## Math Trivia

Because there are two sets of calendars, for leap years and non-leap years, and seven possible calendars in each set to cover the cases of January 1 falling on a Sunday, a Monday, and so on through the week, it follows that the calendar for any particular year will be one of fourteen possible calendars. Do you agree? Why or why not?

Investigations

How many Δ's to balance a ◯ ?
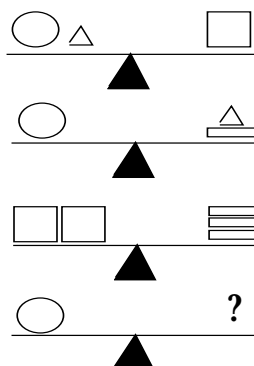
Create new problems using these figures.

(1.03, 5.02)

Using Numbers in Powerful Ways

Write a letter to fourth grade students and explain the four operations: addition, subtraction, multiplication, and division. Explain when you use each operation. You might compare and contrast these processes. Help them see the importance of understanding each operation and how that understanding will help them to be able to use numbers in powerful ways.

(1.03)
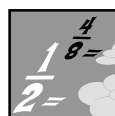
Decimal Fraction Fun

Find at least two numbers that make each of these number sentences true:

1) $14.2 - 2M > 5$

2) $3N + 7 > 12$

3) $2 L + 5 < 6$

4) $0.25 + R < 1.5$

(5.02)

For Further Study

Look at the numbers in the set, what do they have in common?

{341, 80, 62, 35, 332}

(1.03, 5.01)

Tug of War

1. Players move in opposite directions and race to the winning point. One marker per player is needed.

2. Place game cards face down. Players take turns drawing a card and answering the question. If the answer is correct, the player rolls a die. If the number rolled is even, the player moves his or her marker 1 space forward. If the number is odd, the player may not move. If the player rolls a 2, he or she may move 2 places instead of one.

Start Here ↕

You Win!!!

Tug Of War

Which of these is the most reasonable estimate for
0.6 x 0.5?

   a. 30   b. 3   c. 0.3

Tug Of War

Which of these is the most reasonable estimate for
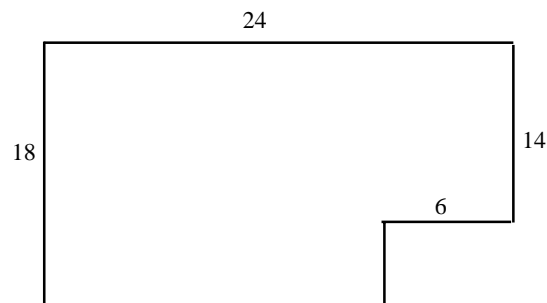$16 \div 0.51$?

   a. 8   b. 30   c. 0.8

Tug Of War

Which is the most reasonable estimate for $2.54 \div 0.5$?
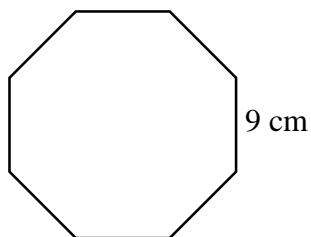
   a. 50   b. 5   c. 0.5
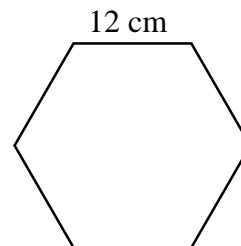
Tug Of War

What is the perimeter of this figure?

24

18

14

6

Tug Of War

What is the perimeter of this regular octagon?

9 cm

Tug Of War

If the sides of this regular hexagon are halved, what is the perimeter?

12 cm

Tug Of War

Which of these is the most reasonable estimate for
109 x 0.4?

a. 400   b. 45   c. 405

Tug Of War

Where should you place the decimal point in the middle number so that the 3 numbers are in order from *largest* to *smallest*?

110, 714, 42
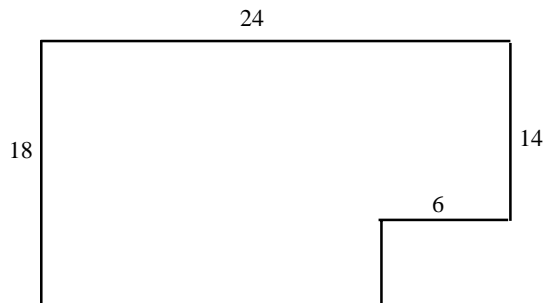
Tug Of War

Which is the most reasonable estimate for 0.54 x 54?

a. 250   b. 25   c. 2.50

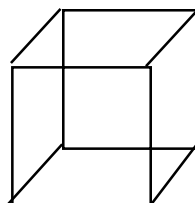## Tug Of War

What is the area of this figure?

24

18

14

6

Tug Of War

Where should you place the decimal point in the middle number so that the 3 numbers are in order from *smallest* to *largest*?

19.7, 514, 122

Tug Of War

If the sides of a cube are doubled, how many vertices will it have?

Tug Of War

Which of these is the most reasonable estimate for

25 x 0.6?

a. 1.5   b. 15   c. 150

Tug Of War

Where should you place the decimal point in the middle number so that the 3 numbers are in order from *largest* to *smallest*?

110, 714, 42
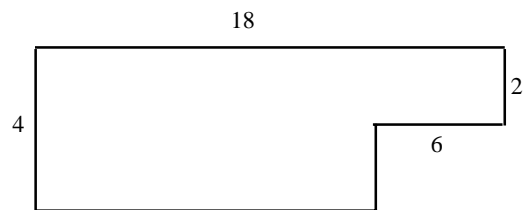
Tug Of War

Which is the most reasonable estimate for 150.21 - 40.5?

a. 100   b. 105   c. 15
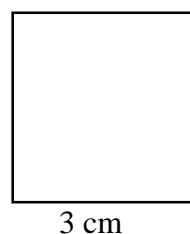
Tug Of War

What is the area of this figure?

18

2

4

6

Tug Of War

Where should you place the decimal point in the middle number so that the 3 numbers are in order from *smallest* to *largest*?

4, 615, 12.2

Tug Of War

If the sides of this square are doubled, what will happen to the perimeter?

3 cm

Tug Of War

Which of these is the most reasonable estimate for 38 x 0.8?

a. 30   b. 40   c. 3.8

Tug Of War

Where would you place the decimal point in the middle number so that the 3 numbers are in order from *largest* to *smallest*?
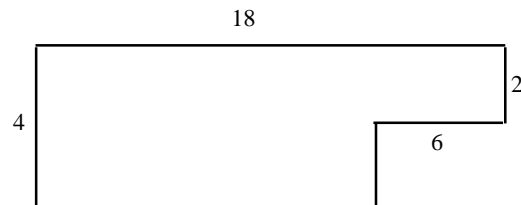
10, 314, 2

Tug Of War

Which is the most reasonable estimate for 6.21 + 4.18?

a. 10   b. 100   c. 1

Tug Of War

What is the perimeter of this figure?

18

2

4

6
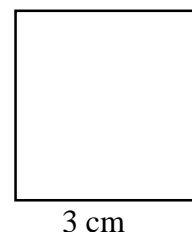
Tug Of War

Where should you place the decimal point in the middle number so that the 3 numbers are in order from *smallest* to *largest*?

10, 6275, 100

Tug Of War

If the sides of this square are doubled, what will happen to the area?

3 cm

Keeping Skills Sharp

1. A used car business bought a car for $18,250 and sold it for $21,150. How much profit did it make?

2. $6 + 4 \times (3 + 2)$

3. Write $\frac{53}{100}$ as a decimal

4. Write as a mixed number: $\frac{483}{9}$

5. Mark drives about 60 miles in one hour. About how far does he drive in half an hour?

6. $(4 + 2) + 3 = 4 + (n + 3)$ n = ?

7. Draw two circles. Shade 1 $\frac{3}{4}$

8. The local baseball league is selling raffle tickets to finance new uniforms. Walt sold 32 tickets. Ricardo sold 34 tickets, and Bernard sold 18. If they have 200 tickets to sell, how many are left to sell?

Solve this!

Mr. Wingate has 30 vehicles. Some are bicycles and some are cars.
These vehicles have a total of 88 wheels.
How many bicycles are there?

(1.03)
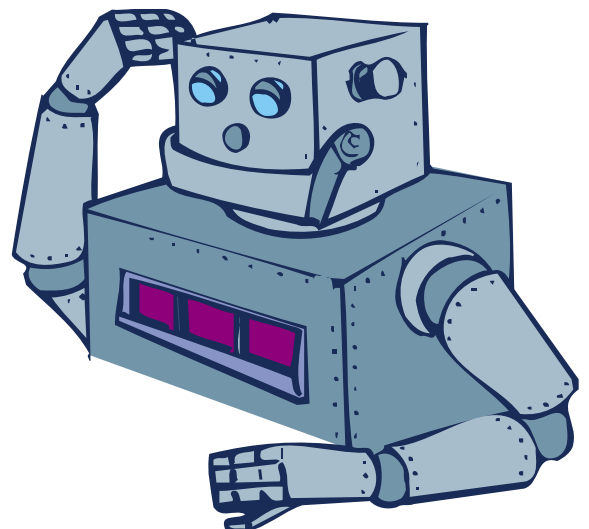
Investigations: It takes three △'s to balance a ◯

For Further Study:
The sum of the digits in each number is 8.

Solve This: By drawing a picture all students should be able to solve this problem by now. Hopefully others will be able to solve it more easily. Have all strategies explained. If no one does it this way, explain it to class.

All bikes and cars have at least two wheels, so if I give all 30 two wheels, that is 60 wheels used. Leaving 28 wheels. Cars take 2 more wheels. So if I divide 28 by 2. That gives 14 cars. Then subtract 14 from 30, leaving 16 bikes.
14 cars and 16 bikes.

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. $18 + 20 - 2 \div 6$
2. $50 + 22 \div 9 \times 7$
3. Write as a mixed number: 8/5
4. Nearest whole number to: 53.81
5. Sum of the factors of 6
6. Half of 250
7. Centimeters in 50 millimeters
8. Feet in 5 yards
9. 7 quarters + 3 dimes
10. Perimeter of triangle 9 ft. on each side

Keeping Skills Sharp

1. $2900
2. 26
3. .53
4. 53 6/9 = 53 2/3
5. 30 miles
6. 2
7. ◯ ◗
8. 116

Math Trivia

The Earth's rotation can be minutely altered by the effects of weather from the forces of winds on the planet's surface. On January 24, 1990 Dr. Dennis McCarthy of the United States Naval Observatory reported that the Earth's day was lengthened by .0005 of a second. Westerly bursts of wind coming from Asia across the Pacific Ocean caused the change.

Investigations

Do the activity "**Triangles Have Three Sides**." Try to discover a property of triangles.

You will need to collect data, make models, and look for patterns. Straws or pipe cleaners work well for the models. If you use paper strips, they need to be very thin.
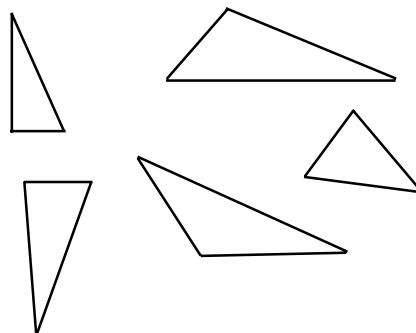
(3.04)

Using Numbers in Powerful Ways

The number zero is important in our place value system. It also influences the results of our computations.

Explain what happens when zero is used in each of the four operations (addition, subtraction, multiplication, division).

(1.03)

Decimal Fraction Fun

Use your calculator to explore the results of multiplying and dividing a whole number by a number less than one. Try 0.25 first. Any surprises?

For Further Study

In a game of tic-tac-toe, what is the greatest number of squares that may be left unmarked when a game is won?

(1.03)

Triangles Have Three Sides

Name: _____

Partner: _____

Needed: Pieces of uncooked spaghetti (or thin strips of paper or Cuisenaire rods) that are 2, 3, 4, 5, 6, 7, 8, and 9 cm long. Label with tape each piece to tell how long it is.

1.   Make at least ten triangles using the strips. Record the length of the sides in the table to the right.

Triangle	Longest Side	Shortest Side	Other Side
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

2. Which of these will make a triangle? Use your strips to decide.

Triangle	Longest Side	Shortest Side	Other Side	Triangle Yes or No
11				
12				
13				
14				
15				

3. Study the two tables. For the strips to form a triangle, what has to be true?

4. Use the rule you wrote to help you write the lengths of the sides for 5 more triangles you can make with the strips. Sketch these and label them. Then make each with the strips to check yourself.
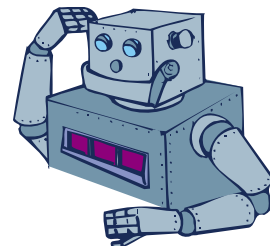
(3.04)

Keeping Skills Sharp

1.   342 x 24

2.   Use < or > $\frac{13}{15}$ ◯ $\frac{13}{14}$

3.   2509 ÷ 4

4.   The years 1984, 1988, and 1992 were leap years. What were the next three leap years?

5.   What is the value of 5 in 25,069?

6.   Jill is 5 feet 4 inches tall. How many inches is this?

7.   If the average cost of running a refrigerator for a month is $8.12, approximately what will it cost to run the refrigerator for one year?

8.   The weights of six boys are 87 pounds, 112 pounds, 91 pounds, 89 pounds, 96 pounds, and 100 pounds. What is the median weight?

Solve this!

Complete the following patterns and tell how they are similar and different.
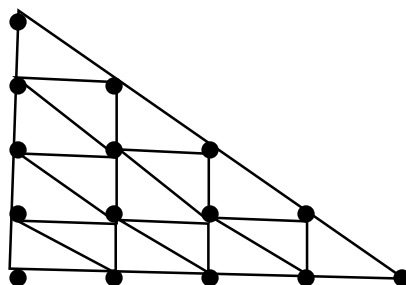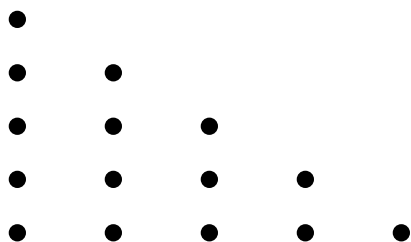
1   4   9

3   6   10

(5.01)

145

Solve This:

Both patterns build at the bottom layer. Both require the same number of data. The dot pattern increases by adding 1 to each layer. The triangle pattern adds 2 triangles to each pattern.

Dot Pattern: 15   Triangle Pattern: 16

For Further Study: 4 squares left.

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. $2 \times 8 - 1 \div 7$
2. $6 \times 5 + 26 \div 8$
3.   Write in fraction and decimal form .656
4.   Closest whole number to sum of 5.9 and 3.2
5.   Product first six whole numbers
6.   Angle formed by clock hands 2 o'clock
7.   Meters in 500 centimeters
8.   Inches in 3 1/2 feet
9.   Faces on 3 cubes
10. Days in 2 years

Keeping Skills Sharp

1.   8,208
2.   <
3.   627 r 1 or 627 1/4
4.   1996, 2000, 2004
5.   5,000
6.   64 inches
7. $96
8.   93.5 lbs.

Math Trivia

The Scottish physicist, Sir David Brewster, invented the kaleidoscope in the early 1800's. It has never lost its popularity, and people continually discover and enjoy kaleidoscopes. The images that one sees in a kaleidoscope have many lines of symmetry.
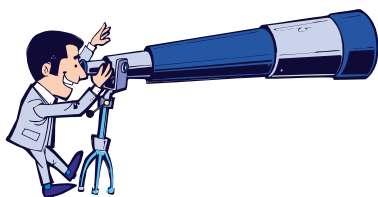
Using Numbers in Powerful Ways

Alphametics are puzzles that replace letters with digits and often have interesting results. Here are some to work on.

1) THREE
    THREE
    THREE
    + ELEVEN
    TWENTY

2) SNIP - NIPS = PINS

3) WHAT x A = SHOW

Hints: 1) E = 4, T = 7
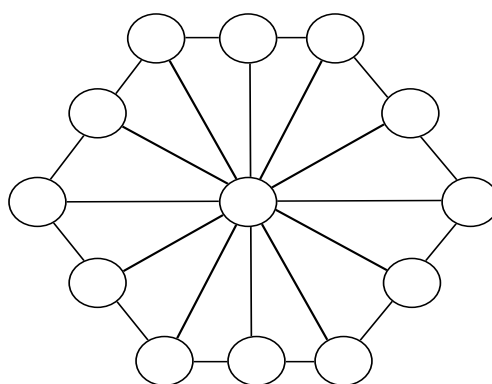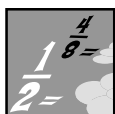   2) S + N = 10
        3) H = 0, O = 5

(1.03)

Investigations

Place the numbers 1 to 13 in the hexagon puzzle so that the sum of any 3 circles from the outer edge through the center to the opposite edge (straight path) is 21.

(1.03)

Fraction Fun

Is half of a half plus one third of a half greater than, less than, or equal to a half of a whole? Use a model to justify your answer.

(1.01c)

For Further Study

Fill in the blanks with three different single digits to make the number sentence true.

_____ x _____ x _____ = 144

(1.03)

Luck of the Draw

(A Game for Two)

Preparation:

1. Cut out strips and tape to make a numberline from −15 to 15.
2. Remove A, 10, J, Q, K from a deck of cards. Shuffle cards and place face down on the table.
3. Each player places a marker on 0.

To play:

1. Players take turns drawing a card and moving. Black cards mean that players add (move to the right). Red cards mean that players subtract (move to the left).
2. The object is to be the first player to get back to 0. *Note:* Two players may occupy the same point. If movement goes beyond −15 or 15, the player loses a turn.

Keeping Skills Sharp

1.   30 x 6 x 15

2.   4000 ÷ 6

3.   A watermelon weighs 3 pounds 6 ounces. How many ounces does
        it weigh?

4.   Think of an odd number greater than 25. If you were to multiply it
        by 5, what would the digit in the ones place be?

5.   Doughnuts are sold by the dozen. You need 90. How many dozen
        should you buy?

6.   Write the largest possible even number using the digits 2, 3, 4,
          5, and 6.

7.   9 x 9 x 9 + 3 x 3 = ?

8.   Write in standard form: Three thousand eight and six hundredths.

Solve this!

An alarm clock beeps the same number of
times as the hour. It beeps once at 1:00,
twice at 2:00, and so on. How many
times does it beep in one day?
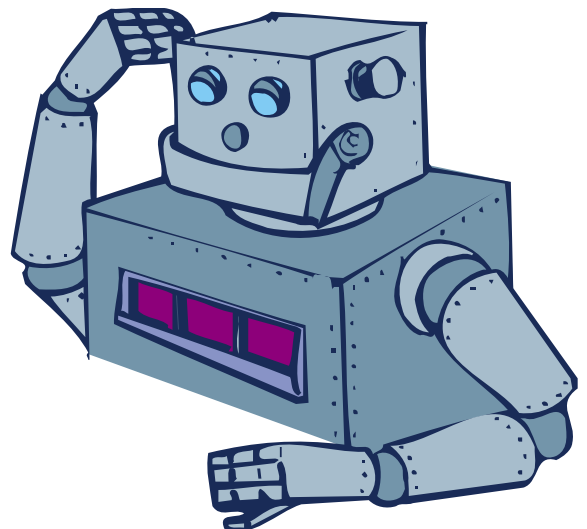
(1.03)

For Further Study:
Two possible solutions are 9 x 8 x 2 or 3 x 8 x 6.
If the students realize 18 x 8 = 144, then they can break 18 into two 1-digit factors to make an additional solution. This is a good time to review the properties of multiplication with the students.

Investigations:
Explain the following strategy when students have completed. List all numbers and find the median.
That is the number to be in the middle of the puzzle. Then pair opposite numbers to make 14 for a total of 21: (14 + 7 = 21).
Example: 1   2   3   4   5   6   ⑦   8   9   10   11   12   13

1 + 13 + 7=21   2 + 12 + 7=21   3 + 11 + 7 and so on

Solve This: 156 times a day

Using Numbers In Powerful Ways:
1) THREE = 73544; ELEVEN = 494046; TWENTY = 714678
2) SNIP = 9108
3) 0, 2, 4, 5, 7, 8 ~ H, A, W, 0, T, S

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. $82 - 50 \div 4 \times 7$
2. $1/2 + 1/2 + 1$
3. Write in fraction and decimal form 3.09
4. Estimate sum nearest whole number: 7.3 + 4.8
5. Sum of first 4 prime numbers
6. Number of degrees in a circle
7. Grams in 5 kilograms
8. Ounces in 10 pounds
9. Hours in 3 days
10. Which is heavier, a gram or a pound?

Keeping Skills Sharp

1. 2,700
2. 666 r 4 or 666 4/6 or 666 2/3
3. 54 ounces
4. 5
5. 8
6. 65,432
7. 738
8. 3008.06