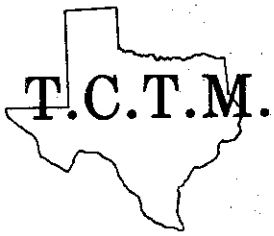
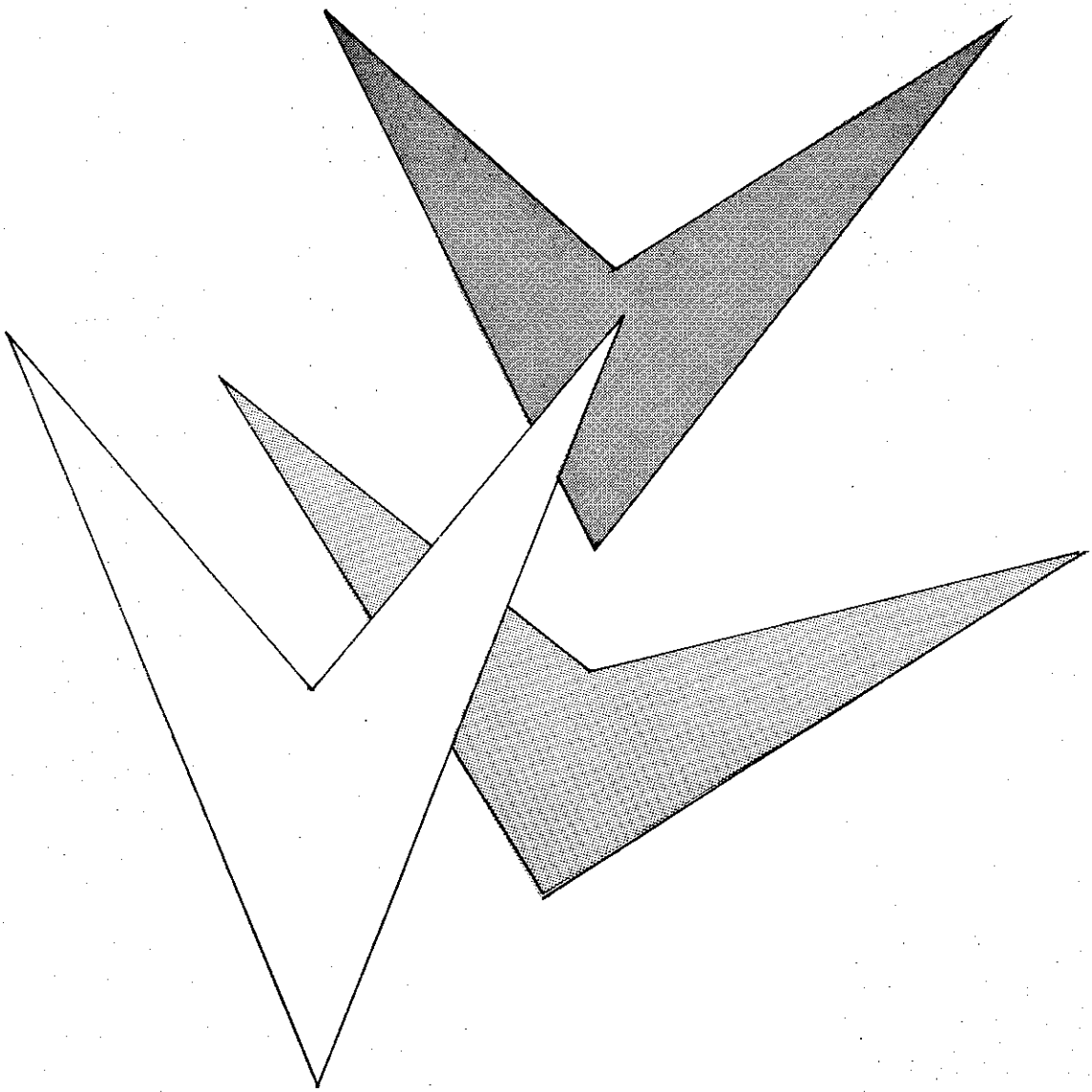


TEXAS MATHEMATICS TEACHER



Texas Council of Teachers of Mathematics

TEXAS MATHEMATICS TEACHER is a refereed journal and is the official journal of the Texas Council of Teachers of Mathematics. The views expressed are the contributor's own and are not necessarily those of the publisher or the editor. All manuscripts and correspondence about this publication should be addressed to Mr. J. William Brown, Texas Mathematics Teacher, 3632 Normandy Avenue, Dallas, Texas 75205. Manuscripts should be typed (letter-quality print is acceptable) double spaced throughout with wide margins, on 8 1/2 x 11 paper, and with figures on separate sheets. No author identification should appear on the manuscript. Five copies are required.

TEXAS MATHEMATICS TEACHER is published quarterly by the **Texas Council of Teachers of Mathematics.** Payment of membership fee of **$5.00** entitles members to all regular Council Publications.

TEXAS MATHEMATICS TEACHER

Texas Council of Teachers of Mathematics

Volume XXXIV JANUARY, 1987 No. 1

PRESIDENT'S MESSAGE

WOW! What a challenge Ralph Cain issued to the incoming president in his October President's Message. As the incoming president, I have to take this challenge personally. I will work with the Executive Committee of TCTM to make the council a more active, viable organization.

For some time the Executive Committee has been concerned about making TCTM more useful and relevant to all its members. The name and membership include the classroom teacher, but recently the Executive Committee has not. So, a step toward greater involvement of those who teach mathematics to elementary, middle and high school students every day was the election of just such a member as president. A teacher of students in grades 9 - 12 at Memorial High School, Spring Branch Independent School District, I am delighted to introduce myself, Maggie Dement, to you as president.

To honor all members and say that we appreciate you, a members only breakfast was held during CAMT this October. Very special thanks from me and all who attended the TCTM Breakfast at the Hyatt on Friday, October 10, must go to John Huber and Bettye Hall. John created the breakfast, securing financing through donations from publishers and making all arrangements with the Hyatt. Bettye handled the work involved in inviting the members through the mail.

The six publishing companies who so generously sponsored our breakfast are:

1. Harcourt Brace Jovanovich
2. D. C. Heath and Company
3. Holt, Rinehart and Winston
4. Houghton Mifflin Company
5. Charles E. Merrill Publishing Company and
6. Scott, Foresman and Company.

Many warm thanks to you from all of us who enjoyed the delicious feast.

The annual business meeting of TCTM was held immediately following the breakfast. Ralph Cain presided over the meeting. Among the items on the agenda was a report from the TEA Paperwork Reduction Advisory Committee by Cathy Rahlfs, TCTM's representative on that committee. Because of two vice-president vacancies on the Executive Committee, an election was held. Beverly Cunningham from Bulverde and Susan Smith of Ysleta ISD were elected.

Attendance at the business meeting was considerably improved over the 1985 meeting. However, it wasn't large enough! Since the next Conference for the Advancement of Mathematics Teaching is during the summer, teachers are free from school duties and may go. Plan now to attend CAMT and the annual business meeting of the Texas Council of Teachers of Mathematics. We want your suggestions and ideas.

There are already some suggestions and ideas in the works for those who are expecially involved with elementary mathematics teaching. Ramona Jo DeValcourt has been thinking, planning, working, and talking to interested educators. Keep your eyes and ears open for her very exciting plans.

Maggie Dement

DATES FOR CAMT

1987: August 3 — 5
1988: August 2 — 4

Note your mailing label for
renewal date of TCTM membership!

MATHEMATICS ANXIETY

Patricia Rhodes Nicasia
Del Rio, Texas

Mathematics anxiety is one of the greatest hindrances to students desiring to enter math-related fields. "Mathematics anxiety involves feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations" (Richardson & Suinn, 1972, p. 551). Mathematics anxiety has been identified in both male and female students but this article will focus only on female students.

The idea of anxiety is not new but until recently many people have ignored the existence of mathematics anxiety. Public attention was given to the phrase "math anxiety" in 1976 when Sheila Tobias' article, "Math Anxiety: Why Is a Smart Girl Like You Counting on Your Fingers?", was published in Ms. magazine. Tobias (1976) states that "math anxiety is an 'I can't' syndrome. Math anxiety is handed down from mother to daughter with a father's amused indulgence" (p. 56). A positive, patient influence has a great effect on a girl's intellectual development. In a study of highly creative female mathematicians, Revanna Helson (1971) found that two-thirds of these women had professional men as fathers. The interviews showed that these mathematicians identified primarily with their fathers. This would suggest that a girl's self-concept is greatly enhanced by the attitudes of the parent with whom she identifies most.

A common reaction to anxiety is avoidance. A survey conducted by Lucy Sells (1973) at the University of California at Berkeley found that only 8% of the first-year females had taken four years of high school mathematics, compared to 57% of the first-year males. This survey definitely shows that a large percentage of female students at Berkeley are avoiding mathematics classes.

Marilyn N. Suydam (1984) has found that attitudes toward mathematics tend to remain positive until sixth grade and then become less positive as students progress through school. It is possible that this trend could be offset somewhat if mathematics were presented in a more interesting manner. Could it be that female students tend to think of mathematics as less appealing than do male students?

Teachers' attitudes have a tremendous effect on whether a female will continue the study of mathematics or pursue a differenct field of study. Fennema (1977) found no sex difference in achievement in mathematics if the number of mathematics courses taken by girls and boys is held constant. Many teachers believe boys are better in this subject than girls. A survey was conducted by John Ernest (1976), a mathematician at the University of California, with a small group of teachers and education majors, which showed that almost 40% of them expected girls to do more poorly in mathematics when compared with boys.

People usually try to live up to the expectations of others, whether these expectations are perceived as good or bad. Students have a tendency to fulfill their teacher's expectations regarding performance. This phenomenon has been referred to as the "Pygmalion effect." Presumably it would be valuable if teachers have the same expectations for female students as for male students in their classes.

An observational study conducted by Joanne Rossi Becker (1981) found a distinct trend for disproportionate teacher contacts with male students in mathematics classes. The study revealed that the male students received more teacher attention and reinforcement than the female students. A change in the distribution and form of feedback might well change the female student's attitude toward mathematics and possibly increase her success in the subject.

Laurie Buxton believes that one of the causes of anxiety in the classroom is the student's perception of the person in authority as a judge. This authority figure is perceived by the student as one who "demands answers" and waits to judge the answers publicly. The student also feels extra pressure to respond quickly or be judged as "not knowing" the correct answer. Buxton believes "the resolution lies in getting the pupil to admit and discuss the feeling, and in the teacher explaining the mechanism leading to it" (Buxton, 1982, p. 110). This fear should be confronted in the early years, and failure to do so causes many female students to avoid mathematics.

Fear contributes to anxiety. How can the fear of mathematics be reduced? One possibility is for students to possesss a "storehouse" of resources upon which to draw when solving mathematics problems. If students merely "memorize" mathematical concepts as isolated pieces of facts, then when memory fails, the students do not have alternative approaches available to solve the problem and fear may emerge. Richard R. Skemp contends that there are two types of understanding: "instrumental understanding" and "relational understanding." "Instrumental understanding" refers to memorization of steps or rules without reason. Skemp (1978) defines "relational understanding" as knowing both what to do and why. "Learning relational mathematics consists of building up a conceptual structure (schema) from which its possessor can (in principle) produce an unlimited number of plans for getting from any starting point within his schema to any finishing point" (Skemp, 1978, p. 14). That is, if mathematics concepts are learned relationally, then students will possess numerous paths for arriving at an answer to a problem. Thus, the likelihood of panic and fear is reduced.

My experience in teaching mathematics at the college level to preservice elementary teachers leads me to believe that mathematics anxiety is contagious. Many of the students appear to be apprehensive, worried, and tense at the beginning of the course. This observation was confirmed when I read their answers to the following questions: "Do you feel anxious about mathematics? Why?" Several students reported that previous teachers have made them feel anxious about mathematics. Considering these comments, I constantly strive to reduce mathematics anxiety by being specific about course expectations, providing clear and easily understood lectures, and by being enthusiastic about the subject. It is important that we as educators be "cautious" about not causing mathematics anxiety in the classroom.

Considering the previously cited research findings, it is evident that mathematics anxiety is a serious problem in education, and it is important that we deal with factors that contribute to it. Hopefully, this article will stimulate thoughts about the following two questions:

1. Will success in mathematics reduce mathematics anxiety and change the female student's attitude toward mathematics?
2. What can be done to encourage female students to take more than the minimum number of mathematics classes required for general education?

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A SPECIAL TRIBUTE . . .

One of GDCTM's most devoted members, W. K. "Bill" McNabb, passed away on Sunday, September 14, 1986, after a brief illness. Bill had taught in several private and public schools in the Dallas area over the past forty years. From 1946 to 1961, he chaired the mathematics department at Hockaday School. For the next ten years, he headed the mathematics department at St. Mark's School of Texas. At that point in his teaching career, Bill became director of the mathematics magnet school at Skyline High School in Dallas, where he served until 1984. He resigned that position to become chairman of the mathematics department at Episcopal School of Dallas, where he remained until his recent death.

One of Bill's greatest joys was to develop new mathematics programs in order to train high school students. He did this very thing at each of the schools he served. He believed in challenging students through mathematical competitions; he accomplished this through secondary mathematics competitions he directed for GDCTM in the fall and spring of each school year.

Bill was an officer of GDCTM for many years and also actively supported the national organization, NCTM, in a variety of roles. His more recent project was to chair NCTM's Southwest Regional Conference in Dallas in February of 1986. He was also a fellow of the Texas Academy of Science.

Bill was the recipient of numerous mathematics awards, including the Advanced Placement Award for Teaching Excellence for the Southwestern Region in 1985 from the North Texas Area Association of Advanced Placement Mathematics Teachers. He also received the Sigma Xi Award for Teaching Excellence from the Southern Methodist University chapter of Mu Alpha Theta.

As a tribute to Bill and his continuous contributions to secondary mathematics, the Greater Dallas Council has established the Bill McNabb Student Scholarship Fund, which will be used to assist students as they pursue advanced mathematics training. If any individual or organization wishes to contribute to this fund, please send checks payable to GDCTM to Mrs. Josephine Langston, 127 West Harvard Drive, Garland, TX 75041. What better way to remember Bill than to remember those high school mathematics students who were so dear to him!

PROPOSED CHANGES IN TCTM BY-LAWS

ARTICLE VI Section 2

Present	Membership Dues	
	a.	Annual dues for any active member shall be five dollars.
	b.	Annual dues for any associate member shall be one dollar.
	c.	There shall be no annual dues for honorary members.
Proposed:	Membership Dues	
	a.	Annual dues for any active member shall be eight dollars.
	b.	Annual dues for any assoicate members shall be four dollars.
	c.	There shall be no annual dues for honorary members.

NOTE: Associate members are student members.

ARTICLE VII Section 1.

Present	One regular meeting of the Texas Council of Teachers of Mathematics shall be on Friday of the annual meeting of the Conference for the Advancement of Mathematics Teaching (CAMT). A quorum shall consist of twenty-five members.
Proposed	One regular meeting of the Texas Council of Teachers of Mathematics shall be held at the annual meeting of the Conference for the Advancement of Mathematics Teaching (CAMT). A quorum shall consist of twenty-five members.
NOTE:	This change is due to CAMT 1987 being held on Monday-Wednesday.

If you have any questions with regard to these proposed changes, please contact:

John Huber, Secretary
Texas Council of Teachers of Mathematics
P.O. Box 6768
Huntsville, TX 77340

MATHEMATICS ANXIETY continued from page 4

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TCTM JOURNAL NEEDS ARTICLES
FOR ALL LEVELS OF MATHEMATICS

THANKS! THANKS! THANKS!

Members of the Texas Council of Teachers of Mathematics wish to thank the following publishers/ representatives who furnished the wonderful breakfast at CAMT at the Hyatt Regency Hotel in Austin, October, 1986.

CHARLES E. MERRILL
D.C. HEATH AND COMPANY
HARCOURT BRACE JOVANOVICH, INC.
HOLT, RINEHART AND WINSTON
HOUGHTON MIFFLIN COMPANY
SCOTT, FORESMAN AND COMPANY

Aubrey Bain
David Anderson
Steve Gandy
Don Hale
Mike Shaw
Jay Lackey

ANNOUNCEMENT

Two outstanding professional organizations will join in presenting the conference "Using Computers to Enhance Mathematics Teaching" in San Antonio on Feb. 7, 1987. The Alamo District Council for Teachers of Mathematics (ADCTM) and the Texas Computer Education Association (TCEA) will pool their resources to provide a really unique opportunity for professional growth for mathematics teachers in grades K-12. Application has been submitted for AAT credit.

Sandy Pratscher, who began her career in education as a math teacher and is a former Director of Instructional Technology at TEA, will deliver the keynote. She's great! Many other outstanding speakers will be coming from across the state as well. There will be presentations for all grade levels on a variety of topics related to using computers in mathematics classrooms.

For more information contact Dr. Pat Semmes, TCEA Area III, P.O. Box 120156, San Antonio, TX 78212-9556, phone (512) 826-1960.

REFEREES WANTED

Manuscripts published in the TEXAS MATHEMATICS TEACHER are reviewed by at least three mathematics educators. Members of TCTM who are regular readers of the journal - classroom teachers, supervisors, and teacher educators - who would like to review manuscripts should write to the TCTM indicating their willingness to serve and the level of interest (Elementary, Secondary, or both). Contact George H. Willson, Box 13857, North Texas State University, Denton, Texas 76203-3857. The Editorial Panel will review the responses and make the final selection.

Items of Interest

NEW OFFICERS

After the TCTM Breakfast at the Hyatt, Friday, October 10, at CAMT, the annual business meeting for all members of TCTM was held.

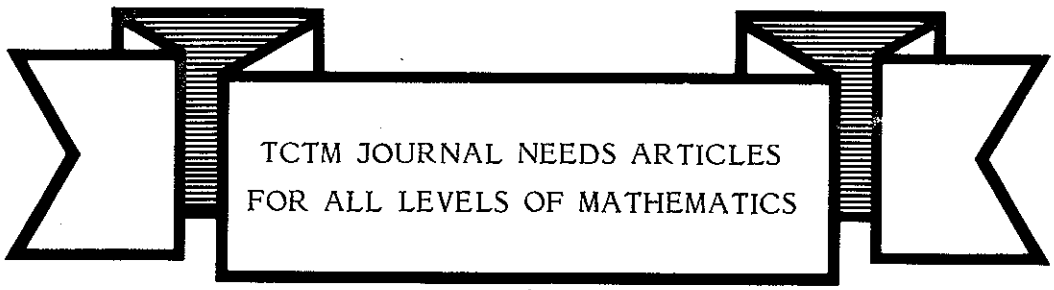
The major item of business was the election of two vicepresidents to fill vacancies.

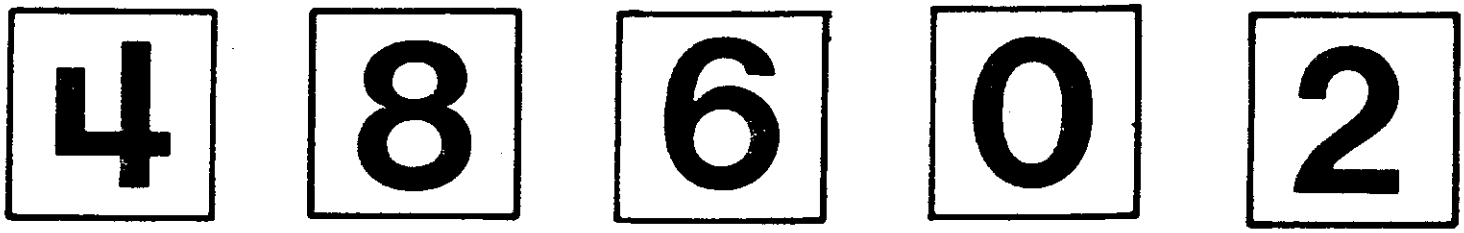
Beverly Cunningham of Bulverde and Susan M. Smith from Ysleta ISD, El Paso, are the newly elected officers.

CAMT DATES

Do you notice some previously published CAMT dates missing from the list? They are the June dates and were for the years 1989-1991.

It was decided that June wouldn't be prime time for CAMT. The new dates for those years will be published in the Journal as soon as they are selected.





This page contains some teaching ideas to explore numeration with students in grades 3 through 8. These suggestions can be expanded and adapted to meet the needs of many grade levels. Each student is to have a set of the 10 tiles shown here. The tiles may be cut from heavy paper or made from one-inch ceramic tiles. They offer a great way to have 100% involvement of your students!

From: MARY M. HATFIELD
MATHEMATICS CONSULTANT
Lawrence Public Schools
Lawrence, Kansas

1. Choose any three tiles. Form a three-digit number. Read the number to others in the group.

2. Compare the three-digit numbers made by the group. Order them from greatest to least.

3. With the three-digit number, exchange the tile in the hundred's place with the tile in the one's place. What effect did this exchange have on the number? Compare and order these new numbers in the group. Reverse the digits in the ten's and one's place. Compare and order these numbers. Read numbers aloud in the group.

4. Form the greatest three-digit number possible from all 10 tiles.

5. Form the least three-digit number using all 10 tiles.

6. Make a three-digit number that is greater than 250 but less than 375. Read this number to the group and check if it fits the given parameters. Repeat using different parameters.

7. Write this number in expanded numeral form.

8. Increase this number by two hundred. decrease the number by ten, etc.

9. Repeat these activities for four-digit and five-digit numbers.

10. Have students think of a three-digit number. Give clues about the secret chosen number, such as: a multiple of five, the digit in the hundred's place is an odd number. If desired, students can continue to adjust their number with clues provided until the secret number is discovered.

11. Form a four-digit number. Divide it by 10. Use a pencil tip or finger to show decimal point. Multiply it by 100. Divide it by 1000.

12. Have students continue a counting pattern by indicating the next number in a sequence with their tiles. For example, 235, 240, 245, 250, ?

13. Dictate numbers and have students form them with the tiles. Read numbers in scrambled form: 5 ones, 6 thousands, 3 tens.

14. Show numbers in written word form and have students form with tiles in symbolic form: e.g. four hundred seventeen = ?

15. Form dictated decimal numbers with the tiles. Form decimal numbers for written word form of the numbers.

16. Show a decimal number that is greater than 4 but less than 10 and has four digits. Read numbers aloud in the group then compare and order in decreasing (or increasing) value.

17. Make a four-digit decimal number. Multiply it by 10. Read this number. Divide it by 1000. Read this number.

18. Use five tiles. Make the greatest decimal number possible. Read to the group. Make the least decimal number possible. Read to the group.

19. Use any five tiles and form a decimal number. Read aloud. Compare and order the numbers in the group.

20. Form a five-digit decimal number. Round to the nearest tenth. Form other five-digit decimal numbers. Round to various places.

STUFF Strategic Tactics Ultimately For Fun

SAME OLD STUFF!

Dear T.C.T.M. Member,

January is here and where are you? We do not have a "STUFF" winner this month because you did not send us any stuff. The offer is still good. Membership is on a one-to- one correspondence basis; one activity - one free membership. We need you ideas if this stuff is going to be worth the stuff it is printed on.

We are standing by our mail boxes eagerly waiting for your large brown envelopes.

Send your material to Bettye Hall, Mathematics Dept., Houston I.S.D., 3830 Richmond, Houston, TX 77027 or Judy Tate, H.C.D.E., 6208 Irvington Blvd., Houston, TX 77022.

Sincerely,

The STUFF staff
Bettye & Judy

ELEMENTARY ACTIVITY

Eighteenth Century Money

You need: paper and pencil and perhaps a friend

The colonists had very little use for money. They made most of what they needed. They made some coins called shillings and pence. They didn't mine gold or silver. Most of the coins were made in England. Because of trading with Spain there were many Spanish coins in the colonies. Paper money was first issued in the 1600's. In the 1750's paper money was not worth its face value. Because paper money was losing its value, in 1764, England ordered the colonies to stop making paper money.

During the Revolutionary War, the Continental Congress made paper bills. They were called "continentals." The money lost its value very soon. Because of this, colonists would say anything that was useless was "not worth a continental."

The Fugio penny was the first coin issued by the U.S.A. Written on it was, "Mind your own business." This was one of Benjamin Franklin's favorite sayings.

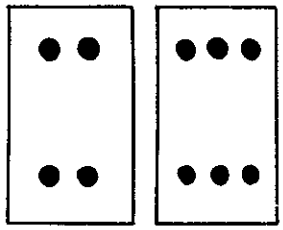
Did you know that money tells you a lot about history? Important people of history have had their pictures on coins and bills.

Match the name of the person with the money value their picture appears on.

A ___ penny	1. George Washington
B ___ nickel	2. Benjamin Franklin
C ___ dime	3. Alexander Hamilton
D ___ quarter	4. Dwight Eisenhower
E ___ half dollar	5. William McKinley
F ___ silver dollar	6. Ulysses S. Grant
G ___ one dollar bill	7. Abraham Lincoln
H ___ 5 dollar bill	8. James Madison
I ___ 10 dollar bill	9. Franklin Roosevelt
J ___ 20 dollar bill	10. Andrew Jackson
K ___ 50 dollar bill	11. John F. Kennedy
L ___ 100 dollar bill	12. Grover Cleveland
M ___ 500 dollar bill	13. Thomas Jefferson
N ___ 1000 dollar bill	14. Woodrow Wilson
O ___ 5000 dollar bill	15. Abraham Lincoln
P ___ 10,000 dollar bill	16. George Washington
Q ___ 100,000 dollar bill	17. Salmon P. Chase

PRIMARY ACTIVITY

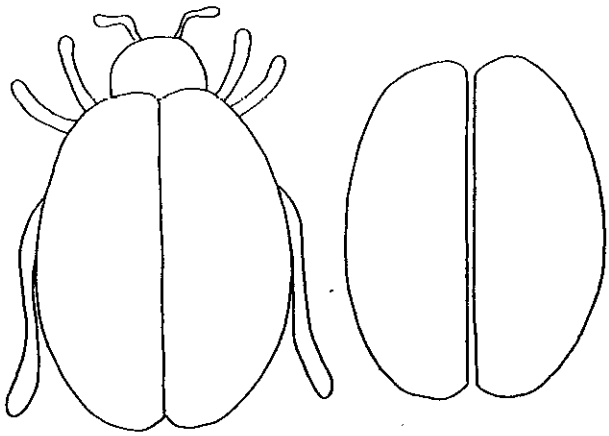
Adding Spots



Two people play this game.
You will need a regular set of dominoes.

Turn dominoes face down on the table. The first player draws out two and turns them face up. His opposing player must be ready to name the number of spots on each domino (such as 6, and 4) and be able to tell the total (10). If he fails, the dominoes are mixed back in the pile. If he succeeds, he gets to keep the dominoes. In either case, the second player draws two dominoes and the first player must identify the spots on each and the total. The winner is the player who has collected more dominoes.

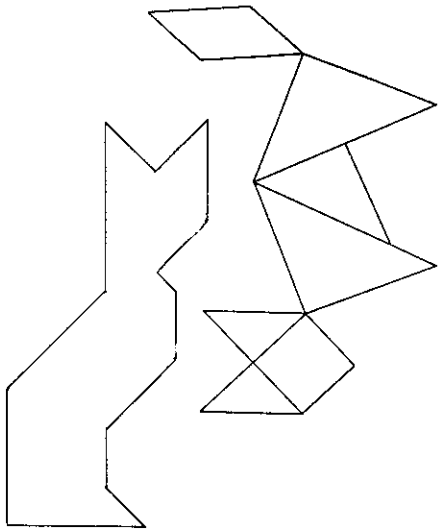
Speaking of dots, WHOOOOOOOOOOPS!!!!, we left the Lady Bug pattern out of the last issue. Never fear we caught it even if you did not, so here it is:



INTERMEDIATE ACTIVITY

The Tangram Puzzle

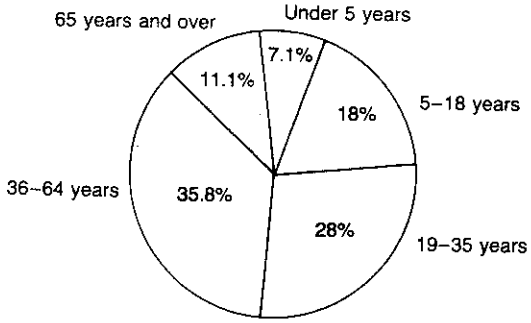
Traditionally the problem addressed with the Tangram puzzle is to put the seven shapes into the form of a square. Our form of the puzzle gives you the pieces in the shape of a "Halloween Cat" and asks that you arrange the pieces in the shape of a "Haughty Cat." If you have never put the puzzle together to form a square you might try that activity also.



MIDDLE SCHOOL ACTIVITIES

Here are some ideas for reading and interpreting circle graphs.

This circle graph shows the age groups of a large city with a population of 225,000 people.



Use the circle graph to answer these questions.

1. Which age group makes up 28% of the city's population?

   Find the section of the graph that is marked 28%. Read the label next to this section.

2. According to the graph, how many people are in the 19–35 age group?

   The 19–35 age group is 28% of the total population. Multiply 225,000 by 28%. Write 28% as a decimal.

3. What percent of the population is 19 to 64 years old? Be careful! You need to find the percent for two age groups for this one.

4. How many more people are 5–18 years old than are 65 and over?

   Compare the percents for each age group.

5. A survey showed that one-half of all the people in the 36–64 year age group own an automobile?

   You need to read the graph and use the information in the problem to get the answer to this one.

SENIOR HIGH SCHOOL ACTIVITIES

One and the Same

Here are some logic questions that your students might like.

1. Chuck likes ice cream better than candy. Charles likes candy better than ice cream. Can Chuck and Charles be the same person?
2. Bob likes hockey but not football. Robert likes both basketball and football. Can Robert and Bob be the same person?
3. Lisa, Paula, and April are three girls. Lisa is Paula's sister. Paula is April's sister, Is Lisa April's sister?
4. Fred likes pizza with sausages. Frederick likes pizza without sausages and pizza with mushrooms. Rick doesn't like anything with sausages, and he likes pizza with mushrooms.

   a. Can Fred and Frederick be the same person?

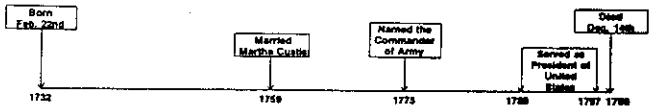
   b. Can Rick and Frederick be the same person?

   c. Can Fred, Rick, and Frederick all be the same person?

SECONDARY ACTIVITY

Solving George's Problem

TIME LINE OF GEORGE WASHINGTON'S LIFE



Use the time line above to solve the problem below. Problems #7 and #8 are only for Problem Solving Pros!

1. How many years old was George when he:
   a. Became Commander of the Colonial Army?
   b. Became President?
   c. Died at Mt. Vernon?
2. Martha Washington, his wife, was born on June 21, 1731 and died on May 22, 1902. How old was she when she died?
3. If George was living today, how old would he be?
4. If he were living, how many years older than you would he be?
5. The terms of office for a President of the United States is 4 years. Use the time line to determine how many terms George served as President of the United States.
6. When George died the population of the United States was about 5 million. According to the 1970 Census, our population was 41 times larger than it was in 1799. What was the population of the United States in 1970?
7. In his will George listed his property holdings as 23,341 acres in Virginia, 5000 acres in Kentucky, 3050 in the Northwest Territory, 1119 acres in Maryland, 1000 acres in New York and 234 acres in Pennsylvania. If the average value of each acre was $14.50, what was the value of the land George left in his will?
8. How many days did George live? Remember that all years divisible by 4 are leap years and contain an extra day.

TEACHER ACTIVITIES

Something for Not-so-Tired Teachers

Al had a red marble, Bob had a yellow marble, and Carol had a green marble. They traded the marbles in this order:

Al traded with Bob. Bob Traded with Carol.
Bob traded with Al. Al traded with Carol.
Carol traded with Bob. Carol traded with Al.
Bob traded with Al. Carol traded with Bob.
Bob traded with Al. Bob traded with Carol.

Who has whose marbles??????????????????????

MATH NEWS

National Council of Teachers of Mathematics

COMMISSION ON STANDARDS FOR SCHOOL MATHEMATICS--PHASE I

The National Council of Teachers of Mathematics (NCTM) has established a Commission on Standards for School Mathematics (CSSM). The purpose of this twelve-member group, chaired by Thomas A. Romberg, University of Wisconsin-Madison, is to develop professional standards for curriculum and instruction in grades K-12 that will delineate more effective ways of teaching and learning mathematics.

The readiness of the mathematics education community for such standards has manifested itself in many ways: the shortage of well-qualified teachers; outdated curriculum; inadequate textbooks that shape the curriculum; the limited methods that measure the outcome of instruction in mathematics; and a need for national leadership. Furthermore, data from the National Assessment of Educational Progress, international studies, and various college entrance testing programs indicate a discouraging pattern of student mathematical achievement, particularly in important problem-solving and higher-order thinking skills.

The standards will be developed in four phases. Phase I, the first meeting of the CSSM, is scheduled for 27-28 October 1986, in Chicago, Illinois. At this time the commission members will review their charges, plan a time line, and develop a format for the standards. Simultaneously, a survey will be conducted soliciting ideas from leaders in the mathematical sciences education community.

The next meeting of the CSSM, Phase II, is scheduled for spring 1987. The agenda for the summer includes writing the standards. Phase III is scheduled for the 1987-88 school year during which time the standards will be reviewed by many groups. This is followed by approval in Phase IV, September 1988. Disseminating and implementing the standards will then begin.

Other professional organizations represented on the CSSM include the Mathematical Sciences Education board, the Mathematical Association of America, the National Council of Supervisors of Mathematics, and the Conference Board of the Mathematical Sciences. The publishing community is also represented.

(Contact: Jan R. Goldenberg)

ADDRESSING THE NEEDS OF GIFTED STUDENTS

The National Council of Teachers of Mathematics has taken the following position concerning "provisions for mathematically talented and gifted students:"

"All students deserve the opportunity to achieve their full potential; talented and gifted students in mathematics deserve no less. It is a fundamental responsibility of all school districts to identify mathematically talented and gifted students and to design and implement programs that meet their needs. Further, it is the responsibility of mathematics educators to provide appropriate instruction for such students.

"The identification of mathematically talented and gifted students should be based on multiple assessment measures and should involve teachers, counselors, administrators, and other professional staff. In determining admission to talented and gifted programs, the evaluators must consider the student's total educational development as well as his or her mathematical ability, achievement, and aspirations. Eligible students and their parents should fully understand the nature and demands of the program before making a commitment to participate. Unqualified students should not be admitted for any reason.

"The needs of mathematically talented and gifted students cannot be met by programs of study that only accelerate these students through the standard school curriculum, nor can they be met by programs that allow students to terminate their study of mathematics before their graduation from high school. The curriculum should provide for all mathematically talented and gifted students every year they are in school. These students need enriched and expanded curricula that emphasize higher-order thinking skills, nontraditional topics, and applications of skills and concepts in a variety of contexts.

"Therefore, the National Council of Teachers of Mathematics recommends that all mathematically talented and gifted students should be enrolled in a program that provides a broad and enriched view of mathematics in a context of higher expectation. Acceleration within such a program is recommended only for those students whose interests, attitudes, and participation clearly reflect the ability to persevere and excel throughout the entire program."

The National Council of Teachers of Mathematics is the major international organization devoted specifically to the interests of mathematics teachers and teacher educators.

(Contact: Jan R. Goldenberg)

MANUSCRIPTS NEEDED FOR YEARBOOK

The Educational Materials Committee of the National Council of Teachers of Mathematics announces that the 1989 Yearbook will be "Elementary School Mathematics: Issues and Directions," and will be edited by Professor Paul Trafton of National College of Education. The yearbook Advisory Panel is now seeking manuscripts for the yearbook. They are interested both in substantive papers addressing issues or directions in teaching of elementary school mathematics and in relatively short papers relating classroom practices to these issues and/or directions.

Guidelines for the preparation of manuscripts are available from the General Editor, Albert P. Shulte, Oakland Schools, 2100 Pontiac Lake Road, Pontiac, MI 48054.

NIMBLE CALCULATOR

Ancient game of NIM meets the ubiquitous CALCULATOR.

Gather: Two people and a calculator.

Each version has a starting number, a target number, and a range of numbers (the take) which you can add (in the "up" versions) or subtract (in the "down" versions). The winner is the first person to reach the target number.

Challenge: Find a strategy for winning. Some hints are below.

I.	7 UP: Clear the calculator so it reads 0. Each player on his/her turn adds 1 or 2 into the calculator. The winner is the first person to reach 7. Going over 7 loses.	Start: 0 Take: Add 1 or 2 Target: 7
II.	11 DOWN: Clear the calculator and enter 11. Subtract 1 or 2 on each turn. Winner is the person to reach 0.	Start: 11 Take: Subtract 1 or 2 Target: 0
III.	NOW YOU'RE 21: Clear the calculator so it reads 0. Add 1, 2, 3, or 4 on each turn. The person to reach 21 wins.	Start: 0 Take: Add 1 - 4 Target: 21
IV.	TRAVEL DOWN 101: Enter 101 on the calculator. Each person in turn subtracts 1, 2, 3, 4, 5, 6, 7, 8, or 9 from the number in the display. Make the display read 0 and you win.	Start: 101 Take: Subtract 1 - 9 Target: 0
V.	CENTURY: Start at 0 and add 1 - 9 on each turn until 100 is reached. This one has a twist.	Start: 0 Take: Add 1 - 9 Target: 100
IV.	2001: Enter 2001 in the calculator. Subtract 1 - 99 on each turn. The person to reach 0 wins.	Start: 2001 Take: Subtract 1 - 99 Target: 0

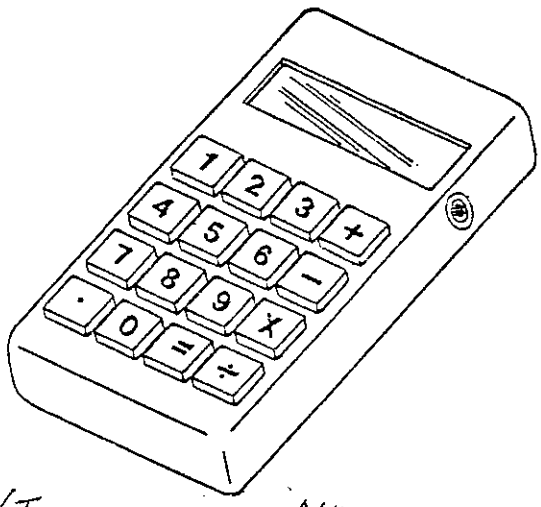
Search for strategy:

Here's a way to begin to crack the strategy. Play one version at least 5 times. Each time the loser chooses whether to play first or second the next round. Notice at which point in the game you know which is going to win.

Next level of analysis:

Consider the simplest case. Explore possible moves and resulting winners. Look for pattern.

SOURCE: EQUALS Project, Lawrence Hall of Science, U. C. Berkeley.



(JOURNAL OF THE NMCTM, FALL, 1986)

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