Summer 2004

Mathbits

2004 Spring Conference a Great Success!

Inside this issue:

Thanks to the dedication and hard work of many MCTM and MinnMATYC members the annual conference, held on April 30-May 1 in Duluth, was again a great success!
One of the highlights of the conference was NCTM president Cathy Seeley's keynote address on Friday evening. This was Cathy Seeley's first official appearance as the new NCTM president. Her address was entitled "Home Depot Leadership—All Students Learning High Quality Mathematics," with the theme being "You can do it. I/We can help."

The "You can do it" referred to both students and teachers. Students can learn and understand mathematics that is challenging but accessible; they can learn mathematics well and remember it. And teachers can teach effectively and efficiently. Cathy pointed out that teaching *effectively* involves teaching for learning that makes sense — usefulness, understanding, and balanced with grounded practice. She also stated that teaching *efficiently* involves using the connections based on knowing what others are doing and communication across grade levels. Cathy stated the *premise* is that "changing what and how we teach will open the door to math for more students" and the *promise* is that "if we teach a good mathematics program well to every student, the test scores will take care of themselves."

Upcoming Events:

- **NCTM Regional Conference Nov 2004**

This is the big one!!

Be sure to register and bring your colleagues!

The "I/We can help" referred to both teachers helping students and NCTM helping teachers. Teachers can teach a good math program, commit to their own lifetime learning, use good materials, be skeptical consumers of test prep materials, teach for understanding and proficiency, and act like they say they believe. Cathy reminded the audience about the importance of high expectations for every student, believing students can meet the expectations, and doing whatever it takes to get them there. She illustrated these points by relating stories about her class while teaching with the Peace Corps in West Africa. (To learn more about Cathy's experience teaching and living in Burkina Faso visit csinburkinafaso.hitspot.net) NCTM can help by continuing to develop and providing resources and materials for teaching and learning, and for advocacy and outreach. Cathy Seeley closed her address by emphasizing that, "Mathematics opens doors for students, and mathematics teachers are the key."

(Continued on page 4)

Pondering by the President

Sue Westegaard

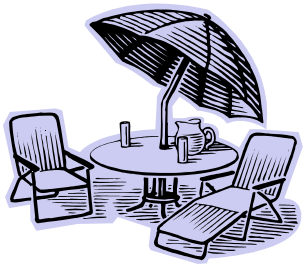
As the school year comes to a close, I wonder how many of us will get a thank you … from a student or a parent or an administrator. Every once in a while one comes your way … treasure it. I have a box of assorted notes and letters. Every once in a while, when I have a bad day, I dig out my box and read a few. It reminds me of why I am a teacher.

Thank you to:

- To the co-chairs of the Duluth meeting … Genni Steele, Don Karlgaard, and Denise Anderson.
- To Judy Stucki and all the members of the Program Committee. It is no small task to set up that many sessions.
- To all the people who were willing to speak or to preside at the sessions.
- To Glen Richgels and Bemidji State who provided all the data projection devices as well as the laptop computers. Thank you to Greg Gearey and Glen who kept everything running.
- To Mary Jo Furtman who was in charge of the Exhibit Hall and to Paul Agranoff who took care of the NCTM materials booth.
- To all the members of the Board of Directors of MCTM who worked so very hard to make our conference in Duluth a success…. They worked registration, greeted speakers, took tickets, answered questions, etc.
- To any other person who helped out in any way!
- To the wonderful crew at the DECC who provide such a wonderful venue as well as feed so many people such tasty meals so quickly
- To MinnMATYC who joins us for this conference.

Recognition to:

- Ellen Eigner, Rutheford Elementary, Stillwater, who was awarded a 2004 Toyota Time Grant for her project, Musical Games.
- Sharon Dailey, Park Rapids High School, who was awarded a Radio Shack National Teacher Award.
- Sonja Goerdt, on leave from Sauk Centre Public High School, had an article in the *Mathematics Teacher*, May 2004, "Identifying Features of functions Stated in Graph Form or Equation Form."
- Lynnette Lenoch-Craft, Willow Creek Middle School, Rochester, was featured in an article called, "The Fix", NEA Today, April 2004
- Kristy Loehlein, drawn as the winner of 2 years MCTM membership and 1 year NCTM membership



My wishes for you:

- A very restful, rejuvenating, invigorating summer
- Time with your families
- Time to read a few of those professional journals or books that have piled up
- Time to just "sit on the dock of the bay" … to rock in your rocker on the porch … to listen to a bird sing …

Enjoy your summer … see you next fall.

A PROBLEM WITH RESEARCH?

Research-based has become an extensively used term in the education profession. Questions such as "What does the research say about curriculum *x*?" or "What does the research say about strategies for helping students learn the basic facts?" are examples of how the profession is looking to research for answers. And rightfully so.

So what is the problem? We cannot look to research to always provide a definitive answer. For some, scientifically-based research needs to be stringently applied to the field for this very purpose. Yet, in the field of medicine, for example, there are many instances where the findings of a study contradict the findings of an earlier study. There is very little research of a purely scientific nature available to the education profession. However, purely scientific research may not be the best model to use in education because it may not be possible to implement a controlled experiment to the extent required for generalizing results. If research is to be used to move the profession forward, we need to be open to using a variety of research models and methods in the search for answers and we need to accept the ambiguity that research many times produces. Good research in many instances raises more questions than it answers.

We must also be open to research results even when they produce consistent evidence that contradicts deeply held beliefs. Too often results are discounted when they do not support long-standing beliefs. For example, there is increasing evidence to support the theory that with appropriate instruction, most children can learn mathematics. Because of this mounting evidence we need to let go of the belief that people are "genetically predisposed" to the learning of mathematics.

On the other hand, we need to be careful not to overreach in using research. The results must always be viewed within the context that produced them. To use findings in a totally different context is to misuse research. One of the reasons that research seems to produce contradictory results is that what may prove to be effective in one setting may not be effective in a different setting.

Finally, research is done to produce evidence that either supports or discounts a theory. Too often we accept a theory or apply a theory without paying attention to research findings. The application of constructivist learning theory is one example. Evidence suggests that when properly implemented, strategies based upon the constructivist theory help students develop deep understanding. But to employ a strategy in the name of "constructivism" without being thoughtful as to what this means in terms of how the learning environment is structured is again a misapplication of research.

Research has and will continue to move the profession forward. We must continually be open to what it can and cannot do for us.

Speaking of research, Isaiah Benjamin is reading the research on the effects of class size on achievement. The size of his class is scheduled to double in January. Meanwhile his mother and father are working with him to incorporate the concept of cooperative learning into his life. So far he has been rather uncooperative.

MDE Mathematics Specialist Report

Tom Muchlinski

...we must be open to what research can and cannot do for us.

(Continued from page 1)

At the Friday evening dinner, Marlys Otis presented Nancy Nutting as this year's Honorary MCTM Member. Nancy was honored for her service and many contributions to mathematics education teaching and leadership in Minnesota. In her acceptance speech, she shared some inspiring words about the effects of opportunities offered early in her teaching career and challenged audience members to "think about win-win situations in your district" to involve yourselves and others in.

Conference attendees were entertained by Scott Flansburg, the Human Calculator, during Saturday's lunch event. He demonstrated his amazing ability to compute successive addition in his head more quickly than someone could enter it into a calculator. He also educated the audience on alternative methods of doing computations and how these algorithms can lead to a better understanding of numerical computation. To see the Human Calculator in action, view video clips at www.humancalculator.com.

Over 1200 people attended the two-day conference. A special thanks to all who were involved: speakers, presiders, volunteers, and all who worked behind the scenes prior to, during, and following the conference. Minnesota can be proud of having one of the best state-level conferences in the entire country!

New Board Members

Outgoing MCTM Board members Genni Steele, Kathy Cramer, Paula Freidson, and Larry Luck were thanked for their service and recognized during the spring conference. The following new MCTM Board members were introduced and officially assumed their duties at the board meeting following the spring conference.

Jeannine Salzer—Vice President for Middle School / Junior High
Terry Wyberg—Vice President for Mathematics Education
Margaret Williams—District 6 Director
Karen Coblentz—President Elect

Calculus – Traditional or Reform? Calculus I or Calculus II?

Mathematics educators commonly believe that when the NSF-funded secondary curricula projects (for example: Core-Plus, IMP, ARISE) were being developed, mathematics curriculum writers thought that undergraduate mathematics was going to reform as well. This was a strong possibility in the area of calculus. I asked my network across Minnesota (consisting of all four-year colleges and a representative sample of the two-year colleges) if their mathematics department taught reform calculus or not.

Only three places were willing to call what they teach reform. Quite a few places (almost 10, including some of the larger four-year campuses) called what they taught very traditional. One even emphasized, " We are traditional with a capital T!"

However, the vast majority answered that they teach a compromise course. They weren't willing to call it reform, but it wasn't exactly traditional either. Some places included projects (involving some type of written report which differed from regular homework), and others used *Mathmatica* software applications or had some type of lab time.

One said this to describe the compromise approach: "We look at functions defined numerically (by a table of values), graphically, and symbolically. We estimate derivatives, antiderivatives, and integrals numerically or graphically *before* we introduce formal rules for differentiation, anti-differentiation, and integration. We do, however, expect students to become proficient with symbolic computation."

So, it appears that Minnesota undergraduates are not experiencing major reform in their calculus classes, but at the same time things are not as traditional as they once were. The smaller, liberal arts colleges in Minnesota are more likely to call what they teach reform, and the state colleges are more likely to call what they teach traditional. The community colleges try to align with the majority of colleges, and thus tend to be more traditional.

Besides the reform versus traditional question, I also asked my network of mathematicians what course they feel is the "first" course for students entering college, Calculus I or Calculus II. When I was earning my bachelors' degree in mathematics, the first course I took was Calculus I. I never took calculus in high school. Now, when I teach Calculus I, I ask the class if they have already had calculus, and almost everyone raises their hand. This lead me to propose to my department that we make Calculus II the first mathematics course required for a mathematics major, and then leave room at the end of the major for an additional course. My department voted this proposal down, because they believe that high school calculus and college calculus are still different courses.

Almost everyone in the network answered that Calculus I should be the first course. Some people agreed with my department that Calculus I in high school and Calculus I in college are two different courses, and, thus, feel that most students are not ready for Calculus II.

Others acknowledged that larger percentages of incoming freshmen are indeed prepared for Calculus II, but since that is still not the majority of students, Calculus I is the appropriate required starting point. One person did say that *most* of their math majors begin in Calculus II. And, in fact, many are qualified to skip Calculus II as well.

One idea that another person shared is to keep Calculus I as the first incoming course and even if most students end up beginning with Calculus II, because of AP credit or high

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College Corner

Carmen M. Latterell
University of MN Duluth

The purpose of the College Corner column is to help build a closer connection between the secondary schools and the colleges in Minnesota in order to help bridge the gap that students often encounter in their transition from secondary to college mathematics classes.

(Continued from page 5)
school/college dual credit, allow them credit for Calculus I, giving them credit towards the major before they start. The idea is that this might encourage students to pursue mathematics majors or even double majors (with mathematics as one of the majors).

In summary, it seems that I'm ahead of the game by wanting Calculus II to be the starting point, but not terribly ahead of the game. At least one institution in Minnesota is already seeing most of their mathematics majors begin in Calculus II, and an additional undergraduate department in Minnesota is offering a single semester of intensive calculus for mathematics majors, covering both Calculus I and II. So, it appears that this question of whether to make Calculus I or Calculus II the beginning course may start being an issue of debate in mathematics departments. At this point, however, most institutions in Minnesota are offering a fairly traditional calculus sequence, beginning with Calculus I, to their incoming freshmen.

MCTM Foundation

Contributed by Emily Larsen

The MCTM Foundation is pleased to announce the recipients of the Spring Conference Support Awards for 2004. The two recipients were Matt Danielson and Kerry Childers. Each received $250 to help pay for conference expenses at the Spring Conference. Congratulations to Matt and Kerry!

The Spring Conference Support will be available again next year. If you are a teacher new to the teaching profession, please consider applying for this award. If you know someone who is within their first five years of teaching, please encourage that person to apply. The award application is available at www.mctm.org.

Also, a special thank you is extended to Don Langlee for serving on the METM Foundation Governing Board for the past two years. His continued service to MCTM and mathematics education in Minnesota is greatly appreciated.

Sharon Dailey receives national award

Sharon Dailey, a mathematics teacher at Park Rapids High School, is one of 110 educators nationwide who received RadioShack National Teacher Awards. The $3,000 cash awards go to teachers who demonstrate a commitment to academic excellence in mathematics, science, and technology. Sharon Dailey is the only Minnesota high school educator to receive the award this year.

"This award is one of the high points of my teaching career," said Sharon. "It reaffirms the importance of technology in mathematics instruction." "A teacher must be a good listener and encourage and challenge students," said Dailey. "I always let my students know how much I enjoy teaching them."

RadioShack has given awards to 1,550 educators for their commitment, excellence, and innovation in the classroom since the program began in 1088. The National Teacher Awards program is funded by RadioShack Corporation of Fort Worth, Texas and is open to all accredited public and private high schools. Award recipients are selected from a nationwide competitive call for applications. The selection process includes judging applicants on their commitment to education and their implementation of innovative classroom teaching methods. A panel of distinguished educators selects the honorees. For more information about the RadioShack National Teacher Awards, visit the program's Web site at http://education.RadioSchack.com/TeacherAwards.

Announcement condensed from press release provided by RadioShack Corporation public relations.

Plan now to attend!!
NCTM Central Regional Conference
November 11 – 13, 2004

Quality Mathematics for ALL Students: Making the Vision a Reality

Hosted by the Minnesota Council of Teachers of Mathematics.
Held at the Minneapolis Convention Center and the Hilton Minneapolis.

Visit http://www.nctm.org/meetings/minneapolis/ for information including:

- ✓ Registration
- ✓ Schedule Highlights
- ✓ Speakers and sessions
- ✓ 10 reasons to attend

Announcements & Reminders

- **PLAN NOW** to have your students' work exhibited at the NCTM Regional Conference. For details and registration forms see www.mctm.org or previous *Mathbits*. Prizes will be awarded.

- **BE AWARE** that NCTM student membership is $36 with the choice of one online journal. For a hard copy version of the chosen journal or additional journals, the cost is an extra $30 each. If you have teacher education students, please explain this to them so their orders can be processed correctly and they can get online access quicker.

- **DID YOU KNOW** that NCTM members can download up to five journal articles per year from any NCTM journal to which they do not already subscribe?

Thinking of putting in an elliptical flower garden?

Call Hering's Elliptical Garden Service! The following garden was produced with a maximum width of 5 feet and a maximum length of 12 feet. The ellipse was created by using a 12 foot length of trilene XL attached to two stakes that were each 5.45 feet from the center of the garden. The fishing line was kept tight to create the boundary of the garden. The equation of the garden is

$$\frac{x^2}{36} + \frac{y^2}{(2.5)^2} = 1$$

Created by Brent Hering, Hopkins High School

Professional Development Opportunity

The following is a professional development opportunity made available by the Minnesota Council on Economic Education. This workshop is free of charge and includes free curriculum materials and a monetary stipend for attendance. For more detailed information or to register online, please visit the MN Council's web site at www.mcee.unn.edu. You may also register by calling 612-625- 3727.

Math & Economics: Connections for Life, grades 9-12
August 3, 2004, 9:00 - 3:00
University of Minnesota, St. Paul

Whether the class is basic algebra or AP calculus, there are lessons in this curriculum designed to reinforce math concepts and processes by using examples from economics and personal finance. The workshop will demonstrate the curriculum lessons and each participant will receive the curriculum free. There is no fee to attend and a $30 stipend is provided for attendance. Lunch and refreshments are also provided. Enrollment is limited to 30. Please register by July 23. Register online at www.mcee.umn.edu or by calling 612-625-3727. Funding for this workshop is provided by Medtronic Foundation.

NCTM Advocacy Toolkit

The National Council of Teachers of Mathematics has a newly developed resource—the NCTM Advocacy Toolkit. The toolkit is a how-to guide in becoming politically proactive with mathematics education and provides numerous resources.

NCTM (and MCTM) has 501(c)3 tax exempt charitable organization status and thus is limited in spending on political advocacy. NCTM and MCTM cannot endorse candidates, campaign for or against candidates, or contribute to a campaign. However, NCTM and MCTM members can directly lobby by contacting legislators and urging them to support or oppose legislation and be active at the grassroots level by informing others. The NCTM Advocacy Toolkit contains the following items:

- Overview letter from past president Johnny Lott and president Cathy Seeley
- Congressional Directory
- NCTM Legislative Platform
- Executive Summary of the *Principles and Standards for School Mathematics*
- FAQ's about the *Principles and Standards for School Mathematics*
- NCTM at a glance…
- NCTM Mission Statement and key messages
- Communication Guide...tips on how to write letters, contact legislators, etc.

Copies of the NCTM Advocacy Toolkit may be obtained by contacting Ken Krehbiel, NCTM Director of Communications at (703) 620-9840 or by email kkrehbiel@nctm

Digital Resources

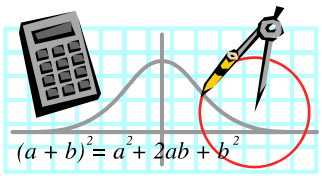
The Eisenhower National Clearinghouse for Mathematics and Science Education
http://www.enc.org
Classroom Calendar—contains ready-to-use activities, background information, and suggested materials related to math and science topics; new activities and topics each month.
Digital Dozen—each month 12 high quality K-12 math and science websites are highlighted; selection based on value related to content and pedagogy, audience usefulness and engagement, functionality and navigation, use of web technology and design; archives of previous months only contain sites that are still available.

Math Tools
http://mathforum.org/mathtools/
A digital library of technology tools and support materials for K-12 mathematics; searchable by grade level and topic.

Unisys and MCTM Co-Host 38th Annual High School Math Recognition Day

The 38th annual High School Math Recognition Day, co-hosted by Unisys Corporation and the Minnesota Council of Teachers of Mathematics was held on May 4 at the University of Minnesota Digital Technology Center. Students from metro-area public and private high schools, scoring highest on the American Mathematic Competition (AMC12) in their respective school buildings, were invited to attend the special recognition event. Accompanying each student was his/her math teacher.

This annual event recognizes metro-area students for their academic achievement and serves as a way to strengthen the importance of mathematics in relation to future career choices. Unisys selected the University's Digital Technology Center site because of their strong partnership relationship with the DTC and to reinforce to the students the importance of science and technology education and research for companies like Unisys. The event included a breakfast, awards presentation and tour of the DTC.



Keynote speaker for the program was Professor Andrew Odlyzko, Director, Digital Technology Center, who talked about "Mathematics and the Real World." Other special guests included Larry Luck, a past president of MCTM, extending greetings on behalf of MCTM, and Kate Rubin, President, Minnesota High Tech Association, who talked about the importance of mathematics in relation to the state's future technology developments.

Professor Wayne Roberts, Minnesota Coordinator for the AMC Competition and Professor of Mathematics at Macalester College, shared results from the AMC Competition.

Unisys scholarships were presented to the top-scoring student in the state, Silas Johnson from Bloomington Jefferson, the second highest scoring student, Ning Zhou from Wayzata, and the third highest scoring student, Daniel Gibson from Highland Park in St. Paul. Unisys also presented a $300. check to Wayzata for being the top-scoring team in the state.

Following the program, guests were invited to tour the Digital Technology Center, a hub of innovation and excellence at the University of Minnesota in the digital technologies. The center integrates research, education and outreach in digital design, computer graphics and visualization, telecommunications, intelligent data storage and retrieval systems, multimedia, data mining, scientific computation, and other digital technologies.

Several of the newest resources available from NCTM

Empowering the Beginning Teacher of Mathematics: High School
Edited by Michaele F. Chappell, Jeffrey Choppin, and Jenny Salla; 2004

Navigating Through Problem Solving and Reasoning in Grade 1
By Carol R. Findell, Mary Cavanagh, Linda Dacey, Carole E. Greenes, Linda Jensen Sheffield, and Marian Small; 2004

Navigating Through Problem Solving and Reasoning in Grade 2
By Marian Small, Linda Jensen Sheffield, Mary Cavanagh, Linda Dacey, Carol R. Findell, and Carole E. Greenes; 2004

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Check the mailing label for your membership renewal date.
Renew online at www.mctm.org

Mark Your Calendar for 2004 - 2005

11/11 – 11/13	NCTM Regional Conference, Minneapolis Convention Center
4/06 – 4/09	NCTM Annual Meeting, Anaheim, California
4/28 – 4/30	MCTM Spring Conference, Duluth

Do we have your correct address?

MCTM 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. Is your correct address printed on the label of this issue of *Mathbits*? If not, please contact Executive Director Arnie Cutler at 612-626-8326 or cutler@tc.umn.edu or visit the MCTM web site (www.mctm.org) and go to the membership page to make your change. Student MCTM members and members in transition are especially encouraged to provide us with a permanent address. Thank you for helping us stay in touch!

Please submit items for the next issue of *Mathbits* to tlgonske@nwc.edu by August 25, 2004. Thank You. You may also call 651-631-5228 if you have questions. - Teresa Gonske, Editor