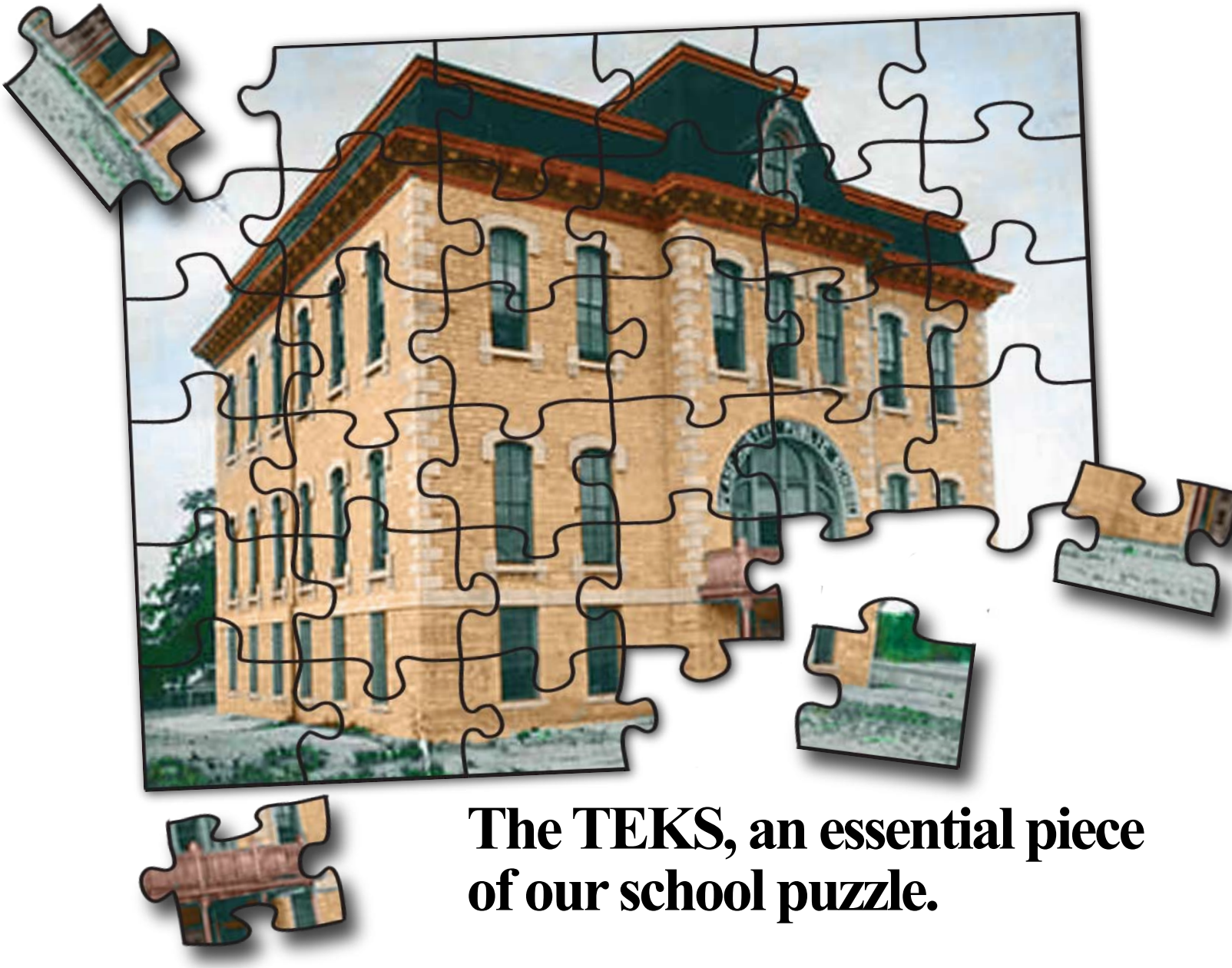
Texas Mathematics Teacher

Volume LIV Issue 1 Spring 2007



The TEKS, an essential piece of our school puzzle.

2007 Election Ballot Enclosed

Volunteer at CAMT

Check out our website for scholarship applications and nomination forms

http://www.tctmonline.net/

Texas Council of Teachers of Mathematics
2006-07 Mission and Goals Statements

MISSION

To promote mathematics education in Texas

GOALS

Administration

- Streamline online membership registration through CAMT

Publications

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

Service

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

Communication

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

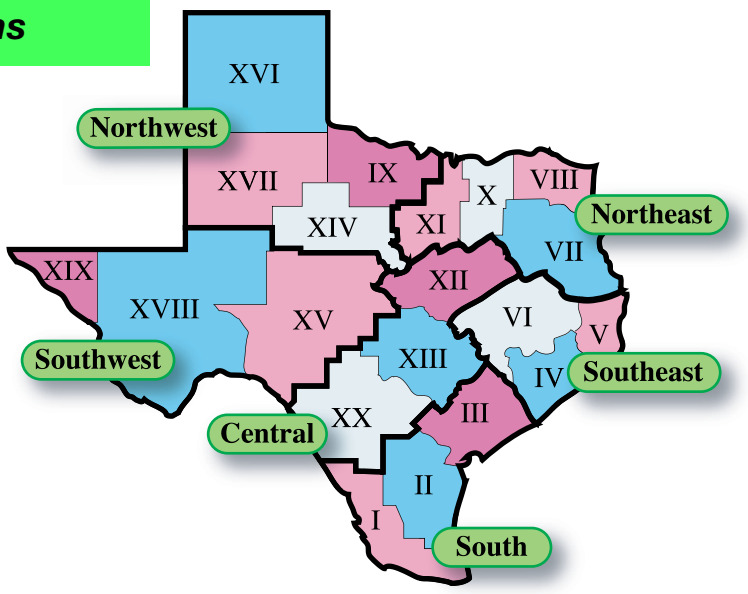
Membership

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

Public Relations

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

TCTM Regions



TCTM Past-Presidents

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

Texas Mathematics Teacher

A PUBLICATION OF THE TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

Volume LIV Issue 1 **Spring 2007**

Articles

Features

Departments

TCTM Applications

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

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

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.

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

Letter from the President

Dear TCTM Members,

2007 is an exciting year to be teaching mathematics in Texas. In addition to old favorites such as CAMT, there are many new offerings for mathematics teachers to include in their teaching toolkits.

We are about to complete our first full year of implementing the refined K-12 Texas Essential Knowledge and Skills (TEKS) for Mathematics. Many concepts were realigned to provide a seamless transition of teaching and learning from grade to grade. Some student expectations were clarified while others were moved to different grades or courses. To help mathematics educators understand the cross-grade and cross-concept connections included in the refined TEKS, the Texas Education Agency has partnered with university systems across the state and the regional Education Service Centers to introduce the Texas Mathematics Initiative.

A cornerstone of the Texas Mathematics Initiative is a professional development series titled "Mathematics TEKS Connections" (MTC). This series of research-based professional development sessions are designed to give educators an in-depth understanding of the mathematics TEKS, the explicit connections among mathematics TEKS within and across grade levels, and effective methods for teaching mathematics TEKS at differing grade levels. Additionally, participants will examine key concepts that are developed vertically within the grade band and explore multiple methods of building procedural fluency in relation to those concepts. MTC offers one module for each of the following grade bands: K-2, 3-5, 6-8, and 9-12.

To extend the MTC series, TEA will be releasing two other new professional development opportunities: "Maximizing Algebra 2 Potential" (MAP) and "MTC: Geometry." These two workshops focus on connections found within each of the high school courses of Algebra 2 and Geometry, respectively.

Preservice Teacher Preparation modules are also a part of the Texas Mathematics Initiative. The MTC Preservice Teacher Preparation modules are designed by a team of mathematics education and mathematics faculty members from Texas A&M University (TAMU) and are intended to provide a resource for preservice math methods classes. These modules are research-based, highlight key mathematics content in the TEKS, and emphasize connections between important mathematical concepts taught in the pre-K-12 classroom.

Members of the TAMU development team served as reviewers of the MTC inservice modules described above. This dual role gave the TAMU faculty a closer understanding of how to prepare teacher candidates to enter the K-12 classroom with knowledge of the concepts addressed in MTC professional development.

The modules will be shared with teacher educators from regional universities, community colleges, and alternative certification programs across Texas. Materials will also be available online. To learn more about the Texas Mathematics Initiative, visit *<www.tea.state.tx.us/math>*.

Mark your calendars now for CAMT 2007: The Magnitude of Mathematics – Powering the Future for Every Student. CAMT this year will be in San Antonio and it will be earlier than usual—June 28, 29, and 30. Preconference sessions for CAMT 2007 will include sessions for each grade band of MTC. Visit *<www.camtonline.org>* for details. See you at CAMT!

Speaking of CAMT, you will not want to miss out on your opportunity to apply for a TCTM sponsored CAMTership. CAMTerships are awarded to elementary, middle, and high school mathematics teachers who are relatively new to the field of teaching. Applications for these scholarships are available online through the TCTM website, *<www.tctmonline.net>*. Download and return your application today.

At the secondary level, many changes are also afoot. This year's eighth-grade students will be the first class required to take four years of high school mathematics and science. This requirement was included in spring 2006 House Bill 1 and is also known among educators as the "4X4" requirements. The four years of mathematics must include Algebra 1, Geometry, and Algebra II. Currently, the fourth year can be satisfied with Mathematical Modeling with Applications (taken before Algebra II), Precalculus, Statistics, or Calculus. These new requirements will help students prepare for an exciting, ever-changing future, whether they are bound for the workplace, community college, or university.

As President of TCTM, it is my distinct privilege and pleasure to work with all of you as we navigate these changes in mathematics education.

Best wishes for an engaging and productive 2007.

Sincerely,

Jo Ann Wheeler
TCTM President 2006-2008

Lone Star News

Affiliate Groups

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

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

Rebecca Ontiveros, Regional Director

Greater El Paso CTM
Annual fall conference. Contact: Lori Correll <*llcorrel@episd.org*>.

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

Paul Gray, Regional Director

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

Houston CTM

1960 Area CTM
Holds two meetings and one competition a year to serve the districts of Aldine, Klein, Katy, Humble, Tomball, Spring, and Cypress-Fairbanks. Provides scholarships for students in mathematics education and awards for local mathematics education leaders. Contact: Sheila Cunningham, <*scunningham@kleinisd.net*>.

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

Nita Keesee, Regional Director

Big Country CTM & Science
Will hold their annual conference on February 3, 2008. Contact: Leslie Koske, <*lkoske@esc14.net*> or 325-675-8661.

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

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

Shirl Chapman, Regional Director

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

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

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

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

Barba Patton, Regional Director

You are invited to join a listserv which will be for the purpose of promoting math education. The listserv will be a means to communicating your concerns about math education, share teaching ideas, etc. This listserv is managed by Dr. Barba Patton, Assistant Professor of Education at the University of Houston-Victoria. To join, send an email to imailsrv@listserv.uhv.edu Leave the subject line blank and put in the message subscribe Math at MathED-L your full name (example subscribe Math at MathED-L Barba Patton). Barba's email is <*pattonb@uhv.edu*>.

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

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

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

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

David Hughes, Regional Director

Austin Area CTM
A spring meeting will be held on May 1, 2007 at ESC 13. The fall conference will be held on October 13, 2007. Contact: Carol Lindell, <*clindell@taylor.isd.tenet.edu*>. See <*www.aactm.org*>.

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

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

NON-AFFILIATED CONFERENCES

STATEWIDE

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

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

Probability Tasks in Textbooks:
Not All Are Created Alike

When teaching mathematics, I sometimes find that what I intend to occur in the classroom is not what actually happens. Early in my career, I became uncomfortably familiar with the following three scenarios in my own classes:

- During class, students work on an activity that is challenging and helps them to grapple with deep mathematical concepts, but their textbook homework consists of routine procedural problems.
- Class activities focus on procedural understanding. When a few textbook homework problems require students to think more deeply about these procedures, students seem surprised or unprepared and do not complete the tasks.
- I utilize a task in which I intend for students to think deeply about mathematical concepts, but they approach it in search of a quick-fix formula, disregarding potentially rich mathematical investigation.

The above three scenarios have been particularly evident during probability lessons that I have taught. Probability is one of the content strands recommended for inclusion in a comprehensive middle school curriculum by the National Council of Teachers of Mathematics (NCTM) in Principles and Standards for School Mathematics (2000), and by the Texas Education Agency (2006) in the Texas Essential Knowledge and Skills (TEKS). Specifically, students in grades 6, 7, and 8 are expected to use experimental and theoretical probability to make predictions and describe real-life events (See Subchapter B, items 6.9, 7.10, and 8.11). In the recent revision, the recommendations for probability remained virtually unchanged from the 1998 TEKS.

Compared to number, algebra, and geometry, probability is a recent addition to the school mathematics curriculum. One reflection of that trend is evident in the NCTM-published journals. As Figure 1 shows, the number of articles published in Mathematics Teacher and Mathematics Teaching in the Middle School indexed as "probability" has increased in recent decades. This graph suggests that attention to probability in school mathematics grew explosively beginning in the 1960s. The apparent decrease in the 2000s is due to the fact that the data only are reported through 2005, and thus represent only six years of this decade. Additionally, the roughly equal numbers of probability articles appearing in these two journals during the 2000-2005 time period provide evidence that probability is a current topic of interest in the middle grades.

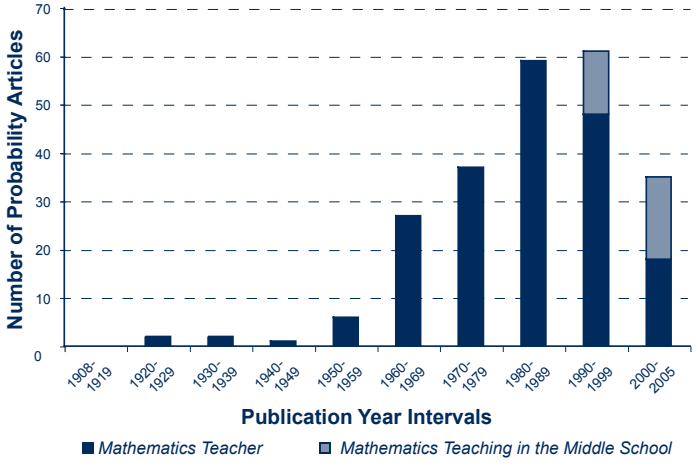


Figure 1: Number of articles in Mathematics Teacher (1908-2005) and Mathematics Teaching in the Middle School (1994-2005) indexed as "probability"

As I reflected on the three scenarios listed above, I realized that the mathematical tasks from the textbook played a central role in each scenario. I began to wonder about the features of these tasks, particularly those related to probability, within a series of textbooks. Also, because probability is a recent addition to the middle grades mathematics curriculum, I was curious about how the treatment of these topics had changed over time, if at all.

Examining Textbooks

To answer these questions, I examined eight series of mathematics textbooks intended for students in the middle grades, giving special attention to the probability content of each textbook (Jones, 2004).

In an attempt to identify any trends or differences in textbooks over time, I selected two textbook series from four "eras" of mathematics education, beginning in the 1960s—New Math, Back to Basics, Problem Solving, and Standards (Fey & Graeber, 2003; Osborne & Crosswhite, 1970; Payne, 2003; Usiskin, 1985). Within each era, I selected one "popular" series and one "alternative" series; the popular series was determined using market share data (Weiss, 1978, 1987; Weiss, Banilower, McMahon, & Smith, 2001), while the alternative series was selected based on its reputation among mathematics educators as being distinctively different from the popular series of the time. The textbooks that were examined are listed in Table 1. (Complete bibliographic information for each of these textbooks is listed in the Appendix.)

Era	Type	Title (Publication Date)	Publisher
New Math	Popular	*Modern School Mathematics: Structure and Use 6* (1967) *Modern School Mathematics: Structure and Method 7 & 8* (1967)	Houghton Mifflin
	Alternative	*Mathematics for the Elementary School, Grade 6* (1962) *Mathematics for Junior High School, Vols. I & II* (1961)	Yale University Press
Back to Basics	Popular	*Holt School Mathematics: Grades 6, 7, & 8* (1974)	Holt, Rinehart, & Winston
	Alternative	*Real Math: Level 6, 7, & 8* (1981, 1985)	Open Court
Problem Solving	Popular	*Mathematics Today: Levels 6, 7, & 8* (1985)	Harcourt Brace Jovanovich
	Alternative	*Math 65: An Incremental Approach* (1987) *Math 76: An Incremental Approach* (1985) *Math 87: An Incremental Approach* (1991)	Saxon Publishers
Standards	Popular	*Mathematics: Applications and Connections, Courses 1, 2, & 3* (1998)	Glencoe/ McGraw-Hill
	Alternative	*Connected Mathematics* (1998)	Dale Seymour

Table 1: Textbooks examined for this study

Within each textbook, I first identified all of the probability tasks. I defined a probability task as an activity, example, exercise, or set of exercises that focused on a single probabilistic context or situation. I then analyzed these tasks along several dimensions, including the learning expectations, type of device used in the task, and the level of cognitive demand required by the task. In this article, I will focus on the results relating to the level of cognitive demand.

My interest in the cognitive demand required by tasks was initially fostered through studying the work of the QUASAR research team (see, for example, Stein, Smith, Henningsen, & Silver, 2000). These researchers argue that mathematical tasks, as written in curriculum materials, can be categorized as requiring one of four different levels of cognitive demand:

1. Doing Mathematics: Tasks at this level do not suggest a predictable pathway to a solution, and require complex thinking and self-monitoring. These tasks also require that students explore and understand underlying mathematical concepts and relationships.
2. Procedures with Connections: These tasks focus students' attention on the concepts or meaning behind the procedure, and suggest the use of broad, general procedures. Tasks at this level may require students to utilize multiple representations.
3. Procedures without Connections: Tasks at this level are algorithmic, and require no explanations except those that deal with the procedure being used. These tasks do not require students to make connections to underlying concepts or meaning.
4. Memorization: Tasks at this level require students to reproduce facts or rules, and those facts or rules are disconnected from the underlying concepts or meaning. These tasks are not ambiguous.

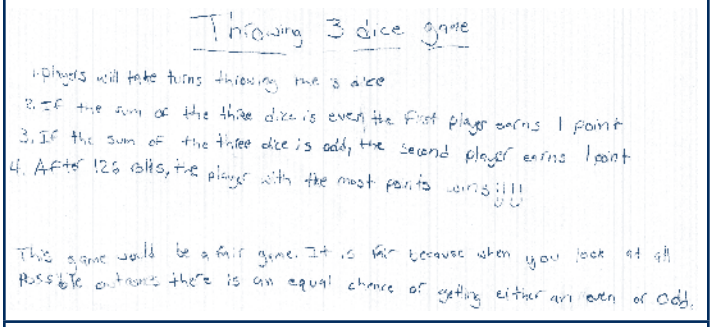
The levels of Memorization and Procedures without Connections are referred to collectively as "lower levels," while Procedures with Connections and Doing Mathematics are considered to be "higher levels." For a further discussion of these levels, see Smith and Stein (1998). Figure 2 displays examples of probability tasks that would be classified at each of the four levels, and student responses to these tasks.

As a result of their work with analyzing mathematical tasks, the QUASAR researchers found that the cognitive demand of a task rarely increased above the level required by the task as it was written (Stein, Grover, & Henningsen, 1996). That is to say, during instruction, the cognitive demand of a task may be reduced through the actions of teachers or students. Teachers may modify a task or suggest a pathway

Sample Tasks and Student Responses

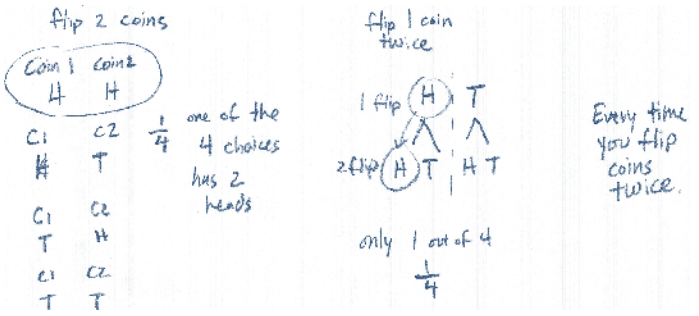
Doing Mathematics

A fair game is one in which all players have an equal chance of winning. Make up a fair game for two players using three dice. Describe the rules of your game and explain why the game is fair. (Adapted from Connected Mathematics: What Do You Expect? Lappan, Fey, Fitzgerald, Friel, and Phillips, 1998)



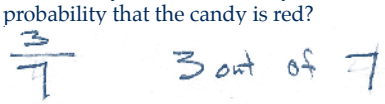
Procedures with Connections

If you flip two coins, what is the probability that you will get heads on both coins? If you flip one coin twice, what is the probability that you will get heads both times? How do your answers to the above two questions compare? Explain why these answers have this relationship. (Adapted from Connected Mathematics: What Do You Expect? Lappan, Fey, Fitzgerald, Friel, and Phillips, 1998)



Procedures without Connections

A dish contains three red candies and four yellow candies. If you select a candy at random, what is the probability that the candy is red?



Memorization

Tell what a sample space is.

Figure 2: Examples of tasks at each of the levels of cognitive demand, with student response

to a solution, and thus "short-circuit" the thought process required by a task. On the other hand, these researchers noted that selecting a high-level task does not guarantee that students will "think and reason in cognitively complex ways" (Stein et al., 2000, p. 24). Therefore, while a teacher may select a "high-level" task, the task may not remain at a high level throughout a lesson.

Results of the Study

After examining these textbooks, I found that each series addressed topics from probability, usually in or near the final chapter of the text. Five textbook series contained about 100 probability tasks for grades 6-8, one series had 42 probability tasks, and the two most recently published series contained more than 200 probability tasks (see Figure 3). This increase in the number of tasks related to probability in recent years may be related to the influence of the NCTM Standards documents (NCTM, 1989, 2000). Other possible influences may be the larger size of textbooks in terms of the number of pages, or the inclusion of probability on state education standards documents or high-stakes assessments. Regardless of the cause, more than half of the probability tasks that I examined were located in textbooks from the Standards era.

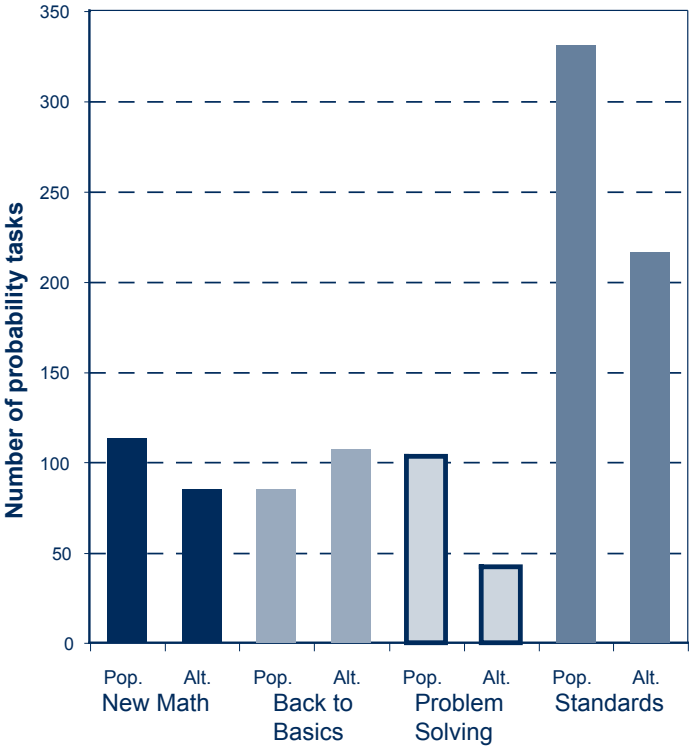


Figure 3: Number of probability tasks in each series

Most of the probability tasks examined were classified as Procedures without Connections, one of the lower two levels of cognitive demand. In six of the eight textbook series, more than 80% of the probability tasks required low levels of cognitive demand (see Table 2). Only the Connected Mathematics series (Lappan et al., 1998) had a majority of probability tasks that required high levels of cognitive demand.

Additionally, only three series contained probability tasks that required students to "Do Mathematics," while two series contained no tasks at the two higher levels of cognitive demand.

	New Math		Back to Basics		Problem Solving		Standards	
	Pop.	Alt.	Pop.	Alt.	Pop.	Alt.	Pop.	Alt.
Doing Mathematics	0	0	0	4	0	0	2	12
Procedures w/ Connections	6	14	0	22	2	0	15	47
Procedures w/o Connections	83	82	95	74	97	98	75	40
Memorization	11	4	5	0	1	2	8	1

Table 2: Percent of tasks coded at each level of cognitive demand

Selecting textbooks and tasks for the classroom

This study revealed that one textbook series can be very different from another in terms of the level of cognitive demand required by probability tasks. Because of this variation, it is critical that the teacher carefully examine textbooks prior to adoption or selection, and individual tasks before assigning them to students. In order to maximize the effectiveness of the mathematics textbook on student learning, teachers must match their instructional goals with tasks from textbooks. Teachers using textbooks that contain tasks that require various levels of cognitive demand are able to utilize tasks that reinforce written algorithms or procedures, engage students in making sense out of procedures, or investigate problems with no predictable solution pathway, depending on the focus of the lesson. Additionally, textbooks that have some tasks at each of the levels of cognitive demand may prove to be accessible to a wide audience of students with varying levels of mathematical sophistication.

Teachers should strive to incorporate tasks requiring high levels of cognitive demand into their instruction. Such tasks will push students to make sense out of the mathematical ideas and to take ownership in the concepts that are discovered. If such tasks are not available in textbooks, teachers may modify the existing textbook tasks by making them open-ended, incorporating technology, or asking questions about why a particular procedure works. (For more on this topic, see Thompson, Beckmann, & Senk, 1997.)

As mentioned previously, it is possible to lower the level of cognitive demand of a task. Stein et. al (2000) stated that a teacher may inadvertently or purposefully reduce the cognitive demand by making the problematic aspects of a task more routine, as in providing a formula without sufficient justification of the formula's origin and usefulness to the process. Teachers may also reduce the level of cognitive demand by asking leading questions, emphasizing correct answers over conceptual understanding, and not allowing an appropriate amount of time for students to explore or struggle with a task. To work at maintaining a high level of cognitive demand, teachers may provide necessary information and adequate support for student thinking and reasoning, build on students' prior knowledge, model high-level performance, and press for justification and explanation from students throughout the implementation of the task. In this way, the teacher allows a student to learn mathematics through higher-level tasks without "taking over the thinking" of the students.

Both prospective and practicing mathematics teachers may benefit from examining the levels of cognitive demand required by tasks in various textbooks. This activity helps dispel the myth that all textbooks are created alike. As a result, mathematics teachers may be more prepared to scrutinize their own textbook and possibly realize the need to increase the levels of cognitive demand of certain tasks. In addition, it is possible that prospective teachers with experience in analyzing curricula will be better prepared to assist in the selection of curriculum in their future careers, and less likely to examine only surface characteristics of textbooks. Ultimately, students will benefit from an increased mathematical understanding that comes from grappling with cognitively complex tasks.

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Appendix

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Dusty Jones • <dljones@shsu.edu>
Assistant Professor • Sam Houston State University

CAMT 2007 Volunteers

Dear Members of TCTM,

Volunteer to be a VOLUNTEER!

We believe that there is an opportunity for everyone to find their niche in helping CAMT to be a success for everyone involved – here's how you can join in on the efforts (we would love to have over 250 volunteers ready to go!). We are looking for fellow mathematics educators to assist us with supporting participants in areas such as the following: Registration, Exhibits, Speaker Check-In, or Transportation. Come work "behind the scenes." We need you! Please e-mail, telephone or fax your name and contact information (be sure to include contact information for the summer) to Paul Gray, along with which of the following dates you are available to volunteer, Wednesday June 27, Thursday June 28, Friday June 29, or Saturday June 30. Specify if morning or afternoon is best and which area you prefer. Paul will respond via e-mail or home phone with a specific scheduled time and location.

Thank you for making every CAMT a wonderful experience!

Volunteer Information

Name:	Last	First	Middle
Address:	Number and street		Apt. number
	City	State	Zip Code
Contact:	( ) Home Phone	( ) Cell Phone	Email Address
Affiliation:	District or Professional Affiliation		ESC

Please submit your form to Paul Gray,

by mail: **Paul Gray,**
Region 4 Education Service Center
7145 W. Tidwell
Houston, TX 77092

by fax: **(512) 232-1855**
ATTN: Paul Gray

by email:
< pgray@esc4.net >

TCTM Leader Spotlight

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. This person is honored for his/her contributions to the improvement of mathematics education at the local and state level by designing innovative staff development and/or promoting their local mathematics council. The second award, the E. Glenadine Gibb Achievement Award, is presented to someone nominated by a TCTM member for his/her contribution to the improvement of mathematics education at the state and/or national level. 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 this year, please see the forms on our website at *<www.tctmonline.net>*.

Our prior awardees are

Year	Leadership(local/state)	Gibb (state/national)
1995	Mary Alice Hatchett	Iris Carl
1996	Bettye 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

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Air Coasters

The Futures Channel website offers lessons on Algebra in the Real World along with many other topics (for example Hands-On Math). Video clips are also available to be viewed as a launch for these lessons. We have selected the following example related to roller coasters as a lesson that could be easily modified for the grades 6 through high school course TEKS by our Texas teachers. Be sure to check out the video clip at

<www.thefutureschannel.com/dockets/algebra/roller_coasters/>

Other lessons related to this clip are The Drop (algebraic equations and expressions, grades 6-12) and Roller Coasters (algebra, polynomial equations and functions, grades 9-12). Enjoy!

– The Editor

Teaching Guidelines

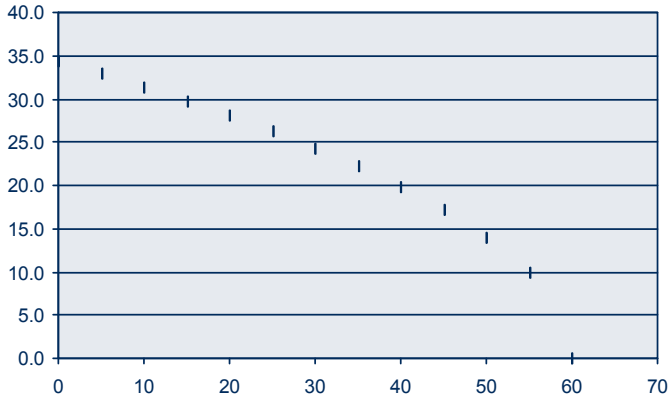
Subject: Mathematics
Topics: Algebra, Coordinate Systems, Patterns, Relations and Functions
Grades: 6 - 12
Knowledge and Skills

- Can plot a point in a two-dimensional coordinate system, given the coordinates, or determine the coordinates of a given point
- Can find a "best-fit" equation as a model for a relationship, given a set of data points

Materials: None
Procedure: This activity is best done by students individually or in teams of two.

Distribute the handout and discuss the instructions. (Begin by asking students if they can explain what the diagram represents.)

The graph that students make should look something like this.



To test the given equations, students can plug in one pair of h and v values to find a value of k, then use that value to graph the equation and see how well the resulting curve matches the other data points on their graph.

Alternatively, and as a method of investigating the behavior of these equations more thoroughly, you might wish to ask students to graph a family of equations for different values of k, and in that way determine the value of k that creates a curve that most closely matches their data for each type of equation. For such an investigation, it is suggested that students use graphing calculators or spreadsheet software to create the graphs.

Air Coasters Handout

To: Performance Analysis Chief
From: Design Team Manager

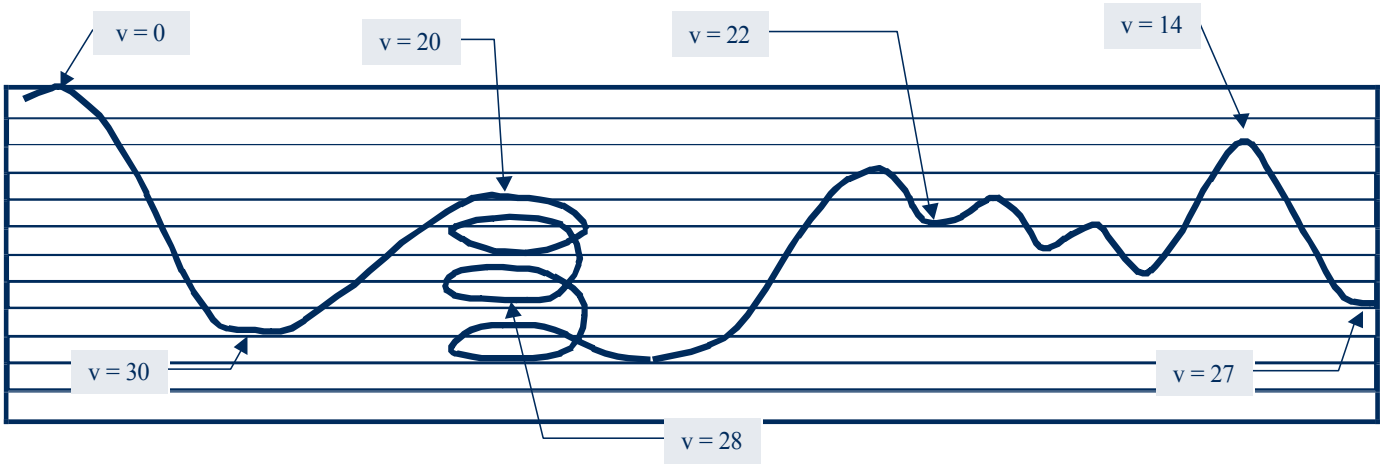
Luis, here is the data we collected on our last test run on the frictionless coaster. As usual, let's plot the velocity versus height.

The highest point in this test run was 60 meters, and the grid lines below are 5 meters apart. Velocities are in meters per second.

In order to compare the actual performance against what we predicted, the project physicist wants you to try to match the data to one of these equations, and let him know which has the closest match, and the value of "k."

Have fun!

Tina



We Need Leaders!

by Francis (Skip) Fennell
President, National Council of Teachers of Mathematics

Like NCTM itself, many Affiliates are in search of leaders. Our challenge is ongoing. We all, NCTM included,* need to attract new members and leaders, invest them in our respective Affiliates, and keep them engaged. I get tired of conversations with former NCTM members who say they grew dissatisfied with their Affiliate or with NCTM. We all need to look into a mirror! How did we lose these members? Members keep us going. Members support our conferences, our publications, and eventually become our leaders. We need to find and develop new leaders, but how do we do this?

Connecting. The first step toward increasing membership and developing leadership is getting connected to an organization. This means NCTM Affiliates need to actively pursue potential members. How? Locate potential new members who are new to your department or your school. Be creative. Get the list of new teachers, teacher educators, or leaders in your area. Send them an e-mail. Visit them personally. Then encourage them to come to one of your meetings. Okay, let's be more direct—drive them to the meeting yourself. Share your publications with a new colleague. Recruiting members is not a passive act. In short, pursuit is good. Make sure to talk about why your own involvement in an Affiliate is important to you—whether it is the annual conference or their publications that you value, or the camaraderie that grows from such involvement.

Engaging. Once we find new members, the challenge is to engage them in the work of our Affiliate. This could be assisting at the annual conference, helping to edit the group's newsletter or journal, or serving on Affiliate committees. The analogy to teaching is important. Recruitment of new members is important, but retaining them may be even more important. Teacher retention is a challenge all across the country. Your challenge, as an Affiliate, will be to find ways to engage your newest members. All too often Affiliates, even our most effective ones, can give the appearance of an "old boy or girls club" that is very hard to get into. We need to change this image of a closed network unwelcoming to newcomers.

Leading. Here's the challenge for all of us. We all need new leaders. We need to find a way to encourage and promote new Affiliate leaders, as well as a way to ensure a diverse leadership pool. This diversity should include race, ethnicity, gender, and age, as well as teaching level (elementary, middle, and high school, and college or university). We know that although experienced (dare I say older!) Affiliate leaders help keep things moving, meet deadlines, and get things done, but such well-established leadership can sometimes also present challenges with regard to their willingness to move forward, take risks, and involve others.

What to do? In one sense we all need to keep our established leaders and simultaneously develop new ones. An analogy to teaching is relevant. Affiliates need to find ways to create new leaders, and mentoring offers one way to begin the process. Just as new teachers benefit from working with mentor teachers, Affiliates will benefit from using experienced leaders to mentor emerging leaders. For instance, we could create Affiliate teams of both experienced and emerging leaders in positions that require conference planning, committee assignments, or publication editorship.

Affiliates need to connect with potential members, engage them in the work of the Affiliate, and find ways to nurture their development as leaders. Although these stages involving membership and active participation in the Affiliate can lead to leadership, let us not forget the important contributions of our established leaders. We also need to recognize their contributions and continue to engage these experienced leaders in the work of the Affiliate in meaningful ways.

Sincerely,

Francis (Skip) Fennell
President

- Note: At this writing, an NCTM task force is working on the challenges of leadership development within the Council.

Editor's Note: For more information see <*www.nctm.org*>

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. Our current website archives the more recent journals in PDF format. Please see *<www.tctmonline.net>* if you wish to view prior issues.

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

Our reviewers for 2006-07 have been **Rita Tellez, Cindy Schimek, Tony Martinez, April Chauvette, Linda Shaub, Tim Pope, Maryann McDaniel, Tricia Rothenberg, Jacqueline Weilmuenster, Barba Patton, Susan Green, David Hughes, Eric Aurand, Larry Lesser, James Epperson, Juli Ratheal, Sherri Jones, Roberto Castenada, Janice Bradley, Barbara Tharp. Bill Jasper, Judy Beauford, John Huber, Pam Littleton, Thomas Butts, Alicia Torres, Jo Ann Wheeler, Trena Wilkerson, Linda Shaub, Carol Lindell, and Lisa Brown**. We wish to thank all of these members for contributing time and expertise to making this publication a useful and informative journal.

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 $300.00, quarter page $200.00.

All advertisers must adhere to the following guidelines:

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

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

2007 CAMTerships Available

There are twelve $500 CAMTerships available for 2007. 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 recieved by May 1, 2007**. If selected, you will also volunteer two hours at CAMT and attend the TCTM Recognition Breakfast as a guest of TCTM.

TEA Talks

Hot News

For additional information, refer to the websites listed

- **New Graduation Requirements (4 X 4)** Begins with students entering high school in 2007-2008 and requires four years of English, Social Studies, Science, and Mathematics.

- **New Recommended High School Plan for Math** Requires four credits, three of the credits must be Algebra I, Algebra II, and Geometry. The fourth credit may be:
  - Mathematical Models with Applications-may not be taken after Algebra II; however, it may be taken concurrently with Algebra II
  - Precalculus
  - Independent Study in Mathematics
  - Advanced Placement Statistics
  - Advanced Placement Calculus AB
  - Advanced Placement Calculus BC
  - IB Mathematical Studies
  - IB Mathematics Standard Level
  - IB Mathematics Higher Level
  - IB Advanced Mathematics Standard Level
  - AP Computer Science
  - Concurrent Enrollment in College Courses

- **New Distinguished High School Plan for Math** Requires four credits, three of the credits must be Algebra I, Algebra II, and Geometry. The fourth credit must have Algebra II as a prerequisite. Math Models and AP Computer Science cannot be used as the fourth credit.

- **Secondary Math Textbook Timeline**
  - 2006-2007: Adoption Year for MS and HS
  - November 2006: SBOE approved list of conforming and nonconforming textbooks
  - 2007-2008: Textbooks scheduled to be in classrooms
  - Proclamation 2004 is the SBOE's procedure for adopting secondary mathematics instructional materials. However, funding for any proclamation is a decision made by the legislature.
  - The status of funding for Proclamation 2004 will be determined during the current regular session of the legislature, which is scheduled to adjourn May 28, 2007.

- **Elementary Math Textbook Timeline**
  - 2007-08: Adoption year for K-5
  - 2008-09: Textbooks scheduled to be in classrooms
  - Proclamation 2005 is the SBOE's procedure for adopting elementary mathematics instructional materials. However, funding for any proclamation is a decision made by the legislature.
  - The status of funding for Proclamation 2005 will be determined during the current regular session of the legislature, which is scheduled to adjourn May 28, 2007.

- **Alignment of TAKS Grades 6-11 Math Tests to Refined TEKS.** The spring 2007 tests will not assess skills/concepts that have been removed from the TEKS, i.e. narrower focus, limitations, etc. The spring 2007 tests will assess skills/concepts that contain clarified language or are unchanged. The spring 2007 tests may include field test items that assess additional skills/concepts. The spring 2008 tests may include live items (for accountability) that assess additional skills/concepts.

- **Alignment of TAKS Grades 3-5 Math Test to Refined TEKS**. The spring 2007 tests will not assess skills/concepts that have been removed from the TEKS, i.e. narrower focus, limitations, etc. The spring 2007 tests will assess skills/concepts that contain clarified language or are unchanged. The spring 2008 tests may include field test items that assess additional skills/concepts. The spring 2009 tests may include live items (for accountability) that assess additional skills/concepts.

- **Revised TAKS Math Charts**. In December 2005, the Student Assessment Division of the Texas Education Agency gathered feedback from Texas educators on the refined TEKS student expectations and suggested changes to the TAKS mathematics charts for grades 6–10 and exit level. As a result of educator input, there are some minor revisions to the TAKS mathematics charts for these grades based on the TEKS refinements. The revised TAKS math charts for grades 6-10 and exit level will be shipped to districts for use beginning with the April 2007 administrations. These revised charts will also be printed in students' test booklets for the April administrations. Be sure to use the revised TAKS math charts for grades 6-10 and exit level during the April 2007 TAKS administrations. You can recognize these revised charts because they have the TAKS logo in the top left-hand corner. The revised TAKS math charts for grades 6-10 and exit level can be found on the TEA website at: *<www.tea.state.tx.us/student.assessment/taks/math/>*.

- **TAKS Information Booklets.** TEA is currently revising the TAKS Information Booklets to align with TEKS refinements. The TAKS Mathematics Information Booklets for grade 6-10 and exit level will be posted online in spring 2007. The TAKS Mathematics Information Booklets for grades 3-5 will be posted online in fall 2007.
- **Online TAKS Testing** The following tests are offered in both paper-and-pencil and online formats.
  - Spring 2007 TAKS grade 7 math and reading
  - Spring 2007 TAKS grade 8 math, reading, social studies, and science
  - Spring 2007 TAKS grade 9 math and reading
  - Spring 2007 TAKS grade 10 math, ELA, social studies, and science
  - July 2007 TAKS exit level math, ELA, social studies, and science

Julie Guthrie • <Julie.Guthrie@tea.state.tx.us>
Director of TAKS Math & Science •
Student Assessment Division • Texas Education Agency

- **End-of-Course Exams.** The following exams are offered online only.

	Spring 2007	Spring 2008	Spring 2009
Algebra I	EOC Exam	EOC Exam	EOC Exam
Geometry	EOC Field Test	EOC Exam	EOC Exam
Biology	EOC Field Test	EOC Exam	EOC Exam
Chemistry		EOC Field Test	EOC Exam
Physics		EOC Field Test	EOC Exam
U.S. History		EOC Field Test	EOC Exam

Norma Torres-Martinez •
<norma.torres-martinez@tea.state.tx.us>
Director of Mathematics • Texas Education Agency

FEATURE

TCTM Recognition Breakfast at CAMT 2007

Saturday, June 30, 2007, 6:30 a.m. - 8:00 a.m.
Marriott Rivercenter Hotel

Award recipients and board members will be recognized at the breakfast, along with a door prize drawing. Admittance to the breakfast is for TCTM members only and is not included with membership or CAMT registration. We regret that children or other guests cannot be accommodated. You must register and pay your breakfast fee in advance through TCTM. The registration form and payment instructions for the breakfast are below. Admittance at the breakfast is limited by the room size and catering contract which must be finalized before the conference, so please **register by the deadline of May 1, 2007**. Your e-ticket for the breakfast will be e-mailed to you no later than June 1.

Member Information

Name: Last | First | Middle

Address: Number and street | Apt. number

City | Zip Code

Phone : Home Phone | Cell Phone | Email address

Affiliation: District or Professional Affiliation | ESC

☐ Enclosed please find my $15.00 check, payable to TCTM, for the breakfast.

Please mail your check and form to **Jo Ann Wheeler, 7145 West Tidwell, Houston, TX 77092**

Decimating the Decimal Dilemma through Lesson Study

Lesson study, the prominent method of professional development for teachers in Japan, entails "practitioner" teachers becoming researchers who collaboratively spend an extensive period of time setting goals, investigating curriculum, planning a unit and research lesson, observing the teaching of the research lesson, gathering data pertaining to student learning, revising the research lesson, teaching and observing the revised lesson, conducting another revision of the research lesson all in an effort to increase student learning of some difficult concept. The process ends with a lesson study group writing a final report about the experience in an effort to share with other teachers lessons based on student learning. Lesson study is not about producing the "perfect" lesson. Rather it is a process that promotes reflective teaching practices. The spirit of lesson study is to evaluate the lesson, not the teacher (Stigler & Hiebert 1999, Lewis 2002, Takahashi & Yoshida 2004). Thus, this article has a two-fold purpose: 1) to increase Texas teachers' awareness of the process of lesson study as professional development, and 2) to disseminate the product of a lesson study that was devoted to increasing fifth grade students' understandings of the connection between fraction and decimal concepts.

The beginning step in lesson study is to set a goal from which the research theme can be identified. Since lesson study can be conducted by teachers of any discipline, the goal is usually a long-term societal one that expresses the mission of a school or desires of a group of teachers. First teachers list the characteristics or skills they want to see in their students upon leaving the school. Next the lesson study group outlines what characteristics or skills students currently possess. By looking at the gap, the lesson study group can set a long-term societal goal that will be worked toward through the study of a challenging content topic. For this lesson study group, consisting of the authors, the long-term societal goal was for fifth grade students to cultivate better communication skills.

The second step in lesson study is to investigate curriculum. In its initial stage, investigating curriculum assists in formulating the research theme, too, as it pinpoints the content topic from which the long-term societal goal will be addressed. This lesson study group began by looking at the fifth grade Texas Essential Knowledge and Skills (TEKS) for mathematics and decided that concepts involving rational numbers was a hurdle for students in their understanding of number. Subsequently this component extended to reading articles about student learning of rational number concepts – one of which analyzed responses to fraction and decimal questions given as part of the Third International Mathematics and Science Study (TIMSS) multiple-choice assessment. The analysis revealed the "decimal dilemma," that is, why is decimal understanding weaker than fractional understanding in U.S. students at the third and fourth grade levels (Glasgow et.al. 2000).

To see if students in local schools exhibited the same characteristic of weaker decimal understanding than fraction understanding, the questions from the TIMSS test addressed in the article were administered to third, fourth, and fifth grade students enrolled in an elementary school in West Texas. When the outcome was the same, the group ascertained that connecting fraction and decimal concepts was problematical for fifth grade students and would serve as the subject matter from which the long-term societal goal would be addressed. Now after setting the goal and conducting an initial investigation of curriculum, the research theme emerged: if students are taught fraction and decimal concepts through an integrated approach that required students to communicate their reasoning about rational numbers, then their understandings of the multiple representations of rational numbers would increase, which in turn would deepen their understandings of rational numbers.

Continuing with the investigating curriculum stage, national standards were reviewed and more articles read. Principles and Standards for School Mathematics (National Council of Teachers of Mathematics [NCTM] 2000) emphasized students' understanding of various representations and relationships when teaching rational numbers to students in grades 3-5 (NCTM 2000). Looking at curriculum below the grades 3-5 level, the group saw that representations of number began when children

first learn the Hindu-Arabic system and encounter three distinct representations, i.e. number (abstraction or idea), numeral (the symbol representing the number), and name (the word representing the number). These representations associated with a value can be displayed in a triangular model like the one displayed in Figure 1 (Musser, Burger, & Peterson 2003).

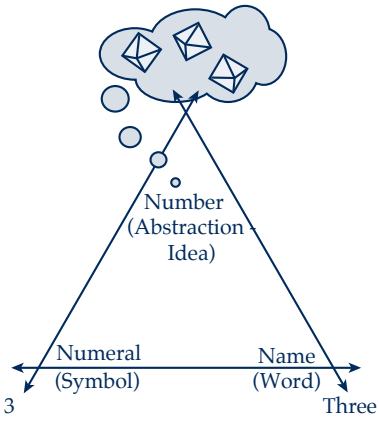


Figure 1. Counting Number Representations

Reflecting on the readings, this lesson study group surmised that just as children in grades PreK-2 learn to "connect number words and numerals to the quantities they represent, using various physical models and representations" (NCTM 2000, p. 78), students in grades 3-5 extended this triangular model for counting numbers to rational numbers represented as fractions (Figure 2). Then the triangular model appeared again when rational numbers were represented as decimals (Figure 3). Ultimately, as students progress in their learning of rational numbers, they must extend to connect fraction and decimal representations and to convert from one form to the other (Figure 4). Since the models for rational numbers' representations grew more complex from grades 3 to 5, the lesson study group decided to focus on building understanding for the connections depicted in the model in Figure 4. This figure necessitated instruction based on an integrated approach in lieu of teaching fractions and decimals as separate topics.

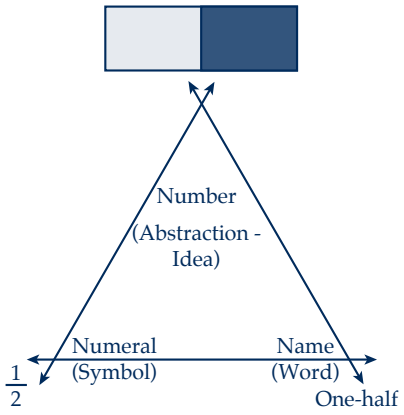


Figure 2. Rational Number Representations: Fraction

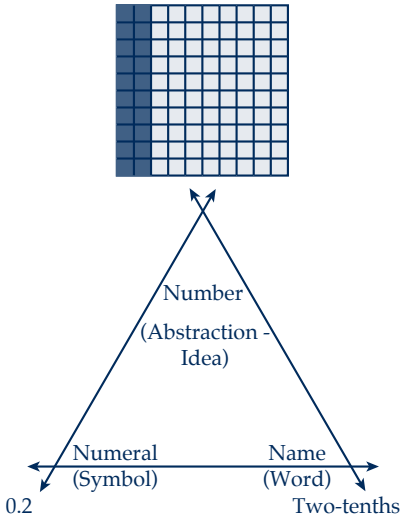


Figure 3. Rational Number Representations: Decimal

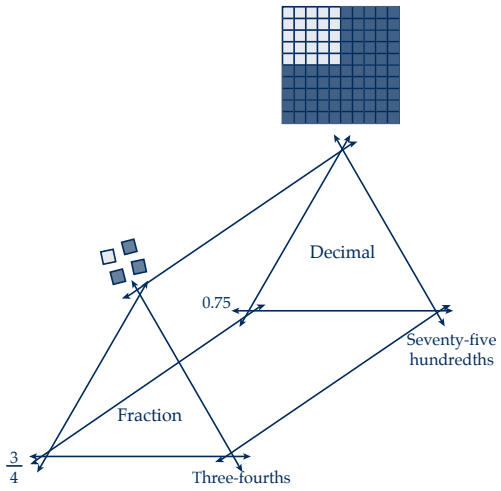


Figure 4. Connecting Rational Number Representations

Since Texas has standards-based accountability testing, the lesson study group made an adaptation to the lesson study process by writing an assessment based on the TEKS. This adaptation had the premise that if students can provide satisfactory answers to the questions on the group's assessment, then students would be able to answer questions related to fractions and decimals on the state's accountability test (Charles A. Dana Center 1999). Also, the assessment included questions that addressed the social goal of developing better communication skills. For example, students were asked to explain why a dime was 1/10 of a dollar and how fractions and decimals were related, etc.

Influenced by past experiences in teaching students entering the fifth grade, the group made the assumption that students had little or no practice using concrete materials to help build visualization of rational numbers. Those students who had some familiarity with fraction models were limited to working with area models, in particular circles and rectangles. In addition, students' understandings of the division algorithm, which is one method used to change a fraction to a decimal, was procedural. Therefore, the developed unit included lessons that concentrated on conceptual understanding of rational numbers and the processes of changing from one representation to another. Next a description of each lesson in the unit is given.

Components of the Lesson Study Unit

Lesson one addressed "number" and was designed to help students develop a visualization of rational numbers expressed as fractions. Manipulatives (including white boards with dry erase pens and erasers) were available to students in groups of four. As the teacher called out a fraction, each group member modeled the fraction using a manipulative of choice with each student using a different manipulative. The social goal was addressed by asking students to verbally justify why the model represented the given fraction.

Since fifth grade students seldom modeled fractions using a number line, *lesson two* introduced this model using Cuisenaire® Rods. This lesson attended to the symbolic representations of rational numbers by asking students to build a number line model of a fraction based on its symbolism. For example, if the brown C-rod is $\frac{2}{3}$ of a whole, then what is the whole? If the blue C-rod is $\frac{3}{2}$ of a whole, then what is the whole?

Earlier in the school year, students modeled decimals using base 10 blocks. *Lesson three* built on this experience as it initiated thinking about representing rational numbers as both decimals and fractions. Each group of students was told a particular rational number to model using base 10 blocks. Denominators were limited to tenths and hundredths. Then students, walking from table to table, wrote the modeled rational number in its symbolic representations communicating it as a decimal and a fraction. Again, justification of an answer was expected.

Lesson four was similar in content as it required students to represent rational numbers in place value quantities of tenths and hundredths as fractions and decimals. However, the visualization was depicted differently from the one in lesson three as the manipulative changed. Fraction circle pieces were sorted by students, and each fraction circle piece was expressed as a fraction. Next students represented each piece in its equivalent decimal representation through concrete means by aligning the center of a circle made from a transparency, one divided into tenths and another divided into hundredths (Figure 5) with the center corner of a fraction circle piece. See Figure 6. Students justified their fraction and decimal names by concentrating on the part to whole relationship. Then each model was represented symbolically as a fraction and a decimal. After students were proficient using the tenths and hundredths circles as a resource for decimal representation, a "decimal circle" depicting both tenths and hundredths on one transparency with no labeling (Figure 7) was introduced.

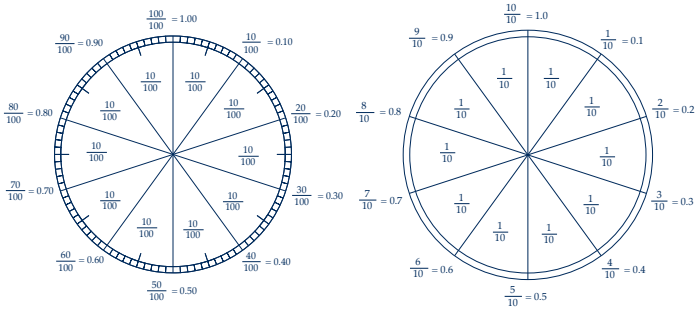


Figure 5. Tenths and Hundredths Circles

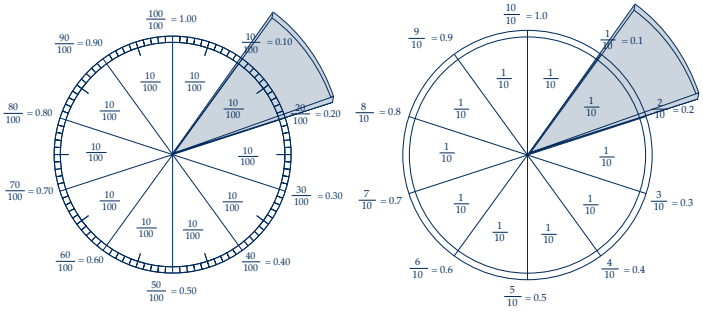


Figure 6. Alignment of Fraction Circle Piece

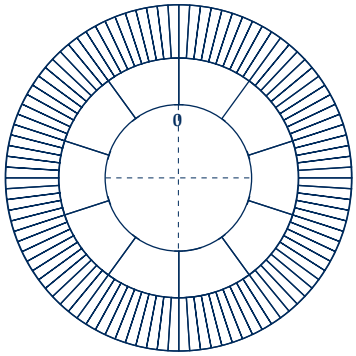


Figure 7. Decimal Circle

Lesson five concentrated on visualization of rational numbers as fractions and decimals on a number line. Fifth grade students lack the dexterity that is needed to mark off a whole into equal parts. Thus, to assist them in drawing number line models, a fraction manipulative with a straight edge was utilized. See Figure 8. Students drew line segments along the straight edges of the top and bottom of the manipulative, extended each line segment, and added arrows at both ends, thus forming two number lines. Using the length of the manipulative as the unit, they marked 0 and 1 on each number line then lengthened the equally-spaced vertical line segments on the manipulative to mark off each number line into equal portions. To connect the visualization of a rational number on the number line with its symbolic representations, each number was labeled using fraction symbolism on one number line and decimal symbolism on the other. Again, all representations were in a place value quantity – tenths.

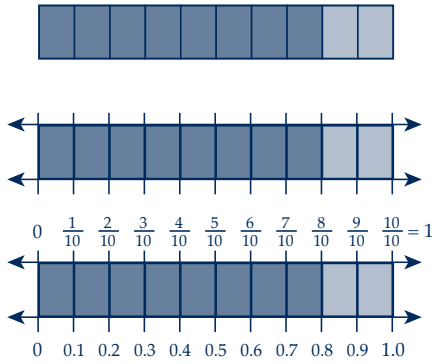


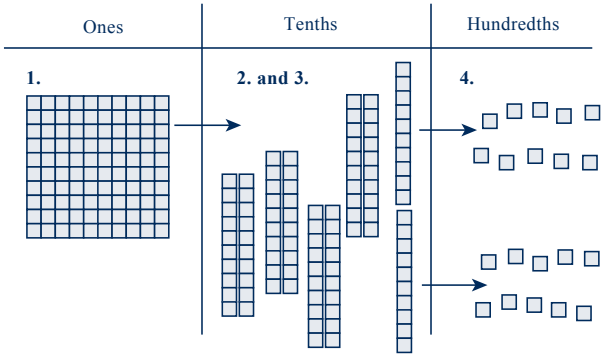
Figure 8. Fractions and Decimals on Number Line Models

Lesson six extended rational number representation to wholes that were not divided into place value quantities. Students were asked, "What is the decimal representation for $\frac{1}{4}$?" At this point, students were moved from a visualization of representing a rational number as a fraction and decimal to a process of changing from one form to another. This process focused on using a pattern/ratio table (Figure 9) and the concept of equivalency to change from one form to another (Middleton & van den Heuvel-Panhuizen 1995). During this lesson, students were allowed to encounter situations where a fraction cannot be converted to tenths or hundredths as in $\frac{3}{6}$. However, they discover that if they "undo" the multiplication process applied in finding equivalent fractions and use division of common factors to change $\frac{3}{6}$ to its simplest form of $\frac{1}{2}$, then $\frac{3}{6}$ can easily be converted to a decimal. Other fractions they investigated were ones that did not have an equivalent representation with a denominator of 100 such as the fraction $\frac{1}{3}$. Students concluded that $\frac{1}{3}$ does have a decimal representation, but its value was approximately 0.3 or 0.33 since a denominator of 100 could not be reached. This method of converting a fraction to a decimal via a pattern/ratio table gave students who were not proficient in long division another tool to use when making this conversion.

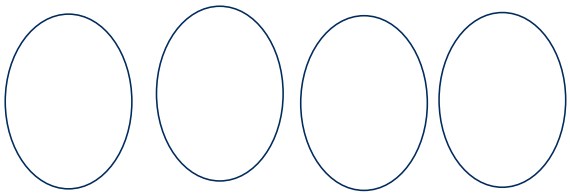
1	2	3	4	5	6	···	20	21	22	23	24	*25*	
4	8	12	16	20	24	···	80	84	88	92	96	*100*	
1	2	*3*	4	5	6	7	8	···	10	20	30	40	*50*
2	4	*6*	8	10	12	14	16	···	20	40	60	80	*100*
1	2	*3*	4	5	6	7	8	···	28	29	30	31	32	*33*
3	6	*9*	12	15	18	21	24	···	84	87	90	93	96	*99*

Figure 9. Pattern/Ratio Table

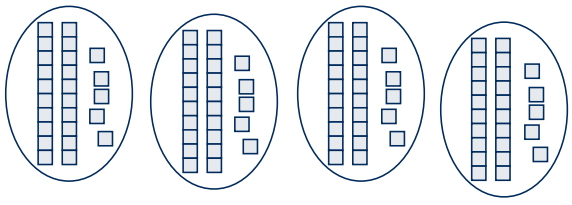
In *lesson seven*, students first explored the idea of changing a fraction to a decimal by conceptually looking at the division procedure. First base 10 blocks were used to model the long division algorithm using whole numbers. Emphasis was placed on the meaning of "bring down," that is, to exchange the present place value for the next lower one. Students then were asked if long division could be used as a process for converting $\frac{1}{4}$ to a decimal. Using base 10 models, they concluded that it could (Figure 10) and soon dropped the modeling preferring pencil and paper methods. Again the goal of developing better communication skills was emphasized as students were asked to explain their steps in performing the conversion.



Steps 1. and 2. 1 ÷ 4 (partition 1 into 4 groups); 0 "ones" can be partitioned into 4 groups; write 0 and decimal point (exchange 1 for 10 sets of 10)



Steps 3. and 4. 4 goes into 10 2 times (Ten "tens" can be partitioned into 4 groups – 2 tens in each group); multiply – 8 "tens" were used in total; subtract – 2 "tens" left; "bring down" 0 (exchange 2 "tens" for 20 "ones" and partitioned into 4 groups); 4 goes into 20 5 times (5 "ones" in each group)



1 ÷ 4 = 0.25

Figure 10.Modeling Long Division

Lesson eight was chosen by the lesson study group to be the research lesson. In it, rational numbers with its multiple representations, diverse models, and various processes to convert from one form to another would be encountered. Thus the group believed this lesson to be the most difficult since it integrated all previous lessons into one and could serve as an informal assessment of students' understandings of rational numbers. Also, the lesson included a four-part organizer that (Figure 11) served as a tool for students to depict models as well as symbolic and verbal representations of rational numbers (Gates & McNemar 2002).

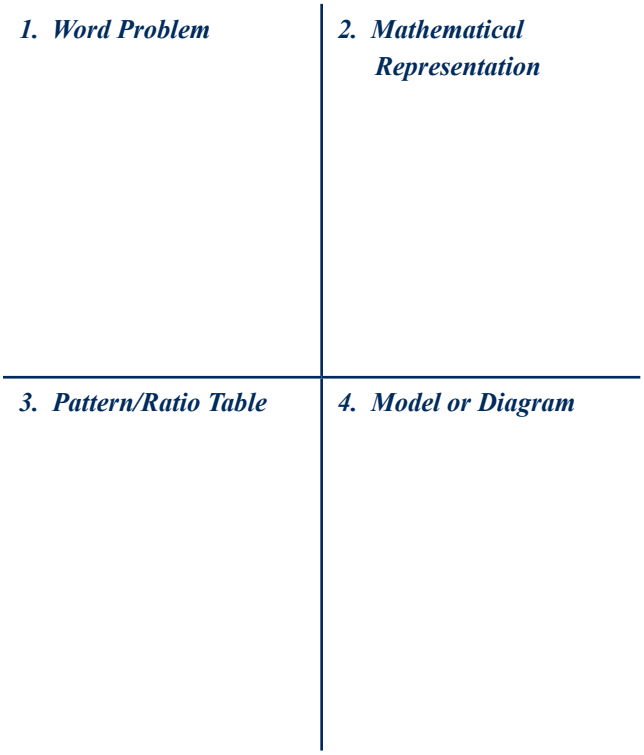


Figure 11.Four-Part Organizer

Lesson Study Research

After the research lesson was designed, the lesson was taught to a class of fifth grade students and observed by others who gathered data pertaining to student learning. Observers were admonished not to interfere with the natural flow of the lesson but to become extra sets of eyes and ears for the teacher. The teaching/observing session was followed by a debriefing. First the teacher of the lesson and members of the lesson study group stated their views of the lesson. Following this, visitors (education professor and curriculum consultant from regional service center) made comments concerning the lesson. As previously mentioned, the emphasis in this stage was not to evaluate the teacher but to focus on the lesson and what students learned from the lesson. Subsequently, the group revised the lesson based on the analysis of what occurred during the first

teaching. Then the lesson was taught again to another fifth grade class with another debriefing and revision.

During the teaching of the research lesson, the top left part labeled "Word Problem" presented one complication. Here a problem involving a rational number was posed and students drew their model of choice to represent the fraction stated in the problem. However, data gathered during the teaching of this lesson indicated that students still tended to draw area models – preferring a circle or rectangular model, even when the problem related more to a set model. In the revision, students were told to view their minds as video cameras and to draw what the camera was recording. Posed with this terminology, students switched their area models to a set model that more appropriately matched the context of the problem (Figure 12).

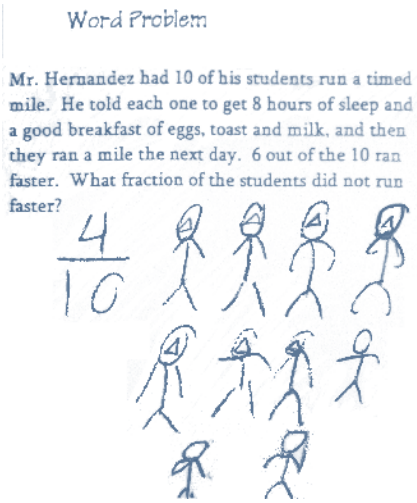


Figure 12. Student Work - Modeling Fractions

Another point based on the analysis of the gathered data occurred in the section labeled "Mathematical Representation" (Figure 13). First, students wrote the rational number that was the answer to the posed problem using fraction symbolism. Then, they changed the number to its decimal representation by performing long division. Next, they wrote a language representation for both. Many of the students wrote "four tenths" or "forty hundredths" as an expression of the symbolism for the decimal, but wrote "four out of ten" for the fraction. As a result, more emphasis was placed on vocabulary in the revision as teachers felt their terminology of stating "four out of ten parts are shaded" instead of "four tenths of the whole is shaded" contributed to this outcome.

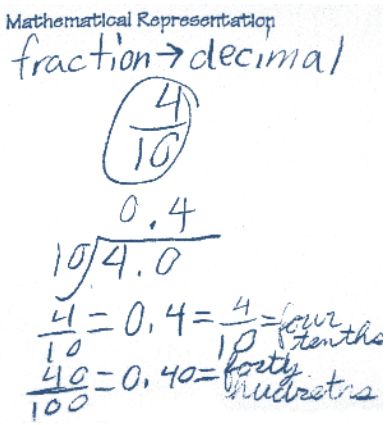


Figure 13. Student Work - Mathematical Representations

The bottom left part labeled "Pattern/Ratio Table" reminded students that another method for changing fractions to decimals existed (Figure 14). However, instead of using long division, the students used equivalent fractions and patterns in a ratio table. An analysis of the data collected concerning this part of the lesson indicated that almost all students were able to change a fraction to a decimal using the pattern/ratio approach, but several had difficulty performing the long division algorithm. In the revision, the Mathematical Representation and Pattern/Ratio Table of the four-part organizer was switched so that students who had difficulty changing a fraction to a decimal using long division achieved success in performing this conversion to another rational number representation.

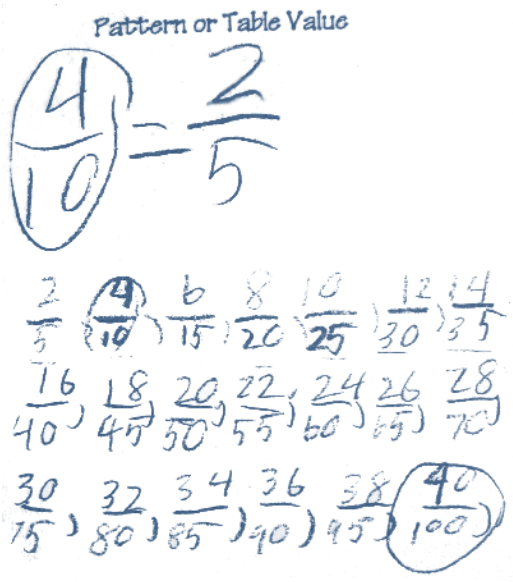


Figure 14. Student Work - Pattern/Ratio Table

The section entitled "Model" provided a space for the visualization of the rational number. Students demonstrated number line and circle models for both fraction and decimal symbolism (Figure 15). All manipulatives were available if students needed them to draw their models. During the first teaching of the lesson, students were given the transparency decimal circle shown in Figure 7. Three barriers to student learning happened. First students had not seen a decimal circle of any type before this lesson and the introduction of a new tool when dealing with all the multiple representations of rational number proved to be a major stumbling block. In the revision, another lesson was added to the unit, lesson four, and the decimal circle was introduced gradually – first as two different circles, one depicting tenths and the other hundredths (Figure 5). Then at the conclusion of the lesson, the decimal circle seen in Figure 6 was presented. A second hindrance came from the teacher who instructed the students to place the fraction circle piece on top of the decimal circle and to align its center corner to the center of the circle. After experiencing trouble with seeing the center of the decimal circle, the lesson study group learned from the students a better set of instructions as students promptly reversed the process laying the decimal circle on top of the fraction circle piece. Thus, in the revision, the instruction was changed. The third obstacle came when students, after placing the decimal circle on top of the fraction circle piece modeling $\frac{1}{3}$, stated that the decimal representation for $\frac{1}{3}$ was a "little less than thirty-hundredths." This occurrence was unexpected by the lesson study group, and they quickly saw the mistake. For the first teaching, a similar circle from the middle school curriculum, *Mathematics in Context* (National Center 1998), was enlarged onto transparencies. Distortion occurred when making the enlargements. In the revision, a decimal circle was drawn in *Geometer's Sketchpad* and scaled to correctly align with the fraction circle pieces (Figure 16). Students' decimal circle transparencies were then copied directly from the Sketchpad drawing.

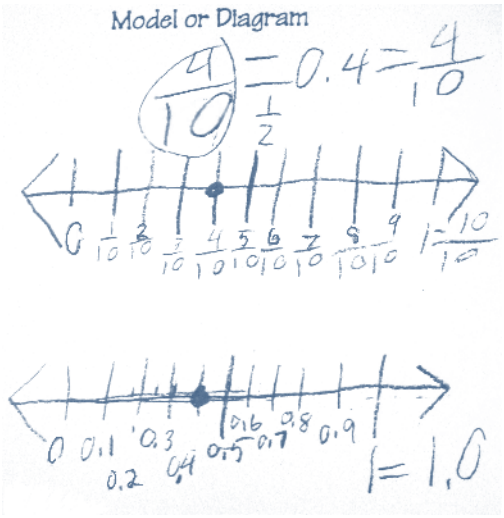


Figure 15. Student Work - Model or Diagram

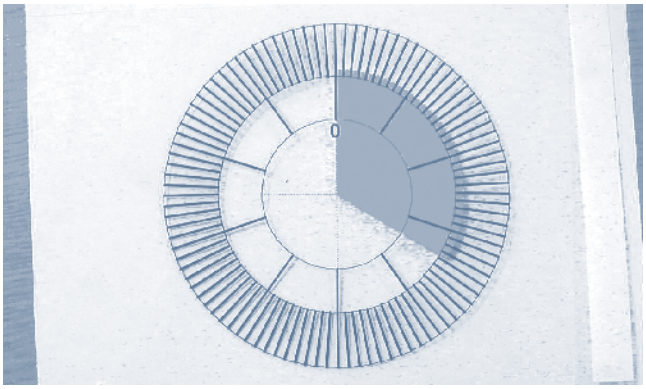


Figure 16.

An analysis of the pre- and post-test assessments indicated that lesson study students did increase in their understanding of the multiple representations of rational number and in their communication skills. However, the results also brought about another revision in the teaching of this unit. A comparison of the assessment results from two fifth grade classes at the same school (a lesson study class and a non-lesson study class each with 19 students) indicated that the non-lesson study group had more knowledge of rational number one month before the teaching of the unit than the lesson study group. However, three months after the teaching of the unit, the lesson study class outperformed the non-lesson study class on all unit-related questions (see Appendix). In addition, lesson study students were more apt to attempt the written response portion of the assessment than non-lesson study students. Many non-lesson study students wrote a question mark sign (?) as a response to questions requiring an explanation. On the other hand, the majority of lesson study students described

a relationship between fractions and decimals in terms of equivalent forms for the same number; whereas, those non-lesson study students who did respond were more likely to cite part to whole or place value concepts. Thus, future teachings of this unit by teachers in the lesson study group reiterated the part to whole concept as well as equivalency and symbolic meaning of the fraction bar as division.

The process of lesson study is time-consuming as it is a year-long process. Initially this group met at the professor's office every other week for approximately three months, meeting for as long as two hours, as goals were set, investigation of curriculum conducted, and research lesson as well as the unit were planned. Immediately following the teaching of the research lesson in a participant's classroom, a one-hour debriefing of data collected by the group and outside observers was held at the school. Within one week the group met again at the professor's office to revise the research lesson based on the debriefing summary. During the revision process, plans were made for another classroom teaching, observation, and debriefing as the cycle continued. This particular lesson went through 5 or 6 revisions before becoming the final product described in this article.

In conclusion, lesson study provided a professional development opportunity that compelled participating teachers to enhance their content knowledge, to reflect on current teaching practices of fraction and decimal concepts, and to set the goal of "decimating the decimal dilemma." This group has conducted other lesson studies funded by Texas Teacher Quality Grants and are formally known as the Lone Star Lesson Study Group. This expansion supplied a means for teachers throughout the region, by participating in lesson study, to work collaboratively to research student learning of difficult topics in the natural setting of their classrooms.

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Appendix: Comparison of Percent Increase of Students who Demonstrated Competency from Pre-Test to Post-Test

Assessment Items given to Fifth-Grade Students at Same School	Lesson Study Class	Non-Lesson Study Class
Question #1: Number line, number between 1 & 2		
• fraction symbol	61.1	-15.5
• decimal symbol	65.2	29.3
• fraction word	32.8	23.3
• decimal word	-5.9	-16.9
Question #2: Number line, number between 2 & 3		
• fraction symbol	26.5	14.3
• decimal symbol	21.1	14.6
• fraction word	4.6	36.5
• decimal word	15.8	-0.3
Question #3: Area (Base 10), number between 0 & 1		
• fraction symbol	25.1	6.4
• decimal symbol	40.7	6.4
• fraction word	44.1	24.6
• decimal word	62.5	24.3
Question #4: Area (Circle), number between 0 & 1		
• fraction symbol	12.1	10.8
• decimal symbol	64.3	11.7
• fraction word	34.6	34.5
• decimal word	77.3	18.1
Question #5: Student Choice, Given fraction between 0 & 1		
• model	8.7	-4.4
• label	-17.4	10.5
• decimal representation	32.5	26.3
Question #6: Number Line, Given decimal between 1 & 2	71.2	
• model	70.2	20.1
• label	20.6	14.9
• fraction representation		3.2
Question #7: Application of concept-money		
• acceptable explanation	14.6	14.1
Question #8: Skills-fraction to decimal		
• acceptable explanation	52.0	21.1
Question #10: "Big Picture" Concept		
• acceptable explanation	21.3	3.2

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Voices from the Classroom

I Will Survive

The first and second halves of this lyric came from comments I have heard from several students and teachers, respectively, as they were gearing up again for the TAKS. You may sing it to the tune of the same-titled song by Dino Fekaris and Freddie Perren that was a #1 hit in 1979 for Gloria Gaynor.

While your performance may not win a Grammy (as Gloria Gaynor did for Best Disco Recording), I hope it yields some stress relief!

"I Will Survive" lyric © 2007 L. Lesser

At first I was afraid, I was petrified--
Thought I'd never pass that test before the day I died.
But then we spent so many months on a preparation path
Mostly focused on reading and math!
So now it's here, we drilled all year--
My pencils are sharp, and I will not fear.
I won't skip breakfast or a full night's rest--
I learned a lot for passing the test!

Go on now-- go, walk out the door--
We turned our scores 'round, we're not failing anymore!
Weren't you the test with stakes way up high?
You think we'd crumble or lay down and die?
Oh no, not I – I will survive:
As long as I know how to learn, I know my mind will thrive.
Multiple-choice can't show all that I know
But I'll survive, I will survive! hey hey

I don't see why a passing rate
Is the only thing they use to say who's doin' great.
It tempts us to focus on those near the line,
But could that leave some children behind?
Let us teach the way that's best--
And that's more than boring drills for a standardized test!
No quick fix or canned alibis--
Focus on good teaching and everyone can rise!

Go on now-- go, walk out the door--
We exceeded your chosen cutoff score!
Weren't you the test with stakes way up high?
You think we'd crumble or lay down and die?
Oh no, not I – I will survive:
I've learned I can function with our jobs on the line.
This test is but a week, there's more than that to teach
And I'll survive, I will survive! I'll survive!

A few of the participants at the Austin Area Council of Teachers of Mathematics Fall Conference in October 2006. Left to right: Karen Anders (Pflugerville ISD), Robb Wilson (Texas Instruments), Kit B'Smith (Pflugerville ISD and Presidential finalist), Catherine Collins (Pflugerville ISD winner of 2006 TCTM CAMTership), and Betty Neimann (Pflugerville ISD).

FEATURE

Mathematics for English Language Learners

The Texas State University System Mathematics for English Language Learners (TSUS MELL) project is a multi-year effort to develop instructional resources designed to increase the effectiveness of mathematics instruction for English Language Learners (ELL) in Texas K-12 schools. The MELL project is one of the six major components of the Texas Mathematics Initiative and is a partnership between the Texas State University System, its component universities and the Texas Education Agency. Educators from Texas State – San Marcos, Sam Houston State, Lamar, Angelo State, and Sul Ross Universities worked together to develop research-based instructional materials to help teachers raise the performance levels of ELL students.

Scores on the annual Texas Assessment of Knowledge and Skills (TAKS) show a consistent achievement gap between ELL students and other special population groups of students. The MELL project addresses this statewide need by providing instructional materials and professional development training for teachers. The MELL Project Director, Dr. Leslie Huling, guides this important effort, and is particularly proud of the Classroom Practices Framework, which contains six components necessary for success in mathematics by the English Language Learner. These six components are learning atmosphere and physical environment, instructional practices, mathematics content and curriculum, language practices, family and community involvement, and assessment of student learning. This framework, along with all copyrighted MELL products, is available free for educators on the MELL website *<www.TSUSMELL.org>*.

An additional MELL resource includes the Teacher's Guide to Teaching Mathematics for English Language Learners, developed by Dr. Bill Jasper *<jasper@shsu.edu>* and his team at Sam Houston State University, and is aimed at the TAKS objectives on the Exit-level Mathematics TAKS test. This detailed guide provides instructional strategies for helping ELL students, and focuses on the ten objectives on the exit-level test. Dr. Joyce Fischer *<JoyceF@txstate.edu>* at Texas State University – San Marcos and her team created a thorough list of Spanish resources and an analysis of professional development models. Another important resource from the MELL team includes the Quick Start Module, an on-line training program available for college credit through Sul Ross University. Additional resources are available on the TSUS MELL website.

The MELL project also involves professional development training, including six Critical Campus Partnership Summer Institutes that were held in 2006. Additional summer institutes are planned for 2007, involving partnerships between university educators and Region Education Service Center experts. An additional teacher's guide for middle school geometry and measurement, and a two-day MELL training module for service centers are currently being developed, with anticipated delivery before this summer. In addition, MELL sponsors an annual conference on Math for English Language Learners for teachers and university faculty. The 2007 MELL conference will be July 5-7 in San Marcos. Interested educators should visit the MELL website *<www.TSUSMELL.org>* or contact any of the key personnel on the MELL project.

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FEATURE

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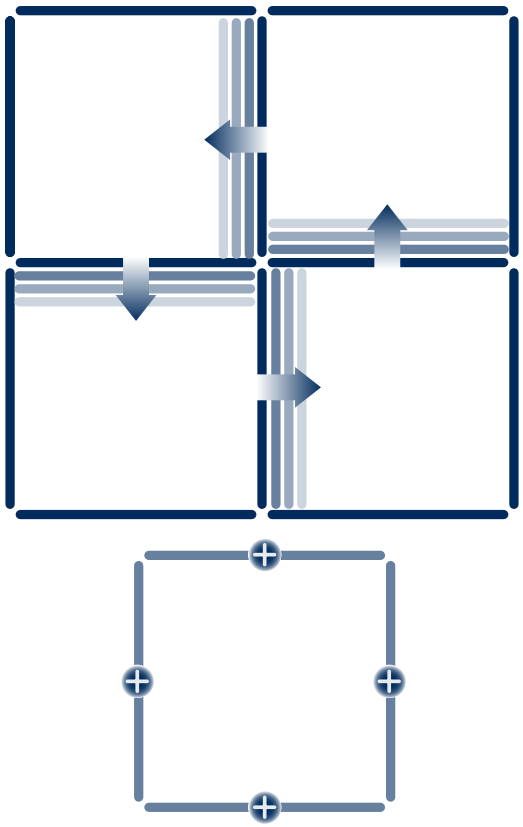
Puzzle Corner

Sticks #8 Answer

Arrange 12 craft sticks to form the original figure. Rearrange four sticks to form two squares.

Shown is a diagram of a solution.

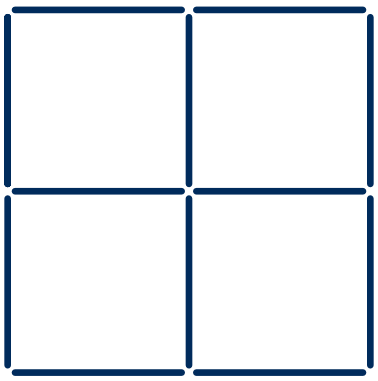


Sticks #9 Puzzle

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.



Remove four sticks to make three squares.

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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 by indicating this on your membership application. We will attempt to contact you via postcard if there is a crucial issue at hand. TCTM members that have e-mail and have not received e-mail messages from the president, Cynthia Schneider, in the last six months, should contact her immediately at <*cschneider@satx.rr.com*> or by phone at 512-475-9713. Also note, if your server is not accepting our messages due to security, we would like to work with you on this issue.

Voices from the Classroom

NCTM's Focal Points and the TEKS: Sharing a Professional Development Experience

In December, I finished a five-hour workshop with a group of about seventy teachers in the San Antonio area. They are a group of teachers that have been working together in an inservice teacher leadership project all year called the San Antonio Mathematics Collaborative which is funded by the Texas Teacher Quality Grant Program. They asked me to come and speak about National Council of Teachers of Mathematics *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics* (2006). I will refer to the book simply as the Focal Points in the remainder of this article. I was the Chair of the writing team for the Focal Points and have spent some time introducing them to groups around the country. I spent about an hour presenting the purpose, rationale, and process of creating the document.

Next I gave the teachers some time in small groups to look at the Focal Points carefully and make a list of questions they wanted to ask about it. One question arose that I had not heard before, "What does it mean when the words "fractions" and "rational numbers" appear in Grade 7 and earlier then disappear in Grade 8?" It really made us talk about getting students to learn and then move on -– that the focal points of Grade 8 assumed that the students had computation with fractions as a tool they could use – whereas many of these Grade 8 teachers were spending a lot of time on these computational procedures because students had not learned them yet.

After lunch, the teachers worked in grade-level groups to design some type of representation of how to apply the concept of focal points to the Texas curriculum. Since we just revised the TEKS, I thought it was important to focus on the concept of a focal point rather than the specific content. They spent about an hour doing this, and most of the grade level groups that were high school groups looked at Grades 6, 7, and 8 in the Focal Points. Their presentations were very thoughtful, but many made lists of small pieces of content that matched or didn't match between the TEKS and the Focal Points (similar to what Washington State has posted at *<http://www.k12.wa.us/assessment/wasl/Mathematics/pubdocs/NCTMFocalPtsGLEsCompared101306.doc>*). This was a good exercise for learning more about the Focal Points document. However, a couple of the groups observed that the Focal Points were not really written for identifying little pieces of content like we have in the TEKS, and one group even decided that they needed to look at the "left side" of the TEKS (the essential Knowledge statements, that are rarely looked at) to be able to compare the TEKS to the Focal Points. What a great observation.

Finally, the one elementary group looked at Grade 2 and produced the visuals for explaining the Grade 1, 2, and 3 focal points they saw in the TEKS. See Figure 1 below. The house represents Grade 2 as reflected in the focal points-the foundation is number, there's a "load bearing wall" labeled, there are computational walls, there are "windows" into Grade 3 of beginning understanding of multiplication and division. There is a "roof base" of measurement and the roof of problem solving that "holds it all together". The "smoke" wafting from the chimney is "on to Grade 3" content. The little car on the second picture (see Figure 2) is the Grade 1 content all in the form of models (represented by the car) that take you on the road to Grade 2. Their conclusion was that if you look at the focal points like the house diagram, the TEKS for Grade 2 can be put into that house format to help you see how they fit together. Anyway, the large group loved it (including the high school teachers), and I wanted to share it with you. It may not explain all of the mathematics that is involved, but it certainly captures the intent.

Based on the questions and products, I thought the experience was very successful — everyone was very engaged on a Saturday when I know they would rather have been shopping! And it was all based on looking at the material in the Focal Points publication in a variety of ways. Considering the concept of a focal point and applying it to our existing state curriculum is an excellent way to capture the important ideas in mathematics for a grade level. In the future, the understanding of these big ideas will facilitate the incorporation of any possible national standards at the local level.

The pictures in Figures 1 and 2 were produced by teachers in the San Antonio Mathematics Collaborative, a project funded by the Texas Teacher Quality Grant Program. Directors of the project include Drs. Betty Travis, Sandy Norman and Kathleen Mittag. Our thanks go to the teachers in this project for sharing their diagrams.

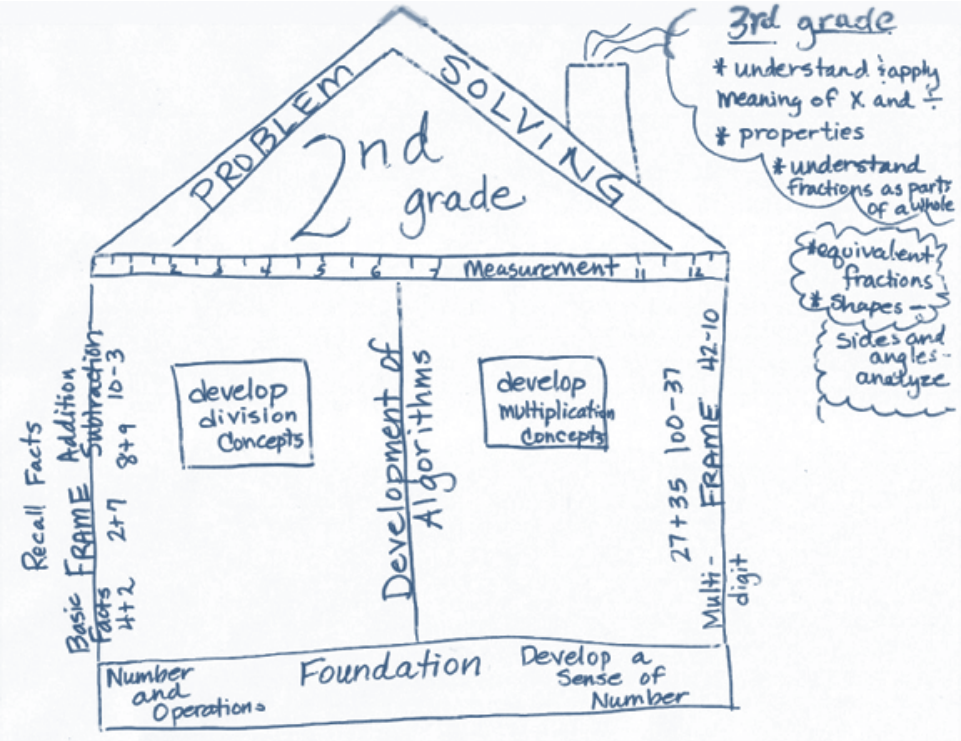

Figure 1. Grade 2 Focal Points in the TEKS

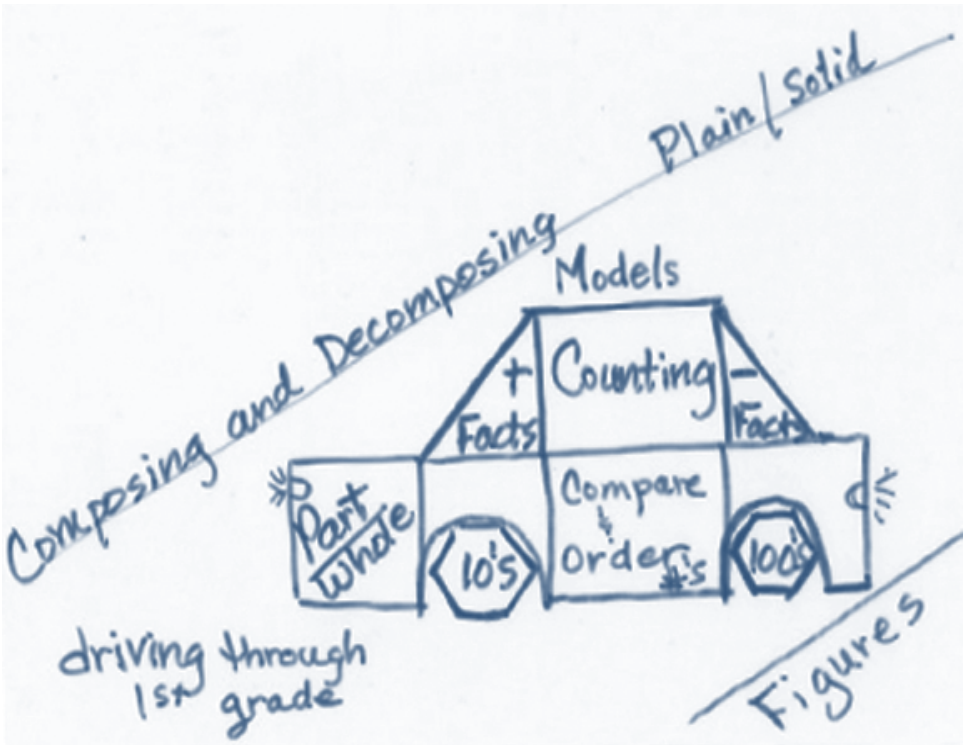

Figure 2. Grade 1 Focal Points in the TEKS

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Associate Dean for Assessment and PreK-12 Education •
Texas A&M University

Assistance for this article was provided by
Cynthia L. Schneider, Ph.D. • <cschneider@satx.rr.com>
Research Associate • Charles A. Dana Center,
The University of Texas at Austin.

DEPARTMENT

Errata

Texas Mathematics Teacher,
Volume LIII, Issue 2, Fall 2006

The author of "Choosing a Textbook for the Future" pages 6-8 and "Legislative Update and Advocacy" on page 27 of the Fall 2006 *Texas Mathematics Teacher* was Cynthia L. Schneider, Ph.D., *<cschneider@satx.rr.com>* Research Associate, Charles A. Dana Center, The University of Texas at Austin.

"Recommended Readings and Resources" on page 27 and "A Measurement Book List for the Early Grades" on page 29 of the Fall 2006 *Texas Mathematics Teacher* was written by Mary Alice Hatchett, *<mahat@earthlink.net>*, Independent K-12 Mathematics Consultant, Georgetown, Texas.

One of the 2006 CAMTership recipient photographs was inadvertently left off of page 9 of the Fall 2006 *Texas Mathematics Teacher*. Here is the picture and corrected spelling of the recipient's middle name.

Julie Ann Chavez
San Elizario ISD

DEPARTMENT

2007-08 TCTM Mathematics Scholarship

There are five $2000 scholarships available for 2007-08. Any student attending a Texas collage or university - public or private - and who plans on student teaching during the 2007-08 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 recieved by May 1, 2007.**

FEATURE

Recommended Readings and Resources

Math Matters: Understanding the Math You Teach Grades K-8
(second edition) by Suzanne H. Chapin and Art Johnson

Math Matters Understanding the Math You Teach Grades K-8 (second edition) by Suzanne H. Chapin and Art Johnson
ISBN 13:978-0-941355-71-1

The first edition of Math Matters addressed several fundamental questions:

- What math concepts and skills are important in the elementary grades?
- What does a teacher need to understand in order to teach these concepts and skills well?
- What can we learn from research about teaching and learning these ideas so that we can bridge the gap between research and practice?

So what is new in this second edition? They have broadened the scope from 13 chapters for K-6 to 14 chapters for K-8 that addresses important topics such as: integers, exponents, similarity, the Pythagorean Theorem, Platonic solids, box –and-whisker plots, and more. They have added a new chapter on understanding ratios and rates; expanded the chapter on algebra; and elaborated on topics including operations with decimal numbers, informal solution strategies, and algorithms for solving fractions and percent problems. Scattered throughout each chapter are activities that make real the mathematical information presented. Following each activity is a thorough discussion of the mathematics involved (including the answer!), as well as information about how it fits into the larger framework of mathematics.

Also included in the second edition is a list of certain web sites that have the potential to support the understanding of math by both teachers and students.

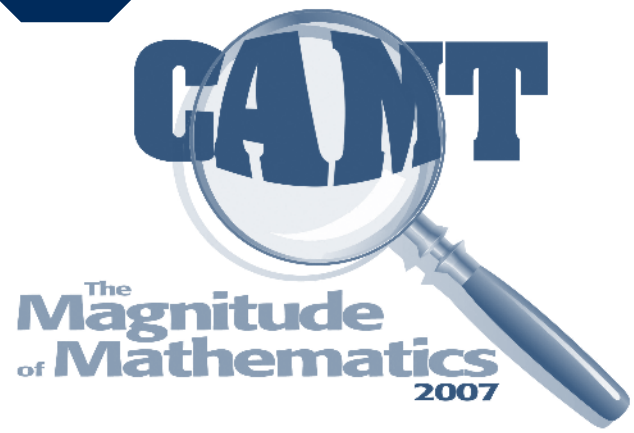
The goal of Math Matters is to help teachers deepen their understanding of the mathematics they teach. Chapin and Johnson have written an important, exciting, and accessible book that presents a concise description of the significant mathematical ideas one encounters in the K-8 grades

Mary Alice Hatchett • <mahat@earthlink.net>
Independent K-12 Mathematics Consultant • Georgetown, TX

Note the Early Date!

CAMT 2007

The Magnitude of Mathematics June 28 – 30, 2007



CAMT 2007 will be held June 28-30, 2007, at the Henry B. Gonzalez Convention Center in San Antonio, Texas. The Program Chair is Sandra Browning of Seguin ISD. Program information will be available online next spring (probably May 1) at:

<www.camtonline.org>

Many favorite speakers such as Kim Sutton, Randy Charles, Marcy Cook, Chris Trioli, Juanita Copley and many others are returning in 2007. There will also be a strong strand on sessions for teachers of English Language Learners (ELL). Math-A-Rama will be all three mornings, and STEPS will be two full days. We will be using an easy online registration process. Look for information via your email.

2006 Scholarship Donors

The TCTM Board wishes to thank the following contributor for their very generous donation to the TCTM scholarship fund in 2006.

Major Contributor

Texas Instruments

Legislative Update and Advocacy

As you may have read in the TEA Talks on page 18, the State Board of Education (SBOE) will allow the course Mathematical Models with Applications (MMA) to count as one of the credits for four years of mathematics toward the Recommended High School Plan if it is taken before or concurrently with Algebra II. While the Independent Study course is also an option, the description in the Texas Administrative Code, Chapter 111. Texas Essential Knowledge and Skills for Mathematics, Subchapter D. Other High School Mathematics Courses requires that the content in an Independent Study course have a prerequisite of both Geometry and Algebra II. (See more at *<www.tea.state.tx.us/rules/tac/chapter111/ch111d.html>*) For frequently asked questions on the new graduation requirements, please see *<www.tea.state.tx.us/curriculum/fourbyfour.html>*. During the current legislative session, the legislators will be considering the funding of the mathematics textbook adoption and the implementation of end-of-course (EOC) exams. The Algebra I End-of-Course Exam currently exists as an online option for districts. The Geometry End-of-Course Exam is under construction by TEA. Your opinion on textbook funding, EOCs, or other issues matters to your elected representatives. Please contact your SBOE member and inform them of the impact decisions on these issues will have on you as a classroom teacher and on your students. As part of our support for members, TCTM has included a link to an advocacy website that will help you reach out to your elected officials and state agencies. We encourage all TCTM members to voice their opinion. If you want to contact a SBOE member (or legislator), go to the TCTM website, *<www.tctmonline.net>*, click on Members Only, then click on the link under Legislative Action. For SBOE members, click on View next to TX Officials and Agencies, scroll down to Department of Education. This will open up the list of board members and an envelope next to their name. Click on the envelope to send a message

Cynthia L. Schneider, Ph.D. • <cschneider@satx.rr.com>
Research Associate • Charles A. Dana Center,
The University of Texas at Austin

VOTE

TCTM Candidates

for President

Paul Gray

Paul Gray currently serves as a Secondary Mathematics Specialist for Region IV Education Service Center. Paul holds a Bachelor of Science in Meteorology from the University of Oklahoma, a Master of Education in Curriculum and Instruction-Mathematics Education from the University of Houston, and is currently a doctoral student at the University of Houston studying Curriculum and Instruction-Teacher Education. Paul is also a certified 8-12 Master Mathematics Teacher. During his tenure at Region 4, Paul has participated in the development and implementation of secondary mathematics curriculum and professional development for secondary teachers of mathematics. He is also an author of instructional materials and textbooks that provide students with the opportunity to develop a conceptual understanding of mathematics that bridges them toward procedural fluency. Paul currently and proudly serves as the volunteer coordinator for CAMT and as TCTM Southeast Regional Director. During his eight years in the classroom, Paul taught junior high and high school mathematics and science in Oklahoma and Texas.

Connie Yarema

Connie Yarema is an associate professor of mathematics at Abilene Christian University. She teaches courses that address the content knowledge of pre-service middle school and high school mathematics teachers related to what they will teach. Her interests include providing in-service teachers professional development through the Japanese model lesson study. In the past two years, she has conducted lesson study with teachers in the Region 14 Education Service Center area through Teacher Quality Grant funding, and has presented at national and state meetings addressing these efforts. In addition, Yarema has served on advisory boards for the Charles A. Dana Center and Texas College Mathematics Journal, as president of the Big Country Council of Teachers of Mathematics and Science, and as chair of the Texas Section of the Mathematical Association of America. Yarema earned a doctorate in higher education with an emphasis in the content area of mathematics from Texas A&M University-Commerce.

for Vice-President Elementary

Joyce Polanco

Joyce Polanco serves as a senior program coordinator for mathematics in the Partnership for High Achievement at the Charles A. Dana Center at The University of Texas at Austin. In this position, she works with teachers and administrators in Texas to improve student success. Prior to joining the Dana Center in 2005, Joyce worked for a large urban Texas district as a mathematics specialist. She has eleven years of classroom teaching experience in elementary and middle school. Additionally, she has extensive experience providing staff development in mathematics for teachers in grades K–8. She holds a B.S. in education from The University of Texas at Austin.

Caren Sorrells

Caren Sorrells, as the math consultant for Birdville ISD, has worked with children and families as a teacher, educator, and administrator since 1973. She has overseen the district curriculum and implanted strategies for working with at-risk students since 1999. Caren has participated in the National Council of Teachers of Mathematics, the National Council for Supervisors of Mathematics conferences, and the Conference for the Advancement of Mathematics Teaching (CAMT) both as a speaker and as a participant since 1999. Mrs. Sorrells has presented at Texas ASCD and several school districts on strategies to use with at-risk students and the hard to motivate. Caren has been a leader in mathematics since 2000. She has been the program chair for the post conference of the 2005 CAMT in Dallas. She was treasurer for the Texas Association of Supervisors of Mathematics from 2002 to 2004. She was president of the Metroplex mathematics supervisors' organization, McMath, from 2001 to 2003.

Janet Vela

Janet Vela serves as an elementary mathematics education specialist with the Region 4 Education Service Center (Houston). As an education specialist, Janet's responsibilities include creating and facilitating professional development for elementary mathematics educators both in Region 4 and across the state of Texas. She is a contributing author to instructional resources published by Region 4 Education Service Center, as well as the recently developed Mathematics TEKS Connections (MTC) Grades 3-5 state professional development module. She will be presenting at the 2007 national conferences for the National Council of Supervisors of Mathematics (NCSM), the National Council of Teachers of Mathematics (NCTM) and the 2007 NCTM Regional Conference in Houston. Janet is also active at the state-level, having most recently served as the Program Chair for the 2006 Conference for the Advancement of Mathematics Teaching (CAMT) and as a member of the 2007 CAMT Program Committee. She also served on the advisory panels for the Mathematics TEKS Awareness (MTA) K-5, Mathematics TEKS Connections (MTC) K-2, and the Mathematics TEKS Refinements (MTR) K-5 state professional development modules. Janet was a speaker at the 2005 and 2004 CAMT conferences and is a certified TEXTEAMS leader for "Rethinking Elementary Mathematics Parts 1 and 2." Prior to serving as an elementary mathematics education specialist, Janet taught elementary mathematics in Spring ISD, where she was Teacher of the Year (2000). She is a member of NCSM, NCTM, TASM, and TCTM. Janet looks forward to representing and serving the elementary mathematics educators across the state of Texas!

TCTM Candidates

for Treasurer

Rebecca Ontiveros

Rebecca Ontiveros is currently the Director for the Math/Science Partnership, a collaborative grant with the El Paso Collaborative for Academic Excellence (EPCAE). The Math/Science Partnership, located at the Education Service Center-Region 19 (ESC-R19), works primarily with secondary mathematics and science teachers in 9 rural school districts. The ESC-R19 in collaboration with the EPCAE has been awarded a TSTEM Grant to establish a TSTEM Center, in which Rebecca will serve as the program coordinator. She has also been involved with the Texas Math Academies, where she served as a Master Trainer for the state of Texas. As part of her responsibilities, she coordinated 22 sessions that served about one thousand 5th and 6th grade mathematics teachers in the Region 19 area. She has also been a K-12 Mathematics Instructional Coordinator at Clint ISD (largest rural school district in the area). Additionally, she was an Urban Systemic Initiative/Program Mentor for 6 years. The last 11 years of her educational experience have involved, in some capacity, the work of systemic reform in the area of mathematics and science by providing staff development. She currently serves on the TCTM Board as the Southwest Regional Director. She is also a member of NCTM, TASM, GEPTCM, TODOS and ASCD. She was involved in the coordination of the El Paso Regional NCTM, and in CAMT 2005 and 2006.

Betsy Urschel

Betsy Urschel began her career in education almost 20 years ago teaching middle school and high school mathematics in Pasadena and Clear Creek School Districts. She then became a senior associate for curriculum and development with the Center for Occupational Research and Development. While in this position, Betsy worked with school districts, state education agencies and community colleges nationally in the area of mathematics education. After traveling for four years and missing Texas, Betsy came back home and became the high school mathematics consultant for Region 10. For the past two years, she has been the secondary mathematics curriculum coordinator for Sherman ISD in north central Texas. Not only is Betsy a TEXTEAMS trainer for multiple institutes, but she was also a contributing writer for the Mathematical Modeling Institute. She has delivered over 150 staff development workshops at district, state, and regional levels including the following national conferences: National Council of Teachers of Mathematics (NCTM), National Tech Prep Network (NTPN), National Science Teachers Association (NSTA), Southern Regional Educations Board's High Schools That Work (HSTW), and Kids Who Know and Do (KWKD). Betsy is a member of NCTM, National Council of Supervisors of Mathematics (NCSM), TCTM, Texas Association of Supervisors of Mathematics (TASM), Association for Supervision and Curriculum Development (ASCD), Metroplex Coordinators for Mathematics (MC-Math), National Staff Development Council (NSDC), and Texas Classroom Teachers Association (TCTA). She is a published author and is certified in both elementary and secondary mathematics.

for Southeast Regional Director

vote only if you live in Service Center Region 4, 5, or 6

Kathy Fuqua

Kathy Fuqua has been teaching math to middle school students for 33 years. She presently serves as Math Coach on her campus and is teaching math to the students in her campus Disciplinary Alternative Education Program. She received both her B.A. in Elementary Education and her Master of Elementary Education degrees from McNeese State University. Upon completion of her B.A., she returned to college to become certified to teach math. Her most recent certification, one that she is very proud of, is Master Math Teacher for grades 4 – 8. This year she was asked to help teach the K – 4th grade Teacher Quality Program at Lamar University at Orange. She has presented programs at the Middle School Conferences held yearly through the local Education Service Center. She was selected as the 2002 Middle School Teacher of the Year for Region V. Kathy is a regular CAMT attendee and attended the Regional NCTM conference in New Orleans. She is currently a member of Texas Classroom Teachers Association, Texas Council of Teachers of Mathematics, Texas Association of Supervisors of Mathematics, and the educational sorority Delta Kappa Gamma.

Lenore Walker

Lenore Walker has 32 years experience in the field of education as a teacher, department chair, testing coordinator, Instructional Specialist, School Improvement Facilitator, and Data and Compliance Manager. She was the 2000 Pasadena ISD "Teacher of the Year" and a nominee for the 1999 Pasadena Rotary Club Teacher of the Year and 1987 Presidential Award for Excellence in Science and Mathematics Teaching. As a department chair, mathematics specialist and School Improvement Facilitator, she supported teachers and campus leadership in providing data-driven, innovative, alternative instructional strategies to enhance academic achievement of all student groups. Ms. Walker is an accomplished staff development provider, who focuses on a direct alignment between curriculum, instruction, and assessment. In her current position as Data and Compliance Manager, she works closely with 58 schools to implement, coordinate and supervise all functions and activities related to data quality. She provides assistance to principals with data and compliance related concerns, monitors and verifies data, investigates anomalies, and monitors schools' compliance. Ms. Walker is a proactive problem solver with the innate ability to anticipate potential obstacles and long range needs.

VOTE

TCTM Candidates

for Southwest Regional Director

vote only if you live in Service Center Region 15, 18, or 19

Veronica Hernandez

Veronica Hernandez is a Professional Development Consultant for Education Service Center Region 19, a service center dedicated to educating the community in order to create opportunities for an improved quality of life. She directs the Texas Regional Collaborative Excellence in Mathematics Teaching Grant (TRCEMT) which continues to provide quality professional development to pre-service and K-12 mathematics teachers in the El Paso and Hudspeth counties. Prior to her current position, she positively impacted middle and high school mathematics students and teachers as a Math Science Partnership (MSP) Staff Developer. As the Elementary Mathematics Facilitator at El Paso ISD Veronica worked to organize and provide professional development to 56 elementary campuses. Veronica is a member of GEPCTM, NCTM, and TASM. She strives to hone her talents, to learn, and to serve the community. Born and raised in El Paso, Texas, Veronica continues to enjoy the culturally diverse atmosphere and mountainous dessert landscape of far west Texas with her two children, Danielle and Rene, and her husband of 16 years, Daniel.

Rita Tellez

Rita Tellez is the Math Facilitator for El Paso ISD and has been in education for twenty years. She was a middle school and high school mathematics teacher before holding the position of math coach. In her current position, she is responsible for district wide planning, organizing, and delivering of staff development for high school mathematics teachers as well as high school math coaches on a regular basis. Currently, she has had the opportunity to organize the district's high school standards-based curriculum writing as well as mathematics textbook evaluations for this year's adoption. She has been a member of NCTM for fifteen years and holds memberships in NCSM, TASM, TCTM, GEPCTM, and ASCD. She has a BS in Electrical Engineering and an M. Ed.

for South Regional Director

vote only if you live in Service Center Region 1, 2, or 3

Amy Gaskins

Amy Gaskins received her M.S. Ed. from Texas Tech University, and M.S.Ed. from East Central University in Ada, Oklahoma. After 19 years teaching mathematics in public schools she received her Ed.D. from the University of Nevada, Las Vegas. Since that time she has taught as a math educator at Northwest Missouri State University and has served as the director of the alternative certification program at West Texas University. Since 2000, she has enjoyed her work as a math specialist at Region XIII in Austin and as a math Specialist for the MSP Grant awarded to Del Mar College in Corpus Christi. She presently teaches college algebra for Kaplan University, in the master's at Walden University and in the master's and doctoral program at Capella University. One of her greatest joys is working with Texas teachers across the state as she travels as a mathematics consultant.

Barba Patton

Barb Patton has been active in math education for many years. She has taught Kindergarten, 4th – 8th grade math and science, math at the community college, math at Texas State Technical College, community college and lastly at the University level. She earned a doctorate in mathematics education at the University of Houston. Her interest has been/and is diagnosing error patterns in various math concepts. She has presented at local, state, regional, national and international conferences. She has also published several articles as well as a study guide to accompany a child development text. She was honored to be in Who's Who in American Teachers 2005 and 2006. Her interest in math education is working with pre-service and in-service teachers, dyscalculia, and visual representations. She enjoys working with special needs children in math and teaching others to use manipulatives and methodology. Barb currently teaches at the University of Houston-Victoria and has been there for the past 17 years (full or part-time). She is also the coordinator of the Center of Academic Excellence, which assists students with their TExES tests. On the personal side, she is married to Burson, who is a pre-stress concrete engineer, and they have 3 sons (Keith, Craig and Todd); 1 grandson (Chris); 3 granddaughters (Michelle, Stephanie and Carissa) and one poodle (Beignet) that is now the only child.

TCTM Ballot

Circle your choices below. Write-in candidate names are acceptable. Copy and mail your ballot to Sheryl Roehl at the address below. **Your ballet must be recieved by June 1, 2007**.

for President

☐ Paul Gray ☐ Connie Yarema ☐ _____
write in candidates

for Vice-President Elementary

☐ Joyce Polanco ☐ Caren Sorrells ☐ Janet Vela ☐ _____
write in candidates

for Treasurer

☐ Rebecca Ontiveros ☐ Betsy Urschel ☐ _____
write in candidates

for Southeast Regional Director

vote only if you live in Service Center Region 4, 5, or 6

☐ Kathy Fuqua ☐ Lenore Walker ☐ _____
write in candidates

for Southwest Regional Director

vote only if you live in Service Center Region 15, 18, or 19

☐ Veronica Hernandez ☐ Rita Tellez ☐ _____
write in candidates

for South Regional Director

vote only if you live in Service Center Region 1, 2, or 3

☐ Amy Gaskins ☐ Barba Patton ☐ _____
write in candidates

Mail your ballot to:

Sheryl Roehl
TCTM Vice-President Secondary
129 Eddie St.
Victoria, TX 77905

Sheryl Roehl
TCTM Vice-President Secondary
129 Eddie St.
Victoria, TX 77905

Texas Council of Teachers of Mathematics
Executive Board 2006 - 2007

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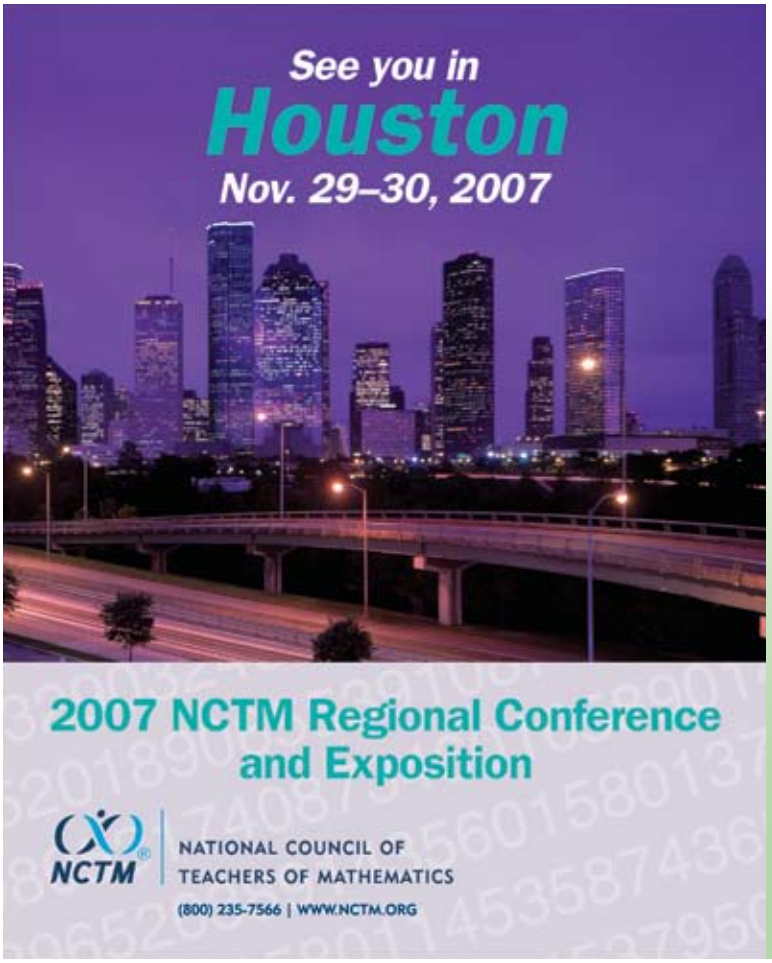

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