ideas, I'm still having trouble helping students solve "word problems". I know it involves careful reading but can you give more specific examples?

In the last column, we dealt more with your general concern about integrating reading into the mathematics curriculum. So, let's focus specifically on supporting students in reading and comprehending word problems that can be found in textbooks and in statewide assessments.

What does it mean to comprehend?

When you come upon a challenging math problem to solve, what do you do to understand the problem? If you are an experienced problem-solver, you likely do most of the following:

First, you read the problem more than once. You try to visualize or imagine the situation and ask yourself, "What is this all about? What is happening here? You may try to put the problem in your own words.

Then you do an inventory by asking questions about the problem: What do I know for sure—what data is here? What do I want to figure out—what is the question? What constraints or limitations exist? What extra information is here that isn't important? How will I know when I have solved this problem?

To get started, you likely try to make as many connections as possible: Have I seen a problem or situation like this before? Is this related to anything in other content areas that I've done before? What is the big math idea here? What are some other math ideas that might be related to this? What strategies can I use to help me get started?

As you work on the problem, you often use a visual representation—a picture or table or chart. You check back and reread the problem to be sure you haven't made some assumptions about the problem that were incorrect. You sort out facts from inferences. You check for the accuracy of the inferences you have made. You make decisions about problem-solving strategies to use and how you might use different representations, including symbols and equations. You use appropriate technology if it is available. When you hit a roadblock, you go back and try something else. You look for patterns.

The challenge is to help students develop more explicit approaches to solving problems...

When you get an answer, you check to see if it makes sense within the context and constraints of the problem. You see if you can get the same answer using a different strategy. You reflect on how this problem connects to the bigger picture of mathematics.

If you are an experienced problem solver, you probably do these things automatically. You aren't conscious of these steps as you go through them, but because you have been successful in the past, you go back and use them over and over. The challenge for us as teachers of mathematics is to help our students develop more explicit approaches to solving problems that will reap similar success over time and in doing so, make them more confident mathematicians.

How can we help students get started?

It is often helpful to have a process for reading word problems that you model consistently until students can use it independently. Many teachers use the 3-Read Strategy in which each problem is read three separate times, with a different task each time.

1. Read the word problem out loud slowly and with expression. As you read, model the "thinking aloud" questions that come to mind. The task during this initial reading is to have students summarize the context – what 's happening here? What is this problem about? As stated in the last article, use this as an opportunity to connect to

(Continued on page 10)

(Continued from page 9)

students' lives, previous knowledge, or previous lessons.

2. Read or ask a student to read the problem a second time. This time ask, "What is the question we are trying to solve?" You may want to have students stop after this discussion and write the solution sentence under the problem. Here is a sample problem:

Michele gave Anne $\frac{1}{3}$ of a box of bagels. Then she gave Stan $\frac{1}{4}$ of the bagels that were left. Michele had 8 bagels left over after sharing with Anne and Stan.

The teacher intentionally left the question off. After reading this problem a second time, the students brainstormed many different questions that could be asked. They decided to solve the question, "How many bagels did Michele have in the box to start with?" They added this question to the problem, then wrote the solution sentence under the problem: Michele started with ___ bagels in the box.

After students solve the problem, they write their solution in the blank in the solution sentence and see if it makes sense.

3. Have students read the problem a third time. This time the task is to examine the information in the problem. You might use a graphic organizer to help students better understand the problem. Complete this together as a group many times before you ask students to use it independently. The following is a KWCE chart, a modification of the well-used KWL format:

What do you <u>know</u> for sure?	What are you trying to find out?	Are there any <u>conditions</u> or <u>constraints</u> or things to remember?	Is there any <u>extra</u> information that you don't need to solve the problem?

4. The 3-Read Strategy is only one classroom process for helping students read word problems. The important thing is that students are encouraged and supported to interact with the text before they jump in to try to solve the problem.

Many teachers' efforts have been rewarded by also helping students use a modeling process to solve word problems. Modeling can encompass acting out problems, using manipulatives, drawing pictures and using graphic representations of problem situations. You may find it helpful to read the section on Modeling Word Problems in the Best Practices section of the SciMathMN Mathematics Framework at

<http://scimathmn.org/stemtc/resources/mathematics-best-practices/modeling-word-problems>

Comprehension is not simply reading the problem. Reading in the service of mathematics is thinking. Good readers and good mathematicians interact with what they read. Good readers and good mathematicians continually ask themselves questions and refine their strategies. Our hope is that our math students will bring at least a subset of these skills to the future problem solving they do in class, on assessments, and in life.



For Pinterest users,

NCTM has several pinboards. <http://www.pinterest.com/nctmpins/boards/>

And 11 more for Illuminations—lesson activities, apps, videos. <http://www.pinterest.com/nctmillum/>

NCTM Mobile apps for smartphones. <http://www.nctm.org/news/content.aspx?id=39242>

MCTM Foundation

Rose Gundacker, Chair

REPORTS FROM RECENT FOUNDATION GRANT RECIPIENTS

Karen Millette, Secondary Mathematics Teacher. Pillager Schools

First, thank you to the members of MCTM who make the foundation scholarships available to members. Without this my school could not have sent me this year, and I would have missed out on this valuable experience.

So why do I attend the MCTM conference, and what experiences do I gain? I want to leave with strategies and tools I can use on Monday, encouragement and support from peers, and reinforcement for why we teach math. I also appreciate the validation concerning what I am experiencing in the classroom.

I walked away with everything on my wish list and more. The Keynote speaker Judy Willis started the experience with a presentation that met all my criteria. The conference was filled with wonderful presentations that had me thinking and refining how I use the time in the classroom. The keywords that resonated with me from the conference: release dopamine, engagement not obedience, update MCA III, and create wonder, are the broad brush highlights of my experience.

Thank you again for the funding to attend this year's conference.

Lisa Eischens, Secondary Mathematics Teacher , Detroit Lakes High School

I am very appreciative of the grant from the MCTM Foundation which paid a portion of the expenses for me to attend the 2013 Spring MCTM Conference. I came away inspired to bring new ideas into my classroom to motivate my students toward higher levels of learning.

There were so many wonderful benefits from attending this conference, from hearing new ideas, to be reminded of older ideas that I had not thought of for a while. One of my favorite experiences was the opportunity to meet other teachers from around the state and hear what is happening in their classrooms. I was thrilled to visit with someone following my last break out session who told me all about how their school is embarking on a lunch program for students who are in need of remediation. Since my school is looking at a similar program, I was able to bring back the details from someone who is further down that road than us in that area.

There were many interesting sessions offered at the conference. As a matter of fact, I often found it difficult to choose which I wanted to attend. One of the sessions I chose to attend was on the topic of using Algebra Tiles by Lisa Fisher-Comfort. Her presentation was well planned out and covered a great deal of algebra topics so I was able to see how many ways that algebra tiles could be implemented in my classroom. I came away with some ideas that I will use when I teach my classes as a whole next year, and some ideas that I will use for my struggling learners.

I also attended a few sessions that dealt with the student as a learner. One of the sessions, presented by Jennifer Fuzzey and Courtney La Roche addressed how many factors are in play in order to get a student engaged in what we are teaching. They shared a video which I was able to bring back to my classes the next week which helped the students think about how they learn best. Their topics will definitely be useful next year for me as I begin my courses and address some basic study skills for my students as they are transitioning into the high school setting.

I really enjoyed hearing the keynote speakers. Linda Gojak shared a variety of interesting facts and ideas. I enjoyed hearing about the history of the MCTM and felt challenged to promote deeper understanding of mathematics for my students by providing more activities which require reflective thinking.

(Continued on page 12)

I walked away with everything on my wish list and more.

I found it very difficult to summarize all I learned from these two days.

(Continued from page 11)

Lastly, I came away from the conference with numerous web-based resources. I learned a great deal from Judy Willis about how a brain learns and ways to promote the highest levels of learning. Following hearing her talk, she directed us to her free website which is filled with her research and numerous articles.

As I looked over all of my notes from the conference, I found it very difficult to summarize all of valuable information I gained from these two days. Thank you again for your financial support which helped make it possible to attend this conference.

Robin Albert, Secondary Mathematics Teacher, Youth Educational Services, Moorhead

Fun, food, formulas and friends! These words describe my very enjoyable experience attending the MCTM Teacher's Conference in Duluth, MN. I have taught since 1990, for 23 years. I have had the experience to teach at the middle school level, the high school level and the college level. It doesn't matter what level I have been at, it seems that all learners want to have fun and enjoy their classroom activities. I also believe that we all have a need to keep the "youth" in us alive, by laughing, playing and sharing stories. This is what was so special about the workshops I attended. I was able to share classroom stories, learn new methods of teaching and laugh while meeting new friends and old.

I believe we all have a need to keep the "youth" in us alive...

Some of the most memorable activities involved making two origami cubes, practicing with the new colored TI-Nspire, utilizing new I-pad software available, creating tessellations, viewing Pi Day activities, playing Facts on a Mat and viewing flipping the classroom ideas. I am truly grateful that I was given the opportunity to attend and will be happy to help in the future, with setup, planning and organizing another wonderful conference in 2014.

Danielle (Dani) Berry, Mathematics Instructor, Headway Academy, Hopkins

The MCTM Spring Conference holds an important place in my professional life. Every year it provides me with the opportunity to be inspired by some of the best mathematics educators in the state, expand my professional network and connect with friends from the past. This year was especially important because I was able to speak on a panel where I shared my (very limited) experience with pre-service and beginning teachers. It wasn't too long ago that I was on the other side of that panel, just trying to figure out if what I was doing in the classroom was not just effective, but passable as teaching.

It isn't about going along with education fads, but knowing and implementing what my students need to be successful.

MCTM has provided me with valuable learning experiences that have given me the ideas and confidence to ensure that I am doing the best that I can to educate my students. Each year, I walk away with an underlying message that resonated from each of the sessions that I attended. This year I was presented with innovative ways to integrate technology through flipped classroom themes and how to implement truly engaging lessons. As for the underlying message? I learned that it isn't about going along with educational fads, but rather knowing and implementing what my students need to be successful in the math classroom.

Two MCTM members are on the ballot for the 2013 National Council of Teachers of Mathematics Board of Directors election.

Paul Kelley from Anoka High School is a candidate for the High School Director's position on the NCTM Board. **Kay Wohlhuter** from the University of Minnesota - Duluth is a candidate for one of the At-Large Director's positions on the NCTM Board.

If you are a member of NCTM, watch for an email from NCTM announcing the election in the near future. The election will be conducted electronically and will run from Sept. 5 through Oct. 31.

MCTM is proud to have two members on the national ballot. Congratulations Paul and Kay.

Start the year off with a few math jokes

Russ Davidson, District 8 Director

MCTM Math Jokes for New School Year

Please answer these math jokes using a MATH term. 😊

1. What your fingers get the longer you throw snowballs? _____.
2. What kind of angles are never wrong? _____.
3. What the acorn said when it grew up? _____.
4. What the father did when his daughter did not want to go to school? _____.
5. I was making an angle and my son bumped my arm. I made a(n) _____.
6. What the boy said when the wicked witch lifted her curse off of him? _____.

Teachers – You may use hints such as:

For question #3 – The math vocabulary term that includes shapes and lines.

For question #4 – Draw a circle and put a dot in the middle.

For question #5 – It is the name of a geometry shape.

For question #6 – It is the name of a geometry shape.

Answers:

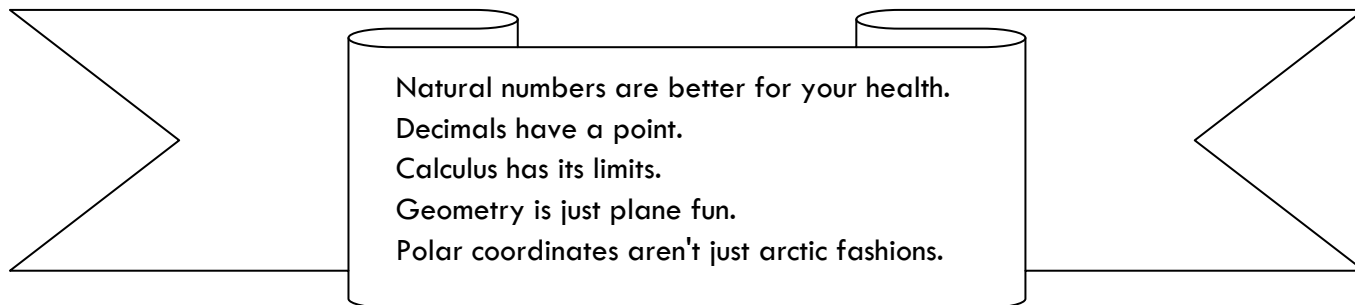
1. *Number*
2. *Right Angles*
3. *Geometry*
4. *Center*
5. *Rectangle*
6. *Hexagon*

Encouragement

Christopher Danielson, VP Mathematics

Classroom teachers sometimes feel disempowered by the constraints of testing and curriculum. But curriculum—whether district curriculum or published textbooks—is really a framework. It is a teacher’s job and responsibility to flesh out that framework in ways that will create powerful mathematics learning for kids.

So I encourage teachers (at all levels) to not stray from the agreements that are necessary to make as a district or as a school—in terms of sequence of content, or basic resources we use in our classrooms—and to remember too that we teachers have a tremendous amount of leeway in terms of setting the tone. What kinds of questions are we going to ask? What kinds of mathematical contributions are we going to value from our students? These are the things that have power to make important differences in our work.



CONNECT

Committee to Orient and Network New/Novice Educators into a Community of (math) Teachers

Pass this on to new teachers in your building!

If there are teachers in your building who are in their first few years of teaching math, make sure that they get CONNECTed to MCTM. As part of the Council's service to our members, the MCTM CONNECT Committee offers several opportunities to help beginning teachers feel supported and grow professionally. Since there is no convenient way to get in touch with new colleagues, we rely on you, our members, to help us get connected. Please give this page to your colleagues who are new.

Services that MCTM CONNECT provides include:

- **Virtual mentoring:** Monthly emails to connect with teaching ideas, problem ideas, useful websites and professional growth opportunities.
- **Mentors:** Beginning teachers who are interested can be connected with an experienced math teacher for email and telephone consultation and support.
- **The MCTM CONNECT Session, May 1, 2014:** Held the evening before the Spring Conference, pre-service and beginning teachers will make connections, learn how to maximize their conference experience, enjoy a meal, compliments of MCTM, and participate in the famous door prize and book give-away.
- **The MCTM Spring Conference, May 2-3, 2014:** This major mathematics professional development event in Minnesota held annually will enable new teachers to become more aware of what others are doing and of the resources available, in addition to getting connected to state and national leaders in mathematics education.

To be sure that all new math teachers are connected to these professional growth and support opportunities, encourage them to contact MCTM. We can't inform them of these activities if we don't know who they are. For more information visit www.mctm.org or to be CONNECTed, contact Larry Luck at larryluck@aol.com or at 763-784-0084.

CONNECT CONTINUES TO SUPPORT BEGINNING MATH TEACHERS!

On Thursday, April 25, the night before the opening of the 2013 MCTM Spring Conference in Duluth, over 85 preservice teachers, beginning teachers, college/university faculty and MinnMATYC mentored students attended the annual CONNECT Session. Hosted by the CONNECT Committee and the MinnMATYC Mentoring program, organized by **Betty Johnston** and emceed by **Becky Groseth** the evening featured a meal, a program led by **Terry Wyberg** and **Anne Bartel**. The program encouraged participants meet and talk with other new teachers, provided an orientation to the Conference program, and included an arm load of free materials to take home. Most of the major exhibitors provided sample textbooks, support materials and manipulatives for participants to take as well as about 15 door prizes. Teachers and college faculty also donated books and materials for the famous book giveaway (Remember us next year when you're cleaning your book shelves).



But the benefits of coming to Duluth early didn't end on Thursday night for these teachers. They are already enrolled in the MCTM Virtual Mentoring program and have begun receiving biweekly emails from **Ann Sweeney** which contain helpful websites, resources, teaching ideas and upcoming events. And if any of them or any other

new teachers would like an actual, live mentor all they need to do is contact **Larry Luck**, larryluck@aol.com, to make arrangements.

At least one group of student teachers was asked by their university faculty to report about their MCTM Spring Conference experience. It was rewarding to hear how excited they were about the sessions they attended and the ideas that they brought back to their classes. They all plan to come back next year.



CONNECT Committee members will be working with the Spring Conference Planning Committee to insure that there will be an ample number of sessions next year that will be of interest to beginning teachers. They will also be contacting those colleges and universities who did not take advantage of this opportunity to ascertain ways that MCTM CONNECT can be of help to them.



We would also like to have a greater outreach to beginning elementary teachers and we need the help of all MCTM members for that effort. Please let them know that MCTM has help and support available for them. Remember, **CONNECT** stands for **Committee to Orient and Network New/Novice Educators into a Community of (Math) Teaching**. MCTM makes it happen!



Recap of Spring Conference 2013

The Minnesota Council of Teachers of Mathematics and Minnesota Mathematics Association of Two-Year Colleges sponsored the annual Minnesota Spring Mathematics Conference April 26-27, 2013 at the Duluth Entertainment Convention Center.

The theme for the 2012 Spring Conference was “**Teaching & Learning Mathematics in the Age of Innovation**” and this theme was well-framed by the keynote speakers. Conference events opened Friday morning with **Dr. Judy Willis** setting the tone for engagement with "Motivating Active Learning, Memory, and Perseverance by Harnessing the Power of the Video Game Model." NCTM president **Linda Gojak** held audience attention and made further connections to brain processes in learning with “Developing Number and Operations through Reasoning, Sense-making, and Connections” as she gave the closing address on Saturday. Materials from both keynote presentations are available for download on the MCTM website.

Dr. Tom Post, University of Minnesota, and **Roger Larson**, Anoka-Hennepin School District and Anoka Ramsey Community College, were awarded **Honorary MCTM Membership** in recognition of their years of service and contributions to mathematics education in Minnesota.

Minnesota state finalists for the 2012 Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) were also recognized. They include **Kristin Kayo**, Forset Hills Elementary in Eden Prairie, and **Mike Wallus**, Valley Crossing Community School—Northeast Metro 916.

Conference participants enjoyed a wide variety of sessions, many offering active learning and networking opportunities. There was also plenty of time to socialize, catch up with old friends, and make new acquaintances. New teachers and teacher education students easily mingled and were heartily welcomed by the seasoned veterans.

Some of the best summaries of conference experiences can be found in the reflections submitted by the Foundation grant recipients and showcased in this issue and the next issue of *MathBits*.



(THANK YOU)[∞] to MCTM from Roger Larson

I am infinitely grateful to the MCTM organization for my selection as an Honorary Member. Thank you, Jim Foley, for the wonderful introduction at the Duluth Conference luncheon and thanks also, Jim, for the fifty-year friendship that began when we took math classes together at UMD in 1963!

Several years ago as I was the K-12 Math Coordinator for Anoka-Hennepin schools, Bonnie Hagelberger invited me to observe a math lesson as she taught her class of first grade students. As I arrived, Bonnie told the class, “OK boys and girls, our special guest is here. His name is Mr. Larson. Does anyone know what Mr. Larson’s job is?” In unison all of the hands in the class went up and were waving to get her attention. I’m sure Bonnie had prepared them well for this question. Bonnie said, “ Yes, Jason. What does Mr. Larson do?” Jason replied, “He is a mathematician!!” Yes, we can be mathematicians in the classroom...so have a great year being MATHEMAGICIANS! THANKS AGAIN FOR THE RECOGNITION! ~Roger Larson



Think about this:

If a plane makes a round trip and a wind is blowing, is the trip time shorter, longer, or the same?
(Assume the wind maintains constant speed and direction.)

Is your answer based on human intuition, or supported with mathematics?

Opportunities—

MCTM/MDE Webinars

MCTM, in partnership with the Minnesota Department of Education (MDE), is offering webinars designed specifically for K-12 mathematics teachers. Each session will include two 45-minute sessions; the first session (2:45-3:30) will focus on grades 6-12, and the second session (3:45-4:30) will focus on grades K-6. The content of each webinar will include a brief update from MDE followed by a presentation by Minnesota mathematics teachers.

Webinar Dates and Topics

Tuesday, Sept. 24	Top Considerations for Teaching Math
Tuesday, Dec. 3	Math and Gifted Education
Tuesday, Jan. 14	Math and Special Education
Tuesday, Mar 18	Math and English Language Development"

Register for all four webinars at: <http://w20.education.state.mn.us/WebsiteContent/Calendar.jsp>

Math Modeling Workshop for High School Teachers

U of MN STEM center and Wayne State University are offering a one day Math Modeling Workshop for high school math teachers on October 8, 2013. The workshop is free and up to \$100 of substitute costs may be covered. Registration by October 1.

Information Flyer with Registration Information <http://www.mctm.org/MathModelingWorkshop.pdf>

Problems and Puzzles

The three cats

If three cats catch three rats in three minutes, how many cats will catch 100 rats in 100 minutes?

Beware: There is a "usual" answer to this old riddle, but is it really that simple? This about the assumptions that you may be making.

The colored socks

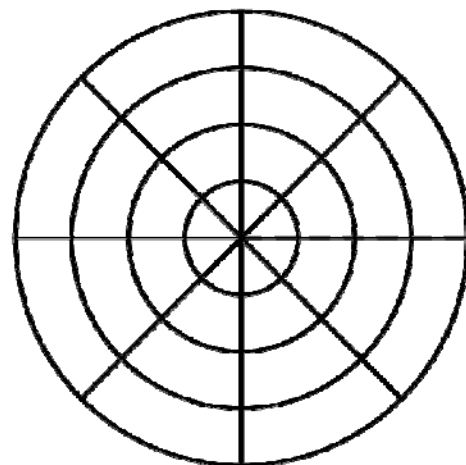
Ten red socks and ten blue socks are all mixed up in a drawer. The twenty socks are alike except for color. The room is completely dark and you want two matching socks. What is the least number of socks you must take out of the drawer in order to be certain you have a pair that match.

Placing dots

Place 8 dots on the diagram in such a way that there are 2 dots on each circle and 2 dots on each line.

Find the number

Find the greatest five digit number such that when you multiply it by a single digit number you get a six digit number in which all digits are identical.



NCTM Resources

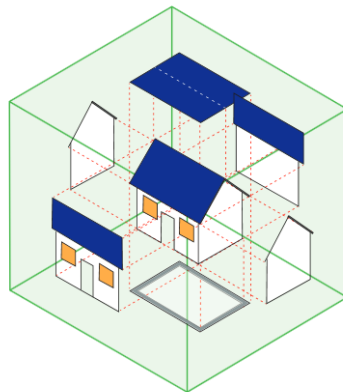
Student Explorations in Mathematics (SEM), formerly known as *Student Math Notes*, are problem-based investigations for students in grades 5–10. The new and improved activities now include a Teacher Edition complete with instructional notes, discussion questions, sample solutions, and alerts about potential student misconceptions. A recent activity, [Are We There Yet? A Journey through Our Solar System](#), guides students in the use of proportional reasoning to build a football field scale model of our solar system. A hands-on activity designed to help students experience the vast distances between celestial objects, it concludes with students developing a logarithmic scale to help represent the immense distances between planets and other celestial objects in our galaxy. This activity guides students in the use of proportional reasoning to build a football field scale model of our solar system. A hands-on activity designed to help students experience the vast distances between celestial objects, it concludes with students developing a logarithmic scale to help represent the immense distances between planets and other celestial objects in our galaxy.



Build It, and They Will Come! Experiences in 3-D

What is one skill that architects, artists, physicists, designers, and engineers have in common? *Spatial reasoning*. This skill is the ability to visualize with the mind's eye. People in these professions are able to rotate an object mentally. They can examine a two-dimensional drawing or blueprint and imagine what the object will look like in three dimensions.

In this activity, you will explore cube constructions and isometric drawings as a means to develop your own spatial reasoning skills.



Build It, and They Will



It suddenly struck me that that tiny pea, pretty and blue, was the Earth.

I put up my thumb and shut one eye, and my thumb blotted out the planet Earth.

I didn't feel like a giant. I felt very, very small.

Neil Armstrong,
first astronaut to walk on the moon

Are We There Yet?



Are We There Yet? A Journey through Our Solar System

This next highlighted activity, [Build It, and They Will Come](#), is designed to provide a series of experiences that develop student understanding of how two-dimensional drawings can be translated into three-dimensional models and vice versa. Beginning with rich experiences in building structures, students move from creating their own concrete models to building structures from a variety of visual representations, including isometric drawings and orthographic and mat views.

The National Council of Teachers of Mathematics (NCTM) announces *Math of Tomorrow (MOTO)*, a new Response to Intervention (RtI) digital series for kindergarten through second grade. Available for any web browser, and most tablets and mobile devices, MOTO for K–2 comprises 7 student books and a teacher website—Teacher Connect—that is available exclusively through NCTM's website.

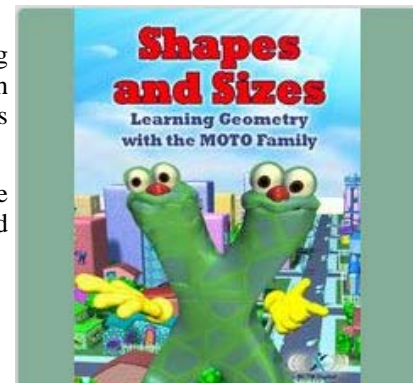
Developed specifically for a digital environment, MOTO encourages active learning through interactive games, puzzles, songs, tasks, videos, and stories. Working along with the MOTO family of characters, students learn mathematics by doing. The entire series is designed to meet and support the Common Core State Standards for Mathematics.

In each student book, four math friends (Addison, Mina, Split, and Multiplex), practice such essential skills as counting, telling time, adding and subtracting, sorting data, and much more.

See more at: <http://www.nctm.org/moto/>

Video of MOTO opening song <http://www.youtube.com/watch?v=bYFrhh7etS4>

To see what the 7 student books look like, check Pinterest <http://www.pinterest.com/nctmpins/moto/>



Opportunities—

Invitation to teachers from the American Mathematical Society—Who Wants to be a Mathematician

Are you looking for a chance to reward and showcase your best math students -- and the chance to share the winning contestant's \$10,000 award with your math department?

The American Mathematical Society is again conducting its national contest for high school students, Who Wants to Be a Mathematician, with a top prize of \$5000 for the winning student and \$5000 for the math department of that student's school. There is no fee to participate.

When/where: The 2014 contest will take place Thursday, January 16, from 9:30 to 11:00 a.m. at the Convention Center in Baltimore. The event is part of the Joint Mathematics Meetings, which will take place January 15-18, 2014.

Qualifying test: Contestants are chosen based on their scores on qualifying tests. This year we will have two rounds of tests, which will be conducted online (but if you absolutely can't do the test online, we can send you a hard copy) thanks to one of our sponsors, Maplesoft, Inc. The first round will be Sept. 14-27. There will also be a practice test available during that time, so you and your students can become accustomed to the test procedure.

Qualifying procedure: Let us know how many students at your school plan to take the test and we will send you a password for each in addition to a proctor password for you. The online test is a timed (15-minute), closed-book, no-calculator (and no other electronic help) test. Each student who plans to take the test must have his or her own password. Past participants in the national Who Wants to Be a Mathematician are eligible to compete again.

Deadline: The first-round testing period ends Sept. 27. Students who score eight or above on the 10-question test will move on to the second round of testing in mid-October. The AMS will select 10 contestants from different regions of the US from the second round of testing to compete in the 2014 contest in January in Baltimore.

Contest format: There will be two semifinal games, each with five of the contestants. The winners of the two semifinals will go "head-to-head" in the finals for the national championship. The champion will win \$5000 for himself or herself, \$5000 for your math department, a traveling trophy for you to display at the school until the 2015 contest, a trophy for the school/department to keep, and an individual trophy for the winner to keep. All contestants will win prizes, cash for themselves, and cash for your department (the minimum cash prize is \$500 for the student and \$500 for the department). The AMS will reimburse reasonable travel expenses and room and board for each contestant and a parent/guardian for a maximum of two nights. Contestants and their parent(s)/guardian(s) are welcome to attend other events at the meeting.

See more about the contest at www.ams.org/programs/students/wwtbam/wwtbamnational

Mike Breen, AMS Public Awareness Officer and Host of Who Wants to Be a Mathematician, paoffice@ams.org

Invitation from Mu Alpha Theta, National High School and Two-Year College Mathematics Honor Society

Mu Alpha Theta (www.mualphatheta.org) is the National High School and Two-Year College Mathematics Honor Society. Mu Alpha Theta is dedicated to inspiring keen interest in mathematics, developing strong scholarship in the subject, and promoting the enjoyment of mathematics in high school and two-year college students.

Mu Alpha Theta was founded in 1957. The Mathematical Association of America (MAA) has been a primary sponsor of the organization since 1958 and the National Council of Teachers of Mathematics (NCTM) nominated the first officers and Board of Governors. Presently, representatives from MAA, NCTM, SIAM, and AMATYC all serve on the Governing Council.

Currently there are over 2000 chapters and 99,000+ student members. In the 2012-2013 school year, Mu Alpha Theta awarded \$166,000 in scholarships. \$25,000 in summer grant money was made available to members, along with \$25,000 in grants to our chapters. In addition to this, Mu Alpha Theta presents five annual awards, runs a national convention each summer, and offers three free math contests.

One of these free contests, the Rocket City Math League Contest, is an international math contest that is open to all middle, high school, and two-year college students enrolled in Pre-Algebra through Pre-Calculus and above math courses. For more information about the contest, visit <http://www.mualphatheta.org/Contests/RocketCity.aspx>

Minnesota Council of
Teachers of Mathematics
P.O. Box 289
Wayzata, MN 55391

Ellen Delaney, President
ellendelaney3047@gmail.com

Tom Muchlinski, Exec. Director
612 - 210 - 8428
mctm@mctm.org

www.mctm.org



Call for Articles

Seeking articles for *MathBits* on issues of interest to mathematics teachers in Minnesota. This includes particular learning tasks and activities that have been implemented in your classroom along with a description of the learning outcomes and any unique results. Photos and images are welcomed. Contact the newsletter editor or your district director with any questions or a proposed idea.

Also seeking information on professional opportunities and professional resources. If you are aware of items of interest please pass them along for dissemination to the MCTM membership. Don't worry about format or having all the details, simply email what you know to the editor.

Thanks!

Mission Statement

The MCTM is an organization of professionals dedicated to promoting the teaching and learning of meaningful mathematics for all students by supporting educators in their efforts to improve mathematics education.

The Minnesota Council of Teachers of Mathematics strives to provide membership with current information regarding mathematics education in the state of Minnesota. To accomplish this goal, we need an accurate, permanent address for each member and a correct email address. To update your information contact Exec. Director Tom Muchlinski at 612-210-8428 or mctm@mctm.org or visit the MCTM website (www.mctm.org) [membership page](#) to make your change.

If you have received a paper copy of *MathBits*, either 1) you explicitly requested to receive a hard copy through the USPS mail or 2) messages sent to your email address have come back to MCTM as undeliverable. If you have not made a direct request for a hard copy, please contact MCTM to [verify a correct email address](#). Also, check that messages from the address mctm@mctm.org are not being blocked by your server or being sent to your spam folder. Most communication from MCTM is being conducted through email. (And now Facebook and Twitter for those of you who use the social media!) If you would like to receive a hard copy of the newsletter by mail, you may simply make a request by contacting mctm@mctm.org.

Submit items for publication in the upcoming issues of *MathBits* to tlgonske@unwsp.edu. Many types of contributions are welcomed. Email or call 651-631-5228 with questions or comments. Thank you.

Teresa Gonske, Editor.