

## Math Trivia

In the 17th century John $N$ apier (1550-1617) of Scotland devised a set of rods called $N$ apier's bones, used by merchants to perform their accounting. He was from a famous military family and predicted the invention of submarines, military tanks, and machineguns even though he himself was not in the military.

Read more about N apier in M athematiciansAre People, T 00 by Luetta and W ilbert Reimer.

## Friz Using Numbers in Powerful Ways

Suppose you wake up tomorrow morning and find that numbers could no longer be used.


W rite a story about what might happen, telling how life would change.

## 圈 <br> Investigations

If it costs one penny to ride 1000 miles, a trip around the world would cost $25 \$$. W hat is the approximate circumference of the world at the equator? W hat would it cost to travel through the center of the earth at this rate? H ow can you answer these two questions with the data given to you in the first sentence?

A trip to the moon would cost $\$ 240$. About how far away is the moon? W hat is the approximate distance to the sun if a trip would cost $\$ 930$ ?

U se the rate of one penny for each 1000 miles and figure costs of trips from Alaskato M iami or T oronto to M exico City. What trips in the northwestern hemisphere could you take for $\$ 0.04$ ?

(1.01c,d)

## Decimal Fraction Fun

$A, B, C$, and $D$ are four numbers to be graphed on thisnumber line. $A>0.5 ; \mathrm{C}$ and A are equally distant from $1 ; B$ is halfway between 0 and $0.5 ; \mathrm{A}+\mathrm{B}=0.80 ; \mathrm{D}<\mathrm{C}$.


In what order will the pointslieon the number line?


H ow can you make the display on your calculator show 24.013 by using only the 0,1 , decimal point, and +keys?

## Let's Eat! Real World Mathematics

Here are five investigations which use menus. Read all five and then choose the two you want to complete. Be sure to organize your work so that others can follow what you have done.

1. You and your family are going on vacation. Your parents plan to cook breakfast and dinner at the campsite but they agree that you will eat out for lunch every day. You have the task of figuring out about how much money the family ( 6 people) will need to eat lunch every day, Sunday through Sunday. Since your mother is planning carefully, she wants very realistic figures. She will add tax and tips to the total.
2. For his eleventh birthday, Ross' uncle took four boys out to eat. Choose a restaurant, order four complete meals, and figure the costs. Taxes for the area are $6 \not \subset$ on every dollar. Ross' uncle said that he wanted to leave a $15 \%$ tip (multiply the total by 0.15 to figure the tip).
3. The class is planning a celebration. You must choose one basic meal and order for everyone in your class. Begin with an informal survey to see what would be the best menu and figure what the costs will be. The restaurant charges $22 \%$ for tax, tip, and delivery (multiply 0.22 by your total).
4. You have a part-time job which pays $\$ 4.00$ an hour. Because you are not able to work when it rains, you figure that you can work about 9 hours a week. Twice a week you plan to eat in a restaurant. What will you budget for meals? How much do you think you can save each week? Explain.
5. Wanda has a new job downtown. She plans to order lunch from a local restaurant each day, Monday through Friday. There is a food service which allows her to order her lunches a week in advance for a fee of $50 \notin$ per day. The food service will pick up her order and deliver it to her workplace at 12:30 p.m. Wanda decides this is a good service since she wants to visit the exercise center for 30 minutes each lunch break. Figure a week's worth of menus (different each day, please) to show what the food service lunches will cost Wanda.

$$
\begin{aligned}
& \text { sуич.иの }
\end{aligned}
$$

$$
\begin{aligned}
& \text { Onion Rings }
\end{aligned}
$$

> s.apıo apiS
> with tomato, lettuce, and special sauce
> Chicken Burger
> (tomato and lettuce add 15¢)
> Cheeseburger
> (tomato and lettuce add 15ф)
> Basic Burger
> with mushrooms, onions, and cheese Mushroom Big Burger $\$ 2.29$
> with tomato, lettuce, cheese, bacon, and special sauce
> All-in-one Big Burger $\quad \$ 2.49$
> $\begin{gathered}\square 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0\end{gathered}$

> |  |
| :--- |
|  |
| 0 | $\stackrel{\sim}{i}$ $\$ 1.45$



Mostly Chicken

$\$ 1.95$
$\$ 2.39$

$\$ 0.90$ ea.
$\$ 0.50$

| $\infty$ | $\because$ |
| :--- | :--- |
| $\infty$ |  |
|  |  |

Side Orders
All White Meat, please add $50 \phi$
Chicken Sandwich
Grilled Chicken
Chicken Nuggets
6-piece
9-piece
12-piece
Three-Piece Dinner (both with slaw, fries, and roll)
Two-Piece Dinner

$\dot{j}$
 Drinks
Cole Slaw, French Fries,
Onion Rings, Hush Pupp
Rolls


## ${ }_{1 / 3}^{273}$ Keeping Skills Sharp

1. $316 \times 28$
2. $913 \div 7$
3. $38.6-1.57$
4. $8 \times n=72$
5. Walter found a big difference in the price of colas. To plan a budget for a camping trip, he decided to use the cheapest brand. The prices of the four different colas were $\$ 1.30, \$ 1.50, \$ 0.99$, and $\$ 1.25$. What did he save by buying the cheapest colas rather than the most expensive if he needed ten six-packs?
6. $1.8+.65+23$
7. Which is a better buy? 4 yards of ribbon for $69 \notin$ a yard or 5 yards of ribbon for $\$ 3.25$
8. Jennifer's swim team coach wanted her to practice laps for 45 minutes each morning before the group worked together at 6:30 a.m. What time does she need to begin her laps?

If Jon, Mac, and Heather are taking a group photo, how many different ways can the photographer line them up? When Taneeka, Chad and Kim join them, how many ways can they all be lined up?

Later that day two of these six students are going to pick up snacks for the group. How many
 different ways can two people be selected to pick up snacks?

# ${ }^{\circ}$ To the Teacher <br> WEEK <br> 16 

For Further Study:
$10+10+1+1+1+1+.01+.001+.001+.001$
Solve This: 6; 720; 15
Decimal Fraction Fun: D, C, 1, B, A

Mental Math
3. $2 / 5$ of 10
4. Estimate the product: $23 \times 4$
5. Factors of 30
6. The distance around a circle
7. Term for 1000 grams
8. Ounces in $1 / 2$ pound
9. Years in 36 months
10. Perimeter of square 4 ft . on each side

## Keeping Skills Sharp

1. 8848
2. 130 r 3
3. $\quad 37.03$
4. 9
5. $\$ 5.10$
6. $\quad 25.45$
7. 5 yards for $\$ 3.25$
8. 5:45 a.m.


## Math Trivia

Thebar code symbol you see on most of your grocery items is composed of a set of numbers that tells the cash register in the store what kind of product it is, who made it, and something about its size, color, and the like. It does not say what the price is; that has to be programmed into the cash register separately. This system was begun in 1973 by the U niform Code Council in Dayton, O hio.


## Using Numbers in Powerful Ways

Imagine that \$1,001,100 is stacked in your school's lunchroom. This sum is entirely made up of coins, and there are exactly the same number of pennies, nickels, dimes, quarters, and silver dollars. Determine how many coins of each denomination you would need to make $\$ 1,001,100$.


Hint: Start with equal numbers of coins that total \$100.11, and then multiply by 10,000.

## (ars) Investigations

A pilot, a cab driver, a sailor, and an engineer are named Peter, Connie, Sam and Evelyn.

- only one person's name and occupation begin with the same letter
- Sam is taller than either the cab driver or Evelyn.
- The engineer is younger than the pilot.
- C onnie is the oldest and a neighbor of the cab driver.
- Sam is older than Peter.



## Decimal Fraction Fun

W hat part of the whole square is section $A$ ?
W hat part of the whole square is section $B+D$ ?
W hat part of the whole square
is section $A+B+G+H$ ?
W hat part of the whole square
is section $D+F+C$ ?
(1.01a)


## For Further Study

What is the Euro and which countries are using it? W hat are the benefits for these countries?
W hat effect will the use of the Euro have on the U nited States?

## Adopt a Number

This is a project for the second half of the school year. You are getting a headstart this week. At the end of the project you will be part of a big celebration for the adopted numbers and will have an opportunity to present your special number to the class. Below are some guidelines. Use the form at the bottom of the page to let your teacher know what number you have chosen.


1. Your number may be any decimal, fraction, or whole number you choose. Try to select a number that others may not think of, but keep in mind the guidelines.
2. Collect information about your number and its use in everyday life (examples from newspapers, magazines, and television, use in literature, measurement, geometry, etc.)
3. Describe your number as it would fit in various classifications (i.e., odd or even, fraction or whole number, a factor of . . ., a multiple of . . . , a palindrome, etc.)
4. Create a game which focuses on your number and/or write its autobiography.
5. Use your number in a collection of story problems, riddles, and statistics. (For example, a cheetah can run for short distances at 70 mph .)
6. Be creative! Start now to think about presenting your number at the adoption celebration. Involve your family, friends, and neighbors!


I have chosen as my number to adopt:

If you have special ideas for me, I would appreciate your assistance.

## Keeping Skills Sharp

1. $152 \times 106$
2. $30 \div 5$ $\qquad$ $6 \times 9 \quad$ Use <, >, or $=$
3. $7 \times 7 \times 7-9=n \quad n=$ ?
4. The average American uses 70 gallons of water a day. How many gallons of water would a community of 1200 people use in a day?
5. When Abraham Lincoln became President in 1861, he was 52 years old. In what year was he born?
6. Six-eighths minus four-eighths equals how many eighths?
7. $\$ 39.42+\$ 106.03+\$ 8.19=$ ?
8. $5+5+5+5=5 \mathrm{x}$ $\qquad$ would it take to go around the perimeter of your classroom?


# To the Teacher 

Using Numbers in Powerful Ways: This is a challenge. It would take 71 coins of each denomination to give $\$ 100.11$. So, 710,000 of each coin gives $\$ 1,001,100$. You may want to suggest solving a simpler problem as a strategy.

Investigations: Peter - cabbie, Connie - sailor, Sam - pilot, Evelyn - engineer

Mental Math
Directions to Students: Number your paper from
1 to 10 . Write your answers as the questions are called out. Each question will be repeated only once.

1. $9 \times 8+8 \div 10 \times 5$
2. $8 \times 5+14 \div 6$
3. Write in fraction and word form - . 3
4. Estimate the product: $17 \times 3$
5. Number of factors in 25
6. Figures that are exactly the same size and shape
7. Meters in kilometer
8. Abbreviation for pound
9. Minutes in 120 seconds
10. $\quad \$ 5.00$ less $75 ¢$

## Keeping Skills Sharp

1. 16,112
2. <
3. 334
4. 84,000 gallons
5. 1809
6. $2 / 8$ or 2 eighths
7. $\$ 153.64$
8. 4


## Math Trivia

The Dewey Decimal System, named after the librarian M elvil Dewey (1851-1931), is a classification system which helps people locate books. All bookscan beclassified in one of theten categories which begin with 000-099 and go through 900-999. Booksabout mathematics and science are numbered 500-599.

Idea: Ask the librarian to relate the decimal notation used in themedia center to your study of tenths, hundredths, and thousandths.

## Frat Using Numbers in Powerful Ways

Rebecca made up a number riddle with these clues:

1) I am thinking of a 5-digit odd number.
2) The sum of all its digits is 20 .
3) The digits in the hundreds place and in the tens place are consecutive numbers.
4) W hen you multiply thedigits in the tensand hundredsplaces, you get thedigits for the thousands and ten-thousands places? W hat is Rebecca's number?
(1.01b)

## Investigations

W hat numbers can be expressed as the sum of consecutive numbers? For example, 5 may be expressed as $2+3$. Work with 2 or 3 friends on the investigation on the next page. A chart is started for your use, but continue to complete the chart.


Compare the results from each group's work. W hat patterns do you see? D iscuss the questions from the student sheets.


## Decimal Fraction Fun

Bob and Ellen painted a fence in 6.5 hours. Bob worked for 3.8 hrs, how long did Ellen work?

$W$ hat is the next number in this sequence?

$$
\frac{1}{4}, \frac{7}{12}, \frac{11}{12}, \frac{5}{4} \cdot \cdot
$$

## Consecutive Sums

What numbers, 50 or less, can be written as the sum of consecutive numbers? Is there more than one way to express some numbers?


| Sum |  |
| :--- | :--- |
| 1 | $0+1$ |
| 2 | No |
| 3 |  |
| 4 |  |
| 5 | $2+3$ |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 | $4+5$ |
| 10 |  |

A. Make other charts and continue through 50.
B. What do you notice about numbers that cannot be written as consecutive sums? Those that may be written only one way? Those that may be written in more than one way?

## 1,3 Keeping Skills Sharp

1. $121 \times 12$
2. Write 0.13 as a fraction.
3. $35.6+.28$
4. Julio walked to the top of the Washington Monument. After climbing 549 steps, he rested. There were 349 more steps to climb. How many steps are there to the top?
5. Shanika saw a blouse for $\$ 18.98$ and 2 skirts for $\$ 14.00$ each. She found 2 other skirts for $\$ 21.00$ each. She bought one of the skirts for $\$ 21.00$ and the blouse. What change did she get from $\$ 50.00$ ?
6. $\frac{7}{8}+\frac{11}{8}=$
7. Find the perimeter.

8. There are 24 hours in one day. How many hours in four weeks?

## - Solve this!

Sara went to the mall to buy her family presents. She spent $\$ 20.00$ of her money on a gift for her mother, then half of her remaining money on a gift for her dad. Sara's last gift, for her brother, cost her $\$ 15.00$. She left with $\$ 10.00$. How much money did she start with?


# To the Teacher <br> 18 

Using Numbers in Powerful Ways:
20,459 or 42,671.

## Investigation Help

1. $0+1$
2. No
3. $1+2$
4. No
5. $2+3$
6. $\quad 1+2+3$
7. $3+4$
8. No
9. $4+5$ or $2+3+4$
10. $1+2+3+4$

The students should discover that any number that is a power of 2 will not have a consecutive sum. Example: $2^{1}, 2^{2}, 2^{3}, 2^{4}$

SolveThis:
\$70.00

## Suggested Strategy:

Work backwards
For Further Study: $1 \frac{7}{12}$ or $\frac{19}{12}$

Mental Math
Directions to Students: Number your paper from
1 to 10 . Write your answers as the questions are called out. Each question will be repeated only once.

1. $(100-55) \div 9$
2. $(50+22) \div 8$
3. Write in fraction and decimal form 0.5
4. Round to nearest ten: 7,349
5. First four multiples of 8
6. The distance around a rectangle
7. Abbreviation for kilometer
8. Inches in $1 / 2$ yard
9. Weeks in one year
10. $11 / 2$ hours before 5:00

## Keeping Skills Sharp

1. 1452
2. $13 / 100$
3. 35.88
4. 898 steps
5. $\$ 10.02$
6. $18 / 8=21 / 4$
7. 26
8. 672 hours
