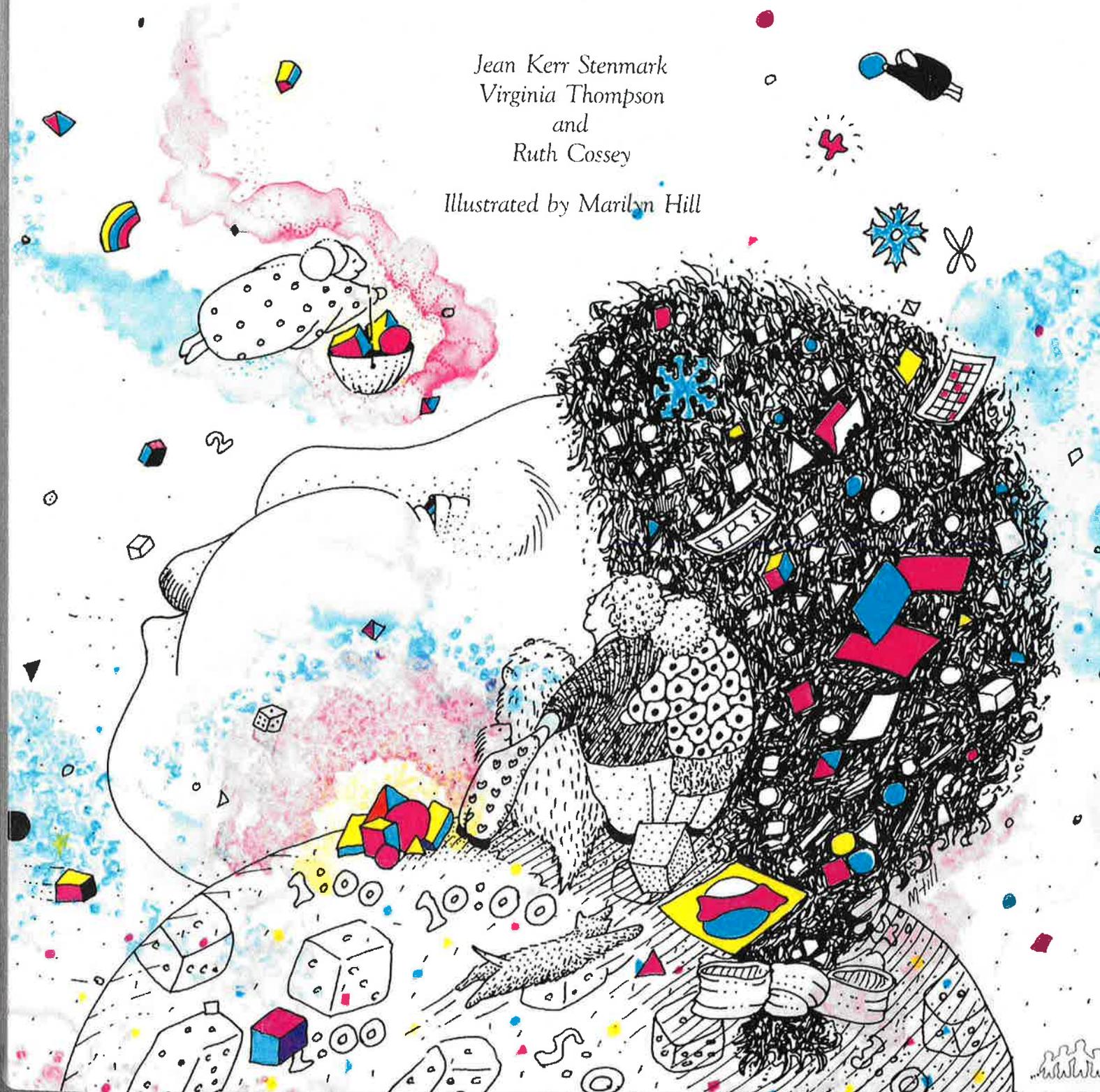


# FAMILY MATH

Jean Kerr Stenmark  
Virginia Thompson  
and  
Ruth Cossey

Illustrated by Marilyn Hill



# Do Math

You Can Do  
Anything!!!

Resources: \_\_\_\_\_

*ABOUT TEACHING MATHEMATICS A K-8 Resource, by Marilyn Burns*

Website: [www.mathsolutions.com](http://www.mathsolutions.com)

*Elementary School Mathematics: WHAT PARENTS SHOULD KNOW ABOUT ESTIMATION  
and PROBLEM SOLVING (Second Editions), by Barbara J. Reys*

*FAMILY MATH, by Jean Kerr Stenmark, Virginia Thompson, and Ruth Cossey*

Website: <http://www.lawrencehallofscience.org/equals/>

*MATH CURSE, by Jon Scieszka and Lane Smith*

*G is for Googol – A Math Alphabet Book, by David M. Schwartz*

*MATHEMATICS PENTATHLON*

Website: <http://www.mathpentath.org/>

*24 GAME*

[www.24game.com](http://www.24game.com)

**Manipulatives & Activities That Help ... children learn MATH**

Presented by Deb Romanek, Director, Mathematics Education

Nebraska Department of Education

301 Centennial Mall So, Lincoln, NE 68509-4987

402-471-2503 or [deb.romanek@nebraska.gov](mailto:deb.romanek@nebraska.gov)

NDE Math Website: <http://www.education.ne.gov/math/index.html>



**S A M P L E**  
**FAMILY MATH**  
**SESSION I**

<u>Time</u>	<u>Activity</u>	<u>Reference Page In Family Math</u>
7:00 p.m.	Name Tags – Write Your Own Sign In Sheets (Venn Diagram) Estimation Contest	284 59
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7:20 p.m.	Double Digit	111
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Kim

Kilometer

Deb

Digit



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# Venn Diagrams

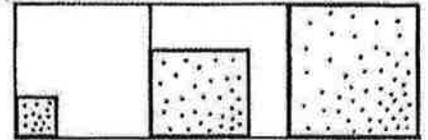
## Why

To develop a logical way of sorting and classifying

## How

▶ Venn diagrams are usually drawn with circles and labels to indicate what belongs inside the circles. ◀

- This activity will involve making Venn diagrams for friends to sign or initial, and can be done with a class or over a longer period of time at home.
- These sketches illustrate various Venn diagrams and the kind of sorting statements that might be used with them:



Grade Level

## TOOLS

Large paper  
Pen or pencil

1

I am wearing red

2

I am a sister

I am a brother

3

I live in California

I live in San Francisco

4

I am wearing red

I am wearing blue

5

I am a female

I have used a computer

I am a male

6

I went to school today

I worked at home today

I watched TV today



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## *Value of Words*

How much is your name worth?

<b>A</b> 2¢	<b>F</b> 12¢	<b>K</b> 22¢	<b>P</b> 5¢	<b>U</b> 15¢
<b>B</b> 4¢	<b>G</b> 14¢	<b>L</b> 24¢	<b>Q</b> 7¢	<b>V</b> 17¢
<b>C</b> 6¢	<b>H</b> 16¢	<b>M</b> 26¢	<b>R</b> 9¢	<b>W</b> 19¢
<b>D</b> 8¢	<b>I</b> 18¢	<b>N</b> 1¢	<b>S</b> 11¢	<b>X</b> 21¢
<b>E</b> 10¢	<b>J</b> 20¢	<b>O</b> 3¢	<b>T</b> 13¢	<b>Y</b> 23¢
				<b>Z</b> 25¢

PLEASE - Calculate the value of your *first name* using this pattern.

How much is your friend's name worth?

Find a name with a value more than yours.

Find a name with a value less than yours.

In your class, whose name do you think is worth the most?

Can you find a word worth exactly \$1.00?

# Value of Words

## Why

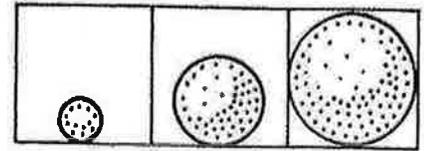
To practice mental arithmetic and estimation while problem-solving

## How

- Assign values to the letters of the alphabet, as shown:
- Have each person in your family find the value of his or her first name.
- Add up the numbers without using paper and pencil if you can.
- What is the most expensive word each of you can find?
- Can you find a word worth exactly \$50? \$100?

## More Ideas

- You and your child may want to make up different activities, such as:
  - Hold a week's contest to find the most expensive word.
  - Use penny values instead of dollars.
  - Find the difference between your first and last names.
  - Multiply the values instead of adding them.
  - Use fractional values, so that  $A=1/26$ ,  $B=2/26$ , etc.

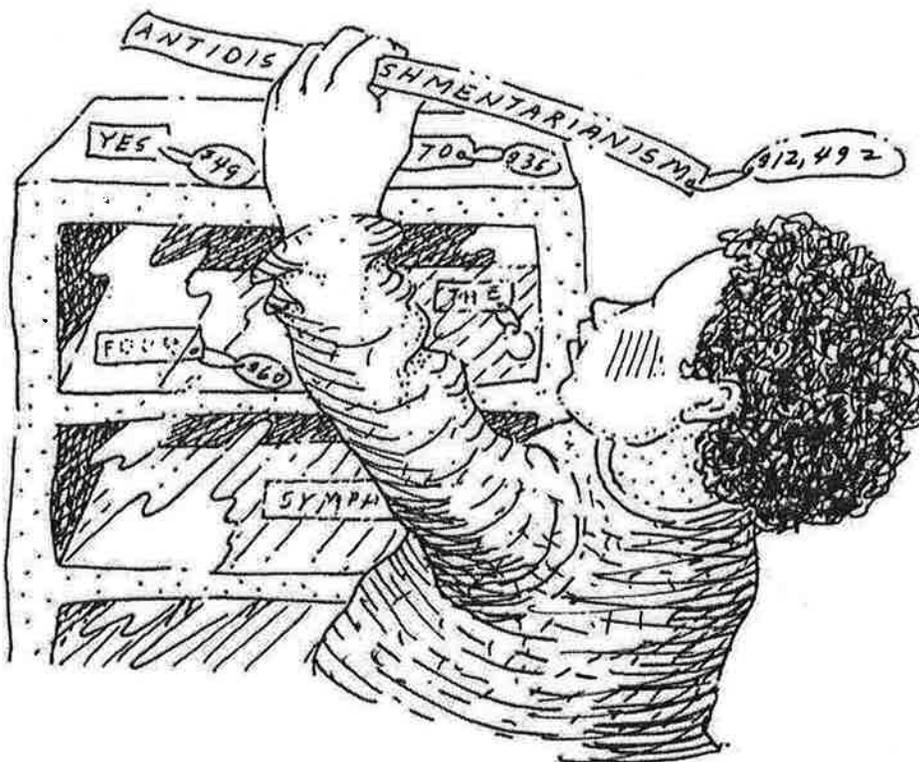


Grade Level

## TOOLS

Pencil  
Paper

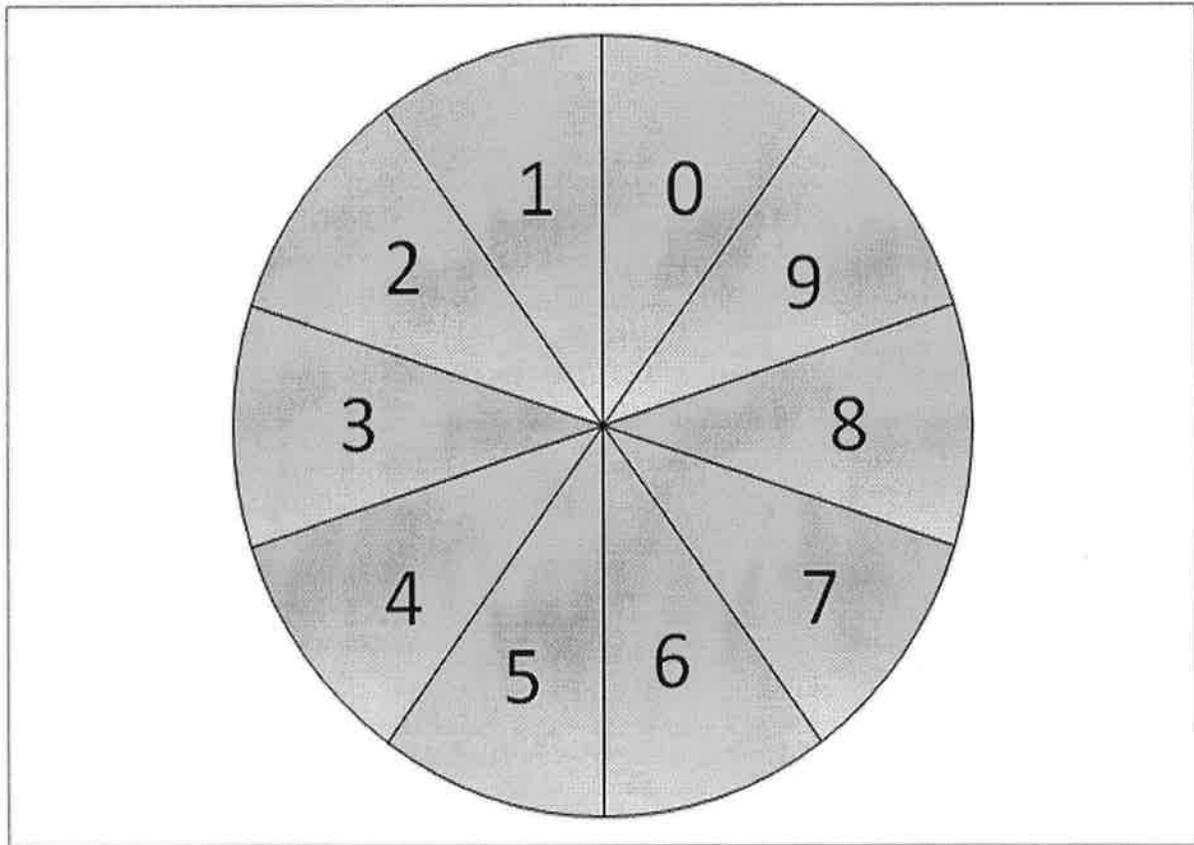
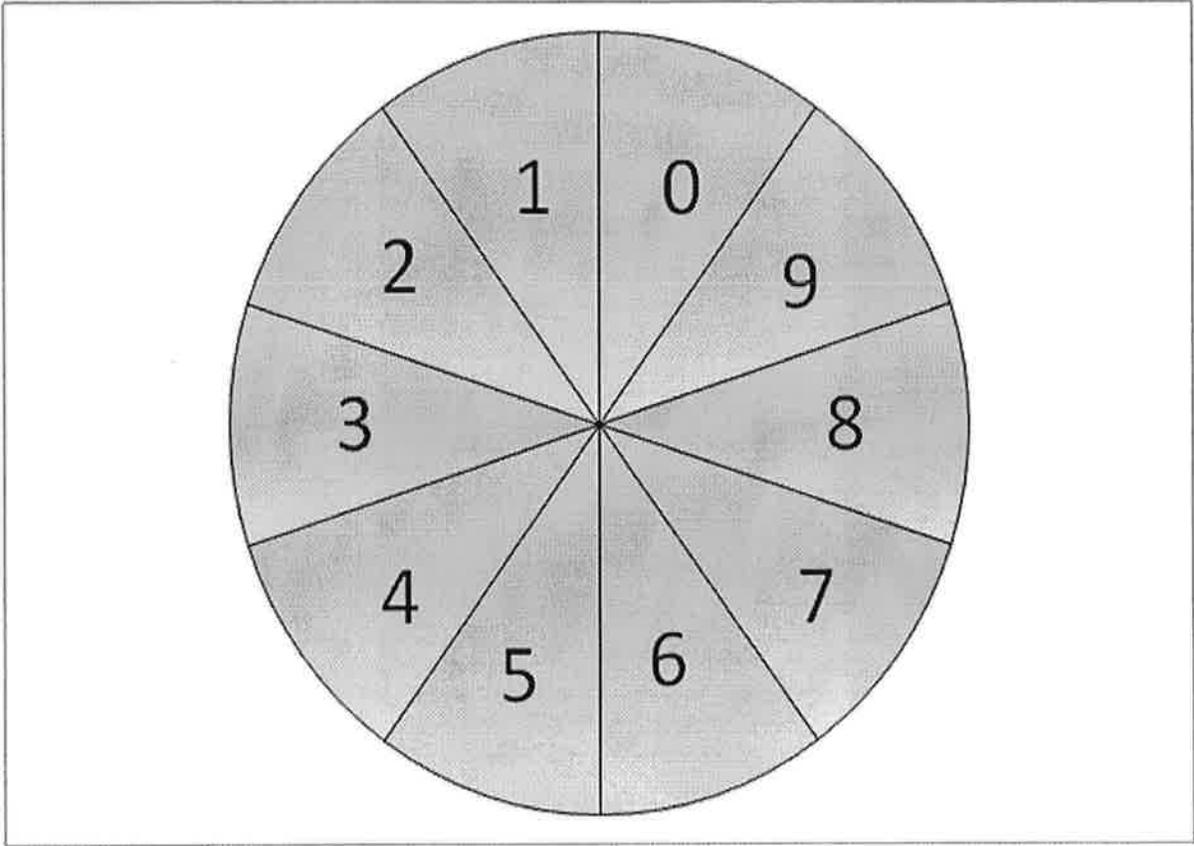
A = \$ 1	N = \$14
B = \$ 2	O = \$15
C = \$ 3	P = \$16
D = \$ 4	Q = \$17
E = \$ 5	R = \$18
F = \$ 6	S = \$19
G = \$ 7	T = \$20
H = \$ 8	U = \$21
I = \$ 9	V = \$22
J = \$10	W = \$23
K = \$11	X = \$24
L = \$12	Y = \$25
M = \$13	Z = \$26





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*Double Digit*

Tens	Ones
1	
2	
3	
4	
5	
6	
7	
Total	

*Double Digit*

Tens	Ones
1	
2	
3	
4	
5	
6	
7	
Total	

Double Digit

Deb

	Tens	Ones
1		6
2		5
3		6
4		5
5	4	
6		6
7	1	
Total	7	8

Double Digit

Kim

	Tens	Ones
1		6
2		4
3	3	
4		5
5		4
6		4
7		6
Total	5	9

45

# Double Digit

## Why

To practice place value and estimation skills

- Both skill and chance play important roles in this game. The dice rolls make it difficult to use a consistent winning strategy. However, an intuitive understanding of probability, or what usually happens, will allow children to find a strategy that will be successful more often than not. Development of estimation skills will increase a child's chances for success in other areas of mathematics. ◀

## How

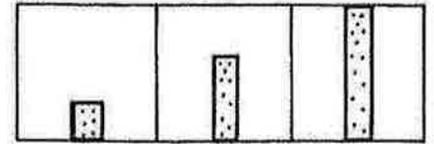
- You will need one die for the group and a scoresheet for each person in your family, like this one:

TENS	ONES
1.	
2.	
3.	
4.	
5.	
6.	
7.	

- Each person takes a turn rolling the die.
- The number may be written in either the tens' column or the ones' column of the scoresheet.
  - When a number is entered in the tens' column, "0" is written next to it in the ones' column. Thus, 4 written in the tens' column counts as 40.
- After each player has rolled the die **seven** times, the players add up their numbers.
- The players who are left in the game compare their totals.
- The player who is closest to 100 without going over is the winner.

## More Ideas

- At the end of the game, talk about what the best total could have been with those seven rolls.
- See also the game Dollar Digit, for younger children.



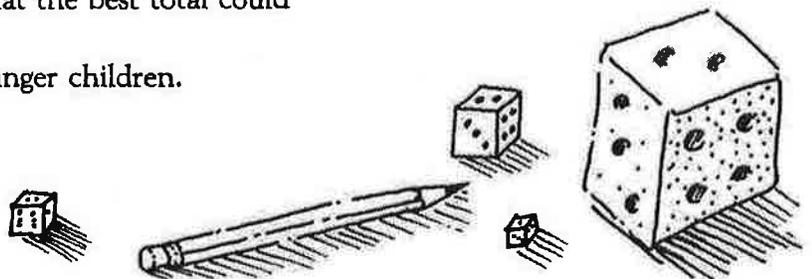
## TOOLS

Pencil

Paper for scoresheets

Dice

A game for  
2-6 players





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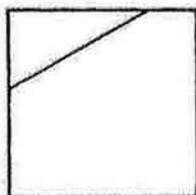
# Create a Puzzle

## Why

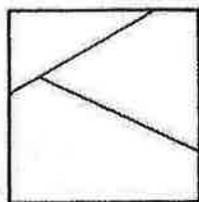
To explore the attributes of geometric shapes by building and solving a sequenced series of puzzles

## How

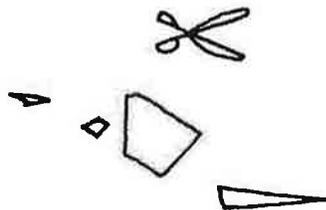
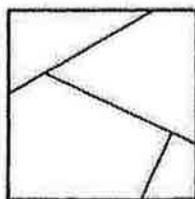
- Start with a square or any other shape you find pleasing.
- Make one straight cut in any direction. For example:



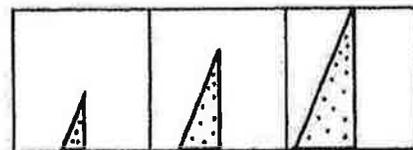
- Make a second cut. For example:



- Fit the three pieces together to make sure you can solve this puzzle.
- Make any third cut. For example:



- Practice with the four pieces, then give your puzzle to a friend to solve.
- Special Note: If you wish to make your puzzle a little easier to solve, color the backs of the pieces differently from the front.



Grade Level

## TOOLS

Scissors  
Cardboard or  
Heavy paper





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# MATH USED IN JOBS

Name \_\_\_\_\_

## Ranking Sheet

Rank the 10 math skills according to how many people in the following occupations said they used the skill. Place number 1 by the math skill used most often, number 2 by the skill used second most frequently, and so on through number 10, which is the math skill used the least.

Use Of	Your Answer	Actual Answer	Percentage
Fractions	_____	_____	_____
Basic geometric concepts	_____	_____	_____
Calculators	_____	_____	_____
Formulas	_____	_____	_____
Decimals	_____	_____	_____
Averaging	_____	_____	_____
Ratio and proportion	_____	_____	_____
Estimation	_____	_____	_____
Per cent	_____	_____	_____
Statistical graphs	_____	_____	_____

### Occupations

Accountant	Electronics Technician	Nurse
Accounting systems Analyst	(Civil) Engineer	Oceanographer (Biological)
Administrator: Shopping Mall	(Electronics) Engineer	Optician
Advertising Agent	(Industrial) Engineer	Orthopedic Surgeon
Airline Passenger Service Agent	(Petroleum) Engineer	Painting Contractor
Airplane Mechanic	Environmental Analyst	Payroll Supervisor
Airplane Pilot	Farm Advisor	Personnel Administrator
Air Traffic Controller	Fire Prevention Officer	Pharmacist
Appraiser (Land)	Fire Fighter	Photographer
Architect	Forestry Land Manager	Physical Therapist
Artist (Graphic)	Forestry Recreation Manager	Plumber
Attorney	Geologist (Environmental)	Police Officer
Auditor	Highway Patrol Officer	Political Campaign Manager
Auto Mechanic	Hydrologist	Printer
Bank Teller	Income Tax Preparer	Psychologist (Experimental)
Biologist (Environmental)	Insurance Agent	Publishing: Order Manager
Carpenter	Insurance Claims Supervisor	Publishing: Production Manager
Carpet Cleaner	Interior Decorator	Purchasing Agent
Cartographer	Investment Counselor	Radio Technician
Chiropractor	Landscape Architect	Real Estate Agent
Computer Programmer	Librarian	Roofer
Computer Systems Engineer	Machinist	Savings Counselor
Contractor (General)	Manager: Appliance Store	Sheet Metal/Heating Specialist
Controller (Hospital)	Manager: Temp. Employment Service	Social Worker
Counter Clerk (Building Materials)	Marketing Rep. (Computers)	Stock Broker
Data Processor	Masonry Contractor	Surveyor
Dentist	Medical Lab Technician	Technical Researcher
Dietician	Meteorologist	Title Insurance Officer
Doctor (G.P.)	Motorcycle Sales and Repair	Travel Agent
Drafter	Navigator	T.V. Repair Technician
Economist	Newspaper: Circulation	Urban Planner
Electrician	Newspaper: Production	Veterinarian
Electrical Engineer	Newspaper: Reporter	Waitress/Waiter
		Wastewater Treatment Operator

# Useful Math Skills

## Why

To provide information about math as it is actually used on a variety of jobs.

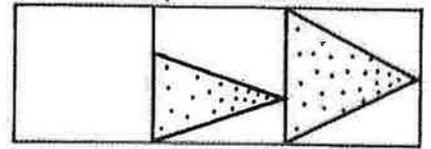
## How

- With your family, look at the following list of mathematics skills:

Fractions	Calculators
Basic geometric concepts	Formulas
Decimals	Averaging
Ratio and proportion	Estimation
Percent	Statistical graphs

Now, think carefully about all of the occupations that you know of. There is a list of 100 different occupations on the next page for you to look at if you wish. Imagine that you asked people from all of those occupations what math skill they use most often. Which of the above skills do you think it would be? Write that skill at the top of a piece of paper.

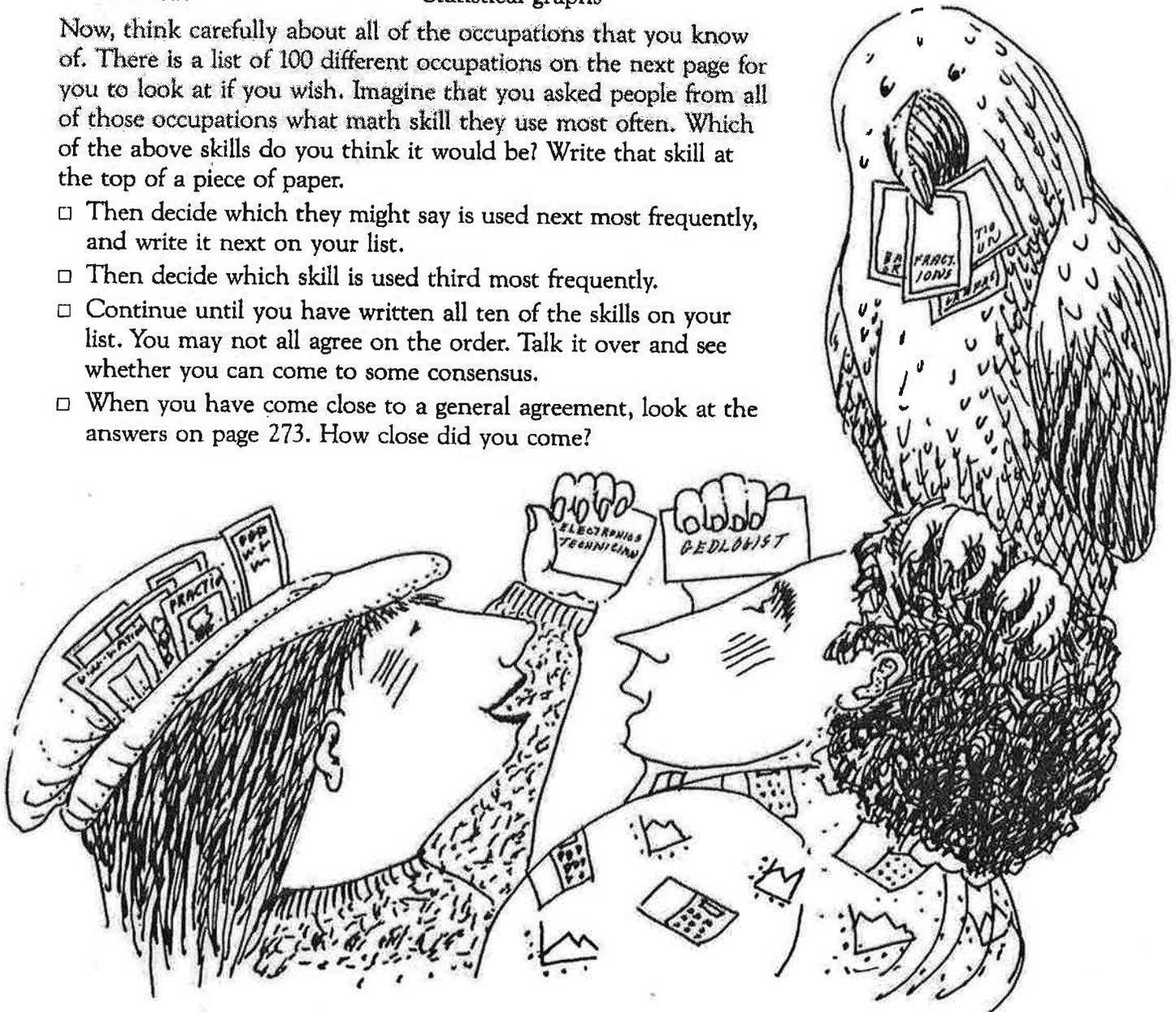
- Then decide which they might say is used next most frequently, and write it next on your list.
- Then decide which skill is used third most frequently.
- Continue until you have written all ten of the skills on your list. You may not all agree on the order. Talk it over and see whether you can come to some consensus.
- When you have come close to a general agreement, look at the answers on page 273. How close did you come?



Grade Level

## TOOLS

Paper and pencil



# OCCUPATIONS

Accountant	(Civil) Engineer	Oceanographer (Biological)
Accounting Systems Analyst	(Electronics) Engineer	Optician
Administrator: Shopping Mall	(Industrial) Engineer	Orthopedic Surgeon
Advertising Agent	(Petroleum) Engineer	Painting Contractor
Airline Passenger Service Agent	Environmental Analyst	Payroll Supervisor
Airplane Mechanic	Farm Advisor	Personnel Administrator
Airplane Pilot	Fire Prevention Officer	Pharmacist
Air Traffic Controller	Fire Fighter	Photographer
Appraiser (Land)	Forestry Land Manager	Physical Therapist
Architect	Forestry Recreation Manager	Plumber
Artist (Graphic)	Geologist (Environmental)	Police Officer
Attorney	Highway Patrol Officer	Political Campaign Manager
Auditor	Hydrologist	Printer
Auto Mechanic	Income Tax Preparer	Psychologist (Experimental)
Bank Teller	Insurance Agent	Publishing: Order Manager
Biologist (Environmental)	Insurance Claims Supervisor	Publishing: Production Manager
Carpenter	Interior Decorator	Purchasing Agent
Carpet Cleaner	Investment Counselor	Radio Technician
Cartographer	Landscape Architect	Real Estate Agent
Chiropractor	Librarian	Roofer
Computer Programmer	Machinist	Savings Counselor
Computer Systems Engineer	Manager: Appliance Store	Sheet Metal/ Heating Specialist
Contractor (General)	Manager: Temp. Employment Service	Social Worker
Controller (Hospital)	Marketing Rep. (Computers)	Stock Broker
Counter Clerk (Building Materials)	Masonry Contractor	Surveyor
Data Processor	Medical Lab Technician	Technical Researcher
Dentist	Meteorologist	Title Insurance Officer
Dietician	Motorcycle Sales and Repair	Travel Agent
Doctor (G.P.)	Navigator	T. V. Repair Technician
Drafter	Newspaper: Circulation	Urban Planner
Economist	Newspaper: Production	Veterinarian
Electrician	Newspaper: Reporter	Waitress/Waiter
Electrical Engineer	Nurse	Wastewater Treatment: Operator
Electronics Technician		

► This list is based on a survey of one hundred people from the 100 different jobs shown below. Each person was asked what kind of mathematics he or she actually used on the job. The person who made the survey was Hal Saunders, a junior high school math teacher in Santa Barbara, California. The information was first published in an article, "When Are We Ever Gonna Have To Use This?" written by Hal Saunders for *The Mathematics Teacher*, January, 1980. He points out, however, that since only one representative of each occupation was interviewed, more data may be needed. ◀

## More Ideas

Have the members of your family make their own survey of people they know, asking them what math skills they use on their jobs.



### Useful Math Skills—Answers

Rank	% of the 100 jobs that use this skill	Math skill
1	100	decimals
2	98	calculators
3	97	percent
4	89	estimation
5	88	fractions
6	83	averaging
7	77	ratio and proportion
8	74	statistical graphs
9	68	formulas
10	63	basic geometric concepts





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Thinking it over ...

I learned:

I liked ....

and I ...

A problem I solved today was:

I would have liked:

I plan to:

I would like to know more about:

I am: *optional*  
Name \_\_\_\_\_  
School \_\_\_\_\_

Use separate sheet of paper for additional comments and suggestions. Thank you!  
Adapted from a form developed by Sidney L. Hahn, University of Nebraska-Lincoln, 1985.

