Texas Mathematics Teacher

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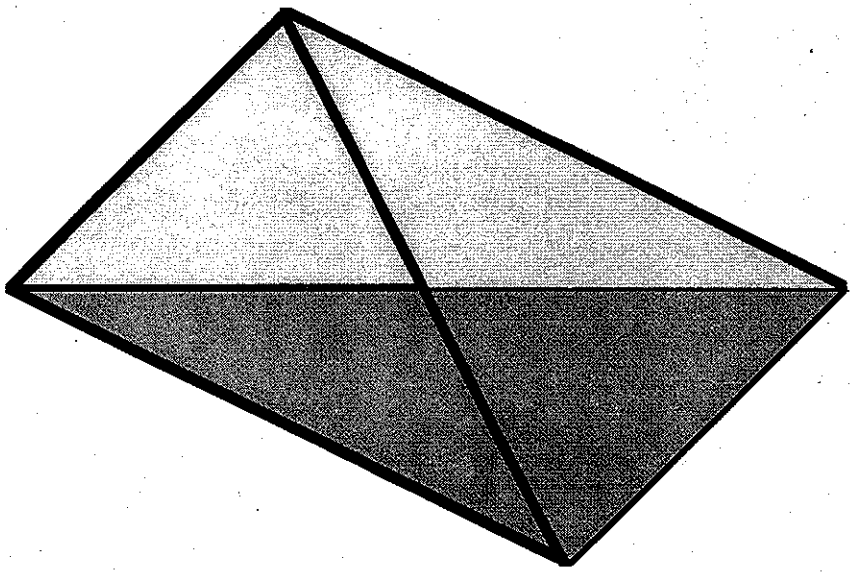

IN THIS ISSUE

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The ***Texas Mathematics Teacher***, the official journal of the Texas Council of Teachers of Mathematics, is published in the fall and spring. Authors are encouraged to submit articles that deal with the teaching and learning of mathematics at all levels. Editorial correspondence and manuscripts should be mailed or e-mailed to the editor, Paul Kennedy.

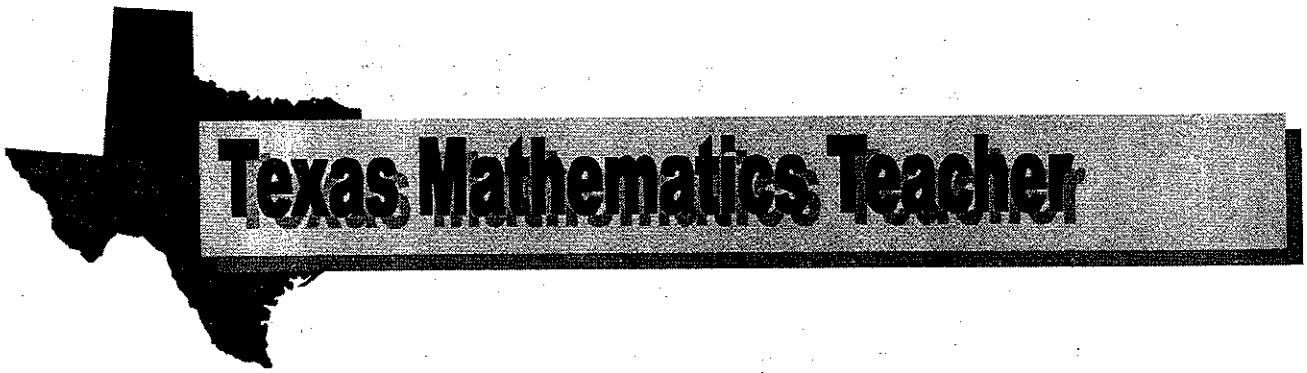
Potential authors should adhere to the following guidelines.

1. Manuscripts should be word-processed meeting APA guidelines. Tables and figures should likewise be computer generated. No author identification should appear on the manuscript.
2. Submit four copies. Include a Macintosh or IBM 3 1/2 inch diskette containing the manuscript indicating the word-processing program used on the label or send as an attachment on e-mail to pk03@swt.edu.
3. Include a cover letter containing author's name, address, affiliations, phone and fax numbers, e-mail address, and the article's intended level.
4. Articles for *Voices From the Classroom* should be relatively short and contain a description of the activities sufficient in detail to allow readers to incorporate them into their teaching. A discussion of appropriate grade level and prerequisites for the lesson should be included.

After refereeing, authors will be notified of a publication decision. Two copies of the issue in which an author's manuscript appears will be sent to the author automatically.

Items for *Lone Star News* include reports, TCTM affiliated group announcements, advertisements of upcoming professional meetings, and any other appropriate news postings.

Advertisements support the publication of this educational journal. Businesses interested in placing an advertisement for mathematics materials should contact Paul Kennedy.



Letter from the President

Hi, everyone!

Welcome to our rejuvenated journal/newsletter format. In an effort to trim costs, the Executive Board decided to bring back a format from a few years ago that combines the classic journal style with news items following. As you will see in my remarks regarding TCTM's Goals for 1999-2000, maintaining the quality of the *Texas Mathematics Teacher* is first on our list!

I will detail our other goals.

- *Maintain journal quality* - All of the journal participants, including authors of the articles, our membership person, and editors and reviewers of the journal, strive for quality.
- *Support CAMT* - A very special thanks to the 80+ volunteers who helped at CAMT 1999. Your assistance is truly invaluable. A group that often goes without formal thanks is the 600+ folks who volunteer their time and expertise to make presentations to the over 6000 attendees each summer. In this journal, you will find a backup speaker proposal for CAMT 2000 in Houston. (The speaker proposals were due to Basia Hall, Program Chair, by November 1.) Consider sharing your experiences with the teachers attending in Houston --grab a "speaker-buddy"-- share that really super activity you guide your students through each year. Start out with a brief presentation or utilize ETA's offer of session manipulatives for some of those hands-on activities you manage so well. The first time you present is the hardest, so have a partner and experience what so many of us have. It really is fun to share with other teachers the excitement you have so often in your classroom. Locate the proposal and fill it out. CAMT will be better because of it!
- *Award scholarships* - Each year TCTM offers scholarships to talented high school seniors who plan to pursue teaching mathematics as a career. Our budget allows us to do this on a limited basis. Prentice Hall has been a scholarship sponsor for some years, allowing us to award a few more scholarships. Yet, we always turn away very qualified applicants. If there are other sponsors of which you may be aware, please let me know. We all know how badly mathematics educators are and will be needed in the future. If TCTM can help in some way, let's do it! Also, we sponsor CAMTerships for new attendees at CAMT. A CAMTership is a grant to assist their attendance. It's not much but is an incentive to participate in the *BEST* professional development around! This year anyone who has been teaching for 5 or less years and has never attended CAMT before will be eligible. Check out your department or grade-level team for that perfect person and share the application with him or her prior to CAMT 2000.

- *Communicate better among Board members and Affiliated group. Maintain website* - Communication is vital to all efficiently run organizations. Email is essential as well as an accessible website. Our current webpage address is:

  http://edtech.ci.swt.edu/pub/tctm/index.htm

  Check it out and bookmark it for updates on group news at the local, state, or national level. In addition, a Leadership Conference is planned for January, hosted by NCTM, and will be held at Dana Center facilities in Austin. Those of you involved in leadership of the more than fifteen NCTM Affiliated Groups in Texas should look for the announcement of this professional development opportunity.

- *Support Affiliated Groups conferences by advertising in journal and on website* - Please notify one of the Editorial Committee of your local conferences, so it can be posted in the Lone Star News and on the webpage. The more publicity, the more participants!

- *Encourage Affiliated Groups to put TCTM membership on their membership forms* - Membership in professional organizations is a critical element to nurturing and maintaining an active focus in this profession. For your $13 dues, members have access to an outstanding journal, opportunities to connect with others in Texas who also share this fabulous career, and ready access to all of the upcoming events in NCTM, TCTM, and your local Affiliated Group through one of the many communication devices offered.

- *Staff and sponsor TCTM booth at CAMT 2000* - Plans are to "bring back" a TCTM booth at CAMT to share information about our organization. Many inquiries were made this past summer at the NCTM Materials booth, which we manage, so the Board decided to go forward with this initiative. A new banner, copies of the *Texas Mathematics Teacher*, brochures, and other informative materials are expected.

All in all, these goals seem reasonable for an organization of 4200+ members. Get involved. Find out who your Regional Director is, contact her, and see how you can help TCTM to achieve even more in 2000!

Have a great school year. Let any of the Board listed on the back cover know how we can help you. The Executive Board is here to assist in anyway we can to accomplish TCTM's mission, *to promote mathematics education in TEXAS.* Let us hear from you.

Sincerely,

Pam

Pam Alexander, TCTM President

Backup Session

CAMT 2000 Presenter/Presider Proposal

Your interest in being a presenter at CAMT 2000 is greatly appreciated.
Please fill out this form legibly and completely. Thanks!

Presenter 1: _____ (please print)
District/ Organization _____ (only abbreviate ISD)

Year-round address: _____ Street
_____ City State Zip

School/ work phone: _____
Home phone: _____

FAX: _____
email: _____

Presenter 2: _____ (please print)
District/ Organization _____ (only abbreviate ISD)

Year-round address: _____ Street
_____ City State Zip

School/ work phone: _____
Home phone: _____

FAX: _____
email: _____

On-site back-up speakers will be needed to fill sessions that are canceled just prior to and during the conference. If you are willing to be "on call" to cover a block of time during the conference, please mark times that you would be available. You will not be asked to cover more than one block, but marking more than one time slot will help in scheduling coverage for all time periods. Information on your assigned time and where to report will be FAXed to you prior to the conference.

Thursday, July 27	Friday, July 28	Saturday, July 29
____9:45-12:00	____9:15-11:30	____9:30-11:45
____12:30-2:45	____1:45-2:45	____12:15-2:30

TITLE OF SESSION (limit 70 characters). _____

DESCRIPTION to appear in program (limit 150 characters). _____

TYPE OF SESSION: ___Presentation-1 hr ___Activity-1hr ___Activity-2hr

GRADE LEVELS: circle all that apply: PK K 1 2 3 4 5 6 7 8 9 10 11 12 college Gen'l Interest Research

EQUIPMENT: An overhead projector will be in each room.

Return by June 1, 2000 to:

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CAMT 2000 Program Chair
P.O. Box 200669
Austin, TX 78720-0669
Phone: (512) 335-2268 (CAMT)
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Teaching Pre-Service Teachers About Place Value: A Key Element in the Improvement of Mathematics instruction

James W. Hunt, Ed. D.

Professor and Chair, Department of Education, Southwestern University

Most elementary and middle school teachers agree that place value is an essential concept necessary to facilitate the effective mathematics learning of their students. However, some teachers and pre-service teachers themselves may not have a complete understanding of the basic meaning of place value at the conceptual level. Like their students, they may have memorized the rules for base ten without truly understanding the function of the rules as they relate to the underlying concept of place value. For some, base ten and place value are synonymous terms, when in reality, they are not. In this article we will discuss the issue and importance of place value instruction and will present a sequence of activities that can help pre-service teachers (and their students) better understand the concept of place value.

An understanding of place value is essential to effective computation in our number system. However, most teachers agree that a lack of understanding on the part of their students regarding place value is an issue that creates a roadblock to the teaching and learning of mathematics in their classrooms. From regrouping in basic operations with whole numbers to problems dealing with decimals, a lack of understanding regarding place value can seriously deter a student's progress in learning the basics of computation.

The concept of place value is such a basic and necessary element in the understanding of mathematics. Yet, many students have difficulty understanding the concept. There may be two explanations for this problem. First, the words that are used in the English language to r.epresent numbers in our base ten number system do not provide a clear description of the number. For example, the number name "twelve" is used to represent the number that could be described as "one ten and two ones." Unfortunately, the word "twelve" does not adequately describe this number in a way that makes sense in the base ten number system. As a result, for many students the language of numbers in English can prove to be a hindrance in the understanding of place value. In fact, two articles released in recent years (Geary, 1995; McCloskey and Macaruso, 1995) suggest that one reason Asian students may do better than American students in basic mathematics is that the words for numbers in their respective languages more accurately reflect the base ten number system.

A second explanation for the problems students encounter in understanding place value focuses on the way students are taught place value. In many classrooms the concepts of place value and base ten are taught as though they were one and the same. While it is true that in our number system, base ten is the type of place value we utilize, it is not true that these terms are synonymous. In reality, place value is the broader and more important concept, and base ten is merely one type of place value. To further complicate the issue, in most cases, students are being asked to understand place value simply by memorizing the rules for base ten. It is clear that this type of rote learning of the rules of base ten place value is not serving students well.

Improving Place Value Instruction

The most obvious way to improve elementary and middle school students' understanding of place value is to improve the way the concept of place value is taught. Following is a sequence of activities that can be used to improve pre-service teachers' understanding of place value. This sequence of

activities can also be adapted for use with students.

The first step in understanding place value is developing a working definition of the concept. When asked to define place value, most pre-service teachers will accurately state that place value is "a system of grouping numbers to show the value of each number." It is interesting to note that rarely do they talk about "tens" when they are defining place value. While the definition of place value as a "system of grouping numbers," is a good place to begin an examination of place value, this definition does not go far enough in providing the necessary clarity to the complete description of the concept. To more accurately define the concept of place value, the definition should state that place value is a system of grouping numbers that is based on the following rules:

1. The position of the digit determines the number being represented.
2. Explicit grouping and trading rules are established and consistently followed. (Reys, Suydam, Lindquist, and Smith, 1998)

Statement one means that, for example, the digit "3" in the numeral "343" has a different value dependent upon its position in the numeral. Thus, in base ten, the first "3" (from right to left) has a value of "3 ones" while the second "3" has a value of "3 hundreds." Statement two means that once a system, or a number, for grouping and trading in a number system has been established, that grouping and trading rule must be consistently followed. For example, if in our number system people will regroup each time they get a group of seven, then they must always follow that rule. Conversely, when they trade or "borrow" during regrouping, they must always take a group of seven.

Having established the preceding definition and clarifying rules of place value, we can proceed to a series of hands-on exercises that serve to lay the conceptual basis for an understanding of place value. The first exercise involves an activity that requires pre-service teachers to group numbers according to a certain rule. In actuality, they will be converting base ten numerals into numerals in another base. Each person is given a series of sheets (See figure 1 for an example.) with each sheet divided into three columns. The first column has a list of base ten numbers. By design, the first base ten number on each sheet should be the largest number that can be represented on the sheet given the specified base. This feature will be important during the discussion phase of the activity. The second column has the grouping rule for the sheet presented in the form of a "groups of . . ." statement. The last column is labeled "leftovers." The teachers are then instructed to take the first base ten number and, with the help of unifix cubes, see how many "groups of..." there are and how many leftovers. For example, on the sheet with "groups of seven," they will take the first base ten number, 48, and find that there are six groups of seven and six leftovers. The teachers then proceed to complete all of the sheets in the series, following the same procedure on each sheet.

After all the sheets have been completed, the teachers are asked to share their responses. At this point, there are four points that should be made. First, pre-service teachers should begin to understand that what they have been doing is converting a base ten numeral to a numeral in another base. Although many of them will know this already, it is a point worth mentioning for those who have not come to this realization. Second, many will use "base ten words" when describing the numerals they have on their sheets. Using the example from the "groups of seven" sheet, many will say that 48 in base seven is "sixty-six." It is important at this point to make them aware that the "sixty-six" is a term that reflects base ten and that the more accurate terminology would be "six, six" or "six, six, base seven." This also presents an excellent opportunity to discuss the problems with the English language and the words used to describe numbers in base ten. Third, pre-service teachers should begin to understand the numerical restrictions of each base. For example, in base seven, the numerals that can be used are 0 - 6, in base five, 0-4, in base three, 0-2, and so on. Finally, pre-service teachers should be asked to examine the first number of the base ten number column on each sheet. They should be asked to brainstorm about what each of these first

numbers has in common with the other first numbers. Then they should come to the conclusion that the first base ten number on each page is the largest number that can be represented given only two places in the number system.

Once pre-service teachers begin to realize the limitations of the "two place" grouping chart, they then are ready to move on to the next phase of the lesson sequence. In this phase, they are given a place value chart with three columns or divisions. (See figure 2.) From right to left, the first column is labeled "ones" (or "units"), the second column is labeled "base" and the third column is labeled "base^2." At this point, they are asked to relate this chart to their existing knowledge of the base ten number system. They should note that the "ones, base, base^2" sequence correlates with the "ones, tens, hundreds" sequence of base ten. The pre-service teachers should also be asked to brainstorm about the places that would follow the base^2 column. Using their knowledge of base ten, they should deduce that the subsequent columns would be "base^3, base^4, base^5, ..."

Next, the teachers will begin the process of converting base ten numbers into numbers in another base. To begin this process, each person is given two index cards that will be used to indicate the base and base^2 numbers for a selected base. As a group, they will decide upon a base to be used in the first set of conversions. If, for example, a group chooses base five, they will write a "5" on one index card and place it at the top of the "base" column. They will then write "25" on the second index card and place it at the top of the "base^2" column. They are then led through a discussion regarding the meaning of each column. Using the base five example, they should discover that each unit in the "ones" column is a "one" and that the maximum number of "ones" that can be in that column is four. Continuing to the next column, teachers should discover that each unit in the "base" column is a "group of five" and that the maximum number of "groups of five" that can be in that column is four. Finally, teachers should discover that each unit in the "base^2" column is a "group of twenty-five" and that the maximum number of "groups of twenty-five" that can be in that column is four. Teachers should also be asked to consider the largest base ten number that could be represented on the base five chart. They should conclude that the base ten number is 124, or one less than "base^3" in base five.

After the pre-service teachers have become familiar with the base five system they have developed on the place value chart, they are ready to begin converting base ten numbers into base five numbers. Given several base ten numbers (all less than 125) and with the use of unifix cubes, the they are asked to convert these numbers to base five. Working in groups and with the assistance of the session leader, the they should be allowed ample time to explore this process. Once they have become comfortable with the process, it is time to change the base and repeat the sequence utilized with the base five chart. Teachers should be encouraged to explore other bases on their own and to challenge others in their group with conversions from base ten to other bases.

Through the preceding sequence of activities, pre-service teachers should begin to understand the underlying principles of the concept of place value. It should be reinforced that place value is utilized with any system of grouping numbers, not just base ten. As a result of an increased understanding of place value and other systems of grouping numbers, they should also develop a better understanding of the base ten number system. This increased understanding should serve to make them better teachers and/or learners of mathematics.

Extension Activities for Place Value Instruction

There are several ways to extend and reinforce one's knowledge regarding place value and bases other than base ten. One of the best ways is to have people perform computations involving addition and subtraction of whole numbers in bases other than ten. Using the place value charts and unifix cubes from the previous activity, they should set up their boards to reflect a base other than ten. If, as in the previous example, they select base five, they will set up their boards with the following columns from

right to left: ones, fives, twenty-fives. Then they are given an addition problem to solve. Using the unifix cubes, they set up the problem on the place value chart and then combine the numbers using the steps they use to teach their students base ten computations. They may need to be reminded that the grouping rule is "five" and that at no time should they have five units in any one column. After they have solved several problems in base five, have them switch bases and challenge themselves and each other with more addition problems. (One of the most challenging bases is base two; the regrouping process can be quite challenging.) After teachers have explored addition, have them repeat the process with the operation of subtraction. Again, they must remember the grouping and trading rules and may "borrow" only amounts that are allowable under the rules of the base. It should be noted that these activities not only extend the pre-service teachers' knowledge of place value, but they also tend to give them a new empathy for the struggles their students deal with in learning addition and subtraction algorithms in base ten. This knowledge alone could be a key factor in improving mathematics teaching and learning in classrooms.

A second method of extending and reinforcing one's knowledge of place value is through the use of the problem solving activity Punch-Out Arithmetic (Lola May, 1987). Although designed as a problem solving activity that can be adapted to a variety of grade levels, Punch-Out Arithmetic can serve as an excellent activity for further exploration of place value. Each Punch-Out Arithmetic activity page (Figures 3 and 4 are examples.) consists of a chart with a set of numbers across the top and a set of "given numbers" along the right-hand side. At the bottom of each page is a workspace section for each given number. For each chart, there is a set of rules. For example, on the "Two's Chart," the instructions are to use addition to find the combination of numbers along the top of the chart that will produce the sum equal to the first "given number" on the right of the chart. Each number can be "punched" only once, utilizing the fewest number of punches possible. After the first given number has been computed, they repeat the same process for the other given numbers. (Numbers across the top of the chart are used again for each given number.) For the Three's, Four's, and Five's charts, the rules are the same with one exception, the number of punches that each top number can receive in creating a given number. Specifically, on the Three's chart the number of punches is two, on the Four's chart the number of punches is three, and on the Five's chart the number of punches is four.

Once pre-service teachers understand the rules for each chart, they should proceed with the process of solving the problems. Upon completion of the charts and after a discussion of the results, they should be led to a closer examination of the composition of the charts, the establishment of the rules for each chart, and the relationship of the Punch-Out Arithmetic activity to the concept of place value. This closer examination should lead them to the realization that on each chart, they have been converting a base ten number (the given number) into a number in another base. Taking the Two's chart as an example, they should see that the numbers across the top of the chart (from right to left) are actually the place value numbers for base two. Also, they should see that the numbers across the top of the chart (1, 2, 4, 8, 16, 32, . . .) correspond with the place value system developed in previous activities (units, base, $base^2$, $base^3$, $base^4$, $base^5$, . . .). They should also see that, while the numbers across the top of the chart are specific and in a fixed order, the given numbers can be any base ten number, up to a certain point. Encouraged them to explore the upper limit of the chart by discovering the largest base ten number that can be represented on the chart. For example, on the Two's chart, the largest base ten number would be 255, or 1 less than 256 ($base^8$ in base two).

After pre-service teachers have come to a better understanding of the construction of the charts, they should examine the relationship between the rules for each chart and the place value represented by the numbers across the top of the chart. Again using the Two's chart as an example, they should be asked to consider the numerals in base two. Relying on their

experiences with previous activities, they should state that the numerals in base two are 0 and 1. At this point, they should begin to see the correspondence between the numerals in base two and the rules for the two's chart. Specifically, they should see that for each top number, there are only two possibilities: a punch or no punch. If the punches were converted to numerals, the possibilities would be either 1 or 0. Therefore, if the punches were converted to numerals, the chart would depict a conversion of the base ten given number into a number in base two. Similarly, the possibility of two punches on the Three's chart corresponds with the numerals 0, 1, 2; the possibility of three punches on the Four's chart corresponds with the numerals 0, 1, 2, 3; and the possibility of four punches on the Five's chart would corresponds with the numerals 0, 1, 2, 3, 4.

Conclusion

Effective instruction regarding the concept of place value is recognized by most elementary and middle school mathematics teachers as a key element in foundation of mathematical knowledge and skills. However, before teachers can become effective teachers of place value, they must first increase their basic understanding of the underlying meanings and construction of the place value system. The preceding activities can help beginning teachers more clearly understand these concepts. Subsequently, the teachers will be able to use this knowledge to construct lessons that will aid their students in their exploration of place value. The end result will be a level of understanding of place value that will facilitate and enhance future learning of other mathematical concepts and skills.

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Do you have a great, new idea?
An original activity that your students enjoy?

Send it to us!
See inside cover for details.

Deadline for:
Fall journal – June 15
Spring journal – December 1

Figure 1

Number of Objects	Sets of Three	Leftover
8		
5		
3		
7		
6		

Figure 2

base^2	**base**	**ones**

Figure 3

Punch-Out Arithmetic

Two's Chart

128	64	32	16	8	4	2	1	Given Number
								7
								53
								110
								157
								226

Rule: Find the GIVEN NUMBER using the fewest number of "punches." You may punch each number only once.

Workspace

7	53	110	157	226

Figure 4

Punch-Out Arithmetic

Four's Chart

4096	1924	256	64	16	4	1	Given Number
							30
							199
							396
							3744
							8304

Rule: Find the GIVEN NUMBER using the fewest number of "punches." You may punch each number only once.

Workspace

30	199	396	3744	8304

Measuring Change or What's the Fuss about Calculus?

Sandra L. Canter, Burris Laboratory School, Ball State University
Krystina K. Leganza, University of Indianapolis

Nothing in the world is immune to change. Everything grows or shrinks, warms up or cools down, changes its position, its color, its composition—perhaps even its spots.

The process of change is vital to understanding the laws of nature. Because change is continuous, it is difficult to pin it down at one point. Isaac Newton is largely responsible for the development of a kind of mathematics that combines the slicing of solids to get different shapes and the coordinate graphing system developed by Rene Descartes.

These are the ideas that helped Newton work out the laws of motion and gravitation. Calculus helps explain why the solar system acts as it does or why a moving object reacts as it does to outside forces like gravity. Calculus is the connection between practical science and mathematical ideas. Every airplane, television set, spacecraft, and even the movement of athletes is a function of calculus.

All calculus topics are based on limits, though few calculus students really appreciate this. Without the formal terminology and notation, but with a concrete understanding of "gets close to," students from elementary school to college will be better prepared to tackle and understand calculus. Several activities will help students explore the concept of "gets close to" (i.e., limits), one of the basic ideas of calculus.

I. Each pair of students will need:
1 set of Cuisenaire rods of lengths 1 to 10 centimeters
Calculator
1 Student Page 1

Questions for the students to explore:
1. As the volume of the rod increases, what happens to the surface area?
2. What do you notice happens in the column "surface area ÷ volume"?
3. As the length of the rod increases, what number is the ratio of surface area to volume "getting closer to"?
4. Will the ratio of surface are to volume ever be exactly 4? Explain your thinking.

II. For this activity each pair of students will need:
1 sheet of grid paper
Colored pencils
1 Student Page 2

The problem to be explored is to add these fractions: $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\frac{1}{32}+\ldots$

(See Student Page 2 for the student exploration questions.)

For more information and problems like these, try *Calculus By and For Young People (ages 7, yes 7, and up)*, by Don Cohen, published by Don Cohen—The Mathman, 1991. Available through Dale Seymour Publications.

Reprinted with permission from the *Indiana Mathematics Teacher* (Fall/Winter 1998).

Student Page 1

Complete the chart.

The surface area is the number of 1 centimeter squares that would cover the outside of the Cuisenaire rod.

The volume is the number of 1 centimeter cubes that it would take to build a tower as tall as a given rod.

Length	Surface Area	Volume	Surface Area ÷ Volume
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
100			
1,000			
10,000			

Student Page 2

The problem to be explored is to add these fractions: $\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\frac{1}{32}+\ldots$

1. On the grid paper outline an 8 x 8 square.
2. In order to think about the sum of these fractions, first shade 1/2 of the 8 x 8 square. What part of the 8 x 8 square is shaded?
3. Next shade 1/4 of the total square with a second color. What is the total part of the 8 x 8 square that is shaded now? So 1/2 + 1/4 = _____.
4. Next shade 1/8 of the total square with a third color. What is the total part of the 8 x 8 square that is shaded? So 1/2 + 1/4 + 1/8 = _____.
5. Now shade 1/16 of the total square with a fourth color. What is the total part of the 8 X 8 square that is shaded? This picture shows that:

   1/2 + 1/4 + 1/8 + 1/16 = _____.
6. Next shade 1/32 of the total square with a fifth color. What part of the total 8 x 8 square is shaded? This picture shows that:

   1/2 + 1/4 + 1/8 + 1/16 + 1/32 = _____.
7. Shade 1/64 of the total square that with a different color. What part of the total 8 x 8 square is shaded? This picture shows that:

   1/2 + 1/4 + 1/8 + 1/16 + 1/32 + 1/64 = _____.
8. How could you shade 1/128 of the total square? Show this in your picture.
9. By looking at your picture could you predict what the sum of these fractions is "getting close to." Explain your thinking.
10. Repeat this procedure for:
    a. 1/3 + 1/9 + 1/27 + 1/81 + . . . on a 9 x 9 square.
    b. 1/4 + 1/16 + 1/64 + 1/256 + . . . on an 8 x 8 square.
11. Look for a pattern in your answers. Describe what you "see."
12. Predict what 1/5 + 1/25 + 1/125 + . . . will "get close to." Test your prediction by trying it.

Modeling Equations

Bettye C. Hall, Mathematics Consultant

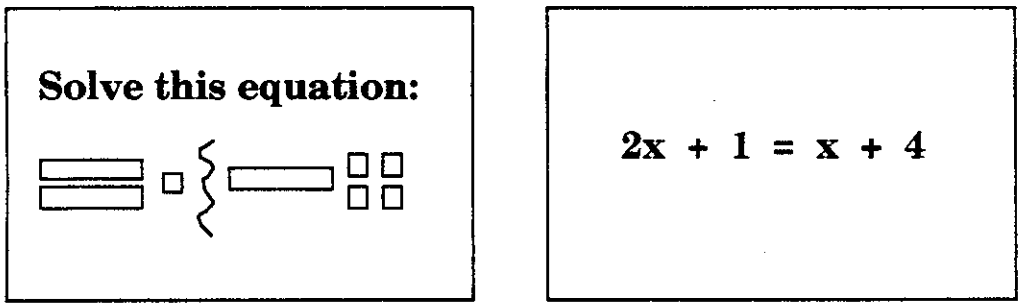
Objective: Reinforce a model for solving linear equations using algebra tiles.

Materials: A set of Modeling Equation cards for each group of four.

Procedures:

- Separate the cards into two sets:
  (1) representations of equations using algebra tiles, and
  (2) algebraic equations.
- Shuffle each set of cards separately.
- Find the algebra tile cards that have equations to be solved and place them in the center of the table, face up.
- Choose the equivalent algebraic equation card for each algebra tile card and place the two cards side-by-side.

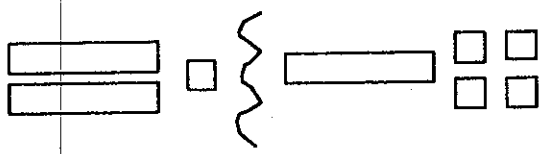
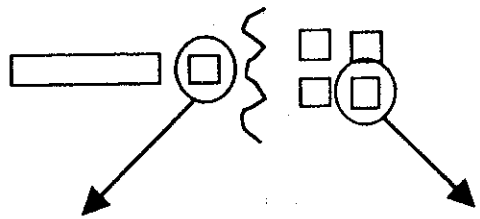
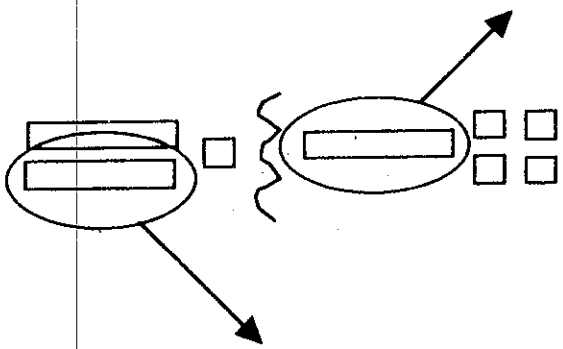
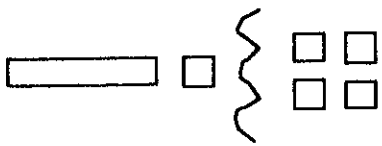
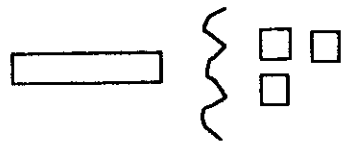
  Example:

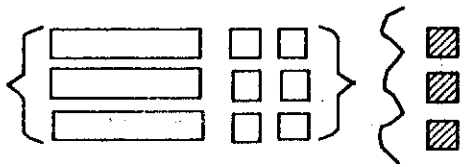
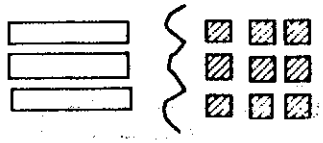
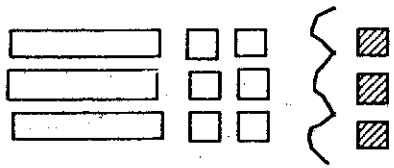
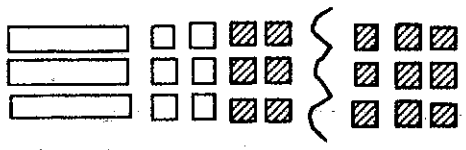
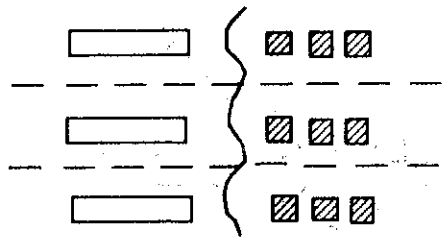


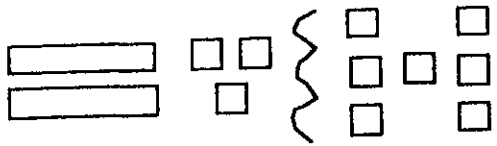
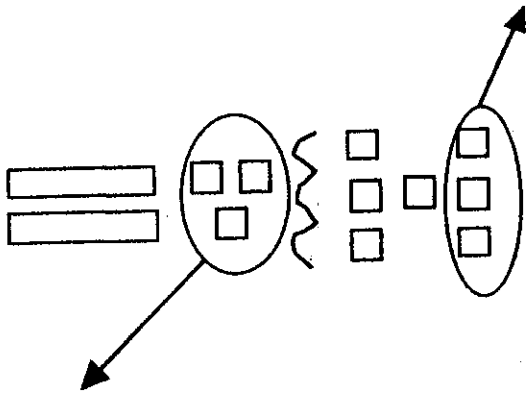
There are 6 equations to solve.

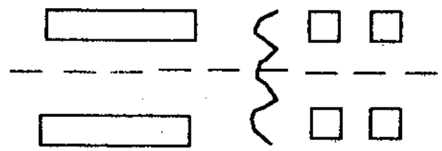
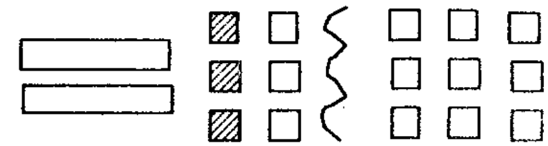
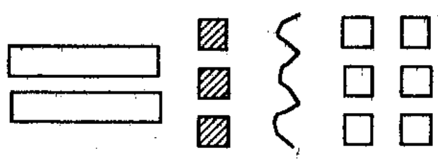
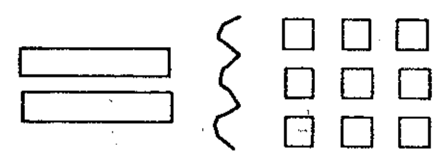
- Find the algebra tile card and equivalent algebraic equation card that could be the second step in the solution and place them underneath the first cards.
- Continue this way until all the equations are solved.

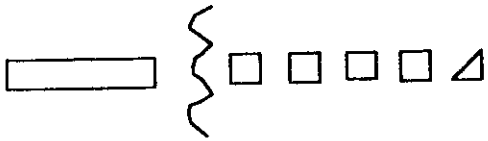
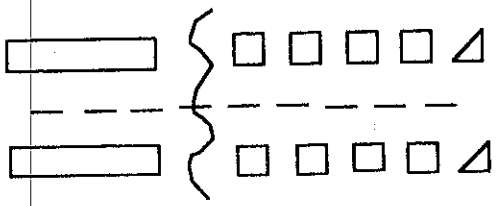
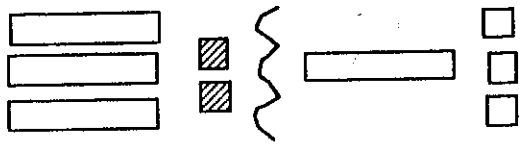
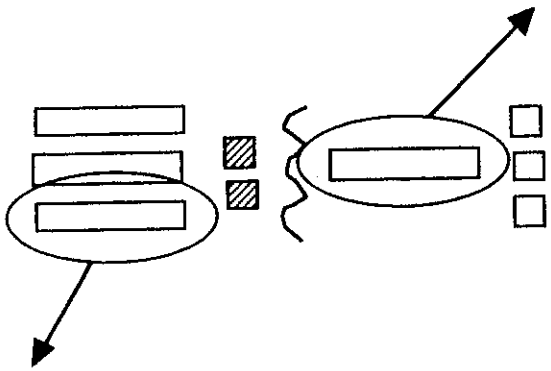
This activity is one of the many Bettye Hall presented at CAMT 1999 in Dallas.

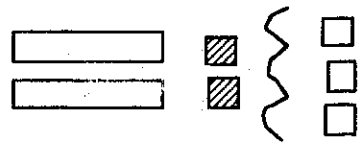
Solve this equation: 	$2x + 1 = x + 4$	
	$2x + 1 = x + 4$ $-x \quad = -x$	$x + 1 = 4$ $-1 = -1$
	$x + 1 = 4$	

Solve this equation: 	$3(x + 2) = -3$	
	$3x + 6 = -3$	$3x = -9$
	$3x + 6 = -3$ $-6 = -6$	

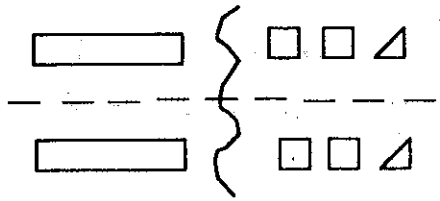
$\frac{3x}{3} = \frac{-9}{3}$	**Solve this equation:** 	$2x + 3 = 7$
		$2x + 3 = 7$ $-3 = -3$
$x = -3$		$2x = 4$

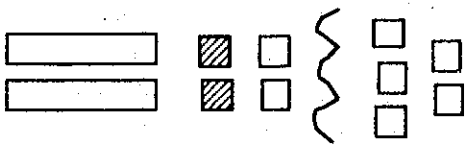
	$\frac{2x}{2} = \frac{4}{2}$	
	$x = 2$	$2x - 3 = 6$ $+3 = +3$
Solve this equation: 	$2x - 3 = 6$	

$2x = 9$		$x = 4\frac{1}{2}$
	**Solve this equation:** 	$3x - 2 = x + 3$
$\frac{2x}{2} = \frac{9}{2}$		$3x - 2 = x + 3$ $-x \quad\quad = -x$



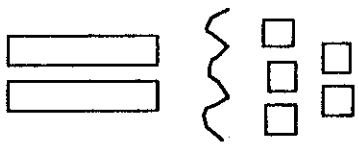
$2x - 2 = 3$



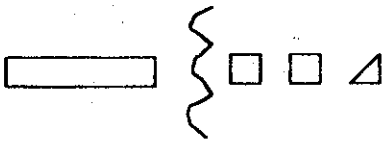


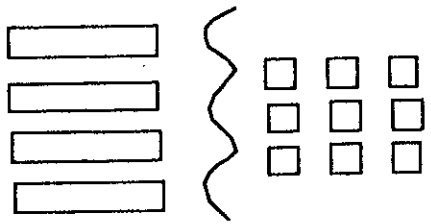
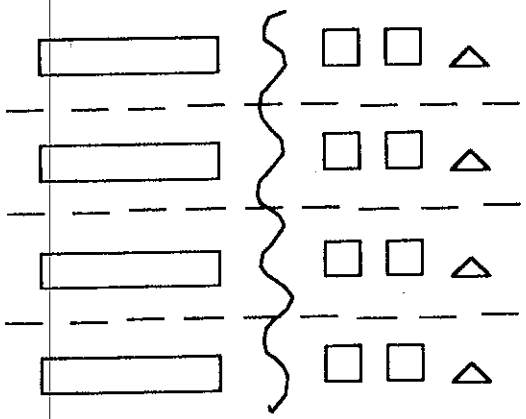
$2x - 2 = 3$
$+2 = +2$

$\frac{2x}{2} = \frac{5}{2}$



$2x = 5$



Solve this equation: 	$4x = 9$	$x = 2\frac{1}{2}$
	$\frac{4x}{4} = \frac{9}{4}$	$x = 3$
	$x = 2\frac{1}{4}$	

Tetrahedron Envelopes

Dr. Pam Littleton, Associate Dean of Arts and Science, Tarleton State University

Objective: Participants will use ordinary business envelopes and paper folding to investigate attributes of 2 and three dimensional figures.

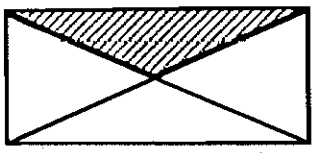
Materials: An envelope for each participant
Rulers
Scissors

Procedures:

1. Have each participant seal the envelope. Using the ruler, draw the two diagonals of the rectangle. When one diagonal is drawn, ask what shapes are now created. (triangles) Do the two triangles have any special characteristics? (They are congruent.) When the second diagonal is drawn, ask what is formed. (two pairs of congruent isosceles triangles) Ask if participants can justify why the triangles are congruent.

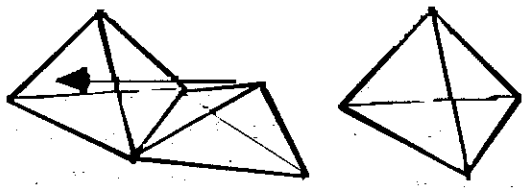
2. The participants should now fold the envelope along the diagonals. Using the ruler as a creasing guide helps. Scoring along the diagonal with a ball point pen helps also, but you have to be very careful not to cut the paper.

3. Cut out one of the triangles that is formed by two half diagonals and the longer edge of the envelope. Ask participants to open the triangle they cut out. What geometric shape do they have? (Most will say parallelogram; it is actually a rhombus.) If needed, clarify the more specific name. Why is it a rhombus? (Opposite angles congruent makes it a parallelogram; adjacent sides congruent makes it a rhombus.)



4. Using the envelope, ask what geometric shape it is. (Concave pentagon) Fold the envelope in half by matching the two shorter edges. Open, turn the envelope over, and make the same fold again. This fold should be a very crisp crease. Ask what geometric shape the folded envelope is. (trapezoid)

5. Now open the envelope until the new fold is a straight line. At this point, the right half will fit inside the left half and form a tetrahedron.



6. Now identify the vertices, edges, and faces of the tetrahedron.

Notes:

1. Any size envelope will work except square envelopes. The average "letter" size envelope will produce an almost regular tetrahedron.

2. Instead of using new envelopes, collect the return envelopes often included in promotions.

3. The basic idea for this activity came from "Tetrahedral Models from Envelopes" by Charles W. Trigg in *Mathematics Magazine,* Vol.51, No. 1, January 1978.

Maximizing Math: Digits in Disguise

Dave Youngs

Editor's Note:

The editors would like to thank *AIMS* for allowing us to reprint the following article from *AIMS* magazine (Activities Integrating Math and Science), July/August 1999.

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Maximizing Math

Digits in Disguise

by Dave Youngs

This month's activity has students creating their own number riddles and provides an excellent opportunity for students to think and communicate mathematically. While the activity is aimed at upper elementary students, the basic idea behind it can be used at various grade levels.

Digits in Disguise is my mathematical adaptation of a language arts activity from Bob and Marlene McCracken, well-known consultants in the area of reading and writing. While I was a teacher at Maple School in Tulare, California, the McCrackens worked successfully with our staff to help us improve our reading and writing instruction. On one of their visits, they shared the following activity called "Who am I?" This activity was intended to help students become better at using descriptive language in their writing. In the first part of the activity, students picked a character from a book that they were reading and then listed as many adjectives and/or phrases as they could describing that character. In the second part, students used this list to come up with several statements describing the character, without saying the character's name. These statements were incorporated into a riddle of sorts. However, the goal of this riddle was not to stump its readers, but to help them know exactly which character was being described. For example, if students were reading *Charlotte's Web*, the statements (riddle) describing Charlotte might be:

I saved a friend's life.
I created quite a stir with my evening's work.
I am not afraid of heights.
I have a soft spot for porcine pets.
I am a skilled weaver.

Who am I?

After writing and refining these riddles, students used construction paper and marking pens to make nice copies for placement on a bulletin board. The line with the question "Who am I?" was written on a narrow strip of different-colored construction paper that was as long as the larger piece of construction paper was wide. A piece of tape was put along the top of this strip and attached to the construction paper so that it served as a flap hiding the solution which was written at the bottom of the paper. The completed riddles were pinned to the bulletin board and students went there and read the riddles in their free time. After reading each riddle, they guessed the solution and lifted the flap to see if they were correct.

My students loved this language arts activity so much, I decided to adapt it to math. To do this, I simply changed the final question to "What number am I?" Since students hadn't had much practice describing numbers using mathematical language, I picked several numbers and put five statements describing each number on the board as shown in the following example:

I am less than 100.
I am an even number.
My tens digit is five greater than my ones digit.
The sum of my two digits is nine.
I am the product of eight and nine.

What number am I?

After doing several examples like the one above together as a class, I challenged each of my five groups to pick a number and create a number riddle describing that number. I then went from group to group facilitating this process by giving hints when needed without doing students' thinking for them. This interaction gave me insight into students' thinking and helped me assess their numeracy skills. After each group had finished writing a riddle, we put it on the chalkboard for others to see. We then solved each of the riddles together as a class. During this process, students saw how other groups had described their

numbers. This exposed everyone in the class to a variety of mathematical language. After this introduction, individual students were ready to construct their own number riddles. The completed riddles were placed on the bulletin board along with the riddles from reading.

Digits in Disguise is my attempt to put the above activity into a usable classroom format. While teachers can do this activity as described above by making up their own riddles and writing them on the chalkboard, I have included three different sheets with riddles aimed at different grade levels. Pick the riddles that are most appropriate for your students and either write them on the board or run off copies and give them to your students. These riddles are intended to be done in groups, but you may choose to give them to individual students instead. Be sure to monitor your students' work on solving the riddles. Spend time as a whole class discussing this process before asking students to create number riddles. When you sense that your students are ready to write their own riddles, hand out the last page which gives them instructions on how to do this. You will need a supply of sticky notes for this section so that students can cover up their numbers. After they have written their riddles they can trade papers with each other and try to solve other students' riddles. The riddles can then be placed on a bulletin board so that everyone has access to them.

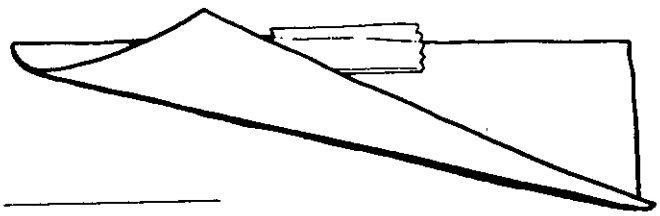
The success of this activity will depend on your facilitation of it. Students need plenty of practice describing numbers using correct mathematical statements before they are asked to write number riddles. Students need to be reminded that a good riddle is one that leads the reader to the correct answer, not one which stumps the reader. Be sure to assess students' readiness before having them create their riddles. To make this process less intimidating, you can have groups write riddles and share them before asking individual students to do this. End this activity with a class discussion.

I hope you find this activity worthwhile for your students. I'll have another one for you in the next issue.

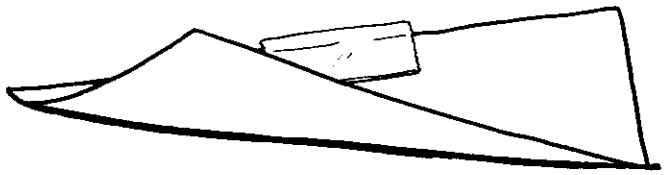
Digits in Disguise

Try to solve the following number riddles.
Show your work.

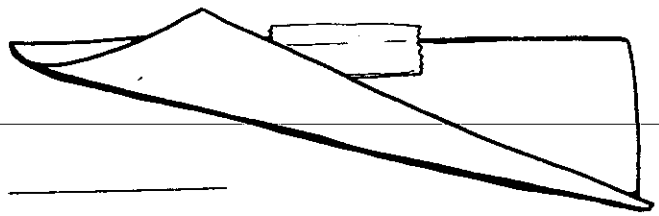
I am odd.
I am less than 10.
I am greater than 7.



I am even.
I am greater than 10.
I am less than 14.



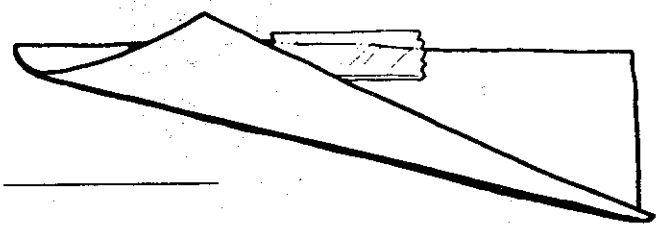
I am between 5 and 12.
I am odd.
I have two digits.



Digits in Disguise

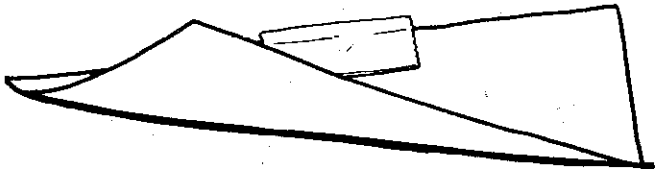
Try to solve the following number riddles.
Show your work.

I have two digits.
I am an odd number.
Both of my digits are the same.
I am greater than 80.



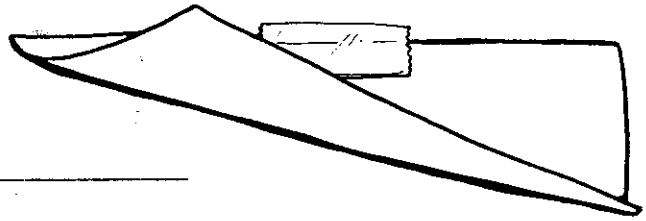
_____

I am a two-digit number.
I am less than 60.
My digits are consecutive numbers.
The sum of my digits is 11.



_____

I have three digits.
I am greater than 500 and less than 600.
My tens and ones digits are both the same even number.
The sum of all my digits is nine.



_____

Digits in Disguise

Try to solve the following number riddles. Show your work. You may need to use the back of the paper.

I am less than 100.
I am an odd number.
My tens digit is three greater than my ones digit.
The sum of my two digits is nine.
I am the product of sever and nine.

_____

I have two digits.
I am a multiple of three.
I am divisible by four.
My tens digit is five more than my ones digit.
I am greater than 50.

_____

I have three digits.
I am a multiple of five.
My hundreds digit is four less than my ones digit.
My tens digit is 3.
I am less than 200.

_____

Digits in Disguise

Create a number riddle by following these instructions:

1. Choose a number for your riddle. Write it on the line at the bottom of the paper and cover it with a sticky note.

2. Write several clues describing your number on the lines provided.

3. Trade papers with a classmate and see if he or she can guess your number.

Clues

_____

_____

_____

_____

_____

What number am I?

_____

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___Mathematics Teaching in the Middle School

___Journal for Research in Mathematics Education

_____ Institutional Membership for Campus $75.00 (Please indicate the one journal you wish to receive.)

Total Amount Due to NCTM: $ _____

Make check payable to TCTM and mail to:
TCTM Treasurer
38 Bradford Circle
Sugar Land, TX 774

Total Amount Due: $ _____

Lone Star News: Revised Constitution and By-Laws

The changes to the Constitution and By-Laws proprosed in the Spring 1999 journal were approved. The revised Constitution and By-Laws follow.

THE CONSTITUTION OF THE TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

ARTICLE I - NAME

This council shall be known as the Texas Council of Teachers of Mathematics, hereafter referred to as the Council, or TCTM.

ARTICLE II - AFFILIATION

This council shall be affiliated with the National Council of Teachers of Mathematics (NCTM).

ARTICLE III - PURPOSES

Section 1. To encourage an active interest in mathematics.

Section 2. To provide the opportunity to study and keep abreast of any new trends in the teaching of mathematics.

Section 3. To improve teacher training programs for Texas mathematics teachers.

Section 4. To assist Texas mathematics teachers in obtaining the benefits from the NCTM and the Conference for the Advancement of Mathematics Teaching (CAMT).

Section 5. To promote and sustain active local affiliated councils throughout the state.

ARTICLE IV - MEMBERSHIP

Section 1. Individual membership is available upon payment of dues as provided in the by-laws.

Section 2. Associate membership is available to any full-time student upon payment of dues as provided in the by-laws.

Section 3. Honorary membership may be granted to any person who has rendered service which this council may desire to recognize with a life-time honorary membership, upon the recommendation of the Executive Board. An honorary member shall be exempt from paying dues and shall enjoy all privileges of individual membership.

Section 4. Institutional membership is available to any school, college, or organization, upon payment of dues as provided in the by-laws.

Section 5. Special interest groups, whose goals are consistent with TCTM, may be recognized by the Executive Board.

ARTICLE V - OFFICERS AND EXECUTIVE BOARD

Section 1. The officers of the council shall be a president, two vice-presidents, a secretary, a treasurer, and six regional directors elected by a plurality vote of the membership.

Section 2. There shall be an NCTM representative, a director of publications, two editors, a parliamentarian, a CAMT Board representative, and a Government Relations representative appointed by the president with the approval of the Executive Board.

Section 3. The voting members of the Executive Board shall consist of the elected officers.

Section 4. The non-voting member of the Executive Board shall be the NCTM representative, the director of publications, the editors, the parliamentarian, the president-elect or past president, the CAMT Board representative, the Government Relations representative, and the TEA Director of Mathematics.

ARTICLE VI - MEETINGS

Section 1. There shall be at least one regular meeting of the Council during the fiscal year.

Section 2. There shall be at least one meeting of the Executive Board during the fiscal year.

ARTICLE VII - AMENDMENTS

This constitution may be amended in the following manner:

A. The proposed amendment or amendments shall be sent to the president or to the secretary at least ninety days prior to the annual meeting.

B. An announcement of the proposed change(s) and a mailed ballot shall be included in the general announcement of the annual meeting.

C. To become effective, any change(s) in the constitution shall be approved by a two-thirds majority of members who respond to the mailed balloting.

ARTICLE VIII - DISSOLUTION

If, at any time, the Texas Council of Teachers of Mathematics shall cease to carry out the purposes that are herein stated, all assets and property held by it, whether in trust of otherwise, shall, after payment of its liabilities, be paid over to the National Council of Teachers of Mathematics to be used exclusively for any project, or educational purpose, as determined by the Board of Directors of that organization.

THE BY-LAWS OF THE TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

ARTICLE I - RULES OF ORDER

Robert's Rules of Order or *Greggs Parliamentary Law* shall be the authority on all questions of procedure not specifically stated in this constitution and by-laws.

ARTICLE II - EXECUTIVE BOARD

The executive board shall serve as the governing body of the Council. It shall have power to transact the business of the council; initiate, develop, and determine the policies of the council; establish the budget; and appoint officers as provided in the constitution and by-laws.

ARTICLE III - SPECIAL INTEREST GROUPS

Special Interest Groups currently recognized by TCTM are:
State of Texas elementary Association of Mathematics (STEAM).

ARTICLE IV - QUALIFICATIONS, TERMS, AND DUTIES OF OFFICERS AND OTHER MEMBERS OF THE EXECUTIVE BOARD

Section 1. Qualifications of Officers

a. Officers of this council shall be individual members of the Council and the NCTM.

b. One vice-president shall be a member with elementary mathematics responsibilities, and one vice-president shall be a member with secondary mathematics responsibilities.

Section 2. Terms of Office

a. All elected officers shall assume their duties at the beginning of the fiscal year.

b. The president shall serve for a period of two fiscal years, succeeding to office from the office of president-elect. This office, if vacated in the second fiscal year, shall be filled by the president-elect. This office, if vacated in the first fiscal year, shall be filled by the secretary.

c. The president-elect shall be elected to serve for the fiscal year corresponding to the second fiscal year of the president's term of office. This office, if vacated, shall be filled by an election either by mailed ballot or at the annual meeting of the Council.

d. The vice-presidents shall be elected to serve for the period of two years, one elected each year. This office, if vacated, shall be filled by an election either by mailed ballot or at the annual meeting of the Council.

e. The secretary shall be elected to serve for a period of two years and shall be subject to reelection. This office, if vacated, shall be filled by an election either by mailed ballot or at the annual meeting of the Council.

f. The treasurer shall be elected to serve for a period of two years and shall be subject to reelection. This office, if vacated, shall be filled by the executive board, or by an election, either by mailed ballot or at the annual meeting of the Council.

g. The regional directors shall be elected by members in each of the six geographical regions of the State of Texas, designated as Southeast, Northeast, Northwest, Southwest, South and Central, for a period of two years and shall be subject for reelection. This office, if vacated, shall be filled by an election either by mailed ballot or at the annual meeting of the Council.

h. The representative to the National Council of Teachers of Mathematics shall be appointed by the president, with the approval of the executive board, for a period of one year, and shall be eligible for reappointment.

i. The director of publications shall be appointed by the president, with the approval of the executive board, for a period of two years and shall be eligible for reappointment.

j. The editors shall be appointed by the president, with the approval of the executive board, for a minimum of two years, and shall be eligible for reappointment.

k. The parliamentarian shall be appointed by the president, with the approval of the executive board, for a period of one year and shall be eligible for reappointment.

l. The CAMT Board representative shall be appointed by the president, with the approval of the executive board, for a period of one year and shall be eligible for reappointment.

m. The government relations representative shall be appointed by the president with the approval of the executive board, for a period of one year and shall be eligible for reappointment.

Section 3. Duties of Officers

a. The president shall preside at all meetings of the Council and the executive board; shall administer the affairs of the council; shall appoint all committees not otherwise provided for; and shall be an ex-officio member of all committees. The president shall prepare an annual report to be given at the annual meeting of the Council and filed as part of the permanent record. The president, or designated delegate, shall serve as the official delegate to the NCTM Annual meeting.

b. The president-elect shall perform duties as assigned by the president and shall be an ex-officio member of all committees.

c. The immediate past president shall assist the president and executive board.

d. The vice-president with elementary responsibilities shall serve as a board member of STEAM, promoting membership and providing publicity. The vice-president with secondary responsibilities shall represent the secondary interests, promoting membership and providing publicity.

e. The secretary shall keep all records and minutes of the Council and of the executive board; and shall preserve the annual reports and historical records of the council.

f. The treasurer shall collect all dues and other income of the Council; shall pay all routine bills provided for by the annual budget and such other bills as approved by the executive board or the president; shall maintain a current membership list; shall keep all financial records, and shall make an annual financial report to the executive board and the council. A copy of this report shall be filed as part of the permanent records.

g. Each regional director shall promote the organization and maintenance of the local councils and solicit from the region nominations for TCTM offices. The regional director may organize

leadership workshops for officers of local affiliated groups and may organize TCTM sponsored regional conferences, or any other activity which may benefit the local affiliated groups.

h. The NCTM representative shall serve as the liaison between NCTM and TCTM and shall be responsible for the NCTM booth at CAMT.

i. The director of publications shall print and distribute council publications, such as the journal, the newsletter, and ballots.

j. The editor(s) of the journal shall solicit articles, submit them for review, and prepare all materials for publication. The editor(s) of the newsletter shall prepare the newsletter for publication.

k. The parliamentarian shall advise the president on matters of parliamentary procedure.

l. The CAMT Board representative shall represent TCTM on the CAMT board which meets semi-annually and shall prepare a report from such meetings for the executive board.

m. The Government Relations representative shall represent TCTM in business and public affairs where requested by the executive board or the president.

ARTICLE V - GEOGRAPHICAL REGIONS

The State of Texas shall be divided into six regions comprised of areas which coincide with designated ESC regions.

Section 1. The NORTHEAST Region consists of ESC regions ~~6~~, 7, 8, 10, and 11.

Section 2. The SOUTHEAST Region consists of ESC regions 4, 5, and 6.

Section 3. The NORTHWEST Region consists of ESC regions 9, 14, 16, and 17.

Section 4. The SOUTHWEST Region consists of ESC regions 15, 18, and 19.

Section 5. The SOUTH TEXAS Region consists of ESC regions 1, 2, and 3.

Section 6. The CENTRAL TEXAS Region consists of ESC regions 12, 13, and 20.

ARTICLE VI - COMMITTEES

Section 1. Standing Committees

a. Publications Committee
This committee shall consist of the director of publications, the editors, and two members appointed by the president. The chair shall be the director of publications. The committee shall be responsible for the procurement of materials for publication and distribution of all bulletins of the council and shall submit announcements and other pertinent materials to state and national publications.

Section 2. Special Committees

a. Nominations and Elections Committee
This committee shall consist of the vice-president who is not standing for election, and one member from each region. The vice-president shall serve as chair. The committee shall serve for regular elections. The committee shall make every effort to secure at least two nominees for each vacant office. The nominees shall be presented to the members by way of a printed ballot. Ballots

shall be returned to the chair of the committee, who shall, with one other officer, count the ballots and certify the results to the committee.

b. The Auditing Committee
This committee shall audit the financial records before the annual meeting. This committee shall consist of the president, treasurer, and one other member of the executive board.

c. Other Special Committees
These committees shall assume duties as outlined when appointed.

ARTICLE VII - FISCAL YEAR AND MEMBERSHIP DUES

Section 1. The fiscal year for the Council shall be from September 1 extending through August 31.

Section 2. Membership dues

a. Annual dues for an individual or associate member shall be thirteen dollars.

b. There shall be no annual dues for honorary members.

c. Annual dues for an institutional member shall be forty dollars. Institutional members receive three copies of all publications.

ARTICLE VIII - MEETINGS AND QUORUMS

Section 1. One regular meeting of the Council shall be held during the annual meeting of the CAMT. A quorum shall consist of twenty-five members.

Section 2. At least one meeting of the executive board shall precede the annual council meeting at the CAMT meeting. A quorum shall consist of six members.

ARTICLE IX - AMENDMENTS

These by-laws may be amended by a two-thirds majority of the voting members of the executive board present.

TEXAS COUNCIL OF TEACHERS OF MATHEMATICS
MATHEMATICS SPECIALIST SCHOLARSHIP

Amount: $1000 or $500

Application Deadline: March 15, 2000

Eligibility: Any student who will graduate in 2000 from a Texas high school - public or private - and who plans to enroll in college in the fall of 2000 to pursue a career in mathematics teaching either as a mathematics specialist in elementary school or as a secondary school teacher with certification in mathematics.

Name: _____
Last First Middle

Address: _____
Number and street Apt. number

_____
City Zip code

Phone number: ( )_____ Birth date: _____

Social security number: _____

High school(s) attended: _____

What college or university do you plan to attend? If you are awarded this scholarship, TCTM's treasurer will send a check directly to the business office of the college. We need the college's complete address.

Enclose the completed application with each of the following in the same envelope and mail to Pam Alexander at the address listed below. **YOU MUST INCLUDE 3 COPIES OF ALL REQUIRED MATERIALS.**

1. On a separate sheet, list high school activities including any leadership positions.
2. Official high school transcript
3. Letter of recommendation from a TCTM member
4. An essay describing your early experiences learning mathematics and any experiences explaining mathematics to your classmates or friends. This essay must be no more than two pages, double-spaced.
5. An essay telling why you want to be a mathematics specialist in elementary school or a mathematics teacher in middle or high school. This essay must be no more than one page, double-spaced.

Return all materials in one envelope to: Pam Alexander
Rt. 4 Box 5212
Nacogdoches, TX 75964

E. Glenadine Gibb Achievement Award Application

The E. Glenadine Gibb Achievement Award is presented to someone nominated by a TCTM member to be honored for his/her contribution to the improvement of mathematics education at the state and/or national level.

Deadline: February 15, 2000

Information about the TCTM member nominating a candidate:

Name: _____

Home address: _____

Home phone: _____ Business phone: _____ E-mail: _____

Are you a member of TCTM? _____ NCTM? _____

Information about the nominee:

Name: _____

Home address: _____

Home phone: _____ Business phone: _____ E-mail: _____

Is the nominee a member of TCTM? _____ NCTM? _____ Retired _____

Applications should include 3 pages:

- Completed application form
- One-page, one-sided, typed biographical sheet including:
  - Name of nominee
  - Professional activities
  - National offices or committees
  - State TCTM offices held
  - Local TCTM-Affiliated Group offices held
  - Staff Development
  - Honors/awards
- One-page, one-sided essay indicating why the nominee should be honored for his/her contribution to the improvement of mathematics education at the state/national level

Send the completed application, biographical sketch, and essay to:

Pam Alexander
Rt. 4 Box 5212
Nacogdoches, TX 75964

TCTM Leadership Award Application

The TCTM Leadership Award is presented to a TCTM member who is nominated by a TCTM Affiliated Group. This person is to be honored for his/her contributions to the improvement of mathematics education at the local and state level. He/she has designed innovative staff development and has promoted the local TCTM Affiliated mathematics council.

Deadline: February 15, 2000

Information about the of Affiliated group nominating a candidate:
Name of Affiliated Group: _____

President of the Affiliated Group: _____

Home address: _____

Home phone: _____ Business phone: _____ E-mail: _____

Are you a member of TCTM? _____ NCTM? _____

Information about the person being nominated:

Name: _____

Home address: _____

Home phone: _____ Business phone: _____ E-mail: _____

Is the nominee a member of TCTM? _____ NCTM _____ Retired _____

Applications should include 3 pages:

- Completed application form
- One-page, one-sided, typed biographical sheet including:
  Name of nominee
  Professional activities
  State/local offices or committees
  Activities encouraging involvement/improvement of math education
  Staff Development
  Honors/awards
- One-page, one-sided essay indicating why the nominee should be honored for his/her contribution to the improvement of mathematics education at the state/national level.

Send the completed application, biographical sketch, and essay to

Pam Alexander
Rt. 4 Box 5212
Nacogdoches, TX 75964

CAMTership Application

Six $100 CAMTerships will be awarded to those teaching five or less years who are members of TCTM and have not attended CAMT before. The money is intended to help cover expenses associated with attending CAMT and to encourage new teachers to attend CAMT. Two CAMTerships will be awarded to teachers in each of the following grade levels: K - 4, 5 - 8, and 9 - 12. Winners will be determined by random drawing of names and will be notified by March 1, 2000. Winners will be asked to work for two hours at registration or NCTM material sales and will be TCTM's guest at our breakfast, where the checks will be presented. GOOD LUCK!

Deadline: February 15, 2000

Name: _____

Phone number: _____

Home address: _____

City, zip: _____

School: _____

Grade(s) taught: _____

School address: _____

School phone: _____

Principal's name: _____

Are you a member of TCTM? _____

Note: If you are not a member of TCTM, you may enclose $10 with this application to apply for membership.

Have you attended CAMT before? _____

How long have you been teaching? _____

Describe your primary teaching responsibilities:

Send your completed application to:

Pam Alexander
Rt. 4 Box 5212
Nacogdoches, TX 75964

Notes:

TEXAS COUNCIL OF TEACHERS OF MATHEMATICS

Affiliated with the
National Council of Teachers of Mathematics

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When does YOUR membership expire?

Note the expiration date an your mailing label.
Use the membership form inside to renew **before** that date.

Texas Council of Teachers of Mathematics

Member 1999-2000

NAME _____

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Texas Mathematics Teacher
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