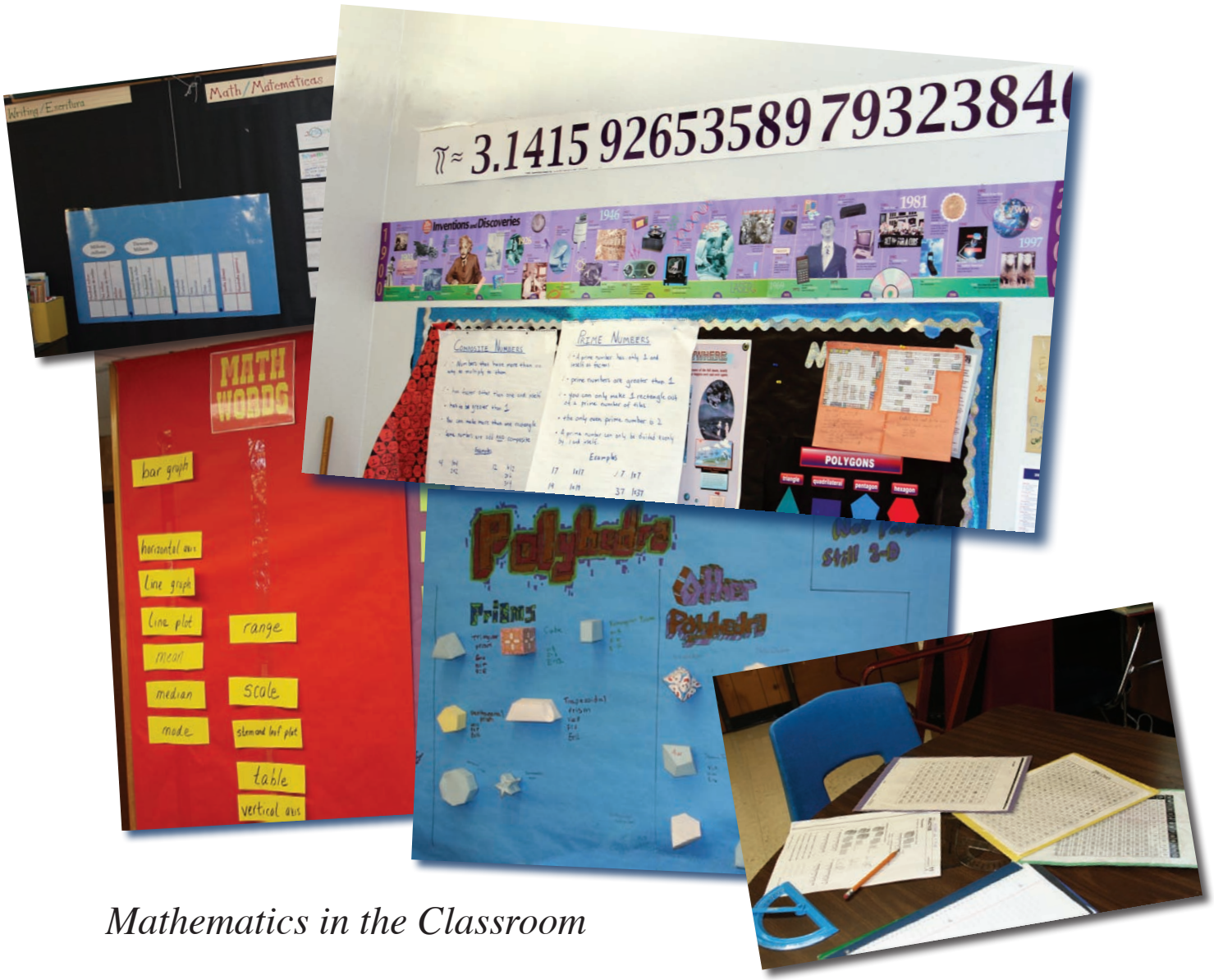
Texas Mathematics Teacher

Volume LV Issue 2 Fall 2008



Mathematics in the Classroom

Check the Back Cover
for your membership card

2008 Awards!
see page 6

CAMT 2009!
see page 19

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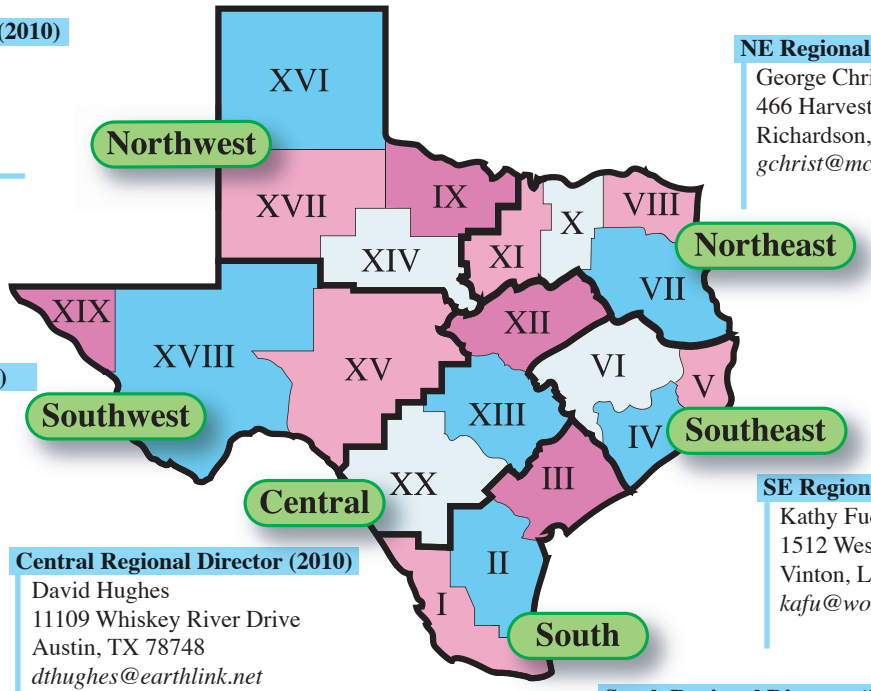

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Texas Mathematics Teacher

A PUBLICATION OF THE TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

Volume LV Issue 2 **Fall 2008**

Articles

Features

Departments

TCTM Applications

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

Texas Mathematics Teacher (ISSN# 0277-030X), the official journal of the Texas Council of Teachers of Mathematics (TCTM), is published in the fall and spring. Editorial correspondence should be mailed or e-mailed to the editor.

This journal is funded by the Texas Council of Teachers of Mathematics and printed at The University of Texas at Austin, which does not imply endorsement by the University or by the Charles A. Dana Center.

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 to another new school year and an exciting year to be a member of the Texas Council of Teachers of Mathematics!

If you attended CAMT 2008 in Dallas this summer, you'll remember some of the excitement. I hope you are finding opportunities to try out those new lessons and ideas that you gathered while there. We made some changes this summer, and I think you'll agree that many of them were for the better. Our traditional luncheon became a dinner event with Bill McBride, who delivered an excellent keynote address. Rather than the traditional TCTM Breakfast and separate Business Meeting, we combined both events into a Business Meeting and Reception. We had over 300 people join us in the Chaparral Room on the 37th floor of the Sheraton (with spectacular views of the Dallas skyline!) for a fun evening of refreshments, door prizes, and a little bit of TCTM business. If you were unable to join us, you missed quite an inaugural event! Be sure to look for us at CAMT 2009 in Houston.

CAMT isn't the only place where we are trying some new things. As you read this issue of the Texas Mathematics Teacher, you'll find more information about how we are trying to better serve you, our members. Of course, we are keeping some favorite traditions, like the CAMTerships, mathematics specialist scholarships, and leadership awards. We're also trying a new winter writing retreat, polishing our website (stay tuned!), and using technology to keep all of our members more informed with what is going on in the world of Texas mathematics. I am very excited about some of these changes, and I hope you are, too.

TCTM isn't alone in making some changes – the National Council of Teachers of Mathematics, NCTM, is working hard to better serve us, too. If you haven't seen their website, *<www.nctm.org>*, recently, take a look at it. They have added many new features and resources for all of us to use in our work with students.

I would also like to encourage all of us to participate in the NCTM Focus of the Year for 2008-09, which is a critical look at equity in mathematics education. There are many dimensions to equity, all of which boil down to meeting the mathematical needs of every child whom we encounter. The children in our classrooms come to us from a variety of cultures, economic classes, and educational experiences. We have children with varying levels of fluency with the English language, technology, and mathematical reasoning. Some of our children require more resources and support from us in order to be successful. By choosing to focus on equity this school year, NCTM is providing multiple opportunities for us to think about how we can better meet the needs of all of our students. I invite you to join me in reflecting this year on how we can be more attentive to providing meaningful and rigorous mathematical opportunities for all of our students. For more information on equity resources see NCTM's website at

<www.nctm.org/equity.aspx>.

Best wishes for a stellar 2008-09 school year!

Paul Gray
TCTM President 2008-2010

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 front cover.

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

Rita Tellez, Regional Director

Greater El Paso CTM
Annual fall conference was held on October 18, 2008 at the El Paso Community College Transmountain Campus. Contact: <*gepctm@yahoo.com*> or see <*www.math.utep.edu/Faculty/lesser/gepctm.html*>

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: Alene McClanahan, <*alene.mcclanahan@fortbend.k12.tx.us*>.

Houston CTM

1960 Area CTM
This Affiliate is currently reorganizing. It serves the districts of Aldine, Klein, Katy, Humble, Tomball, Spring, and Cypress-Fairbanks.

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

Nita Keesee and Leslie Patrick, Co-Regional Directors

Big Country CTM & Science
Will hold their annual conference on January 31, 2009. Contact: Leslie Koske, <*lkoske@esc14.net*> or 325-675-8661.

Texas South Plains CTM
Fifteenth Annual Panhandle Area Mathematics and Science Conference was held on September 20, 2008, 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*

George Christ, 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 an annual conference in June in Corpus Christi. Contact: Elaine Young, <*eyoung@sci.tamucc.edu*>, or see <*www.cctmonline.org*>.

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

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

Rio Grande Valley CTM
The 43rd annual conference will be held on Saturday November 15, 2008, at the University of Texas - Pan American, Edinburg, Texas, from 8:00 to 4:00 p.m. Contact: Nancy Trapp <*nancy.trapp@lyfordcisd.net*> or see <*www.rgvctm.org*> .

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

David Hughes, Regional Director

Austin Area CTM
The fall conference was held on October 11, 2008. 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 2008 and a spring mini-conference in Febuary 2009, in Waco at the Region 12 Service Center. Contact: Rachelle Meyer <*Rachelle_Meyer@baylor.edu*> or see <*www.baylor.edu/soe/ctctm*>.

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*>.

National Council of Teachers of Mathematics (NCTM) Annual Meeting and Exposition will be held in Washington, D.C. on April 22–25.

The Association of Mathematics Teacher Educators of Texas (AMTE-TX) will hold their annual meeting at CAMT 2009. For more information contact the current president Sandi Cooper at <*Sandra_Cooper@baylor.edu*>.

2008 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 affiliate. The second award, the E. Glenadine Gibb Achievement Award, is presented to someone nominated by a TCTM member. The following individuals have been honored and we wish to acknowledge their former and ongoing contributions this year in the leader spotlight. **If you wish to nominate someone for 2008, please see the forms on our website**.

Our prior awardees are:

Year	Leadership(local/state)	Gibb (state/national)
1995	Mary Alice Hatchett	Iris Carl
1996	Betty Forte	Cathy Seeley
1997	Diane McGowan	Pam Chandler
1998	----	----
1999	Linda Shaub	Eva Gates
2000	Lloy Lizcano	Bill Hopkins
2001	Susan Hull	Pam Alexander
2002	Janie Schielack	Judy Kelley
2003	Bonnie McNemar	Dinah Chancellor
2004	Dixie Ross	Jacqueline Weilmuenster
2005	Barbara "Basia" Hall	Barrie Madison
2006	Nancy Trapp	Lois Gordon Moseley
2007	Kathy Hale	Cynthia L. Schneider

TCTM Leadership Award

Jim Wohlgehagen

Honored for his service in mathematics education in Texas to improve professional development and empower teachers to provide the best teaching environment for all students, **Jim Wohlgehagen** of Plano ISD received the 2008 TCTM Leadership Award. He was recognized for his contributions to the improvement of mathematics education in Texas at the 2008 CAMT luncheon in Dallas.

TCTM E. Glenadine Gibb Achievement Award

Juanita Copley

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, **Juanita Copley** of the University of Houston received the 2008 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 2008 CAMT luncheon in Dallas.

TCTM Mathematics Specialist Scholarship

Ten Texas students were awarded the $2000 TCTM Mathematics Specialist Scholarship for 2008-09.

Ashley Larson

Texas Christian University

Carol Tyger

University of Texas at Austin

Christine Riemer

Baylor University

Jennifer Walker

Texas Christian University

Jennifer Polasek

Sam Houston State University

Julianne Hockaday

Texas Woman's University at Denton

Kacie Wade

Midwestern State University

Meredith Casas

Baylor University

Ryann Shelton

Texas A&M, College Station

NO PHOTO AVAILABLE

Debbie Wilson

Texas A&M University at Commerce

2008 Award Recipients

TCTM CAMTership

Sixteen $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 five 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.

Rebecca Bridges
Grades 7, 9, 11
Faith Academy
Victoria, TX
Region 3

Mary Coward
Grade 5
Anahuac Elementary
Anahuac ISD
Region 4

Anna Davila
Grades 6 & 8
Sartartia MS
Fort Bend ISD
Region 4

Steven Davis
Grade 7
Web MS
Garland ISD
Region 10

Erika Edwards
Grades 9, 11, 12
Granbury ISD
Region 11

Tangee Thomas Fontenot
Grade 8
Baytown Jr. High
Goose Creek ISD
Region 4

Angela Hutchison
K-4 SPED
Young Elementary
Pasadena ISD
Region 4

Steve Kuwitzky
Grade 6
Wiley MS
Leander ISD
Region 13

Ellen Lukasik
Grades 9-12
Anderson HS
Austin ISD
Region 13

Karen McCollum
Grade 3
Spring Hill Elementary
Pflugerville ISD
Region 13

Bernadine Moody
Grade 1
Hartman Elementary
Judson ISD
Region 20

Jennifer Moody
Grade 2
Montclair Elementary
Garland ISD
Region 10

Adriana Sanchez
Grade 2
Galena Park Elementary
Galena Park ISD
Region 4

Alfonso Salinas Silva
Grade 5
DAEP
Donna ISD
Region 1

Marla Warden
Grades 11-12
Argyle HS
Argyle ISD
Region 11

Patricia Valdez
Grade 4
Rancho Isabella Elementary
Angleton ISD
Region 4

Presidential Awards for Excellence in Mathematics and Science Teaching

PAEMST Award

What started with a letter stating that I had been nominated for the Presidential Awards for Excellence in Mathematics and Science Teaching, ended with the trip of a lifetime and more! I felt honored to have been nominated for such a prestigious award, and I was intrigued by the application process which included a video of a lesson, essay questions and letters of recommendation. One of my favorite lessons of the year was coming up, so I thought I would give it a shot and see how videotaping the class would go. It turned out to be a lot of fun, and the kids enjoyed it. Upon completing the application, I mailed it all to Austin – not expecting to win anything, but very proud of myself for putting it all together.

A few months later I was invited to Austin for the State Board of Education meeting as a state finalist for 2007. It was eight months later when I found out that I would be the Math teacher representing Texas in Washington D.C. My husband and I were treated to an all-expense paid week long trip to our nation's capitol. One math teacher and one science teacher from each state attended the recognition week ceremonies. We had breakfast on Capitol Hill, a brunch cruise down the Potomac River, a Department of State dinner, and an awards ceremony at the National Academy of Sciences. We met with scientists and mathematicians at the National Science Foundation and spent an evening at the National Air & Space Museum. We toured the White House and had our picture made with Vice President Cheney. Some of us were able to meet with our congressmen and tour the Capitol. It was a week filled with new experiences and an opportunity to network with talented teachers from across the United States. Knowing that all those present were able to sit and dialogue with our congressmen gave me an empowerment that I wasn't expecting. These men and women were listening to us and jotting down ideas that they felt relevant to the nation's needs for academics. That meeting in itself gave me a sense of pride that coincided with just being at the nation's capitol. The entire trip was outstanding! I applaud those in Congress who support this program for their efforts and for allowing educators to relish the sights and also bring a loved one to share the experience.

I would encourage anyone who is nominated for this award to follow through with the application process. I learned more about myself as a teacher while working on my application and watching the video lesson. This is an amazing opportunity for teachers to exhibit what we do best – teach!

Toni Norrell • Secondary Mathematics Consultant
Education Service Center 2 • <toni.norrell@esc2.us>

Toni Norrell
2007 Texas PAEMST
Awardee

Presidential Awards for Excellence in Mathematics and Science Teaching

Applying for PAEMST

What Are the Presidential Awards for Excellence in Mathematics and Science Teaching?

The Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) is the highest recognition that a kindergarten through 12th-grade mathematics or science teacher may receive for outstanding teaching in the United States. Enacted by Congress in 1983, this program authorizes the President to bestow up to 108 awards each year. The National Science Foundation administers PAEMST on behalf of The White House Office of Science and Technology Policy.

Awards are given to mathematics and science teachers from each of the 50 states and four U.S. jurisdictions. The jurisdictions are Washington, D.C.; Puerto Rico; Department of Defense Schools; and the U.S. territories as a group (American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, and the U.S. Virgin Islands).The teachers are recognized for their contributions to teaching and learning and their ability to help students make progress in mathematics and science.

In addition to honoring individual achievement, the goal of the award program is to exemplify the highest standards of mathematics and science teaching. Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education.

Why Apply?

Recipients of the award receive the following:

- A citation signed by the President of the United States.
- A paid trip for two to Washington, D.C., to attend a weeklong series of recognition events and professional development opportunities.
- Gifts from program sponsors from around the country.
- A $10,000 award from the National Science Foundation.

In addition to recognizing outstanding teaching in mathematics or science, the program provides teachers with an opportunity to build lasting partnerships with colleagues across the nation. This growing network of award-winning teachers serves as a vital resource for improving science, technology, engineering, and mathematics education and keeping America globally competitive.

Problems with Pigeons

Problem solving continues to be highlighted as an area that should receive strong emphasis by mathematics teachers at all levels, even in a time when high stakes testing is receiving a great amount of attention across the nation. As the *Principles and Standards for School Mathematics* states in the problem-solving standard, "The teacher's role in choosing worthwhile problems and mathematical tasks is crucial" (NCTM, 2000, p. 53). At all levels of the Texas Essential Knowledge and Skills (TEKS), kindergarten through Grade 8, the Underlying Processes and Mathematical Tools Standard states that students need to be engaged in the four-step process of problem solving – understand the problem, make a plan, carry out the plan, and look back to evaluate the reasonableness of the solution. It also makes clear that students need to choose and apply a variety of specific problem solving strategies, like drawing a picture, acting it out, or working backwards. Problem solving, done in the flavor of NCTM and TEKS guidelines, takes time and careful planning but provides an excellent avenue for students to uncover and learn the mathematics they need and gain confidence in their ability to do mathematics.

In order for students to take flight as problem solvers, they need many opportunities to interact with situations. They also need to learn to invest time and effort as well as be persistent in their pursuit of solutions. One way to motivate students to engage in the process of problem solving is to establish an interesting context for the problem. To illustrate that such contexts for worthwhile problem solving are possible, the authors set out to use a popular piece of children's literature as a beginning point for constructing some engaging problems about pigeons. The problem design process discussed in this article will detail the selection of a book, the design and presentation of problems based on the book, and the solutions.

The Pigeon Problem Design Process

As part of a problem-solving course for middle school mathematics specialists, we wanted our preservice teachers to experience first-hand how literature can be utilized to engage mathematics students in the problem-solving process. Our plan was to illustrate that even a book containing no apparent mathematics connections can provide the context for an entertaining, thought-provoking problem. We chose the book *Don't Let the Pigeon Drive the Bus!* by Mo Willems. On the first page of the story, the bus driver asks the reader to keep an eye on things while he is gone, and gives one important order, "Don't let the pigeon drive the bus!" Throughout the rest of the book, the little pigeon, determined to convince the reader to let him drive, tries all sorts of shenanigans from throwing a pity party ("I never get to do anything!") to bribes ("I'll be your best friend.") to throwing a temper tantrum with feathers flying ("LET ME DRIVE THE BUS!!!").

To create the problems, the authors considered the problem-solving strategies studied during the semester, decided which strategies lent themselves well to the story, then picked those we felt the students needed to work on most. The two specific problem-solving strategies that we selected were Work Backwards and Draw a Diagram. Although we used the problems as part of a review session, such problems would also work beautifully to introduce a particular strategy to students.

The authors designed the first problem to be most efficiently solved using the Work Backwards strategy. We tried to make the problem fun and humorous but also challenging since it would be part of the review (see Figure 1). Thus, this multi-step problem contained extraneous information (2 fire hydrants, 1 bicycle, 2 windows) and fractions as well as whole numbers. Since all the chickens in the chicken truck were supposedly alive and clucking, we carefully adjusted the values so that the answer (the original amount of chickens) was a whole number.

Pigeon Problem #1

The red semi-truck driver was new in town and didn't realize the danger in having the little pigeon sit in the driver's seat while he went in to check on a few things. Finding the key still in the ignition, the pigeon's big round eyes lit up with joy!

As the pigeon sped around the corner and over the curb, six chickens slid off the back of the truck. Not realizing the truck was so long, the pigeon rammed the back corner into a light pole, sending ⅓ of the remaining chickens to freedom. Their cages broken, these chickens crossed the road and escaped into Miss Humphrey's backyard. Because the seat was so low and the pigeon so short, he did not immediately see the train crossing the tracks in front of him. Slamming on the brakes, the truck came to a screeching halt as ¾ of the remaining chickens rapidly slid off the back of the truck and into the free world. Being a conscientious driver, the pigeon patiently waited for the train to go by. During this time, 5 more chickens managed to free themselves from their now broken cages. On the way around the block, the pigeon knocked over 2 fire hydrants and 1 bicycle, broke 2 windows, and sent pedestrians running while ½ of the remaining chickens flew out of the truck to safety. By the time the pigeon made it around the block, bringing the semi back to its owner, the last 2 chickens had escaped, leaving the truck-driver chickenless. How many chickens was the truck driver originally carrying?

Figure 1. A "Working Backwards" Pigeon Problem

The second pigeon problem involved using a specific type of diagram, a Venn diagram (see Figure 2). To create the problem, we drew a Venn diagram with three overlapping loops, one for each of the three types of vehicles we chose: buses, semi-trucks, and Corvettes. Next, we wrote a clue for the number that should go in each section of the diagram. Again, since this was a review problem, some of the clues were quite challenging.

The Pigeon Problem Presentation and Solution Process

To get students started on solving the problems, the book was read to the class. The drawings of the pigeon's facial expressions and body language reminded us so much of the youngsters in our own families that we all laughed at some point, thoroughly enjoying the author's artistic skills. After finishing the story, pigeon problems one and two were shared with the students (see Figures 1 and 2). Although the students were a bit lethargic at the end of a difficult

Pigeon Problem #2

In the past few years, a number of bus drivers, semi-truck drivers, and Corvette drivers have reported a total of 52 different pigeons begging them to drive their vehicles. Unfortunately, many owners succumbed to the pigeons' tactics, resulting in huge losses for insurance companies.

1) 3 pigeons begged to drive the owner's vehicle, but in all three cases, the wise owners did not allow it.

2) 2 pigeons were caught driving a bus, a semi, and a Corvette at different times.

3) 11 pigeons begged but were not allowed to drive a bus or a semi-truck; they did get to drive a Corvette.

4) 4 pigeons managed to get the owners to let them drive their semi-trucks and their busses but not their Corvettes.

5) 6 pigeons managed to get the owners to let them drive their Corvettes and semi-trucks.

6) Of the pigeons lucky enough to drive semi-trucks who did not drive busses, one-third of them fulfilled their dream to drive a Corvette.

7) The number of pigeons allowed to drive busses and Corvettes but not semi-trucks is equal to the number allowed to drive semi-trucks.

QUESTION: How many pigeons were successful at persuading the owner to let them drive their bus, but not successful at persuading the owner to drive their semi-truck or Corvette?

Figure 2. A "Venn Diagram" Pigeon Problem

semester, after reading the problems to them, they excitedly asked, "Can we try to solve them? Let's solve!" Juli's solution to the first pigeon problem can be seen in Figure 3.

The class then moved on to consider the second pigeon problem and began by considering the clues given. The first four clues were easy for the students to place within the circles (see Figure 4): 3 went outside the three loops, 2 went in the center where all three loops overlap, 11 went in the non-overlapping portion of the Corvette loop, and 4 went in the section outside the Corvette loop where the semi-truck and bus loops overlap.

Step	Rolling the Tape of the Chicken Incident in Reverse	Number of Chickens Getting Back into the Truck
7	0 chickens left.	*0 chickens.*
6	The last 2 that escaped now return.	Juli: "I started this problem with the last two chickens that were thrown off the bus." *2 chickens.*
5	The ½ that escaped now fly back in the truck.	Juli: "With two chickens being the last, that makes the sentence before it, being half of the remaining chickens flew off the bus, making the total 4 chickens." *4 chickens.*
4	The 5 chickens that freed themselves now return to their cages.	Juli: "Add the 5 chickens to the four chickens and get 9 chickens." *9 chickens.*
3	The ¾ that slid off the truck now slide back on.	Juli: "The preceding sentences say that ¾ of the chickens fell of the bus. If I have 9 chickens left after ¾ of them slid off then that 9 the remainder of the ¾. Take 9×9×9×9=36 to get 36 chickens." [Comment: Juli meant 9+9+9+9 and did get the correct answer of 36.] *36 chickens.*
2	The ⅓ that freed themselves now get back into their cages.	Juli: "The preceding statements say that before there were 36, ⅓ of the chickens had been sent to freedom. [This] makes 36 chickens the leftover ⅔ from the whole minus the ⅓. So divide 36 by 2 to get 18. 18 is the ⅓. 18 added to 36 gives you 54 chickens." *54 chickens.*
1	The 6 chickens that slid off the truck now slide back on.	Juli: "54 chickens added with the 6 chickens that slid off the back make the total number of chickens of the bus 60." *60 chickens.*

Figure 3. Solution to the "Working Backwards" problem.

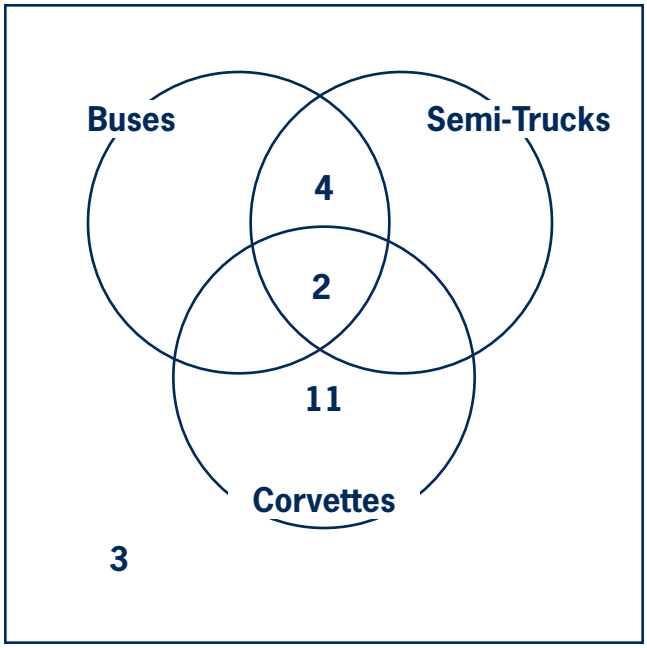

Figure 4. Representing the first four clues of the Venn diagram problem.

The last three clues were more difficult for students to interpret. For example, from the fifth clue, 6 pigeons should be represented in the two sections where the Corvette and semi-truck loops overlap (see Figure 5). Since 2 pigeons were already present in the center section, this left the remaining 4 of the 6 to be placed in the section outside the bus loop where the Corvette and semi-truck loops overlap. A few students incorrectly placed a 6 in this section instead, overlooking the 2 in the center. The students especially struggled with the sixth clue. Some thought "one-third of them" meant one-third of the entire 52 pigeons. However, looking back at the clue's initial clause, we see that "them" concerns the pigeons lucky enough to drive semi-trucks who did not drive buses. The two sections marked in gray in Figure 5 represent these pigeons. (We will call them the "gray" pigeons). Since the gray section inside the Corvette loop represents one-third of the "gray" pigeons, we know 4 is equal to one-third of the "gray" pigeons. Thus, the remaining two-thirds of the "gray" pigeons (the other gray section) must equal 8.

To solve the seventh clue, most students first calculated the total number of pigeons driving semi-trucks (4 + 2+ 4 + 8 = 18) then correctly placed 18 in the section outside the semi-truck

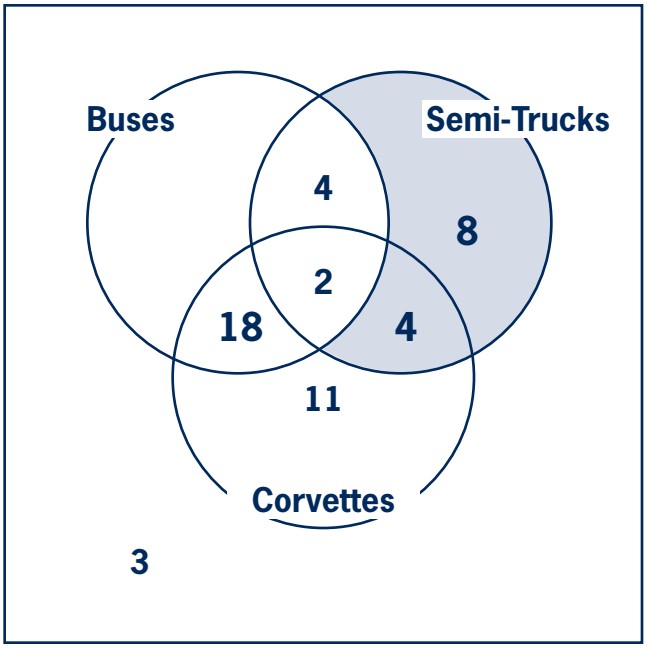

Figure 5. Representing the last three clues of the Venn diagram problem.

loop where the bus and Corvette loops overlap (see Fig. 5). Finally, they filled the last open section by subtracting each value in the diagram from the total number of pigeons (52). One student, Erin, explained how to determine the final answer: "I added all the pigeons up, even the ones that did not get to drive (respectfully named Bob, George, and Ringo) and I had accounted for all fifty-two pigeons. I then looked at the diagram and found that there were two pigeons in the area designated for those that ONLY drove the bus, and I had the answer…two pigeons."

Conclusion

In this article, we gave an example of how children's literature can be used as a context to create worthwhile mathematical problems supportive of the TEKS performance indicators. We showed how the process of creating, presenting, and solving problems based on literature can be used to address specific problem-solving strategies; however, problems with a literature connection can also be designed to engage students in deepening their understanding of almost any mathematics concept.

An important part of creating worthwhile problems is to assure that the numbers and vocabulary used are appropriate for the students. For example, the pigeon problems can be simplified by replacing fractions with whole numbers or made more difficult by utilizing larger numbers. For ELL (English Language Learner) students, the background for the problem can be simplified by removing descriptive language or by reading the problem out loud as the solution process begins.

While teacher-created problems are a great way to incorporate problem solving into the classroom, an excellent next step is to let the students be the problem writers. As students go through the design process themselves, they are further connecting the language arts experience with mathematics, benefiting both areas of study. Students may wish to bring in their favorite children's book or to select a book from their school library or a class list. During the design phase, students might brainstorm together for ideas and will want to have a few classmates solve their problem, checking for clarity and mathematical correctness. Finally, students can proudly present their problems for the class to solve.

So, what have you been reading with your class lately? What situations and contexts can you use to increase your students' attention and involvement with great problems? As the pigeon might say, "The sky's the limit!" when we think about problem solving in a creative way.

References

National Council of Teachers of Mathematics. (2000). *Principles and standards for school mathematics.* Reston, VA: Author.

Willems, M. (2003). *Don't let the pigeon drive the bus!* New York: Hyperion Books for Children.

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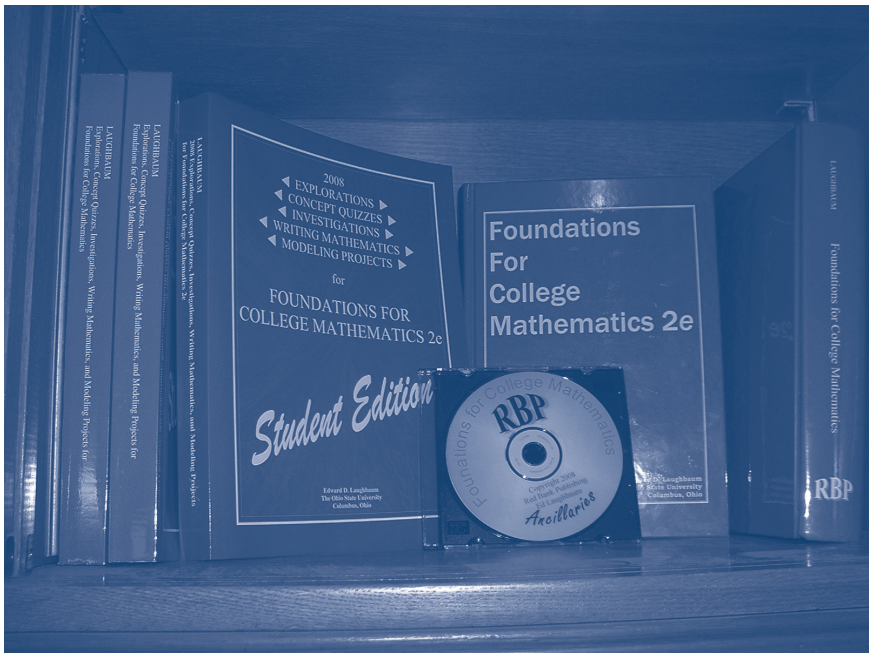
Foundations for College Mathematics 2e and Explorations, Concept Quizzes, Writing Mathematics, Investigations, and Modeling Projects for Foundations for College Mathematics 2e



Foundations for College Mathematics 2e is a senior remedial algebra textbook (and in many schools, a low track Algebra II text) using a function approach with the introduction to new content based in real-world contexts. Teaching algebra from a function approach requires the use of function representation and function behaviors to teach concepts and skills such as factoring, equation solving, arithmetic operations on polynomials, systems of equations, inequalities, properties of inequalities, definitions, concept of asymptotic behavior, absolute value, slope, laws of exponents, etc. Guided discovery learning is implemented with an expectation of student understanding, and the use of the graphing calculator is required. The over-all structure of Foundations 2e seamlessly integrates brain functioning – as connected to learning, understanding, and long-term memory.

Contact: Ed Laughbaum, author and publisher
www.redbankpublishing.com
ed@redbankpublishing.com

Ed is an emeritus professor of mathematics and has given over 225 presentations on teaching at conferences in the United States, Europe, and Asia. Foundations 2e is the end product of 18 years of study on teaching algebra with hand-held technology, and of basic brain function related to understanding and memory.

For information on professional development to learn how to use a function approach when teaching algebra, see www.redbankpublishing.com

Texas College Readiness Standards in Mathematics

The importance of college readiness in Texas is reinforced by the Commission for a College Ready Texas (2007, p. 89), which cites results such as "Texas ranks last among the 10 most populous states in the proportion of the workforce with bachelor's degrees" and "The average (median) income for a Texan with a bachelor's degree was $49,167 in 2003 compared to $25,455 for a person with a high school diploma." Students who enroll in college still needing developmental and remedial courses are at risk for spending more time and money and possibly not finishing college. The state of Texas has taken the initiative to assure that its students are prepared for an ever-changing and complex future by way of the College Readiness Standards (CRS).

The Third Special Called Session of the 79th Texas Legislature passed House Bill 1, which became Section 28.008 of the Texas Education Code under the title "Advancement of College Readiness in Curriculum." This legislation established that the Texas Higher Education Coordinating Board (THECB) and the Texas Education Agency work collaboratively toward the creation of the CRS. The statute required the formation of discipline-specific vertical teams comprised of secondary and postsecondary faculty for the four core content areas: mathematics, English, science, and social studies.

In Phase 1 of the work, vertical teams spent most of 2007 writing the Texas College Readiness Standards, facilitated by the Educational Policy Improvement Center from the University of Oregon. The CRS were adopted by the THECB on January 24, 2008 and can be viewed online at THECB (2008). The 10 mathematics CRS are: Numeric Reasoning, Algebraic Reasoning, Geometric Reasoning, Measurement Reasoning, Probabilistic Reasoning, Statistical Reasoning, Functions, Problem Solving and Reasoning, Communication & Representation, and Connections. The ten-member Phase 1 mathematics vertical team had diverse geographic representation and was co-chaired by Selina Vasquez-Mireles (Texas State University) and Linda Gann (Northside ISD).

In Phase 2, a mostly-new vertical team was chosen to analyze the nature and strength of alignment between the mathematics CRS and the mathematics Texas Essential Knowledge and Skills (TEKS). The Phase 2 mathematics vertical team also had diverse geographic representation and was co-chaired by this article's authors. During July-August 2008, the team conducted and wrote up its analysis and its suggestions for the mathematics TEKS writing team which sat in on the vertical team's in-person meeting. The vertical team found the mathematics CRS to be well-aligned with the TEKS for secondary mathematics. In particular, the numeric reasoning and probabilistic reasoning mathematics standards were found to be "aligned" with the secondary mathematics TEKS and the other eight standards were found to be "strongly aligned." The team was unable, however, to assess alignment with Cross-Disciplinary CRS (especially technology standards) and also noted that during Phase 3 the vertical team will need to ensure that teachers understand the rigor and intent of the standards through professional development and the establishment of online student support materials.

The mathematics TEKS writing team is in the process of incorporating the revisions put forth by the mathematics vertical team. The revisions will be submitted to the State Board of Education for a first reading in November 2008. Second reading and final adoption have been scheduled to occur in January 2009. The intent is to implement these newly-adopted TEKS in the fall of 2009.

Having College Readiness Standards (CRS) in mind from the beginning of one's education is hugely important. As Texas Council of Teachers of Mathematics then-President Wheeler (2008, p. 4) stated: "Mathematics educators at all levels should be aware of these standards – they aren't just for high schools! Many of these student performance descriptors originate in elementary schools and are refined vertically through middle and high school."

Acknowledgment: This article is adapted from the first author's invited half-plenary paper for the 2008 Charles A. Dana Center Higher Education Mathematics and Science Conference and both authors' narrative report (as co-chairs) on the work of the Phase 2 mathematics vertical team.

References

Commission for a College Ready Texas (2007). *The Report of the Commission for a College Ready Texas*. Accessed on the Internet at: www.collegereadytexas.org/documents/CCRT%20Report%20FINAL.pdf

Texas Higher Education Coordinating Board (2008). *Texas College Readiness Standards*. Accessed on the Internet at www.thecb.state.tx.us/collegereadiness/TCRS.cfm/

Wheeler, J. A. (2008). Letter from the President. *Texas Mathematics Teacher,* 55 (1), p. 4

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Games You Can Play While Driving Somewhere

It is amazing how much time parents and children spend in cars driving to places. Some of the trips are long ones, and many are short, but all driving trips represent an opportunity for families to do math together, and happily pass the time. The family automobile is an especially good place to play a math game since it is to a parent's advantage to keep their children busy (as opposed to listening to, "Are we there yet?"). Make use of that time: play a math game, have a bit of fun, and exercise your young minds. Here is a selection of simple math games that don't require any "stuff", that children of all ages (and adults) can play with voices, eyes, and minds while the miles roll along.

Guess How Far

Many of the driving trips families make are within 50 miles of home, and often by freeway. When setting out for a location, start by setting the trip meter on your auto's odometer. Then ask every person, child and adult, to make an estimate of the total miles to that location. If the location is one your students haven't been to yet, it's best to give them a frame of reference. For instance, you might say, "Remember, the trip to Grandma's house was 50 miles; this place is (pick one: FARTHER than that; not nearly as far; at least twice as far; etc.)." If you want to encourage your children to read the signs on the highway, tell them what city your destination is in, and let them change their estimates as they get closer and closer. Make a rule that there will be no new estimates AFTER leaving the freeway. Of course, the winner is the person, child or adult, with the CLOSEST estimate of the final odometer reading!

Guess How Long

This is a variation of the "Guess How Far" game, but it is all about TIME, not miles traveled. This game works great for places you have already driven to with your children, when they already have a frame of reference. When you first hit the highway, announce the current time (as read on your auto's clock), and ask each person in the car to estimate what time it will be when you arrive, to the nearest minute. If you know the distance in miles, by all means tell them that before they make their estimate—the more information they have, the better their estimates will be; you want them to become better at estimating the more they play this game. The winner is the person with the closest estimate of the arrival time, either plus OR minus minutes from the actual time on the car's clock.

The Counting Game

The Counting Game is so simple it can be played by anyone who can count! It requires only voices and minds, and is a great car game! In this game, two people take turns counting aloud. The first person starts by saying, "1," and the game is over when either player, counting in order, says, "20." Each player counts out loud by saying one, two, or three numbers in order from where the last player stopped counting. No player can pass or say more than 3 more numbers. Whoever says the number 20, by itself or in the last group of numbers, is the winner.

For example:

Player One	Player Two	
1, 2, 3	4	
5, 6	7, 8	
9, 10, 11	12	
13, 14	15, 16	
17	18, 19, 20!	*Player Two wins!*

The more often you play, the sooner you and your children will discover the winning strategy. When it becomes too easy to win, try changing the rules of the game by having a different winning number, such as 21. When you change the winning number, the winning strategy also changes, and the thinking must begin again (yours too)!

The License Plate Game

The License Plate Game is great, even when you leave your state, because you can play this game with the license plates of ALL states. It is a simple game that involves your children "spotting" certain numbers of your choice, while driving along carefully looking at the license plates of cars that pass your car in your direction. This game is all about observation and numbers. Someone in the car, a child or an adult, the driver or a passenger, yells out a certain kind of number to look for in the three digit part of a car's license plate. The first person to see a number that "fits," and points it out to the others in the car, wins that round, and a new round begins. For example, an adult may yell out, "Look for an odd number!"…and a child may spot the license plate 6RSD123; 123 is an odd number.

The game is limited only by the math knowledge of the students in the car, and the creativity of the "announcer." Here are some examples of numbers to look for: multiple of ten (e.g. 140), numbers that start with 0 (e.g. 092), numbers with two digits the same (e.g. 878), numbers with two digits IN A ROW the same (e.g. 122), numbers with three digits in order (e.g. 678), and, a number that is a prime (e.g. 211—HARD!). Kids can be the announcer too, and certainly, if you run out of ideas, you can look for the same number characteristics again. You can even use this game to teach math. For example, you could say, "Look for an even number; that's a number that ends in 0, 2, 4, 6, or 8."

Guess My Number

This number guessing game is ageless; you may have played it when you were a child! An adult (or child) first thinks of a number (for example, let's say that number is 53—but don't tell them). Then that person says, "I'm thinking of a number between 1 and 100. OK, guess my number." Taking turns, a player might say, "Is your number 12?" You would answer, "No; my number is BIGGER than 12." …And so on until someone guesses the number 53 correctly. If you want to be nasty, give them ONLY 20 guesses to get the number, and if they don't guess your number in 20 guesses, NEVER TELL THEM WHAT IT WAS!

A variation that is more mathematically interesting, but is also a harder version of this game, is to give all sorts of different math clues, not just "more" or "less" clues. For example, once again using 53 as the "secret number," if someone guesses 34, you might say, "No; my number is an ODD number." If someone guesses 55, you might say, "No, my number is NOT a multiple of 5." If someone guesses 43, you might say, "No, my number has no digit 4 in it." …And so on. Change the range of numbers, 1–10, 0–100, 500–1000, etc., depending on the age and ability of the children playing the game. Suggestion to the person who thinks of the number to guess: don't forget your number, or change the number in mid-game—players get angry!

A note to parents and guardians, the drivers

While these simple math games can be great for you and your children to while away the time of driving trips, always keep in mind that safety comes first while driving. In my own family, we had a rule that whenever the driver got to an important junction in the road, an important sign approaching, or an on or off-ramp to take on the freeway, all game playing was temporarily placed on hold until that juncture was passed, and we were "cruising" again. Then the game began again. Help your children understand the importance of this rule, and that the driver always says when to stop playing, and when to resume the game. Drive safely, AND play math games!

A note to teachers:

This article, while it will be of little use to you as a teacher, could be a valuable way to encourage families to do mathematics with their children OUTSIDE of school. Please consider sending copies of this article home with your students, or include it in your school newsletter. Parents and guardians playing math games with their children can only have positive effects on students mathematics learning in class!

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FEATURE

CAMT Board Update

Did you know that along with TCTM, two other organizations, the Texas Association of Supervisors of Mathematics, and the Texas Section of the Mathematical Association of America, sponsor our annual conference, CAMT? This past year in Dallas, we had almost 7,000 participants, making that the highest attendance for CAMT ever in the Dallas area.

It really does take a village to plan and orchestrate such a large conference experience. The CAMT Board, consisting of 13 members, is like a village council, of sorts, providing direction for CAMT. Each of the sponsoring organizations has three representatives on the CAMT Board who join the Director of Mathematics at the Texas Education Agency, Conference Chair, and Conference Director. Right now, your CAMT Board members are:

- Scott Fay, Harmony Science Academy (TCTM)
- Paul Gray, University of Houston (TCTM)
- Cindy Schneider, University of Texas Charles A. Dana Center (TCTM)
- Jean Frankie, Lamar CISD (TASM)
- Jacqueline Weilmuenster, Northwest ISD (TASM)
- Jim Wohlgehagen, Plano ISD (TASM)
- James Epperson, University of Texas at Arlington (TX-MAA)
- Janie Schielack, Texas A&M University (TX-MAA)
- Dawn Slavens, Midwestern State University (TX-MAA)
- Norma Torres-Martinez, Texas Education Agency
- Anita Hopkins, Conference Director
- Paula Moeller, Conference Chair
- Linda Sams, Treasurer, Cypress-Fairbanks ISD

The CAMT Board meets three times a year: once at CAMT, once in the fall to reflect on the past CAMT, and once in the spring to plan for the next CAMT. Most recently, the CAMT Board met in August in San Antonio to consider your feedback from CAMT 2008 in Dallas. First of all, thank you so much for responding to the electronic survey! The entire Board really did read through the comments and take them to heart. Many comments were made from participants about issues related to the layout of the hotel hosting the conference, and I think you will find a new and different experience when CAMT returns to the Dallas-Fort Worth metroplex in 2011 at the Gaylord Texan Resort in Grapevine.

We are also working to make changes to improve and streamline registration at CAMT 2009 in Houston. Many of you who preregistered online for CAMT 2008 found yourselves in a line that was, frankly, longer than it should have been. We have heard you, and are making changes in the way registration is organized for CAMT 2009. Stay tuned to the CAMT website, www.camtonline.org, for information about registration and how you can efficiently receive your registration materials.

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CAMT Board Rep • Houston, TX

FEATURE

NCTM 59th Delegate Assembly

April 10, 2008 — Salt Lake City, Utah

National Council of Teachers of Mathematics (NCTM) President Francis "Skip" Fennell welcomed representatives of NCTM Affiliates from across the nation to the NCTM Delegate Assembly on April 10, 2008 in Salt Lake City, Utah. Following the president's report, Dr. Fennell presented a charter to our newest Texas affiliate, Coastal Council of Teachers of Mathematics.

A resolution initiated by the Eastern Caucus was presented to the assembly. The resolution recommended that the NCTM Board of Directors consider providing increased opportunities for participants to use technology in sessions at the Annual Meeting and Exposition and Regional Conferences and Expositions. The resolution passed by majority vote to be sent forward to the NCTM Board of Directors. A report on the actions taken by the NCTM Board of Directors on this resolution can be found at *http://www.nctm.org/about/content.aspx?id=15759* .

NCTM Representative, Candy George, represented the Texas Council of Teachers of Mathematics (TCTM) at the Southern Caucus and the Delegate Assembly.

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NCTM Rep • Houston, TX

Recommended Readings and Resources

Secrets, Lies, and Algebra
by Wendy Lichtman
(ISBN: 0061229571)

Secrets, Lies, and Algebra captures the essence of middle school life and engages the mathematical and creative interests of young readers in a fun, clever mystery involving –Tess (a 8th grade math-loving "detective"), whose unique view of life has her imagining everything around her as it relates to math. Tess values math because it is the one subject she can trust – there's always just one right answer, and it never changes. But then she starts ALGEBRA and discovers those mysterious variables.

This is a great read for all middle school students and EVERY math teacher will thoroughly enjoy *Secrets, Lies, and Algebra.*

Sort It Out! by Barbara Mariconda (Author), and Sherry Rogers (Illustrator)
(ISBN-10: 1934359327)

Packy (a rodent) like many young children enjoys collecting treasures. Finally his mom announces 'Enough is enough!' and orders Packy to sort it all out and put it away.

Sort It Out! is told in rhyme and defies the reader not to read it out loud and the listener to help as Packy sorts his treasures according to like attributes. Packy and his mother discover a small mystery – some of his treasures seem to be disappearing! Who is pilfering from Packy's pile? – watch the illustrations!

After reading the book, you are treated to a section of fun activities about sorting, categorizing and classifying. The publisher's website also has educational materials for this delightful children's book

<www.sylvandellpublishing.com>.

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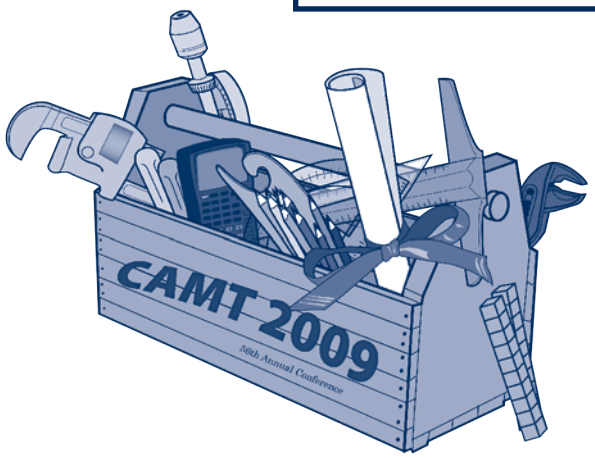
CAMT 2009

July 15- 17 2009

Houston, TX
George R. Brown Convention Center



CAMT 2009 will be held July 15- 17, 2009, at the George R. Brown Convention Center in Houston, Texas. The Program Chair is Beatrice Moore Luchin of NUMBERS Mathematics Professional Development. Complete program information will be available online next spring at:

<www.camtonline.org>.

Many favorite speakers such as Kim Sutton, Marcy Cook and many others are returning in 2009. 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.

Their Tomorrow Starts Today: Building a Future takes a Mathematical Foundation

TEA Talks

Hot News

For additional information, refer to the websites listed

Curriculum Updates

- **2008–2009 Mathematics Requirements**
  This year's high school seniors will be the second class to graduate under the required Recommended HS Plan, which includes Algebra I, Geometry, and Algebra II.

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

  This year's entering high school freshmen class is the first class affected by SSI 8th grade advancement requirements

  This year's sixth 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 4 X 4 graduation requirements, there is a FAQ document posted on the TEA Curriculum website at

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

- **Proclamation 2005:**
  Elementary Mathematics Instructional Materials were fully funded. As a result, new instructional materials for elementary math should be in elementary classrooms beginning fall 2008.

- **Texas Math and Science Diagnostic System (TMSDS)**
  The Texas Education Agency is pleased to announce that the new Texas Mathematics and Science Diagnostic System (TMSDS) will be managed by The Princeton Review. TMSDS is provided at no cost to Texas school districts and charter schools.

  TMSDS is a web-based TEKS-aligned diagnostic assessment system that covers grades 3 – 8 in mathematics and science as well as Algebra I, Geometry, Algebra II, Integrated Physics and Chemistry, Biology, Chemistry, and Physics.

  TMSDS replaces the Texas Mathematics Diagnostic System (TMDS) and the Texas Science Diagnostic System (TSDS) with several improvements built into the new, combined system. Some new features included in TMSDS are:

  - Three pre-configured, TEKS-aligned diagnostics per grade
  - 35 TEKS-aligned mini-quizzes per grade
  - English and Spanish diagnostics and quizzes
  - Online mathematics skill resources for teachers, students, and parents
  - Expanded teacher and administrator reporting
  - Classes may be pre-loaded with student names at the district level

  Instructions for enrolling in TMSDS can be found at *<http://www.TMSDS.org>*. Please contact your regional education service center for training opportunities and technical assistance.

- **College Readiness Program**
  This program was created under Article 5, HB 1. "Public school educators and faculty of institutions of higher learning shall work within subject-specific vertical teams to address high school and college readiness curriculum issues." Vertical teams (VT) of 10 members were created in each core subject area. The teams included two co-chairs (one from public education and one from higher education).

  In Phase 1 of this program, the VT established the college readiness standards (CRS). In Phase 2, the VTs were reconstituted to reflect 60% public education members and 40% higher education members. The charge of the VT is to evaluate whether secondary TEKS prepare students for college-level course work, and to recommend how those TEKS can be aligned to the CRS.

  On July 23-34, 2008, the Phase 2 College Readiness Mathematics Vertical Team met to evaluate the degree of alignment between the College Readiness Standards (CRS, adopted January 24, 2008) for Mathematics and the Texas Essential Knowledge and Skills (TEKS) for secondary mathematics.

  At the May 2008 State Board of Education (SBOE) meeting, there was a discussion item regarding a limited scope review of the secondary math TEKS to incorporate the math CRS. The SBOE submitted nominations for a math TEKS review committee. The charge of this committee is for a limited scope review of the secondary math TEKS to recommend additions to the secondary math TEKS to address the CRS.

  The SBOE timeline for adopting the proposed revisions to the secondary math TEKS is as follows. In September 2008 there will be a discussion item to share the progress of incorporating the CRS into the math TEKS. In November 2008 there will be a first reading of the proposed revisions to the secondary math TEKS that incorporate CRS. After first reading, the intent is to post

the proposed revisions on the Texas Register. In January 2009 there will be a second reading and final adoption of the proposed revisions to the secondary math TEKS that incorporate the CRS.

- **Texas Virtual School Network (TxVSN)**
  The Texas Virtual School Network (TxVSN) was authorized by the Texas Legislature in 2007 to provide online courses to students in Texas.

  Education Service Center (ESC) Region 10, in collaboration with the Harris County Department of Education, has been tasked with establishing communication efforts to facilitate the delivery of online courses and provide information to stakeholders.

  ESC Region 4 has been selected to conduct the review of electronic courses to be offered through the network. ESC Region 10, in conjunction with Region 4, will solicit courses from school districts for review and Region 4 will provide training to qualified online course reviewers to determine if an online course(s) submitted for offering through the TxVSN meets the quality standards established by the state.

  The TxVSN is a supplemental rather than diploma granting program. Online courses will supplement the services the district currently offers students, based on students' academic needs. The home (receiving) district will continue to award credits and diplomas with the TxVSN partnering with the home district to meet student needs. SB 1788 does not affect the provision of distance learning courses offered under other law.

  As an alternative to traditional classroom teaching, online courses are proving especially beneficial to reach students across the state—wherever they may live—who need: 1) additional or advanced courses; 2) to retake courses for graduation purposes; 3) options to courses currently offered in their schools; or 4) increased access to courses because of physical disabilities or health issues.

  Some benefits for Texas districts include 1) assistance with teacher shortages; 2) expansion of course offerings options; 3) increased availability of AP courses; and 4) service to students in alternative school settings.

  The current timeline for initial TxVSN course offering to Texas students includes 9-12 courses beginning January 2009 and 6-8 courses in 2009-2010.

  For more Information, send questions to the TxVSN mailbox at *<txvsn@tea.state.tx.us>*, or visit the website at

  <http://www.txvsn.org>.

Assessment Updates

- **TAKS Mathematics Charts**
  The grades 3–10 and exit level mathematics charts that were revised based on TEKS refinements are currently available on the TEA student assessment website. The revised charts can be identified by the TAKS logo in the top left corner.

- **TAKS Information Booklets**
  The grades 3–10 and exit level information booklets that were revised based on TEKS refinements are posted to the TEA student assessment website. They can be identified by the statement on the cover which states "Revised Based on TEKS Refinements".

- **TAKS Study Guides**
  TAKS study guides for grades 6–10 and exit level were revised based on the TEKS revisions and were sent to districts after spring 2008 administrations. Electronic versions of the guides are posted to the TEA student assessment website.

  Study guides for grades 3–5 are currently being revised and will be sent to districts after spring 2009 administrations. Electronic versions will be posted to the TEA student assessment website in spring 2009.

- **Assessment Options For Students With Disabilities**
  TAKS (Accommodated) is a general assessment that is available to students served by special education who require specific accommodations. This assessment form does not include embedded field test questions and is printed in a larger font with fewer questions on each page.

  TAKS–Modified (TAKS–M) is based on modified academic achievement standards designed to meet the requirements of the federal No Child Left Behind (NCLB) Act and Individuals with Disabilities Act (IDEA). It is intended for a small number of students served by special education who meet participation criteria. For more information go to the TAKS–M resource page on the TEA student assessment website at

  <http://www.tea.state.tx.us/student.assessment/resources/taksm/>.

  TAKS–Alternate (TAKS–Alt) is based on alternative academic achievement standards and is designed for students with significant cognitive disabilities who meet the participation requirements. It is not a traditional paper-and-pencil or multiple-choice test, and involves teachers observing students as they complete assessment tasks that link to the grade-level TEKS curriculum. For additional information go to the TAKS–Alt resource page on the TEA student assessment website at

  <http://www.tea.state.tx.us/student.assessment/resources/taksalt/>.

LEGISLATIVE CHANGES: Senate Bill 1031

- The TAKS program at elementary and middle school is to include TAKS mathematics at grades 3–8; TAKS reading at grades 3–8; TAKS writing at grades 4 & 7; TAKS science at grades 5 & 8; and TAKS social studies at grade 8.

- Among other things, the bill requires the agency to conduct a survey and prepare a report to determine the ability of school districts to administer assessment instruments by computer; requires assessment instruments, starting in 2007–2008, to be administered at least two weeks later than the date on which they were administered in 2006–2007; requires a vertical scale in grades 3–8 for mathematics and reading starting with the 2008–2009 school year; and allows TEA to release assessment questions every third year.

- The Agency has developed a new release plan to comply with requirements of SB 1031, which must be approved by the State Board of Education. Once approved, the release plan will be sent to districts and posted on the TEA student assessment website.

End-of-Course Assessments

- In 2007 Senate Bill 1031 was passed requiring the phase out of high school TAKS and replacing it with EOC assessments in English I, English II, English III, Algebra I, Algebra II, Geometry, Biology, Chemistry, Physics, U.S. History, World History, and World Geography.

- The freshman class of 2011–2012 will be the first group to have EOC as graduation requirement. To graduate, students must attain a cumulative score greater than or equal to 70 times the number of EOC assessments taken. Students must score at least 60 for the score to count towards their cumulative score. Students scoring below 60 must retake the assessment each time it is administered.

- A student's score on an EOC assessment will be worth 15% of the student's final grade for that course.

For more information go to the EOC homepage on the TEA website at

<http://www.tea.state.tx.us/student.assessment/admin/eoc/>.

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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.

Quotes for Thought

> ***"The mediocre teacher tells. The good teacher explains. The great teacher inspires."***
>
> - William Arthur Ward

> ***"The goal of teaching is learning, not teaching."***
>
> - Hugo Rossi

> ***"Math is not about following directions, it's about making new directions."***
>
> - Paul Lockhart

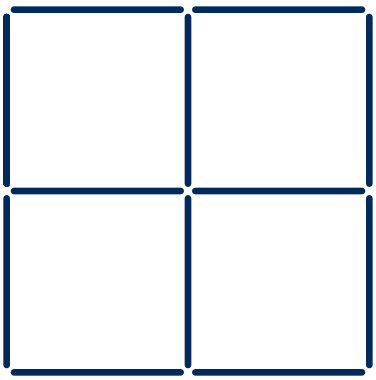
Puzzle Corner

Sticks #11 Puzzle

We are interested in how your students responded to this problem and how they explained or justified 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 figure.

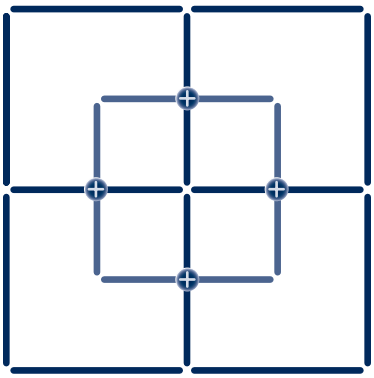


Move two sticks to make six squares.

Sticks #10 Answer

Arrange 12 craft sticks to form the original figure. Add four sticks to make five more squares.

Shown is a diagram of **a solution.**



Card Sorts, State Tests, & Meaningful Mathematics

"Data-driven decision making" is a phrase that is now commonplace in educational conversations. It is used when school districts discuss strategies to help meet the needs of all students while closing the achievement gap between subgroups of students. Within mathematics education, there is a growing need to educate prospective and practicing mathematics teachers about No Child Left Behind accountability measures and corresponding data within a given state in a way that emphasizes meaningful mathematics instruction that is consistent with national recommendations (NCTM 2000). Given pressures that teachers face within high-stakes teaching environments, it is important to analyze assessment tools, such as state-mandated tests, in an efficient, enlightened manner. A goal of such an analysis is to acknowledge accountability through constructive discourse while continuing to emphasize good mathematics teaching. Such discourse about accountability can take on many forms (Chauvot 2006). This article shares card-sorting activities that use items from state-mandated tests with prospective and practicing mathematics teachers. These activities give teachers tools to further accountability measures while exploring reform-minded mathematics instruction.

Card-sort activities capitalize on classification and the notions of example and nonexample when defining concepts. For example, the Roping in Quadrilaterals activity (Gavin, Belkin, Spinelli, and St. Marie 2001) provides a structure in which students explore the properties and characteristics of quadrilaterals. In this activity, students are given sixteen quadrilateral pieces and a series of tasks. Students are asked to sort the pieces according to specified criteria, such as "at least one right angle" and "no right angles," or "all sides the same length" and "at least one acute angle." These sorting tasks then lead to students' understanding the classification of quadrilaterals as rectangles, squares, rhombuses, and so on. A variation of this activity would be to give students a subset of the sixteen pieces (two rectangles, two squares, and a rhombus that is not a square) and ask students to sort into three piles, defining the criteria for each pile. In either example, whether students are given the criteria or asked to define the criteria, they must focus on necessary properties and characteristics for defining concepts.

In a similar way, card-sorting activities for preservice and practicing teachers that involve released state-mandated test items provide opportunities to explore topics in mathematics education. Topics include attributes of algebraic reasoning, proportional reasoning, problem solving, multiple representations, connections, and assessment. These activities also afford opportunities for teachers to explore students' mathematical thinking and conceptual understanding.

Examples of assessment items contained in this article are drawn from the mathematics portion of the Texas Assessment of Knowledge and Skills (TAKS) tests (see *http://www.tea.state.tx.us/student.assessment/resources/release/taks/*). The TAKS is criterion based and is intended to measure student knowledge of

Card 11 Front	**Card 11 Back**
11 A recipe for 12 waffles calls for $1\frac{1}{2}$ cups of milk, $2\frac{1}{4}$ cups of flour, and $1\frac{1}{3}$ cups of other ingredients. How many cups of milk, flour, and other ingredients are needed to make 36 waffles? **A** $20\frac{1}{3}$ cups **B** $15\frac{1}{4}$ cups **C** $12\frac{1}{4}$ cups **D** $5\frac{1}{12}$ cups	Answer: B Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning. (8.2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to (B) add, subtract, multiply, and divide rational numbers in problem situations.

Fig. 1 An example of a card created from the released 2006 eighth-grade TAKS test

Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
Objective 2: The student will demonstrate an understanding of patterns, relationships, and algebraic reasoning.
Objective 3: The student will demonstrate an understanding of geometry and spatial reasoning.
Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement.
Objective 5: The student will demonstrate an understanding of probability and statistics.
Objective 6: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.

Fig. 2 The six objectives that are assessed by the TAKS

the state-mandated objectives, the Texas Essential Knowledge and Skills (TEKS) (see *http://www.tea.state.tx.us/teks/*). Cards are created so that the assessment item is on one side of the card and the objective and corresponding student expectation, as reported by the state, is on the other side. Figure 1 illustrates an example of a card. Figure 2 lists the six objectives that are assessed by the TAKS.

When creating sorting tasks, it is important to focus on one or two goals while judiciously selecting assessment items for the given task. For example, two goals of an activity might be to instruct teachers (1) how the assessment objectives are defined by the state and (2) how some items might seemingly assess more than one objective. As teachers sort assessment items according to their experience and insight, discussions occur regarding attributes of objectives and the alignment of assessment items to those attributes.

Name that Objective

In one activity, teachers are asked to sort nine cards by objective (see appendix A); they are permitted to choose more than one objective for an item and must be prepared to provide a rationale for their decisions. Six of the nine cards reasonably align with Objectives 1 through 6, respectively. Teachers match these cards with the corresponding objective (see fig. 2) with relative ease and develop a sense of what is intended by each objective. The remaining cards, 9, 18, and 40 (in appendix A) often stimulate discussion regarding potential alignment with multiple objectives. For example, it is reasonable to argue that card 9 measures Objective 2 (algebraic reasoning) and Objective 4 (measurement) because the item is about patterns displayed in a table format (Objective 2) of angle measures (Objective 4). Because the choices are about the pattern, teachers may align the assessment item to Objective 2. In fact, according to the state classification, this item measures a student expectation found within Objective 6 (problem solving). This classification furthers the notion that making conjectures from patterns can be considered both algebraic thinking and an aspect of problem solving, and that problem solving is assessed in several mathematical contexts, such as geometry and measurement.

Card 18 is often identified by teachers as assessing Objective 4, a measurement item; however, this item is identified as assessing a student expectation found within Objective 1 (numbers and operations), in which students are expected to estimate values of irrational numbers. Teachers report frustration when trying to sort this item into a specific objective because the alignment with Objective 1 assumes that students were thinking about an irrational number when in fact students may have used the formula for the area of a square (a measurement concept) to simply square each choice to find a value closest to 83 square meters.

Card 40 is typically identified as assessing ideas found within Objective 2 because the student must choose a symbolic representation of a verbal description, essentially translating among representations. Although teachers recognize that Objective 1 also applies, it is typically not their first choice in the sorting process.

This sorting activity leads teachers to realize that the process of classifying items by objective involves assumptions about students' mathematical thinking. Students may apply strategies to successfully solve

problems that may not necessarily align with the state's reported student expectation alignment. Accordingly, the examination of the assessment items deepens conversations about data generated by an item. Care should be taken when drawing conclusions about a student's understanding of a specific objective when he or she may or may not have used strategies specific to that objective. Additionally, when teachers create assessment items, they too are making assumptions about students' mathematical thinking. Overall, teachers begin to recognize and articulate that helping students develop multiple problem-solving strategies will assist them in being successful on the exam, regardless of how the state aligns the item with the objective.

A related sorting activity involves focusing on one objective of the state-mandated assessment. The goal is to differentiate items that do and do not align with a specified objective. For example, teachers may work to identify which preselected subset of items assesses Objective 2 (algebraic thinking). This activity coupled with Schifter's (1999) chapter concerning reasoning about operations create conflict for teachers. Schifter provides convincing examples that young students' reasoning about operations (Objective 1: numbers, operations, and quantitative reasoning) provides a foundation for developing algebraic thinking (Objective 2), and in such instances, the two objectives overlap significantly. Discussions about these tensions broaden teachers' views regarding algebraic reasoning and the structure of mathematics as a web of interrelated concepts rather than mathematics as a discrete set of procedures.

Proportional Reasoning

A third type of sorting activity identifies an alignment of objectives for items that share an overarching notion, such as proportional reasoning. One activity uses cards 15, 17, 27, and 41 from the released 2006 Grade 8 Mathematics TAKS test (see appendix B). Teachers are asked to sort the four cards into two different piles and to provide a rationale for their choices. They are then asked to repeat the sort and decide on two other criteria. All four items involve proportional reasoning, yet they represent four different objectives (3, 4, 1, and 5, respectively). This sorting activity draws attention to the multiple concepts that may be used to answer one problem as well as the different ways that students may approach such problems. Furthermore, the activity shows proportional reasoning as a common thread running through many middle-grades mathematics topics (Aleman 2006; NCTM 2000) and that many different concepts, such as rate, similarity, and ratio, are embedded within proportional reasoning.

Finally, a fourth sorting activity articulates distinctions between procedural and conceptual understanding and how to assess these forms of understanding. Teachers sort items according to whether a successful response indicates conceptual or procedural understanding. Again, teachers must consider multiple solution strategies as part of this sorting activity. For example, some teachers contend that the problem on card 17 might be successfully solved through routinely setting up a proportion and cross multiplying without attaching any meaning to the process (procedural knowledge). Other teachers argue that a student could easily reason that choice C is the only logical choice by making the following conclusions: (1) B is not reasonable, given the scale of the picture; (2) A is not reasonable, because 13 is almost twice the value of 7, whereas 30 is not almost twice the value of 24; and (3) D would be eliminated because the task calls for creating ratios that compare width with length: The original ratio of 24 to 30 is not equivalent to the ratio of the reduced image 7 to 10. Such reasoning focuses on a conceptual understanding of ratios and scale. Still others argue that no conclusions can be made without knowing what the student was thinking when selecting an answer. The discussions surrounding these sorts provide insight into how to vary instructional strategies so that students learn multiple approaches based on conceptual and procedural understanding. Discussions evolve into what evidence provides insight into students' conceptual and procedural understandings.

In each sorting activity described here, the teacher must analyze the mathematical content of the item, consider solution strategies, and reflect on student

understanding and on the specific state expectations to which an item is aligned. Other activities with teachers may include sorting items based on students' anticipated errors. For example, with multiple-choice items, teachers can be asked to identify one very strong distracting choice or choices that are equally distracting. Worthwhile discussions about student thinking emerge as teachers address why a student may choose one response over another. For example, card 17's choice A suggests that the student was reasoning additively rather than multiplicatively. When an analysis of these choices is then compared with actual assessment data, teachers have information about future instructional practices.

It is worthwhile to consider replicating the card-sorting activities to determine how students approach collections of problems and how they discern mathematically appropriate approaches. For example, a teacher might ask students to sort items according to whether or not creating a table of values would be an appropriate strategy or whether or not the calculator would be an appropriate tool for determining a solution. Or depending on what a teacher wants to know about his or her students, he or she could ask students to sort items according to strategy, and allow the student to define the strategy. In either case, such activities help students and teachers focus on mathematical processes rather than correct answers while helping students become more familiar with the state-mandated items.

Card-sorting activities that involve state-mandated test items and objectives provide fruitful opportunities to help teachers familiarize themselves with state mandates while thinking deeply about good mathematics instruction and assessment. In so doing, teachers can investigate student thinking and students can focus on mathematical processes. In all cases, the sorting process provides an opportunity to more fully understand the contexts that create the data by which one's school district are held accountable.

References

Aleman, Brenda. "The Difference in Performance on Proportional Reasoning Items and Performance on Nonproportional Reasoning Items of Eighth-Grade Students on the 2004 Texas Assessment of Knowledge and Skills." Unpublished candidacy paper, University of Houston, Texas, February 2006.

Chauvot, Jennifer. "State-Mandated Tests and Mathematics Teacher Education: Reflections of a Teacher Educator." *NCTM News Bulletin* (July/August 2006).

Gavin, M. Katherine, Louise P. Belkin, Ann Marie Spinelli, and Judy St. Marie. *Navigating through Geometry in Grades 3–5*. Reston, VA: National Council of Teachers of Mathematics, 2001.

National Council of Teachers of Mathematics (NCTM). *Principles and Standards for School Mathematics*. Reston, VA: NCTM, 2000.

Schifter, Deborah. "Reasoning about Operations: Early Algebraic Thinking in Grades K–6." In *Developing Mathematical Reasoning in Grades K–12*, 1999 Yearbook of the National Council of Teachers of Mathematics (NCTM), edited by Lee Stiff and Frances R. Curcio, pp. 62–81. Reston, VA: NCTM, 1999.

Texas Education Agency (TEA). www.tea.state.tx.us/

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Appendix A Name That Objective

Cards
1, 2, 3, 5, 9, 11, 12, 18, 40 (Note: Only cards 9, 18, and 40 are provided here.)

Instructions
1. Sort the cards by objective, and record your answers.
2. You may choose more than one objective for an item, but underline the more dominant objective.
3. Provide a rationale for your choice.
4. Check your choices.
5. Reflection: Write a brief paragraph about what you have learned from this activity. Write two questions you would like to pose to the whole group.

Card 9 Front

9 The table shows n, the number of sides of a polygon, and S, the sum of the measures of the interior angles of that polygon.

Polygon

Number of Sides, n	Sum of Interior Angle Measures, S
3	180°
4	360°
5	540°
6	720°
7	900°

Based on the table, which statement is true:

A The sum of the interior angle measures decreases by $\frac{1}{2}$ for each side increase of 1.

B The sum of the interior angle measures increases by 180° for each side increase of 1.

C The sum of the interior angle measures doubles for each side increase of 1.

D The sum of the interior angle measures is a whole-number multiple of 360°.

Card 9 Back

Answer: B
Objective 6: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.
(8.16) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to
(A) Make conjectures from patterns or sets of examples and nonexamples.

Card 18 Front

18 The area of a square is 83 square meters. Which of these is closest to the length of each side of the square?

F 9.1 m
G 9 m
H 8.9 m
J 8 m

Card 18 Back

Answer: F
Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
(8.1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to
(C) Approximate mentally (and with calculators) the value of irrational numbers as they arise from problem situations (p, 12).

Card 40 Front

40 Which equation can be used to find m, the number of minutes in h hours?

F $m = 60 - h$
G $m = h + 60$
H $m = h \div 60$
J $m = 60h$

Card 40 Back

Answer: J
Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
(8.2) Number, operation, and quantitative reasoning. The student selects and uses appropriate operations to solve problems and justify solutions. The student is expected to
(D) Use multiplication by a constant factor (unit rate) to represent proportional relationships; for example, the arm span of a gibbon is about 1.4 times its height, $a = 1.4h$.

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Cards
15, 17, 27, and 41

Instructions
1. Sort into two different piles using two sets of criteria. Record your answers in the first chart provided.
2. Sort the cards by objective, and record your answers in the second chart below.
   - You may choose more than one objective for an item, but underline the more dominant objective.
   - Provide a rationale for your choice.
   - Check your choices.
3. Reflection: Write a brief paragraph about what you have learned from these activities. Write two questions you would like to pose to the whole group.

Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
Objective 2: The student will demonstrate an understanding of patterns, relationships, and algebraic reasoning.
Objective 3: The student will demonstrate an understanding of geometry and spatial reasoning.
Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement.
Objective 5: The student will demonstrate an understanding of probability and statistics.
Objective 6: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.

	Pile 1	Pile 2
First Sort	Cards: Criteria:	Cards: Criteria:
Second Sort	Cards: Criteria:	Cards: Criteria:

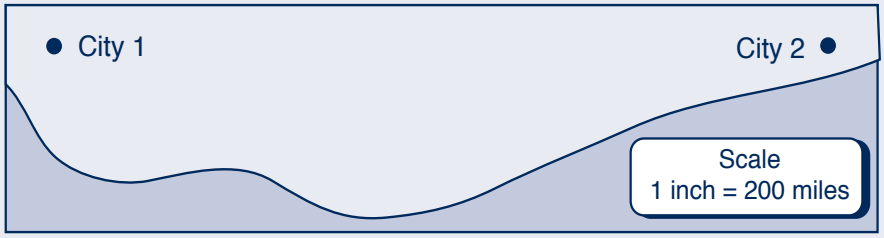
Card No.	Objective	Rationale	Check
15			
17			
27			
41			

Card 15 Front

15 Ivan's car uses gasoline at an average rate of 20 miles per gallon. He must drive from City 1 to City 2. Use the ruler on the Mathematics Chart to measure the distance from City 1 to City 2 on the map below in inches.

How many gallons of gasoline will Ivan's car use at this rate when he drives from City 1 to City 2?

A 10 gal **C** 200 gal
B 40 gal **D** 800 gal

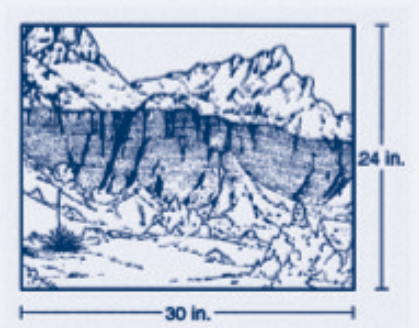


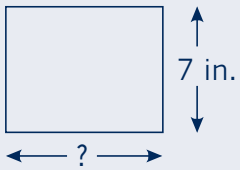
Card 15 Back

Answer: B
Objective 3: The student will demonstrate an understanding of geometry and spatial reasoning.
(8.7) Geometry and spatial reasoning. The student uses geometry to model and describe the physical world. The student is expected to
(B) Use geometric concepts and properties to solve problems in fields such as art and architecture.

Card 17 Front

17 The picture below is Larry's favorite picture.





Larry had a reduced copy of the picture made as a gift for his father. If the reduced picture was similar to the original and the height of the reduced picture was 7 inches, what was its width?

A 13 in.
B 5.60 in.
C 8.75 in.
D 10 in.

Card 17 Back

Answer: C
Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement.
(8.9) Measurement. The student uses indirect measurement to solve problems. The student is expected
to (B) Use proportional relationships in similar shapes to find missing measurements.

Card 27 Front

27 The Texas state flag is rectangular and has a width-to-length ratio of 2:3. Which of the following can be used to find l, the length of a Texas state flag with a width of 28 inches?

A $2 + 28 = 3 + l$

B $\frac{2}{28} = \frac{1}{3}$

C $\frac{2}{3} = \frac{28}{1}$

D $2 \cdot 28 = 3 \cdot l$

Card 27 Back

Answer: C
Objective 1: The student will demonstrate an understanding of numbers, operations, and quantitative reasoning.
(8.1) Number, operation, and quantitative reasoning. The student understands that different forms of numbers are appropriate for different situations. The student is expected to
(B) Select and use appropriate forms of rational numbers to solve real-life problems, including those involving proportional relationships.

Card 41 Front

41 Sharon played an electronic game. There were 15 questions, of which she answered 3 incorrectly. At this rate, how many questions should Sharon expect to answer incorrectly if she answers a total of 135 questions?

A 45
B 27
C 9
D 5

Card 41 Back

Answer: B
Objective 5: The student will demonstrate an understanding of probability and statistics.
(8.11) Probability and statistics. The student applies concepts of theoretical and experimental probability to make predictions. The student is expected to
(B) Use theoretical probabilities and experimental results to make predictions and decisions.

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2009-10 TCTM Mathematics Scholarship

There are ten $2000 scholarships available for 2009-10. Any student attending a Texas collage or university - public or private - and who plans on student teaching during the 2009-10 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, 2009.**

NCTM Membership

What's an easy way to support TCTM?

Join NCTM or renew your NCTM membership!

NCTM is changing the way you can register as a member and still give a rebate to your state council. Starting June 1, 2008, you may sign up for your NCTM membership and use the link on the web form to indicate the state affiliate you wish to receive the rebate. Go to *<www.nctm.og>*.

The state affiliate you select will receive $5.00 if you are joining NCTM as a new member, and $3.00 if you are renewing. In the past, the state affiliate only received the rebate if the NCTM membership flowed through the state treasurer. Now you can sign up directly with NCTM and give back to your state affiliate. However, you may only choose one state affiliate for the rebate (it will not be split).

Please remember, you cannot join your local affiliates from the NCTM website. You must join the local affiliates directly by the process they have established. You may join TCTM by either attending the CAMT conference as a paid participant, or by using our membership form found online at *<www.tctmonline.net>*.

2009 CAMTerships Available

There are sixteen $500 CAMTerships available for 2009. 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, 2009**. If selected, you will also volunteer two hours at CAMT and attend the TCTM Recognition Reception as a guest of TCTM.

Affiliate News

Texas Educators Attend NCTM's Affiliate Leaders Conference in Philadelphia, Pennsylvania August 15–17, 2008

Texas Council of Teachers of Mathematics (TCTM) representatives joined other mathematics educators from across the United States at the National Council of Teachers of Mathematics (NCTM) Affiliate Leaders Conference in Philadelphia, Pennsylvania, August 15–17, 2008. TCTM board members who attended were President Paul Gray, Vice-President Elementary Janet Vela, Southwest Regional Director Rita Tellez, and NCTM Representative Candy George.

The conference, with the theme "Helping Leaders Develop Leaders," included a variety of leadership-enhancing professional activities for mathematics educators and, in particular, for Affiliate leaders. The professional activities promote a commitment to improving mathematics education for all students. NCTM Affiliates are state, local, student, and at-large mathematics councils.

The conference was designed to strengthen Affiliates in the areas of partnership and membership as well as leadership by providing participants opportunities to identify their leadership strengths, network and exchange ideas, develop Affiliate action plans, and share strategies. Facilitated by members of the Council's Affiliate Services Committee (ASC), including TCTM Board member Cynthia Schneider, the conference offered a rich exchange of ideas and expertise for strengthening Affiliates and for making Affiliate leaders more effective in their roles. Throughout the conference participants had opportunities to connect with Council leadership, including NCTM President Henry (Hank) Kepner and NCTM Executive Director Jim Rubillo.

"Today, the increasing importance of mathematics for all students at every level of schooling, along with the demands of No Child Left Behind, high stakes assessments, and a need for curricular coherence, mean that more than ever teachers look to NCTM and its Affiliates for guidance, support, and resources to meet these challenges. The Council and Affiliate leaders are partners in preparing the next generation of teacher leaders to organize professional development activities, become master teachers, support entering teachers, and lead the profession. Let's work together to leave no teacher behind!" said Kepner.

Affiliate leaders conferences offer a forum for the Council's Affiliates to examine and strengthen their role in providing opportunities for emerging, new, and seasoned teachers to grow professionally through the partnership of NCTM and its Affiliates.

The National Council of Teachers of Mathematics was founded in 1920 and is a nonprofit, nonpartisan education association. With 100,000 members and more than 230 Affiliates located throughout the United States and Canada, NCTM is the world's largest organization dedicated to improving mathematics education for all students. The Council's Principles and Standards for School Mathematics provides guidelines for excellence in mathematics education.

Janet Vela, Henry (Hank) Kepner, Paul Gray, Candy George, Rita Tellez, Jim Rubillo

Voices from the Classroom

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<www.nctm.org/tips.aspx>

Tips on Supporting All Students: Equity and Diversity

"Equity" and "Diversity" are very deep topics, and as such, there are dangers in boiling them down to a list of tips. The following is not a list of activities one does to be equitable or to celebrate diversity, and should not be looked at as such. Rather, the goal is to provide a starting point for considering equity and supporting diversity within our classrooms. The following headings are very broad reminders of how we can continue our efforts to achieve the goal of a mathematics education experience that is equitable and celebrates diversity.

- Equity does not mean equal. When considering how equitable one's teaching and expectations are, we must consider the diverse needs and strengths of individual students, as well as the needs and strengths of the whole class. One student may need only a few minutes of extra instruction to master a concept, while the next student may need additional time to work and struggle with a set of manipulatives to develop an understanding which will allow him to own the content. It is not about how much time each student gets, but rather, how to create the appropriate opportunities for each student to learn mathematics.

- Focus on the individual. Learning our students' names is only the first step in developing a relationship with those individuals. The more we understand and respect the individual's background and strengths, the more we understand their particular needs. How do language, culture, gender, and socio-economics shape our students' world? More importantly, how can we, as teachers, understand, celebrate, and utilize the strengths and differences that make our classes unique? A first day handout or classroom exercise might include a survey that asks students to list strengths and rate past successes with mathematics. A simple exercise such as this can give us a good idea of students' feelings about mathematics and about themselves as math students, providing the contextual starting point for classroom interactions.

- Create an environment for success. Do your students know how important their success is to you? It never hurts to remind them! The expectations that we hold for our students send clear messages of how we feel about their education. Holding high expectations for all students shows our confidence in their ability and translates into success for more students. An environment that fosters success can be one in which all ideas and strategies are valued, where students share their thinking, listen with interest, and engage all students in consideration of the ideas presented.

- Identify your biases, and then get over them! Regardless of individual background or upbringing, we all carry own biases and stereotypes. As teachers, we are responsible for helping ALL students succeed, not just the ones that fit into our "box" of people who should do well. Set aside these biases and stereotypes and harness students' strengths to further every student towards the brimming mathematician and problem solver that they can be.

- Create an equitable curriculum that supports diverse needs and celebrates diverse strengths. Not all students learn the same way, so we must vary our approaches to lessons and provide students with manipulatives, visuals, projects, technology and group work to reach as many minds as possible. Give every student the opportunity to shine every day. Most of us have to follow a state or district curriculum, but with some creativity and work, we can meet the state and district requirements while making math interesting, engaging, and attainable for our students.

- Be aware of your questioning and listening techniques. How we ask questions, who we direct them to, and our interest in student responses can have lasting impacts on our students' achievement. We must believe that we can learn from all of our students' responses. We can learn about the students' thinking and often we can learn alternative ways of thinking about the mathematics itself. Are all students asked to engage in rigorous mathematical thought during the course of a lesson? Are all students given the time to think? All students should have the opportunity to tackle rigorous math every day, and carefully examining and altering our questioning and listening techniques can better assure that this happens.

- Walk the tightrope. We need to meet the needs of all our students, but it often feels as though we walk a tightrope to do this. While I am praising and encouraging the student who sits in the front row and knows the answers to even my toughest questions, am I simultaneously discouraging and ignoring that struggling student who sits in the back, never offers answers, and avoids eye-contact when I ask a question? These two students have very different needs, and the one who shouts louder is often more likely to get my attention. After all, the squeaky wheel gets the grease, right? Engaging and supporting all students is not easy, but it is our duty as classroom teachers. I challenge you to touch base with EVERY student, EVERY day. Work to give them opportunities to shine, to show their strengths, every day. You never know when you will turn that corner with a student and have a young scholar on your hands.

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 Editorial Board 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 Editorial Board 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 2007-08, were:

Rita Tellez
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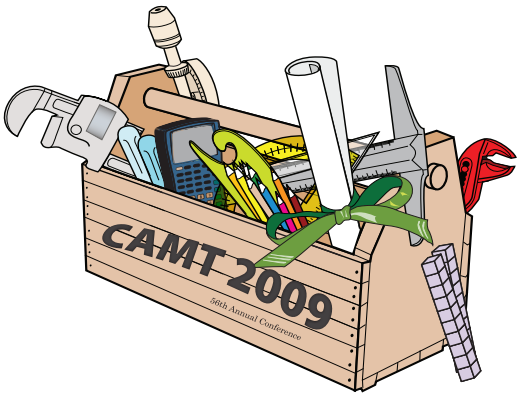
Advertising Guidelines for the Texas Mathematics Teacher

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 before the complaints have been investigated by the journal staff and the advertiser.



Their Tomorrow Starts Today: Building a Future takes a Mathematical Foundation

The Conference for the Advancement of Mathematics Teaching (CAMT) 2009 will be held July 15-17, 2009, at George R. Brown Convention Center in Houston, Texas. See inside for more details, or visit the website at *<www.camtonline.org>*

Texas Council of Teachers of Mathematics 2008-09 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

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