Family Math

Adrian Public Schools

Also please feel free to visit Siena's Math Club Website

For more resources to make math easier!

www.sienaheightspme.weebly.com

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A related web-site:
http://www.pppst.com/index.html

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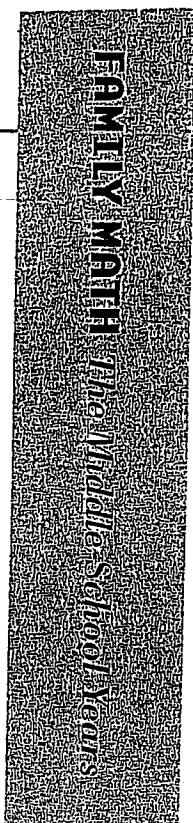
About EQUALS and FAMILY MATH

Since 1977, EQUALS has developed innovative mathematics curriculum materials to increase access and equity for all students and to help children everywhere realize success in mathematics. We have a special focus on traditionally underrepresented groups—females, students of color, and those from low-income and language-minority families. EQUALS, FAMILY MATH, and its Spanish counterpart MATEMATICA PARA LA FAMILIA serve PreK–12 educators, parents, and children. As leaders and experts in the fields of mathematics, equity, and bilingual education, our academic staff present workshops as well as write books for both home and classroom use.

For information about EQUALS and FAMILY MATH, additional book copies, or to receive our publications brochure, contact:

Credits:

PILOT

Math in a Minute

Helping your child to understand and use math doesn't have to take a lot of extra time or money. Here are some easy ways to build math skills, at home, in the sun, or on the run.

At home

- Make sure your child sees you using math as you go through your day. Talk out loud about what you are measuring or figuring. Say: "I need to double this recipe. Let's see, 1 cup plus 1 cup is two cups. If the recipe says 2 teaspoons of baking powder, how much will we need if we double it?" (Number Sense and Numeration; Measurement)
- Napkin Fractions—Make fractions fun. Fold paper towels or napkins into large and small fractions. Start with halves and move to eighths and sixteenths. Use magic markers to label the fractions. (Number Sense and Numeration)
- When putting away groceries or organizing play areas, stack boxes with your children to help them become familiar with how different shapes move and fit together. Sort blocks by those that roll, those that stack, and those that do both. As your children play with containers, they learn about shape and size and also practice their mathematical thinking. (Geometry; Analytical Thinking)

In the sun

- Find shells or pebbles at the beach or park. Line up four or five that share an attribute or two (same shape, color, or size), and one that does not. Ask your child to find the one that doesn't belong. Can she describe why? (Sorting; Matching; Recognizing and Describing Attributes)
- Give your child plenty of containers in many shapes and sizes when you play in the sand or water. Let your child scoop, dump, pour, and fill the cups. Ask him/her to predict how many of each of the smaller cups it will take to fill a large container. Use words such as *more than* and *fewer than*. (Volume and Measurement)
- Draw a giant clock face in the beach sand or with sidewalk chalk on a driveway. Draw in the numbers or mark them using cardboard or sticks. Have your child "walk around the clock," while you count by fives to show that there are 60 minutes in each hour. If you call out a time (10:15), can your child draw it? (Measuring Time)

On the run

- When you travel, across the country or across town, map your route from home to your destination. Ask your child to estimate (guess) how many miles you will travel. Compare your guess to the mileage chart included on most maps. (Measurement; Estimation)
- Keep a piece of string in your purse or car. When you have "down time," play Simon Says Shapes. Give the string to your child. Say, "Simon Says make a triangle." Use the string to make the shape. Can s/he name something in the real world that has that shape? (*Example:* yield sign) (Geometry)
- Let your child help you weigh fruits and vegetables at the grocery story. Ask him/her to guess the weight before you actually weigh them. Ask, "Do you think these apples will be more than a pound? Give him/her an apple in one hand and potatoes in the other, and compare how heavy they feel. Ask, will the potatoes weigh more or less than the apples? If they cost 60 cents a pound, about how much will this cost? (Measurement)

r more information on 1st grade math activities, go to:

tn://

Math in a Minute

Helping your child to understand and use math doesn't have to take a lot of extra time or money. Here are some easy ways to build math skills, at home, in the sun, or on the run.

At home

- Talk out loud so your child can hear you as you use math during your day. For example, "Let's see, our pizza bill is $15.89. That's almost $16. I want to give the delivery person a 15 percent tip. Ten percent would be $1.60. Half of that is 80 cents. If I add 80 cents to $1.60, I get $2.40. Can you help me count out 40 cents? (Numerical Operations)

- While you work in the kitchen, let your child experiment with a box of sugar cubes to help learn about volume. Take small boxes in different shapes and see how many sugar cubes fit inside each one. Record how many cubes it took to fill each shape. Then take other boxes and fill them. (Measuring Volume)

- Get your child involved in practical mathematics. Mention the size of containers, such as pints of cream and half-gallons of milk. Encourage children to help when you bake, lay carpet or tile, or seed or fertilize the lawn, and allow your child actually to measure ingredients, areas or quantities of material. (Measurement)

In the sun

- Take a nature walk and collect items of interest. When you get home, ask your child to sort things you collected. Young mathematicians can sort by color or shape. Older collectors can sort in a variety of ways, using Venn diagrams (two overlapping circles) to group objects that might share some characteristics. (Discrete Mathematics; Geometry)

- Put an ice cube in the sun and have each child guess how long it will take to melt. Write your predictions with sidewalk chalk or a rock. Keep track of the actual melting time. Whose guess was closer? If you use a bigger ice cube, will it take more or less time? Try it and see! (Measuring Time; Estimation; Relationships)

- Record the times of the sunset and sunrises for a week or so. Do you see any patterns. Can you draw a graph to show the changes? What time do you predict it will set a week from now? A month from now? (Data Analysis)

On the run

- Point out numbers when you are out and about. Point out individual numbers in signs, billboards, posters, food containers, books, and magazines. (Number Sense and Numeration)

- Keep a simple hand-held calculator in your purse or car. Calculators can be used to solve real-life math problems, check your estimation, or to play simple games. (Number Sense; Numerical Operations)

- Practice making reasonable estimates during your day. Ask your child to estimate how long it will take to drive across town or how far you might be able to go without buying gas. Estimate how much a bunch of grapes will weigh or how much the groceries in your cart will cost. Always compare your guesses with the actual facts. (Number Sense and Numeration)

- Keep a piece of string in your purse or car. When you have "down time," play Simon Says Shapes. Give the string to your child. Say, "Simon Says make a triangle." Use the string to make the shape. Can s/he name something in the real world that has that shape? (*Example:* yield sign)

For more information on 2nd grade math activities, go to:

Insect Math

Do the math problems and then substitute a letter for each number, from the letter code, to answer the question.

This oval-shaped insect is a type of beetle. It can fly and it has hard wing-covers (called elytra) that protect its delicate wings.

Letter Code:

1-A	4-E	7-L
2-B	5-G	8-T
3-D	6-H	9-U
		10-Y

	1 +7	4 +2	2 +2	5 +2	0 +1	2 +1	3 +7	1 +1	5 +4	3 +2
Math solution										
Letter substitution										

This green, flying insect is nocturnal (most active at night).

Letter Code:

1-a	4-l	7-o
2-c	5-m	8-t
3-h	6-n	9-u

	8 -4	9 -0	7 -1	3 -2	7 -2	9 -2	8 -0	4 -1
Math solution								
Letter substitution								

This flying, stinging insect is a type of wasp.

Letter Code:

1-a	4-j	7-o
2-c	5-k	8-t
3-e	6-l	9-w
		10-y

	6 +4	2 +1	2 +4	1 +5	6 +1	1 +8	1 +3	1 +0	2 +0	2 +3	2 +1	4 +4
Math solution												
Letter substitution												

This is the middle part of an insect's body; the legs and wings attach to it.

Letter Code:

1-a	4-j	7-r
2-e	5-l	8-t
3-h	6-o	9-x

	9 -1	6 -3	9 -3	9 -2	3 -2	11 -2
Math solution						
Letter substitution						

Parents:

Here are the directions for the following five KidZone worksheets that are numbered:

1. Write the number that comes after the numbers in the box.

2. Add the numbers across and down in the boxes. The answers should equal the sum for the right hand box.

3. Add the math problems together to get the sum.

4. Complete each addition problem.

5. Multiply the number at the top of the table by each of the numbers in the left column.

D

Name: _____

www.KidZone.ws

Kindergarten math

Write the number that comes after.

0	1	

8	9	

2	3	

6	7	

4	5	

0 1 2 3 4 5 6 7 8 9 10
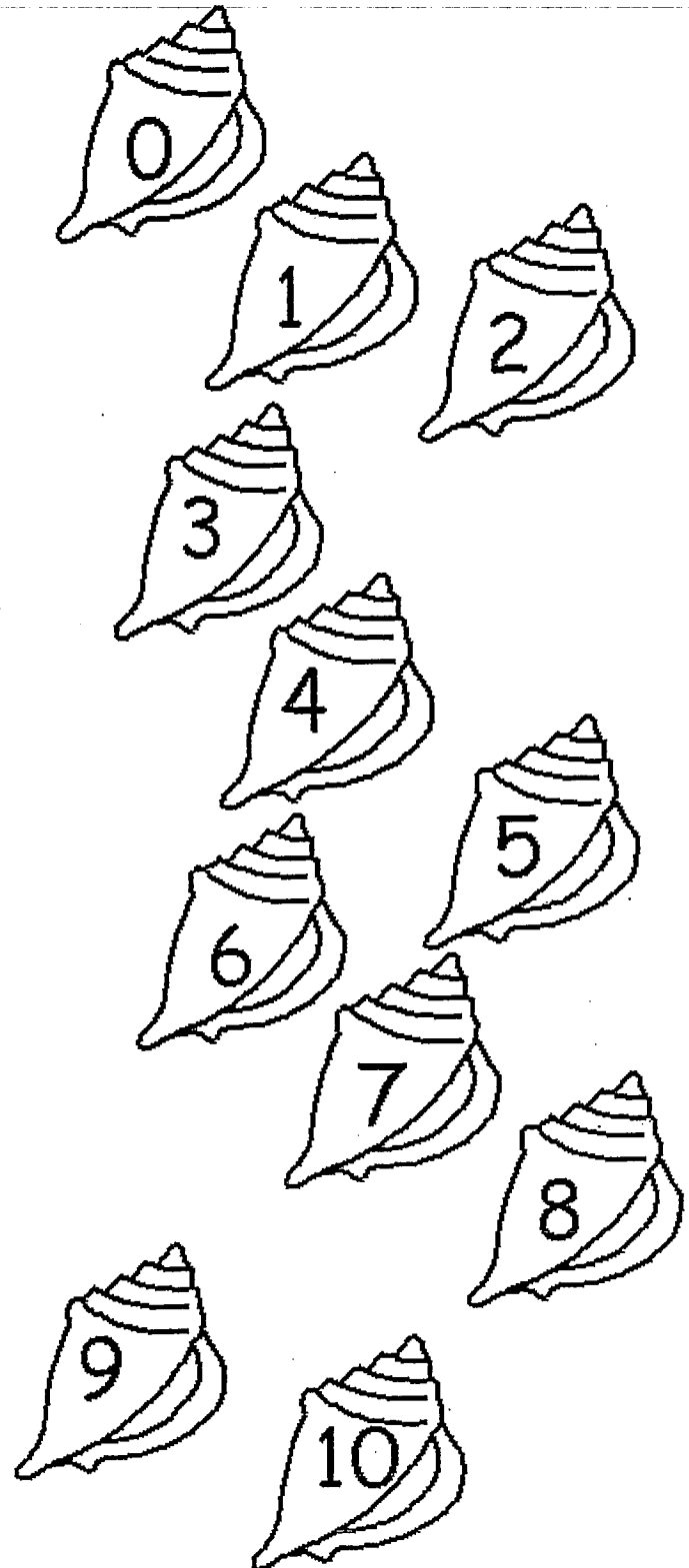
Name: _____

Add down and across. Then add the totals you calculated. The sum across should equal the sum down.

3	7	
3	6	

5	7	
1	7	

2	0	
9	6	

7	1	
0	9	

6	3	
5	9	

Addition Worksheet 1

1 a. $5 + 1 =$ ___   1 b. $6 + 9 =$ ___   1 c. $1 + 4 =$ ___

2 a. $1 + 9 =$ ___   2 b. $9 + 3 =$ ___   2 c. $6 + 4 =$ ___

3 a. $4 + 6 =$ ___   3 b. $5 + 8 =$ ___   3 c. $4 + 7 =$ ___

4 a. $5 + 9 =$ ___   4 b. $3 + 3 =$ ___   4 c. $6 + 8 =$ ___

5 a. $9 + 9 =$ ___   5 b. $3 + 7 =$ ___   5 c. $2 + 8 =$ ___

6 a. $2 + 2 =$ ___   6 b. $5 + 6 =$ ___   6 c. $8 + 5 =$ ___

7 a. $5 + 3 =$ ___   7 b. $3 + 1 =$ ___   7 c. $7 + 9 =$ ___

8 a. $8 + 9 =$ ___   8 b. $6 + 5 =$ ___   8 c. $6 + 3 =$ ___

Answer Key

© 2003-2010 HomeschoolMath.net Worksheets

KidZone.ʜ
Math Worksheets

Name: _____
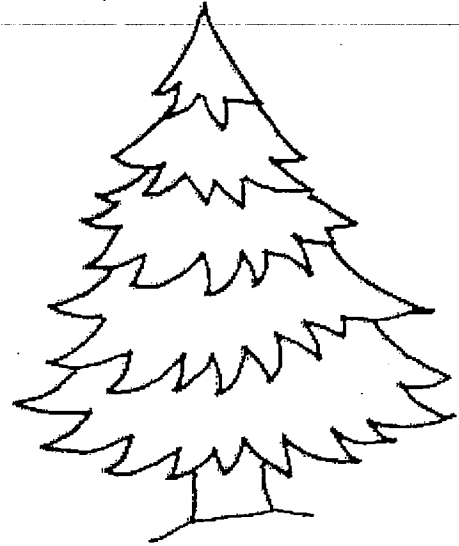
```
  59079          56130
+ 95641        + 93513
```

```
  16691          40655          21599          32489
+ 45553        + 29658        + 73302        + 31415
```

```
  17054          72133          18815          42676
+ 17263        + 50405        + 38280        + 60488
```

0 1 2 3 4 5 6 7 8 9

KidZone.n

Math Tables

Name: _____

Multiply the number at the top of the table by each of the numbers in the left column.

Multiply 96	
80	
61	
66	
97	
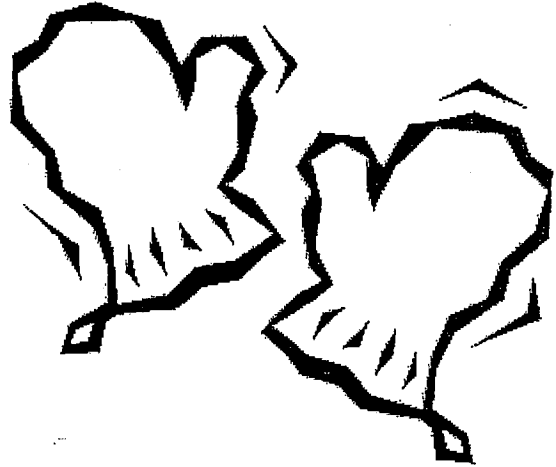
Multiply 1	
24	
43	
62	
28	

Multiply 90	
68	
35	
64	
36	

Multiply 31	
7	
13	
99	
45	

Multiply 6	
26	
98	
4	
90	

2/18/2010

Name: _____

Write the number that comes after.

0	1	

8	9	

2	3	

6	7	

4	5	

0
1
2
3
4
5
6
7
8
9
10

2/18/2010
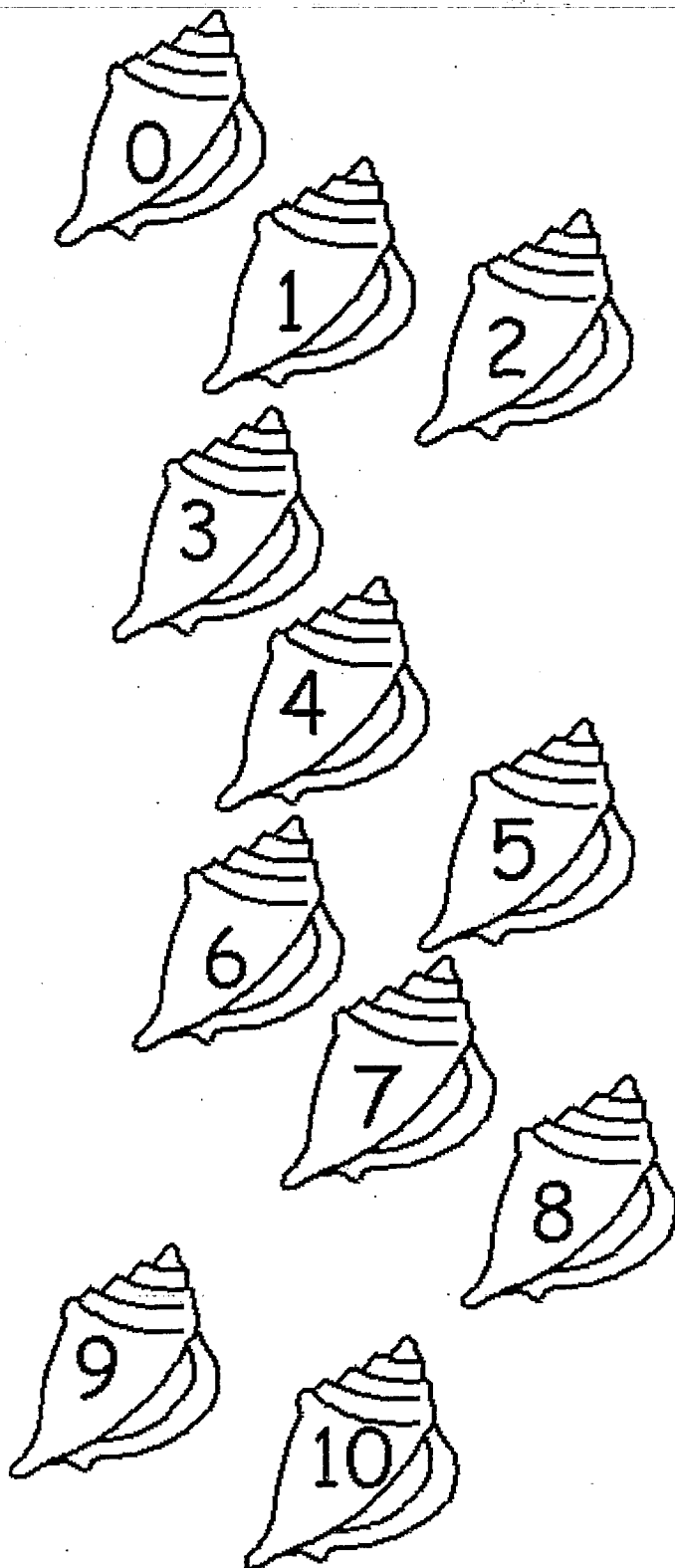
Dice-Roll and Tally Game
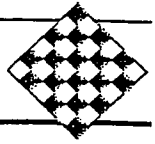
1. Roll a die. Use tally marks to record the results on this chart.

	Tallies
1	
2	
3	
4	
5	
6	

2. Record the number of times each number comes up.
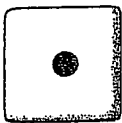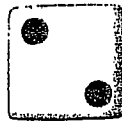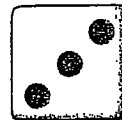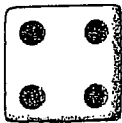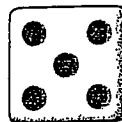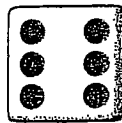
FACT-O

❖ ADAPT THE GAME FOR ANY GRADE!

4th and 5th grade

❖ THE RULES:
- Player rolls the 3 dice to see who goes first. The player with the highest total starts the game and play moves to the left.
- The first player rolls the 3 dice. The 3 numbers rolled are used to create a mathematical problem that uses at least two operations (addition and subtraction, addition and multiplication, subtraction and multiplication). For example, if the player rolls a 2, a 5, and a 6, the player can use the numbers to create the problems like 2x5+6=16 or 5x6-2=28.
- The problems should be written out and solved. Ideally, all children playing will solve for the answer so they can "check" the other players' answers.
- The player should then write the mathematical problem they created and chose to use in the square on the answer sheet (like 16 or 28), then pass the dice to the next player to end their turn.
- If the player creating the equation writes an incorrect equation and another player "catches" the mistake, the player loses the next turn. This cannot be done until the player has passed the dice to the next player, thus indicating the end of that turn.
- The next player repeats the process, and play moves around the group with players attempting to create problems with answers that appear on their answer sheet when it is their turn.
- If a player cannot make an equation for one of the numbers on their game board, then their turn is over. If a player cannot fill in a square for 3 turns in a row, then they are out of the game.
- To win, a player must fill in an entire row of numbers (across or up and down) like when playing Bingo. If the game must finish before any player can declare "FACT-O" then the player with the most squares filled in wins.

Kindergarten – 1st grade

For number recognition with younger children, have them role 1 die, count the dots showing, then mark the correct number symbol. Use the simplified game board with numbers up to 6.

2nd and 3rd grade

For children to practice simple addition or subtraction, use a game board with numbers up to 12. They should record the problem as stated in the general directions above.
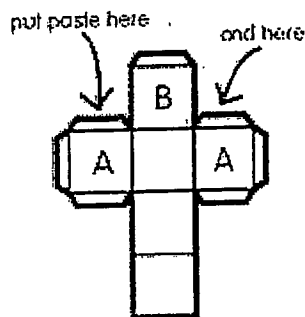
Personalized Paper Dice

Color and decorate these dice cutouts. In the squares on the blank die, draw or write anything you want (faces, friends' names, or shapes are some ideas). Glue the dice to a piece of thin cardboard (such as an empty cereal box). Cut out the shapes along the solid lines.

Making the dice:

STEP 1:
Make creases (folds) along all the dotted lines. Flip the shape over so the decorated side is facing away from you.

put paste here   and here

STEP 2:
Now bend up the sides labeled "A", and apply glue on the two tabs where shown. Fold up the tab labeled "B" and press "B" against the glue-covered tabs.

STEP 3:
Put some glue on all remaining tabs. Fold tab "C" over the top of the die, and press against the glue-covered tabs
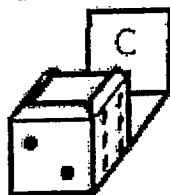
Now lay something (not too heavy) on top of your dice to hold them in place while they dry.
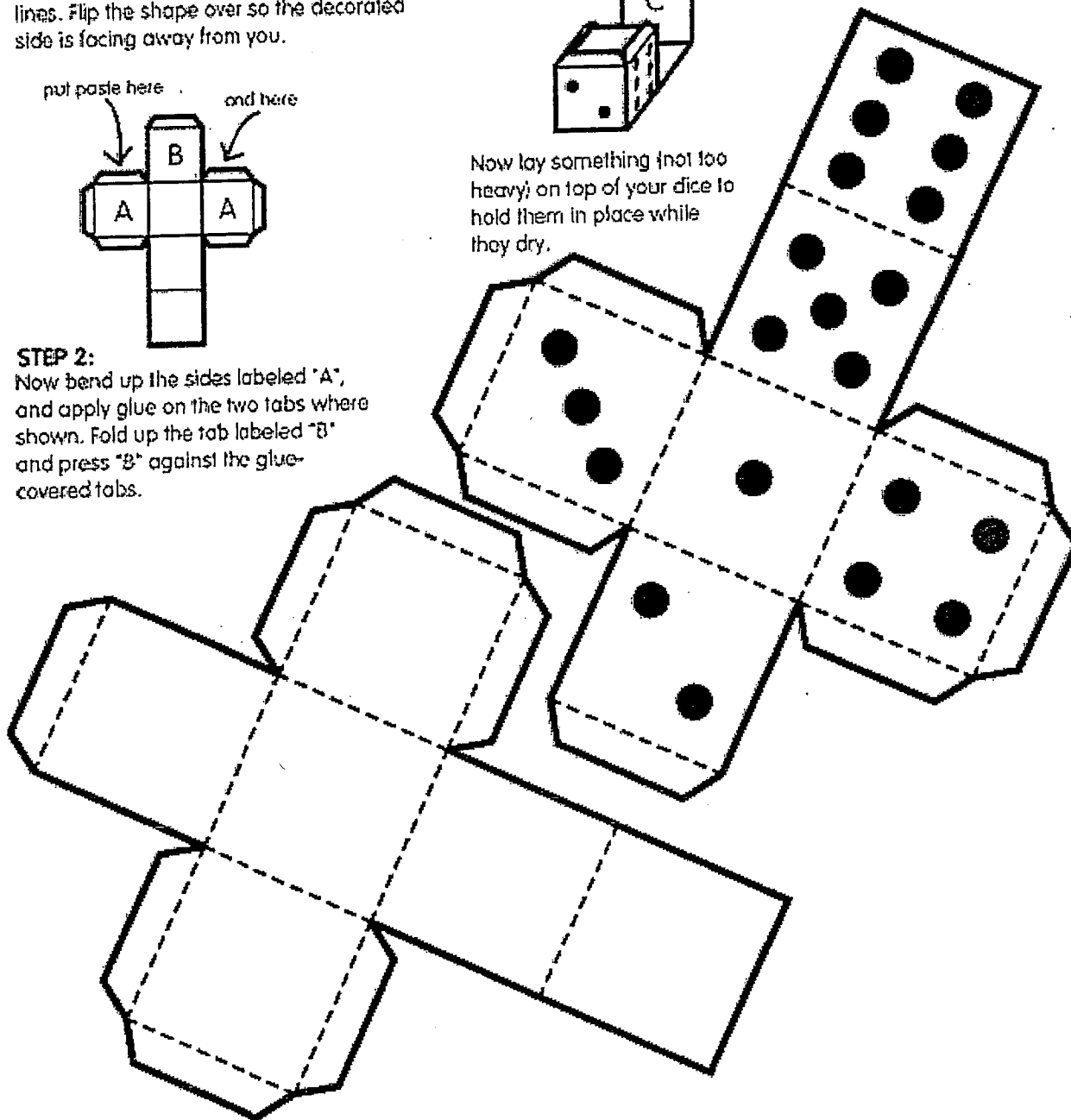
Fact-O Game Card

Name:_____

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	44	45	48	50	54	55
60	64	66	72	75	80	90	96
100	108	120	125	144	150	180	216

F	A	C	T	O
3	2	6	5	1
1	4	2	3	6
5	2	FREE	4	3
6	1	3	2	5
3	2	4	6	1

F	A	C	T	O
9	2	11	8	4
6	4	3	12	7
5	10	FREE	11	9
12	6	7	8	10
10	5	9	11	12

F	A	C	T	O

F	A	C	T	O

Guess and Group

Grade Level

TOOLS

Containers of:
  Beans
  Buttons
  Small blocks
  Straws
  Toothpicks
  etc.

Why

To teach estimation and grouping

How

☐ Reach into the container of one of the materials and take all you can hold in one hand. Have your child also take a handful.

☐ Before you open your hands and look, guess how many you are holding. Write down your guesses.

☐ Count how many pieces you have. Count by groups of five or ten.

☐ Draw a picture of your count and write the number on the record sheet.

☐ Continue with other materials, as shown in the sample record. sheet below.

MATERIAL	GUESS	PICTURE	NUMBER
BEANS	20		12
BUTTONS	15		8
STRAWS	7		6

More Ideas

☐ Have older children count by 3's, 4's, 6's, 7's, 8's, and 9's, to reinforce multiplication and division facts.

► *Grouping is a basic idea in developing the number concepts of place value and multiplication and division. Children need many grouping experiences with a variety of materials and different numbers.* ◄
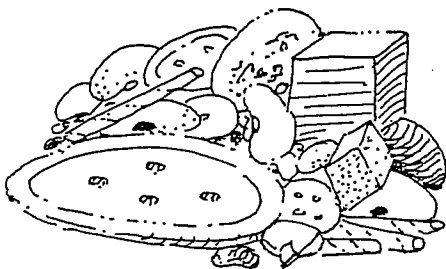
Materials	Guess	Picture	Number
Beans			
Straws			
Counters			

Balloon Ride
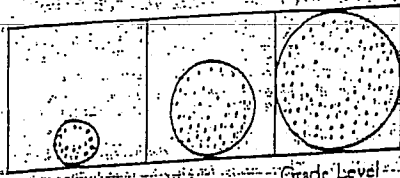
TOOLS

10 or more toothpicks
Balloon Ride board

A game for
2 players

Why

To practice problem-solving techniques by trying to figure out how to win a variation of the old Chinese game of NIM

How

☐ Tell the children a story about the hot air balloon coming to town. There is a contest to win a free ride. There are ten ropes holding the balloon to the ground. Two people take turns cutting the ropes. Each person may cut either one or two ropes. The person who cuts the last rope wins a free ride.

☐ Put out ten toothpicks on the Balloon Ride board to represent the ropes.

☐ Players take turns picking up one or two toothpicks at a time.

☐ No one is allowed to skip a turn.

☐ The person who takes the last one (or two) toothpicks wins the free ride.

▶ When you and your child begin to see some patterns and possible strategies, see if together you can work out a way to win every time. (Hint: Start with a game that has just a few toothpicks. Who has the best chance of winning? Then add a few more toothpicks. This is called working backward.) ◄

More Ideas

☐ After you think you have found a way to win, use a larger number of toothpicks—maybe twelve or nineteen.

☐ You can also change the number of toothpicks that can be picked up—try picking up one, two, or three toothpicks on each turn.

☐ You may even want to change the rules so that the person who has to pick up the last toothpick is the loser instead of the winner.

▶ This activity develops intuitive understanding of subtraction or "take-away." If children can find a strategy to win, it will build a stronger number sense. ◄

BALLOON RIDE

Arrange 10 toothpicks to connect balloon to ground
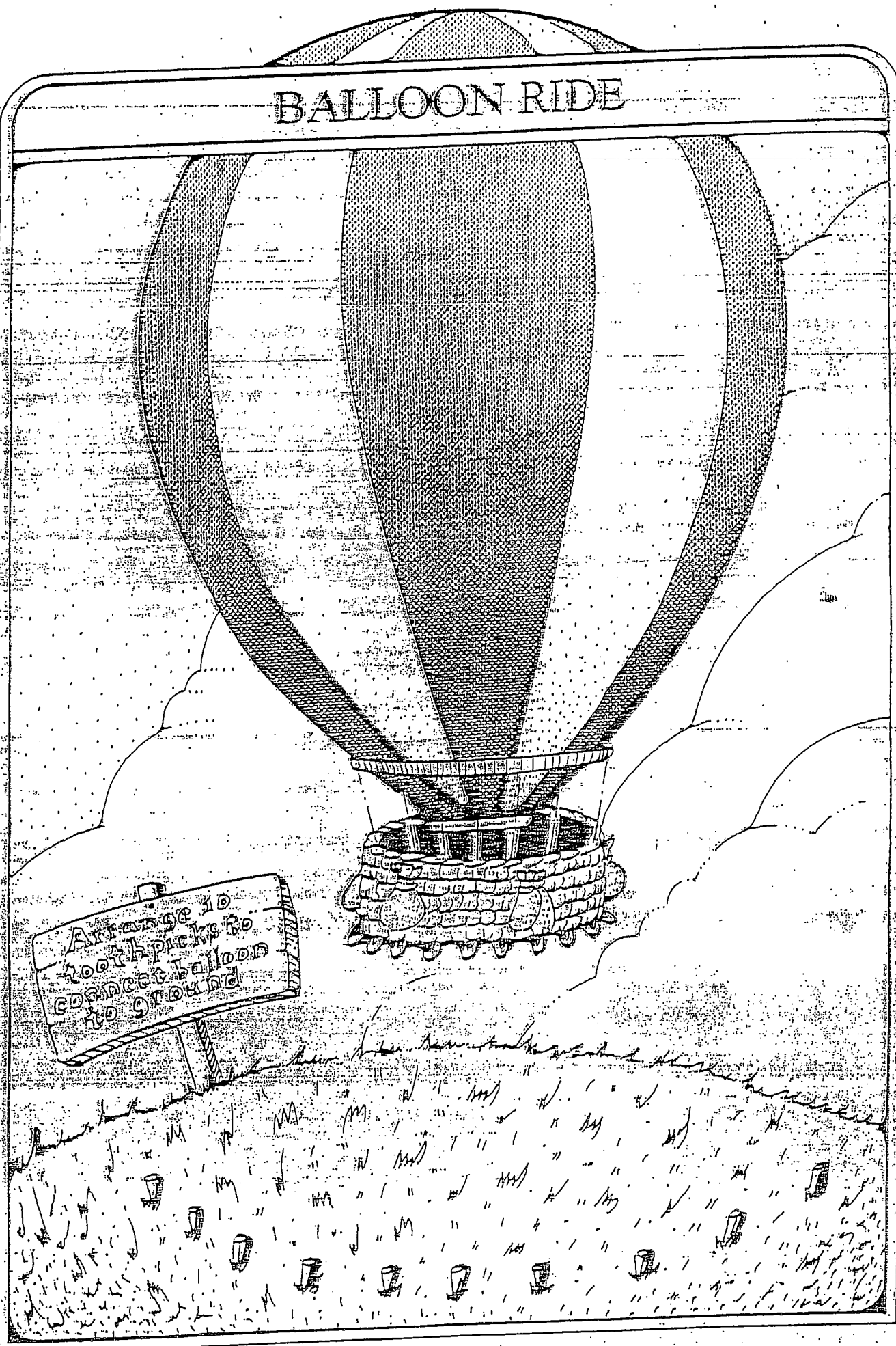
Dollar Digit
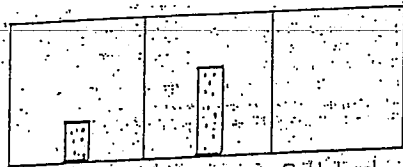
TOOLS

Scratch paper

Play or real money—
  dimes and pennies

Dice

A game for
2–4 players

Why

To practice place value skills using money

This game is meant for younger children to help them learn about the relative values of numbers in columns, building on their understanding of money.

How

☐ Each person will need a playing board made from scratch paper, like this:

DIMES	PENNIES
1	
2	
3	
4	
5	
6	
7	

☐ The dimes and pennies should be in the center of the table within reach of all players.

☐ Each person takes a turn rolling one die.

☐ All of the players use the same number rolled on each turn.

☐ Each player takes as many pennies or dimes as the number rolled on the die, and puts them in the appropriate column— pennies in the pennies' column or dimes in the dimes' column. A player may not take both pennies and dimes on the same turn.

☐ Whenever a player has ten or more pennies, she or he must trade ten of the pennies for a dime. The dime is put with any others in the dimes' column.

☐ The object of the game is to get as close as possible to $1.00. Totals may go over $1.00.

☐ As soon as each player has had seven turns, the players look to see who is closest to $1.00, or who is the winner.

More Ideas

☐ Make a rule that if a player goes over a dollar, the player is out of the game.

☐ Use pennies and nickels to reach 25¢ for very young children.

☐ Base 10 blocks may be used if they are available.

☐ Make a written record of each turn and its money amounts.
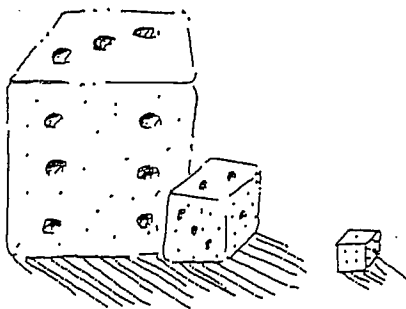
Dimes
(TEN-BLOCK)

Pennies
(UNITS BLOCK)

Turn						
1	2	3	4	5	6	7

Target Addition

TOOLS

Game board (below)

Markers

A game for
2–4 players
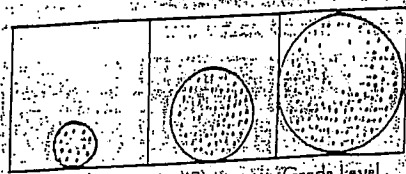
Why

To provide practice in mental arithmetic and strategic planning

How

☐ Choose a target number between 25 and 55.

☐ Take turns placing a marker on one of the numbers on the board, each time announcing the total of the covered numbers.

☐ For example, if the first player covered a 4, the second a 3 and the third a 2, the sum would be 4+3+2 or 9. If the fourth player covered a 4, the total would be 9+4 or 13.

☐ Each square may be used only once.

☐ The first player to reach the target number exactly wins. If a player goes over the target number he or she is out.

5	5	5	5	5
4	4	4	4	4
3	3	3	3	3
2	2	2	2	2
1	1	1	1	1
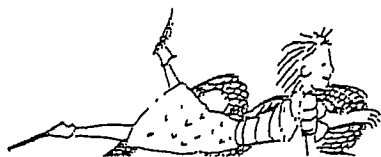
The Sum What Dice Game

Why

To practice basic addition facts and mental arithmetic.

How

□ Give a playing strip to each player, or have each person write out the numerals 1 through 9 on paper.
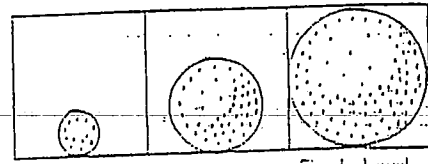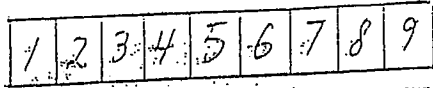
1	2	3	4	5	6	7	8	9

□ Players take turns rolling two dice.

□ On each turn the player may cover either the sum rolled on the dice or any two numbers that are still uncovered and that add to the sum rolled.

□ For example, if a sum 9 is rolled first, the player may cover: 9, or 1 and 8, or 2 and 7, or 3 and 6, or 4 and 5.

□ Later in the game if the sum of 9 is rolled again and the 5 is already covered, then the player cannot use the 4 and 5 combination and must play one of the other open possibilities.

□ When a player cannot play, he or she is out and has a score of the sum of the uncovered numbers.

□ Play continues for everybody else until everyone is out.

□ The last person to go out will not necessarily win; the person with the lowest score wins.

1	2	3	4	5	6	7	8	9
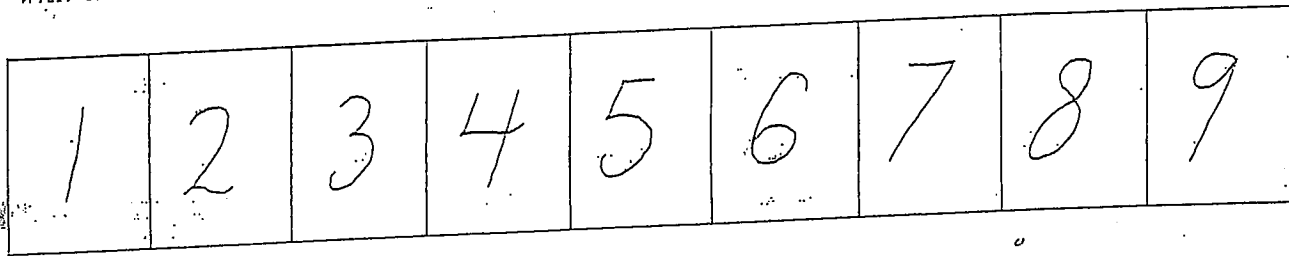
Playing strip

Animal Crossing
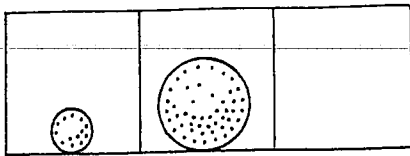
Why

To develop an understanding of two-dimensional representations
by moving game pieces on a grid

How

☐ Each person chooses a different side of the board, and places
  his or her marker anywhere on the edge of that side.

☐ Take turns rolling the die. You may move the number of
  squares indicated by the dice, or you may move fewer squares.

☐ On your first move, you may move into any square on your
  side of the board, continuing from there. Your goal is to reach
  the side opposite your starting side.

☐ On each turn, you may move in only one direction. You may
  change directions only at the beginning of a turn. If you reach
  a barrier, you must stop, even if you have not moved the
  number of squares the dice showed.

☐ Play until all of the animals have moved across the board. The
  last person to finish may be the first to choose a new side for
  the next game.

▸ *This game may be played many times. Children will gain counting*
experiences, as well as learning simple strategies as they plan each
move. Familiarity with a grid is important in later mathematics,
especially geometry and calculus. Children may make up their own
boards to extend the activity. ◂
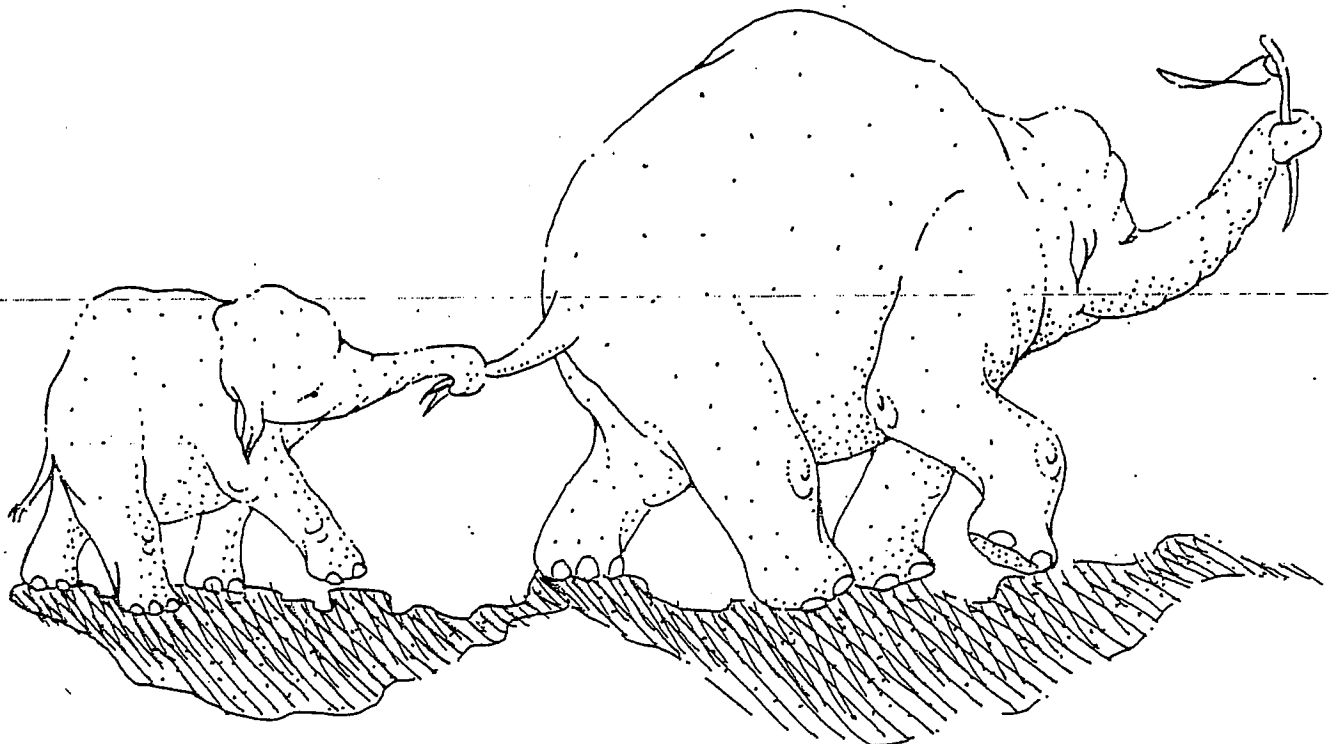
ANIMAL CROSSING I
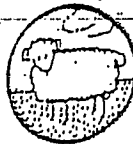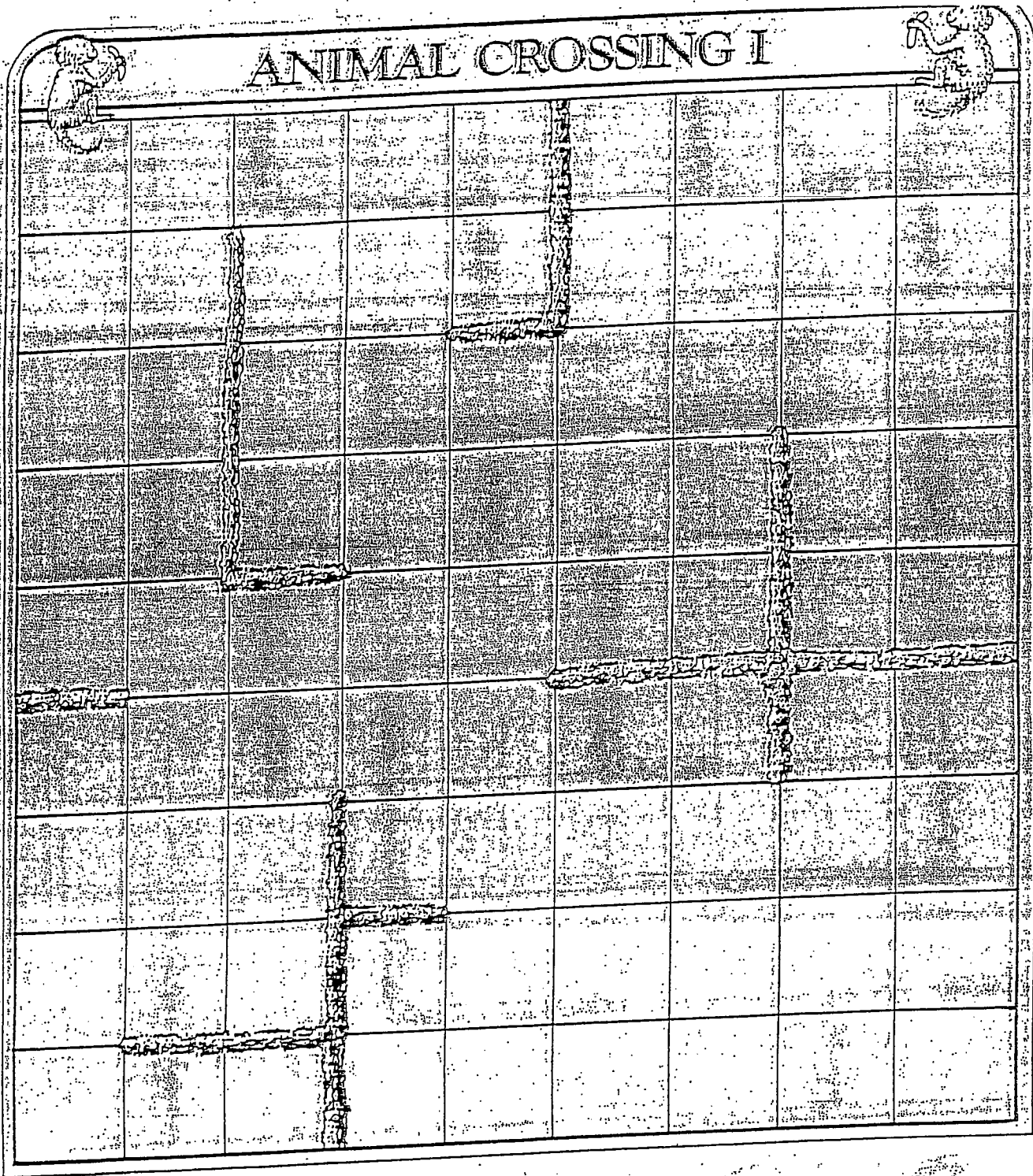
Markers

Markers

Thinking Visually

Why: To practice visualizing spatial relationships and manipulating spatial objects mentally.

How

This is an activity for two people.
Each person has a sheet of white paper inside a file folder and one of two identical sets of five different shapes in colors.

1. Person A places one shape in each corner of the paper and one in the center.

2. Person B takes about 30 seconds to memorize the arrangement, then closes his or her eyes.

3. Person A exchanges two of the shapes, saying "I am switching _____ and _____," then closes the file folder to cover the shapes.
       (For example, "I am switching the red square with the blue triangle.")

4. Person B arranges the set of shapes on the paper as seen "in the mind's eye."

5. The two arrangements of shapes are compared--are they the same?

6. The people change roles and repeat the process.

How good are you at thinking visually?

Try doing two switches, or even three!!!

Extension:
     Try this activity using a different set of five objects at home.
     Try using more than five objects in a set.

Coordinate Tic-Tac-Toe

Why

To reinforce the skills of naming coordinates and graphing points on the Cartesian plane

How

- [ ] The game is played almost like the old familiar Tic-Tac-Toe, except that:
  - [ ] The X's and O's are put on the line intersections instead of in spaces
  - [ ] The board is larger—usually 10 by 10
  - [ ] The goal is to get four X's or four O's in a row
  - [ ] The places where the X's and O's are put must be given according to their ordered pair names (see Coordinates I, page 192)
- [ ] Markers may be used instead of X's and O's, so that the board may be used over and over.
- [ ] First, decide on a leader. For the first game, this should be a parent or other adult. In later games, anybody can be leader.
- [ ] Number a 10×10 sheet of graph paper, using the coordinate system.
- [ ] Players (or teams if there are more than two players) take turns naming the points for the X and O. The points must be named by their ordered pair designations.
- [ ] The leader keeps a record on the grid (with pencil or with markers) of the points called by each team.
- [ ] The goal is to get four X's or four O'x in a row.

TOOLS

Graph paper (10×10)
Pencils or markers

A game for
2 players or 2 teams

Grade Level

10

9

8

7

6

5

4

3

2

1

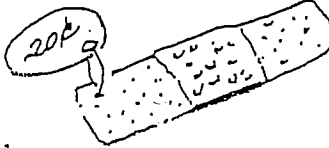0   1   2   3   4   5   6   7   8   9   10   11

Paying the Price

TOOLS
50 pennies
10 nickels
5 dimes
2 quarters
Coin board
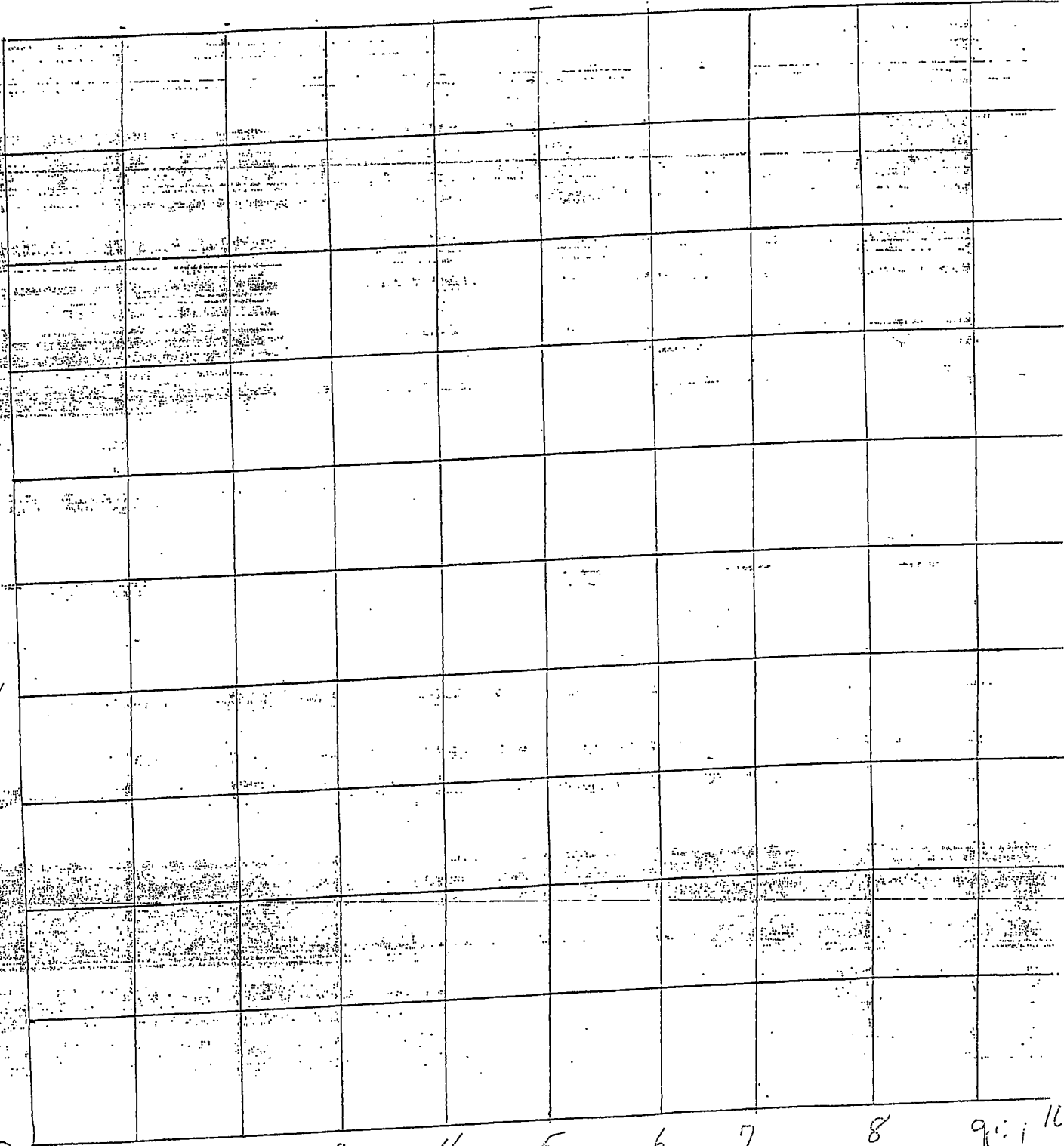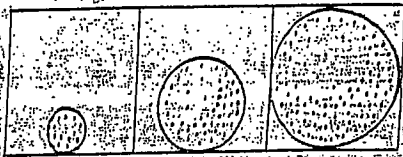
Why

To become familiar with the value of coins and to practice making an organized list.
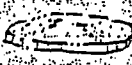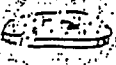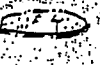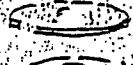
How

☐ Help your child find how many different ways you could pay for each of the items using pennies, nickels, dimes, and/or quarters.

☐ For each way, put the coins on a separate row of the board below, then make a record of how many ways there were.

☐ For example, for a LOLLIPOP that costs five cents, there would be two ways.

COIN BOARD

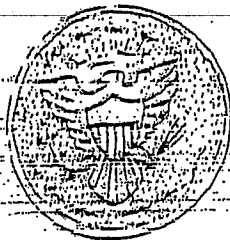| 50¢	25¢	10¢	5¢	1¢

HOW MANY WAYS?

letter _____ pencil _____ cone _____

train _____ duck _____ bandage _____

cake _____ flower _____ fish _____
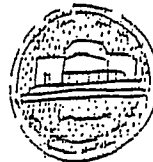
COIN BOARD

| 50¢	25¢	10¢	5¢	1¢

Odd or Even

Why

To understand numbers

How

- ☐ Have your child take a handful of beans or other small objects.
- ☐ Count them with your child.
- ☐ Then help your child arrange them in pairs to find out if the number is odd or even. An odd number will have one bean left over; an even number will come out even, with no beans left over.
- ☐ Keep a record of what happens. Do you see a pattern?

ODD	EVEN
5 ∘ ∘ ∘ ∘ ∘	2 ∘ ∘
7 ∘ ∘ ∘ ∘ ∘ ∘ ∘	4 ∘ ∘ ∘ ∘

- ☐ To picture the pattern, write the numbers in a row. Color the odd numbers blue and the even numbers red.

► *Oddness and evenness are important concepts for understanding fractions, algebra and other advanced mathematics.* ◄
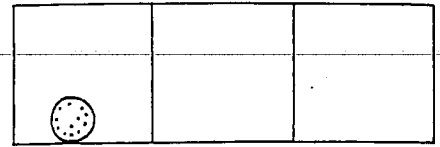
TOOLS

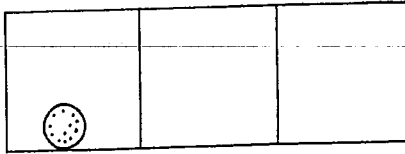Record sheet
Beans or small objects
Blue and red crayons

1	2	3	4	5	6	7	8	9

# Egg Carton Numbers

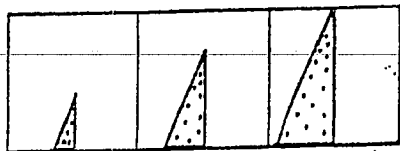
Grade Level

TOOLS

Egg carton
78 beans

Why

To gain experience with numbers

How

☐ Label the sections of an egg carton with the numbers 1 through 12.

☐ Give your child 78 beans (or other small objects) and ask him/ her to count them into the sections of the carton, according to the numbers. There should be one bean in the section marked "1," two beans in the section marked "2," and so on.

☐ If the counting is accurate, the child will use exactly 78 beans. Can you explain why?
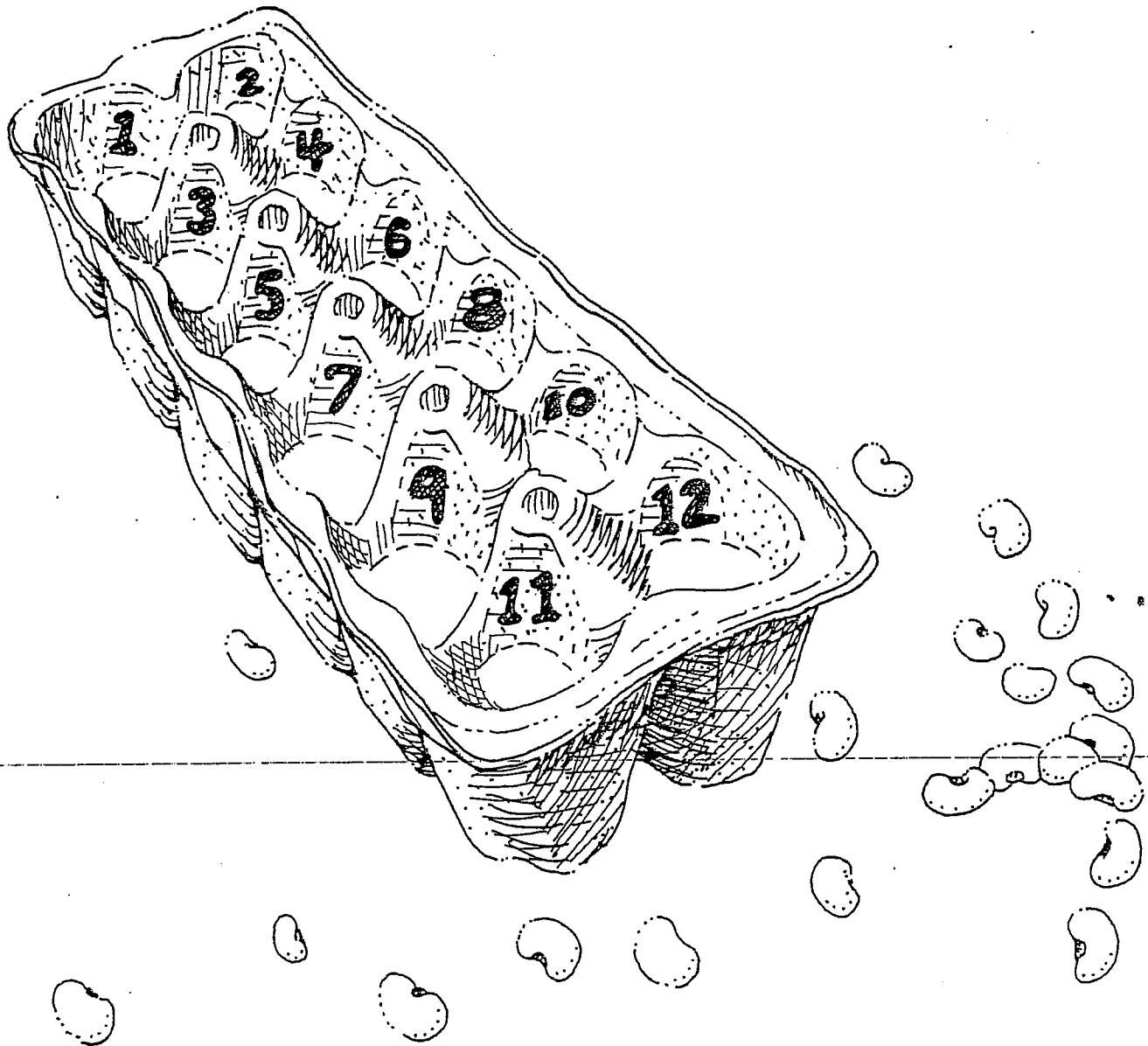
Hurkle

Grade Level

TOOLS

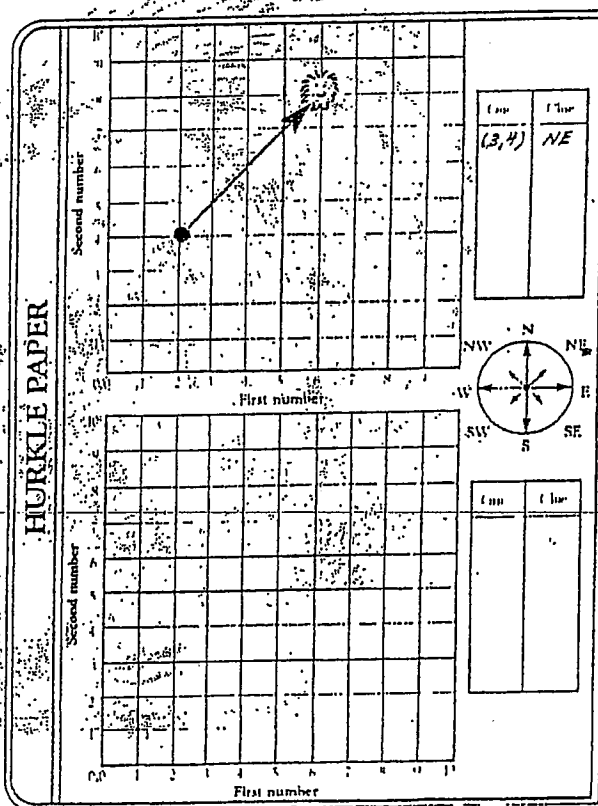**Hurkle paper**
Pencil
Markers

A game for
2 or more players

Why

To practice naming points on a coordinate grid and using compass directions to find the hidden "Hurkle"
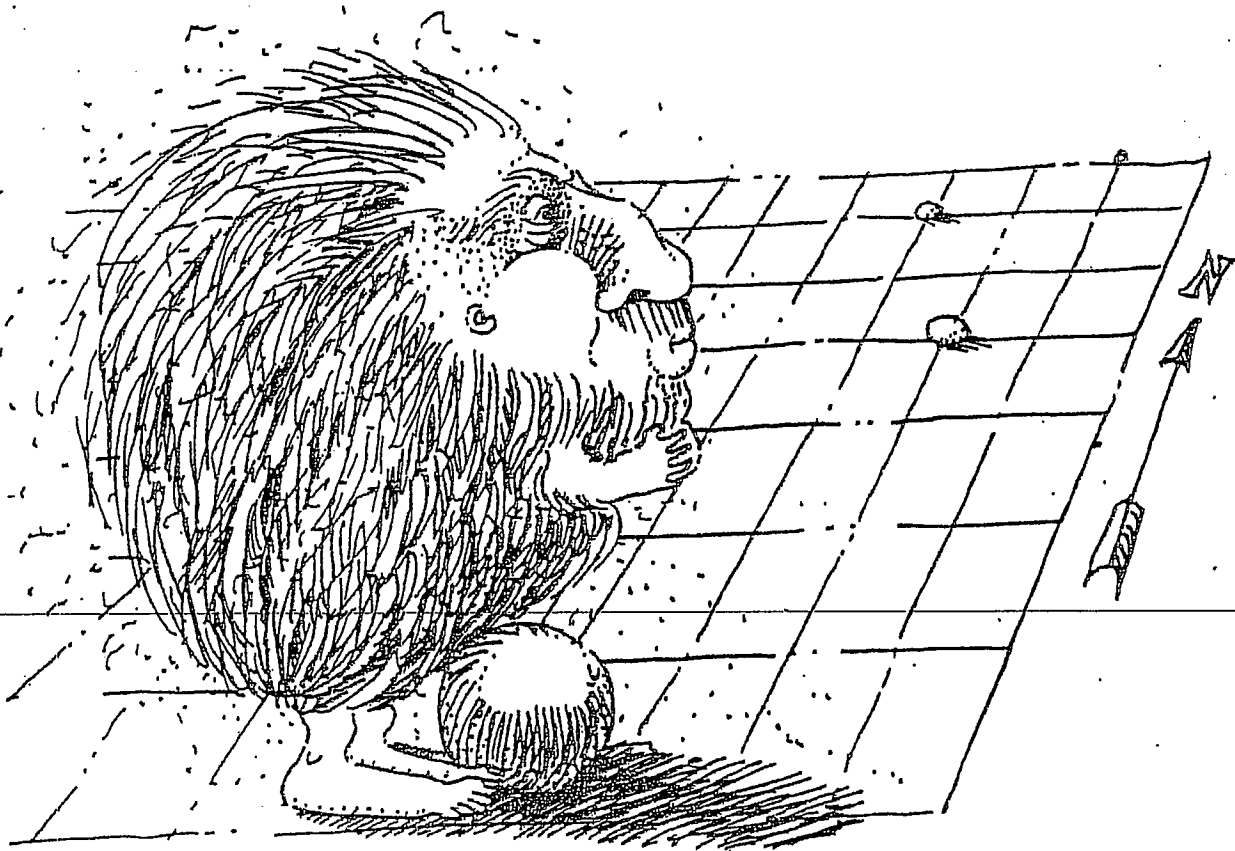
How

☐ Review the directions for naming coordinates (see page 194).

☐ Explain or review compass directions: North, South, East, West, Northeast, Southwest, etc.

☐ Choose a leader for the first game. Other players should have a turn leading later games.

☐ The leader decides on a point where the Hurkle is hiding and announces that a small, fuzzy, creature is hiding behind some point on the grid.

☐ The other players need to discover what the point is.

☐ Players take turns guessing coordinates, naming them by ordered pairs, such as (6,8).

☐ The leader responds to each guess with a clue, telling the players what direction they need to go from their guess to find the Hurkle. For example, if the Hurkle is hiding at (6,8) and the guess is (3,4), the leader will say "Go northeast."
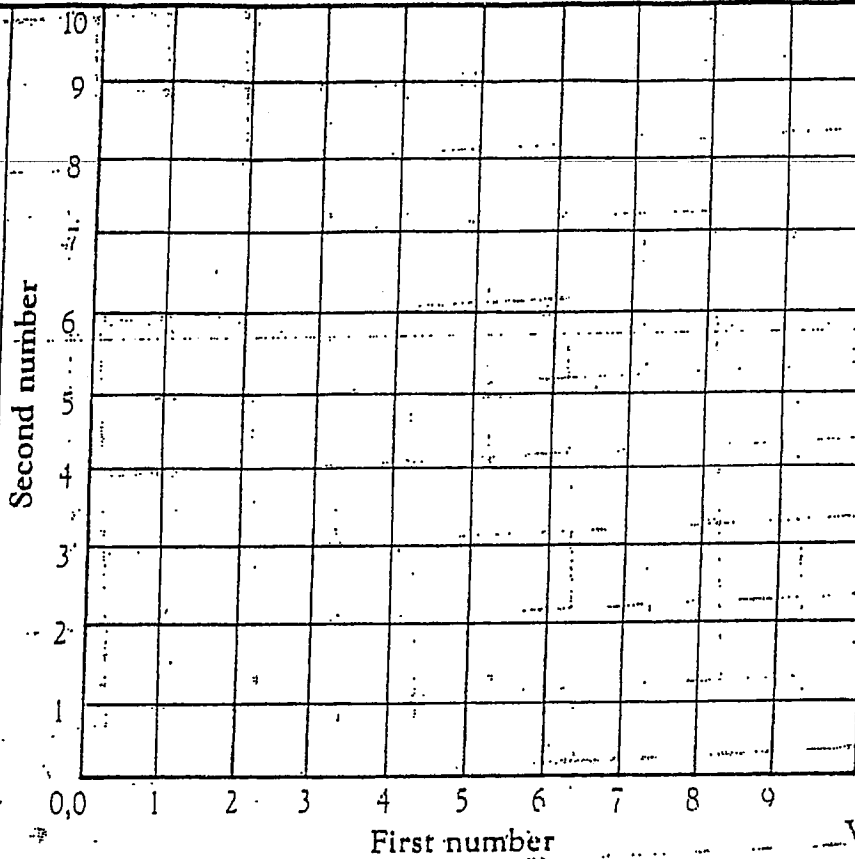
⬜ Players keep track of their guesses and clues.

⬜ The leader should mark the Hurkle's hiding place on a hidden sheet of Hurkle paper. After each guess, he or she should make a mark or place a finger on the guessed point and then give the direction players need to move to find the Hurkle. This helps avoid a common mistake of giving the opposite direction, or the direction from the Hurkle to the guess.

⬜ Be sure to talk about the best strategy for making guesses.
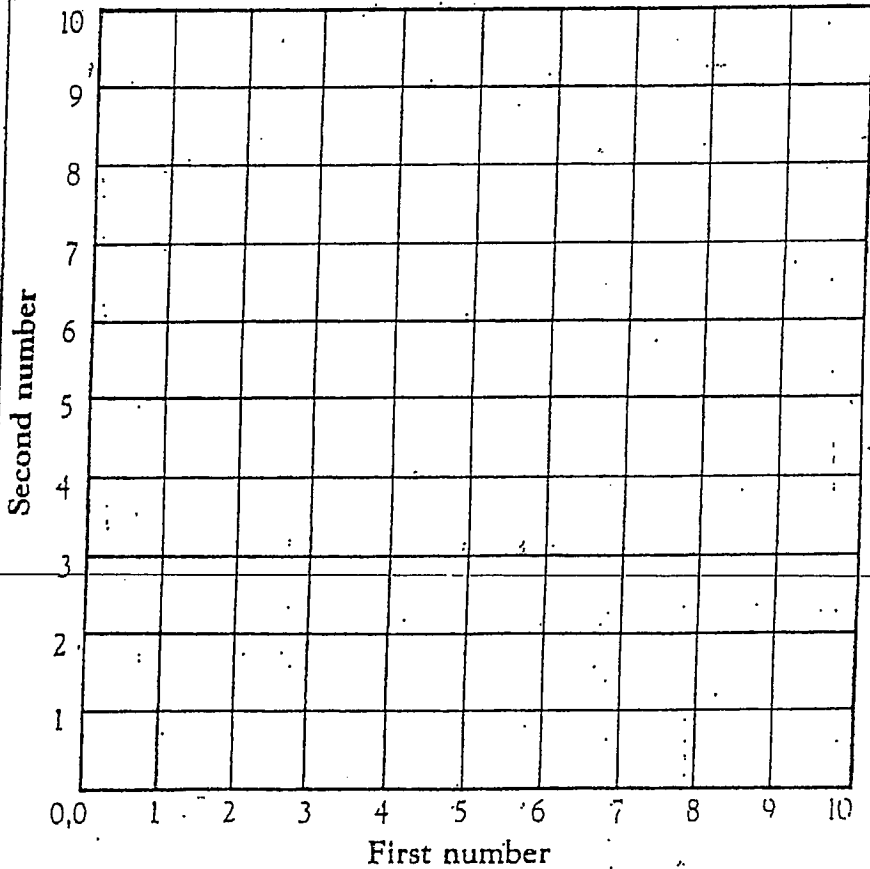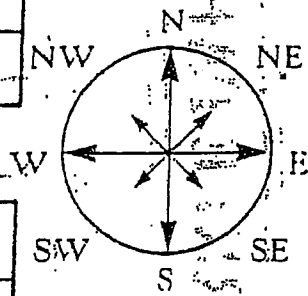
More Ideas

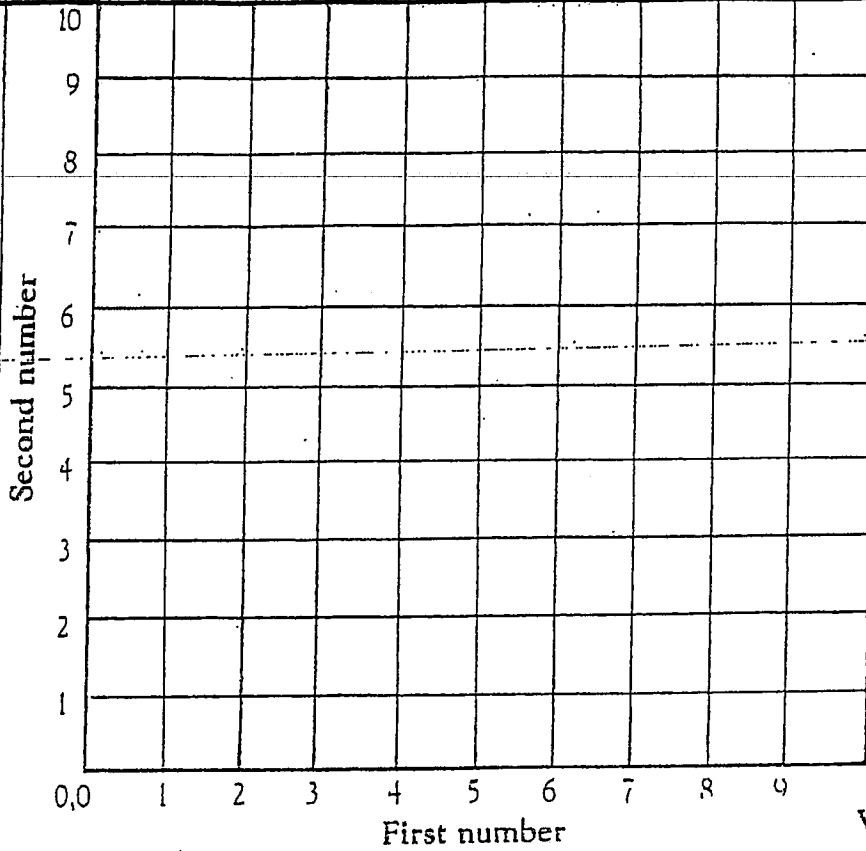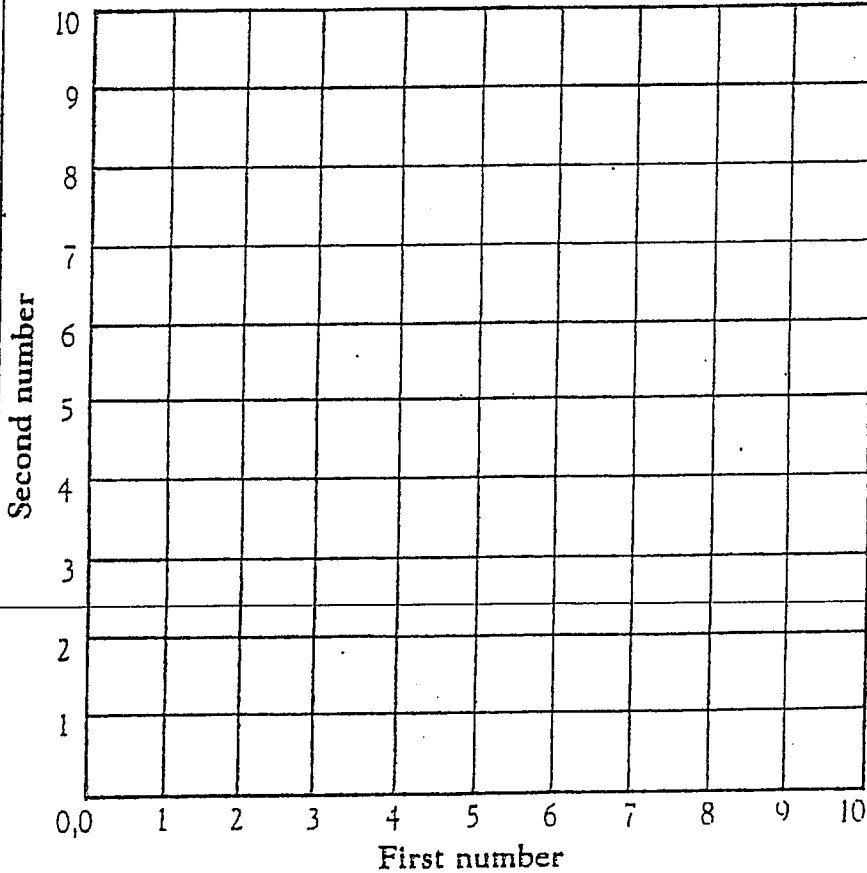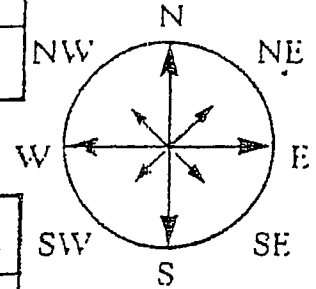Play on a grid including all four quadrants.

HURKLE PAPER

Second number (vertical axis, top grid)
10, 9, 8, 7, 6, 5, 4, 3, 2, 1

First number (horizontal axis, top grid)
0,0 1 2 3 4 5 6 7 8 9

Guess	Clue

N, NE, E, SE, S, SW, W, NW (compass rose)

Second number (vertical axis, bottom grid)
10, 9, 8, 7, 6, 5, 4, 3, 2, 1

First number (horizontal axis, bottom grid)
0,0 1 2 3 4 5 6 7 8 9 10

Guess	Clue

HURKLE PAPER

Second number

10
9
8
7
6
5
4
3
2
1

0,0 1 2 3 4 5 6 7 8 9
First number

Guess	Clue

N
NW   NE
W ←→ E
SW   SE
S

Second number

10
9
8
7
6
5
4
3
2
1

0,0 1 2 3 4 5 6 7 8 9 10
First number

Guess	Clue

Make it count

Grade:
Kindergarten – 2nd grade

Players:
Two – Four

Purpose:
Teach and reinforce addition facts, knowledge of money, and bundling concepts.

Materials needed:
1 – 2 dice numbered 0, 1, 2, 3, 4, 5 "note you can cover 6 with tape"
Pennies
Nickels

Objective:
Be the first person to get five nickels

Directions:
Start the game by placing all the coins in the center of a table.
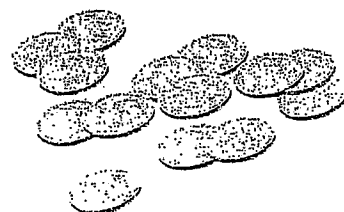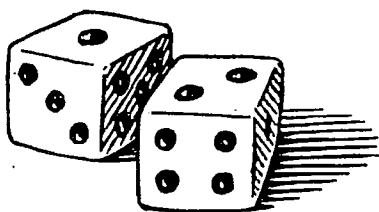The person with the earliest birthday goes first.
Players take turns rolling dice.
Player rolls the dice and takes the number of pennies that matches the number they rolled. Example I a player rolled a 3 they would take "3" they would take three pennies from the center.
If a player rolls a "0" they take no coins.
If a player rolls a "5" they may take a nickel.
When players have five pennies they must trade them in for a nickel

Make it count

Grade:
3rd – 4th grade

Players:
Two - Three

Purpose:
Teach and reinforce addition facts, knowledge of money, and critical thinking

Materials needed:
1 – 2 dice numbered 0, 1, 2, 3, 4, 5 "note you can cover 6 with tape"
Pennies, Nickels, Dimes, Quarters

Directions:
Start the game by placing all the coins in the center of a table.
The person with the earliest birthday goes first.
Teacher or Parent will give a random amount "$0.92, $1.37, $0.43".
Players take turns rolling dice.
Player rolls the dice and takes the number of coin(s) that matches the number they rolled.
Payers can choose any denomination of coins they want.
If a player rolls a "0" they take no coins.
The first person to get the exact amount given by the instructor is the winner.
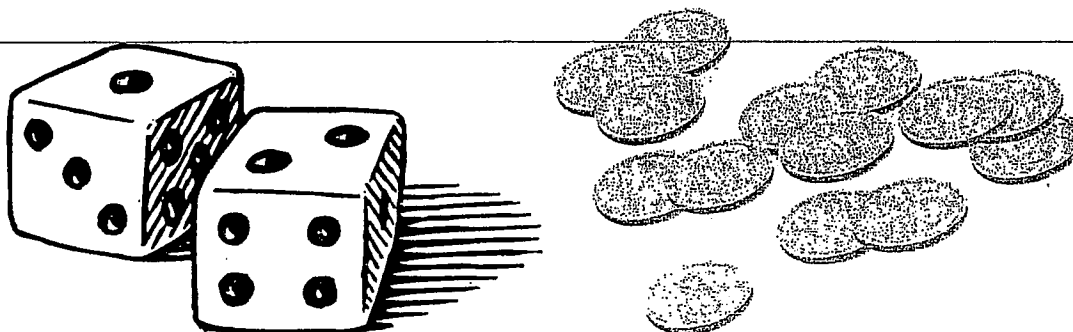
Making a Fraction Kit
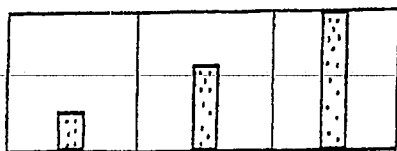
Grade Level

TOOLS

Pencil
Scissors
Strips of 3"×18"
  construction paper
For Kit I you need 4
  strips of different colors
For Kit II you need Kit I
 plus 3 more strips of
  different colors

Why

To see and understand the relative values of fractions by making physical representations

▸ *When young children are learning simple arithmetic, it is essential that they have many experiences with concrete materials, such as blocks, before they can truly understand the difference between three ☐ ☐ ☐ and five ☐ ☐ ☐ ☐ ☐. In the same way, making a physical model of fractions provides reinforcement for understanding the relative values of fractions.* ◂

How

To Make Kit I

☐ Take 5 strips of different colors. With your children, compare the strips to be sure they are all the same length. Talk about the fact that the strips each represent "1 WHOLE" and that you will be cutting some into fractional parts.

☐ Label one strip "1 WHOLE." (Note: It is often convenient to use a black strip for your whole.)
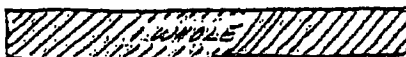
☐ Take another strip and fold it carefully in half.
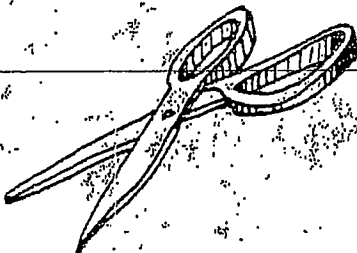 ☐ Fold by first lining up the edges of the strip and then creasing the fold.

   How many sections will you have when you open your folded strip?
   Open it and count.
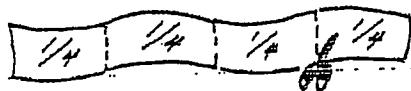☐ Label each part 1/2 and cut on the fold line.

☐ Take another strip and fold carefully in half two times.

Guess how many sections you will have when you open it.
Count the sections.
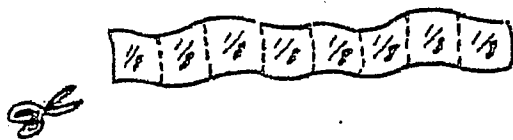
‒ Label each part 1/4 and cut them apart.

‒ Take another strip. This time fold it in half three times.
   Again, be very careful to fold accurately.
   How many sections will there be this time?
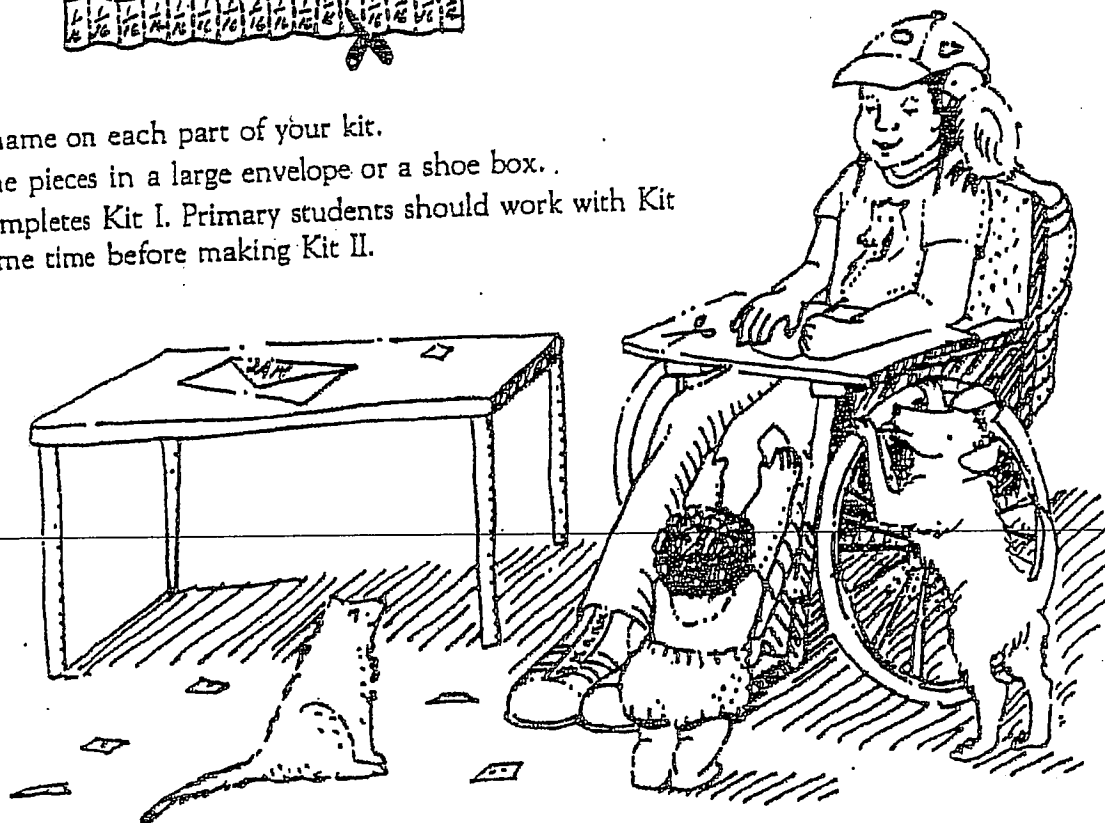   Count to check.
‒ Label each part 1/8 and cut them apart.

□ Continue with the last strip. Fold very carefully four times.
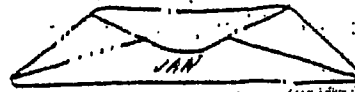   This time you will get one-sixteenth (1/16) for each section.

□ Put your name on each part of your kit.
   □ Keep the pieces in a large envelope or a shoe box. .
   □ This completes Kit I. Primary students should work with Kit
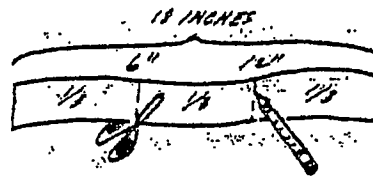   I for some time before making Kit II.

To Make Kit II:

□ Kit II consists of Kit I plus the pieces made from three more 18-inch strips.

□ Make Kit I.

□ Take the next strip, measure and mark it with a pencil at 6" and 12" along the edge. Fold on these lines.

□ You will have three sections.

□ Label each 1/3 and cut them apart.

□ Take the next strip. Make thirds and then fold each third in half.

□ How many sections do you have?

□ Label each section 1/6 and cut them apart.
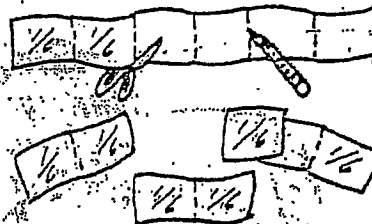
□ Take the last strip. Make sixths and then fold each sixth in half. You will have twelve sections this time.

□ Label each section 1/12 and cut them apart.
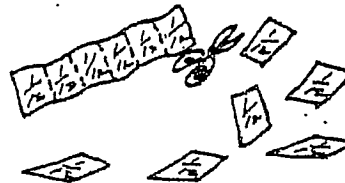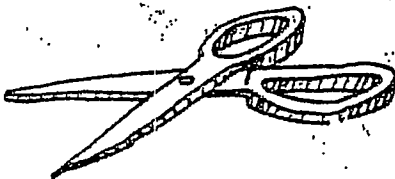
□ Put your name on each part of your kit.
□ Use your fraction kit to compare the sizes of different fractions and for Fraction Cover Up and other fraction activities.
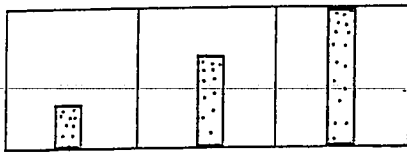
More Ideas

Equivalent Fractions are easily shown with these kits. For example, 1 WHOLE is the same as 2/2, 3/3, 4/4, etc. Explore with your children some other equivalent fractions, using your strips to check. Keep a record like this:

1/2 IS THE SAME AS □/□ OR □/□ OR □/□
2/8 IS THE SAME AS □/□ OR □/□ OR □/□
4/16 IS THE SAME AS □/□ OR □/□
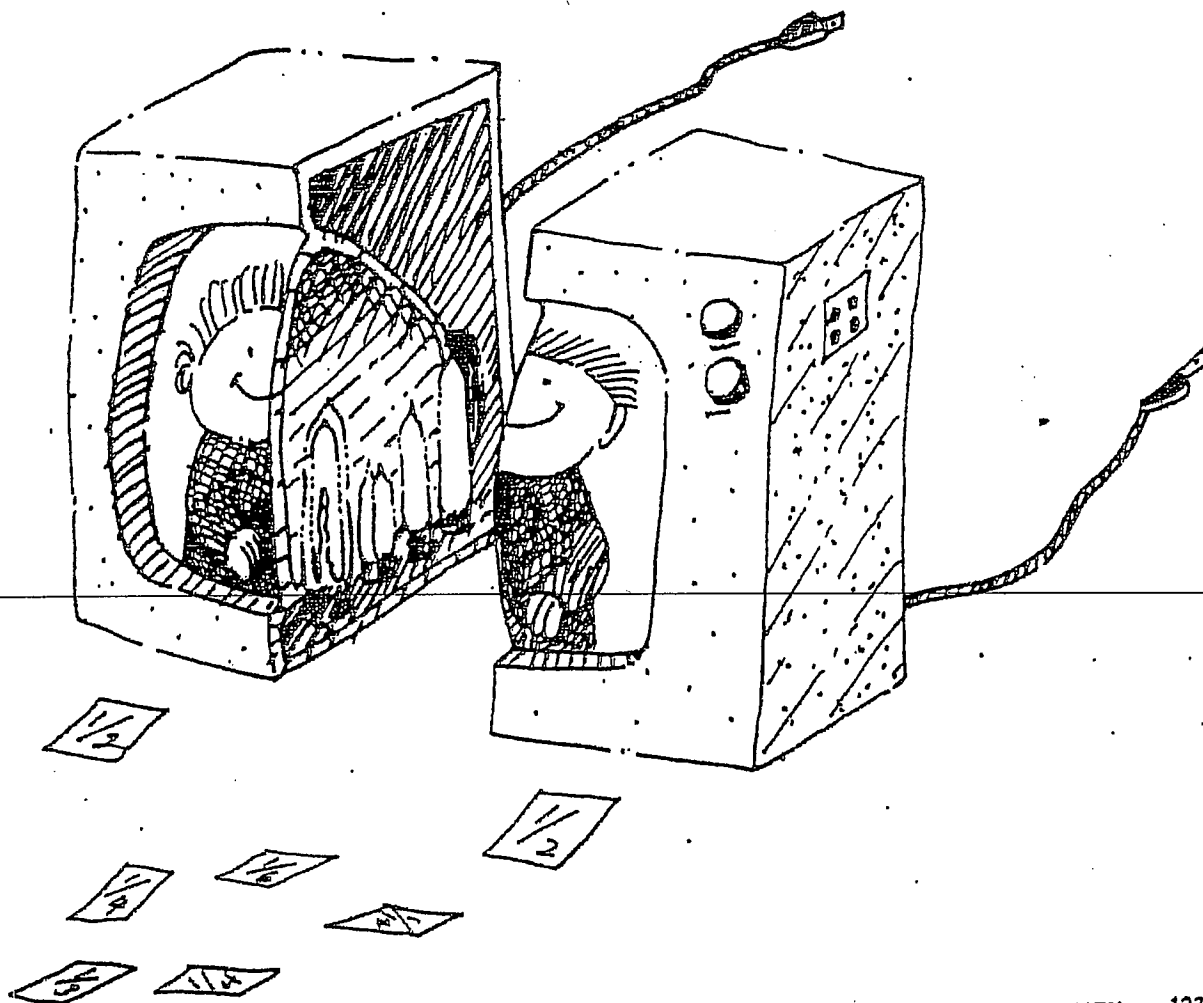
Fraction Kit Games

Grade Level

TOOLS

A Fraction Kit for each
   player (see pages 120-123)
One die labeled:
   1/2, 1/4, 1/8, 2/8,
   1/16, 2/16
   for Kit I or
One die labeled:
   1/3, 1/4, 1/6, 1/8,
   1/12, 1/16
   for Kit II

Games for
2-6 players

Why

To practice using fractional parts of a whole, recognizing relative
sizes and **equivalent fractions**

> *Before your children can learn to add, subtract, multiply, or divide*
> *fractions, they must understand the relationship between different*
> *kinds of fractions.*
>
> *For example, in order to add 1/6+2/3, it is necessary to realize that*
> *2/3 is the same as or* **equivalent** *to 4/6. 1/6 added to 2/3 may*
> *not make sense, but 1/6 added to 4/6 is 5/6. Changing the thirds*
> *to sixths requires finding a* **common denominator,** *or a frac-*
> *tional part that is part of both sixths and thirds.* ◄ ›

How

Fraction Cover Up

□ Start with your "1 WHOLE" strip in front of you.

□ Take turns rolling the die.
□ Take the fraction you roll and place it on your whole.
□ For example, you roll 1/4.
□ The first player to cover their whole **exactly** wins.

Fraction Exchange Subtraction

□ Start with your WHOLE covered with two halves.

□ Take turns rolling the die.
□ Whatever you roll, you take off (or subtract) that fraction. You
   may have to exchange first. For example, if you roll 1/8 on
   your first roll, you must exchange 1/2 for 4/8 before you can
   subtract 1/8.
□ The winner is the first player to uncover his or her WHOLE,
   exactly.

More Ideas

□ Put two fraction kits together and play to cover up different
   amounts. For example, play to cover up two WHOLES, or one
   and one-half WHOLES.
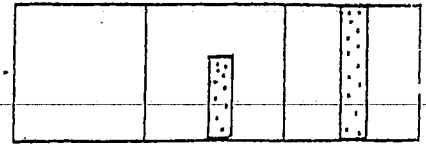□ Play to see who can make the largest number after five turns.

Judy's Fractions

Why

To reinforce the understanding of fractions and mixed numbers

Mixed numbers are those that have a whole number and a fraction together.

TOOLS

Fraction Kit for each
player (see pages 120-123)
Pennies

A game for
3-8 players

How

- Each player takes the equivalent of 6 wholes out of his or her fraction kit, using wholes, 1/2's, 1/3's, 1/4's, 1/6's, 1/8's, 1/12's, and 1/16's.
- At the beginning of each round, the players bet on whether the lead player will toss heads or tails.
- The players decide together how much to bet for the round, say 2 1/4. Each player puts that amount of fraction pieces into the pot and announces his or her bet: heads or tails.
- The lead player tosses the coin.
- The lead player divides the pot evenly among the winners. The winners are responsible for checking that they were given the correct amount.
- If an error was made, the lead player forfeits 1/4 extra for the next pot.
- If the pot cannot be divided evenly among the winners, the extra pieces can be left to sweeten the next pot—or traded for smaller pieces (1/12's or 1/16's) that can be divided evenly. For example, if 1/4 is left over with three winners, trade 1/4 for 3/12.
- Lead player passes to the left after each round.
- Play continues for a specified number of rounds, say 5 or 10; or a specified time, say 5 to 20 minutes; or until one player has won all of the other players' fraction pieces.
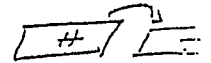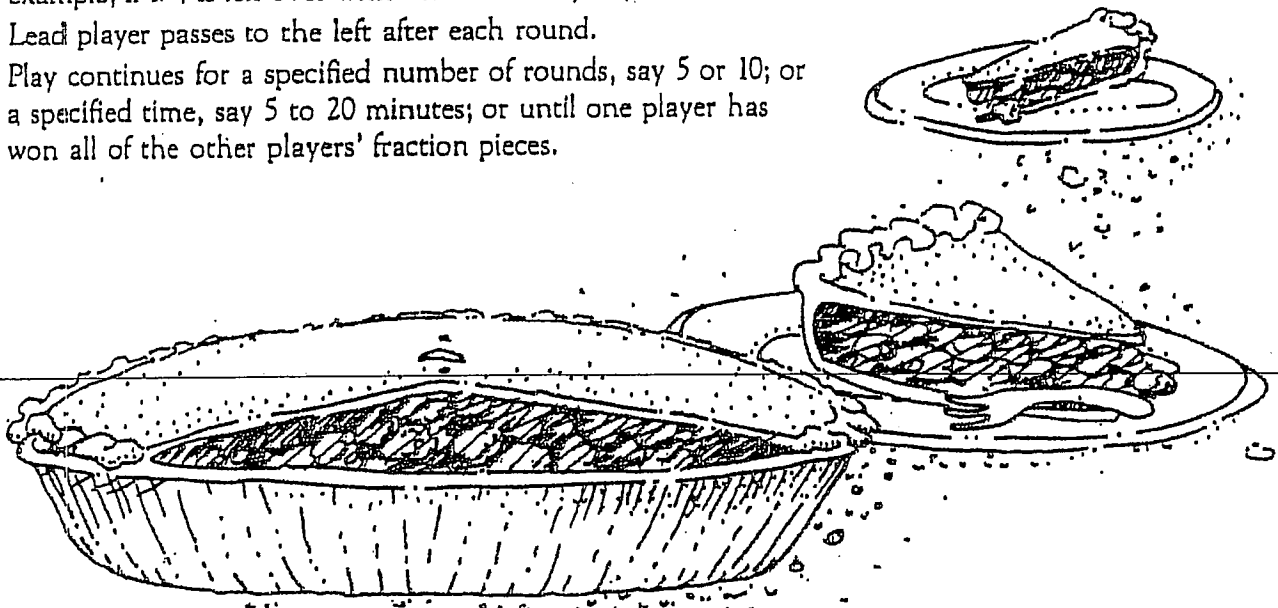
Fraction families

Below are some of the fraction families your child will be learning. Keep this sheet as a hint for learning how to **add** and **subtract** within these families.

Halves family

Thirds family

Fifths -Tenths family