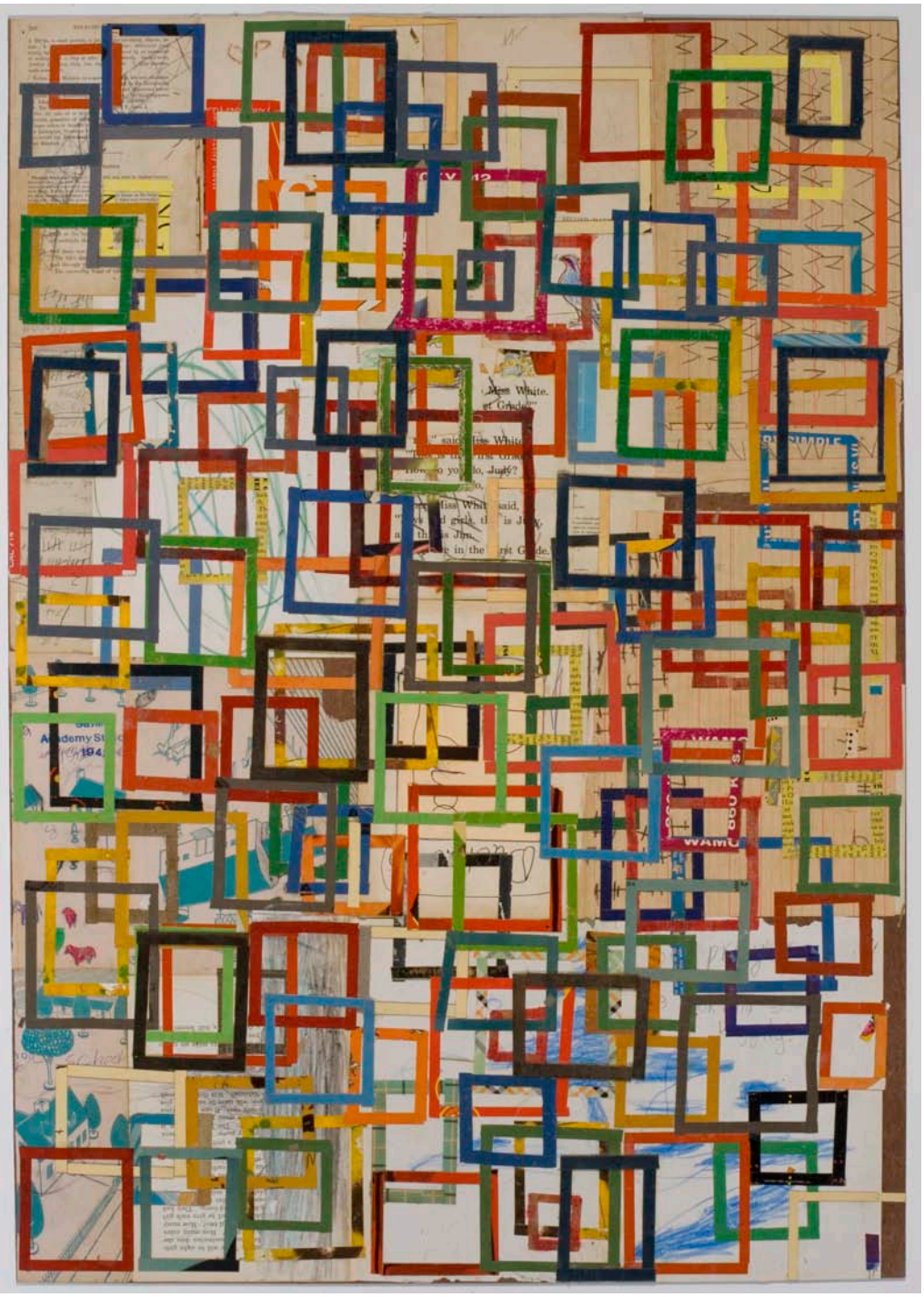
Texas Mathematics Teacher

Volume LIV Issue 2 Fall 2007



State School

Texas Council of Teachers of Mathematics
2007-08 Mission and Goals Statements

MISSION

To promote mathematics education in Texas

GOALS

Administration

- Streamline online membership registration through CAMT

Publications

- Survey membership to identify what they want in the *Texas Mathematics Teacher* (TMT)
- Review and refine the TMT journal and the TCTM website
- Improve the review protocol, establish criteria for reviewers
- Provide tips for new teachers in the TMT and on the website

Service

- Increase the donations toward Mathematics Specialist College Scholarships
- Staff CAMT with volunteers as necessary
- Advertise affiliated group conferences on the TCTM website, in the TMT and at CAMT

Communication

- Maintain an e-mail list of members for timely announcements
- Communicate with affiliated groups in a timely manner

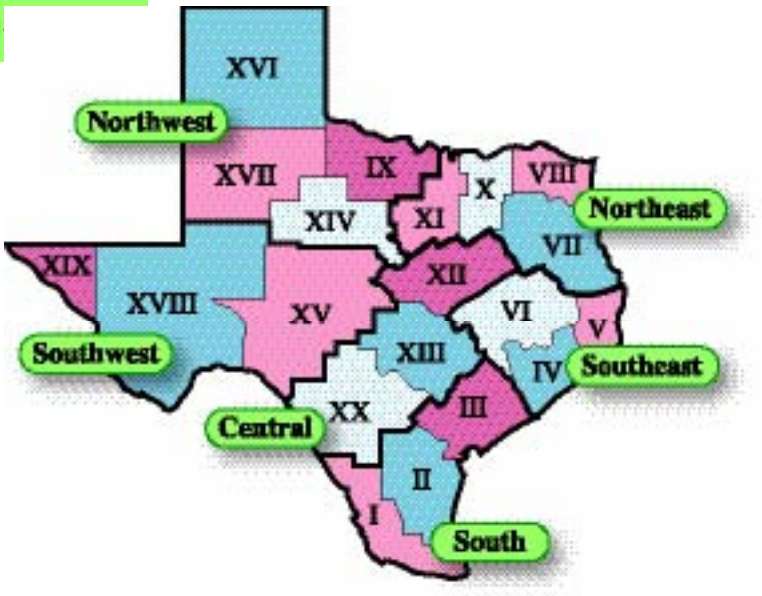
Membership

- Encourage affiliated groups to include TCTM registration on their membership forms

Public Relations

- Sponsor and staff the TCTM booth at CAMT
- Follow NCTM Advocacy Toolkit (2004) for increased voice of TCTM membership on issues relevant to our mission

TCTM Region



TCTM Past-Presidents

1970-1972	James E. Carson	1982-1984	Betty Travis	1994-1996	Diane McGowan
1972-1974	Shirley Ray	1984-1986	Ralph Cain	1996-1998	Basia Hall
1974-1976	W. A. Ashworth, Jr.	1986-1988	Maggie Dement	1998-2000	Pam Alexander
1976-1978	Shirley Cousins	1988-1990	Otto Bielss	2000-2002	Kathy Mittag
1978-1980	Anita Priest	1990-1992	Karen Hall	2002-2006	Cynthia Schneider
1980-1982	Patsy Johnson	1992-1994	Susan Thomas		

Texas Mathematics Teacher

A PUBLICATION OF THE TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

Volume LIV Issue 2 **Fall 2007**

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Articles

The Roller Coaster Project	8
Classroom Census Activity	18
Classroom Census Worksheet	21

Features

2007 Award Recipients	
TCTM Leadership / E. Glenadine Gibb Awards	6
PAEMST	6
TCTM CAMTership	7
TCTM Mathematics Specialist Scholarship	7
NCTM News Release: NAEP 2007	11
Voices from the Classroom	12
Message from NCTM President	13
Puzzle Corner	17
Recommended Readings	20
Legislative Update on Advocacy	23
Affiliate News	24
New 4th-Year Mathematics Course for Texas	26

Departments

Map of TCTM Regions	*inside front cover*
Letter From the President	4
Lone Star News	5
TCTM Communications	12
TEA Talks	14
CAMT 2008	17
About this Publication	25
Scholarship Donors	26
TCTM Board 2007-2008	*inside back cover*

TCTM Applications

2008 Leadership Awards	6
2008 CAMTership	12
2008-09 Mathematics Specialist Scholarship	24

All applications (including membership) are now available online at the TCTM website <*www.tctmonline.net*>.

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Call For Articles

The ***Texas Mathematics Teacher*** seeks articles on issues of interest to mathematics educators, especially K-12 classroom teachers in Texas. All readers are encouraged to contribute articles and opinions for any section of the journal.

Manuscripts, including tables and figures, should be typed in Microsoft Word and submitted electronically as an e-mail attachment to the editor with a copy to the director. No author identification should appear on or in the manuscript. A cover letter containing author's name, address, affiliations, phone, e-mail address, and the article's intended audience should be included. After refereeing, authors will be notified of a publication decision.

Teachers are encouraged to submit articles for ***Voices From the Classroom,*** including inspirational stories, exemplary lessons, or management tools. If submitting a lesson, it should include identification of the appropriate grade level and any prerequisites. Items for ***Lone Star News*** include, but are not limited to, NCTM affiliated group announcements, advertisements of upcoming professional meetings, and member updates.

Businesses interested in placing an **advertisement** for mathematics materials should contact Mary Alice Hatchett. Advertisements do not imply endorsement by TCTM's board, editorial staff or members.

Deadline for submissions: Fall, July 1 Spring, January 1

Letter from the President

Dear TCTM Members,

Welcome back to another exciting school year! 2007-2008 holds a great deal of potential for the world of mathematics education in Texas.

First of all, I'd like to welcome all of our new members who joined TCTM when they attended CAMT 2007 this past summer in San Antonio. The Board of Directors and I are so glad that you are a part of our organization. We have had many new members join over the past few years, and I would like to continue a dialogue about how we can best serve our growing membership. This dialogue can occur at the local level, at local af liate conferences and meetings, or at the state level, by contacting your regional representatives. If you haven't lately, be sure to visit the TCTM website, *<www.tctmonline.org>*, where you can nd contact information for all Board members.

CAMT 2007 was one of our largest conferences ever, with well over 8,000 attendees. The Preconference sessions, Mathematics TEKS Connections, chaired by Dina Grif n, and the conference program, chaired by Sandra Browning, were both very well received by those who participated. I would like to thank all who presented at either the Preconference sessions or the conference sessions for volunteering your time and energy.

Looking toward the 2007-2008 school year, there are opportunities for every mathematics teacher in Texas. At the elementary level, this is textbook adoption year for Kindergarten through Grade 5. It is said that elementary schools are the cornerstone for successful vertical teams. Elementary mathematics teachers will be making critical decisions that will impact their students for the next 8 to 10 years. Beyond this, curriculum choices made this year will impact intermediate, middle, and high school students much longer than that. There are many resources and structures for elementary teachers to use as they look for materials that align to the newly revised TEKS. Your regional education service centers and local universities are excellent places to look for guidance.

At the middle school level, this year's 8th grade students, the class of 2012, face the next hurdle in the student success initiative – Grade 8 TAKS. In order for students to be promoted to high school, they must pass the Grade 8 TAKS mathematics and reading tests this coming spring. "Accelerated instruction" and "intervention" will be phrases heard through many middle schools across Texas in coming months.

High school teachers and administrators are continuing to implement new graduation requirements calling for all students, beginning with this year's freshmen, to successfully complete four years of mathematics coursework, including Algebra II. Around 10 years ago, high school teachers successfully implemented an "Algebra I for All" approach when the Texas Legislature required all students to take Algebra I in high school as an entry-level course. Today, Algebra II teachers have the opportunity to rise to the same occasion.

Like so many other issues, all of these give us, as professional educators, a chance to rethink how we teach mathematics. The 21st century economy demands citizens that are not merely computational experts, but are problem solvers. I extend my best wishes to each of you for a highly successful school year!

Sincerely,

Jo Ann Wheeler
TCTM President 2006-2008

Lone Star News

Affiliate Groups

These are local affiliated groups in Texas. If you are actively involved with them, please send future meeting and conference information to Cynthia Schneider at <*cschneider@mail.utexas.edu*> so we may publicize your events. Contact information for each group is available on the NCTM website, <*www.nctm.org*>. Contact information for regional directors is located on the inside back cover.

SOUTHWEST REGION: *Service Centers 15, 18, 19*

Rita Tellez, Regional Director

Greater El Paso CTM
Annual fall conference was held on October 20, 2007 at the El Paso Community College Transmountain Campus. Contact: Lori Correll <*llcorrel@episd.org*>.

SOUTHEAST REGION: *Service Centers 4, 5, 6*

Kathy Fuqua, Regional Director

Fort Bend CTM
Holds a short meeting in August, a fall mini-conference, a spring mini-conference and an end-of-year banquet to serve the districts of Alief, Fort Bend, Katy, and Stafford. Contact: Jan Moore, <*Jan.Moore@fortbend.k12.tx.us*> or Susan Cinque, <*olsoncinque@alltel.net*>.

Houston CTM

1960 Area CTM
This Affiliate is currently reorganizing. It serves the districts of Aldine, Klein, Katy, Humble, Tomball, Spring, and Cypress-Fairbanks. Contact Sheila Cunningham, <*scunningham@kleinisd.net*>, if you wish to help with the reorganization.

NORTHWEST REGION: *Service Centers 9, 14, 16, 17*

Nita Keesee, Regional Director

Big Country CTM & Science
Will hold their annual conference in January 2008. Contact: Leslie Koske, <*lkoske@esc14.net*> or 325-675-8661.

Texas South Plains CTM
Fourteenth Annual Panhandle Area Mathematics and Science Conference was held on September 29, 2007, in Canyon, TX. Contact: Gilberto Antunez, <*gantunez@mail.wtamu.edu*>, or see <*www.wtamu.edu/academic/ess/edu/*> for information on 2008.

NORTHEAST REGION: *Service Centers 7, 8, 10, 11*

Shirl Chapman, Regional Director

East Texas CTM
For current information contact the president, Robin McClaran, at <*robinmc@etbu.edu*>.

Red River CTM
STEAM (Successfully Training Educators As Mathematicians) is held every four years at the campuses of Texas A&M University-Texarkana and Texarkana College, Contact: Debra Walsh, <*dwalsh@redwater.esc8.net*> or Susie Howdeshell, <*showdeshell@pgisd.net*> or see <*www.tamut.edu/~rrcmath/*>.

Greater Dallas CTM
Holds two mathematics contests (W. K. McNabb Mathematics Contests) for students in grades 7 - 12 - one in the fall (early Nov.) and one in the spring (early April). A banquet in May is held for the winners. Contact: Tom Butts, <*tbutts@utdallas.edu*> .

SOUTH TEXAS REGION: *Service Centers 1, 2, 3*

Barba Patton, Regional Director

Coastal CTM
holds and annual in June in Corpus Christi. Contact: Elaine Young, <*eyoung@sci.tamucc.edu*>.

CTM @ Texas A&M University at Corpus Christi (Student Affiliate)

CTM @ Texas A&M University at Kingsville (Student Affiliate)

Rio Grande Valley CTM
The 42nd annual conference will be held on Saturday November 17, 2007, at the University of Texas - Pan American, Edinburg, Texas, from 8:00 to 4:00 p.m. Contact: Frank Rivera, <*f.rivera@ljisd.esc1.net*> or see <*www.rgvctm.org*> .

CENTRAL TEXAS REGION: *Service Centers 12, 13, 20*

David Hughes, Regional Director

Austin Area CTM
A spring meeting will be held on May 6, 2008 at ESC 13. The fall conference was be held on October 13, 2007. Contact: Cynthia L. Schneider, <*cschneider@mail.utexas.edu*>, or see <*www.aactm.org*>.

Alamo District CTM
Normally holds a fall and spring conference. Contact: Kathy Mittag, <*kmittag@utsa.edu*>, or see <*www.adctm.net*>.

Central Texas CTM
CTCTM will hold a fall meeting in 2007 and a spring mini-conference in Febuary 2008, in Waco at the Region 12 Service Center. Contact: Tommy Bryan <*Tommy_Bryan@baylor.edu*> or see <*www.baylor.edu/soe/ctctm*>.

NON-AFFILIATED CONFERENCES

STATEWIDE

Texas Association of Supervisors of Mathematics (TASM) meets in the fall and spring in Austin. Membership is required to register for this meeting. For membership and registration information, please see <*www.tasmonline.net*>.

NCTM Regional Meeting, November 29-30, 2007 Houston, TX. See <www.nctm.org>.

2007 Award Recipients

Leadership Awards

Each year since 1995, TCTM has accepted nominations for two awards for leaders in our professional community. The TCTM Leadership Award is presented to a TCTM member who is nominated by a TCTM af liate. The second award, the E. Glenadine Gibb Achievement Award, is presented to someone nominated by a TCTM member. **If you wish to nominate someone for 2008, please see the forms on our website**.

TCTM Leadership Award

Kathy Hale

Honored for her service in mathematics education in Texas to improve professional development and empower teachers to provide the best teaching environment for all students, **Kathy Hale** of Region 14 in Abilene received the 2007 TCTM Leadership Award. She was recognized for her contributions to the improvement of mathematics education in Texas at the 2007 CAMT luncheon in San Antonio.

TCTM E. Glenadine Gibb Achievement Award

Cynthia L. Schneider

Honored for her service in mathematics education at the state and national level to empower teachers to provide the best teaching environment for all students, **Cynthia L. Schneider** of the Charles A. Dana Center received the 2007 E. Glenadine Gibb Award from the Texas Council of Teachers of Mathematics. She was recognized for her contributions to the improvement of mathematics education in Texas at the 2007 CAMT luncheon in San Antonio.

Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) identi es outstanding mathematics and science teachers, kindergarten through 12th grade, in each state and the four U.S. jurisdictions. These teachers serve as models for their colleagues and leaders in the improvement of science and mathematics education. The 2007 Texas preliminary nalist nominee is:

- **Toni Norrell** is a teacher at Calallen High School in Calallen ISD.

Each Presidential Awardee will receive a $10,000 award from the National Science Foundation. Each award recipient will also be invited to attend, along with a guest, recognition events in Washington, D.C. These events will include an award ceremony, a Presidential Citation, meetings with leaders in government and education, sessions to share ideas and teaching experiences, and receptions and banquets to honor recipients.

The 2008 PAEMST will be awarded in the Elementary (Grades K – 6) category. The application deadline is spring 2008. At this time, the national website is in transition. When it becomes available, noti cation will be sent out through the TEA mathematics listserv.

Nomination forms must be submitted to Erika Pierce at the Texas Education Agency prior to the application being sent to quali ed candidates. E-mail her at

<Erika.Pierce@tea.state.tx.us>

if you would like to nominate a colleague.

At the state board meeting in September 2007, the Texas nalists for the 2006 and 2007 Presidential Awardees were recognized. The picture below was taken after teachers were recognized.

Front row: Mary Alice Hatchett; Mrs. B'Smith; Kit B'Smith, 2006 Texas Presidential Awardee Finalist; Norma Torres-Martinez, TEA Director of Mathematics

Back row: Louisa Acosta, P ugerville Middle School Mathematics Department Chair; Mary Kimmons, Principal P ugerville Middle School; Charles E. Dupre, Superintendent, P ugerville ISD; Terrence Eaton, Ph.D. Executive Director for Middle School Instruction, P ugerville ISD

2007 Award Recipients

TCTM CAMTership

Ten $500.00 CAMTerships were awarded this past summer by TCTM. We would like to extend our congratulations to each of the following recipients. All recipients volunteered two hours of their time at CAMT and attended the annual TCTM Breakfast as guests of TCTM. If you have been teaching for ve or fewer years, look for the CAMTership application online. The CAMTership is intended to encourage beginning teachers to attend CAMT by helping cover part of the expenses associated with attending the annual conference.

Correna Brown
Terrel ISD

Dindo Delosa
Pasadena ISD

Rotisha Flannel
Galena Park ISD

Shae Fontenot
Pearland ISD

Kayce McBride
Terrell ISD

Argelia Rodarte
Galena Park ISD

Kyle Seipp
Northwest ISD

Randolph Selten
Galena Park ISD

Susie Thacker
Alvin ISD

Chelsea Wade
Northwest ISD

TCTM Mathematics Specialist Scholarship

Five Texas students were awarded the $2000 TCTM Mathematics Specialist Scholarship for 2007-08.

Virginia Arenz
Sam Houston State University

Rachel Carrothers
Midwestern State University

Tami Dashley
The University of Texas at El Paso

Katherine J May
The University of Texas at Austin

Allie Stevenson
Southwestern University

The Roller Coaster Project

In high school math classes, or all math classes for that matter, it is difficult to utilize best practices in our discipline. There is pressure from the state to raise student's standardized test score. There is international pressure for our students to be able to compete on a global scale. There is pressure from administrators to see best practices being used throughout our curriculum. And, most important, there is pressure from students to learn in a way that is relevant to their lives. How can I as a teacher incorporate writing, the use of manipulative, self evaluation, checkpoints, relevance to learning objectives, and meaningful group work all within the context of a 45 minute class? And throughout all this process I am expected to differentiate for ELL students, GT, Special Education, and modify for section 504? Sometimes this seems like an overwhelming task, and one that takes precious and rare time. But, in the words of my wise mother, take the time to think smarter, not work harder. I had a goal: come up with one lesson which would incorporate as many best practices as possible, and differentiate for all my different learners in my classes, while making the students work and think harder than me. The end product was a successful project, but also a new mindset. Let me explain the project that transpired from this endeavor. I also have 3 other projects that are not as long in duration but satisfy the same principals of best practice, higher order thinking skills, self-evaluation, group work, kinesthetic learning, and keeps the kids excited about learning!

The roller coaster project

The objective was to reinforce the concepts of zero, roots, intercepts, and give students a relevance of when and where to use parabolas and exponential equations in real life. The activity also discusses number sense, the concept of what graphs do when they approach a given point, and a coefficient's effect on parabolic/exponential graphs. By the end of this activity the student should have a good grasp of parabolas, parabolic curve, intercepts, zeros, how coefficients alter the graph, and some beginning understanding of exponential curves. One major benefit is the student will have strong knowledge of the table, window, and other functions found on most graphing calculators.

Before the project begins the students need to be familiar with parabolas, graphs, and have a basic understanding of intercepts. I normally do this project after the winter holidays in Algebra 1, or before thanksgiving in Math Modeling.

This project will require five days to teach and implement. Block classes are preferable, but I taught it in a 45 minute class as well with the only difference as less classroom discussion and more teacher led learning, rather then student discovery. If you wanted to keep student discovery in, the project would take seven 45-minute classes. The project requires some preparation and materials. You will need to get marbles, pipe insulator, masking tape, and duct tape which may be found in home improvement stores.

The activity should start with a discussion of roots with factored parabolic equations (i.e.: $(x\text{-}2)(x\text{-}5)$) the roots are (2,0) and (5,0)). With this discussion ask the class if they can find a pattern and why. When the class understands the relationship between zeros and roots, ask them to extend it. (Can a parabolic graph have three roots? How? Why or why not? What would you call a graph with three roots?) This activity should take around 45 minutes to fully understand.

The next day go over the concepts discussed and do a quick review. Graph with the students an exponential graph with four roots (i.e. $(x\text{-}2)(x\text{-}5)(x\text{-}7)(x\text{-}11)$) then discuss why the graph looks like it shoots off the page. Plug in $x = 3$ for example and you get

$(1)(-2)(-4)(-8) = -64$

So even when you go one unit off a root you get a very large number. Lead the class in a discussion:

what would you do to reduce this number? Although it will be difficult, let them hypothesize and make errors. Eventually they will come up with the solution: multiply by a coefficient less than one to reduce the range of the y value then you can graph it in the calculator. After the class practices this several times, probe into what you would do for five roots. This should be a closure for the second day. You could also give them the rubric early and let them begin on the essay section during closure.

The third day is when the students are normally given a rubric describing the activity in detail. This should be a day for all students to work in small groups on their individual concept. The small group is not to come up with one roller coaster, but to provide a support system and net for students to bounce ideas off each other in pursuit of their own roller coaster design. You might want to discuss how to change window settings on the calculator for maximum effect to the desired domain and range. Let the students pick their roots to use. Today will be a day for the student to come up with their "roller coaster" equation and graph. They will also graph on paper what the equation looks like. This would be a good time to go over the list feature on the calculator. This should last one day (on a 45 minute schedule). Remind the students that a rough draft of their paper is due today if you choose to take up the rough drafts.

The next day, the class is divided into small groups of 4 - 5 people and the students take turns explaining their individual graphs, roots, coefficients, and logic and reasoning they took to get there. The teacher will alternate between the groups doing a checkpoint to make sure all the students are with you. This would also be a good time for small group tutoring. Have the groups go over the rubric and make suggestions to other group members as to ways to improve the graph or the project in general. The group should choose the graph that they feel is the most likely to make a working roller coaster. That will be the roller coaster that they build tomorrow. Each student should read their paper in its entirety to the group for critique and suggestions. At the end of class the student should turn in their project (their graph and notes). Although not necessary, it might be a good idea for the group to do a self assessment, what do they think they deserve on this project and why? Did everyone in the group participate? What did you learn from this?

That Friday (or the 5th day of the project) the students are in their critique groups building one of the group's designs for the roller coaster that was selected the previous day. At the beginning of class the students should turn in their final draft of the essay. The materials are tape, pipe insulator (cut in half to make a track), a marble, and the room. For this project the students need to move the desks and tables so that a maximum work area is achieved. When I did this, the students used the tables and desks as taping points for the roller coaster. The students will be "testing" their roller coasters and judging which group is the best. This means that they will be building the track with pipe insulator, connecting it with tape, and running a marble down the track to see which marble makes it to the end without flying off or stopping. There will need to be great momentum, so a full length of track needs to be on the front of the graph to give the marble initial momentum. This is a good area for science integration, using words like velocity, incline, vertex steepness, etc.

At the end of the class, ask the students what they learned. Remind the group members (or the group leader) to turn in their graph with the changes that were made and the reasoning behind the change (i.e. the marble left the track on the second curve, so we adjusted the angle of the vertex, etc.). Survey them to determine what they thought was fun, educational, helpful, most interesting, and so on. This will give you new ways to approach it in the future.

The differentiations for this project are minimal and require no extra work in grading or assessing. The differentiation is in the approach of the concept, rather then the assessment of the project.

For gifted students, rather than solve an exponential graph, tell the students they need use only parabolas and the points should intersect to form a seamless roller coaster. For example, $y = (x)(x\text{-}4)$ and $y = (x\text{-}4)(x\text{-}6)$ intersect at (4,0). Therefore, if you

look at the domain $\{x \mid 0<x<4\}$ for the first graph and $\{x \mid 4<x<6\}$ for the second you would get a seamless graph. The intersections do not have to be on the x-axis. Have them make a roller coaster using the intersections of parabolas. This is very difficult because they are looking at sections of domains, rather then the graph as a whole. They will also have difficulty graphing this on a calculator, but need to refer to their graph as the primary source of information. As a teacher this requires no additional time to assess. Make sure their graphs intersect, look at their parabolas to determine if the domain and range intersect, and grade them on the same rubric as the rest of the class. At least one of their intersections needs to not be located on the x-axis.

For special education and 504 students you would ask them to do the same project with the same expectations. The student will only need three vertices on his/her initial graph and answer three of the four essay questions (student's choice). The students can, and should, still work in regular groups; the other students will not know that there have been modifications.

For English Language Learners (ELL) this project needs no further modifications. Because of the hands-on approach to the vocabulary and the kinetic nature of roller coasters, the ELL student will not need special attention. The one area that I would be cautious about is the essay. Depending on the fluency of the student, they can have difficulty with this section and should be graded according to their language level. If the students are having great difficulty with the essay section, I recommend they work together and submit one essay for a group. If your school has an ELL specialist, consult with them prior to this project.

With the entire lesson described, I have a few pearls of wisdom. First, marbles can break glass windows if there is sufficient velocity. Discuss with the students safety and responsibility before commencing and aim the end of the roller coaster toward a wall. Second, group work goes so smoothly when the group members know what their individual roles are. The groups can be divided up into "analyst" (person who looks at where the marble stopped or left the track), "initiator and dispatch" (the person who lets the marble go and fetches it when it goes off the track), "engineer" (the person who makes changes to the track for the marble to navigate successfully), and "recorder" (the person who notes the changes and reasoning behind them for the group to submit at the end of class). Third, the best way I have found to keep the groups on track is to tie simple competition and public reward for the winners, so the group who has the "best" roller coaster by the last 5 min of class will get a 10-point bonus on their project grade and pictures of the winning roller coaster will be displayed in the halls or room.

The best part of this project was the ability to reference it throughout the remainder of the year. When I would say vertex, line of symmetry, roots, or any other vocabulary word in the project, the students were on the same page as me. And they knew so much about how coefficients affected the graph it did not need to be directly taught. That concept taught itself. When we would discuss graphing or lists on the calculator, everyone knew how to access it. Furthermore, the students became used to the idea of writing in a math class and using essays to digest their learning. The kids had fun, I had fun, we all learned something new, best practices were incorporated, and this was not me working harder, faster, longer, it was working smarter.

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Alissa Carter • <alissakcarter@gmail.com>

NCTM News Release

2007 NAEP Reports Sustained Improvement In Math Scores Nationwide in Grades 4 and 8

Reston, Va., September 25, 2007—The National Council of Teachers of Mathematics (NCTM) welcomed the incremental and sustained improvement in mathematics performance shown by the results of the 2007 National Assessment of Educational Progress (NAEP) released today. NCTM asserted that public attention to math instruction and increased emphasis on professional development for teachers are having a positive effect on the quality of math that students are learning. Since 1990, NAEP math scores have risen steadily, and the 2007 average scores for grades 4 and 8 are higher than in any previous assessment year. NCTM developed its first standards in 1989 and updated them in *Principles and Standards for School Mathematics in 2000*.

Between 2005 and 2007, the average fourth-grade score increased from 238 to 240, and the average eighth-grade score increased from 279 to 281. In 1990, these average scores were 213 and 263, respectively. Nationally, a higher percentage of students in both grades 4 and 8 performed at or above basic, proficient, and advanced levels in 2007 than in all previous assessments. Results for this year's NAEP, known as the Nation's Report Card, show that 82 percent of fourth graders and 71 percent of eighth graders performed at or above the basic level in math, compared to 50 percent and 52 percent, respectively, in 1990. The percentage of those achieving at the proficient level also increased dramatically since 1990, from 13 to 39 percent among fourth graders and from 15 to 32 percent among eighth graders.

"NAEP's 2007 results continue a trend of encouraging national progress in mathematics education," said NCTM President Francis (Skip) Fennell. "This year's record high scores are an affirmation that much of what we are doing is working. The improved test scores for African-American and Hispanic students show progress in closing the achievement gap nationally, although results still lag for too many minority students and children in poverty. One of our highest priorities as educators should be to eliminate the achievement gap and help every child reach his or her potential."

Though average scores for white, black, Hispanic, and Asian/Pacific Islander students in both grades 4 and 8 were higher in 2007 than in any previous assessment year, scores for minority students other than Asians remain lower than for whites. Score increases for all groups did not result in a significant closing of performance gaps that separate whites from blacks and Hispanics.

Since 1990 fourth grade black students have made a 34-point gain, which is greater than the 28-point gain for whites and the 27-point gain for Hispanics. In 2007 both male and female fourth and eighth graders' average scores were higher than in any previous year, with males' average scores 2 points higher.

NCTM's recently published *Results and Interpretations of the 2003 Mathematics Assessment of the National Assessment of Educational Progress* by Kloosterman and Lester, provides a comprehensive study of the 2003 NAEP which is useful in understanding the results of NAEP 2007. For background and an in depth study of the achievement gap with respect to NAEP, the chapter by Lubienski and Crockett provides useful information.

The National Council of Teachers of Mathematics is a public voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students. With 100,000 members and more than 230 Affiliates, NCTM is the world's largest organization dedicated to improving mathematics education in prekindergarten through grade 12. The Council's *Principles and Standards for School Mathematics* includes guidelines for excellence in mathematics education. Its recently released *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics* identifies the most important mathematical topics for each grade level. ■

For more information on NCTM's *Principles and Standards for School Mathematics and Curriculum Focal Points for Pre-Kindergarten through Grade 8 Mathematics*, please go to <*www.nctm.org/standards/*>

FEATURE

Voices from the Classroom

Tips for Teachers

Grading

- Use rubrics. Conduct a class discussion in which students develop a rubric to be used for scoring performance tasks. This allows students to gain an understanding of expectations for solutions to multi-step problems.
- Use notebook/homework quizzes as a way to easily assess if students are doing their homework. Provide students with a list of 10 homework problems to copy from their notebook (no textbooks) and you grade these problems. This also allows student more time to do homework if they get something they don't understand.
- Create macros in a spreadsheet to make grading easier.
- Avoid all-or-nothing grading schemes. Insist on fully detailed explanations whenever your students solve problems, and reward reasonable efforts with partial credit. This encourages students to value the process of solving a problem as much as the product of obtaining a correct answer.
- Uses pluses, not minuses. Use positively oriented credit accumulation; that is, use "+2 out of 4 points" rather than "-2 out of 4 points."
- Test yourself. You should be able to complete a test in a quarter of the time that your students will have.
- Be careful of "indiscriminate zeroes." Some teachers give zeroes for work not turned in, but watch what happens. Say a student has gotten 99, 92, 97, 93, and 99 on five assignments; her average is 96. But for whatever reason, she fails to turn in a sixth assignment, and she is given a zero; her homework average plummets to 80. This makes a student who normally does A-level work look like a C student. Assessment expert Ken O'Connor suggests the following:
  - Work that is not submitted will be identified as I (incomplete.) Zeroes will not be used.
  - Students are expected to complete all required work and will be given opportunities to do so.
  - Late work may be penalized 2% per day, but no more than a maximum penalty of 10% will be enforced.

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<www.nctm.org/tips.aspx>

DEPARTMENT

TCTM Communications

The journal is sent to the address you indicated on your membership form or the address that was used when you registered for CAMT. Please update your mailing address if it is not correct. If you have an e-mail address, please be sure it is on file and up-to-date with TCTM. If you do not have an e-mail address, please let us know. You may update your information with the membership chair at *<cschneider@mail.utexas.edu>* or by phone at 512-475-9713.

DEPARTMENT

2008 CAMTerships Available

There are sixteen $500 CAMTerships available for 2008. The CAMTership is intended to encourage beginning teachers to attend CAMT by helping cover part of the expenses associated with attending the annual state conference. If you have been teaching five or fewer years in Texas and are attending CAMT, look for the CAMTership application online at *<www.tctmonline.net>*. **The application must be postmarked by April 25, 2008**. If selected, you will also volunteer two hours at CAMT and attend the TCTM Recognition Breakfast as a guest of TCTM.

Take a Look At The Data!

Each year, NCTM focuses attention on one of the Principles, Content Standards, or Process Standards that are identified in *Principles and Standards for School Mathematics*. To help in meeting your professional development needs on the topic, we offer activities at our conferences and provide useful resources online. For the 2007–08 school year, the Focus of the Year (FOY) is Data Analysis and Probability—"Becoming Certain about Uncertainty: Data Analysis and Probability" is the official theme.

References to data are all around us. Just think about the popular USA Today and the graphs that introduce each news section. Similarly, books, the Internet, and the television news supply data displays to hook us into watching, reading, analyzing, and perhaps wanting something. And so evaluating data and arriving at our own conclusions are becoming skills that we all use regularly to make sense of information and determine if there is truth in different claims or not.

The Data Analysis and Probability Standard is one of five Content Standards identified in Principles and Standards for grades prekindergarten–grade 12. Each Content Standard requires a different degree of emphasis, depending on grade level; however, charts, graphs, tables, and other data displays present a rich context for thinking about and using the mathematics learned in the other content areas—particularly number and operations and algebra. And probability has applications throughout the study of rational numbers and algebra.

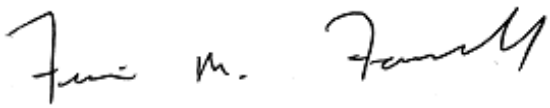
Given the tremendous amount of data swirling around us, the selection of the context and the development of specific data analysis tools to complement the mathematics learned in the classroom are important content-related considerations for the mathematics curriculum. Organizing data allows students regular use of the mathematics they are learning.

Here's an example of how analyzing data can help us discern what the facts tell us and what the truth is. Did you know that the data indicate that the average age of an NCTM member is 54 years? At least one NCTM staffer really dislikes my reference to this piece of information. Why? It is a classic example of "lying with statistics." This information doesn't reflect the fact that the majority of our members do not furnish their age on our annual survey. That notwithstanding, the analysis of the data is based on the information received and allows the current NCTM president to make the claim that there is great need for "emerging" (can I say "young"?) leaders in mathematics at the NCTM Affiliate and national levels.

Now here's an example of how an understanding of probability can affect our decision making: I once led a first-grade class discussion concerning five counters in a paper bag. There were four blue counters and one red counter. I asked a student to predict the color that might be selected from the bag. His response? Red. Why? Because red was his favorite color. No amount of modeling or discussing would change his mind. Could red have been selected—absolutely! Would such a selection have been likely? Nope. The lesson this activity reinforced was to consider the developmental and curricular appropriateness of all activities, especially those involving probability at the early childhood level.

Yes, we have to take a look the data. We collect, organize, and display such information. And I hope that the 2007–08 Focus of the Year activities will help us all as we assist students in gathering, analyzing, and interpreting data—in the news, on the Internet, and in life.

Sincerely,



Francis (Skip) Fennell
President

Editors Note: For more information see <*http://www.nctm.org/2007_09president.aspx*>

TEA Talks

Hot News

For additional information, refer to the websites listed

Curriculum Updates

- **2007-2008 Mathematics Requirements**
  This year's high school seniors are the first class graduating under the required Recommended HS Plan, which includes Algebra I, Geometry, and Algebra II.

  This year's entering high school freshmen are the first class graduating under the required 4 X 4 Recommended HS Plan, which includes Algebra I, Geometry, Algebra II, and a 4th math credit. This 4th math credit can be Mathematical Models with Applications (MMA) if it is taken before Algebra II.

  This year's eighth graders is the first 8th grade class affected by SSI grade advancement requirements. The first administration of the TAKS Grade 5 and 8 Math Tests will be April 8, 2008.

  This year's fifth graders are the first class to have End of Course (EOC) graduation requirements when they enter high school in 2011-2012.

  For more information on the newly adopted 4 X 4 Graduation Requirements, there is a FAQ document posted on TEA Curriculum website at

  <www.tea.state.tx.us/curriculum/fourbyfour.html>

- **Texas Adolescent Literacy Academies (TALA)**
  The 80th Texas Legislature passed House Bill 2237, Section 4 with the goal of increasing academic literacy among middle school students by providing research-based professional development to middle school teachers in grades 6-8.

  There will be an English Language Arts Academy and Content Area Academy for teachers of mathematics, science, and social studies. The English Language Arts (ELA) Academy is designed to meet the needs of secondary-level ELA and reading teachers and will consist of three days of face-to-face training with a one-day online practicum follow-up to be submitted between September and December of the same year. A $500 stipend and 24 Continuing Professional Education credits will be awarded for completion of the ELA Academy.

  The content Area Academy for Mathematics, Science, and Social Studies Teachers will consist of one-and-a-half days of face-to-face training and one half-day online practicum follow-up to be submitted between September and December of the same year. A $250 stipend and 12 Continuing Professional Education credits will be awarded for completion of the Mathematics Academy.

  Eligible educators that teach in a campus labeled Academically Unacceptable (AU) are required by House Bill 2237 to attend an academy. Grade 6 teachers on campuses that are rated AU as of the final accountability rating on November 1, 2007 will attend the academies in summer 2008. Teachers in grades 7-8 on campuses that are rated AU as of November 1, 2008 will participate in the academies in summer 2009. For more information, please visit *<www.tea.state.tx.us/tala>*

- **Mathematics Instructional Coaches Pilot Program**
  This pilot program was established in House Bill 2237, §21.4541 by the 80th Texas Legislature. Districts or campuses are eligible to participate if they have exhibited characteristics that strongly correlate with high dropout rates during each of the three preceding school years (§39.358). Eligible school districts may receive grants to develop the content knowledge and instructional expertise of secondary mathematics teachers. This pilot will implement a two-stage process:

  In Stage 1, a Request for Qualifications (RFQ) will be released to identify entities wishing to provide coaching services and related professional development activities to eligible districts. TEA will review the credentials and experience of respondents and create a list of Approved Service Providers eligible to provide services to districts participating in the pilot program. As established in statute, service provider coaching and professional development activities may include the following: 1) classes to teachers on effective mathematics instruction; 2) providing tutoring or mentoring to teachers regarding effective mathematics instruction; 3) providing incentives to teachers to participate in the program; 4) engaging in other activities likely to improve mathematics instruction.

  Eligible service providers may include: Texas Science, Technology, Engineering, and Mathematics (T-STEM) academies and centers; regional education service centers; institutions of higher education; or private organizations. The RFQ will identify highly qualified service providers who can demonstrate significant past effectiveness in improving math instruction and demonstrate prior success working with students identified as at risk of dropping out of school

  In Stage 2: a Request for Applications (RFA) will be released in early spring of 2008. Eligible districts/campuses will apply for grant funds to participate in the pilot program. Grant recipients will then select a provider from the list generated in response to the RFQ process and negotiate a contract with the provider directly. Interested parties should contact Chris Caesar, Program Manager, Texas High School Project, Texas Education Agency at (512) 936-6434 or *<Chris.Caesar@tea.state.tx.us>*

For more information on recently passed legislation, the 80 (R) Session Legislative Briefing Book can be found at

<www.tea.state.tx.us/comm/leg_reports/LegBreBooJul07.pdf>

- **Texas Math Diagnostic System (TMDS)**
  New items aligned to TEKS are currently being developed through a two-phase review process. During the first phase, an online review was done by educators across state. In the second phase, educators are brought to Austin for a face-to-face review of items. The first in-person educator committee review was held in Austin Sept 10 -12, 2007. A second in person review will be held in Austin in late October, early November, 2007. As a result of these reviews, existing items will be removed from databank. The first half of the new items will be placed in databank by November 2007. TEA is looking for educators to review items in the following grade bands: 3-5, 6-8, Geometry, Algebra I and Algebra II. Educators interested in reviewing TMDS items should contact Erika Pierce at Erika.pierce@tea.state.tx.us with the subject line: TMDS Review.

  As a result of requests by many districts in the TMDS/TSDS user community, the systems will no longer accept student social security number or student PEIMS ID number but will instead use local (district-generated) student ID numbers. You can refer TMDS user ID # questions to the Vantage Help Desk at (800) 322-0848.

- **Proclamation 2005:**
  Elementary Mathematics Instructional Materials were fully funded. As a result, 2007-2008 is the adoption year for K-5 mathematics textbooks. In November 2007, the State Board of Education SBOE is scheduled to vote on the list of conforming and nonconforming textbooks.

- **Regional Collaboratives for Excellence in Teaching Math**
  TEA, in partnership with the UT Austin office of Texas Regional Collaboratives for Excellence in Mathematics, has issued 22 Math Collaborative grant awards for 2007-2008. The purpose of these grants is to improve the academic achievement of students in mathematics by providing high quality, sustained, and high intensity professional development focused on the education of mathematics teachers as a career-long process. These 22 Regional Collaboratives for Excellence in Teaching Math are housed at each of the 20 Education Service Centers, Our Lady of the Lake University in San Antonio (Karen Harrower, Director), and University of Texas – Tyler (John Lamb, Director).

  For more information regarding the Math Collaboratives and 2007-2008 Math Collaborative Awardees:

  <www.theTRC.org>

- **Texas English Language Proficiency Assessment System (TELPAS)**
  Who is impacted by TELPAS writing?

  A TELPAS writing collection must be submitted for every LEP student in grades 2 through 12, in the state of Texas. These collections are rated by trained and qualified TELPAS raters. These ratings are submitted to the state for federal accountability purposes. Any teacher who teaches a LEP student in an academic content area may be required (by local decision) to submit appropriate samples of student writing for the LEP students they serve.

  The requirements for TELPAS samples are as follows. At least 5 total samples are required in each collection. In each collection there must be at least 1 narrative about a past event and at least 2 writing samples from math, science, or social studies.

  TELPAS writing samples should be taken from authentic classroom activities. The writing samples should show the ability of students to connect ideas and express themselves in English in an extended way. Brief writing samples should not be placed in the collections of students who are capable of writing in an extended, connected way in English. Following are suggestions for focused writing assignments in math class: 1) explanations of problem solving steps; 2) student created word problems; 3) comparisons between mathematical processes; 4) application of mathematical processes; 4) mathematical journal writing.

  Verifiers of TELPAS writing collections are designated by local decision. All writing collections must be verified by a trained TELPAS writing collection verifier. Questions about how, and to whom writing samples must be submitted should be directed to your campus testing coordinators. Writing assigned on or after February 1, 2008, may be considered. Writing samples may continue to be gathered until the date designated by the district to assign the ratings.

  For more information, go to *<www.tea.state.tx.us/student.assessment>* ; and click on ELL Assessment Information. Or email questions to *<ELL.tests@tea.state.tx.us>*.

- **Stay Informed**
  To keep informed of updates from the Texas Education Agency, please join the Mathematics Listserv at

  <miller.tea.state.tx.us/lists/>

Mathematics in Texas
How are we doing?

- **National Assessment of Educational Progress (NAEP)**
  On the 2007 National Assessment of Educational Progress (NAEP) mathematics exams, Texas students outperformed the national average on the fourth and eighth grade math exams. And, when the scores are examined by ethnic groups, Texas students in all major groups outpaced students in the same student groups across the country on both the NAEP mathematics and reading tests at both grade levels.

The NAEP is known as the nation's report card because it is the only assessment test given to students of all academic levels in all states. Today's results are based on the performance of over 675,000 fourth and eighth-grade students across the country. There are four achievement levels: below basic, basic, proficient and advanced.

"The NAEP scores validate the progress we have seen on our state tests and validate what Texas educators are doing. Texas stacks up very well when the scores of individual student groups are compared nationally," interim Commissioner of Education Robert Scott.

- **SAT**
  SAT College Entrance Exam: SAT scores for math rise on math tests

- **Advanced Placement**
  Advanced Placement Exam (AP): Minority Students represent more than half of Texas Advanced Placement Test Takers in 2007

For further information on NAEP, SAT, and AP results, you can access the TEA press releases at:

<www.tea.state.tx.us/comm/page1.html >

Assessment Updates

- **TAKS Information Booklets**
  Revised TAKS Information Booklets for grades 3-5 based on the refined TEKS will be posted to the TEA website later this fall.

- **TAKS Study Guides**
  Revised TAKS Study Guides for grades 6-11 based on the refined TEKS will be sent to districts in spring 2008.

- **Student Success Initiative (SSI)**
  The goal of the SSI is to ensure that all students receive the instruction and support they need to be academically successful in mathematics and reading. Grade 3 students are subject to all SSI requirements for reading. Grade 5 students are subject to all SSI requirements for both math and reading. Beginning in spring 2008, grade 8 students will be subject to all SSI requirements for both math and reading. The Grade Placement Committee Manual is currently being updated and will be sent to districts and posted to the TEA website in the coming weeks.

  The first administration of the TAKS GRADE 5 AND 8 MATH TESTS will be April 8, 2008 with a report date of April 25, 2008. The second administration will occur on May 13, 2008 with a report date of June 2, 2008. The third administration will be July 1, 2008 with a report date of July 18, 2008.

- **TAKS Exit Level Retests**
  These tests will be offered both on paper and online in October, March, April, and July. Districts may choose to place individual students in any combination of paper and online testing that best meets the needs of the student and the district. The online TAKS exit level tests must be administered on the same scheduled day as the paper test.

- **End-of-Course Assessments**
  The optional EOC assessments for Algebra I, geometry, and biology will be offered to students completing the specified coursework in the spring semester. These tests will be offered only online during the three-week period of May 12-30, 2008.

  In addition to the optional operational tests, selected districts will be required to participate in EOC chemistry and U.S. history online field tests. Districts were notified of their participation in the field-test letter dated August 20, 2007. The field-test window is May 5-23, 2008.

- **TAKS-M**
  Information concerning TAKS-M can be found at:

  <www.tea.state.tx.us/student.assessment/resources/taksm/index.html>

- **TAKS-Alt**
  Information concerning TAKS-Alt can be found at:

  <www.tea.state.tx.us/student.assessment/resources/taksalt.index.html>

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TAKS Assessment Team • Texas Education Agency

CAMT 2008

Steering Mathematics Towards Excellence July 9 – 11, 2008

CAMT 2008 will be held July 9-11, 2008, at the Adam's Mark Hotel in Dallas, Texas. The Program Co-chairs are Linda Shaub of the Charles A. Dana Center and Mary Valamides of Eagle Mountain-Saginaw ISD. Program information will be available online next spring (probably May 1) at:

<www.camtonline.org>

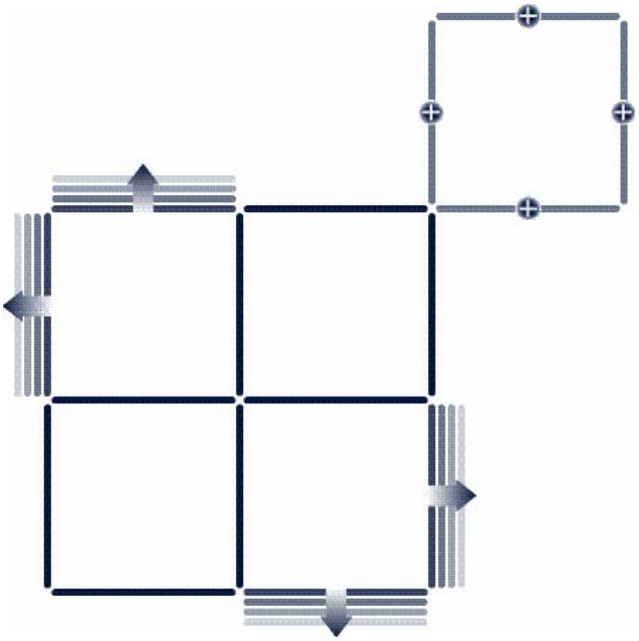
Many favorite speakers such as Kim Sutton, Mary Alice Hatchett, Marcy Cook, and many others are returning in 2008. Math-A-Rama and STEPS will be three half days each. We will be using an online registration process. Look for information via your email.

Puzzle Corner

Sticks #9 Answer

Arrange 12 craft sticks to form the original gure. Remove four sticks to form three squares.

Shown is a diagram of a solution.

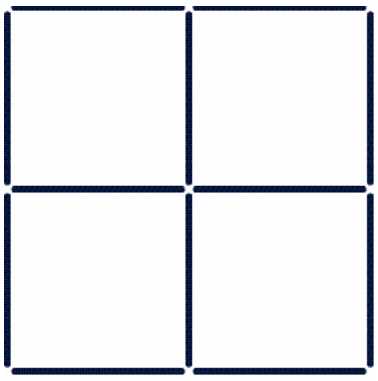


Sticks #10 Puzzle

We are interested in how your students responded to this problem and how they explained or justi ed their reasoning. Please e-mail copies of your students' work, include your name, grade level, campus name and district name to Mary Alice Hatchett, Director of Publications, *Texas Mathematics Teacher*. Selected submissions will be acknowledged and published in subsequent issues.

Please prepare a sketch of your solution

Arrange 12 craft sticks to form the following gure.



Add four sticks to make ve more squares.

Classroom Census Activities

Teachers are always looking for ways in which connections between real world data and mathematics can be developed. Census data provide rich sources of problem settings in which data can be explored and analyzed, especially at the middle school level. These activities involve a number of basic arithmetic processes, including addition, subtraction, computation of percents, rank ordering of data, and the computation of means and medians. These critically important topics can be performed with pencil and paper or with the use of a calculator, according to the teacher's goals for a specific class. It is more meaningful to students when arithmetic processes can be employed in a real world setting.

A census is an official count of a population carried out at set intervals of time. Table 1, located on the following page, reports census data for the fifty states and the District of Columbia. This information can be found in various almanacs for appropriate years. In addition, the history of the U.S. Census Bureau may be found at *<www.census.gov/acsd/www/history.html>*.

The activities of this article are related to TEKS 7.3A, 7.12B, 7.11A, 7.11B, and 8.12A and when using a spreadsheet, some of the Technology TEKS.

The following questions are for small group discussions in your mathematics class. In all of these, the term "state" refers to the 50 states and the District of Columbia.

1. Provide the class with the data of only the first three columns of Table 1. Have the students calculate the entries for columns 4 and 5. Or have students transfer the data in columns 1-3 into a table by linking graphing calculators. Then have students write a rule to generate the data in columns 4 and 5.

Solution:
For instance, for Alabama, the change in population from 1990 to 2000 is: 4,447,100 – 4,040,587 or 406,513. The percent change is 406,513 ÷ 4,040,587 or 10.06%.

Teacher Note: *In one instance (District of Columbia) the population declined from 1990 to 2000, thus leading to the use of negative numbers.*

2. Rank order each of columns 2 through 5. This can be done "by hand" or by using Excel or a graphing calculator. Have students choose a state. Where is this state in each of these rank orderings? What is the significance of its position in each of these orderings? Write a paragraph to analyze each rank ordering and your selected state's position.

3. Compare the rank orderings of column 2 and column 3, the 1990 and 2000 populations. Which states ranked higher and which states ranked lower? Which state made the largest "gain in rank" and which suffered the largest "loss in rank"?

4. Consider the 2000 census (column 3), expressed in rank order. How many of the states at the lower end of the ranking are needed so that their populations total more than the population of Texas?

Solution:
The bottom 18 states are needed.

5. Consider the 2000 census (column 3), expressed in rank order. How many of the states at the lower end of the ranking are needed so that their populations total more than the population of California?

Solution:
The bottom 23 states are needed.

6. Consider column 4, the population change, expressed in rank order. How many states at the lower end of the ranking are needed so that their net population growth total more than the California population growth?

Solution:
The lower 26 states are needed to exceed California's growth; this includes the negative growth for DC.

Teacher Note: *Answers in complete sentences blend language and mathematics and should always be encouraged.*

State	1990 Census	2000 Census	Change in Population	Percent (%) Change in Population
AL	4,040,587	4,447,100	406,513	10.06
AK	550,043	626,932	76,889	13.98
AZ	3,665,228	5,130,632	1,465,404	39.98
AR	2,350,725	2,673,400	322,675	13.73
CA	29,760,021	33,871,648	4,111,627	13.82
CO	3,294,394	4,301,261	1,006,867	30.56
CT	3,287,116	3,405,565	118,449	3.60
DE	666,168	783,600	117,432	17.63
DC	606,900	572,059	-34,841	-5.74
FL	12,937,926	15,982,378	3,044,452	23.53
GA	6,478,216	8,186,453	1,708,237	26.37
HI	1,108,229	1,211,537	103,308	9.32
ID	1,006,749	1,293,953	287,204	28.53
IL	11,430,602	12,419,293	988,691	8.65
IN	5,544,159	6,080,485	536,326	9.67
IA	2,776,755	2,926,324	149,569	5.39
KS	2,477,574	2,688,418	210,844	8.51
KY	3,685,296	4,041,769	356,473	9.67
LA	4,219,973	4,468,976	249,003	5.90
ME	1,227,928	1,274,923	46,995	3.83
MD	4,781,468	5,296,486	515,018	10.77
MA	6,016,425	6,349,097	332,672	5.53
MI	9,295,297	9,938,444	643,147	6.92
MN	4,375,099	4,919,479	544,380	12.44
MS	2,573,216	2,844,658	271,442	10.55
MO	5,117,073	5,595,211	478,138	9.34
MT	799,065	902,195	103,130	12.91
NE	1,578,385	1,711,263	132,878	8.42
NV	1,201,833	1,998,257	796,424	66.27
NH	1,109,252	1,235,786	126,534	11.41
NJ	7,730,188	8,414,350	684,162	8.85
NM	1,515,069	1,819,046	303,977	20.06
NY	17,990,455	18,976,457	986,002	5.48
NC	6,628,637	8,049,313	1,420,676	21.43
ND	638,800	642,200	3,400	0.53
OH	10,847,115	11,353,140	506,025	4.67
OK	3,145,585	3,450,654	305,069	9.70
OR	2,842,321	3,421,399	579,078	20.37
PA	11,881,643	12,281,054	399,411	3.36
RI	1,003,464	1,048,319	44,855	4.47
SC	3,486,703	4,012,012	525,309	15.07
SD	694,004	754,844	60,840	8.77
TN	4,877,185	5,689,283	812,098	16.65
TX	16,986,510	20,851,820	3,865,310	22.76
UT	1,722,850	2,233,169	510,319	29.62
VT	562,758	608,827	46,069	8.19
VA	6,187,358	7,078,515	891,157	14.40
WA	4,866,692	5,894,121	1,027,429	21.11
WV	1,793,477	1,808,344	14,867	0.83
WI	4,891,769	5,363,675	471,906	9.65
WY	453,580	493,782	40,202	8.86

Table 1

The full table is available for electronic downloading under the Members Only tab at <*www.tctmonline.net*>

7. Consider the 2000 population (in column 3), again expressed in rank order. How many states at the lowest end of the ranking (starting with the least populous) are needed so that their populations total more than California's ten-year growth of 4,111,627?

Solution:
Seven states are needed. In other words, California gained approximately as many people as live in all seven of the least populous states.

8. California and Texas rank in population, respectively, as states 1 and 2 in the 2000 Census. How many of the least populated states are needed to account for the difference between the two?

Solution:
The difference is more than the sum of the populations of the 13 least populous states, and only slightly less than the sum of the smallest 14. In other words, the addition of 13 small states would still not enable Texas to pass California.

9. Consider the 2000 population (column 3). What are the mean and median for this set of 51 numbers?

Solution:
The mean is 5,518,077; the state which is nearest to this average in population is Missouri. The median is 4,012,012, the population of the middle or 26th state, namely South Carolina.

Teacher Note: *The teacher should discuss what types of data would lead to the mean being larger than the median. Which measure, mean or median, best describes the typical state in your students' judgment?*

10. Consider the 2000 population (column 3). What is the smallest number of states needed so that their populations sum to more than one-half the total U.S. population of 281,421,906?

Solution:
Nine states are needed. These states – California, Texas, New York, Florida, Illinois, Pennsylvania, Ohio, Michigan, and New Jersey – together contain more than one-half of all the U.S. population.

11. If you rank order the change in population (column 4) and the percent change in population (column 5), what difference will you see?

Solution:
The top five changes in population are in California, Texas, Florida, Georgia and Arizona. The top five percent changes occurred in Nevada, Arizona, Colorado, Utah and Idaho.

Teacher Note: *Only one state, Arizona, made both "top fives". Have your students describe why this occurred. Will your students predict that these rank orderings will be nearly the same?*

12. Locate the ten fastest growing states on a map, using either column 4 or column 5 as your criterion. In which parts of the nation are they located? How can you explain this pattern?

Teacher Note: *The reader and his/her class are challenged to find other patterns and questions from Table 1 and to determine other real world statistical situations and questions. For example, what does the census have to do with congressional apportionment?*

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FEATURE

Recommended Readings and Resources

Count Down : *Six Kids Vie for Glory at the World's Toughest Math Competition*

Count Down : *Six Kids Vie for Glory at the World's Toughest Math Competition* by Steve Olson ISBN 0-618-25141-3

Count Down is the story of six students who compete for a place on the 2001 U.S. Math Olympiad Team and what happens once they get to the big contest. The big contest being the International Mathematical Olympiad, in which high school level students from around the world gather together to solve difficult math problems. How difficult you ask? The first problem they are given reads: "In acute triangle ABC with circumcenter O and altitude AP, angle C is greater than or equal to angle B plus 30 degrees. Prove that angle A plus angle COP is less than 90 degrees." This is the easiest of the six questions the Math Olympians must solve.

Olson devotes one chapter to each member of the U.S. team and his approach to a problem (2001 was an all male team). Olson goes beyond the Olympiad, to discuss topics such as (1) math education in the U.S., (2) the nature of genius, (3) are boys more genetically talented at math than girls, and (4) can the creative abilities of these 6 competitors be taught to others.

If you enjoy math, this is a recommended read. If you don't enjoy math, this is a must read: it will help show why mathematical skill is not merely nice but is essential.

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Census Worksheet

A census is an official count of a population carried out at set intervals of time. Table 1 reports census data for the fifty states and the District of Columbia. This information can be found in various almanacs for appropriate years. In addition, the history of the U.S. Census Bureau may be found at *<www.census.gov/acsd/www/history.html>*.

The following questions are for small group discussions in your mathematics class. In all of these, the term "state" refers to the 50 states and the District of Columbia.

1. Given the 1990 and 2000 census for each state, compute the change in population and the percent change in population.

2. Rank order these four columns: 1990 census, 2000 census, change in population, and percent change in population. Choose a state. Where is this state in each of these rank orderings? What is the significance of its position in each of these orderings? Write a paragraph to analyze each rank ordering and your selected state's position.

3. Compare the rank orderings of column 2 and column 3, the 1990 and 2000 populations. Which states ranked higher and which states ranked lower? Which state made the largest "gain in rank" and which suffered the largest "loss in rank"?

4. Consider the 2000 census (column 3), expressed in rank order. How many of the states at the lower end of the ranking are needed so that their populations total more than the population of Texas?

5. Consider the 2000 census (column 3), expressed in rank order. How many of the states at the lower end of the ranking are needed so that their populations total more than the population of California?

6. Consider column 4, the population change, expressed in rank order. How many states at the lower end of the ranking are needed so that their net population growth total more than the California population growth?

7. Consider the 2000 population (in column 3), again expressed in rank order. How many states at the lowest end of the ranking (starting with the least populous) are needed so that their populations total more than California's ten-year growth of 4,111,627?

8. California and Texas rank in population, respectively, as states 1 and 2 in the 2000 Census. How many of the least populated states are needed to account for the difference between the two?

9. Consider the 2000 population (column 3). What are the mean and median for this set of 51 numbers?

10. Consider the 2000 population (column 3). What is the smallest number of states needed so that their populations sum to more than one-half the total U.S. population of 281,421,906?

11. If you rank order the change in population (column 4) and the percent change in population (column 5), what difference will you see?

12. Locate the ten fastest growing states on a map, using either column 4 or column 5 as your criterion. In which parts of the nation are they located? How can you explain this pattern?

Legislative Update and Advocacy

News from the September 2007 State Board of Education Meeting

At the September State Board of Education meeting information on college readiness standards was shared. The following information was taken verbatim from the TEA website entering at <*www.tea.state.tx.us/sboe/mtg_mat_current.html*> (accessed 10/10/07).

> "House Bill 1, passed by the 79th Texas Legislature, Third Called Session, requires the development of college readiness standards. Vertical teams composed of higher education and public education representatives in each subject area have been working on the standards since February 2007 in an effort to fulfill this legislative requirement. The primary purpose of the vertical team is to recommend college readiness standards and expectations that address what students must know and be able to do to succeed in entry-level courses offered at institutions of higher education. The college readiness standards are scheduled for adoption by the Texas Higher Education Coordinating Board (THECB) and for approval by the Commissioner of Education in January 2008. Subsequently, the SBOE would incorporate the college readiness standards into the Texas Essential Knowledge and Skills (TEKS), as appropriate, in the areas of English language arts/reading, mathematics, science, and social studies."

The standards from these vertical teams have yet to be released at the time this journal went to press.

> "The Commission for a College Ready Texas (CCRT) is appointed by the governor, and is an advisory council whose goal is to provide a forum for diverse stakeholders to share their views on college-readiness, to facilitate the work of the vertical teams, and to provide research and general support to the vertical teams, the State Board of Education, and Higher Education Coordinating Board as they fulfill the requirements of House Bill 1. State Board of Education (SBOE) member Barbara Cargill is a member of the CCRT and [she] present[ed] this item with Commission member Dean Nafziger and Chris Patterson, a consultant for the Commission. Eric Rolfhus, Senior Researcher of Edvance Research, Inc. and REL Southwest [was] invited to present public testimony."

Information from Edvance on college readiness standards was not generally available on their website <*www.edvanceresearch.com/*> at the time this journal went to press.

Look for more information on these upcoming standards, especially as it relates to our high schools and the TEKS.

Following are excerpts from the agenda for the Texas Higher Education Coordinating Board meeting on October 25, 2007, item V-B, found at <*www.thecb.state.tx.us/GeneralPubs/Agenda/Ag2007_10/VB/default.htm*> (accessed 10/12/07).

> "According to legislation adopted by the 80th Texas Legislature, the College Readiness Standards (CRS) will be used as the basis of the college readiness portion of high school end of course examinations."
>
> "Once the CRS are adopted by the Board and approved by the Commissioner of Education in January 2008, they will be validated for use in institutions of higher education through a process facilitated by the Educational Policy Improvement Center (EPIC). Additionally, they will be used to evaluate and align public education and higher education curricula, to develop instructional strategies that support their implementation in Texas public schools, and to create professional development materials and online support materials for students who need assistance in meeting the CRS (Texas Education Code, Section 28.008)."
>
> "Board staff will disseminate the CRS for public comment. At the end of the public comment period, the statewide vertical teams will determine if revisions are necessary and submit a final version of the CRS for Board approval at its January 2008 meeting. At that time, the recommendation will be that, upon completion of the validation process, the CRS be used to determine Texas Success Initiative (TSI) assessment cutoff scores for first-time students entering higher education in 2012."

Below are excerpts from TEA Correspondence by Sharon Jackson, Deputy Associate Commissioner Standards and Alignment, to school administrators on September 27, 2007, <*www.tea.state.tx.us/taa/stanalign092707.html*> (accessed 10/12/07).

> "House Bill 3826 - Adds the requirement that students complete the recommended high school or distinguished diploma program, or its equivalent, to be considered for admissions to any general academic teaching institution, including those with open enrollment policies. Since passage of this legislation, the Texas Higher Education Coordinating Board (THECB) has adopted emergency rules to permit general academic institutions to continue admitting students who would not qualify for admissions under the new requirements until August 31, 2009."
>
> "House Bill 3851 - Gives authority to the THECB for computing students' high school grade point average (GPA) for purposes of determining eligibility for admission."

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TCTM Government Relations Representative

FEATURE

Affiliate News

- In June and July 2007, several affiliate leaders from Texas attended NCTM's Affiliate Services Committee Leaders Conference. The purpose of the conference was to support leaders in their roles in their affiliates, to provide opportunities for networking across affiliates, and to provide local leaders a chance to learn and discuss important issues with NCTM leadership. At the June conference in Salt Lake City, both Texas and Coastal Councils of Teachers of Mathematics were represented by Cynthia L. Schneider and Elaine Young, respectively. At the July conference, Texas and Rio Grande Valley Councils of Teachers of Mathematics were represented.

From left to right: Jim Rubillo, NCTM Executive Director; Nancy Trapp, Rio Grande Valley CTM and Texas CTM; Cynthia L. Schneider, Affiliate Services Committee and Texas CTM; Francis (Skip) Fennel, NCTM President; Amy Gaskins, Texas CTM; and Scott Fay, Texas CTM.

- **Representation at Work**
  Texas CTM's Resolution proposed during the Southern Caucus and taken to the 2007 Delegate Assembly was approved by the NCTM Board at their July meeting. Future Affiliates may now join NCTM's Leadership Circle based on tiered criteria.

DEPARTMENT

2008-09 TCTM Mathematics Scholarship

There are ten $2000 scholarships available for 2008-09. Any student attending a Texas collage or university - public or private - and who plans on student teaching during the 2008-09 school year in order to pursue teacher certification at the elementary, middle or secondary level with a specialization or teaching field in mathematics is eligible to apply. A GPA of 3.0 overall and 3.25 in all courses that apply to the degree (or certification) is required. Look for the scholarship application online at *<www.tctmonline.net>*. **The application must be postmarked by April 25, 2008.** ■

FEATURE

NCTM Membership

What's an easy way to support TCTM?
Join or renew your NCTM membership by using the TCTM membership form *<www.tctmonline.net>* and TCTM will receive a $5.00 rebate from NCTM. It's as easy as that.

About this Publication

Since 1971, the Texas Council of Teachers of Mathematics (TCTM) has produced the journal *Texas Mathematics Teacher* for our members. Our mission is to promote mathematics education in Texas. In the journal we accomplish this by publishing peer-reviewed articles by leading authors, state updates from the Texas Education Agency, and local news from around the state. TCTM is committed to improving mathematics instruction at all levels. We place an emphasis on classroom activities that are aligned to the Texas Essential Knowledge and Skills and the NCTM *Principles and Standards for School Mathematics.*

The *Texas Mathematics Teacher* seeks articles on issues of interest to mathematics educators, especially K-12 classroom teachers in Texas. All readers are encouraged to contribute articles and opinions for any section of the journal. Teachers are encouraged to submit articles for Voices From the Classroom, including inspirational stories, exemplary lessons, or management tools. More specific guidelines for submissions may be found on page 3.

In 2004-05, our publication took on a new look with a four-color cover and one-color interior. Original artwork on the cover is another appealing change for our readers. We publish the journal twice each school year, in the fall and spring semesters. Next year, we plan to provide our publication in a web-based format as well as print. You will be given the option to decide if you wish to continue to receive the print version or not. Our current website archives the more recent journals in PDF format, please see

<www.tctmonline.net>

if you wish to view prior issues.

Our current publications committee consists of Cynthia Schneider, Mary Alice Hatchett, Geoffrey Potter, Larry Lesser and James Epperson. Larry and James serve as expert advisors; Cynthia is the editor. Mary Alice does many jobs, including requesting articles, serving as an elementary expert, and communicating with authors. Geoff is the layout and graphic designer; he manages to fit all the text into the limited number of pages we have to work with. The TCTM Board wishes to thank them for their leadership in improving the *Texas Mathematics Teacher*.

The Publications Committee wishes to acknowledge the contributions - time, effort, and expertise - that our volunteer reviewers make to our final journal. Those that reviewed for the journal and deserve our thanks for their support last year, in 2006-07, were:

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Advertising Guidelines for the Texas Mathematics Teacher

All advertising is subject to the approval of the publisher. The journal staff shall be responsible for ascertaining the acceptability of advertisements. All advertisements should be sent "copy-ready" by the closing dates of September 1 for the fall issue and January 15 for the spring issue. Position preference, such as right-hand pages or first half of issue will be honored on a first-come basis. All advertisements must be pre-paid by the closing date with a check made payable to TCTM, and mailed to our current treasurer, Kathy Hale. Rates for the *Texas Mathematics Teacher* per issue are: full page $500.00, half page $250.00, quarter page $125.00.

All advertisers must adhere to the following guidelines:

- Advertisements should focus on marketing products and services that pertain to the teaching and learning of mathematics.
- The design of all advertisements should be in harmony with the artistic appearance and technical level of the publication.
- Those placing an advertisement must be able to verify their claims.
- Advertising copy should be dignified and professional. Derogatory and inflammatory statements should be avoided, and all advertising copy should be nondiscriminatory with regard to national origin, gender, marital status, race, or creed.
- The journal staff shall be responsible for placement in the publication.

Advertising that elicits significant reader complaints will not be rerun until the complaints have been investigated by the journal staff and the advertiser.

FEATURE

New Fourth-Year Mathematics Course for Texas

Charles A. Dana Center at The University of Texas at Austin and Texas Association of Supervisors of Mathematics seek your feedback on new fourth-year mathematics course for Texas

In recent years, many educators and others have recognized the need for an additional—and nonremedial—path through high school mathematics as an alternative to the precalculus/calculus path. With Texas moving to a four-year mathematics requirement for high school, this need has risen to a new level of urgency.

Schools are struggling to find options for all students, especially for those students who may not be headed toward a career in science, technology, engineering, or mathematics (STEM) fields. In designing options for all students, balancing rigor, relevance, and accessibility of mathematics content has become increasingly challenging and increasingly necessary.

The Charles A. Dana Center at The University of Texas at Austin, in cooperation with the Texas Association of Supervisors of Mathematics (TASM), has received a grant from the Greater Texas Foundation to develop a mathematics course that would follow Algebra II and Geometry and could fulfill this need.

During the 2007–2008 school year, a working group of about 25 educators—from Texas and the nation, representing high school and postsecondary mathematics, and recruited and coordinated by the Dana Center and TASM—will create a course description and student expectations for a course called Advanced Quantitative Decision-Making. The course is intended to be available for implementation in the 2009–2010 school year.

The working group will also develop a basic set of online instructional resources. Ideally, commercial publishers and others will create more comprehensive instructional materials as the course is being developed. The Dana Center and TASM will also seek funding for extensive professional development and teacher support for implementing the new course.

During this year of development, the Dana Center and TASM will seek your ideas on the fourth-year mathematics course during two intensive feedback periods. During the first period, we will coordinate focus groups and other outreach activities **September through November 2007, to collect feedback on an elaborated description of the new fourth-year mathematics course.**

As the working group develops more specific student expectations in December, we will work from **January through April 2008 to seek feedback on the draft student expectations.** Ideally, these expectations will be in a form that could eventually become TEKS for the course if adopted by the State Board of Education.

This development year provides a great opportunity for local communities to convene prekindergarten–16 groups around identifying the mathematics that students need as they leave high school. In particular, this course can be a focus of discussion and collaboration between high school mathematics teachers and those who teach mathematics at the two- or four-year college level.

The Dana Center and TASM welcome your input and encourage you to participate in development of this course. Consider convening focus groups or hosting discussion sessions around this course. Throughout the 2007–2008 school year, you can keep up with how the development is progressing, access the current discussion draft, and submit your feedback by accessing this website:

<www.utdanacenter.org/aqd>

FEATURE

2007 Scholarship Donors

The Texas Council of Teachers of Mathematics recognizes the contribution to our college scholarship fund for 2007-08 from the Texas High School Project (THSP) and the Communities Foundation of Texas. THSP is dedicated to ensuring that all Texas students graduate high school ready for college and career success and to be contributing members of the community. THSP is a public-private alliance that includes the Texas Education Agency, Office of the Governor, Texas Legislature, Bill & Melinda Gates Foundation, Michael & Susan Dell Foundation, and others.

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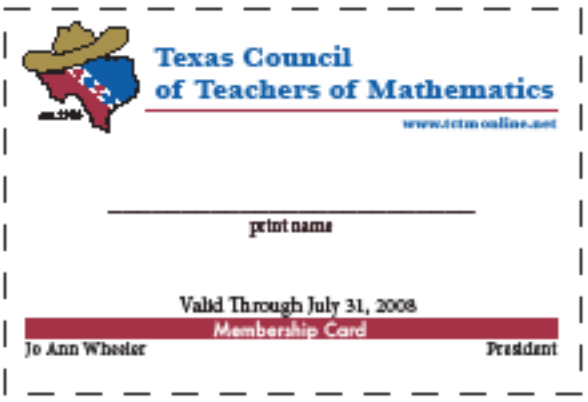

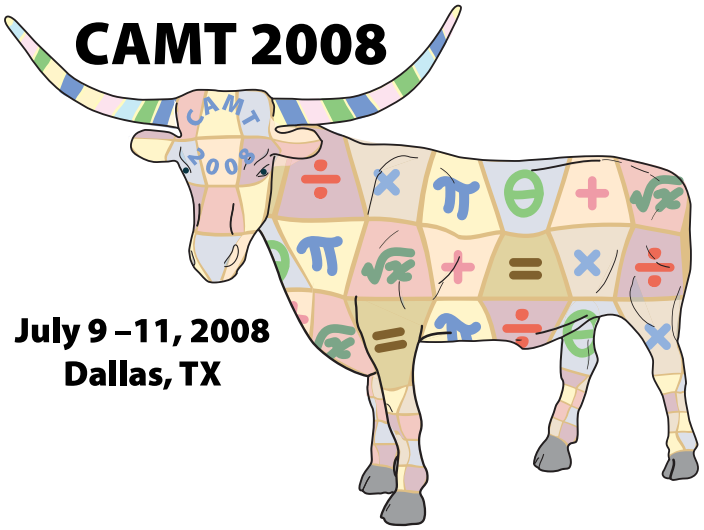

Steering Mathematics Towards Excellence

CAMT 2008 will be held July 9-11, 2008, at the Adam's Mark Hotel in Dallas, Texas. See inside for more details, or visit the website at <*www.camtonline.org*>

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