Date Submitted 9/14/00
Date Implemented 9/19/00

Block III

[redacted]

1. Math/ Kindergarten
2. QCC
   - M.K.16 Counts the number of elements in a set and writes the corresponding numeral (0-10).
   - M.K.18 Uses ordinal numbers to indicate positions first through fifth.
   - LA.K.4 Repeats auditory sequences: letters, words, numbers, and rhythmic patterns.
3. Specific Objectives
   - Students will be able to count the elements in a set.
   - Students will be able to use the ordinal numbers first through fifth.
   - Students will be able to tell the story of The Napping House.
4. Procedures
   - A. Motivation: Is it better to be the first person in line to get ice cream? Have you ever been the caboose for the day? That made you last. What is the third thing that you do in the morning when you get up? Today is Tuesday, September what?
   - B. Tie to Previous Learning: Did you ever realize that we use these types of numbers all of the time—several times a day? We use these kinds of numbers in the calendar and the order in which we do things.
   - C. Teaching Sequence:
     - Read The Napping House.
     - Repeat the story focusing on sequencing.
     - Draw a picture of the directed person/animal.
     - Tell the story based on the students' pictures and sequencing as a class.
   - D. Closure: Review who was first, second, third, etc...
     - Give students an oral pop quiz over the ordinal number sequencing of The Napping House.
   - E. Transition: Explain centers. Table 4 go get your baskets from your cubbies and go to your Seats. Table 3, ... Table 2,... Table 1, ... Begin your centers.
5. Materials
   - paper
   - crayons
   - The Napping House
6. Evaluation
   - Students are able to count the elements in a set.
   - Students are able to use the ordinal numbers first through fifth.
   - Students are able to tell the story of The Napping House.
7. Connections
   - The students are supposed to learn ordinal numbers and they use them daily with calendar time. They sometimes have trouble with them and this lesson should help them use ordinal numbers more and be more conscience of them.
8. Reflections

Block III Lesson Plan

Date Submitted: 09/26/00

Date Implemented: 9/28/00

Subject: Math, Grade Level:5th

Georgia QCC:
M.5.26 Selects and uses appropriate strategies for solving problems.
M.5.36 Adds, subtracts, multiplies and divides whole numbers.

NCTM:
Problem Solving
Build new mathematical knowledge through problem solving.
Solve problems that arise in mathematics and in other contexts.
Apply and adapt a variety of appropriate strategies to solve problems.

Objectives:
The learner will be able to apply the problem-solving strategy of drawing a picture or a diagram to solve word problems.
The learner will be able to describe what he learned about using a drawing or diagram through writing.

Procedures:
Motivation:
The students will be told they can draw to solve today's math problems.

Tie to previous learning:
We will look at a calendar page and asked if they have used a calendar to solve a problem.
I will model how they can use this "diagram" to solve problems.

Teaching Sequence:
The students will be told that today we are going to be practicing using drawing pictures or diagrams to solve math problems.

Each student will be given a calendar page and we will discuss how this is a diagram and it is used to solve problems. How many of you have used a calendar to solve a problem. Let's try it. ex: If October 26th is on Thursday what day will Halloween, October 31st fall on? (Tuesday). How many days from your field trip to the Tennessee Aquarium on Oct. 17th until Halloween?

Next, I will model using a drawing to solve a problem involving distance.

Date Submitted _____

Date of Implementation _____

_____ _____ _____

Student Supervising Teacher University Supervisor

1. Subject/Grade Level:

2. /District Objective and National Standards: (These are to be written out.)

3. Specific Objectives: (What do you want the learners to be able to do as a result of the lesson?)

4. Procedures:
   A. Motivation/Getting Their Attention
   B. Tie to previous learning (How does this lesson relate to something students have already learned?)
   C. Teaching Sequence (What will you do first, second, third, etc?)
   D. Closure (How will you summarize what students have hopefully learned, then leave them wanting to learn more?)
   E. Transition (How will you move from the end of this lesson into the next?)
   F. Special Needs Adaptation (How will you adapt your lesson to meet for students with special needs?)
   G. ESOL

5. Materials: (List everything you and students will need, including evaluation instrument)

6. Evaluation: (Related to specific objectives and includes a method of recording student outcomes)

7. Connections: (How is this related to some other aspect of your curriculum?)

8. Reflections: (After teaching and evaluating student outcomes, write your thoughts about what worked, what you did well, what students did well, what didn't work, what you might change if you were to teach this lesson again, etc.)

Date Submitted: 1/30/04

Date of Implementation: 2/5/04

Name: Tuesday Section 4

Supervising Teacher:

University Supervisor:

1. Math/4th Grade

2. Sunshine State Standard

   MA.A.3.2.3 – The student understands the effects of operations on numbers and the relationships among these operations, selects appropriate operations, and computes for problem solving. Adds, subtracts, and multiplies whole numbers, decimals, and fractions, including mixed number, and divides whole numbers to solve real-world problems, using appropriate methods of computing, such as mental mathematics, paper and pencil, and calculators.

National Standards

   Understand meanings of operations and how they relate to one another.

3. Specific Objective

   Students will be able to solve a division problem that divides a three-digit number by a one-digit number with 100% accuracy.

4. Procedures

   A. Motivation

      - "Who likes money?"
      - "Today we will be working with money to solve division problems."

   B. Tie to previous learning

      - "We have been working on division for the past two weeks. It has been in different forms; dividing single digit numbers, changing improper fractions to mixed numbers, and leaving remainders as fractions. Well

today we are taking this to the next level and divide a three-digit number by a one-digit number."

C. Teaching Sequence

- Have students help with passing out the materials for today's lesson. The students will place their money in three stacks, $100s, $10s, and $1s
- My materials will be laminated with magnets on the back so that they will stick to the board.
- Place 4-$100s, 3-$10s, 6-$1s, and 2 frogs on the board for the students to see.
- "How much money do I have on the board?" $436
- "How many frogs do I have on the board? Just to let you know these frogs represent people." 2
- "If these two frogs/people are sharing this money what would the number sentence be?" $436 ÷ 2 people
- "How do you think we find this answer?" divide the $436 by 2
- Write on board

	hundreds	tens	ones
2	$4	3	6

- "Let's solve this problem together." Have students place 4-$100s, 3-$10s, and 6-$1s in front of them
- "Starting with the $100s how many $100s does each person get?" 2 (write 2 above the 4 or hundreds place value)
- "Are there any remainders?" no
- "Now let's divide the $10s. Using your money how many $10s does each person get?" 1 (write 1 above the 3 or tens place value)
- "Are there any remainders?" yes
- "What do you think we do with this remainder?" divide it into ones (students will now exchange one $10 for ten $1s)
- "Now how many $1s do we have?" 16

- "Let's now divide the $16 between the 2 people. How many $1s does each person receive?" 8 (write 8 above the 6 or ones place value)
- "Can someone tell me how much money each person will receive? I want you to be able to tell me how many $100s, $10s, and $1s each person will get and the dollar amount as well." 2-$100s, 1-$10, and 8-$1s which equals $218 for each person
- "Will someone please remind and show me on the board how we can check this answer?" multiply $218 by the 2 people or the divisor (student will show their work on the board)
- "Let's try another problem."
- Place 7-$100s, 4-$1s, and 5 people/frogs on the board.
- "Who can write the number sentence for this problem on the board for me?" $704 ÷ 5 people
- "Let's use our money again to solve this problem. What is our first step?" divide the $100s by giving each person the same amount
- "How many $100s does each person receive and where do we place that answer?" 1 and it goes over the seven or hundreds place value (write this on the board)
- "Are there any $100s left over?" yes
- "How many?" 2
- "What do we do with these two $100s?" divide them into twenty $10s (students will exchange the two $100s for twenty $10s)
- "Now how many $10s do we have?" 20
- "How many $10s will each person get?" 4
- "Where do we place the 4?" above the 0 or tens place value (write this on the board)
- "Do we have any $10s left over?" no
- "Who can tell me our next step?" divide our $1s
- "How many $1s do we have?" 4
- "Can we divide 4-$1s into 5 people evenly?" no

- "So what do you think we do now?" write 0 above the 4 or ones place value and then 4 is the remainder (write this on the board)
- "Who wants to share their answer with the class?" each of the 5 people will receive 1-$100, 4-$10s and 0-$1s, which is equal to $140
- Have one of the students check their answer on the board with the class.
- Repeat the above steps for the following problem

  $289 divided by 3 people $96
- Have students do these problems on their own with the aid of the manipulative if needed:

  $584 divided by 2 people $292

  $207 divided by 4 people $51

  $680 divided by 5 people $136

  $721 divided by 6 people $120
- Students need to be doing these problems and showing their work on a sheet of paper. I will walk around the classroom to evaluate and help them as needed.

D. Closure

- "Would anyone like to share something with the class that you liked or helped you understand the division process a little more?" allow time for sharing
- "Does anyone have any questions or something that they still do not fully understand?" allow time for sharing
- "Tonight I want you guys to think about what we will do with the remainders. Just keep in mind when we were splitting the cookies and turned those remainders into fractions, but now we are working with money?"

good to remind them! ☺

you also referred to the shell! Great!

E. Transition

- Math usually ends and the students go to specials/block.
- "Can everyone please bundle your $100s, $10s and $1s, and the put the paper clips on each bundle and then put them back in the bag.

Clear off everything except the bags of money and be ready for block. I am now going to share a story about this boy that thought he was cursed by math. I know some of you think the same way and that they are not any good at math, but after working with you on the FCAT practice sheets I know differently. Some of you even said that math was fun." Read Math Curse

F. Special Needs Adaptation

- Higher level students- I would have them figure out the answer without leaving a remainder.
- Lower level students- I would place them next to a higher level student and allow them to quietly ask their neighbor if they were having problems. If there are not enough manipulatives for every student I would be sure that these students did receive theirs first.

This is ok, but the lesson still needs to be modified what will you do? Or did do?

G. ESOL

- Realistic money manipulatitves will help ESOL students relate the $100 dollar bill to the hundreds place value, $10 dollar bill to the tens place value, and the $1 dollar bill to the ones place value.
- I have also made my materials in different colors just incase a student can not clearly see them from their seats: $100s-yellow, $10s-blue, and $1s-orange.

5. Materials

- For each group of students (two students per group)

  10 $100s

  30 $10s

  30 $1s

- Teacher's materials are laminated with a magnet on the back of each piece

  10 $100s

  30 $10s

  30 $1s

7 frogs

- Scrape paper for everyone
- *Math Curse* by Jon Scieszka & Lane Smith

6. Evaluation

With aid of the manipulative the students will be able to solve the additional 4 problems with 100% accuracy. I will evaluate the students by using a yes or no check list.

7. Connection

- Florida History – the class is now discussing the state budget and how it is divided and where that money goes.
- Reading – reading *Math Curse*
- Science – in *Math Curse* science is introduced (science experiments that include math)
- Personal – by reading *Math Curse* to the class they will be able to realize that they are not alone with their fears of math and see that these fears can be beat.

Date submitted January 20,2004

Date of implementation January 27,2004

Student Supervising Teacher University Supervisor

1. ***Subject/Grade Level:*** Graphing/3rd

2. ***Sunshine State Standards:***
The student understands and uses the tools of data analysis for managing information. (MA.E.1.2)
District Objectives:
MA.E.1.2.1.1 Identifies different parts of a graph
MA.E.1.2.1.3 Generates questions, collects responses, and displays data in a table, pictograph, or bar graph.
National Standards:
NM-DATA.3-5.1: Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer

these should continue this

3. ***Specific Objectives:***
- Students will construct a pictograph given a set of collected data with 100% accuracy.
- The students will label the pictograph following our lesson with 100% accuracy.
- Students will be able to define the vocabulary words by including all parts in their pictograph with 100% accuracy.

4. ***Procedures***:

A. ***Motivation***: How many of you like chocolate? How many of you like Skittles better? Today we are going to take a survey and make a pictograph of our answers.

B. ***Tie to Previous Learning:*** we see graphs of information in our social studies books all of the time. What are the most important parts of those graphs so that we can read and understand them? (answers: key, title, labels on the sides)

C. ***Teaching Sequence:***

1. Begin to define terms such as key, horizontal, and vertical.
- What's a good way to remember what horizontal is?
- Has anyone seen the sun rise or set lately?
- What does it rise on? (the horizon)
- Which way is the horizon? (show with arms vertical and horizontal)

2. Draw a horizon on the board.
3. Check for understanding by having the students show horizontal and vertical with their arms.

4. Show the class a sample pictograph on the overhead.
- Can anyone tell me where the key is located?
- What kind of information can we find in this key?
- Why is the key important?

5. Now that we know what we need on our graph, let's take a survey. Write 3 types of candy on the board. (Skittle, M&M's, and Reece's Pieces) Ask the students to think to themselves which one is their favorite, or do they like the most.
6. Make a chart with them and make tallies under each kind of candy for the amount of students what like each kind. Have the students copy this information on their papers.
7. Begin creating the graph together as a class.
- How would we begin to graph this information on a graph like we saw earlier?
- Should we first make a horizontal or a vertical graph? (horizontal)
- If we make a horizontal graph, what label should we put on the bottom? (#of people)
- What relationship are we graphing? Maybe we should title our graph first.
- What label should go down the side? (types of candy)
- What's the next thing we should do?
- How are we going to draw the candy so that we know which is which. (label m,r,s)
- Where should we write what the label means? (key)
- So then we need to make a key next, right?
- How are we going to show how many people like each kind? (stick figures)
- Does each stick person stand for one person or more than that?
- Where should we write that information? (key)

8. Do one type of candy together, then have the students finish the other two while you walk around the room and observe.

D. ***Closure:*** review the importance of a key, which directions horizontal and vertical are, and where we might find graphs and why they are important.

E. ***Transition:*** when we read our social studies today, let's see if we can spot any graphs, and let's see if we can understand the information being displayed for us.

5. ***Materials:***
- Transparency of a pictograph
- Chalk and chalkboard
- Overhead
- Transparency (blank for overhead)

6. ***Evaluation:***
- Students label the graph properly ✓
- Students include a key ✓
- Students title their graph ✓
- Students display information accurately ✓
- Students are able to define horizontal and vertical ✓

Students constructed a pictograph.

See Rubric

7. ***Connections:*** The students should know how to interpret a graph, and locate the key. This should help them interpret t the graphs is their Social Studies book. They should also learn how to organize information into a graph of their own. This is a new concept and should lead into our next concept on probability. Another place we would see graphs like this could be on a news report, in a science book, when collecting data for an experiment, or even in other places in math when analyzing data. When you get ready to buy a pair of shoes they take surveys such as this one to find out what the consumer needs in a shoe so that they know if their product will be marketable. This is a strategy used in many different situations, and is a useful skill for many things you may encounter in your futures.

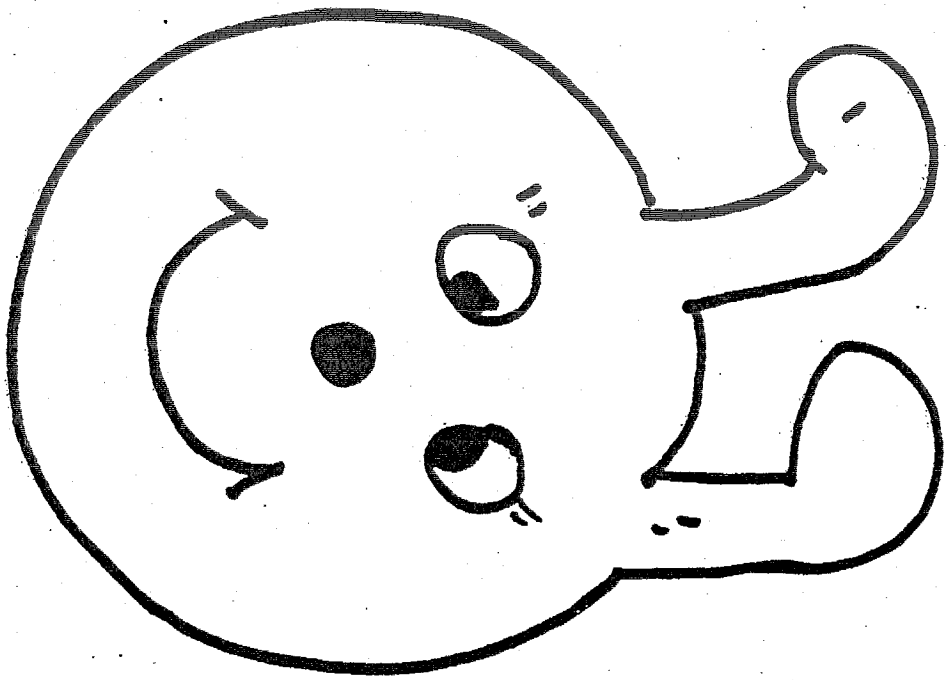
8. ***Reflections:*** See Last Page

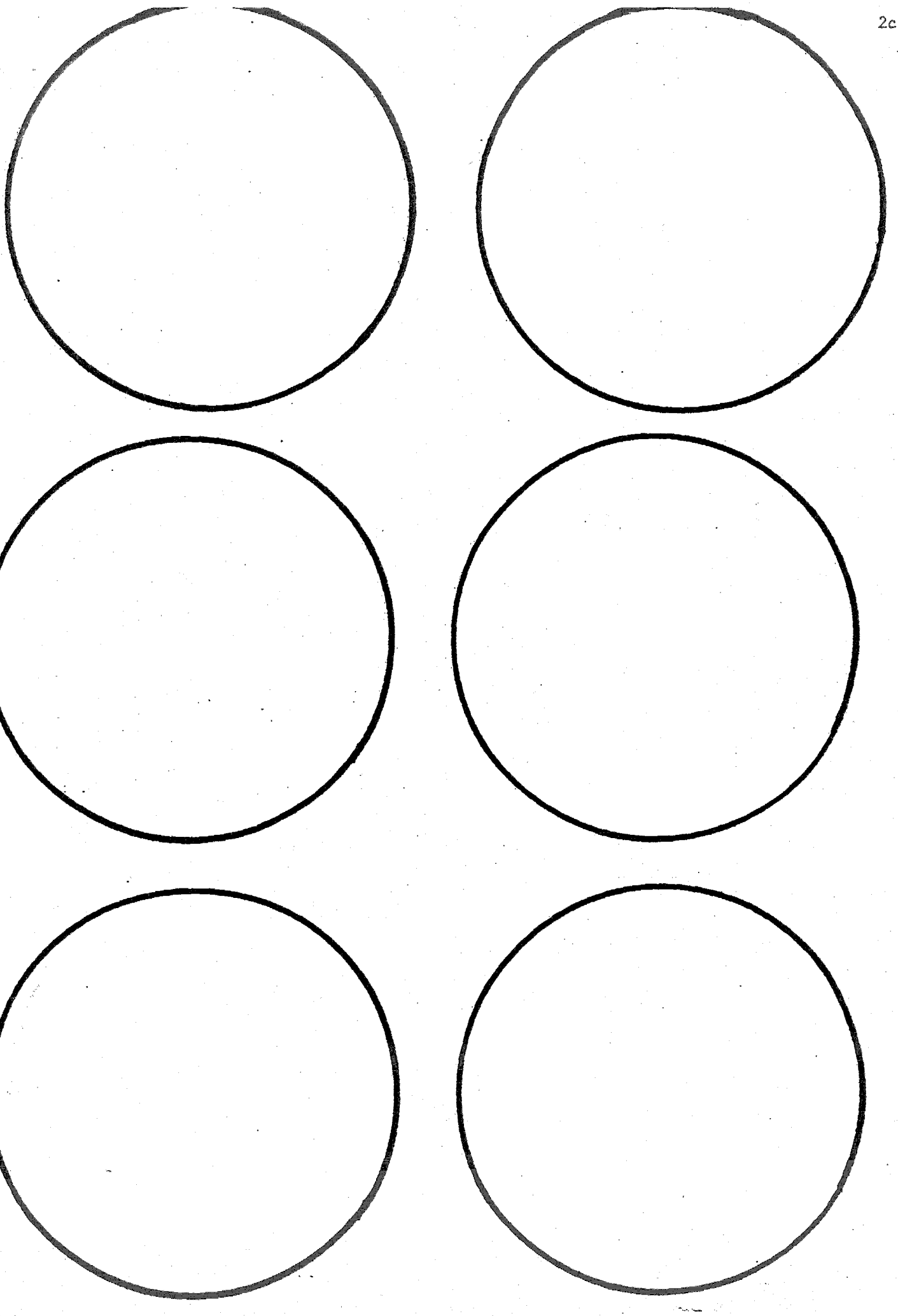
Students	Labeled	Key	Title	Accurate
1. Raquell				
2. Jean				
3. Xiomara				
4. Fredrick				
5. Alex				
6. James				
7. Anaconnette				
8. Shaleyah				
9. Britt				
10. Marissa				
11. Samantha				
12. Cynthia				
13. Kaushlea				
14. Ruiee				
15. Scott				
16. Dylan				
17. Lauren				
18. Peter				
19.				
20.				

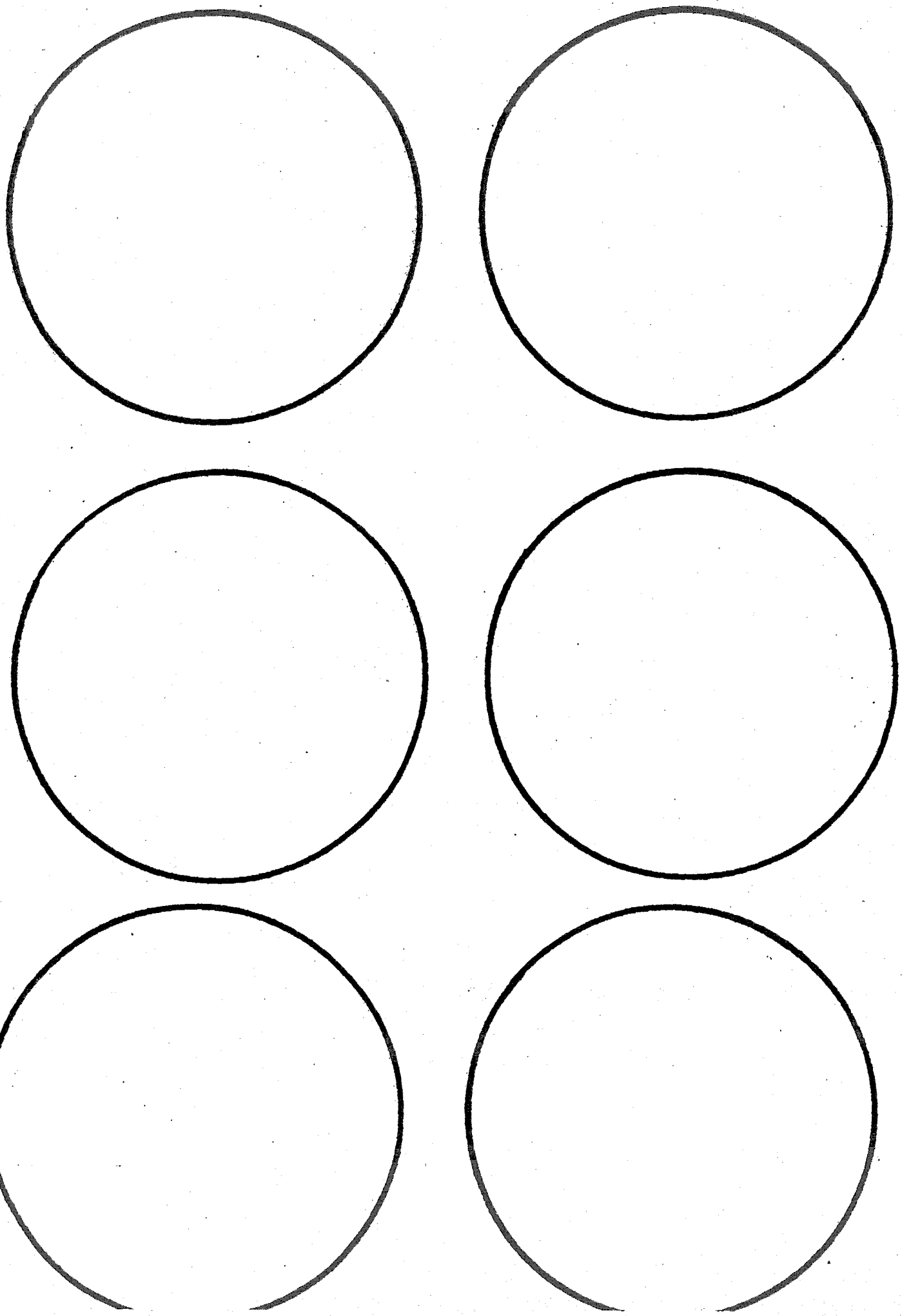
Key: - 100% accuracy

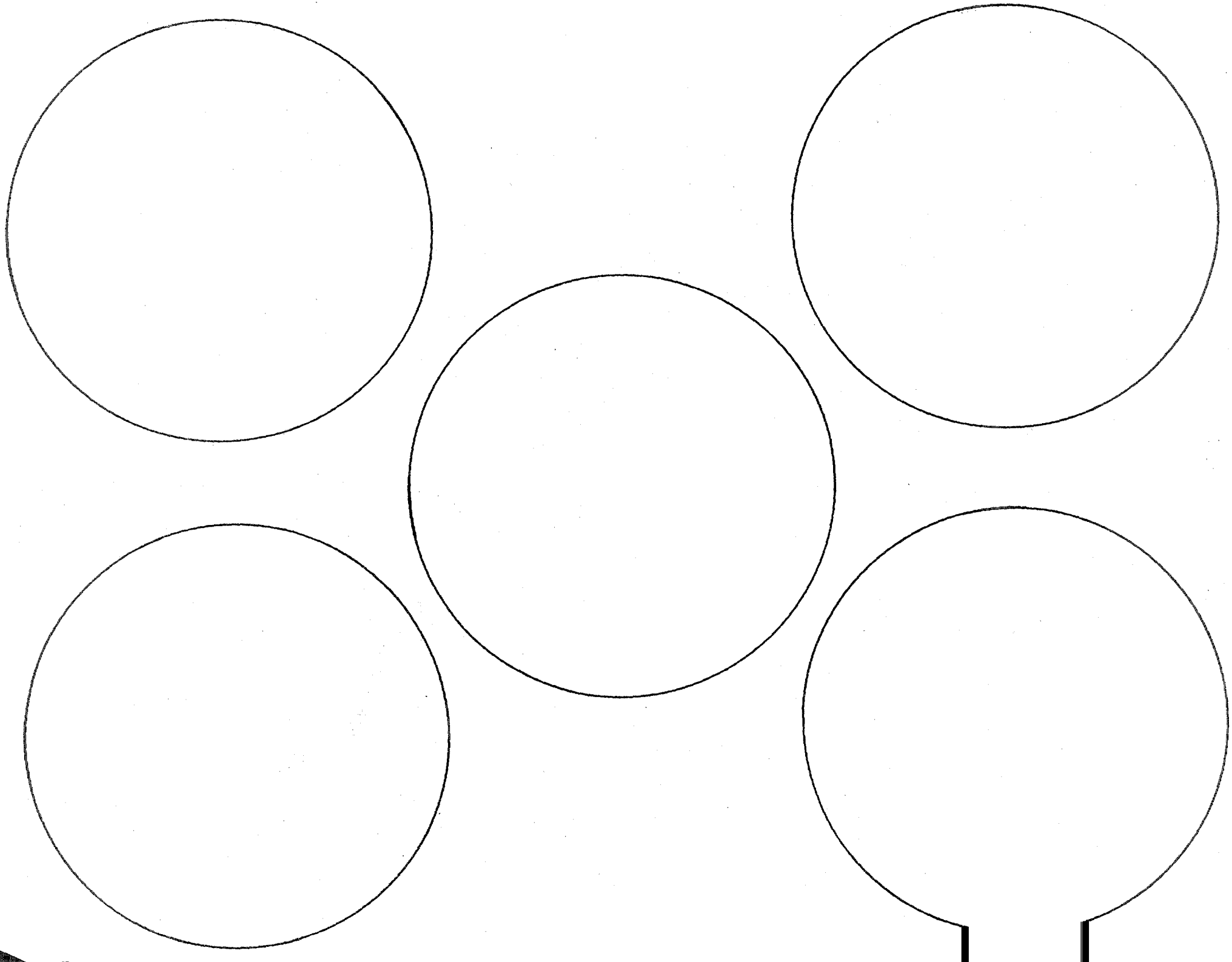
 - 25% - 99% accuracy

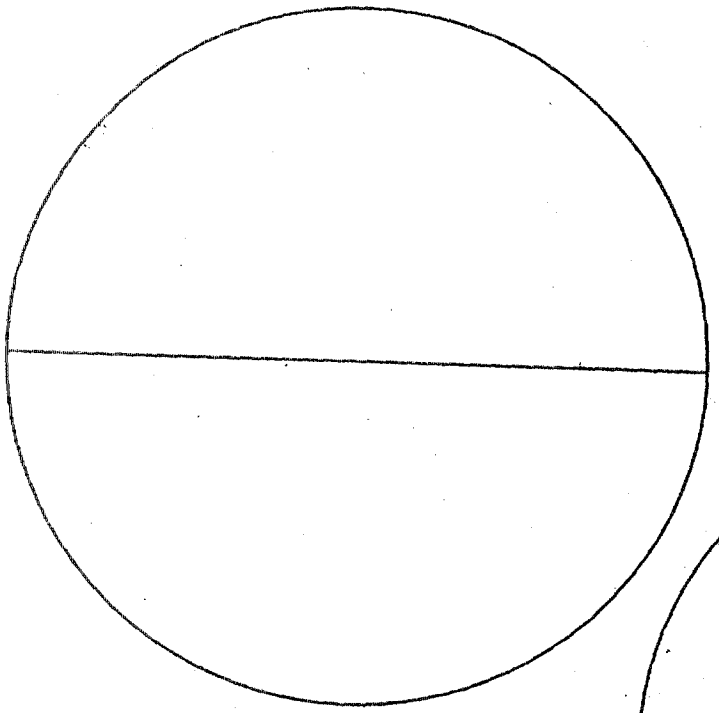
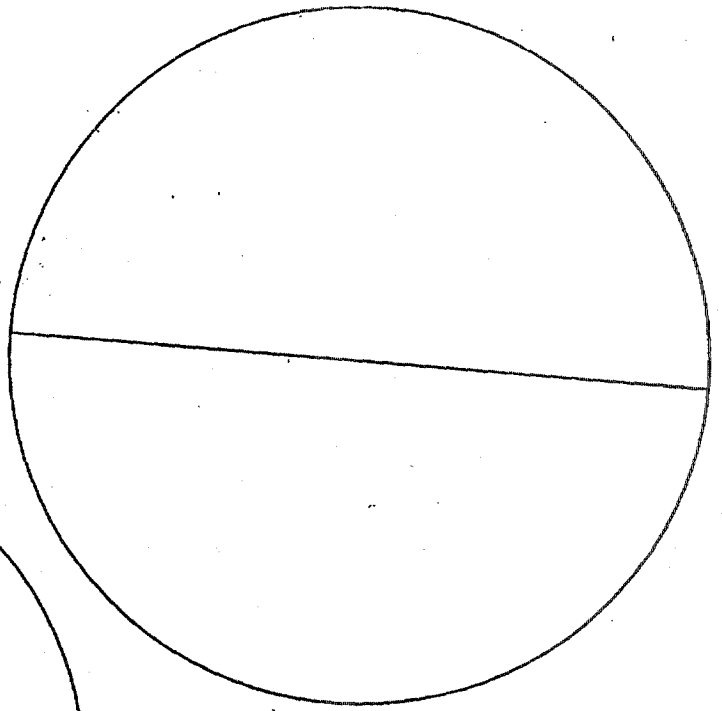
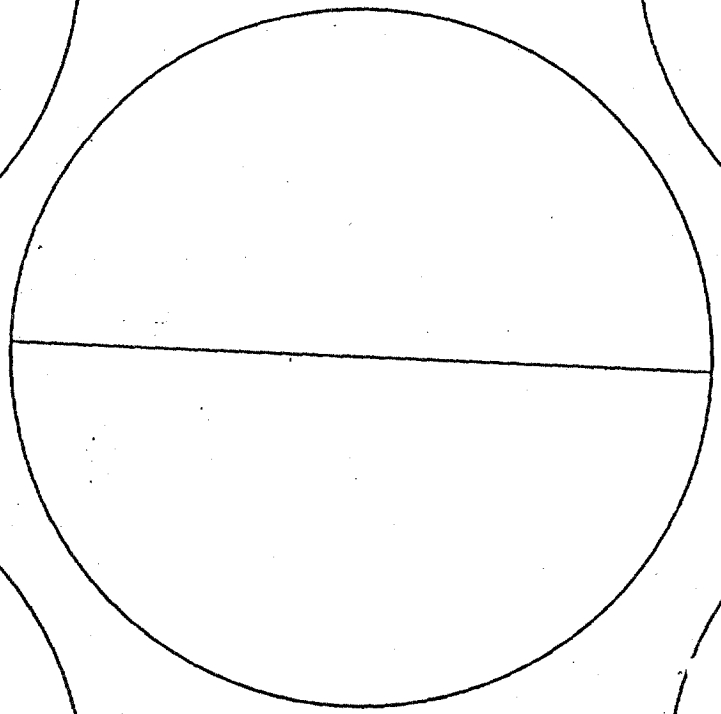
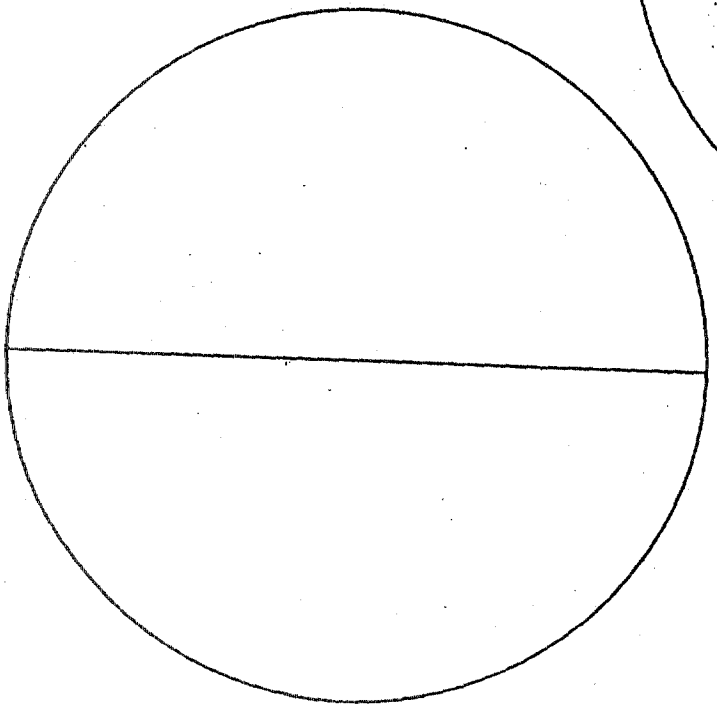
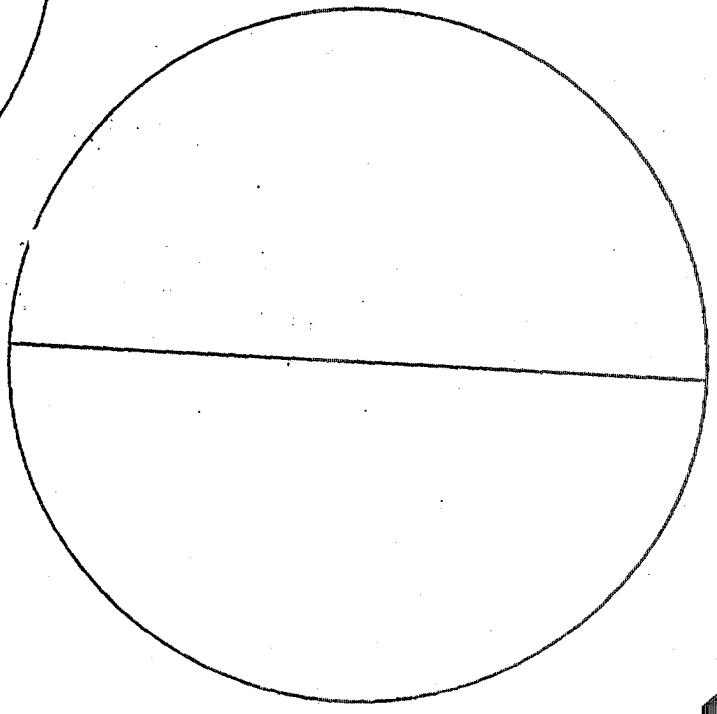
 - 0% - 24% accuracy

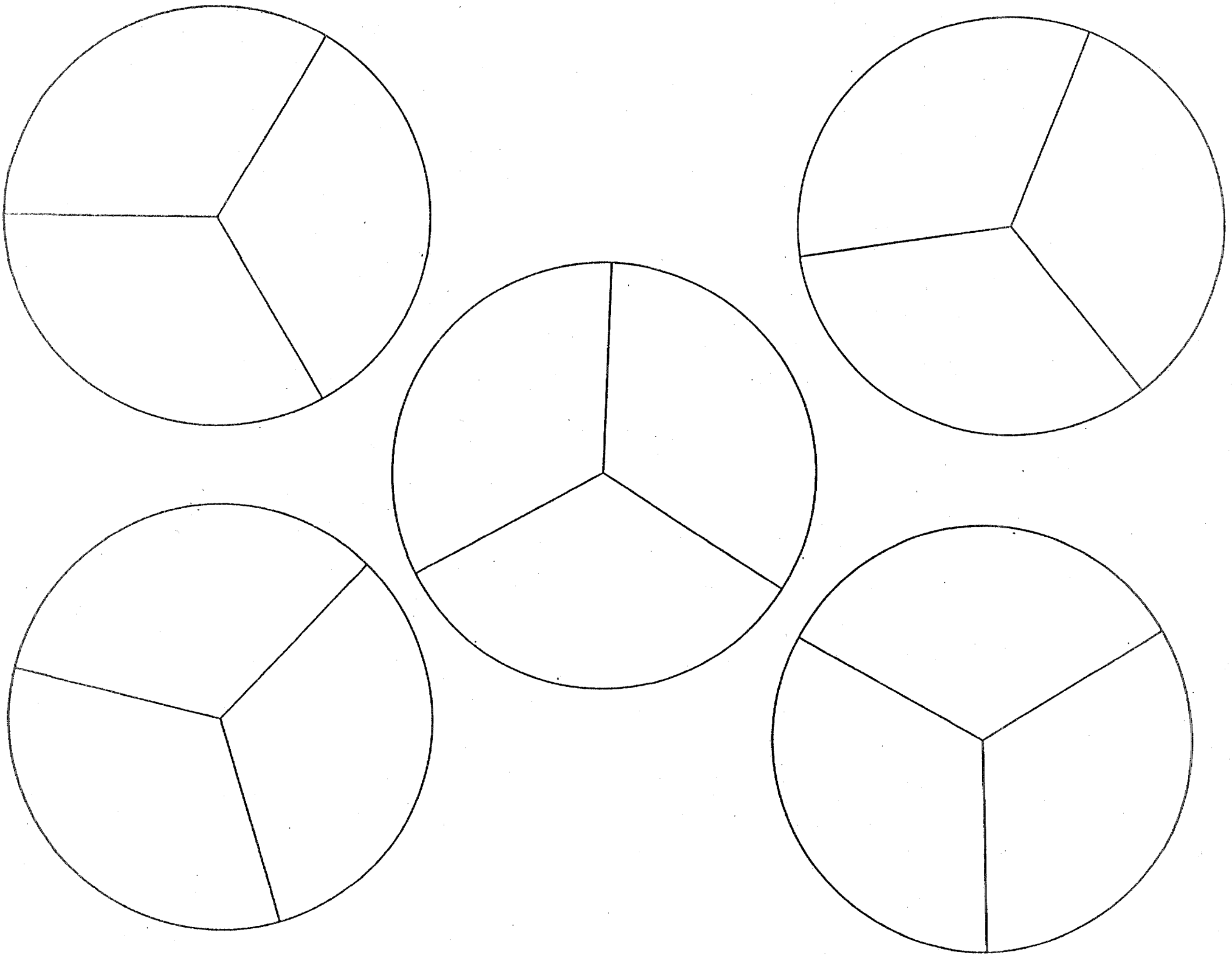


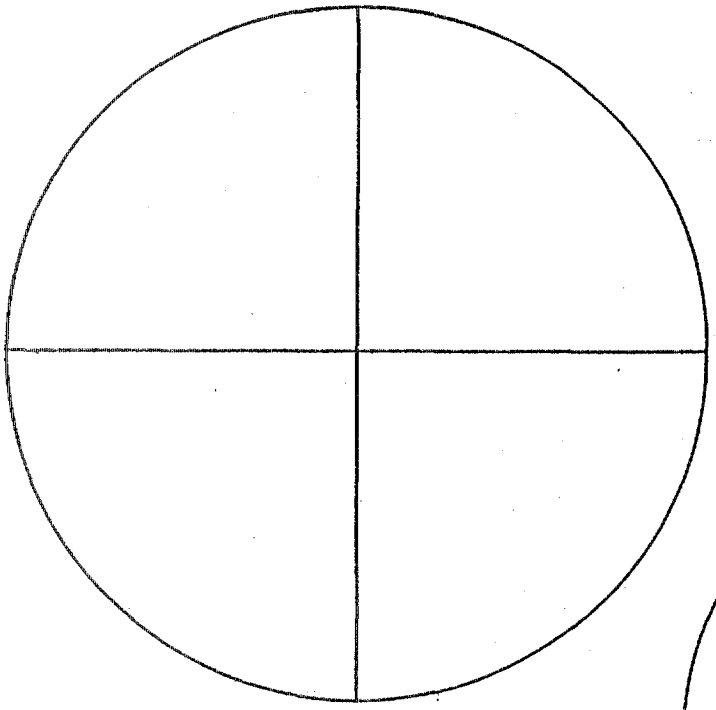


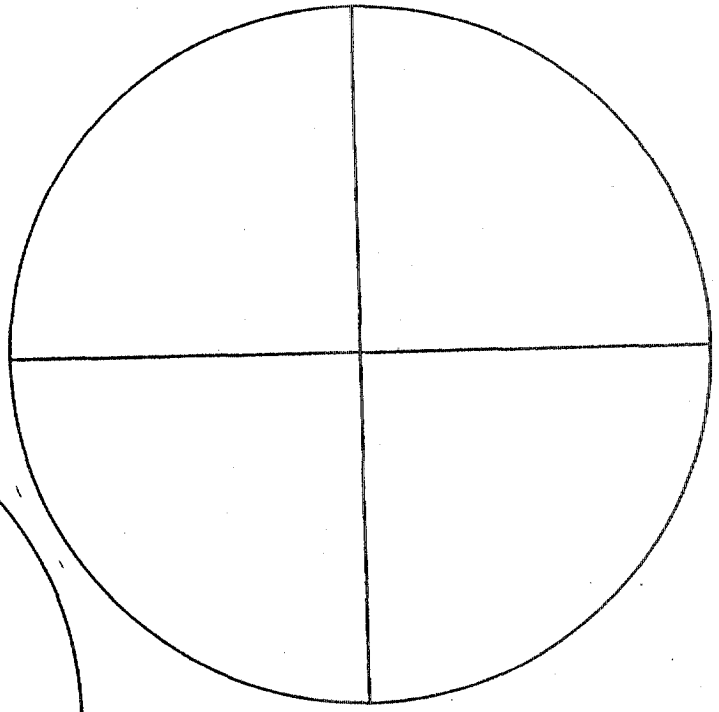


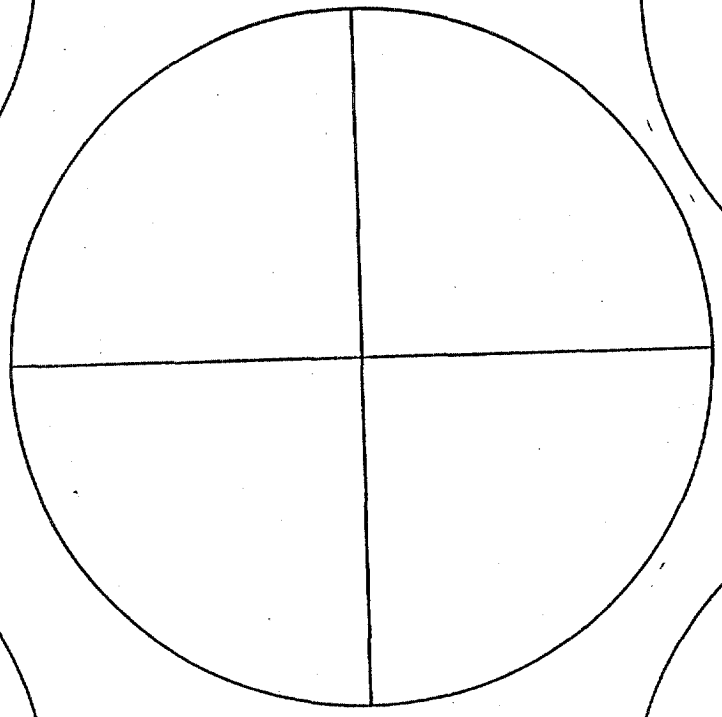


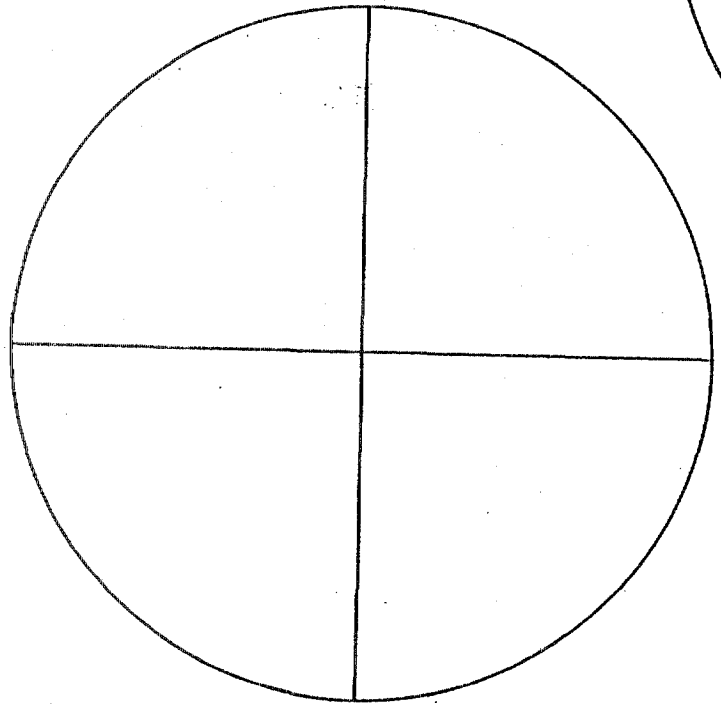






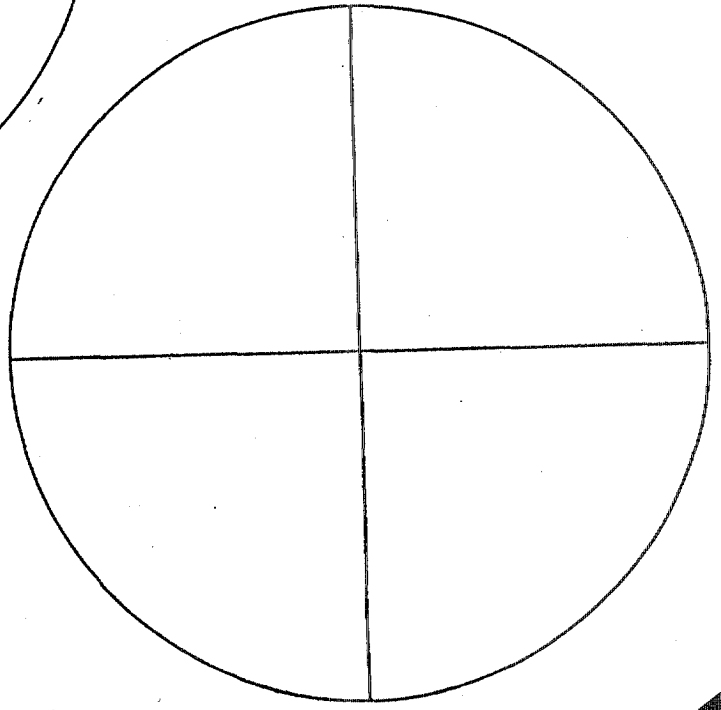


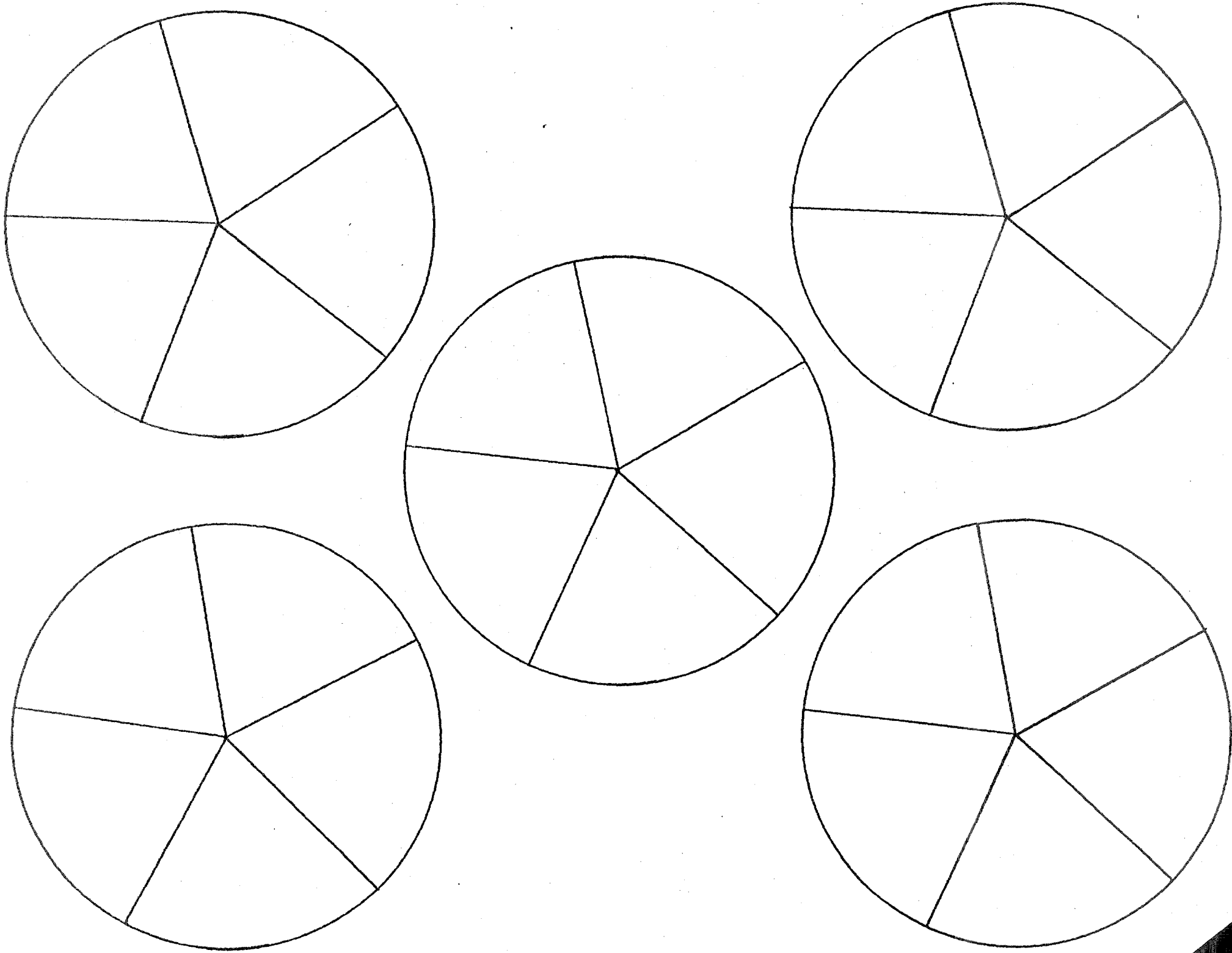


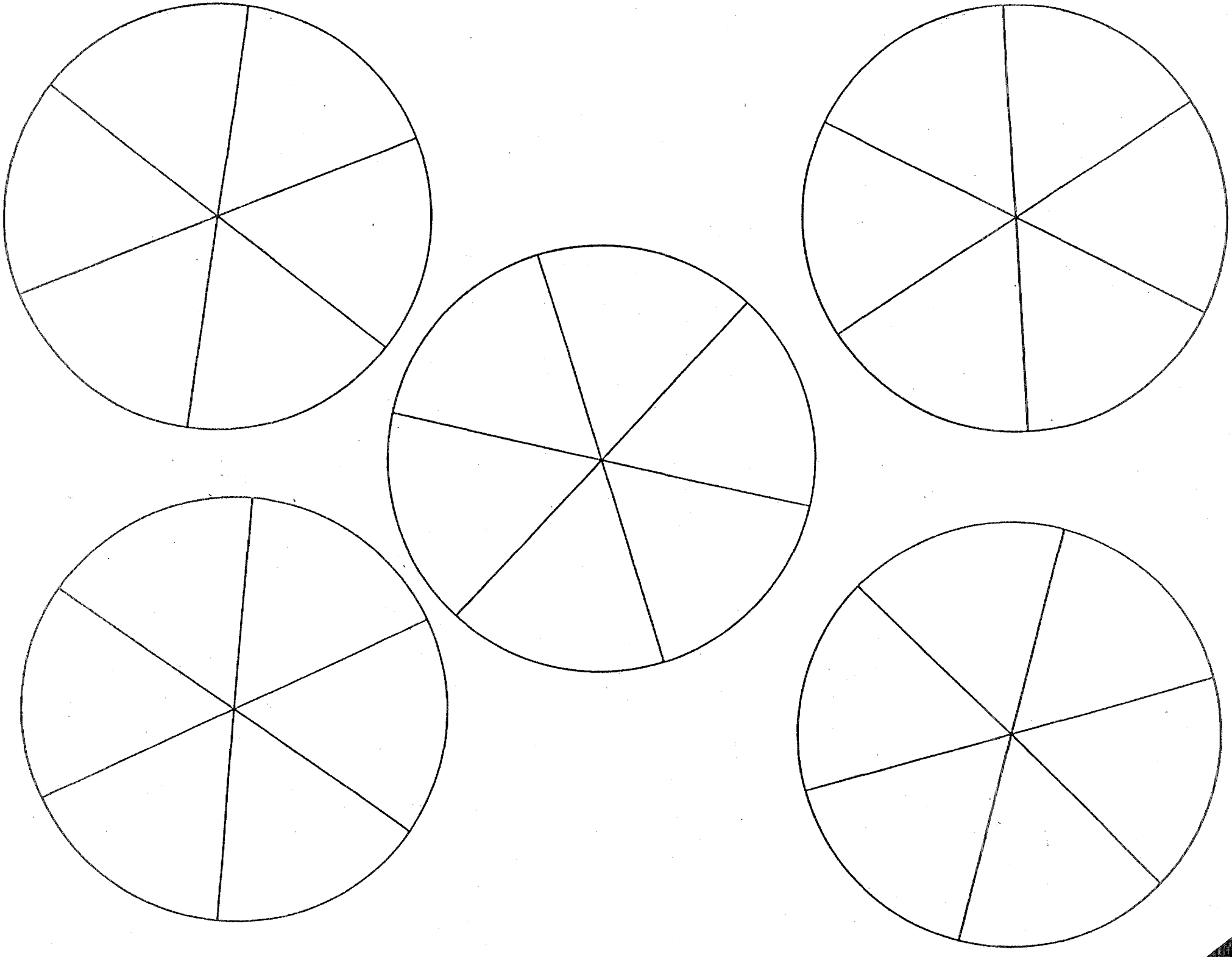


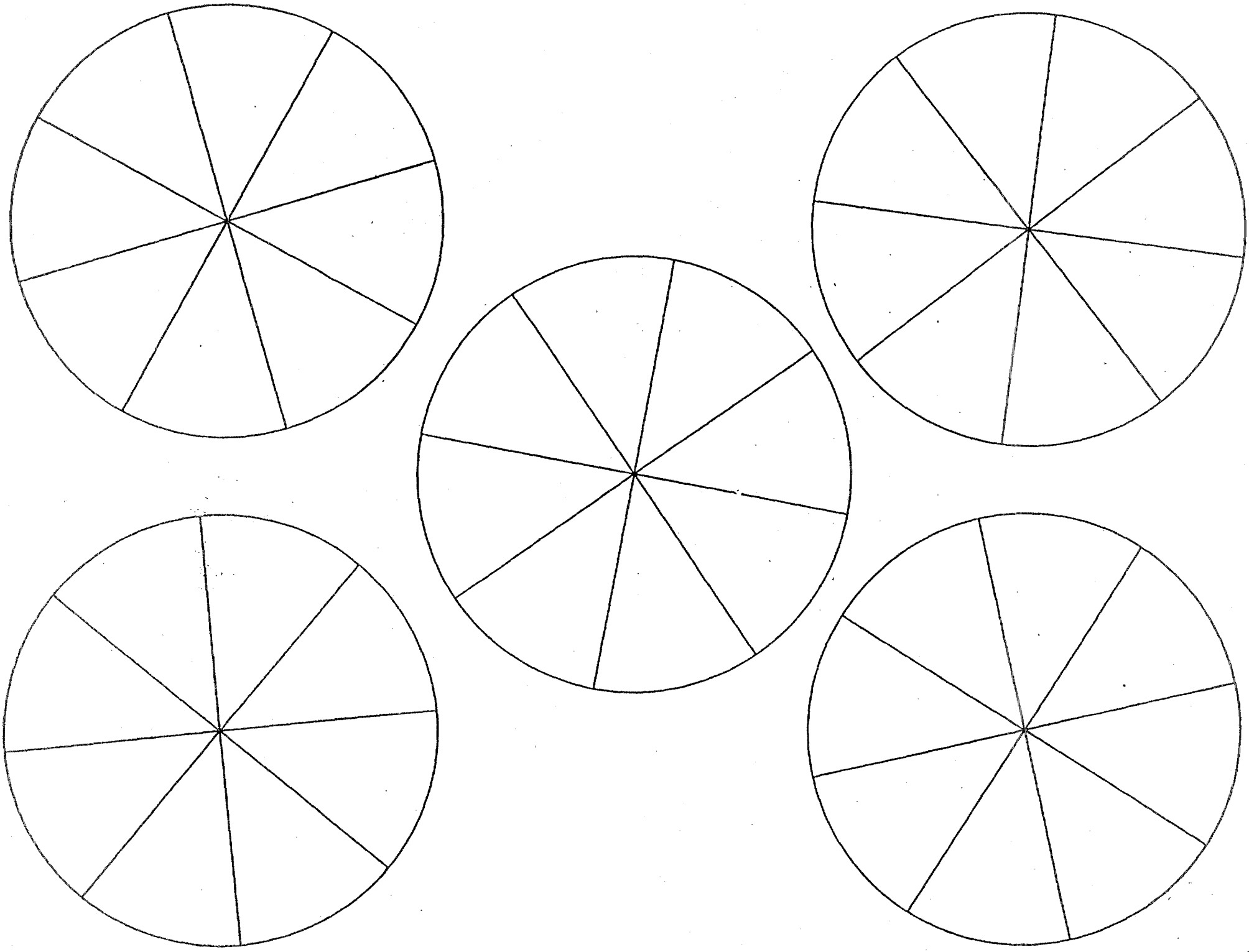


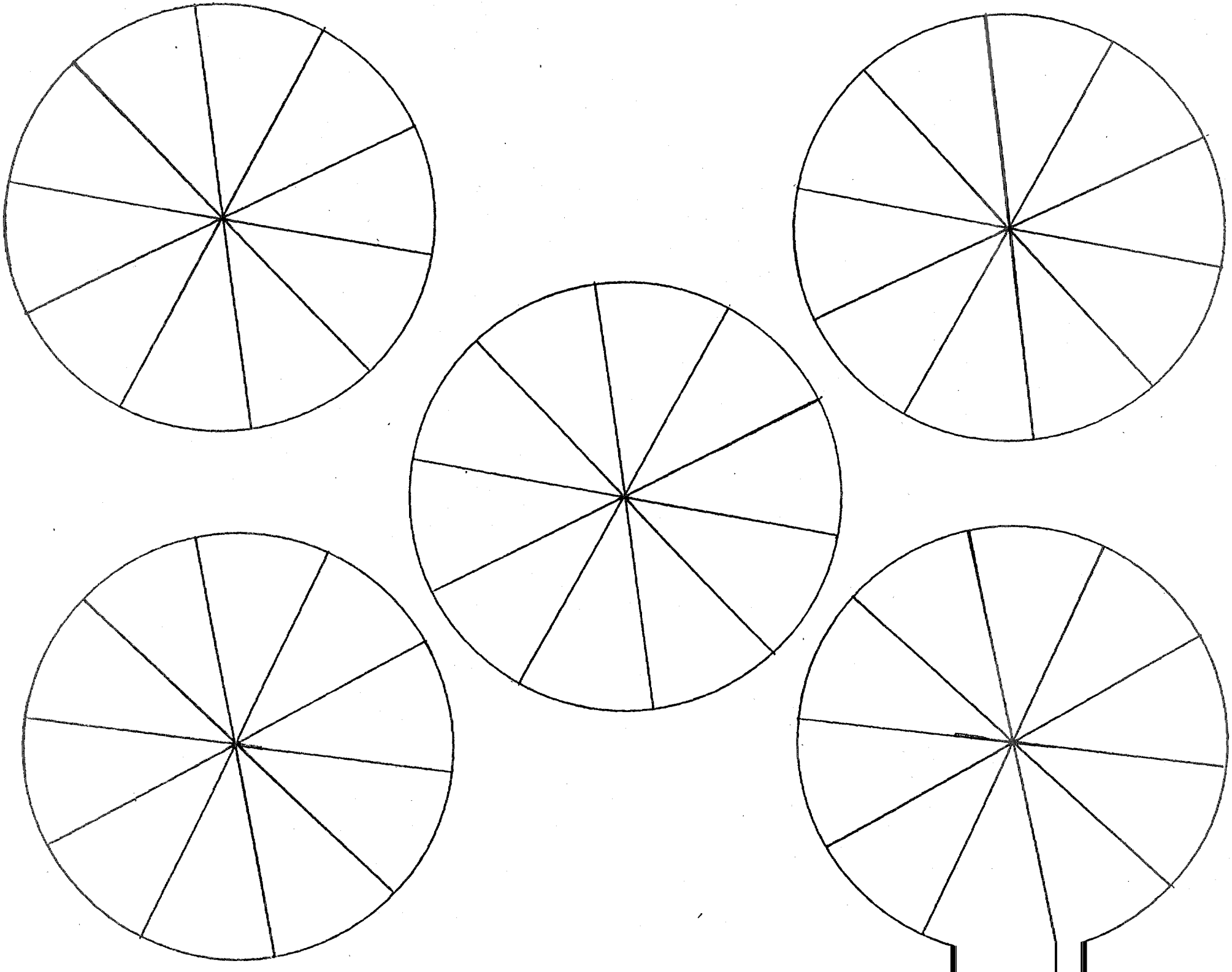


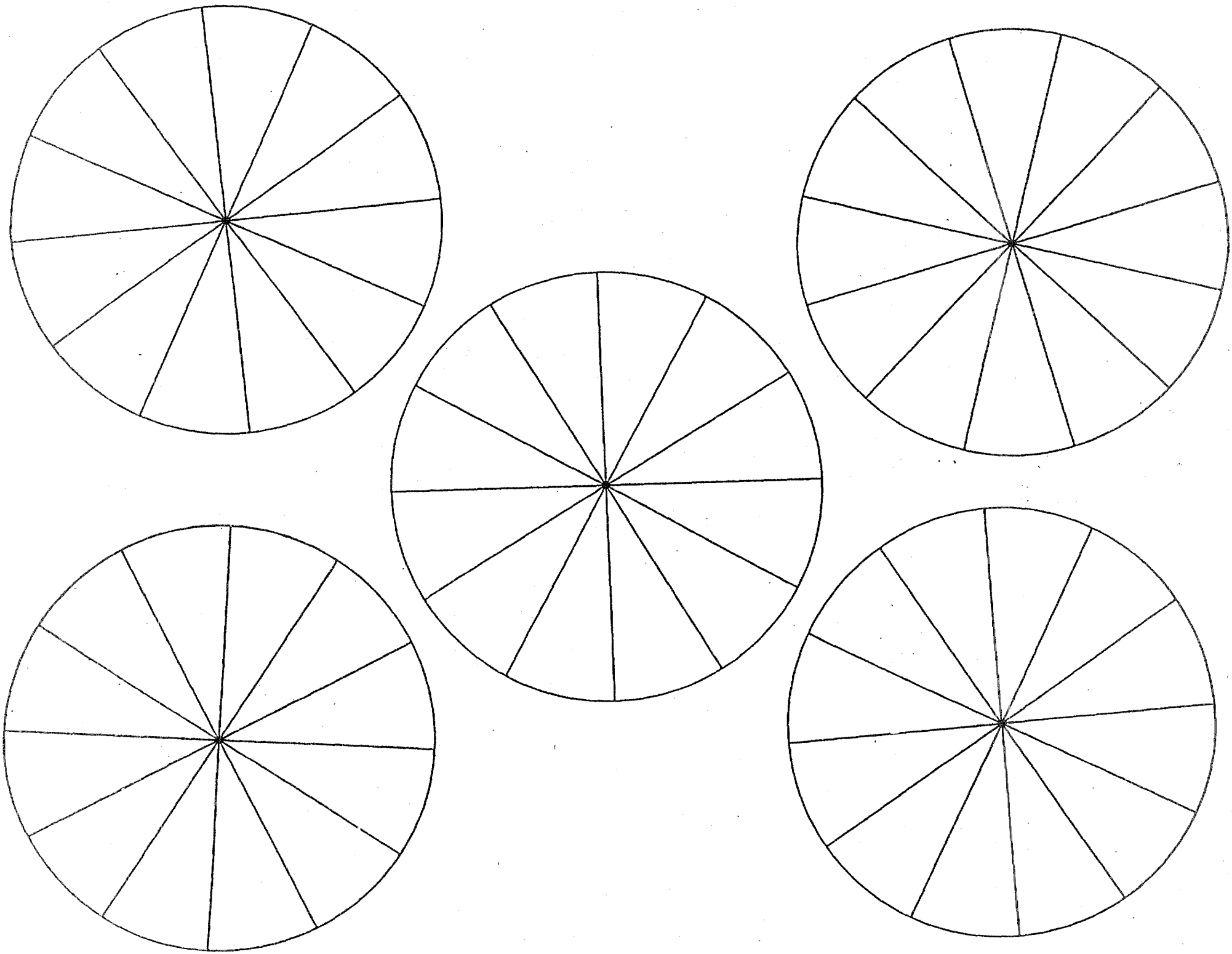




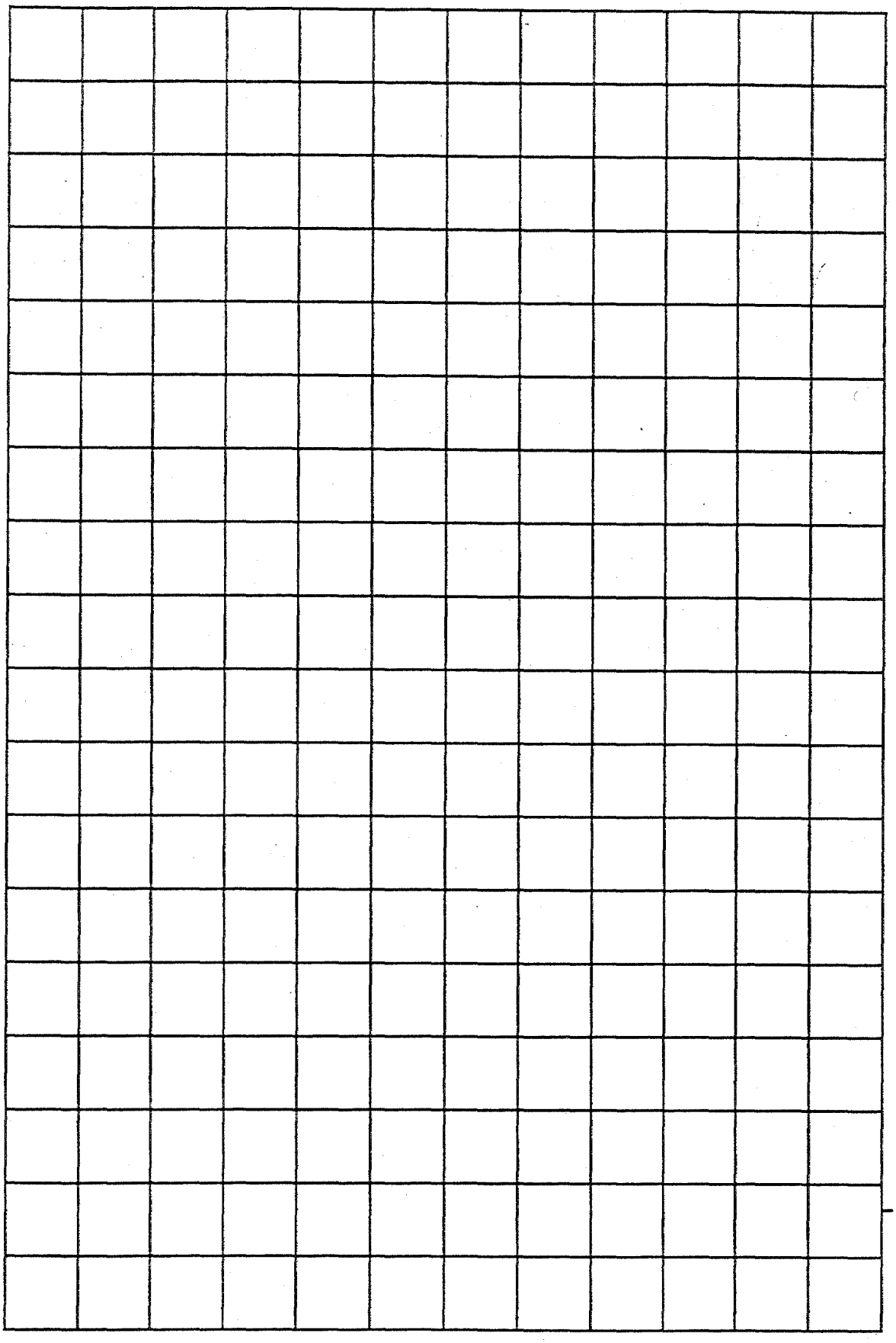


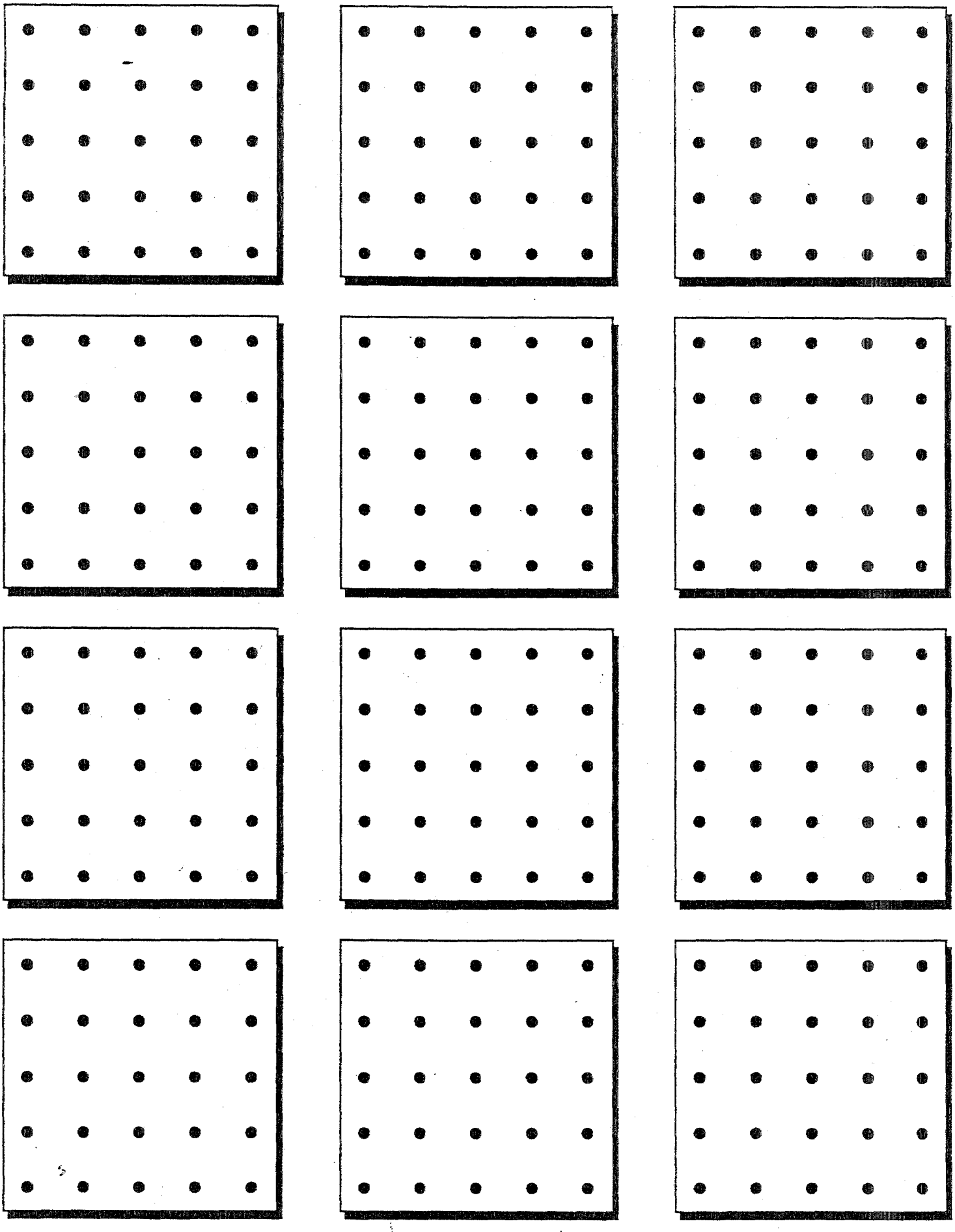






B–18 Half-Inch Grid Paper





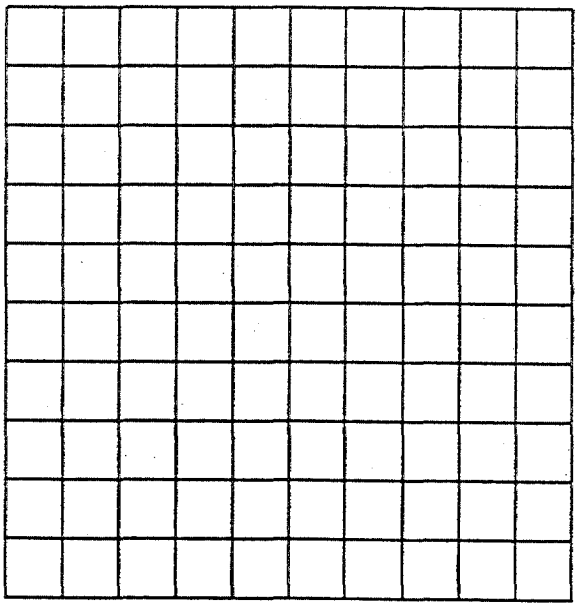
B	I	N	G	O

B	I	N	G	O

B	I	N	G	O

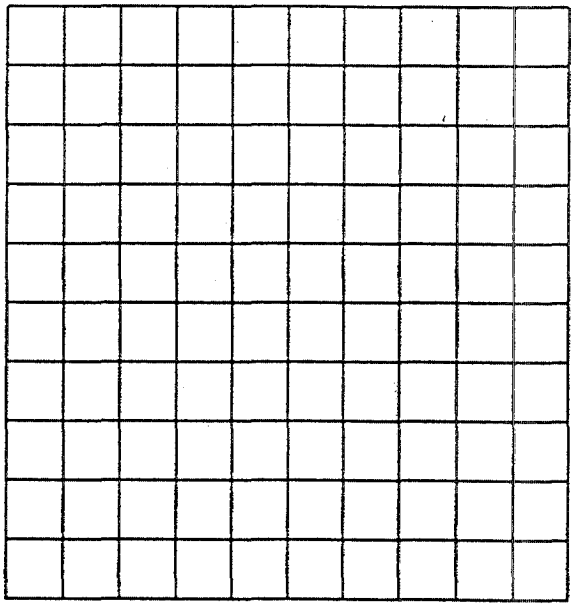
B	I	N	G	O

Break 100



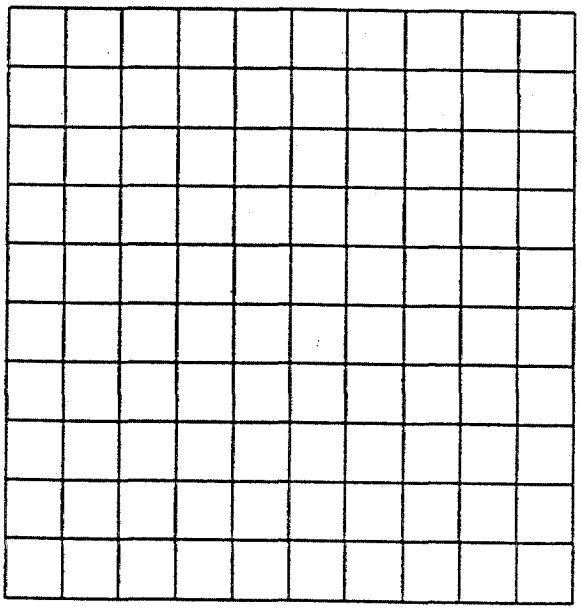
Name _____

Break 100



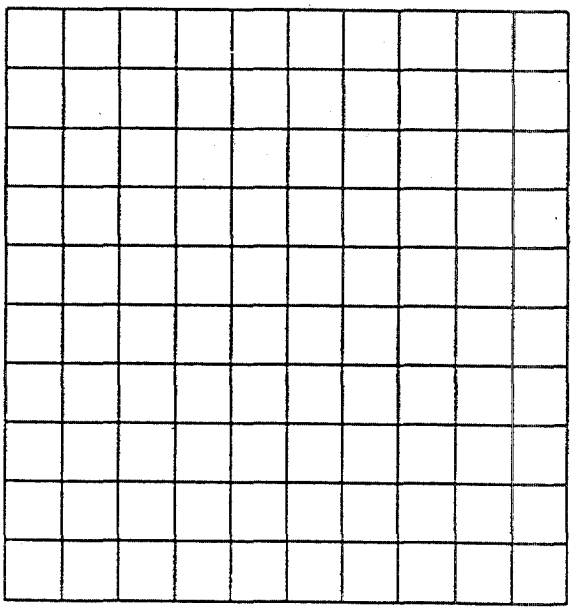
Name _____

Break 100



Name _____

Break 100



Name _____

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41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
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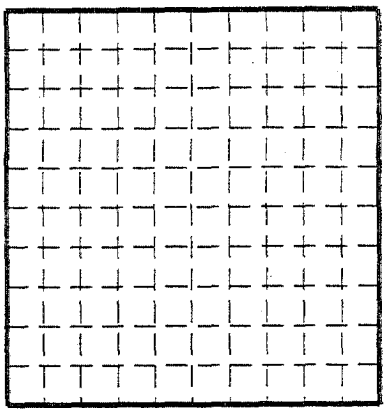
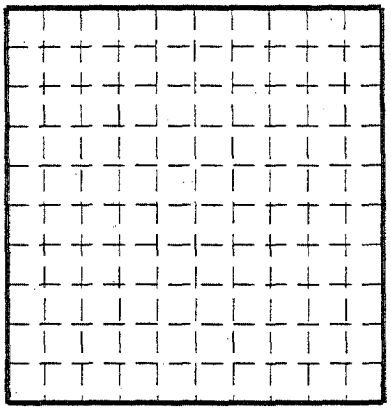
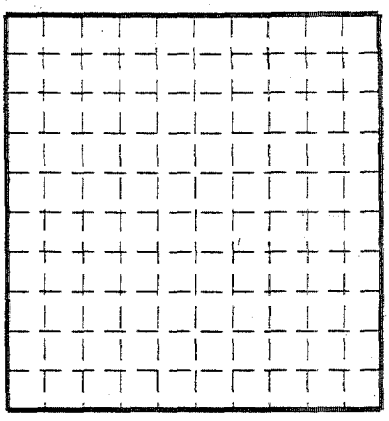
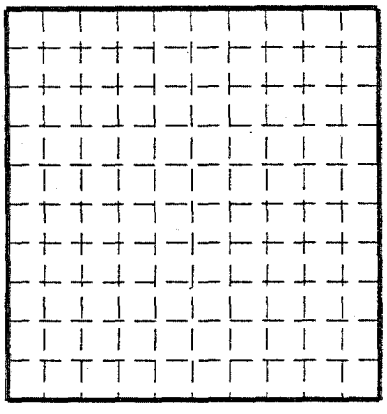
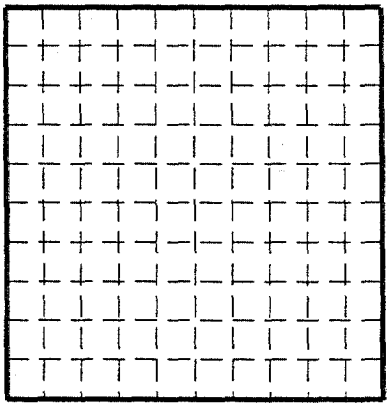
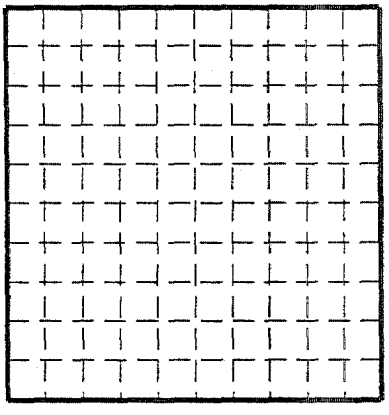
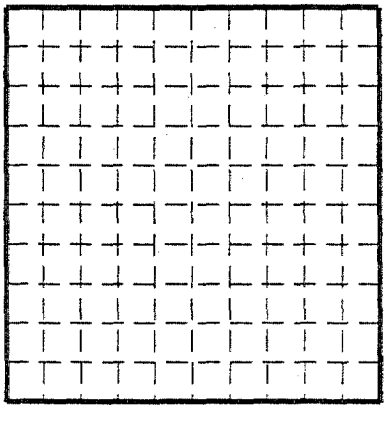
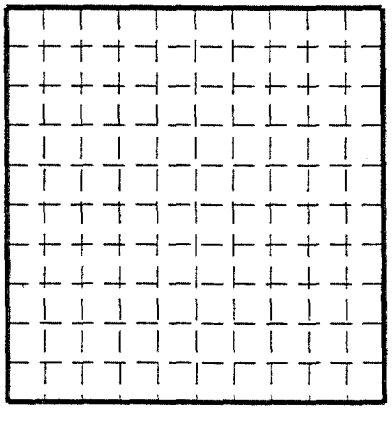
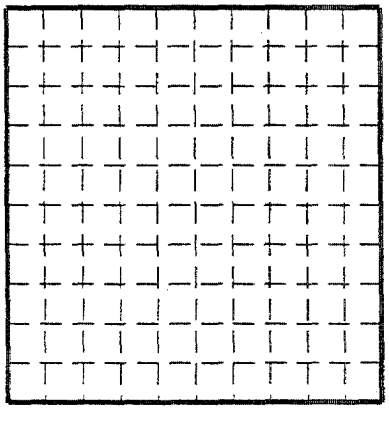
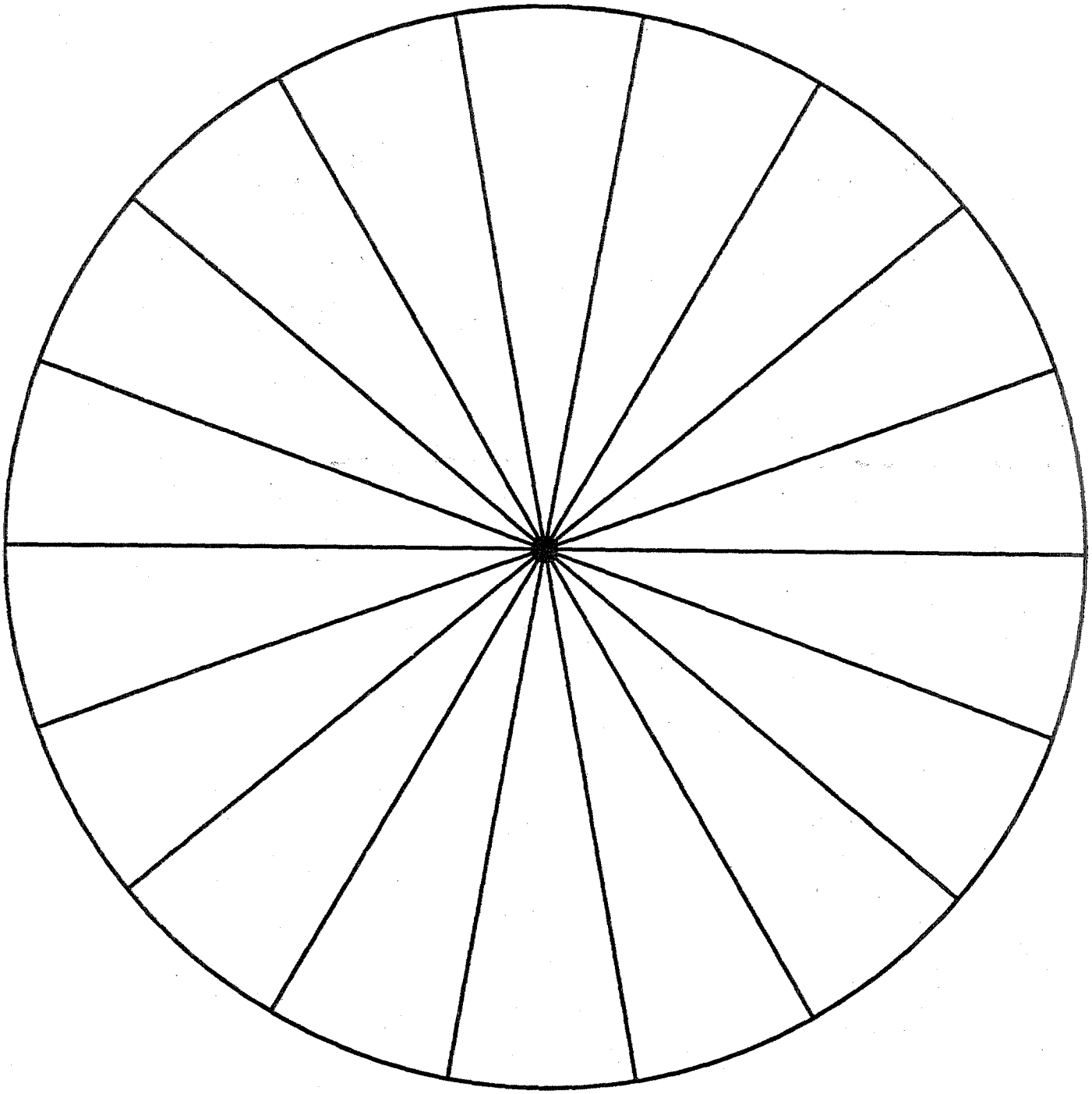
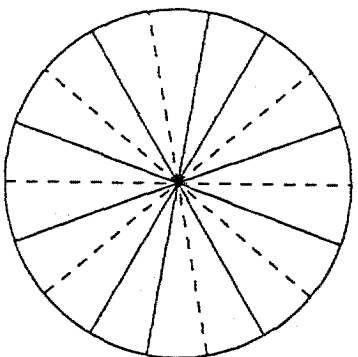
91	92	93	94	95	96	97	98	99	100

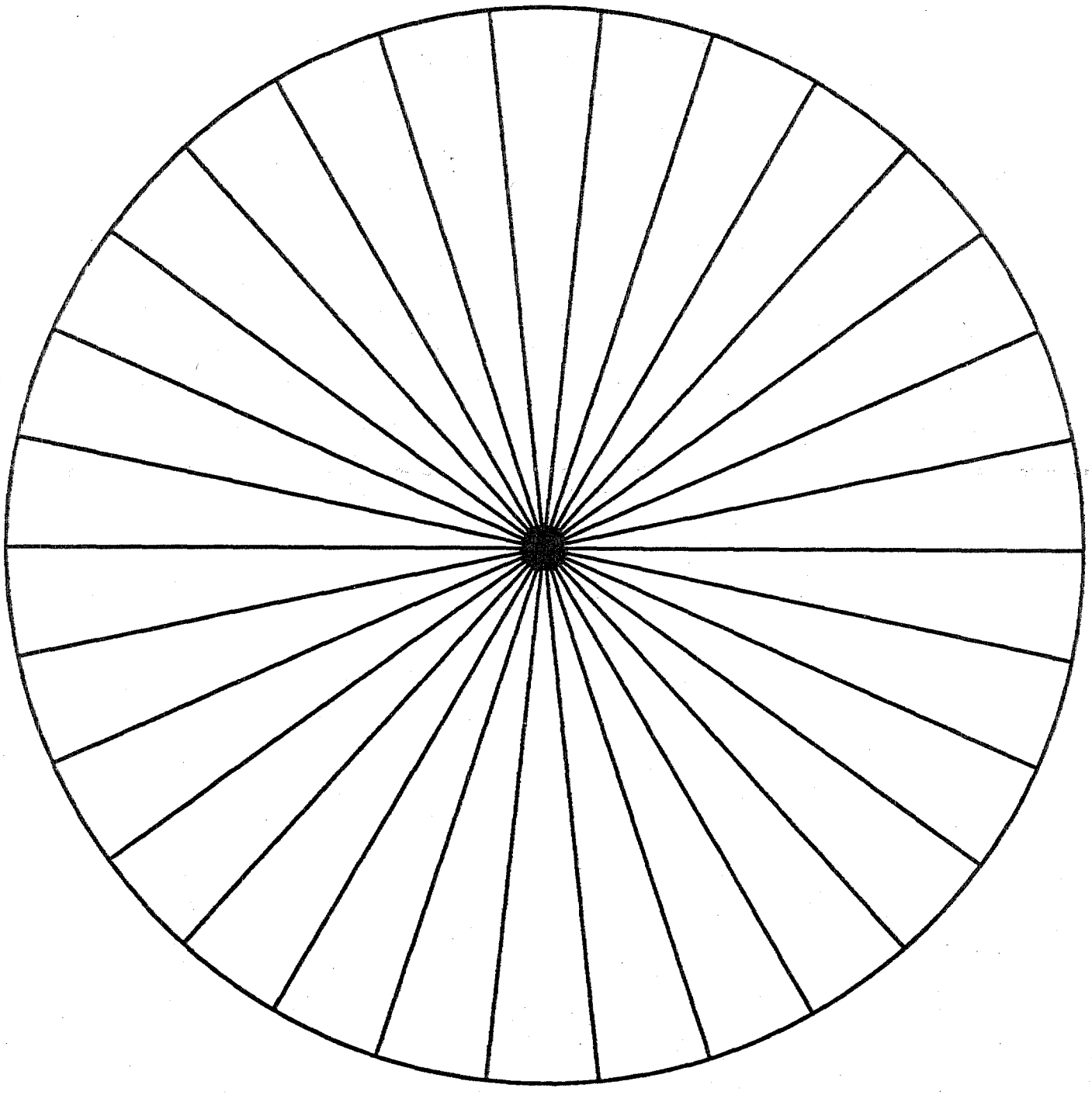












Pie chart—18 sections

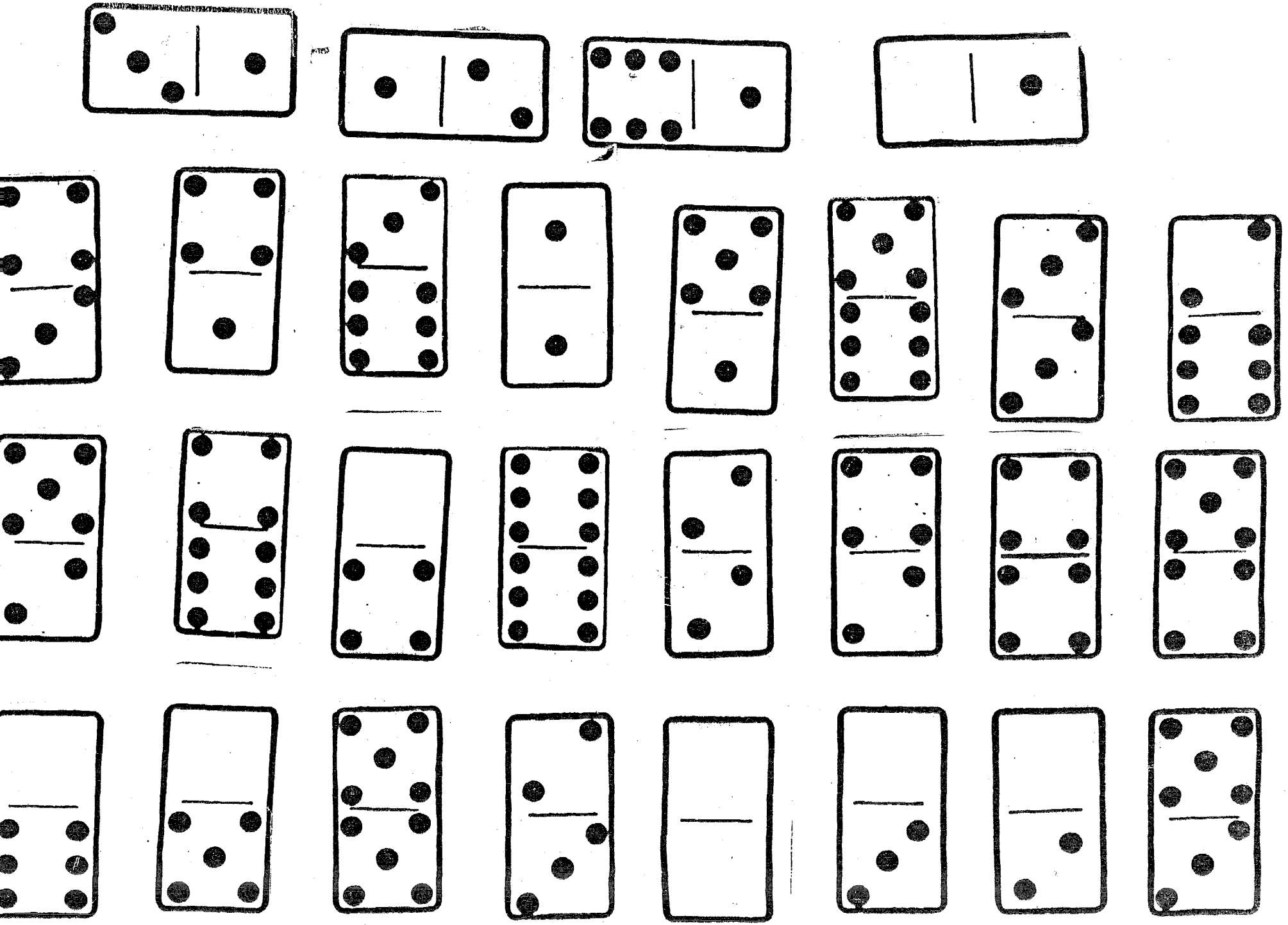
Can be adapted for 3, 6, 9 or 36 sections by omitting lines. By omitting every other line a 9-section pie can be created. Example:

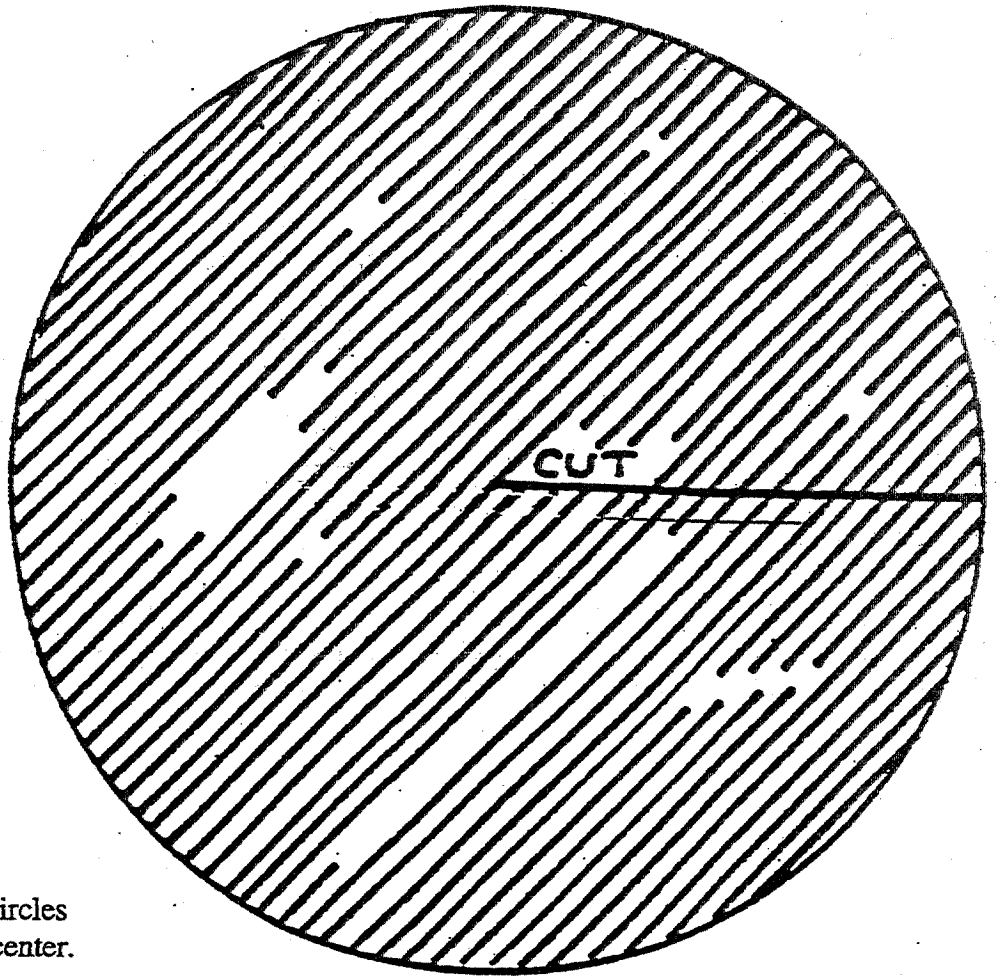




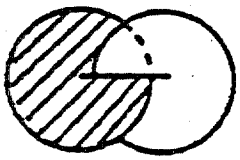
Pie chart—30 sections

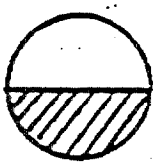
Omit every other line for a 15-section graph.

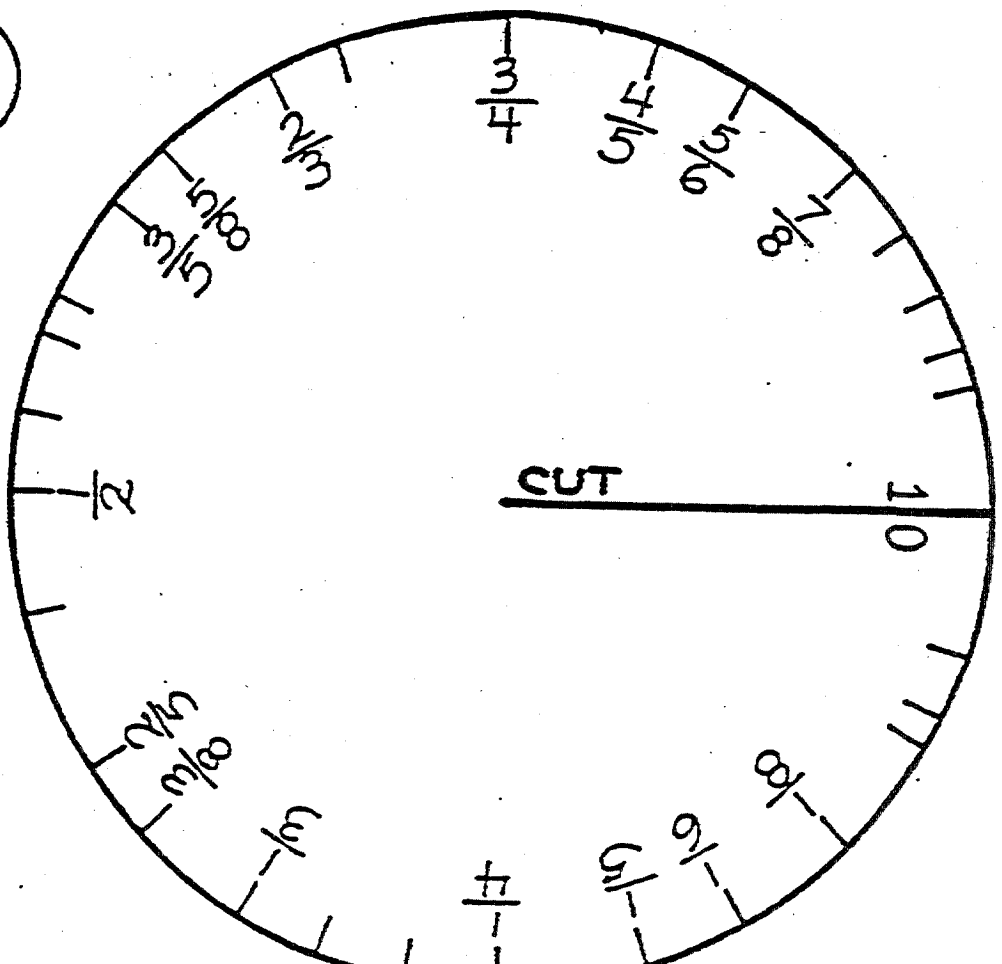




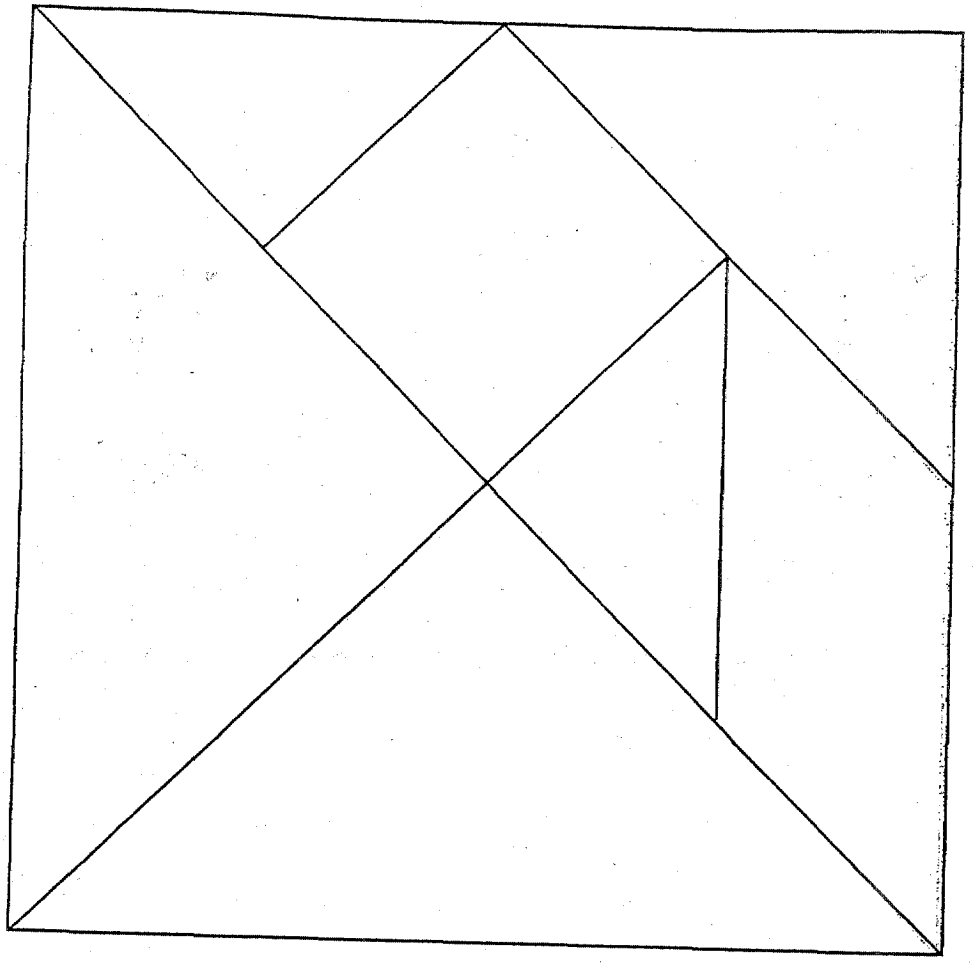
Rotate the circles around the center.

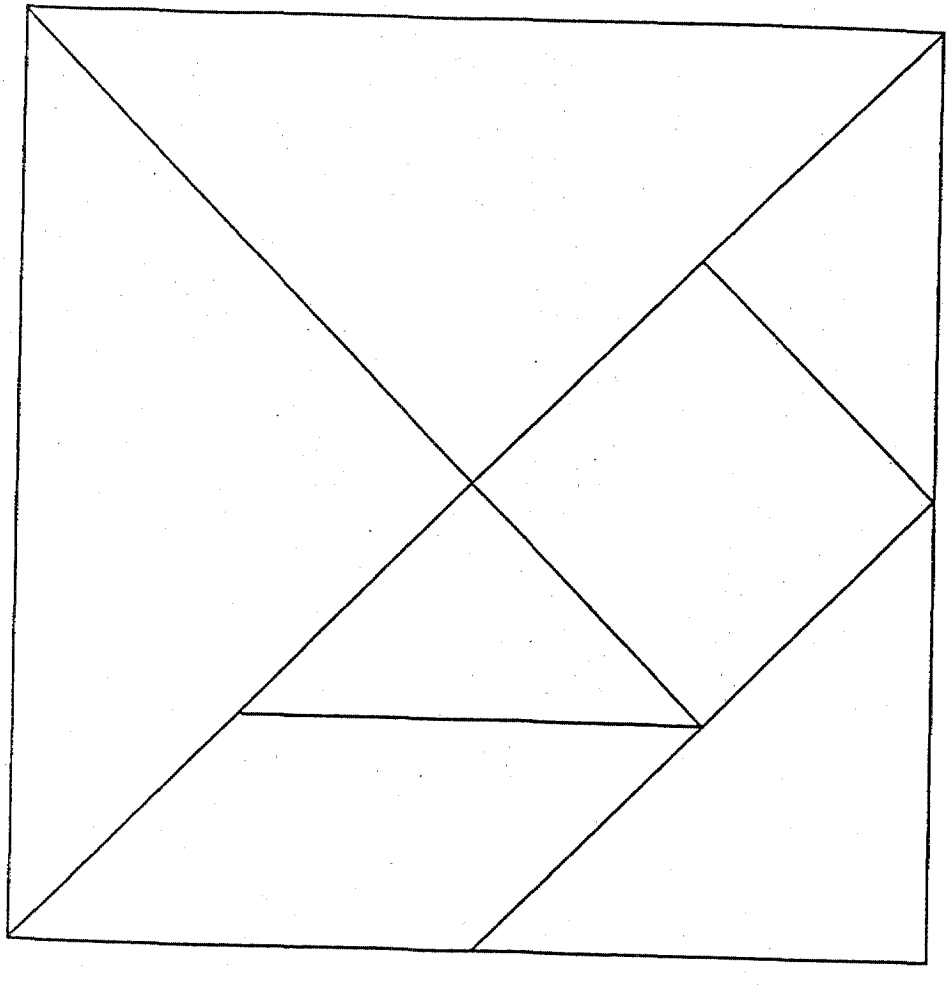






Tangrams

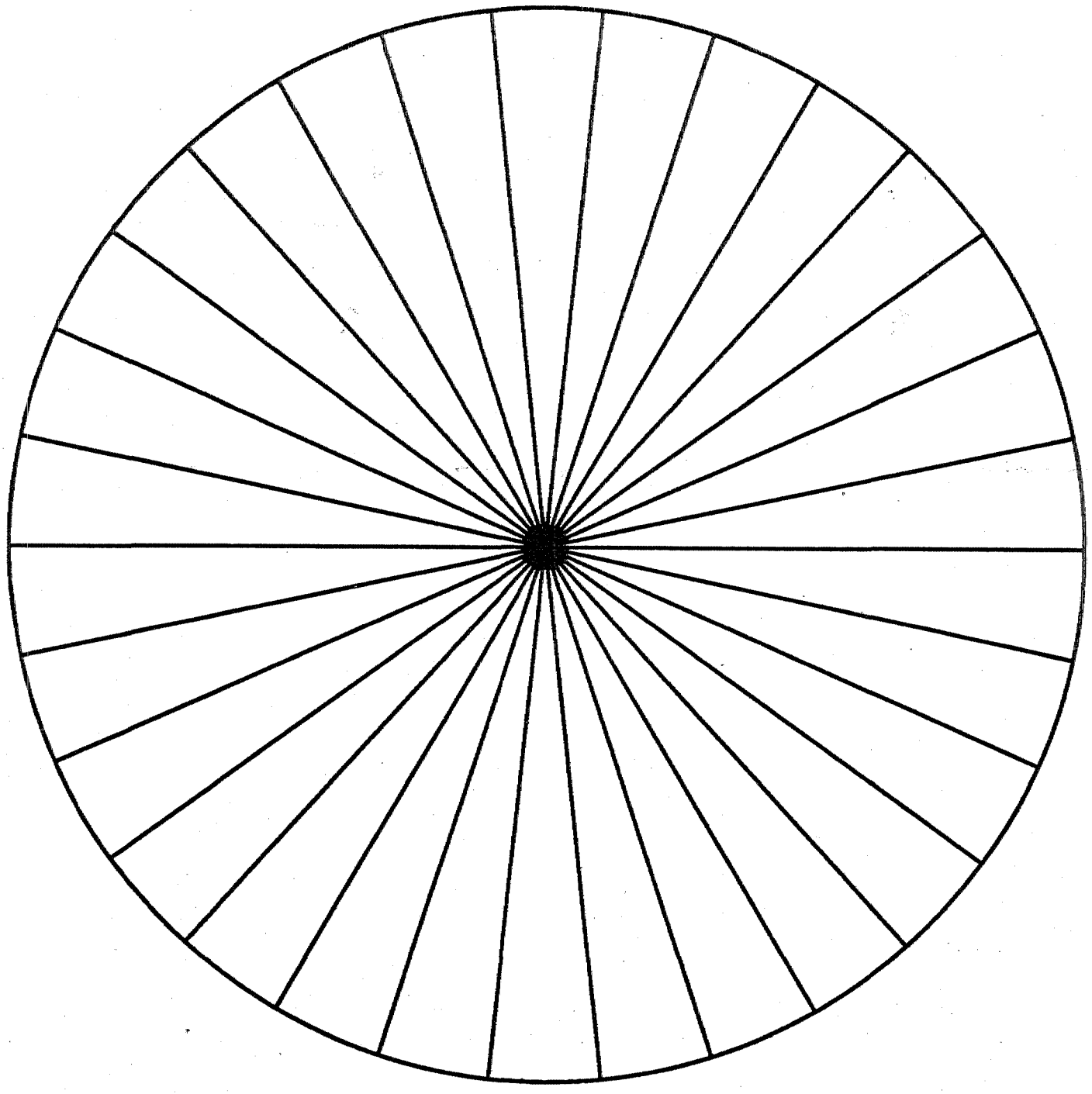




12x12 Multiplication Table for Finding Equivalent Fractions

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

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	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



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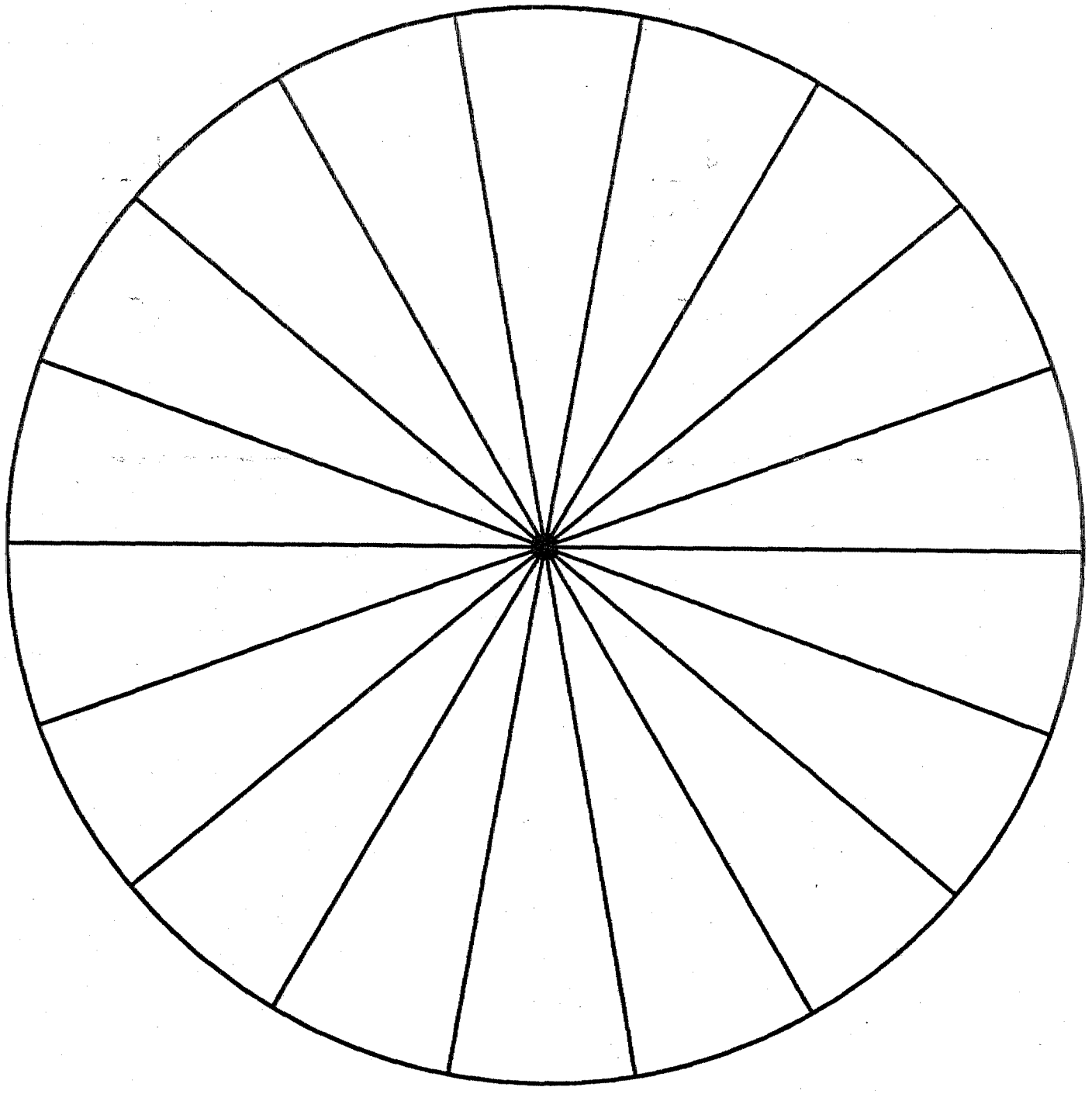

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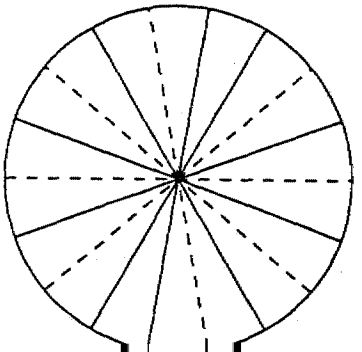


GRADES 3-4

We can begin to ask questions that encourage students to reason about the patterns in the number of blue and white tiles for a *given* pool and to reason about the number of border tiles *given the number of blue tiles* and the number of blue tiles *given the number of border tiles*.

- Build the first 3 pools and record the data in a table
- Continue the table for the next 2 squares. How do you know your answers are correct?
- If there are 32 white tiles in the border, how many blue tiles are there? Explain how you got your answer.
- If there are 36 blue tiles, how many white tiles are there? Explain how you got your answer.
- Can you make a square with 49 blue tiles? Explain why or why not.
- Can you make a square with 12 blue tiles? Explain why or why not.

You can also incorporate fractions.

- In each of the first three square pools, decide what fraction of the square's area is blue for the water and what fraction is white for the border.
- What patterns do you see?
- What fractions will occur in the next two rows of the table? How do you know that your answers are correct?

Pool Number	Total Number of Blue and White Tiles	Fraction of Blue Tiles for the Water	Fraction of White Tiles for the Border

GRADES 5-6

We can use new ways to represent the relationships between the number of tiles of each color and the number of square pools. We can begin to look at functions.

- Make a table showing the number of blue tiles for water and white tiles for the border for the first six square pools.
- What are the variables in the problem? How are they related? How can you describe this relationship in words?
- Make a graph that shows the number of blue tiles in each square pool. Make a graph that shows the number of white tiles in each square pool.
- As the number of the pool increases, how does the number of white tiles change? How does the number of blue tiles change? How does this relationship sow up in a table and in the graph?
- Use your graph to find the number of blue tiles in the seventh square.
- Change there ever be a border for a square pool with exactly 25 white tiles? Explain why or why not.

Next, increase the demand of the problem so that students will look for patterns and make generalizations to help with predicting what will happen in the case of a very large pool.

- Find the number of blue (white) tiles in the 10^{th} pool. The 25^{th} pool. The 100^{th} pool.
- If there are 144 blue squares, what is the side length of the square pool including the border. How many white tiles are needed for the border?

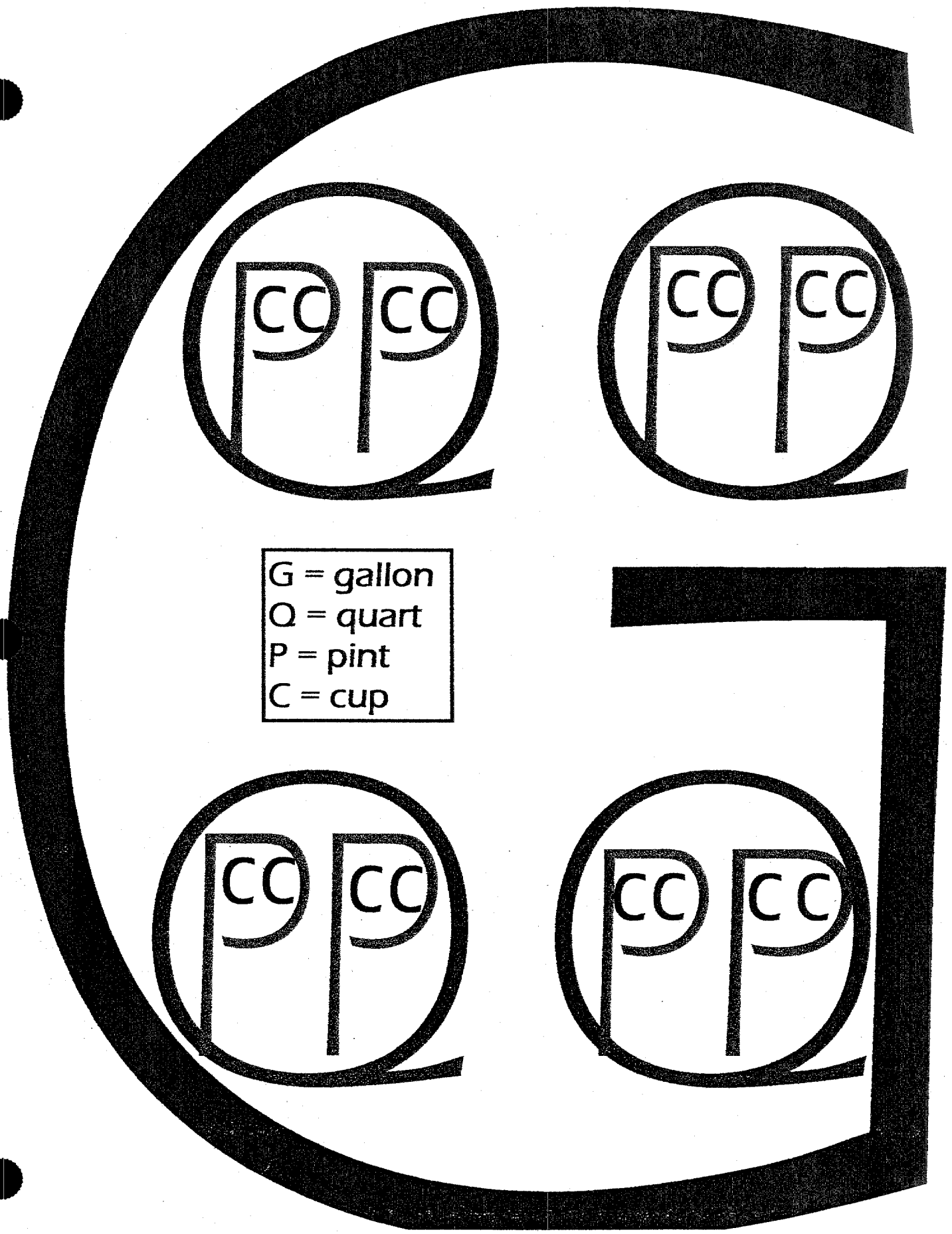
Reference:

Ferrini-Mundy, J. , Lappan, G., and Phillps, E. (1999). Experiences with patterning. In Algebraic thinking, grades, K-12. Reston, VA: NCTM.

Geometry Scavenger Hunt

Directions: Split up into small groups. Below, you will find a list of geometrical shapes. Your task is to find these shapes in this room. You are encouraged to expand your mind. Some will be easy and some will be difficult. Those who find the most shapes within the allotted time will win the prize. Good luck on your hunt.

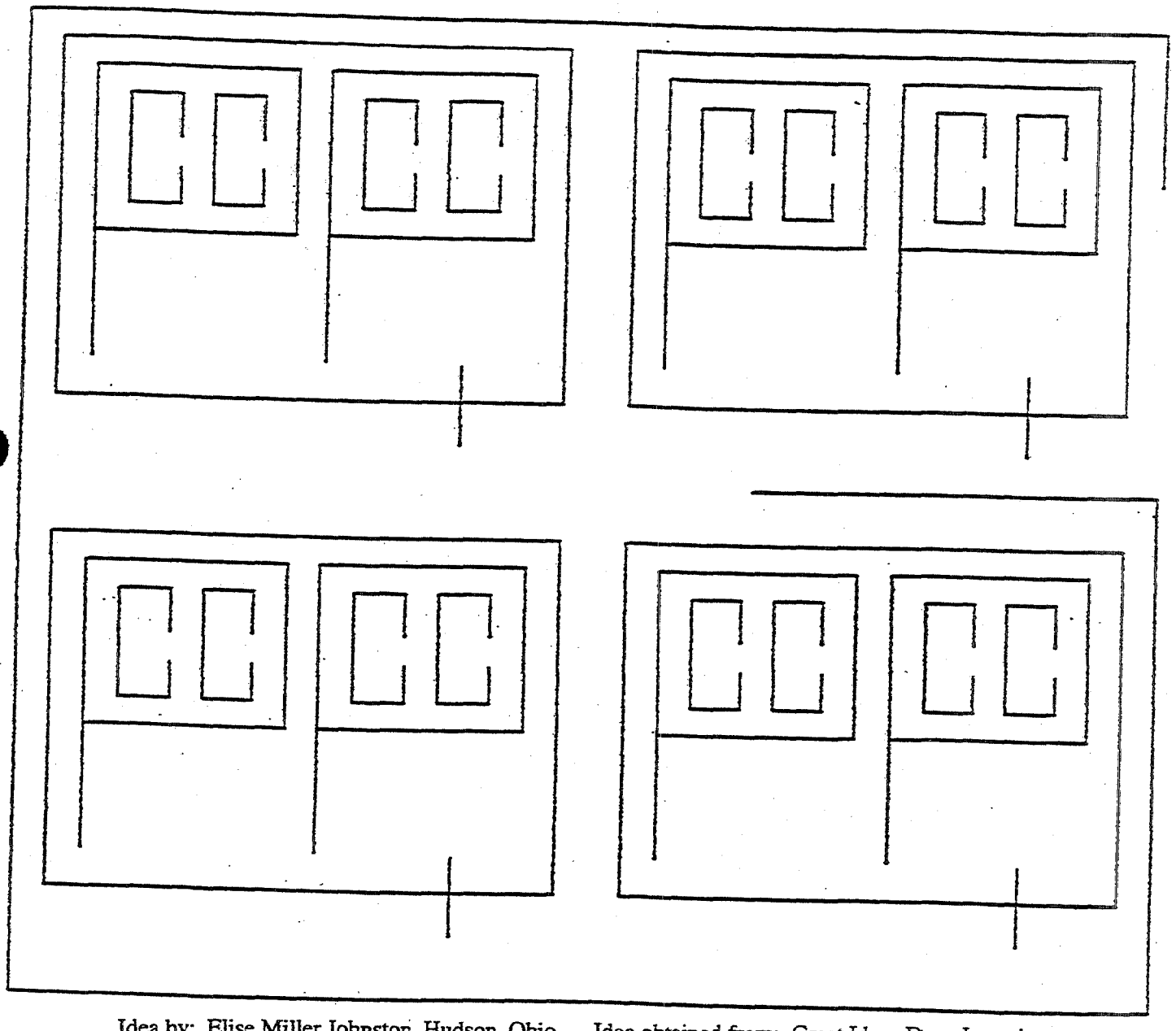
____ Parallel Lines...Where?_____
____ Perpendicular Lines... Where?_____
____ Rectangle...Where?_____
____ Square...Where?_____
____ Circle...Where?_____
____ Prism...Where?_____
____ Tessellation...Where?_____
____ Acute Triangle...Where?_____
____ Cylinder...Where?_____
____ Right Triangle?_____
____ Rhombus...Where?_____
____ A figure with line symmetry and/or Rotational symmetry...Where?_____
____ Cone...Where? _____
____ Trapezoid...Where? _____
____ Dihedral Angle...Where?_____


C C
C C
C C
C C
G = gallon
Q = quart
P = pint
C = cup

Four Quarts to the Gallon?

Or is it two? Kids often have trouble remembering liquid-measure equivalents, but a desk-size chart can help them out.

Have each child make a chart out of a sheet of construction paper. On the page, have them draw a large G for "gallon," four Q's for "quarts" inside the G, eight P's for "pints" inside the Q's and 16 C's for "cups" inside the P's. Kids will be able to see at a glance the different liquid-measure equivalents and can use the chart until the facts are familiar.



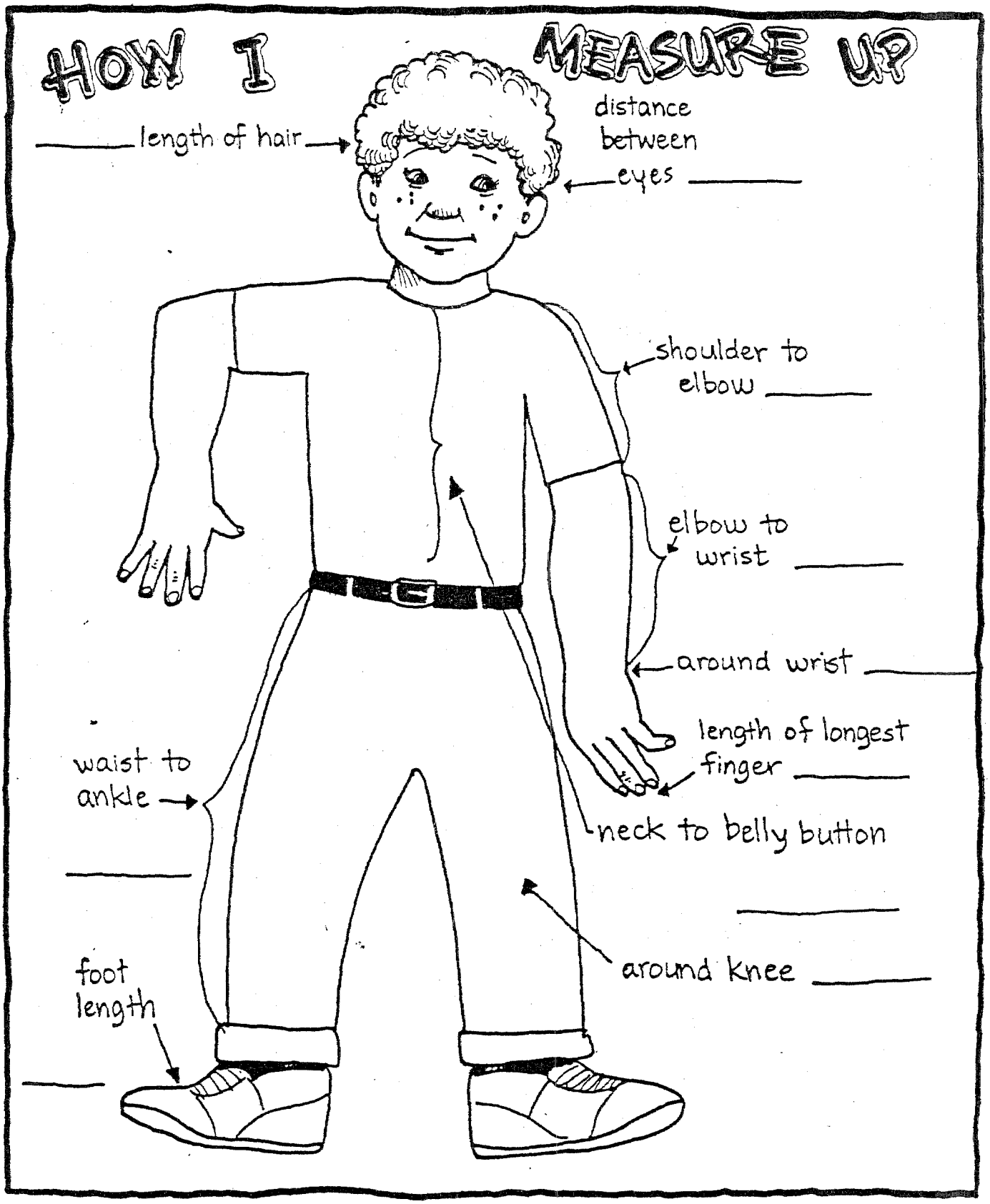
Idea by: Elise Miller Johnston, Hudson, Ohio Idea obtained from: Great Ideas From Learning, Vol. 1, Math (Published by Learning Magazine)

Presented by: Dr. Janie M. Cates, College of Education, The State University of West Georgia, Carrollton, GA 30118 (770) 836-6560

Measurement
Linear

Name _____

Have a partner help you measure yourself to fill in the blanks below! Write your answers in centimeters.



How Big is a Foot?

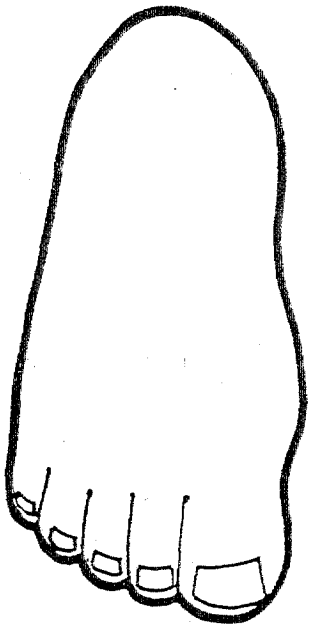
- In a group take the 12 feet cutouts and estimate then measure how many feet it will take to find the width or length of objects in the room.

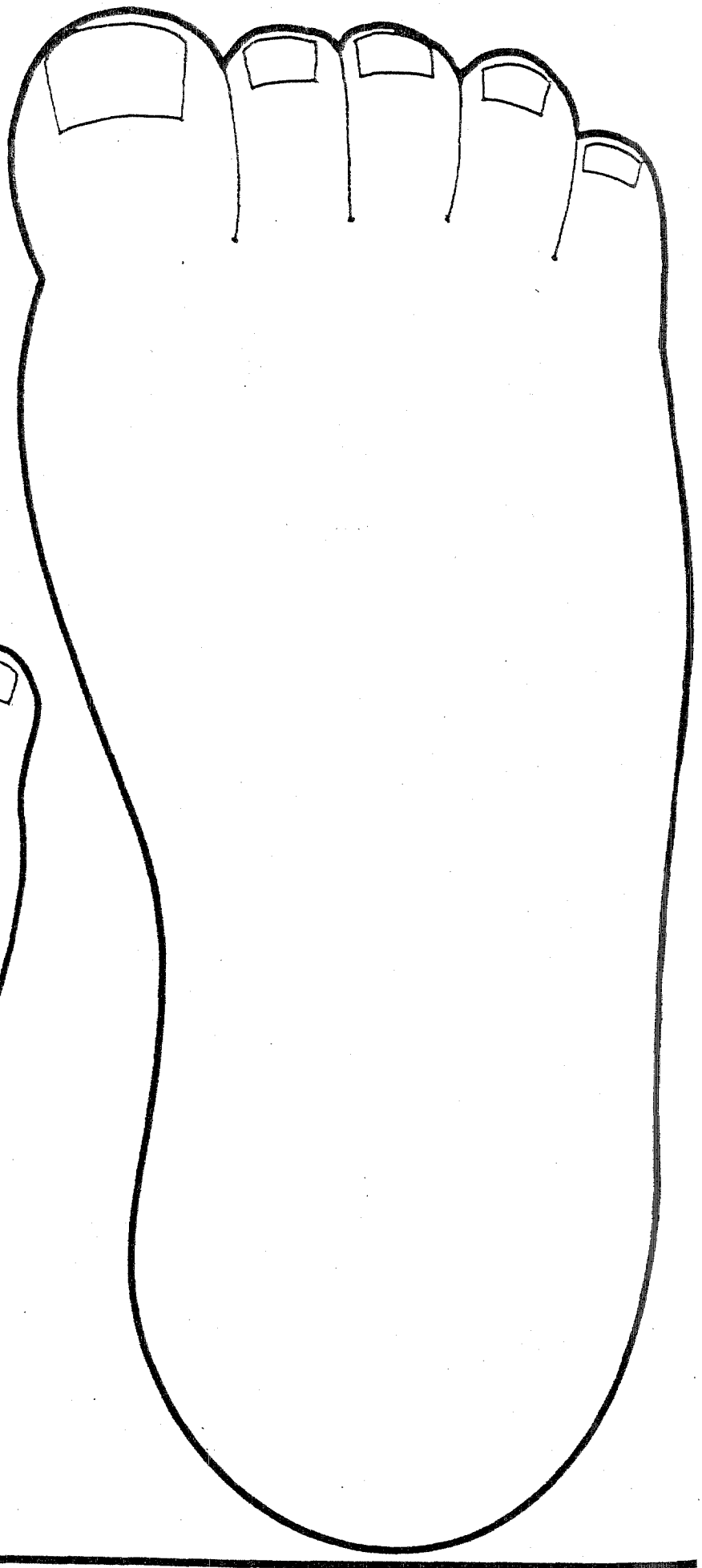
	Estimate number of feet	Actual length of object using feet
Length of the chalkboard		
Width of the doorway		
Length of a table		
Length from back of the room to front of the room		
Height of a chair		
Length of your body, head to toe		
Length of your arm		

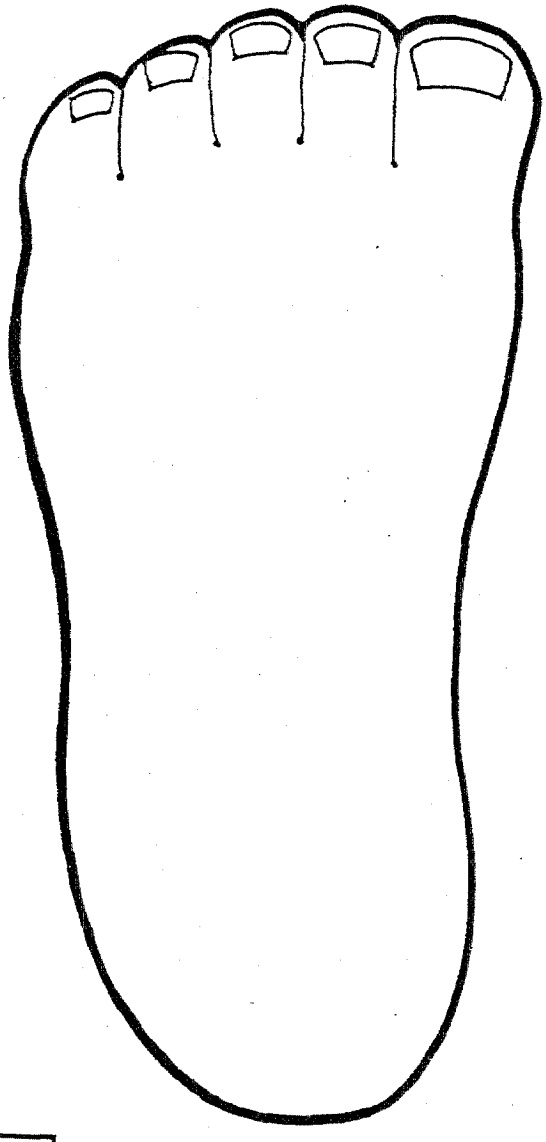
-Make sure when you measure that there aren't any spaces between your feet!

-Have fun and work together!

How Big Is a Foot?







What's the Area and Perimeter?

-Using your bag of Starbursts, estimate the number of starbursts it will take to cover each different rectangle, then find the perimeter and area of each different rectangle.

Area

	Estimate number of Starbursts	Actual number
Rectangle #1		
Rectangle #2		
Rectangle #3		
Rectangle #4		
Rectangle #5		

Perimeter

	Estimate number of Starbursts	Actual number
Rectangle #1		
Rectangle #2		
Rectangle #3		
Rectangle #4		
Rectangle #5		

Mighty M&M's Math

1. Get into groups of 2 or 3.

2. Each group get a bag of M&M's.

3. The group will predict how many total M&M's are in your bag and predict how many of each color. For example, I predict that I have 3/22 M&M's, then record these answers on your charts.

4. Using fractions or decimals, determine the percentage of each color. For example, 3/22 or .136, which equals 14%.

5. Record these percentiles on your chart, rounded to the nearest whole number.

Mighty m&m Math Experiment

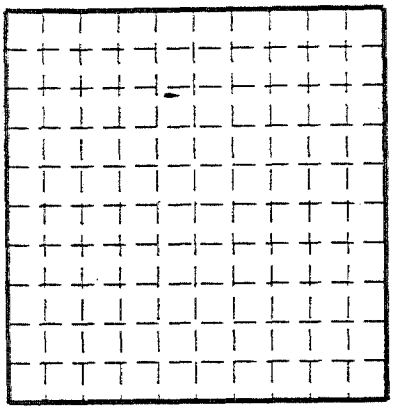
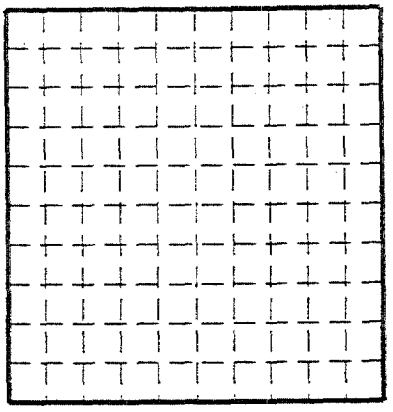
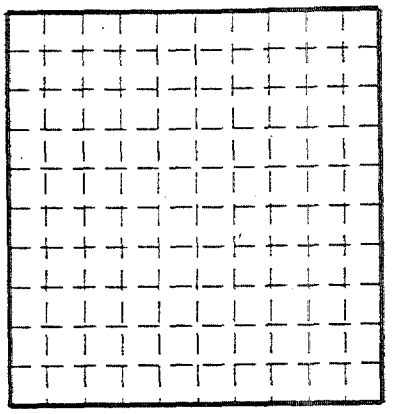
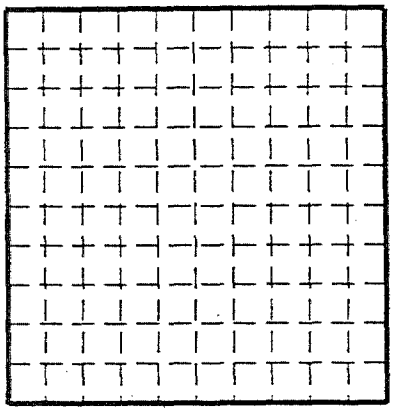
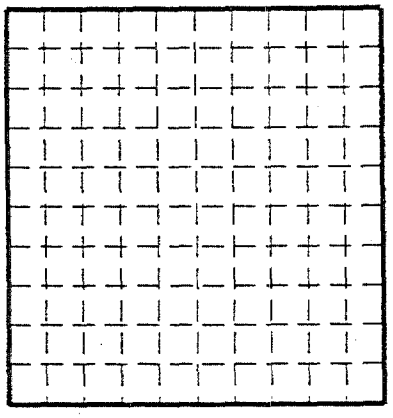
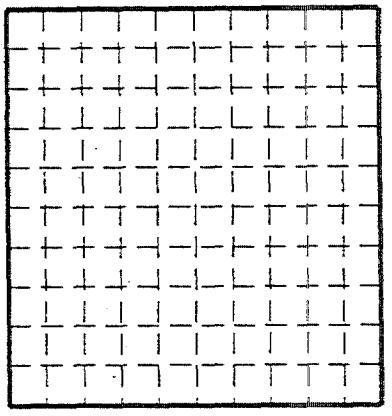
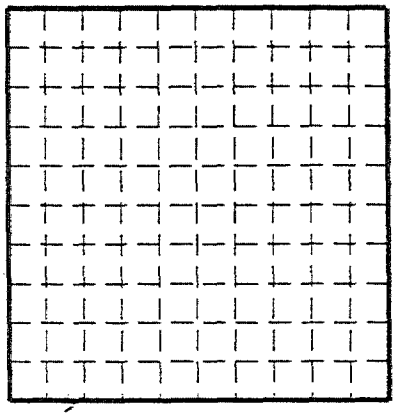
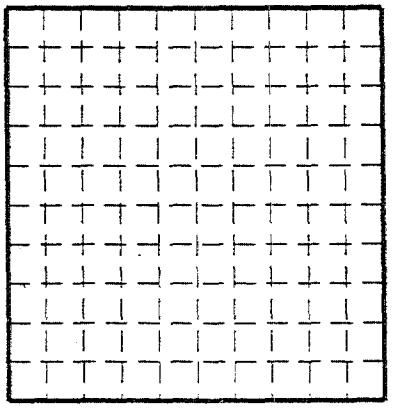
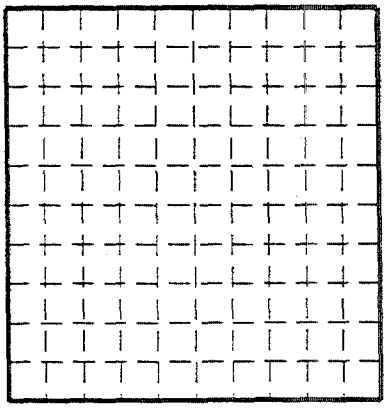
Total Number of m&m's : _____

Actual Number

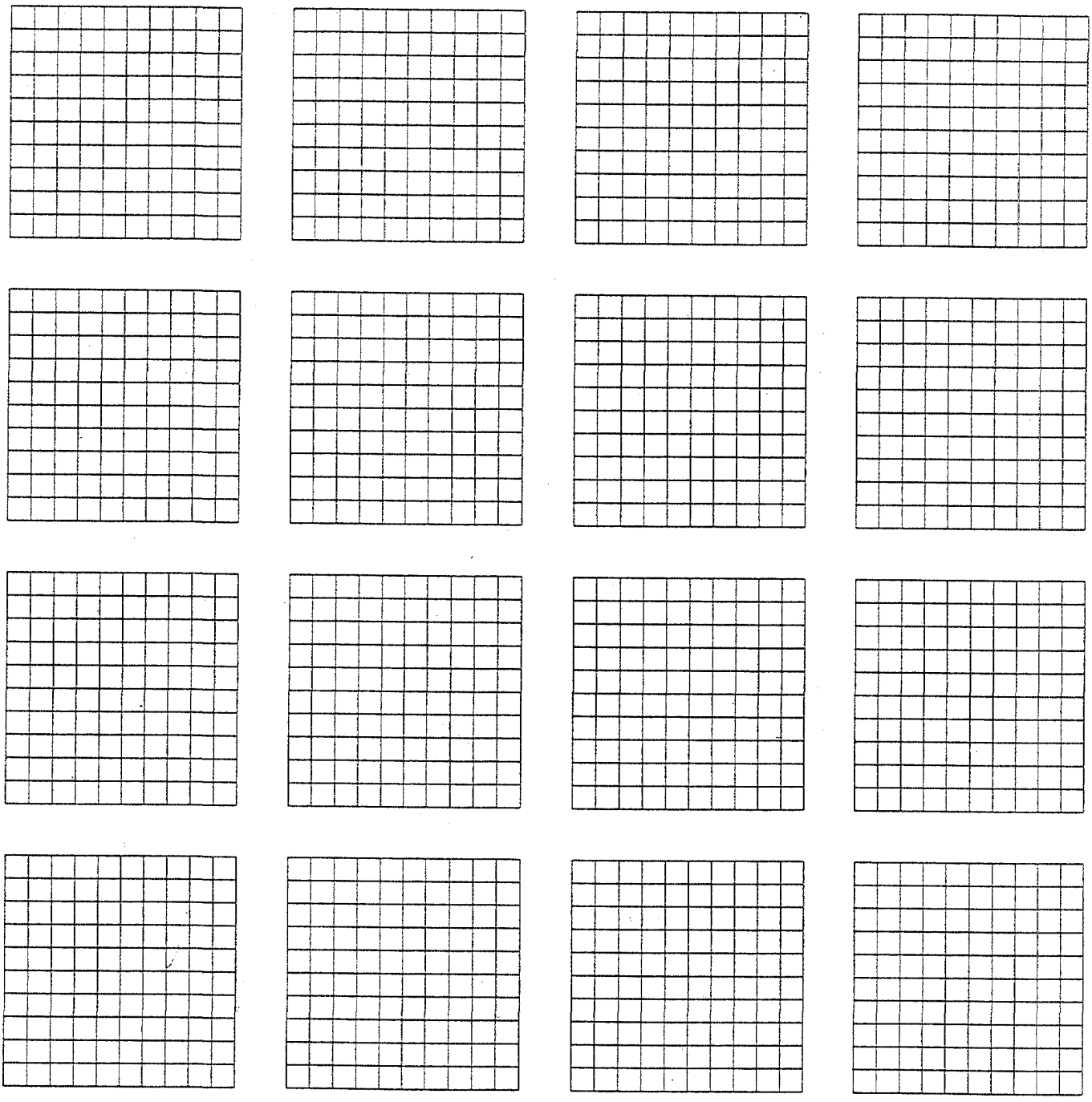
Group	Blue	Brown	Green	Orange	Red	Yellow
1						
2						
3						
Totals						

Percentages

Group	Blue	Brown	Green	Orange	Red	Yellow
1	%	%	%	%	%	%
2	%	%	%	%	%	%
3	%	%	%	%	%	%

B–8 Decimal or Percent Grids



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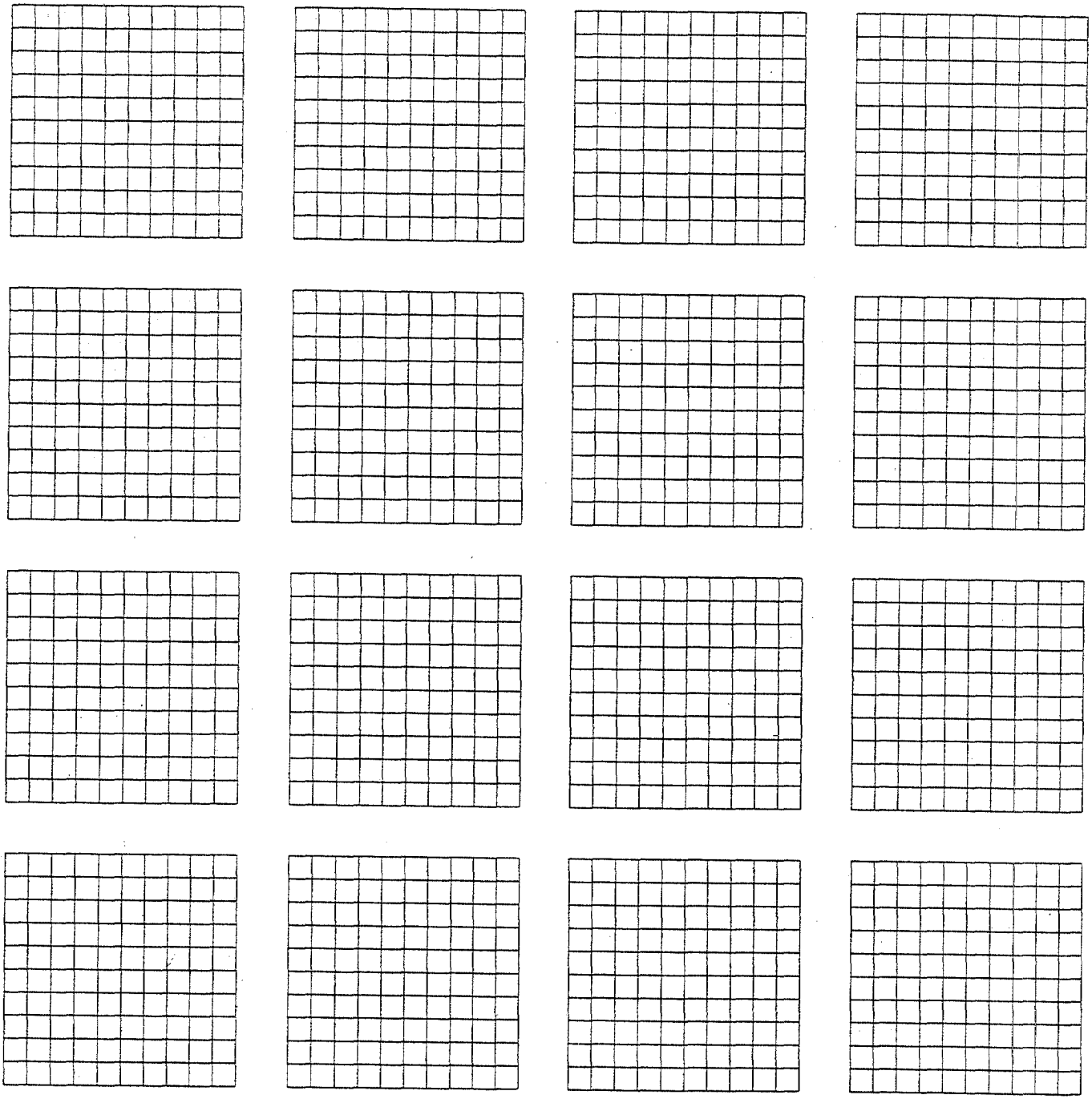
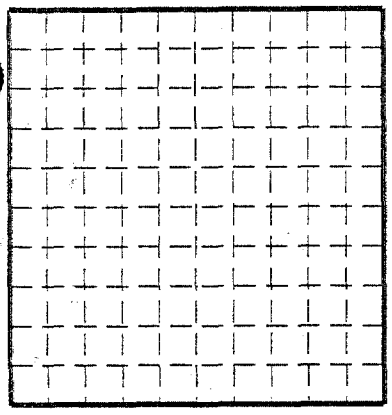
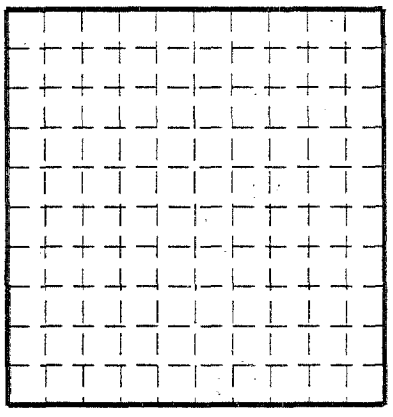
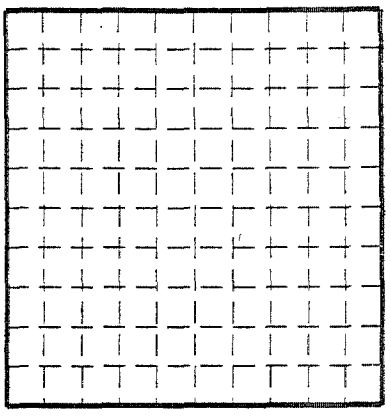
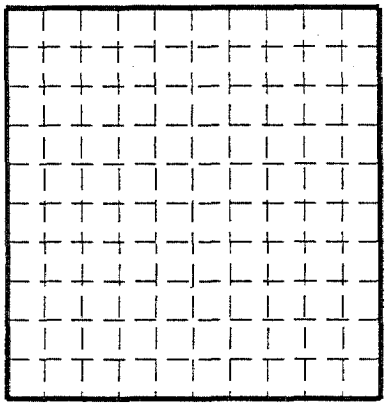
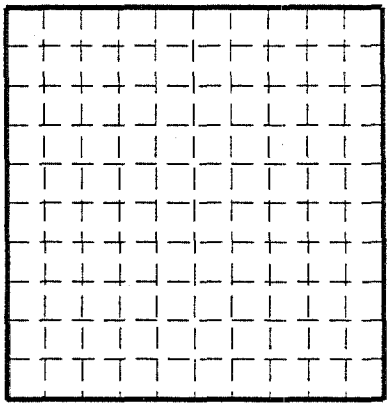
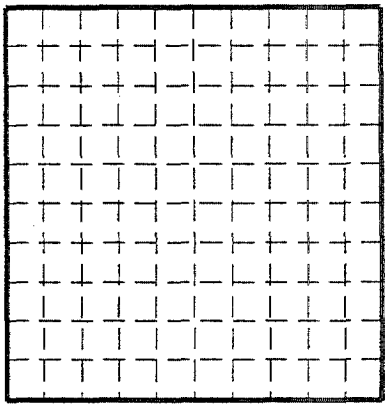
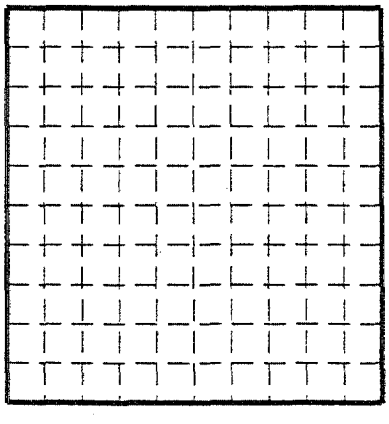
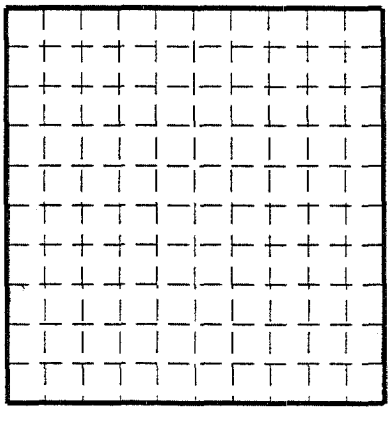
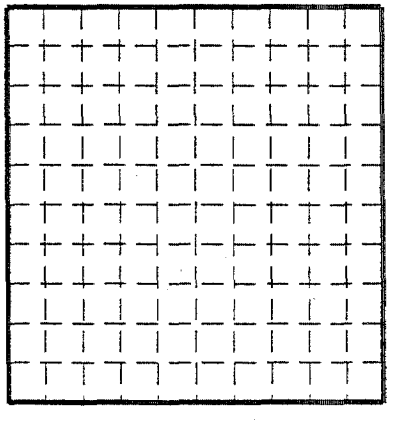


DIRECTIONS:
CUT OUT THE 16 SQUARES. FIT THEM TOGETHER SO THAT THE EDGES THAT TOUCH NAME THE SAME NUMBER.

$\frac{1}{2}+\frac{1}{8}$ $\frac{1}{8}+\frac{3}{8}$	$\frac{8}{12}$ $\frac{1}{7}+\frac{3}{7}$ $\frac{1}{4}$ $\frac{1}{3}$	$\frac{3}{4}$ $\frac{2}{3}$ $\frac{2}{8}+\frac{3}{8}$	$\frac{3}{5}$ $\frac{1}{6}+\frac{1}{12}$ $\frac{1}{3}+\frac{1}{2}$
$\frac{7}{10}$ $\frac{1}{6}+\frac{1}{4}$ $\frac{4}{7}$ $\frac{2}{3}+\frac{1}{3}$	$\frac{1}{4}+\frac{1}{4}$ $\frac{3}{4}$	1 $\frac{1}{12}+\frac{2}{3}$ $\frac{8}{15}$	$\frac{1}{10}+\frac{3}{10}$ $\frac{2}{3}$ $\frac{1}{8}+\frac{3}{4}$
$\frac{5}{6}$ $\frac{3}{8}+\frac{3}{8}$	$\frac{1}{6}+\frac{1}{6}$ $\frac{1}{3}+\frac{1}{5}$ $\frac{3}{4}$	$\frac{2}{5}$ $\frac{1}{2}+\frac{1}{4}$	1 $\frac{2}{6}+\frac{2}{6}$ $\frac{5}{7}$ $\frac{3}{12}+\frac{5}{12}$
$\frac{1}{3}+\frac{1}{3}$ $\frac{5}{8}$ $\frac{1}{2}+\frac{1}{2}$	$\frac{7}{8}$ $\frac{1}{6}+\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{5}+\frac{1}{10}$	$\frac{5}{8}$ $\frac{5}{12}$ $\frac{1}{2}$	$\frac{1}{2}$ $\frac{3}{7}+\frac{2}{7}$ $\frac{1}{5}+\frac{2}{5}$

Fraction Word Hunt

How to play:

Take a fraction word hunt sheet with its ziploc bag of cut out letters.

Read each sentence first.
Using the letters from the ziploc bag, spell out the underlined words in the sentence.
Follow the fraction directions in the sentence and remove the parts from the spelled words as directed.
Place the fractioned parts together to form a new word.
Record the new word in the space provided.

(This is a 2nd-3rd grade level)

http://www/sinc.sunysb.edu/stu/pmaher/classactivities.htm

Fraction Word Hunt

Directions: Read each fraction word sentence. Use the cut out letters to spell the underlined words from each sentence. Then, remove the fraction of the words listed and place those fractional fragments together to form the new word.

1. The first1/4 of door + the last 3/4 of late._____

2. The first half of past + the last 2/5 of chair. _____

3. The first 1/5 of shape + the last 1/2 of heat._____

4. The last third of cat + the first 2/5 of heart._____

5. The first 1/3 of finish + the last third of car + the first 1/3 of strong. _____

6. The first 3/4 of seat + the last half of person. _____

7. The last 3/4 of many + the first 2/5 of think + the last 3/4 of sing. _____

8. The first third of inside + the last 1/3 of church + middle 2/4 of best. _____

9. The first 1/2 of prince + the first half of zebra. _____

10. The first 1/7 of instant + the first fourth of feel. _____

Hershey Fractions Sheet

Names:

_____

_____

Before you open the candy bar estimate how many pieces it is divided into.

Estimate: _____

Actual _____

How many rows? _____

How many columns? _____

What addition or multiplication problem do you see using the above information? Write the problem and a picture below.

Break off the first column of the candy bar. How many pieces did you take?

_____

What fraction of the candy bar did you take? _____

If we use each column to stand for one so that the candy bar has 4 sections, and we take one section, what fraction do you take? _____

Break off another column. How many pieces have you taken all together? _____

What fractions of the candy bar is gone? _____

Can you think of a different way to say that? _____ * Hint: Look at the two piles.

Break off another column. How many pieces have you taken all together?

_____

What fractions of the candy bar is gone? _____

Put all the pieces together in a pile. Discuss how you will share the candy so that each person has the same amount. Write your explanation down using pictures if necessary.

Ch. 6

Fraction Bingo

Fraction Bingo

Fraction Answers

Make transparency or copy to board.

$\frac{17}{6}$	$\frac{12}{7}$	$\frac{19}{4}$	$\frac{10}{3}$	$\frac{16}{6}$	$\frac{11}{4}$	$\frac{21}{7}$	$\frac{18}{5}$
$\frac{10}{6}$	$\frac{15}{3}$	$\frac{14}{3}$	$\frac{15}{2}$	$\frac{12}{7}$	$\frac{23}{6}$	$\frac{8}{6}$	$\frac{4}{3}$
$\frac{25}{4}$	$\frac{11}{6}$	$\frac{22}{4}$	$\frac{36}{7}$	$\frac{54}{7}$	$\frac{31}{9}$	$\frac{37}{6}$	$\frac{29}{7}$
$\frac{41}{8}$	$\frac{6}{6}$	$\frac{34}{5}$	$\frac{26}{8}$	$\frac{13}{5}$	$\frac{25}{4}$	$\frac{8}{3}$	$\frac{51}{8}$
$\frac{17}{4}$	$\frac{12}{7}$	$\frac{43}{5}$	$\frac{33}{6}$	$\frac{44}{9}$	$\frac{19}{4}$	$\frac{58}{9}$	$\frac{61}{6}$
$\frac{29}{9}$	$\frac{15}{7}$	$\frac{59}{7}$	$\frac{52}{5}$	$\frac{71}{8}$	$\frac{53}{4}$	$\frac{51}{6}$	$\frac{32}{9}$
$\frac{48}{6}$	$\frac{21}{6}$	$\frac{15}{4}$	$\frac{25}{3}$	$\frac{32}{7}$	$\frac{14}{6}$	$\frac{17}{6}$	$\frac{13}{6}$

Fraction Answers
Cut squares for bag.

$2\frac{5}{6}$	$1\frac{5}{7}$	$4\frac{3}{4}$	$3\frac{1}{3}$	$2\frac{4}{6}$	$2\frac{3}{4}$	3	$3\frac{3}{5}$
$1\frac{4}{6}$	3	$4\frac{2}{3}$	$7\frac{1}{2}$	$1\frac{5}{7}$	$3\frac{5}{6}$	$1\frac{2}{6}$	$1\frac{1}{3}$
$6\frac{1}{4}$	$1\frac{5}{6}$	$5\frac{2}{4}$	$5\frac{1}{7}$	$7\frac{5}{7}$	$3\frac{4}{9}$	$6\frac{1}{6}$	$4\frac{1}{7}$
$5\frac{1}{8}$	1	$6\frac{4}{5}$	$3\frac{2}{8}$	$2\frac{3}{5}$	$6\frac{1}{4}$	$2\frac{2}{3}$	$6\frac{3}{8}$
$4\frac{1}{4}$	$1\frac{5}{7}$	$8\frac{3}{5}$	$5\frac{3}{6}$	$4\frac{8}{9}$	$4\frac{3}{4}$	$6\frac{4}{9}$	$10\frac{1}{6}$
$\frac{3}{9}$	$2\frac{1}{7}$	$8\frac{3}{7}$	$10\frac{2}{5}$	$8\frac{7}{8}$	$13\frac{1}{4}$	$8\frac{3}{6}$	$3\frac{5}{9}$
8	$3\frac{3}{6}$	$3\frac{3}{4}$	$8\frac{1}{3}$	$4\frac{4}{7}$	$2\frac{2}{6}$	$2\frac{5}{6}$	$2\frac{1}{6}$

Jelly Bean Hunt

Choose a hider and a hunter.

First:
The hunter should open an egg and look at the jelly beans inside. Notice the color and number of jelly beans.

Next:
The hider should hide the beans on the game board behind the green flaps.

In order for the hunter to "find" the jelly beans, she must first reduce the fraction on the green flap covering the jelly bean. The answer does not have to be written down, the hunter may simply say it aloud. Check the answer by looking on the opposite side of the flap. If the answer is correct the hunter should put that jelly bean in her basket.

Before Hunting:
On the paper provided, the hunter should predict how many jelly beans of each color he can find in 20 seconds. (If you don't think you will find any of a certain color put 0 in the blank.)

The hider should set the timer for twenty seconds.

The hunter should "find" as many jelly beans as possible during the allotted time.

Check your predictions. How close were you?

Write a ratio of the number of jelly beans you found to the number of seconds it took you to find them._____

Of the jelly beans found, write a ratio of one color to another color._____
This is called a part-to-part ratio.

Choose one color. Write a ratio of the number of this color jelly beans found to the total number of jelly beans found._____
This is called a part-to-whole ratio.

Choose another color. Write a ratio of the total number of jelly beans found to the number of this color of jelly beans found._____

This is called a whole-to-part ratio.

Would you ever write a whole-to-whole ratio? Why or why not? _____

How many will you find?

White _____

Green _____

Pink _____

Orange _____

Yellow _____

Red _____

Purple _____

Materials needed:

Game board
Jellybeans
Stopwatch
Basket or bag
Paper
Pencil

How to make the game board:

On a large sheet of green construction paper, using an exacto knife, cut ten to twelve flaps. On the outside of the flaps, write a fraction that needs to be reduced. Fold down the flaps. On the opposite side of flaps, write the fraction in reduced form. Stand the flaps up straight. Behind the flaps is where the jellybeans will be hidden.

"Egg"citing Math

Look at the size of the eggs and the jelly beans.

How many small eggs do you think will fit inside the large egg?

Write your prediction here:_____

See how many small eggs you can fit inside the large egg.

How close was your prediction?

Write the number of small eggs you were able to fit inside the large egg here:_____

Write the ratio of small eggs to large egg in three different ways on the lines below:

_____:_____, _____ to _____, _____/_____

How many jelly beans do you think will fit inside a small egg?

Write your prediction here _____

See how many jelly beans you can fit inside a small egg.

How close was your prediction?

Write the number of jelly beans you were able to fit inside the small egg here:_____

Write the ratio of jelly beans to small egg in three different ways on the lines below:

_____:_____, _____ to _____, _____/_____

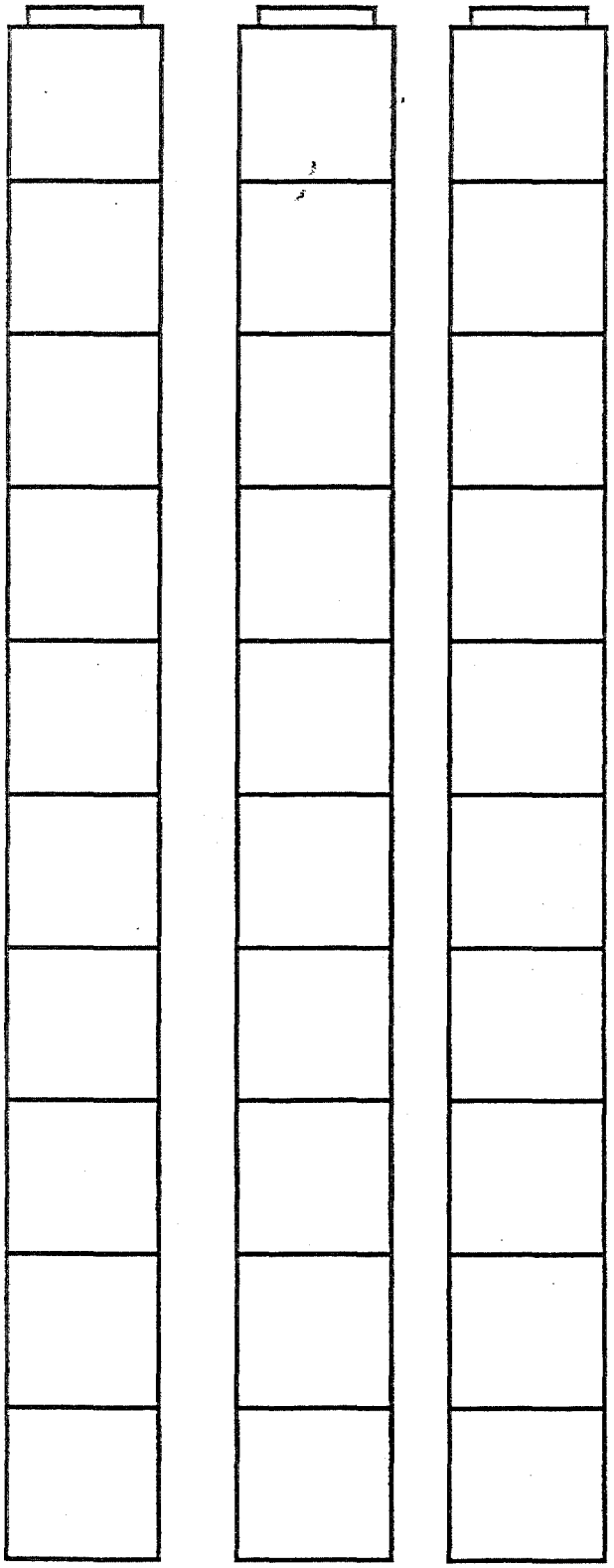
Based on the information you have, approximately how many jelly beans would fit inside the large egg? Write this as a ratio. Choose one of the three ways to write it.

Does this method give you the exact amount of jelly beans that would fit inside the large egg? Why or Why not?

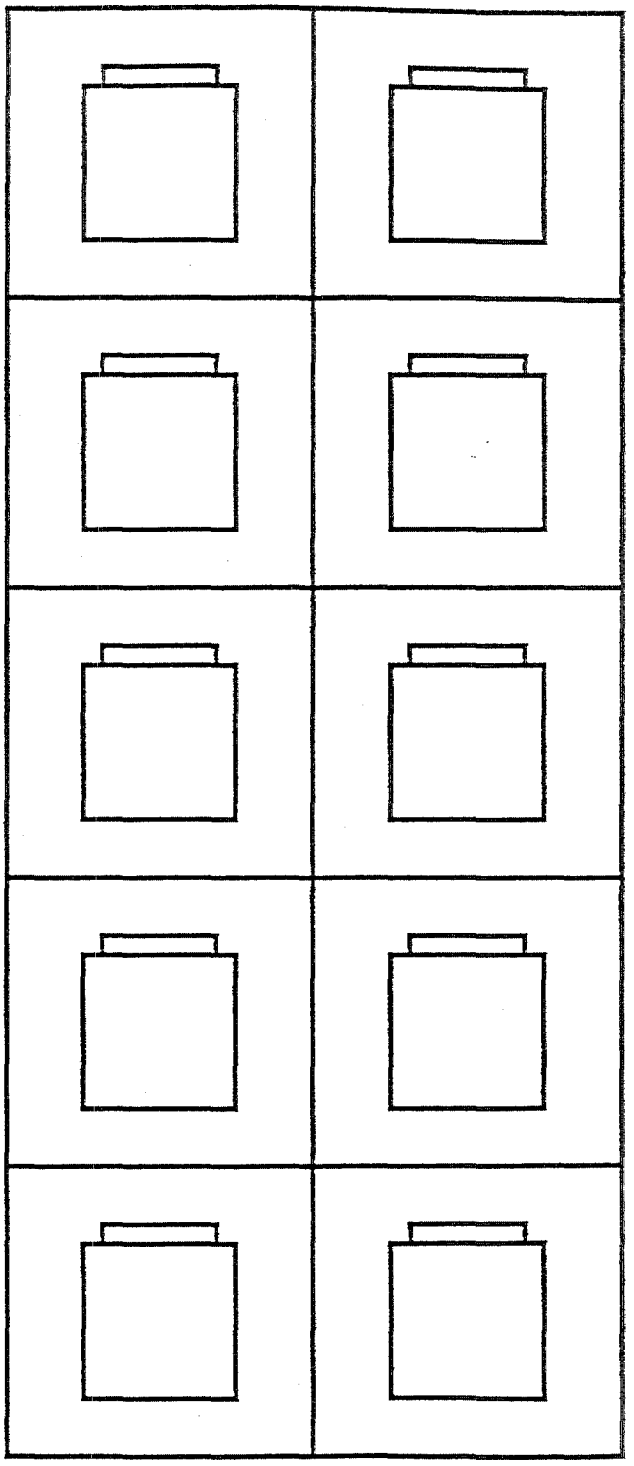
Materials needed:

One large egg per group
More than enough small eggs than needed to fill up the large egg
More than enough jelly beans than needed to fill up a small egg
Worksheet
Pencil

Trains



Cars



Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Trains	Cars

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Bundles	Sticks

Chapter 12- Whole-Number Place-Value Development

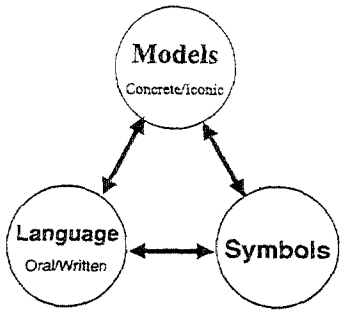
The Language of Place-Value

- Far more difficult than most adults realize. What is "one ten"? What is "ten ones"?
- Develop the concept with the play language and then gradually shift to the standard language.

Number Ideas Before Place Value

- Frequently count (and recount) by ones.
- Make sure the student is confident with a naïve technique before pushing for a more sophisticated technique.
- Make the connections

Representations of P-V Number



Basic Ideas of Place Value

- **Integration of Base-Ten Groupings with Counts by Ones**
  - Children who understand base-ten groupings will not need to count by ones to check the amount
- **Three Ways of Counting**
  - Count by Ones
  - Count groups and singles
  - Count by tens and ones

Place-Value Materials

Proportional Materials		Non-Proportional
Groupable	Grouped	

Place-Value Materials

Proportional Materials		III. Non-Proportional
I. Groupable	II. Grouped	
Popsicle Sticks Straws Unifix Cubes Bean Sticks	Number Blox Dienes' Blocks Cuisenaire Rods	Place-value chart Money Colored Chips Abacus Pocket Chart Number Line

Developing Place-Value Concepts and Procedures

- Use Grouping Activities
- Why do we use 10?
- The Strangeness of Ones, Tens & Hundreds
  - What is "one ten"? What is "ten ones"?
- Use "play language" first.
  - When students are comfortable with the language and the concept has been developed, then "sneak in" the standard language.

Equivalent Groupings and Representations

Bundles	Sticks
3	9
2	19
1	29

Oral Names for Numbers

- Two-Digit Number Names - show arrangements of materials. Have students give both base-ten name and the number name.
  - Start with the names twenty, thirty, through ninety.
  - Next do all the names twenty through ninety-nine.
  - Emphasize the teens as exceptions. Acknowledge that they are formed "backward" and do not fit the patterns.
- Three-Digit Number Names - similar to two-digits
  - Have the children model the numbers at their desk

Problems with Zero

	Hundreds	Tens	Ones	
Three hundred six	3	0	6	306
Twenty-seven	0	2	7	27

•Problems are encountered with written forms of numbers with zero --> *3006 for three hundred six*

•Emphasize the oral base-ten language form to help with zeros.

Symbolism as a Way of Recording

Trains	Cars
3	2

Number Sense Development

- Relative magnitude of numbers
  - Activities p. 162
- Connections to Real-World Ideas
  - Numbers around the class, school, home
- Approximating Numbers and Rounding
  - Nice Numbers - 100, 250, 600 are easier to work with than numbers like 72, 128, 379
- Money
  - Children are often asked to count money with no preparation in skip counting by different amounts
- Rounding - substituting a nice number for easier computation

Numbers Beyond 1000

- Extending the place-value system
  - Generalize the grouping idea - 10 in a group makes one group in the next position.
  - The oral names are duplicated every three to the left: one, ten, hundred
- Conceptualizing large numbers
  - Creating References for Special Big Numbers
    - 1000, 10,000 or 1 million
  - Estimating large quantities
    - Explore through group projects,home projects, literature

Activities

- Zurkie
- Trains and Cars
- Bundles and Sticks
- Hundreds Board

DIRECTIONS:
CUT OUT THE 16 SQUARES. FIT THEM TOGETHER SO THAT THE EDGES THAT TOUCH NAME THE SAME NUMBER.

49 5x8	9x4 24 21 9x2	2x8 7x6 56	8x7 32 63 9x3
42 36 81	18 9 40	6x6 5x4	30 25 7x3
64 3x7 7x7	9x9 7x9 16 36	12 4x8 5x6	16 3x4
20 4x4 8x8	21 9x5	27 5x5 6x4 28	4x7 45 3x3

What is the Operation?

Look to see if you add, subtract, multiply, or divide.

A. When you combine two or more things you <u>add</u>.

B. When you find the difference between numbers or amounts, or which is larger or taller you <u>subtract</u>.

C. When you repeat one number several times you <u>multiply</u>.

D. When you separate something into groups of the same amount you <u>divide</u>.

Circle the operation symbol you would use to solve the question.

Bruce rode a bicycle for 14 hours. He took a 15 minute rest break every 2 hours. He made 205 miles on the trip.

1. If he had 6 rest breaks, how many minutes did he spend resting?

   \+ - x ÷

2. How many hours did he spend riding the bicycle?

   \+ - x ÷

Oscar's bike went 32 miles on one gallon of gasoline. Sam's bike went 37 miles on one gallon of gasoline.

3. Sam's bike got how many miles further than Oscar's bike on one gallon of gasoline?

   \+ - x ÷

4. How far can Oscar go on 5 gallons of gasoline?

   \+ - x ÷

5. If Sam paid $5.85 for five gallons of gasoline, how much does each gallon cost?

   \+ - x ÷

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Developing Number Concepts Using Unifix® Cubes

Kathy Richardson

Addison-Wesley Publishing Company
Menlo Park, California • Reading, Massachusetts
London • Amsterdam • Don Mills, Ontario • Sydney

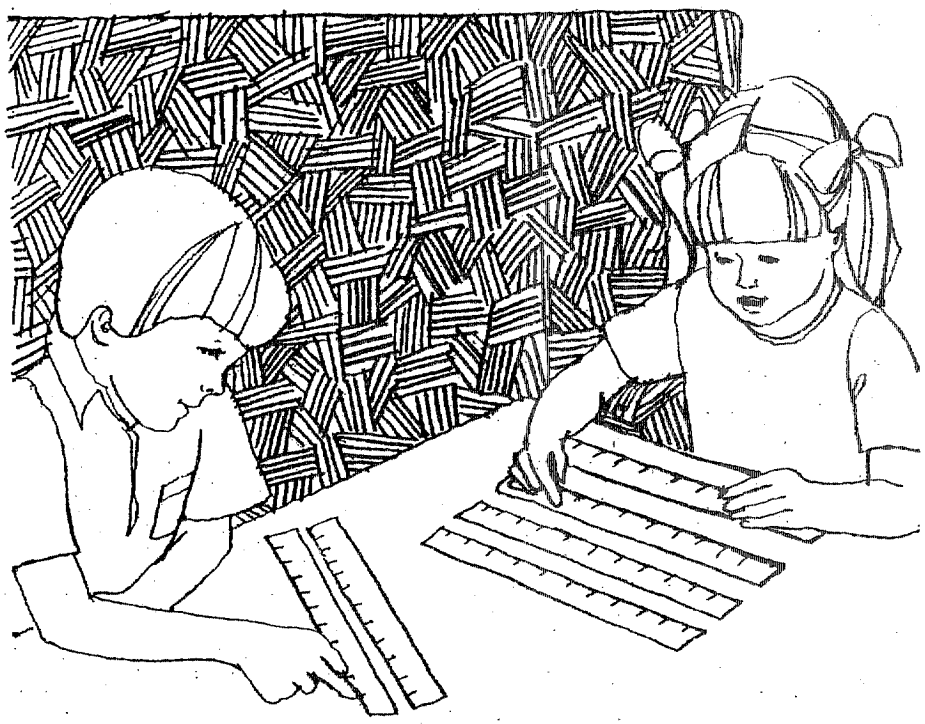
ACTING OUT ADDITION AND SUBTRACTION STORIES—Using Real Things*

Materials: Various objects readily available in the room

Tell addition and subtraction stories, and have the children act them out, using materials readily available in the room (such as books, chairs, pencils, etc.). These stories can be done with the whole class or with small groups. When working with the whole class, be sure you keep a checklist of the children who have had turns so that everyone will get a chance to participate. Present a mixture of addition and subtraction stories, some using mathematical terms and some not using them.

For example: Alice put four rulers on the table. Jim put two more rulers on the table. How many rulers are on the table? (Addition)

*Based on MATHEMATICS *THEIR* WAY, p. 204.



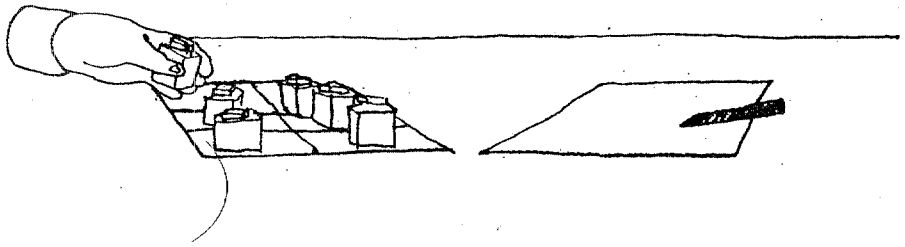
Richardson (1984)

WHAT'S MISSING?

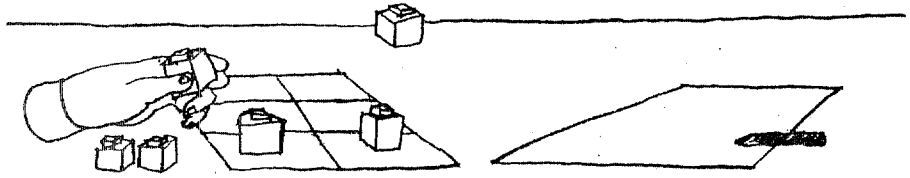
Materials: Unifix cubes (one color) • Number shape • Individual chalkboards

Partner A makes up a problem for Partner B, using cubes and the number shape. Partner B records the equation.

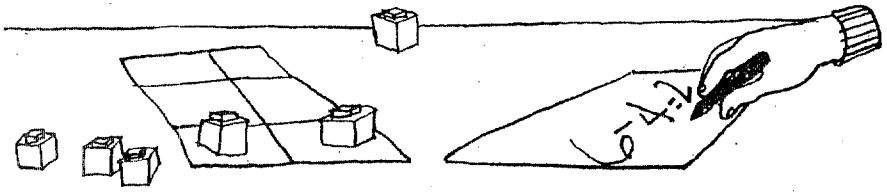
Partner A fills the number shape with Unifix cubes.



Partner B closes his or her eyes while Partner A removes some of the cubes.



Partner B opens her or his eyes and writes the equation to tell what happened.



The partners then switch roles.

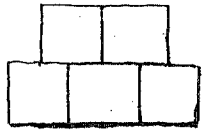
Richardson (1984)

ADDITION AND SUBTRACTION SPIN IT

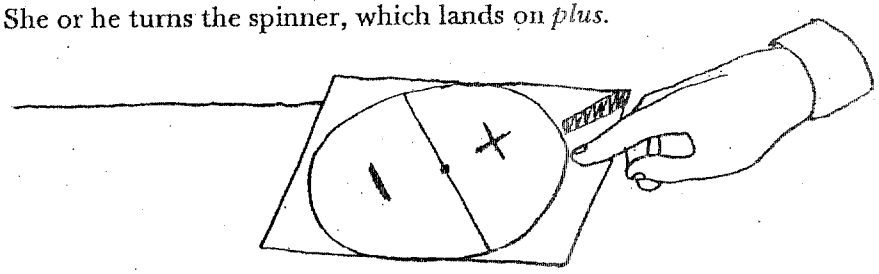
Materials: Various number shapes • Unifix cubes • Plus and minus spinner—see p. 216 for directions for making • Paper

Have available a variety of number shapes with which the children have already worked. A child chooses one of the number shapes and turns the spinner to see if he or she is to add or subtract. The child performs the appropriate action and records the equation.

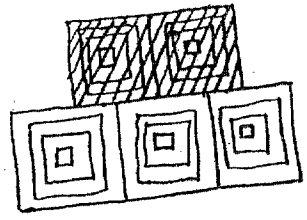
For example: The child picks a number shape.

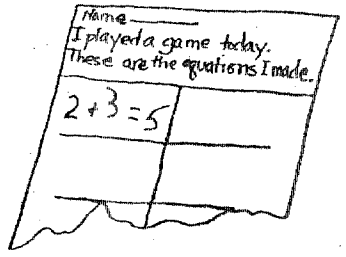


She or he turns the spinner, which lands on *plus*.

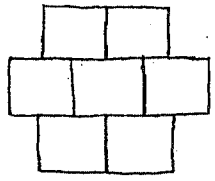


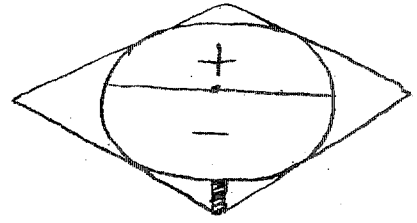
The child puts cubes of two colors on the number shape and writes the equation.





He or she chooses another shape and turns the spinner again. The spinner lands on *minus*.





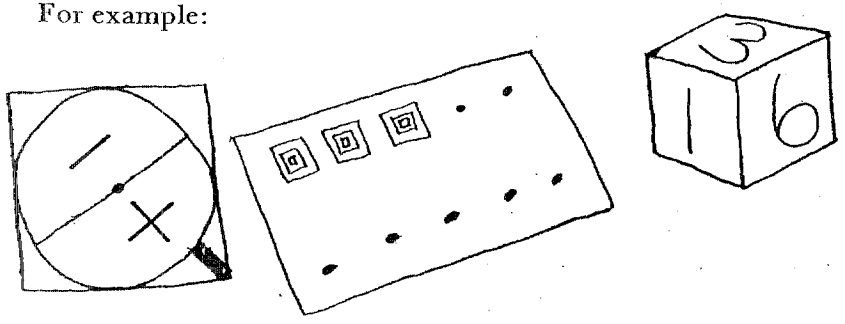
Richardson (1984)

Roll and Count

Materials: Plus and minus spinners—see p. 216 for directions for making • Die • Working space paper for each child—see p. 210 for directions for making • Unifix cubes

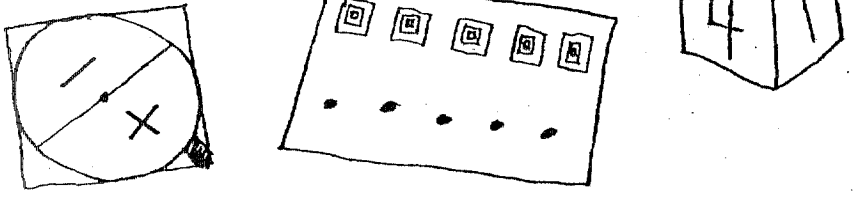
The children take turns rolling the die and turning the spinner. Each child adds or subtracts cubes from his or her working space paper according to the die and spinner.

For example:

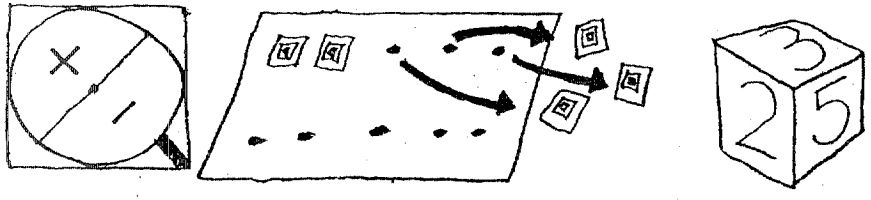


That's a plus, and I rolled a three—plus three.

Another plus.

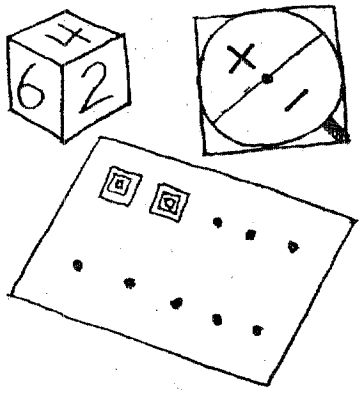


I need two more—plus two.

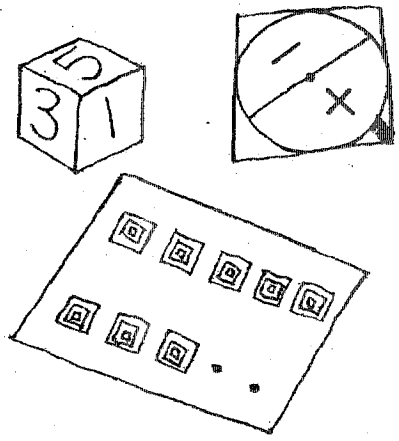


I got a minus. I rolled a three. That's minus three.

If the spinner and die indicate they are to take away more cubes than they have on their papers, the children say "impossible" and spin again. If they are to add more cubes than they have room for on their working space papers, they each get an additional paper.



Minus four—impossible!!



Plus five—we need to get another paper.

Richardson (1984)

SNAP IT

Materials: Unifix cubes

A group of children who need to work with the same number should be seated in a circle on the floor or at a table. They put together whatever number of cubes they are to work with for this period. On the signal "Snap," they all break their trains into two parts and hold them behind their backs. (They may also choose to break no cubes off and have all the cubes in one hand and none in the other.) Each child takes a turn (in order, going around the circle), showing what is in one hand and then the other while the other children say the combination shown. (The child showing the cubes should not say the combination. This will force the other children to look at the cubes to determine the combination formed.)

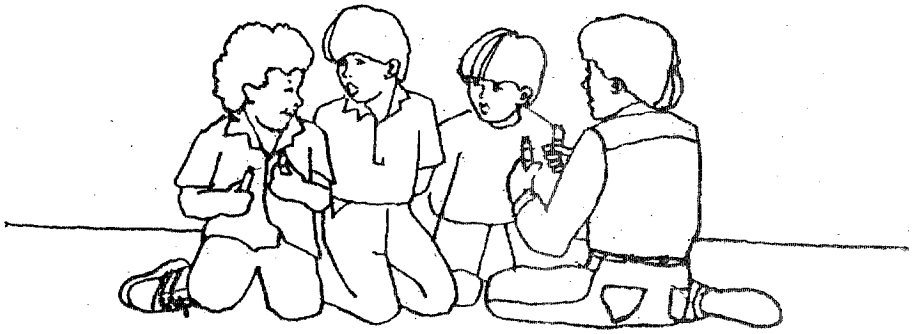
For example: All these children are working with five cubes.

Three and two.

Ask the children to snap the cubes back together, and then ask them to break off a different number of cubes.

Break off five. How many? Three and five.

During some lessons, have the children break off various numbers of cubes in random order. Other times have them break them off in order. For example, say, "Break off one. How many? Break off two. How many? Break off three. How many?"



One and four. etc.

When all the children have had a turn, they put the two parts back together; on the signal "Snap," they break their cubes into different combinations and go around the circle again. Repeat several times. The same combinations will appear again and again. Through this repetition the children will learn the combinations.

Extension: When the children are able to say the combinations for a particular number with little or no hesitation, have the child showing the cubes keep one hand behind his or her back while the other children predict how many cubes she or he is holding. The child can then show the cubes, and the other children can check their predictions.

Working with numbers above six:

When working with numbers above six, it is difficult to tell at a glance how many cubes are in some of the combinations. Instead of having each child form the combination of her or his choosing, you call out the number of cubes you want the group to break off their trains.

For example: *We are going to work with eight today.*
Snap together eight cubes. Now break off two.

At your signal "How many?" the children say the combination formed. (Do not ask *how many* until it appears each child has determined the number of cubes in the combination.)

Richardson (1984)

ACTING OUT MULTIPLICATION STORIES—*Using Real Things*

Materials: Things readily available in the room

Tell the children stories, and have them act out the stories using real things readily available in the room. Have the group direct the children who are acting out the story so that no individual is put on the spot.

For example:

Paul and Linda line up some chairs. They make three rows with four chairs in each row. How many chairs do they line up?

Dennis, Frances, Kathy, Bernadette, and Jamie put five chairs at three tables. How many chairs do they use?

Manuel gives five children two pencils each. How many pencils does he pass out?

Bonnie makes four stacks of books. She puts three books in each stack. How many books does she use?

Carolyn puts five boxes of crayons on the table. Each box holds eight crayons. How many crayons are in the boxes?

Lee puts three erasers at each table in the room. There are six tables. How many erasers does he put out?

Richardson (1984)

BUILDING MODELS OF MULTIPLICATION PROBLEMS

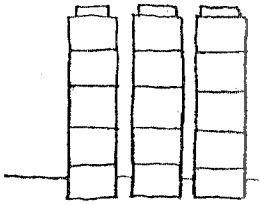
Materials: Unifix cubes

The following activities require the children to interpret various language patterns and build the appropriate models. This lesson will need to be repeated over and over again for some children. Build the models along with the children while they are learning.

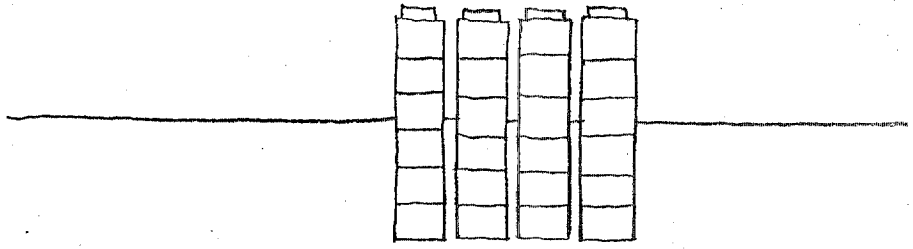
Stacks

Build three stacks of five.

The children build:



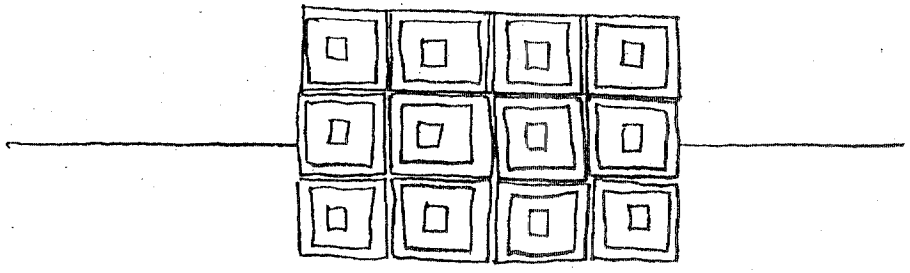
Build four stacks of six.



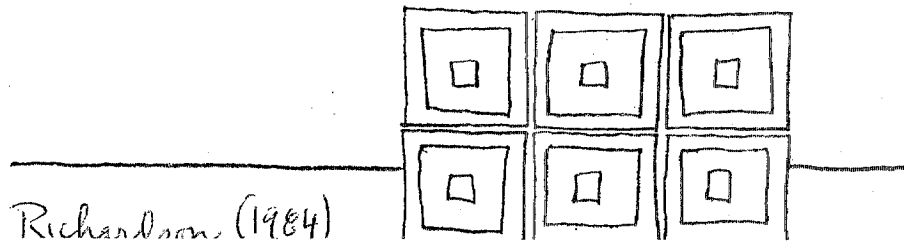
Rows

Make three rows of four.

The children build:



Make two rows of three.



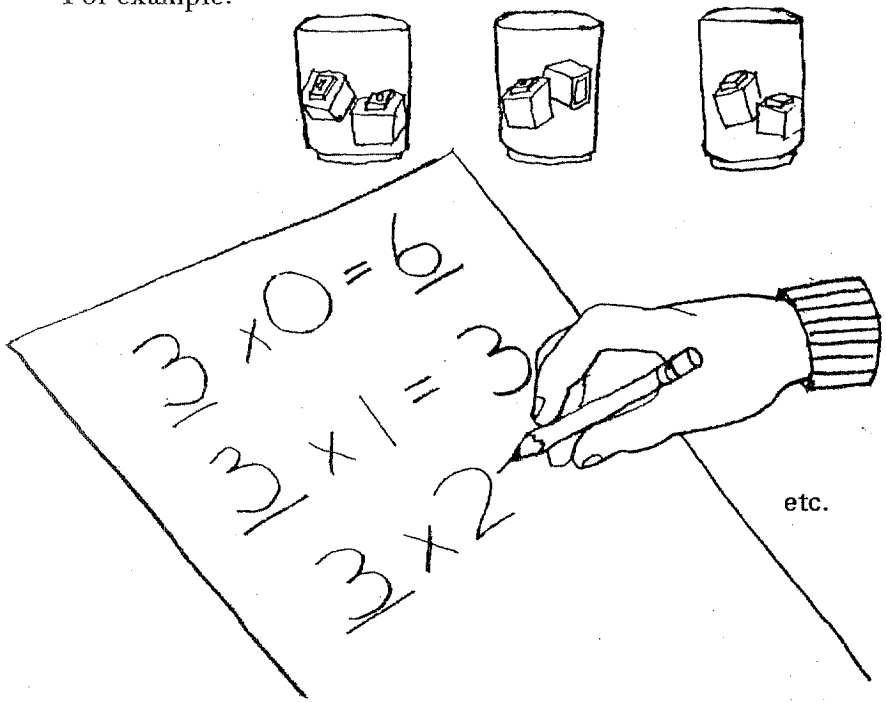
Richardson (1984)

CUPSFUL

Materials: Unifix cubes • Plastic cups • Dice (optional) • Worksheets—see blackline master 76 (cut in half, use half shown in drawing below)

The child takes the number of cups she or he wants to use for the activity (or the child can roll a die to determine the number of cups). He or she writes the number of cups in the appropriate place on the worksheet, then uses the cubes and cups to solve the problems and writes the answers.

For example:



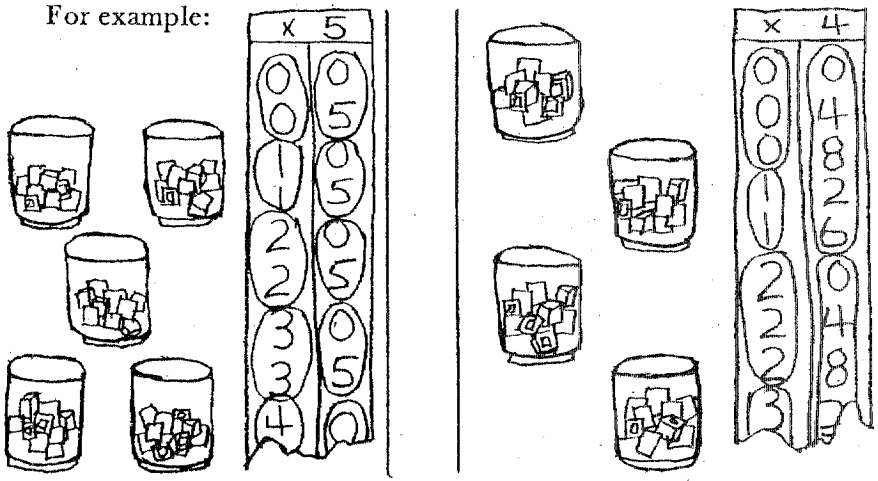
I used four cups yesterday. Today
I want to use three cups.

Extension: Looking for Patterns

The children can record the information on the worksheet and look for patterns.

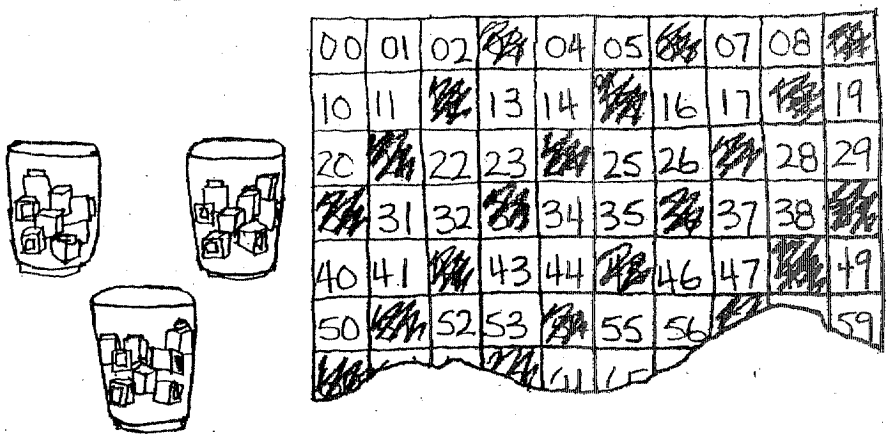
Have them record the answers on the strip used in the place value activities (see page 145). Have them loop the patterns they find and then extend the pattern without using the cubes.

For example:



Have the children color in the answers on the 00–99 chart, then have them extend the pattern without using the cubes.

For example:

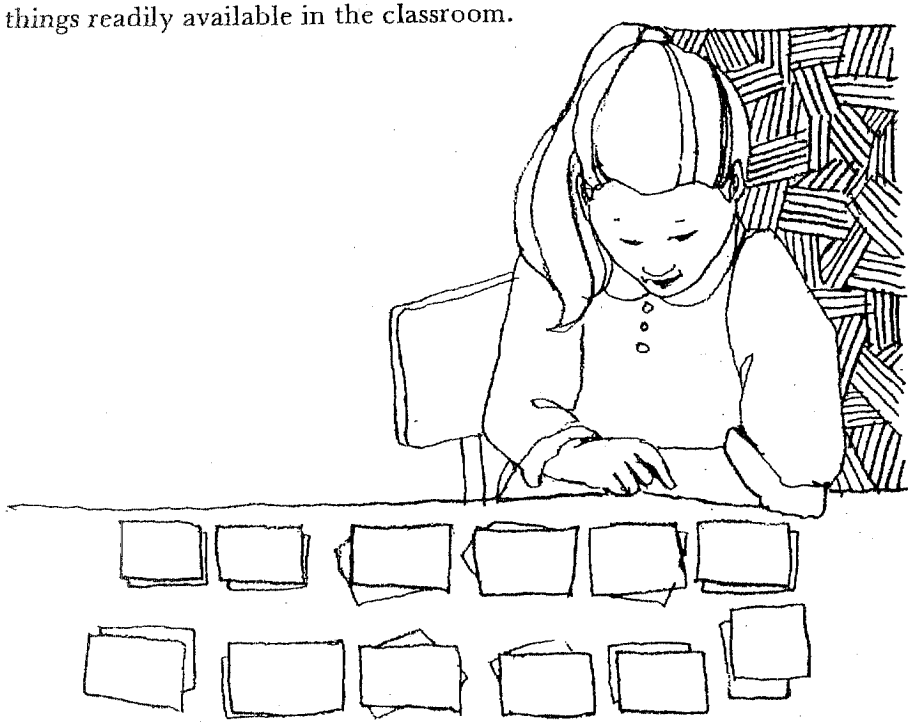


Richardson (1984)

ACTING OUT DIVISION STORIES—Using Real Things

Materials: Various objects readily available in the room

Tell the children stories, and have them act out the stories using real things readily available in the classroom.



For example:

Angela has twenty-four pieces of paper. Each child needs two pieces of paper to make a booklet cover. To how many children can she give two pieces of paper?

Linda had sixteen pencils. She is going to divide them up among five of her friends. How many pencils will each friend get?

There are fourteen books on the shelf. If each child is to take three books, how many children will get three books?

There are eight bottles of glue. Each table needs two bottles of glue. How many tables will get glue?

Note: Let the children deal with the concept of "leftovers" or remainders beginning with these very first experiences.

Richardson (1984)

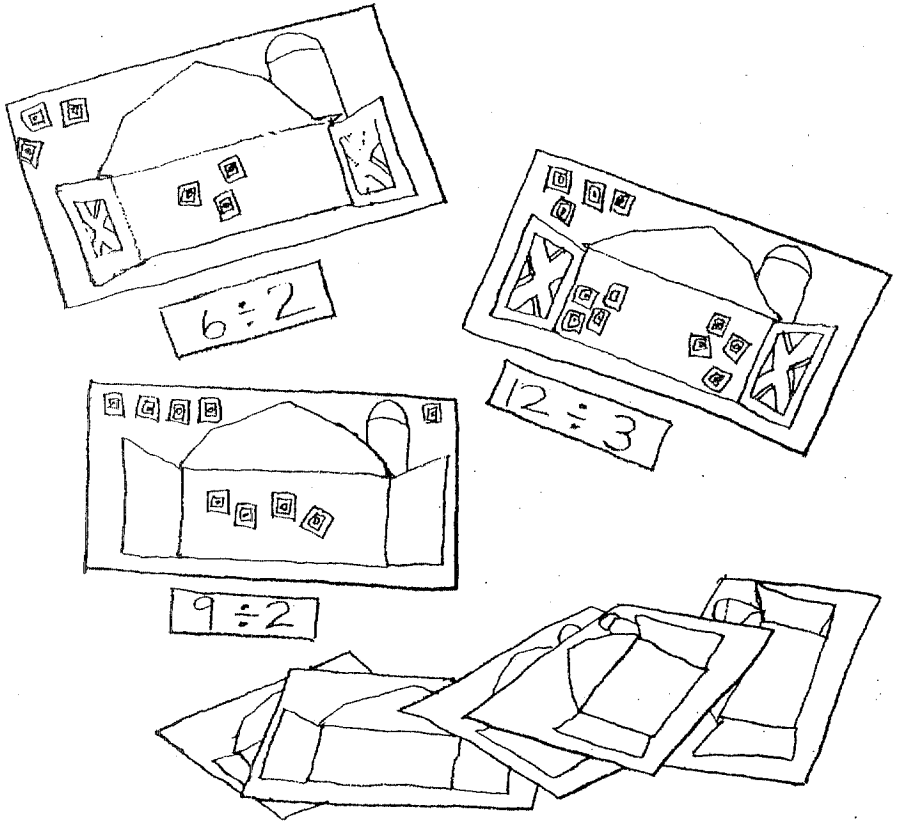
COUNTING BOARDS

Materials: Unifix cubes (sorted by color) • 1 set of counting boards for each child—see p. 210 • Division equation cards—see p. 215 for directions for making

The children can use the counting boards at a variety of levels.

Using the Equation Cards

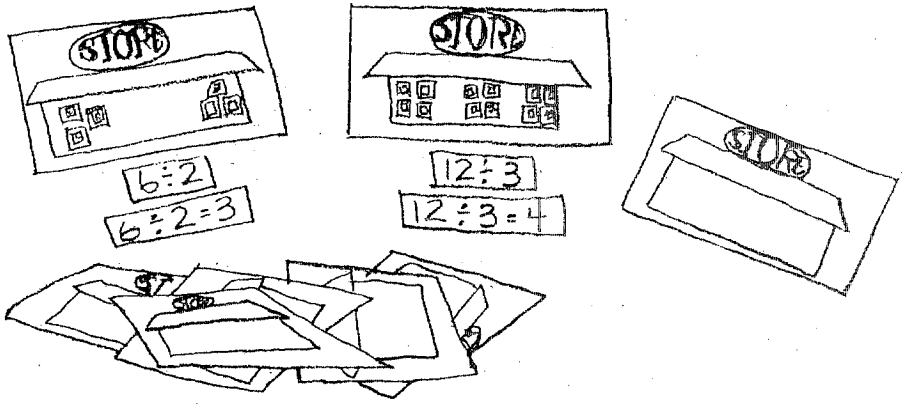
The child chooses a set of counting boards, a container of cubes, and some division equation cards. He or she spreads out the eight boards, puts an equation card with each board, and, after deciding what she or he wants the cubes to represent, puts them out on the boards according to the equations.



(This level is appropriate for a child who needs to focus on the process of division for a time and who does not yet need to be concerned with writing the whole equation.)

Making Equation Books

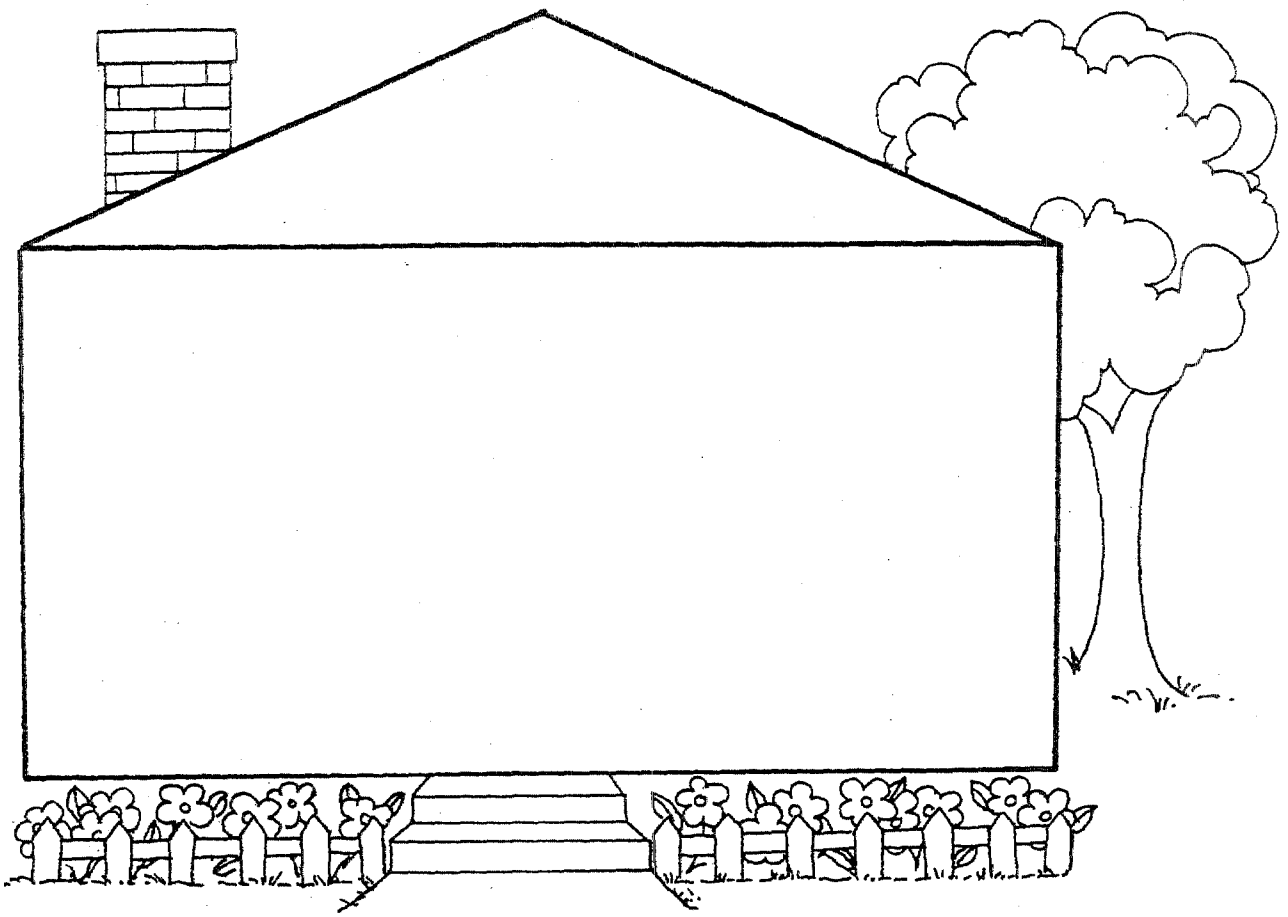
The child chooses a set of counting boards and gets a container of Unifix cubes, equation cards, and 2 x 6 pieces of paper. He or she spreads out the counting boards and equation cards and places the Unifix cubes on the boards according to the cards. The child then writes each problem and the answer on a piece of paper. When all the problems have been completed, the papers are stapled into a little book.

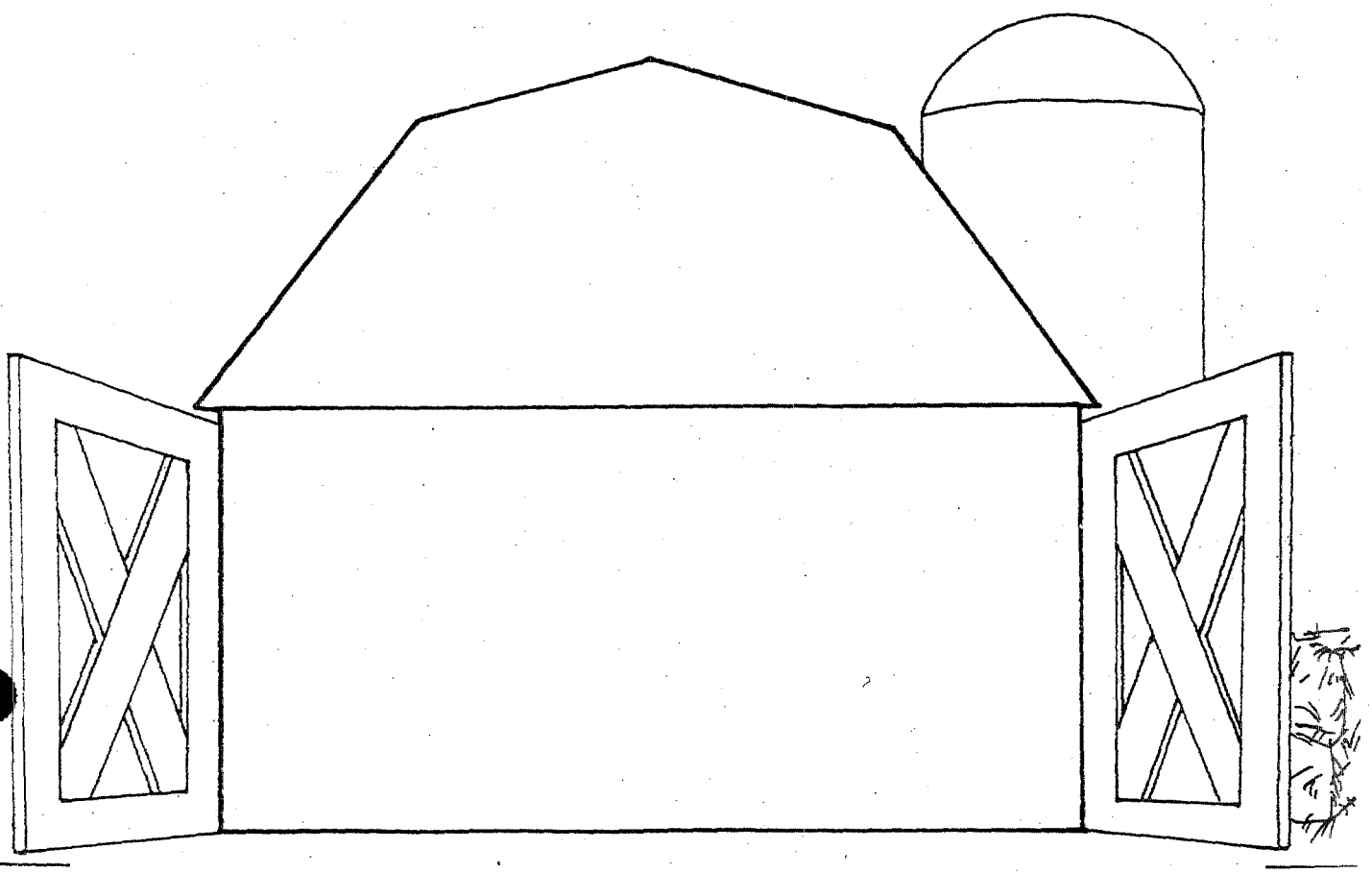


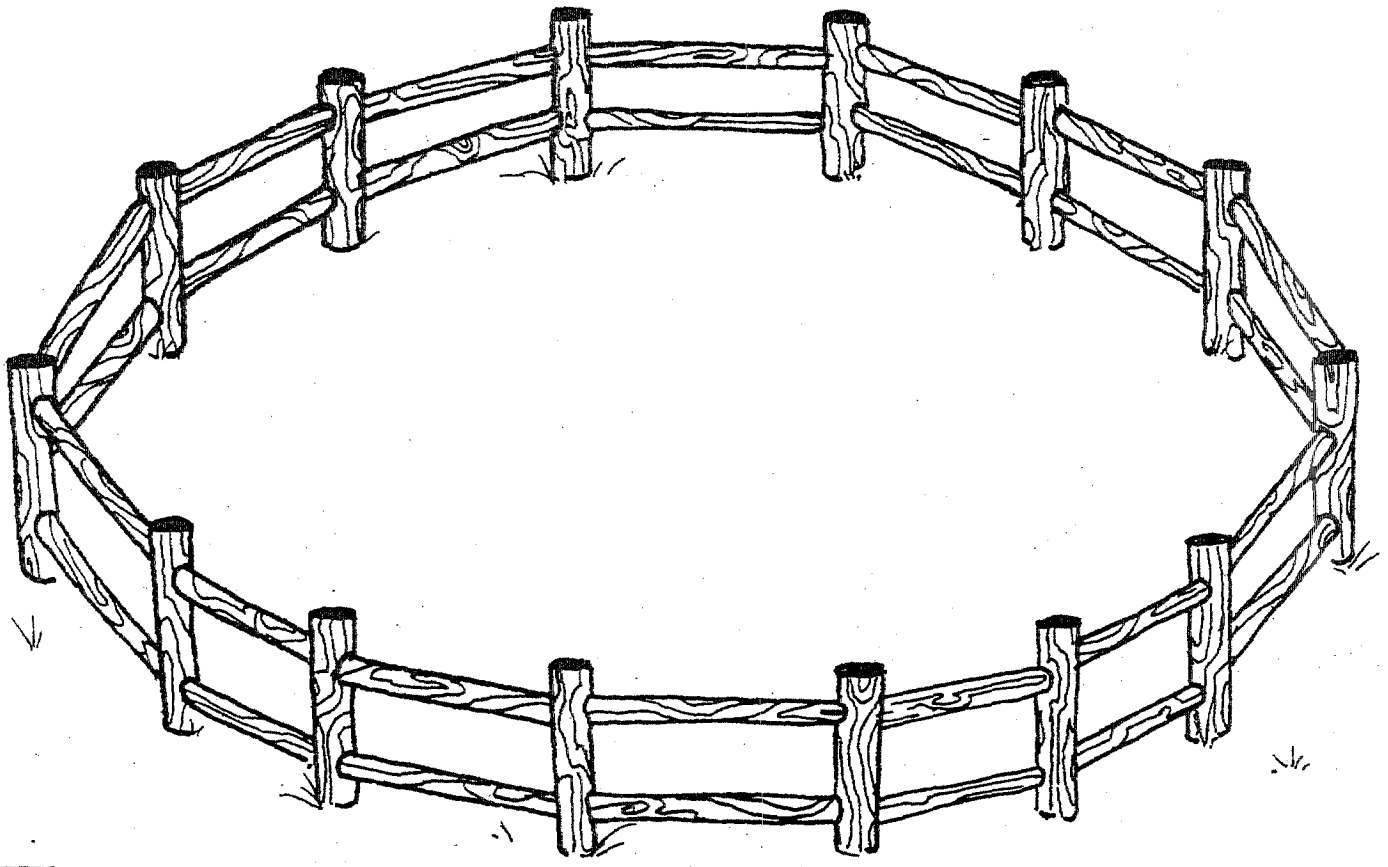
Making Up Equations

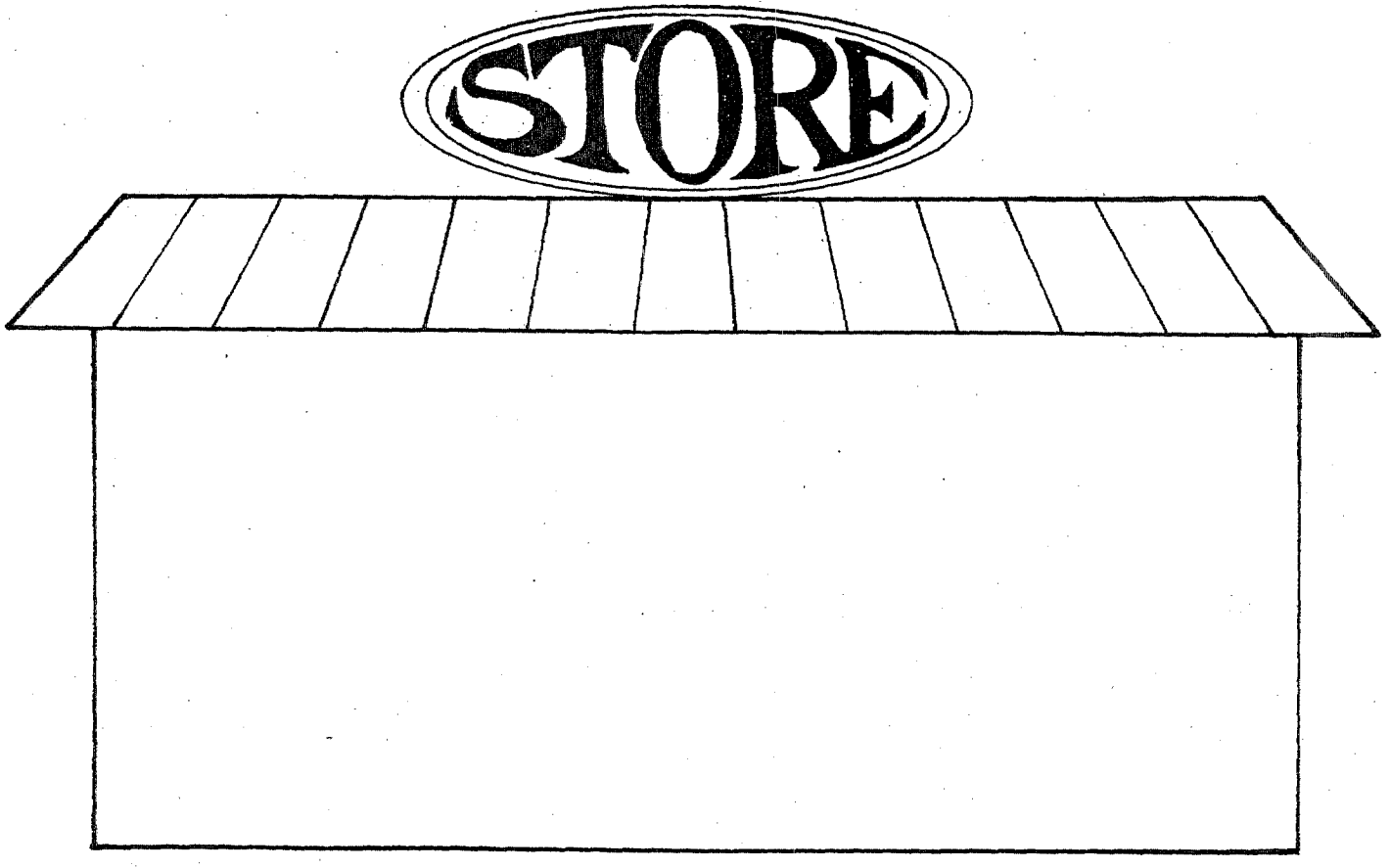
The child no longer uses equation cards but instead makes up his or her own problems.

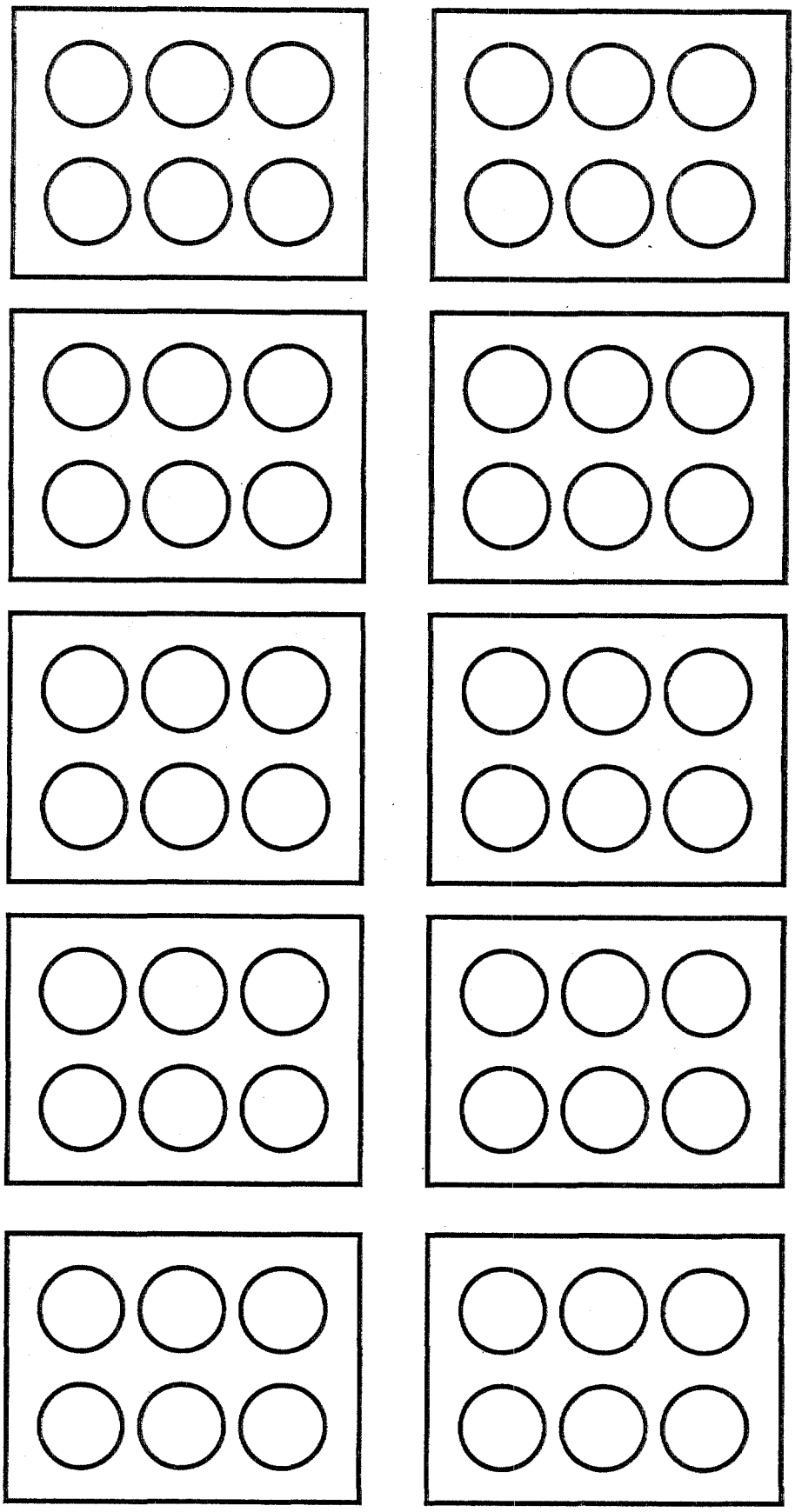
Richardson (1984)







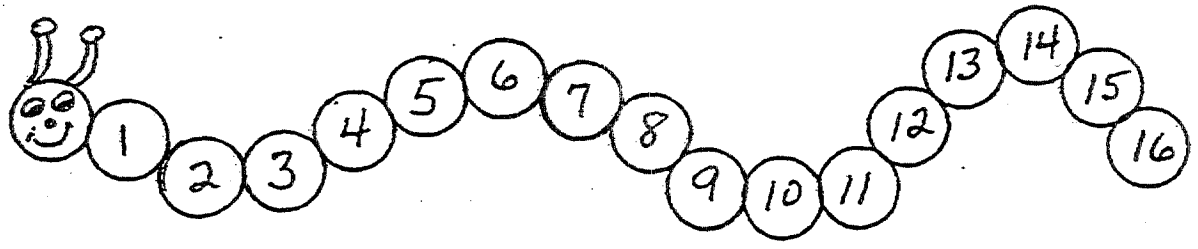




COUNTING SEQUENCE WORM

Description

This aid is designed to provide students with a fun experience in putting numerals, fractions, decimals, etc. in an ordered sequence by making a worm.



Directions for Making

You need:

16 circular disks cut from construction paper or card stock and a "worm head."
disk pattern (or compass), scissors, and marking pen

Use your disk pattern or compass to draw 16 circles on green construction paper (or posterboard). Then write the numerals, fractions, decimals, etc. on the sixteen circular disks. Then take a piece of green construction paper (or posterboard) and draw the worm's "head." This will give you the pieces for your counting sequence worm.

Suggested Uses

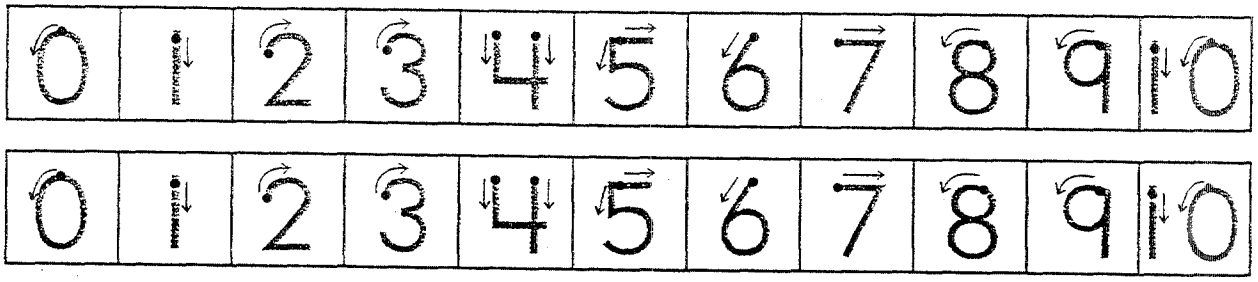
Put the worm's head in the chalk tray or on the floor. Have each student in turn come up and place the "next" disk in order to create the "worm."

Presented by: Dr. Janie M. Cates, College of Education, The State University of West Georgia, Carrollton, GA 30118
(770) 836-6560

LESSON 11 PRACTICE

Name _____

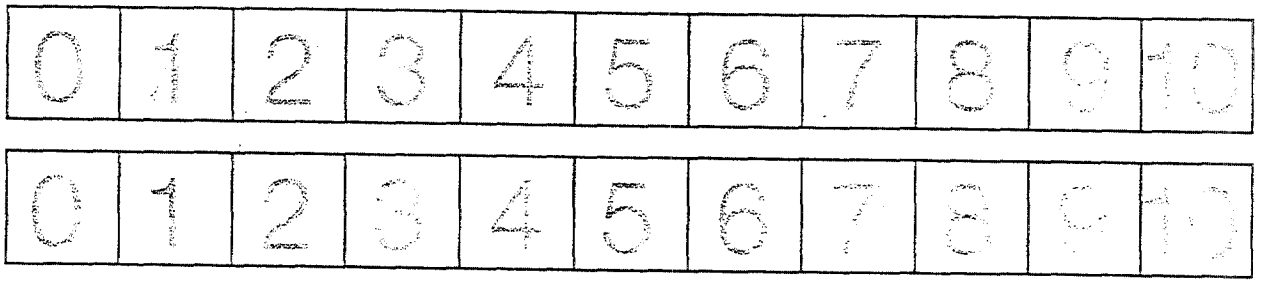
Trace.



Trace.

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

Write.



Name: _____ Date: _____

Wagons and Cans

There are 9 bags of aluminum cans to be taken to the recycling center. The bags contain 1, 2, 3, . . . , 8, 9 pounds of cans, respectively. The students in Mrs. Smith's class are going to place the bags into three wagons so that each wagon will carry the same weight. How should they do it?

Name: _____ Date: _____

In the Cafeteria Line

Elaine, Fran, Gail, and Harriet are in line at the cafeteria. Elaine, Gail, and Harriet each bought a hamburger. The girls on either side of Gail each bought a container of milk. Which girls bought both?

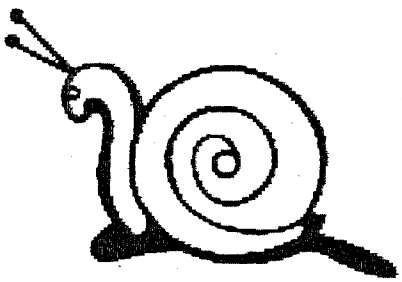
Name: _____ Date: _____

Which comes next?

Which kind of block comes next, the triangle or the circle?

Name: _____ Date: _____

snails, snails, snails



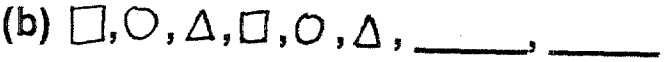
Frank had 2 snails in his tank at the end of the first week. At the end of the second week, he had 4 snails. At the end of the third week, he had 8 snails. If this pattern continues, how many snails will he have at the end of the fifth week?

Name: _____ Date: _____

what's next?

What's next for each of these?

(a) 53, 47, 41, 35, _____, _____

(b)  **_____, _____**

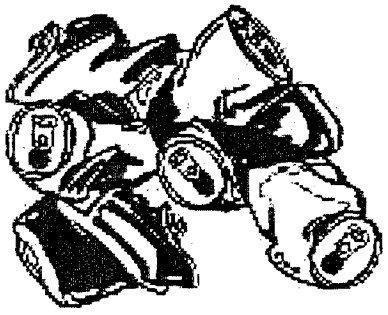
(c) 1, 1, 2, 3, 5, 8, 13, _____, _____

(d) 3, 12, 5, 9, 7, 6, 9, _____, _____

Name: _____ Date: _____

Collecting Cans

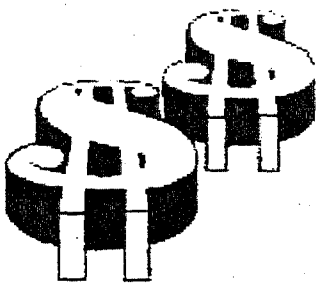
The Girl Scouts were collecting tin cans to recycle. Helen collected the most cans. Amanda collected 7 cans less than Helen. Alex collected 4 more cans than Amanda. Alex collected 14 cans. How many cans did the three girls collect altogether?



Name: _____ Date: _____

Marianne's Allowance

Marianne was given her allowance on Sunday. On Monday, she spent $1.50 for lunch in school. On Tuesday, her sister, Lisa, paid her the $1 she owed her. Marianne now has $3.00. How much was her allowance?



Name: _____ Date: _____

How far is Jeremy from his home?

On his morning walk, Jeremy leaves his home and walks 20 blocks. Then he turns right and proceeds for 10 blocks, turns left for another 20 blocks, and then another left turn and walks 10 blocks. How far is he from his home?

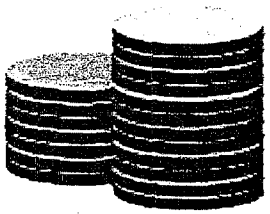
Name: _____ Date: _____

How high is the ball?

A ball is dropped from a height of 80 feet, and rebounds one-half the height each time it hits the ground. How high will it rebound after it hits the ground for the fifth time?

Name: _____ Date: _____

Is Mort *right?*



Mort said that he has more coins than his sister, Ruth. So, he has more money than she does. Is he right? Why or why not?

Name: _____ Date: _____

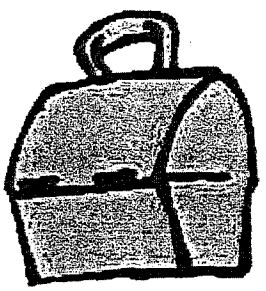
Gone Fishin'

Last week, Jim and his dad went fishing for three days. They caught a total of 15 fish, with a different number caught each day. How many fish did they catch each day?

Name: _____ Date: _____

Who's lunchbox is this?

Myra, Nancy, and Orville each brought their lunch to school in a lunchbox. One lunchbox was blue with one cookie inside, one was yellow with two cookies inside, and one was red with three cookies inside. Which lunchbox belongs to which child?



(1) Myra had more cookies than Nancy.
(2) Orville's lunchbox is not blue.
(3) The yellow lunchbox belongs to a girl.

Name: _____ Date: _____

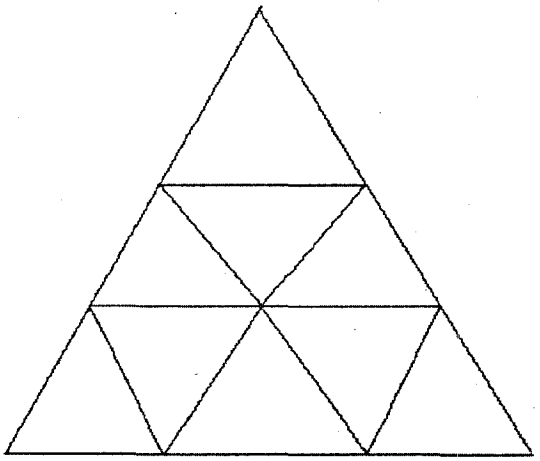
Who teaches what?

Karen has three different teachers for science, mathematics, and music. Mrs. Alexander enjoys her work as a music teacher. Mr. Brown used to teach science, but doesn't any more. Mrs. Carlton was absent last Tuesday. Who teaches each subject?

Name: _____ Date: _____

How many triangles are there now?

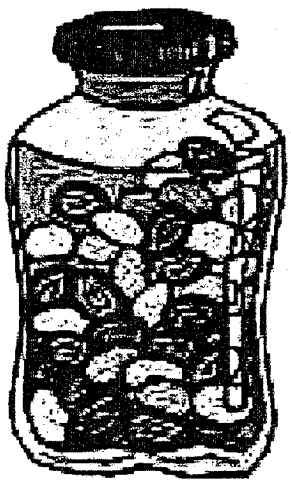
How many triangles are there in this picture?



Name: _____ Date: _____

A Jar of Jellybeans

A jar filled with jellybeans weighs exactly 48 ounces. When exactly half of the jellybeans are eaten, the jar and the remaining jellybeans weigh 32 ounces. How many ounces of jellybeans were originally in the jar?



Name: _____ Date: _____

How many breaths??

How many breaths do you take in one 24-hour day?

Point #1:
Citing a magazine vs. a journal article - Be sure that it is a magazine rather than a journal article. (Usually this distinction is made in the title: Mailbox magazine; a magazine for teachers; Journal of Education; Mathematics Journal for Teachers; etc). If a journal article follow the APA sample sheet we gave. If a magazine, follow this:

More than one author:
Duplechain, R., & Gresham, R. (2002, October 30). Mathematics instruction: Preservice teachers. *Mailbox*, 1-11.
One Author:
Duplechain, R. (2002, October 30). Mathematics instruction: Preservice teachers. *Mailbox*, 1-11.

Notice:
The comma and the "and" sign when one than one author is involved.
First names are noted using initials only.
One space between period and (2002).
Magazines (not journals) need a month and day.
A period after (...October 30)
One space from date and title
Only the first word of title is capitalized and the first word after the colon
Name of magazine is italicized

Page numbers do not have "p." designated. Instead only numbers "1-11".

Point #2:
There are many possible ways of citing from the internet. If you go to grad school, you'll need to purchase an APA manual in order to determine which format is closest to the document you are trying to cite. But for this activity, I feel the closest formats are the following:

Article in an Internet-only journal:
Gresham, R., & Duplechain, R. (2002, February 7). Teaching mathematics: Preservice teachers. Mathematics, 3, Article 001a. Retrieved October 30, 2002, from http://pbs.org/mathematics/teacher education.html

Multipage document created by private organization, no date (in our case: lesson plans, activity ideas, games, etc):

Name of organization. (n.d.). Title of document. Retrieved October 30, 2002, from http://www.pbs.org

Chapter or section in an Internet document (in our case: lesson plans, activity ideas, games, etc):

Name of organization. (1998, July 7). Title of document. Retriedved from http://www.benton.org/Library/Teacher Education/two.html

****
Acceptable adaptations of these internet citations FOR THIS CLASS ONLY:

Lesson plan retrieved and adapted from lesson at (complete URL address)

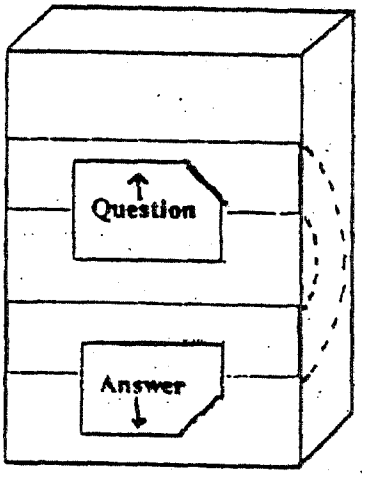
Game retrieved and adapted from educational activities at (complete URL address)

Activity retrieved and adapted from educational activities at (complete URL address)
****

MEMORY BANK

What is a Memory Bank?

A Memory Bank is a tactile/visual learning tool. Students drop cards with questions showing into the top window, and the cards come out the bottom, answer side up. Whatever the grade (including college!), whatever the content, it is a marvelous hands-on drill and practice tool.



Students drop cards in the slot *question* side up....

...and the cards flip over to come out *answer* side up!

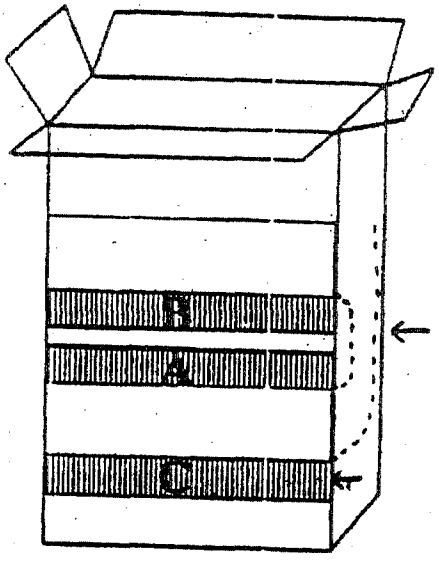
What materials are needed?

- Clean half-gallon milk or juice carton (paper)
- Tagboard (poster board) or card stock
  Strips cut from the new plastic file folders work great.
- Clear Contact paper (or access to laminator)
- Masking tape
- Colored Contact paper
- Scissors
- Exacto knife or razor-type box cutter
- Stapler, glue and/or spray adhesive
- Optional decorating materials: yarn, construction paper, etc.

4. Attach the slide piece inside the milk carton.

A. The slide piece is longer and it fits behind the center piece.

B. Insert slide piece into the lower window and fold the bottom end of the slide piece down. Tape in place C.



Test the slide and the space between the two strips with half of a 3" x 5" index card. Be sure the card slides through easily. If not, you will need to raise or lower the top edge of the longer strip before securing it with tape.

Wrap masking tape all the way around the container at line C to further secure and reinforce.

5. Close the top of the carton.

- Fold two opposite flaps and secure with masking tape.
- Fold the remaining two flaps and apply tape again.

*To ensure a sturdy Memory Bank, wrap masking tape all around the container to reinforce it.

6. Cover the Memory Bank with contact paper, or decorate as desired.

- Use a number, picture or drawing to designate the top of the Memory Bank.

Memory Bank Patterns

score before laminating

Fold this flap down and attach to the outside of the container on line B.

Pattern for Center Section

Center for Success in Learning
4949 Westgrove, #180
Dallas, TX 75248
214/407-9277

Fold this flap up and attach to the outside of the container on line A.

Pattern for Slide

Center for Success in Learning
4949 Westgrove, #180
Dallas, TX 75248
214/407-9277

Fold this flap down and attach to the outside of the container on line C.

Memory Bank Patterns

score before laminating.

Fold this flap down and attach to the outside of the container on line B.

Pattern for Center Section.

Center for Success in Learning
4949 Westgrove, #180
Dallas, TX 75248
214/407-9277

Fold this flap up and attach to the outside of the container on line A.

Pattern for Slide

Center for Success in Learning
4949 Westgrove, #180
Dallas, TX 75248
214/407-9277

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Fold this flap down and attach to the outside of the container on line C.

Mathematical Scavenger Hunt

★ www.coolmath.com/calculators

1. How many statute miles is it from Atlanta, GA to Denver, CO?
2. How many statute miles is it from Charleston, SC to Los Angeles, CA?
3. If the diameter of a circle is 12, what is the circumference? Round to the nearest hundredth.
4. If the area of a circle is 250, what is the diameter? Round to the nearest hundredth.
5. Use the arithmetic calculator to answer the following questions.
   $4623 \times 25 =$ $1892 \div 34 =$
   Is 532×16 greater or less than 9402?
6. If your dog is 8 years old, how old would it be in human years?
7. How many dog years does 1 human year equal?
8. If you weigh 110 pounds and ran 4 miles, how many calories would you burn?
9. If you weigh 150 pounds and wanted to burn 500 calories, would you have to run more or less than 5 miles?

★ http://www.eyelid.co.uk/numbers.htm

10. 1 is shown by _____.
11. 100 is represented by _____.
12. 2 frogs plus 1 finger equals _____.
13. 2 lotus plants minus 4 coils of rope equals _____.

★ http://math.rice.edu/~lanius/pro/rich.html

14. You have been offered a job, and you'll have your choice of two payment options:

    1. One cent on the first day, two cents on the second day, and double your salary every day thereafter for thirty days; or

    2. Exactly $1,000,000. (That's one million dollars!)

    Which option would be the smartest one to choose?

15. How much would you earn after day 12?
16. How much would you earn after day 30?

★ www.aaamath.com/geo318-polygons-numbers.html

17. What is the name of a polygon with 5 sides?
18. How many angles does a heptagon have?
19. How many sides does a nonagon have?

★ http://oncampus.richmond.edu/academics/as/education/projects/webunits/math/shopping.html

20. Read "Shoes Galore." Which would be a better deal?
    Buy one pair, get the second pair free, or
    Buy two pairs, 40% off each pair.
21. Read "Shirts, Shirts, and More Shirts." Which would be a better deal?
    20% off a $17.00 shirt, or
    30% off a $19.00 shirt.
22. Read "Pants, Jeans, Skirts, and Slacks." Which would be a better deal?
    $45.00 – buy one pair, get the second ½ off, or
    $65.00 – 50% off the entire rack.

MAE 4326 – Study Guide
Chapters 1-22

1. What does it mean to teach according to the *Standards*?
2. What does it mean to "do" mathematics?
3. What are some verbs of "doing" mathematics?
4. What are some verbs of the traditional mathematics classroom?
5. What is basic in mathematics?
6. What is constructivism?
7. Why is it beneficial to teach through constructivism?
8. Explain the difference between instrumental and relational understanding. Give an example of each.
9. Explain the difference between conceptual and procedural knowledge. Give an example of each.
10. Diagram the relationship between the five representations of mathematical ideas.
11. How should models/manipulatives be used in the mathematics classroom?
12. What is a problem? What features must it have?
13. Why is it beneficial to teach with problems?
14. What is metacognition?
15. What are the four steps to solving a problem? Why isn't finding the answer the last step?
16. Name 8 problem-solving strategies and be able to solve problems using these strategies.
17. What is the purpose of assessment?
18. What is the difference between analytic and holistic rubrics?
19. How are checklists used?
20. Why are journals an important part of the mathematics classroom?

21. How can the three part lesson format be adapted? List three ways.

22. Why is writing an important tool in learning mathematics? List ways to include this method in your own mathematics teaching.

23. Explain how to use a self-check method of practice for drill-oriented homework.

24. Practice is not how the skill is learned, but rather how the skill becomes more automatic. What does this mean?

25. What ideas do you have to erase gender inequity in the classroom?

26. Meeting the needs of students can be very challenging. Briefly describe how you would change beliefs about how children learn mathematics.

27. How would you argue for the values of a diverse class that includes children with learning problems?

28. How should content and instruction be modified for children with mental deficits?

29. Explain how teacher expectations and tracking have detrimental effects on minorities and low –SES children.

30. Describe several types of tool software in mathematics.

31. Describe the myths associated with using calculators in the classroom.

32. What are the benefits of using calculators in the classroom?

33. What is number sense?

34. Explain how you can tell if a student has the cardinality principle.

35. What role do ten-frames play in developing number sense?

36. Solve by anchoring in 10:

    a. $4 + 9$
    b. $6 + 8$
    c. $15 + 7$

37. Identify five ways a remainder can be expressed. Give an example of each.

38. What role does drill play in fact mastery?

39. What can you do to help older students with fact remediation?

40. Why is place value difficult for students?

41. Classify these place value materials as groupable or pre-grouped.

    a. Sticks
    b. Unifix cubes
    c. Base-ten blocks
    d. Bean sticks
    e. Straws
    f. Beans

42. Classify these place value materials as proportional or non-proportional.
    a. Colored chips
    b. Unifix cubes
    c. Money
    d. Abacus
    e. Bean sticks
    f. Base-ten blocks

43. Show 53 in three different ways with equivalent groupings.

44. What are some benefits of invented strategies?

45. How are invented algorithms different from traditional algorithms?

46. Solve using the given alternative algorithm:

    a. Left to Right: 283 + 357
    b. Partial Sums: 283 + 357
    c. Left to Right: 793 – 348
    d. Add Up: 578 – 369
    e. Partial Products: 34 x 18
    f. Lattice Multiplication: 321 x 68
    g. Division Algorithm: 3481 ÷ 26

47. Why is estimation a difficult concept for students to grasp?

48. What role does number sense play in estimation?

49. How can you help improve students' estimation skills?

50. Describe fractional parts and the two distinct requirements of fractional parts.

51. What are some activities that you can do in your classroom to help children develop the equivalent-fraction concept?

52. What are children learning in activities in which you count fractional parts?

53. Describe several types of ideas for number sense with fractions. List an activity for each.

54. Give an example of each of the three categories of fraction models.

55. Why should fraction symbolism be delayed as long as possible?

56. Why are sets of fractions more difficult for younger children?

57. Explain why it is obvious that 3/4 x 8/5 = 6/5 without using the algorithm and without first getting 24/20.

58. Draw pictures of squares for the whole to illustrate 3x 2/5. Explain your answer.

59. Explain the role of estimation and why it is important for students to estimate decimal computations before they learn to compute with paper and pencil.

60. How can "familiar fractions" be connected to their decimal equivalents in a conceptual manner?

61. Describe three different base-ten models for fractions and decimals. Use illustrations for representation.

62. Consider this problem: If 40 gallons of milk costs $57.96, how much can be purchased for $100? Draw a sketch to illustrate the proportion and set up the equation in two different ways.

63. What is proportion? Give an example of proportion, then make up a realistic proportional situation that can be solved either by a factor-of-change approach or a unit-rate approach.

64. What does it mean to measure in length, area, weight, volume, and time?

65. Explain how a general instructional plan for measurement helps the classroom teacher accomplish his/her instructional goal.

66. Describe the differences between the typical approach for teaching clock reading and the one-handed approach as discussed in the text.

67. Describe van Heile's levels of thought. What can you do when the students in your classroom are at different levels?

68. Give a description of informal geometry. How is it different form what you remember in school and how you were taught geometry?

69. Explain what it means for van Heile's theory of geometric thought that the products of thought at Level 0 are the objects of thought at Level 1.

70. Why is it good to have students conduct experiments before trying to figure out probabilities?

71. Draw a picture of a line graph, a histogram, and a bar graph. How are all of these alike?

72. Describe two different concepts of the mean. How can each be developed?

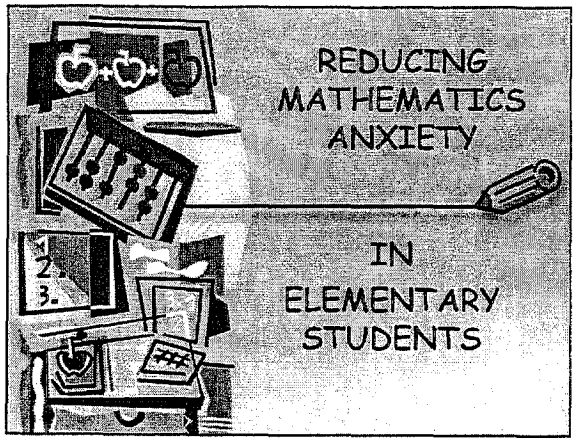
73. Describe how you would use a random number generator on a computer or calculator to produce a simulation of a three-part spinner with all equal parts.

74. How can a hundreds chart be used to develop pattern ideas?

75. Explain how to solve the equation $4x + 3 = x + 12$ using a pan balance.

76. Children often have misconceptions about the equal sign. Why?

77. What does algebraic reasoning mean. At what grade level should algebraic reasoning begin?



MATH ANXIETY DEFINITION

- DEFINED AS THE "I CAN'T" SYNDROME
- EXPERIENCING SUDDEN DEATH WITH MATH ANXIETY
- A FEELING OF UNCERTAINTY, AN IMPENETRABLE WALL AHEAD, STANDING ON THE EDGE OF A CLIFF, READY TO FALL OFF
- THE PANIC, HELPLESSNESS, PARALYSIS, AND MENTAL DISORAGNIZATION THAT ARISES AMONG SOME PEOPLE WHEN THEY ARE REQUIRED TO SOLVE A MATHEMATICAL PROBLEM

IDENTIFYING THE PROBLEM IN STUDENTS

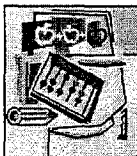
- Beginning of a vicious cycle leading to math avoidance
- Dread or fear of doing mathematics
- Students have lack of understanding of mathematics
- Experience failure and frustration
- Develop a fatalistic "attitude" toward mathematics

Principle Causes of Mathematics Anxiety

- Teacher failure to identify student's lack of mathematics understanding
- Mathematics anxiety is a function of mathematics teaching
- Root of mathematics anxiety lies in teaching methodologies and preparation
- Lack of applied activity and experience in teaching mathematics

Overcoming Mathematics Anxiety

- Teachers' need to expand their instructional strategies
- Change conceptions of mathematics anxiety held by the teacher
- Implement the NCTM Standards in the classroom
- Rethink and realign teaching strategies and math curriculum to align with goals



STUDENT GOALS

Learn to value mathematics

Become confident in their ability to do mathematics

Become mathematical problem -solvers

Learn to communicate mathematically

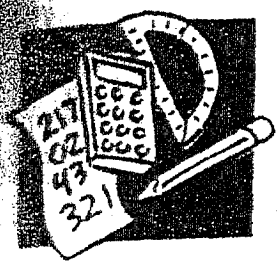
Learn to reason mathematically

Teacher Goals

To change the environment of the student's instruction and focus on the "character" of instruction

Be aware that the problem exists in both teachers and in students

Maximize student potential and relieve mathematics anxiety by implementing hands-on activities in the classroom



REPRODUCIBLE / JOURNALING

Name _____

Me + Math = ?

Use this page as the first entry in your math journal. Complete each statement.

1. The thing I like best about math is _____

2. One thing I don't like about math is _____

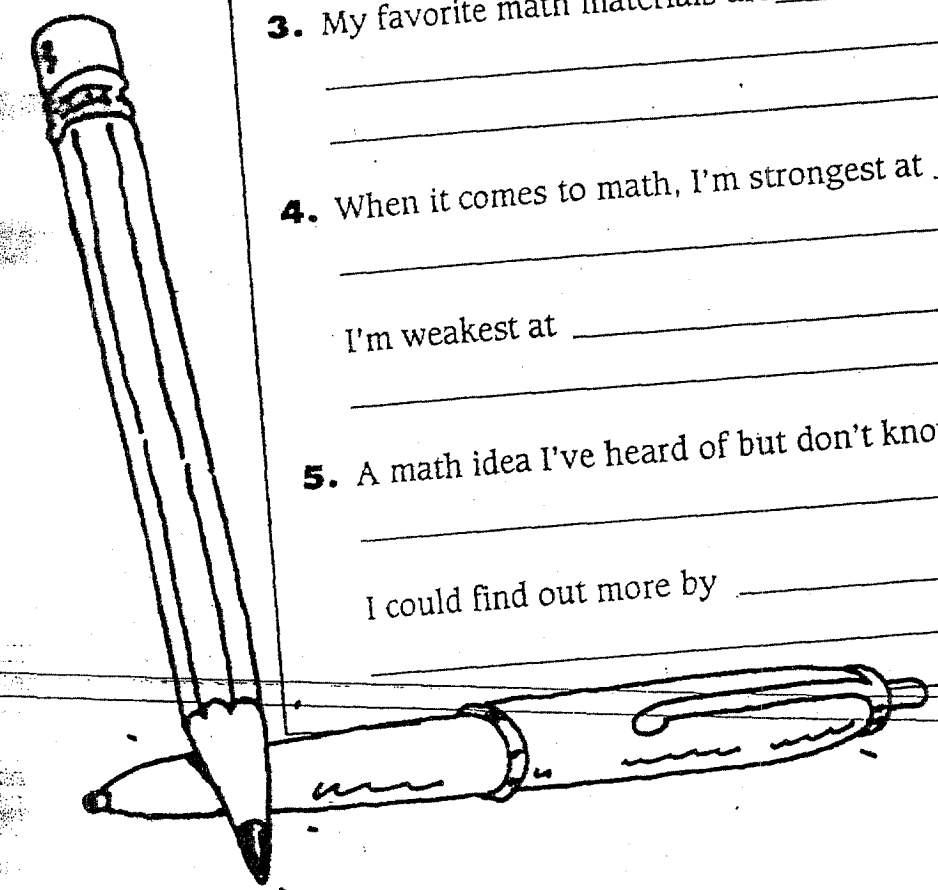
3. My favorite math materials are _____

4. When it comes to math, I'm strongest at _____

   I'm weakest at _____

5. A math idea I've heard of but don't know much about is _____

   I could find out more by _____



More To Try!

Think about how math is used in some jobs. Which jobs seem most interesting to you? the least interesting? Write your ideas on the back of this page or in your math journal.

Author	Year	Title	Publisher	Topic	Order #
Adams, Pam	1973	There Was an Old Lady Who Swallowed A	Playspaces International	Addition	
Adler, David	1975	3D, 2D, 1D	Crowell	Linear Measurement	
Adler, David	1976	A Little at a Time	Random House	Time	
Adler, David	1975	Base Five	Crowell	Place Value/ Numeration Systems	
Adler, David	1975	Base Five	Crowell	Place Value/ Numeration Systems	
Adler, David	1981	Calculator Fun	Franklin Watts	Games, Puzzles, Other Explorations	
Adler, David	1977	Roman Numerals	Crowell	Place Value and Numeration Systems	
Adler, Irving	1974	Magic House of Numbers	John Day	Games, Puzzles, Other Explorations	
Adler, Irving	1978	Math Puzzles	Franklin Watts	Games, Puzzles, Other Explorations	
Adler, Irving	1967	The Calendar	John Day	Time	
Adler, Irving	1955	Time in Your Life	John Day	Time	
Aker, Suzanne	1990	What Comes in 2's, 3's and 4's	Simon & Schuster	Multiplication/Division	
Alain	1964	One Two Three Going to Sea	Scholastic	Counting, Addition, Subtraction	
Alki	1985	Dinosaurs are Different	Crowell	Classification	69469
Alki	1990	My Feet	HarperCollins	Linear Measurement	77946
Allbright, Viv	1985	Ten Go Hopping	Faber and Faber	Counting	
Allen, Marjorie	1991	Changes	Macmillan	Comparisons	
Allen, Pamela	1986	A Lion in the Night	Putnam	Spatial Concepts	69657
Allen, Pamela	1980	Mr. Archimedes' Bath	Lothrop, Lee and Shepard	Linear Measurement	
Allen, Pamela	1983	Who Sank the Boat	Coward, McCann, and Geoghegan	Weight	66758
Allison, Linda	1975	The Reasons for Seasons	Little, Brown	Time	92375
Anderson, L	1976	Two Hundred Rabbits	Worlds Work	Multiplication	57927
Anno, Mitsumasa	1985	All In a Day	Philomel	Time	71541
Anno, Mitsumasa	1977	Anno's Counting Book	Harper and Row	Counting, Place Value/ Numeration Systems	
Anno, Mitsumasa	1982	Anno's Counting House	Philomel	Addition, Classification, Counting	
Anno, Mitsumasa	1984	Anno's Flea Market	Philomel	Classification	
Anno, Mitsumasa	1985	Anno's Hat Tricks	Philomel	Games, Puzzles, Other Explorations	68613
Anno, Mitsumasa	1987	Anno's Math Games	Philomel	Classification/Comparison/Game/Puzzles/Etc.	71994
Anno, Mitsumasa	1989	Anno's Math Games 2	Philomel	Classification, Place Value/Numeration Systems/Etc.	74052
Anno, Mitsumasa	1991	Anno's Math Games 3	Philomel	Shapes, Games, Puzzles, Other Explorations	75876
Anno, Mitsumasa	1983	Anno's Mysterious Multiplying Jar	Philomel	Multiplication/Division, Big Numbers	
Anno, Mitsumasa	1987	Anno's Sundial	Philomel	Time	

Author	Year	Title	Publisher	Topic	Order #
Anno, Mitsumasa	1988	In Shadowland	Orchard	Shapes	72153
Anno, Mitsumasa	1986	Socrates and the Three Little Pigs	Philomel	Games, Puzzles, Other Explorations	77817
Anno, Mitsumasa	1983	The Kings Flower	Collins	Comparisons	60830
Anno, Mitsumasa	1970	Topsy Turvies: Pictures to Stretch the Im	Walker	Shapes	
Anno, Mitsumasa	1971	Upside Downers: More Pictures to Stretcl	Walker/Weatherhill	Spatial Concepts	
Apfel, Necia	1985	Calendars	Franklin Watts	Time	
Archambault, John	1989	Counting Sheep	Holt	Counting	74662
Armitage, Ronda	1985	Grandma Goes Shopping	Puffin	Classification	
Asbjornsen, Peter	1957	The Three Billy Goats Gruff	Harcourt Brace Jovanovich	Weight	
Asch, Frank	1980	The Last Puppy	Prentics Hall	Subtraction	62615
Ashabranner, Melissa	1989	Counting America: The Study of the U.S.	Putnam	Big Numbers	74061
Aylesworth, Jim	1988	One Crow: A Counting Rhyme	Lippincott	Counting	73148
Baker, Jeannie	1982	One Hungry Spider	Deutsch	Counting	
Baker, Jeannie	1991	Window	Greenwillow	Time	76237
Balin, Lorna	1986	Amelia's Nine Lives	Abingdon	Addition	
Bang, Molly	1983	Ten, Nine, Eight	Greenwillow	Counting	66750
Barkin, Carol	1990	Jobs for Kids	Lothrop, Lee and Shepard	Money	
Barrett, Judi	1981	I'm Too Small, Your's Too Big	Atheneum	Comparisons	
Barrett, Judi	1983	What's Left	Atheneim	Subtraction	66755
Bate, Lucy	1975	Little Rabbits Loose Tooth	Crown	Subtraction	
Baum, Arline	1987	Opt: An Illusionary Tale	Puffin Book	Geometry	71591
Baylor, Byrd	1986	I'm In Charge of Celebrations	Scribner	Time	
Becker, John	1973	Seven Little Rabbits	Walker	Subtraction	
Bell, Robbie	1988	Board Games Round the World	Cambridge University Press	Games, Puzzles, Other Explorations	
Belliston, Larry	1989	Extra Cash for Kids	Wolgemuth and Hyatt	Money	
Bendick, Jeanne	1989	How Much and How Many	Franklin Watts	Weight	
Bennett, David	1990	One Cow, Moo, Moo	Helt	Counting	
Berger, Melvin	1985	Germs Make Me Sick	Crowell	Multiplication/Division	68597
Berstein, Mordicai	1984	Roll Over	Crown	Subtraction	
Birch, David	1988	The King's Chessboard	Dial	Multiplication/Division/Big Numbers	72755
Birmingham, Duncan	1988	M is For Mirror	Tarquin	Symmetry	
Bjork, Christina	1990	Elliot's Extraordinary Cookbook	Farrar, Straus and Giroux	Cookbooks	

MATH + READING = INTEGRATION

Author	Year	Title	Publisher	Topic	Order #
Blackburn, Carl	1991	Waiting for Sunday	Scholastic	Time	
Blair, Lee	1971	Arithmetic in Verse and Rhyme-Using Su	Garrard	Subtraction	
Blakely, Peggy	1973	Anna's Day	Black	Time	
Blocksma, Mary	1989	Reading the Numbers...	Penguin	Numbers	
Blumenthal, Nancy	1989	Count a Saurus	Macmillian	Counting	73183
Boeke, Kees	1957	Cosmic View: The Universe in 40 Jumps	John Dax	Big Numbers	
Bogart, JoEllen	1989	10 For Supper	Scholastic	Addition	
Boon, Emilie	1987	How many Animals Can You See	Orchard	Counting	72073
Boynton, Sandra	1977	Hippos go Beserk	Little Brown	Addition	
Brandenberg, Franz	1983	Aunt Nina and Her Nephews and Nieces	Greenwillow	Addition	66700
Brenner, Barbara	1984	The Snow Parade	Crown	Addition	67984
Bridewell, Norman	1985	Count on Clifford	Scholastic	Counting	77203
Brown, Marc	1990	Arthur's Pet Business	Little, Brown	Money	
Brown, Marc	1976	One Two Three: An Animal Counting Boo	Little, Brown	Counting	
Brown, Marcia	1979	Listen to a Shape	Franklin Watts	Shapes	60483
Brown, Margaret Wise	1990	Four Fur Feet	Hopscotch Books	Multiplication/Division	
Bucknall, Caroline	1989	One Bear All Alone	Dial	Counting	
Burningham, John	1990	Hey Get Off Our Train	Crown	Addition	75465
Burningham, John	1985	John Burninghams 1,2,3	Crown	Addition	
Burningham, John	1970	Mr. Gumpy's Outing	Penguin	Subtraction	57567
Burningham, John	1983	Pigs Plus	Viking Press	Addition	
Burningham, John	1980	The Shopping Basket	Crowell	Counting, Subtraction	62649
Burns, Marilyn	1990	$1 Word Riddle Book	Cuisenaire	Games, Puzzles and Other Explorations	
Burns, Marilyn	1975	I Hate Mathematics Book	Little, Brown	Place Value/Numeration Systems/Game/Puzzles/Etc.	97403
Burns, Marilyn	1982	Math For Smarty Pants	Little, Brown	Big Numbers/Games/Puzzles/Explorations	67329
Burns, Marilyn	1976	The Book of Think	Little, Brown	Games, Puzzles and Other Explorations	
Burns, Marilyn	1978	This Book is About Time	Little, Brown	Time	97402
Burton, Virginia	1942	The Little House	Houghton Mifflin	Time	13302
Campbell, Rod	1987	Dear Zoo	Penguin	Size	
Caple, Kathy	1985	The Biggest Nose	Houghton Mifflin	Linear Measurement	
Carle, Eric	1968	1, 2, 3, to the Zoo	World	Counting , Addition	75969
Carle, Eric	1987	A House for Hermit Crab	Picture Books Studio	Addition, Comparisons	

Author	Year	Title	Publisher	Topic	Order #
Carle, Eric	1974	My Very First Book of Shapes	Harper Collins	Shapes	
Carle, Eric	1986	Papa, Please Get the Moon for Me	Picture Book Studio	Shapes	75997
Carle, Eric	1972	Rooster's Off to See the World	Picture Book Studio	Counting	75883
Carle, Eric	1984	The Bad Tempered Ladybird	Puffin	Size	
Carle, Eric	1977	The Grouchy Ladybug	Crowell	Comparisons, Time	75890
Carle, Eric	1975	The Mixed Up Cameleon	Crowell	Classification	75888
Carle, Eric	1972	The Secret Birthday Message	Crowell	Shapes	75887
Carle, Eric	1987	The Tiny Seed	Picture Book Studio	Comparisons, Linear Measurement	75885
Carle, Eric	1984	The Very Busy Spider	Putnam	Addition, Spatial Concepts, Time	75889
Carle, Eric	1969	The Very Hungry Caterpillar	Putnam	Counting, Time	75886
Cayle, Rena	1985	My First Cookbook	Workman	Cookbooks	
Chalmers, Mary	1986	Six Dogs, Twenty Three Cats, Forty Five	Harper and Row	Big Numbers	
Charlip, Remy	1975	Thirteen	Parents Magazine Press	Shapes	
Charosh, Mannis	1972	Mathematical Games for One or Two	Crowell	Games, Puzzles and Other Explorations	
Charosh, Mannis	1970	Straight Lines, Parallel LInes, Perpendicu	Crowell	Lines and Angles	
Charosh, Mannis	1971	The Ellipse	Crowell	Shapes	
Chase, Edith	1986	The New Baby Calf	Ashton Scholastic	Time	70719
Christelow, Eileen	1989	Five Little Monkeys Jumping on the Bed	Clarion	Subtraction	73684
Christelow, Eileen	1991	Five Little Monkeys Sitting in the Tree	Clarion	Subtraction	76168
Ciardi, John	1962	You Read to Me, I'll Read to You-Little B	Lippincott	Fractions	56039
Clement, Rod	1991	Counting on Frank	Gareth Stevens	Counting	
Cleveland, David	1978	The April Rabbits	Coward, McCann, and Geoghegan	Counting	
Clifton, Lucille	1978	Everett Anderson's Nine Month Long	Holt Rinehart and Winston	Time	
Clifton, Lucille	1970	Some of the Days of Everett Anderson	Holt, RInehart and Winston	Time	
Coats, Laura	1990	Ten Little Animals	Macmillian	Subtraction	75078
Coerr, Eleanor	1977	Sadako and the Thousand Paper Cranes	Putnam	Paper Folding	63490
Cole, Betsy	1988	Green Creatures Ten to One	Adventure	Counting	
Comber, Barbara	1987	Dad's Diet	Ashton Scholastic	Fractions	
Considine, Kate	1963	One Two Three Four	Hold, RInehart and WInston	Counting	
Cowley, Joy	1985	Our Teacher Miss Pool	Nelson	Time	
Crews, Donald	1986	Ten Black Dots	Greenwillo	Counting	69692
Crews, Donald	1985	The Bicycle Race	Greenwillow	Counting	

Author	Year	Title	Publisher	Topic	Order #
Cribb, Joe	1990	Money (Eyewitness Books)	Knopf	Money	76242
Dahl, Roald	1990	Esio Trot	Viking Press	Weight	75554
Dale, Penny	1988	Ten in the Bed	Discovery Toys	Subtraction	
Darling, Abigail	1991	Teddy Bears' Picnic Cookbook	Viking	Cookbooks	76102
Darling, Kathy	1972	The Jelly Bean Contest	Garrard	Estimation	75589
Dee, Ruby	1988	Two Ways to Count to Ten	Henry Holt	Multiplication/Division	
Dennis, J. Richard	1971	Fractions Are Parts of Things	Crowell	Fractions	
dePaola, Tomie	1978	Pancakes for Breakfast	Harcourt Brace, Jovanovich	Linear Measurement	
dePaola, Tomie	1978	The Popcorn Book	Holiday House	Linear Measurement	
dePaola, Tomie	1989	Too Many Hopkins	Putnam	Addition	74360
deRegniers, Beatrice	1985	So Many Cats	Clarion	Addition	
Diagram Group	1980	Comparisons	St. Martin's Press	Comparisons	
Dilson, Jesse	1968	The Abacus	St. Martins	Place Value/ Numeration Systems	
Dodge, Bertha	1972	Big is so Big	Coward McCann, and Geoghegan	Comparisons	
Doolittle, Eileen	1988	World of Wonders	Houghton Mifflin	Counting	
Dubanevich, Arlene	1983	Pigs in Hiding	Scholastic	Addition	66740
Dunbar, Fiona	1991	You'll Never Guess	Dial	Shapes	
Dunbar, Joyce	1990	Ten Little Mice	Harcourt Brace Jovanovich	Subtraction	
Dunrea, Oliver	1989	Deep Down Underground	Macmillian	Counting	
Earthworks Group	1990	50 Simple Things Kids Can Do to Save th	Andrews and McMeel	Counting, Big Numbers	
Ehlert, Lois	1990	Color Farm	Lippincott	Shapes	77334
Ehlert, Lois	1989	Color Zoo	Lippincott	Shapes	73540
Ehlert, Lois	1990	Fish Eyes: A Book You Can Count On	Harcourt Brace Jovanovich	Counting	74661
Ehlert, Lois	1988	Planting a Rainbow	Harcourt Brace Jovanovich	Classification	
Eisen, Armand	1987	Goldilocks and the Three Bears	Ariel Books	Counting	74410
Ekker, Ernest	1985	What is Beyond the Hill	Lippincott	Big Numbers	
Emberley, Barbara	1966	One Wide River To Cross	Prentice Hall	Multiplication/Division	
Emberley, Ed	1979	Ed Emberley's Big Green Drawing Book	Little, Brown	Shapes	61629
Emberley, Ed	1980	Ed Emberley's Big Orange Drawing Book	Little, Brown	Shapes	63881
Emberley, Ed	1984	Ed Emberley's Picture Pie: A Circle Drawi	Little, Brown	Fractions, Shapes	
Emberley, Ed	1961	The Wing On a Flea	Little, Brown	Shapes	18536
Epstein, June	1987	Noah's Ark Song	Macmillan	Multiplication	

Author	Year	Title	Publisher	Topic	Order #
Ernst, Lisa	1986	Up to Ten and Down Again	Lothrop, Lee and Shepard	Counting	69628
Feelings, Muriel	1971	Moja Means One: A Swahili Counting Bc	Dial	Counting	
Fey, James	1971	Long, Short, High, Low, Thin, Wide	Crowell	Linear Measurement	
Fisher, Leonard	1984	Boxes! Boxes!	Viking	Shapes	
Fisher, Leonard	1987	Calendar Art: Thirteen Days, Weeks, Mon	Four Winds	Time	
Fisher, Leonard	1987	Look Around	Viking Kestrel	Shapes	
Fixx, James	1978	Solve it! A Perplexing Profusion of Puzzl	Doubleday	Games, Puzzles and Other Explorations	
Freedman, Russell	1981	Animal Superstars: Biggest, Strongest, F	Prentice Hall	Comparisons	
Freeman, May	1946	Fun with Figures	Random House	Shapes	
Froman, Robert	1975	Angles are Easy as Pie	Harper and Row	Lines and Angles	
Froman, Robert	1971	Bigger and Smaller	Crowell	Comparisons	
Froman, Robert	1972	Rubber Bands, Baseballs, and Doughnuts	Crowell	Spatial Concepts	1991
Froman, Robert	1978	The Greatest Guessing Game: A Book Ab	Crowell	Multiplication/Division	
Froman, Robert	1972	Venn Diagrams	Crowell	Classification	
Furchgott, Terry	1977	Phoebe and the Hot Water Bottles	Picture Lions	Counting, Classification	
Furchgott, Terry	1977	Phoebe and the Hot Water Bottles	Picture Lions	Multiplication/Division	
Gackenbach, Dick	1991	A Bag Full of Pups	Greenwillow	Counting, Subtraction	
Gag, Wanda	1928	Millions of Cats	Coward, McCann and Geoghegan	Big Numbers	
Galdone, Paul	1973	The Little Red Hen	Seabury	Time	70667
Galdone, Paul	1981	The Three Billy Goats Gruff	Willow	Weight	
Gardner, Beau	1987	Can You Imagine... A Counting Book	Dodd, Mead	Counting	71317
Gardner, Beau	1984	The Look Again.. and Again, And Again,	Lothrop, Lee and Shepard	Symmetry	67596
Gardner, Beau	1980	The Turn About , Think About Look Abou	Lothrop, Lee and Shepard	Symmetry	63110
Gardner, Beau	1989	What is it? A Spin About Book	Putnam	Symmetry	
Gardner, Martin	1982	Aha! Gotcha	Freeman	Games, Puzzles and Other Explorations	
Gardner, Martin	1978	Aha! Insight	Freeman	Games, Puzzles and Other Explorations	93746
Gardner, Martin	1969	Perplexing Puzzles and Tantalizing Tease	Simon and Schuster	Games, Puzzles and Other Explorations	
Gardner, Martin	1984	Puzzles From Other Worlds	Vintage	Games, Puzzles and Other Explorations	
Garland, Sarah	1985	Going Shopping	Puffin	Money	68628
Geringer,Lora	1985	A Three Hat Day	Harper and Row	Patterns	68628
Gerstein, Mordicai	1989	The Sun's Day	Harper and Row	Time	74274
Gersting, Judith	1977	Yes-No; Stop-Go: Some Math Patterns	Crowell	Games, Puzzles and Other Explorations	

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Gibbons, Gail	1979	Clocks and How They Go	Crowell	Time	61812
Giblin, James	1988	Let There Be Light	Crowell	Building and Architecture	
Giganti, Paul JR	1988	How Many Snails? A Counting Book	Greenwillow	Subtraction	72783
Ginsburg, Mirra	1982	Across the Stream	Greenwillow	Counting, Comparisons	
Ginsburg, Mirra	1974	Mushroom in the Rain	Macmillian	Addition	
Goodall, John	1979	The Story of an English Village	Atheneum	Time	
Goodall, John	1987	The Story of Main Street	Margaret McElderry	Time	
Goor, Ron	1981	Shadows, Here, There and Everywhere	Crowell	Shapes	
Gray, Catherine	1988	One, Two, Three, and Four. No More?	Houghton Mifflin	Addition, Subtraction	73229
Gretz, Susanna	1982	Teddybears Go Shopping	Macmillan	Classification, Add/Sub/Money	67044
Grifalconi, Ann	1986	The Village of Round and Square Houses	Little, Brown	Building and Architecture	74681
Grossman, Virgina	1991	Ten Little Rabbits	Chronicle Books	Counting	76063
Gustafson, Scott	1988	Scott Gustafson's Animal Orchestra: A C	Contemporary Books	Counting	
Hagne, Kathleen	1986	Numbears: A Counting Book	Holt	Counting	
Hamm, Diane	1991	How Many Feet in the Bed	Simon & Schuster	Counting, Multiplication/Division	77236
Hammond, Franklin	1987	Ten Little Ducks	Scholastic	Counting	
Handy, Libby	1982	Boss for a Week	Scholastic	Time	
Haskins, Jim	1989	Count Your Way Through Africa	Carolrhoda	Counting	
Haskins, Jim	1989	Count Your Way Through Canada	Carolrhoda	Counting	
Haskins, Jim	1987	Count Your Way Through China	Carolrhoda	Counting	
Haskins, Jim	1990	Count Your Way Through Germany	Carolrhoda	Counting	
Haskins, Jim	1990	Count Your Way Through Italy	Carolrhoda	Counting	
Haskins, Jim	1987	Count Your Way Through Japan	Carolrhoda	Counting	
Haskins, Jim	1989	Count Your Way Through Mexico	Carolrhoda	Counting	
Haskins, Jim	1987	Count Your Way Through Russia	Carolrhoda	Counting	
Haskins, Jim	1987	Count Your Way Through the Arab World	Carolrhoda	Counting	
Hawkins, Colin	1988	How Many Are in This Old Car?	Putnam	Addition	75699
Hawkins, Colin	1984	Take Away Monsters	Putnam	Subtraction	73180
Hawkins, Colin	1990	When I Was One	Viking Penguin	Counting	
Hayes, Sarah	1990	Nine Ducks Nine	Lothrop, Lee and Shepard	Subtraction	
Hefter, Rich	1983	One White Crocodile Smile	Nelson	Classification, Counting	
Heide, Florence	1968	How Big Am I	Follett	Comparisons	

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Heide, Florence	1968	The Shrinking of Treehorn	Holiday House	Comparisons, Linear Measurement	76541
Hellen, Nancy	1988	Bus Stop	Orchard Books	Addition	
Heller, Ruth	1987	A Cache of Jewels: And other Collective I	Grosset and Dunlap	Multiplication/Division	
Hennessey, B. G.	1988	The Dinosaur Who Lived in My Backyard	Viking	Estimation, Comparisons	72367
Henwood, Simon	1989	The Clock Shop	Farrar, Straus and Giroux	Time	
Hill, Eric	1980	Where's Spot	Putnam	Spatial Concepts	
Hinchcliffe, Jo	1987	The Hilton Hen House	Ashton Scholastic	Counting, Addition, Spatial Relations	
Hindley, Judy	1989	Mrs. Mary Malarky's Seven Cats	Orchard	Subtraction	75101
Hoban, Lillian	1981	Arthur's Funny Money	Harper and Row	Money	64714
Hoban, Russell	1970	A Bargain for Frances	Harper and Row	Money	
Hoban, Russell	1974	Ten What?	Scribners	Counting	52739
Hoban, Tana	1985	123	Greenwillow	Counting	
Hoban, Tana	1987	26 Letters and 99 Cents	Greenwillow	Money	71112
Hoban, Tana	1985	A Children's Zoo	Greenwillow	Classification	69427
Hoban, Tana	1982	A, B, See	Greenwillow	Shapes	65654
Hoban, Tana	1991	All About Where	Greenwillow	Spatial Concepts	75848
Hoban, Tana	1976	Big Ones Little Ones	Greenwillow	Comparisons	
Hoban, Tana	1974	Circles, Triangles, and Squares	Macmillian	Shapes	
Hoban, Tana	1972	Count and See	Macmillian	Place Value/Numeration Systems/Count/Add	51082
Hoban, Tana	1987	Dots, Spots, Freckles, and Stripes	Greenwillow	Classification, Shapes	71356
Hoban, Tana	1990	Exactly the Opposite	Greenwillow	Classification, Spatial Concepts	75110
Hoban, Tana	1983	Here a Chick, There a Chick	Lothrop, Lee, and Shepard	Spatial Concepts	
Hoban, Tana	1983	I Read Symbols	Greenwillow	Shapes	67597
Hoban, Tana	1985	Is It Larger? Is is Smaller	Greenwillow	Classification, Comparisons	68635
Hoban, Tana	1978	Is it Red? Is it Yellow? Is it Blue?	Greenwillow	Classification	
Hoban, Tana	1984	Is It Rough? Is it Smooth? Is it Shiny?	Greenwillow	Classification	67595
Hoban, Tana	1971	Look Again	Macmillian	Shapes	55676
Hoban, Tana	1988	Look! Look! Look!	Greenwillow	Shapes	73178
Hoban, Tana	1981	More than One	Greenwillow	Place Value/Numeration Systems/Multi/Div/Estimati	64949
Hoban, Tana	1989	Of Colors and Things	Greenwillow	Classification	73185
Hoban, Tana	1979	One Little Kitten	Greenwillow	Spatial Concepts	
Hoban, Tana	1973	Over, Under and Through and Other Spati	Macmillion	Spatial Concepts	

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Hoban, Tana	1972	Push-Pull, Empty-Full	Macmillian	Spatial Concepts	57662
Hoban, Tana	1983	Round and Round and Round	Greenwillow	Shapes	66126
Hoban, Tana	1990	Shadows and Reflections	Greenwillow	Shapes	74665
Hoban, Tana	1970	Shapes and Things	Macmillian	Shapes	57663
Hoban, Tana	1986	Shapes, Shapes, Shapes	Greenwillow	Shapes	69650
Hoban, Tana	1981	Take Another Look	Greenwillow	Shapes	63109
Holt, Michael	1975	Maps, Tracks, and the Birdges of Konigst	Crowell	Spatial Concepts/Games/Puzzles/Explorations	
Hooper, Meredith	1985	Seven Eggs	Harper and Row	Addition, Subtraction	
Hughes, Shirley	1987	Lucy and Tom's 1, 2, 3	Viking Kestrel	Multiplication/Division	
Hughes, Shirley	1987	Lucy and Tom's Day	Grossman	Time	
Hughes, Shirley	1985	When We Went To the Park	Lee and Shepard	Counting	
Hulme, Joy	1991	Sea Squares	Hyperion Books		
Hutchins, Pat	1971	Changes, Changes	Macmillian	Spatial Concepts, Building and Architecture	
Hutchins, Pat	1970	Clocks and More Clocks	Macmillan	Time	57677
Hutchins, Pat	1978	Happy Birthday	Greenwillow	Linear Measurement	
Hutchins, Pat	1985	Happy Birthday, Sam	Penguin	Linear Measurement	60741
Hutchins, Pat	1982	One Hunter	Greenwillow	Counting	65792
Hutchins, Pat	1986	The Doorbell Rang	Greenwillow	Multiplication/Division, Fractions	77392
Hutchins, Pat	1971	Titch	Macmillian	Subtraction, Comparisons	76693
Hutchins, Pat	1985	You'll Soon Grow Into Them, Titch	Penguin	Subtraction, Comparisons	
Imershein, Betsy	1989	Finding Red, Finding Yellow	Harcourt Brace Jovanovich	Classification	
Inkpen, Mick	1987	One Bear at Bedtime: A Counting Book	Little, Brown	Counting	
Irons, Rosemary	1987	Shoes in Twos	Rigby	Multiplication/Division	
Irons, Rosemary and Ca	1987	Mirror, Mirror	Rigby	Multiplication/Division	
Isaacson, Philip	1988	Round Bldgs/Square Bldgs/Buildings that	Knopf	Building and Architecture	77497
Johnson, Chester	1969	What Makes A Clock Tick	Little, Brown	Time	
Johnson, Tony	1987	Whale Song	Putnam	Counting	
Johnston, Tony	1986	Farmer Mack Measures his Pig	Harper and Row	Linear Measurement	
Jonas, Ann	1990	Aardvarks Disembark	Greenwillow	Multiplication/Division	76370
Jonas, Ann	1984	Holes and Peeks	Greenwillow	Shapes	67942
Jonas, Ann	1987	Reflections	Greenwillow	Symmetry	76697
Jonas, Ann	1983	Round Trip	Scholastic	Counting, Symmetry, Shape	66742

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Jones, Carol	1990	This Old Man	Houghton Mifflin	Counting	
Juster, Norton	1963	The Dot and the Line	Random House	Lines and Angles	
Juster, Norton	1961	The Phantom Tollbooth	Knopf	Subtraction, Fractions	76174
Kadesch, Robert	1970	Math Menagerie	Harper and Row	Games, Puzzles and Other Explorations	
Kahl, Virginia	1957	The Habbits of Rabbits	Scribner	Multiplication/Division	
Kajima, Naomi	1986	The Chef's Hat	Chronicle Books	Linear Measurement	
Kalan, Robert	1979	Blue Sea	Greenwillow	Comparisons	61000
Keats, Ezra Jack	1971	Over in the Meadow	Four Winds	Counting	
Keils, Phil, Bill Martin	1973	Sounds of Freedomring-Ten Billion, Ten	Holt, Rinehart and Winston	Big Numbers	
Kellogg, Steven	1971	Can I Keep Him	Dial	Comparisons	51263
Kellogg, Steven	1976	Much Bigger than Martin	Dial	Subtraction/Comparisons/Linear Measurement	76070
Kellogg, Steven	1984	Paul Bunyan: A Tall Tale	William Morrow	Comparisons, Linear Measurement	72148
Kellogg, Steven	1977	The Mysterious Tadpole	Dial	Linear Measurement	75894
Kent, Jack	1973	Twelve Days of Christmas	Scholastic	Addition	
Kherdian, David	1990	The Cat's Midsummer Jamboree	Philomel	Counting	
Kimmel, Eric	1989	Four Dollars and Fifty Cents	Holiday House	Money	77261
Kitamura, Satashi	1986	When Sheep Cannot Sleep: A Counting E	Farrar, Straus and Giroux	Counting	
Kitchen, Bert	1987	Animal Numbers	Dial	Counting	72360
Kline, Suzy	1989	The Hole Book	Putnam	Shapes	
Knapp, Edward	1987	How Speedy is a Cheetah	Platt and Munk	Time	
Koch, Michelle	1989	Just One More	Greenwillow	Counting	
Konigsburg, E.L.	1990	Samuel Todd's Book of Great Colors	Atheneum	Classification	74664
Korab, Balthazar	1985	Archabet	National Trust for Historic Preser	Building and Architecture	
Krauss, Ruth	1945	The Carrot Seed	Harper and Row	Comparisons, Linear Measurement	50235
Krensky, Stephen	1989	Big Time Bears	Little, Brown	Time	
Laithwaite, Eric	1987	Size: The Measure of Things	Franklin Watts	Linear Measurement	
Leaf, Munro	1936	The Story of Ferdinand	Viking	Weight	14956
Leedy, Loreen	1985	A Number of Dragons	Holiday House	Counting	
LeSieg, Theo	1988	Ten Apples Up on Top	Random House	Counting/Addition/Subtration/Comparisons	63115
Lesser, Carolyn	1984	The Goodnight Circle	Harcourt Brace Jovanovich	Time	
Lewin, Betsy	1981	Cat Count	Dodd, Mead	Addition	
Lewis, Paul	1989	Bears New Years Eve Party	Hillsboro	Counting	

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Leydenfrost, Robert	1975	Ten Little Elephants	Doubleday	Subtraction	
Lindbergh, Reeve	1987	The Midnight Farm	Dial	Counting	72746
Linn, Charles	1970	Estimation	Crowell	Estimation	51662
Lionni, Leo	1975	A Color of His Own	Pantheon	Classification	
Lionni, Leo	1960	Inch by Inch	Astor-Honor	Linear Measurement	
Lionni, Leo	1975	Pezzettino	Pantheon	Fractions	
Lionni, Leo	1968	The Biggest House in the World	Pantheon	Comparisons	
Lloyd, David	1988	Hello, Goodbye	Lothrop, Lee and Shepard	Subtraction	
Lloyd, David	1986	The Stopwatch	Lippincott	Time	
Lobel, Arnold	1970	Frog & Toad Are Friends The Lost Button	Harper and Row	Classification	51403
Lottridge, Celia B.	1986	One Watermelon Seed	Oxford	Big Numbers	
Low, Joseph	1980	Mice Twice	Atheneum	Multiplication/Division	64786
Lurie, Morris		Toby's Millions	Puffin	Money	
Macaulay, David	1977	Castle	Houghton Mifflin	Building and Architecture	60206
Macaulay, David	1973	Cathedral	Houghton Mifflin	Building and Architecture	
Macaulay, David	1974	City	Houghton Mifflin	Building and Architecture	51498
Macaulay, David	1975	Pyramid	Houghton Mifflin	Building and Architecture	
Macaulay, David	1980	Unbuilding	Houghton Mifflin	Building and Architecture	61748
Macaulay, David	1976	Underground	Houghton Mifflin	Building and Architecture	
MacCarthy, Patricia	1989	Animals Galore	Dial	Multiplication/Division	
MacCarthy, Patricia	1991	Herds of Words	Dial	Multiplication/Division	78171
MacCarthy, Patricia	1990	Ocean Parade: A Counting Book	Dial	Counting	74663
MacDonald, Elizabeth	1990	Mike's Kite	Orchard	Addition	75496
MacDonald, Elizabeth	1985	My Aunt and the Animals	Barron's	Counting	
MacDonald, George	1971	The Light Princess	Puffin	Weight	74147
MacDonald, Suse	1988	Numblers	Dial	Counting	
MacDonald, Suse	1989	Puzzlers	Dial	Spatial Concepts	
Mack, Stan	1974	Ten Bears in My Bed	Pantheon	Subtraction	54673
Maddex, Diane	1986	Architects Make Zigzags	National Trust for Historic Preser	Building and Architecture	
Maestro, Betsy	1984	Around the Clock with Harriet: A Book A	Crown	Time	
Maestro, Betsy	1988	Dollars and Cents for Harriet: A Money C	Crown	Money	73184
Maestro, Betsy	1977	Harriet Goes to the Circus	Crown	Counting	

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Magee, Doug	1985	Trucks You Can Count On	Dood, Mead	Counting , Multiplication/Division	68603
Mahy, Margaret	1986	When the Kind Rides By	Ashton Scholastic	Counting, Classification	
Martin, Bill	1987	Knots on a Counting Rope	Henry Holt	Place Value/Numeration Systems	
Martin, Bill	1970	Monday, Monday, I Like Monday	Holt, Rinehart and Winston	Time	71357
Martin, Bill	1972	Sounds of Number -What is Big	Holt, RInehart and WInston	Comparisons	
Martin, Bill	1963	Ten Pennies for Candy	Holt, Rinehart and Winston	Money	
Martin, Bill	1970	The Turning of the Year	Holt, Rinehart and Winston	Time	
Mathews, Louise	1978	Bunches and Bunches of Bunnies	Scholastic	Multiplication/Division	
Mathews, Louise	1982	Cluck One	Dodd, Mead	Addition	
Mathews, Louise	1980	The Great Take Away	Dodd Mead	Subtraction	
Mathis, Sharon Bell	1975	The Hundred Penny Box	Viking	Time, Money	
Matthews, Louise	1979	Gator Pie	Dodd, Mead	Fractions, Estimation	
Mayer, Mercer	1987	Just a Mess	Westerm	Classification	
McCloskey, Robert	1943	Homer Price	Viking	Estimation, Big Numbers	58649
McMillian, Bruce	1986	Becca Backward, Becca Frontward: A Boc	Lothrop, Lee and Shepard	Spatial Concepts	69617
McMillian, Bruce	1986	Counting Wildflowers	Lothrop,Lee and Shepard	Place Value/Numeration Systems/Counting	72250
McMillian, Bruce	1988	Dry or Wet?	Lothrop, Lee and Shepard	Classification	73227
McMillian, Bruce	1988	Fire Engine Shapes	Lothrop, Lee and Shepard	Shapes	73151
McMillian, Bruce	1988	Growing Colors	Lothrop, Lee and Shepard	Classification	77843
McMillian, Bruce	1991	One, Two, One Pair	Scholastic	Multiplication/Division	
McMillian, Bruce	1989	Super, Super, Superwords	Lothrop, Lee and Shepard	Comparisons	74961
McMillian, Bruce	1989	Time to..	Lothrop, Lee, and Shepard	Time	
Medearis, Angela	1990	Picking Peas for a Penny	Viking	Money	
Mendoza, George	1971	The Scarecrow Clock	Holt, Rinehart and Winston	Time	
Merriam, Eve	1964	It Doesn't Always Have to Rhyme-Gazint	Atheneum	Multiplication/Division	
Merrill, Jean	1972	The Toothpaste Millionaire	Houghton Mifflin	Money	
Miles, Miska	1971	Annie and the Old One	Little, Boston	Time	51226
Miller, Jane	1983	Farm Counting Book	Prentice Hall	Counting	68880
Mitchell, Greg	1986	Going Shopping	Martin	Money	
Moore, Inga	1991	Six Dinner Sid	Simon and Schuster	Addition	
Morgan, Pierr	1990	The Turnip	Philomel	Addition	
Morgensen, Jan	1990	The 46 Little Men	Greenwillow	Counting	

MATH + READING = INTEGRATION

Author	Year	Title	Publisher	Topic	Order #
Morozumi, Atsuko	1990	One Gorilla	Straus and Giroux	Counting	77209
Morris, Ann	1989	Bread, Bread, Bread	Lothrop, Lee and Shepard	Classification	73417
Morris, Ann	1989	Hats, Hats, Hats	Lothrop, Lee and Shepard	Classification	73226
Morrison, Philip	1982	Powers of Ten	Scientific American	Place Value/ Numeration Systems	
Munro, Roxie	1985	The Inside-Outside Book of New York Cit	Dodd, Mead	Building and Architecture	
Munsch, Robert	1987	Moira's Birthday	Annick	Estimation	
Myller, Rolf	1962	How Big is a Foot	Atheneum	Linear Measurement	10449
Nesbit, E	1989	Melisande	Harcourt Brace Jovanovich	Multiplication/Division/Linear Measurement	74042
Norton, Mary	1953	The Borrowers	Harcourt Brace and World	Comparisons, Linear Measurement	
O"Donnell, Elizabeth	1989	I Can't Get My Turtle To Move	Morrow	Counting	73709
O"Donnell, Elizabeth	1991	The Twelve Days of Summer	Morrow	Counting	
O'Neill, Mary	1968	Take a Number	Doubleday	Counting	
Oakley, Graham	1979	Magical Changes	Macmillian	Shapes	66712
Olney, Ross	1984	How Long? To go, To Grow, To Know	Morrow	Time	
Ormerod, Jan	1984	Moonlight	Penguin	Time	65921
Ormerod, Jan	1985	Rhymes Around the Day	Puffin	Time	66034
Ormerod, Jan	1984	Sunshine	Penguin	Time	
Owen, Annie	1988	Annie's One to Ten	Knoph	Addition	73181
Oxenbury, Helen	1968	Numbers of Things	Franklin Watts	Counting	
Paine, Penelope	1990	Time for Horatio	Advocacy	Time	
Parish, Peggy	1979	Be Ready at Eight	Macmillan	Time	
Paul, Ann W	1991	Eight Hands Round	Harper Collins	Patterns	76401
Pavey, Peter	1978	One Dragon's Dream	Puffin	Counting	
Peek, Merle	1981	Roll Over	Clarion	Subtraction	63280
Peek, Merle	1987	The Balancing Act	Clarion	Counting	
Perl, Lila	1986	Blue Monday and Friday the Thirteenth	Clarion	Time	
Perl, Lila	1975	Slumps, Grunts and Snickerdoodles	Seabury	Cookbooks	
Petie, Haris	1975	Billions of Bugs	Prentice Hall	Big Numbers	
Pfanner, Louise	1987	Louise Builds a House	Orchard Books	Geometry	77795
Pfanner, Louise	1989	Louise Builds a Boat	Orchard Books	Geometry	
Phillips, Jo	1975	Exploring Triangles: Paper Folding Geon	Crowell	Paper Folding	
Phillips, Jo	1972	Right Angles: Paper Folding Geometry	Crowell	Paper Folding	

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Phillips, Louise	1982	The Upside Down Riddle Book	Lothrop, Lee and Shepard	Shapes	
Pienkowski, Jan	1985	Numbers	Puffin	Counting	
Pienkowski, Jan	1983	Sizes	Puffin	Classification, Size	
Pittman, Helena	1986	A Grain of Rice	Hastings House	Multiplication/Division, Big Numbers	71150
Plume, Ilse	1990	The Twelve Days of Christmas	Harper and Row	Counting, Addition	75527
Podendorf, Illa	1970	Many is How Many?	Childrens Press	Estimation	
Pomerantz, Charlotte	1984	One Duck, Another Duck	Greenwillow	Addition	
Pomerantz, Charlotte	1984	One Duck, Another Duck	Greenwillow	Counting	
Pomerantz, Charlotte	1984	The Half Birthday Party	Clarion	Fractions	67938
Pomerantz, Charlotte	1977	The Mango Tooth	Greenwillow	Subtraction, Money	
Prelutsky, Jack	1990	Something Big Has Been Here- My Snake	Greenwillow	Lines and Angles	75289
Punnett, Dick	1982	Count the Possums	Children's Press	Addition	
Quinn, John	1977	Nature's World Records	Walker	Time	
Raffi	1989	Everything Grows	Crown	Linear Measurement	
Raffi	1989	Five Little Ducks	Crown	Subtraction	75099
Rahn, Joan	1984	Holes	*Houghton Mifflin*	Shapes	
Randell, Beverley	1987	Ten Little Swimming Crabs	Nelson	Counting, Addition, Subtraction	
Randell, Beverley	1985	What's the Time Mr. Wolf	Nelson	Time	
Read, Ronald	1965	Tangrams, 330 Puzzles	Dover	Shapes	96033
Rees, May	1988	Ten in a Bed	Little Brown	Subtraction	
Reid, Margaret	1990	The Button Box	Dutton	Classification	
Reiss, John	1987	Numbers	Macmillan	Counting	
Reiss, John	1974	Shapes	Bradbury	Shapes	
Rockwell, Anne	1987	Bear Child's Book of Hours	HarperCollins	Time	
Rockwell, Anne	1989	Willy Can Count	Arcade	Counting	
Roennfeldt, Robert	1983	A Day on the Avenue	Penguin	Time	23456
Rogers, Paul	1989	The Shapes Game	Holt	Shapes	
Ross, Pat	1980	Molly and the Slow Teeth	Lothrop, Lee and Shepard	Subtraction	63216
Roy, Ron	1987	Whose Hat is That	Clarion	Classification	
Ruben, Patricia	1978	What is New? What is Missing? What is I	Lippincott	Classification	
Russell, Sandra	1982	A Farmers Dozen	Harper and Row	Addition	65068
Russell, Solveig P	1970	One, Two, Three and Many: A First Look	H. Z. Walck	Place Value/ Numeration Systems	

Author	Year	Title	Publisher	Topic	Order #
Russo, Marisabina	1988	Only Six More Days	Greenwillow	Time	
Russo, Marisabina	1986	The Line Up Book	Greenwillow	Linear Measurement	
Sachar, Louis	1989	Sideways Arithmetic from Wayside Schoc	Scholastic	Games, Puzzles and Other Explorations	
Sackson, Sid	1991	The Book of Classic Board Games	Klutz Press	Games, Puzzles and Other Explorations	
Sarasas, Claude	1964	The ABC's of Origami: Paper Folding for	Charles E. Tuttle	Paper Folding	
Scarry, Richard	1973	1970	Western	Classification	
Schmitt, Lois	1989	Smart Spending: A Young Consumer's Gu	Scribner	Money	
Schwartz, David	1985	How Much is a Million	Lothrop, Lee and Shepard	Big Numbers	76657
Schwartz, David	1989	If You Made a Million	Lothrop, Lee and Shepard	Big Numbers, Money	73191
Scott, Ann	1990	One Good Horse: A Cowpuncher's Counti	Greenwillow	Counting	
Selsam, Millicent	1966	Benny's Animals, and How he Put Them Ir	Harper and Row	Classification	
Sendak, Maurice	1962	Chicken Soup w/ Rice: A Book of Month:	Harper and Row	Time	61005
Sendak, Maurice	1962	One was Johnny	Harper and Row	Addition	
Sendak, Maurice	1977	Seven Little Monsters	Harper and Row	Counting	
Seuss, Dr.	1973	The Shape of Me and Other Stuff	Random House	Shapes	
Seuss, Dr.	1958	Yertle the Turtle and Other Stories	Random House	Linear Measurement	
Seuss, Dr.	1938	The 500 Hats of Bartholomew Cubbins	Vanguard	Big Numbers	10529
Sharmat, Marjorie	1983	Rich Mitch	Morrow	Money	
Shaw, Charles	1947	It Looked Like Spilt Milk	Harper and Row	Shapes	75830
Sheppard, Jeff	1990	The Right Number of Elephants	Harper and Row	Counting	77276
Sherrow, Victoria	1990	Wilbur Waits	Harper and Row	Time	
Shulevitz, Uri	1967	One Monday Morning	Scribner	Time	24010
Siegel, Alice	1985	The Kids' World Almanac	Pharos Books	Big Numbers	
Silverstein, Shel	1964	A Giraffe and a Half	Harper and Row	Fractions	
Silverstein, Shel	1981	A Light in the Attic- Eight Balloons	Harper and Row	Subtraction	64938
Silverstein, Shel	1981	A Light in the Attic- How Many, How Mu	Harper and Row	Estimation	
Silverstein, Shel	1981	A Light in the Attic- Longmobile	Harper and Row	Linear Measurement	
Silverstein, Shel	1981	A Light in the Attic- Reflection	Harper and Row	Symmetry	
Silverstein, Shel	1981	A Light in the Attic-Longmobile	Harper and Row	Comparisons	
Silverstein, Shel	1981	A Light in the Attic-Shadow Race	Harper and Row	Time	
Silverstein, Shel	1981	A Light in the Attic-Shapes	Harper and Row	Shapes	
Silverstein, Shel	1981	A Light in the Attic-Snake Problem	Harper and Row	Linear Measurement	

Author	Year	Title	Publisher	Topic	Order #
Silverstein, Shel	1976	The Missing Piece	Harper and Row	Shapes	
Silverstein, Shel	1981	The Missing Piece Meets the Big O	Harper and Row	Shapes	64937
Silverstein, Shel	1974	Where the Sidewalk Ends- Band-aids	Harper and Row	Addition	52781
Silverstein, Shel	1974	Where the Sidewalk Ends- Hector the Col	Harper and Row	Classification	
Silverstein, Shel	1974	Where the Sidewalk Ends- Invention	Harper and Row	Estimation	
Silverstein, Shel	1974	Where the Sidewalk Ends- Lester	Harper and Row	Multiplication/Division	
Silverstein, Shel	1974	Where the Sidewalk Ends- One Inch Tall	Harper and Row	Linear Measurement	
Silverstein, Shel	1974	Where the Sidewalk Ends- One Inch Tall	Harper and Row	Comparisons	
Silverstein, Shel	1974	Where the Sidewalk Ends- Smart	Harper and Row	Money	
Silverstein, Shel	1974	Where the Sidewalk Ends- Smart	Harper and Row	Place Value/ Numeration Systems	
Simon, Hilda	1980	The Racers: Speed in the Animal World	Lothrop, Lee and Shepard	Comparisons	62335
Simon, Leonard	1972	Sounds of the Storyteller-Counting Light	Holt, RInehart, and Winston	Place Value/ Numeration Systems	
Simon, Leonard	1963	The Day the Numbers Disappeared	Holt, Rinehart and Winston	Place Value/ Numeration Systems	
Simon, Seymour	1984	The Dinosaur is the Biggest Animal That E	Lippincott	Comparisons	
Sis, Peter	1990	Beach Ball	Greenwillow	Classification	77347
Sis, Peter	1989	Going Up! A Color Counting Book	Greenwillow	Addition	73179
Sis, Peter	1988	Waving: A Counting Book	Greenwillow	Counting	72133
Sitomer, Mindel	1971	Circles	Crowell	Shapes	51646
Sitomer, Mindel	1976	How Did Numbers Begin	Crowell	Place Value/ Numeration Systems	
Sitomer, Mindel	1972	Lines, Segments, Polygons	Crowell	Lines and Angles	
Sitomer, Mindel	1974	Spirals	Crowell	Lines and Angles	
Sitomer, Mindel	1970	What is Symmetry?	Crowell	Symmetry	
Sitomer, Mindel	1978	Zero is Not Nothing	Crowell	Place Value/ Numeration Systems	
Slobodkina, Esphyr	1976	Caps for Sale	Scholastic	Classification	50071
Smyth, Gwenda	1984	A Pet for Mrs. Arbuckle	Crown	Classification	
Snape, Juliet	1987	The Boy with the Square Eyes	Simon and Schuster	Shapes	73792
Spier, Peter	1988	Fast-Slow, High-Low	Doubleday	Classification, Comparisons	57832
Spier, Peter	1977	Noah's Ark	Doubleday	Multiplication/Division	70473
Spier, Peter	1980	People	Doubleday	Classification	63103
Srivastava, Jane	1974	Area	Crowell	Spatial Concepts, Linear Measurement	
Srivastava, Jane	1979	Number Families	Crowell	Multiplication/Division	62695
Srivastava, Jane	1980	Spaces, Shapes and Sizes	Crowell	Spatial Concepts	62310

Author	Year	Title	Publisher	Topic	Order #
Srivastava, Jane	1970	Weighing and Balancing	Harper and Row	Weight	
St. John, Glory	1975	How to Count Like A Martian	H. Z. Walck	Place Value/ Numeration Systems	
Stevenson, Robert	1988	Block City	Dutton	Building and Architecture	72858
Sullivan, Joan	1963	Round is a Pancake	Holt, Rinehart and Winston	Shapes	
Tafuri, Nancy	1984	Have You Seen My Duckling?	Greenwillow	Subtraction	68031
Tafuri, Nancy	1988	Spots, Feathers and Curly Tails	Greenwillow	Classification	73432
Tafuri, Nancy	1986	Who's Counting	Greenwillow	Counting	69541
Testa, Fulvio	1983	If You Look Around You	Dial	Shapes	
Testa, Fulvio	1982	If You Take a Pencil	Dial	Counting	
Thaler, Mike	1991	Seven Little Hippos	Simon and Schuster	Subtraction	
Thomson, Ruth	1987	All About 1, 2, 3	Gareth Stevens	Classification, Counting , Subtraction	
Tolstoy, Alexei	1974	The Great Big Enormous Turnip	Heinemann	Comparisons, Weight	
Tompert, Ann	1990	Grandfather Tang's Story	Crown	Shapes	75484
Trivas, Irene	1988	Emma's Christmas	Orchard	Addition	73117
Trivett, John	1975	Building Tables in Tables: A Book Abou	Crowell	Multiplication/Division	
Tudor, Tasha	1956	1 is One	H. Z. Walck	Counting	
Ueno, Noriko	1973	Elephant Buttons	Harper and Row	Comparisons	
Unwin, Pippa	1990	The Great Zoo Hunt	Doubleday	Counting	74778
Van Allsburg, Chris	1981	Jumanji	Houghton Mifflin	Games, Puzzles and Other Explorations	63292
VanNote, Peter	1968	Sam Loyd's Book of Tangram Puzzles	Dover	Shapes	
Viorst, Judith	1978	Alexander, Who Used to Be Rich Last Sun	Atheneum	Subtraction, Silverstein, Shel	60752
vonTscharner, Renata	1987	New Providence: A Changing Cityscape	Harcourt Brace Jovanovich	Time	74595
Vreuls, Diane	1977	Sums: A Looking Game	Macmillian	Shapes	
Wadsworth, Olive	1985	Over in the Meadow	Puffin	Counting	
Wahl, John	1976	I Can Cout the Petals of a Flower	NCTM	Multiplication/Division	
Walsh, Ellen	1991	Mouse Count	Harcourt Brace Jovanovich	Addition	75849
Walter, Marion	1971	Another Magic Mirror Book	Scholastic	Symmetry	
Walter, Marion	1975	Another, Another , Another and MOre	Andre Deutsch	Symmetry	
Walter, Marion	1971	The Magic Mirror Book	Scholastic	Symmetry	
Walter, Marion	1985	The Mirror Puzzle Book	Tarquin	Symmetry	
Warren, Cathy	1983	The Ten Alarm Camp Out	Lothrop, Lee and Shepard	Time	66751
Watson, Clyde	1977	Binary Numbers	Crowell	Place Value/Numeration Systems/Multi/Division	

Author	Year	Title	Publisher	Topic	Order #
Watson, Clyde	1972	Tom Fox and the Apple Pie	Crowell	Fractions	
Watson, N.	1987	The Little Pigs' First Cookbook	Little, Brown	Cookbooks	
Webster, David	1968	Snow Sumpers	Natural History Press	Shapes	
Wheatley, Nadia	1987	My Place	Australia	Time	
White, E.B	1952	Charlottes Web	Harper	Time	50011
Wild, Margaret	1984	Something Absolutely Enormous	Ashton Scholastic	Weight, Linear Measurement	
Wilder, Laura Ingalls	1983	Little House in the Big Woods	Harper and Row	Divisions	10616
Wildsmith, Brian	1980	Animal Shapes	Oxford	Shapes	
Wildsmith, Brian	1987	Toot Toot	OUP	Counting	
Wilkinson, Elizabeth	1989	Making Cents: Every Kid's Guide to Mon	Little, Brown	Money	
Williams, Vera	1983	Something Special for Me	Greenwillow	Money	66233
Williams, Vera	1982	A Chair for my Mother	Greenwillow	Money	65941
Williams, Vera	1981	Three Days on a River in a Red Canoe	Greenwillow	Time	63194
Wilson, Forrest	1968	Architecture: A Book of Projects for Your	Reinhold	Building and Architecture	
Winer, Yvonne	1985	Mr. Brown's Magnificent Apple Tree	Ashton Scholastic	Subtraction	
Winthrop, Elizabeth	1986	Shoew	Harper and Row	Classification	
Wolkestein, Diane	1972	8,000 Stones	Doubleday	Comparisons, Weight	
Wood, Audrey	1984	The Napping House	Harcourt Brace Jovanovich	Addition	68892
Yenawine, Philip	1991	Lines	Delacorte Press	Lines and Angles	
Yenawine, Philip	1991	Shapes	Delacorte Press	Shapes	
Yolen, Jane	1976	An Invitation to the Butterfly Ball	Parents Magazine Press	Counting	
Zaslavsky, Claudia	1980	Count on Your Fingers African Style	Crowell	Place Value/ Numeration Systems	62692
Zaslavsky, Claudia	1989	Zero: Is it Something? Is it Nothing?	Watts	Place Value/ Numeration Systems	73621
Ziebel, Peter	1989	Look Closer	Clarion	Shapes	
Ziner, Feenie	1982	Time	Children's Press	Time	
Zolotow, Charlotte	1981	One Step Two..	Lothrop, Lee and Shepard	Linear Measurement	63182
Zubrowski, Bernie	1988	Clocks: Building/Experimenting with Mc	Morrow Junior Books	Time	74899

Alternative Algorithms:
Moving from Memorization to Conceptual Understanding

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Addition Algorithms

Left-to-Right Algorithm
Starting at the left, add column-by-column; then adjust the result.

1. Add
2. Adjust 10s & 100s
3. Adjust 1s and 10s

```
  2 6 8
+ 4 8 3
-------
  6 14 11
  7 4 11
-------
  7 5 1
```

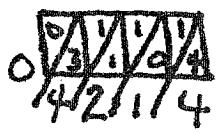
Partial-sums Algorithm
Add the numbers in each column. Then add the partial sums.

1. Add 100s
2. Add 10s
3. Add 1s
4. Add partial sums.

```
  2 6 8
+ 4 8 3
-------
  6 0 0
  1 4 0
    1 1
-------
  7 5 1
```

Lattice Addition Algorithm
Each column is added separately, and the sum of each column is recorded in a box diagonally cut in half. When all the boxes are filled, the numbers are added along the diagonals.

```
  3 4 2 9
+   7 8 5
```



4,214

Fraction-Addition Algorithm
Simply multiply the numerators against both denominators, then add.

1/3 + 5/8 = 1x8/3x8 + 5x3/8x3 = 8/24 + 15/24 = 23/24

a/b + c/d = (a x d) + (c x b)/b x d

Subtraction Algorithms

Add-Up Algorithm

$$\begin{array}{r} 932 \\ -\,356 \\ \hline \end{array}$$

356 + 4

360 + 40

400 + 500

900 + 32

932

576

Left-to-Right Algorithm

Starting at the left, subtract column-by-column.

$$\begin{array}{r} 932 \\ -\,356 \\ \hline \end{array}$$

1. Subtract the 100s: $\begin{array}{r} 932 \\ -\,300 \\ \hline 632 \end{array}$
2. Subtract the 10s: $\begin{array}{r} -\,50 \\ \hline 582 \end{array}$
3. Subtract the 1s: $\begin{array}{r} -\,6 \\ \hline 576 \end{array}$

Same-Change Algorithm

Rename both the minuend and the subtrahend so that the subtrahend ends in zero.

$$\begin{array}{rrr} 932 \rightarrow & 936 \rightarrow & 976 \\ -\,356 \rightarrow & -360 \rightarrow & -\,400 \\ \hline & & 576 \end{array}$$

Fraction-Subtraction Algorithm

Use the generalized formula as in the Fraction-Addition Algorithm.

$2/3 - 5/8 = 2 \times 8/3 \times 8 - 5 \times 3/8 \times 3 = 16/24 - 15/24 = 1/24$

$a/b - c/d = (a \times d) - (c \times b)/b \times d$

Multiplication Algorithms

Partial-Products Algorithm

Each factor is thought of as a sum of ones, tens, hundreds, and so on. For example, in 53 x 67, think of 53 as 50 + 3 and of 67 as 60 + 7. Then each addend in one factor is multiplied by each addend in the other factor, and all of the resulting partial products are added together. In order to use this algorithm efficiently, students need to be very good at multiplying multiples of 10, 100, and 1000.

```
   67
 x 53
 3000   <-  50 [60s]
  350   <-  50 [7s]
  180   <-  3 [60s]
+  21   <-  3 [7s]
 3551
```

The Lattice Method Algorithm

In 1478, the lattice method appeared in Treviso, Italy, in what is said to be the first printed arithmetic book. It was in use long before that, with some historians tracing it to Hindu origins in India before 1100 A.D. To multiply 53 by 67:

- draw a rectangular grid with as many rows as the number of digits in one factor and as many columns as the number of digits in the other factor (2 by 2 in this example)
- sketch a diagonal in each cell of the grid, from bottom left to top right
- write the factors on the outside of the grid, one digit per cell. Left to right for the horizontal factor, top to bottom for the vertical factor
- multiply each digit in one factor by each digit in the other factor and enter the products in the two triangles of the cell corresponding to the pair of digits. If the product is less than 10, enter 0 in the top triangle and the product in the bottom one.
- beginning in the bottom right triangle of the grid, add the numbers inside the lattice along each diagonal strip and write the result at the open end of the strip (along the bottom and left side of the grid). If the sum exceeds 9, add the excess 10s to the next diagonal strip (as if you were carrying a number in the traditional right-to-left addition algorithm).
- read the digits in the answer in order down the left side and across the bottom.

Egyptian Algorithm

An algorithm for multiplication developed by the Egyptians over 4000 years ago eliminates the need for all multiplication facts except for the "2s." The idea of doubling is used repeatedly. Here is how to use the Egyptian method for 28 x 13:

Step 1: List the consecutive powers of 2 beginning with 1. Stop with the power of 2 that is less than or equal to the smaller factor.

Step 2: In the second column, write the other factor next to the 1, and the double the factor repeatedly, stopping with the last power of 2 in the first column. Each number in the second column is the product of the number in the first column multiplied by the second factor.

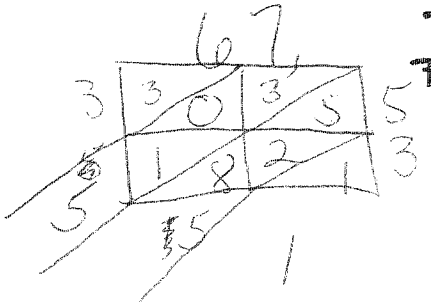
Step 3: Check off the powers of 2 whose sum is the smaller factor (1 + 4 + 8 = 13)

Step 4: Cross out the rows that are not checked off.

Step 5: Add the numbers in the second column that are not crossed off.

(28 + 112 + 224 = 364)

1	28
2	56
~~4~~	~~112~~
8	224
13	364



Russian Peasant Algorithm

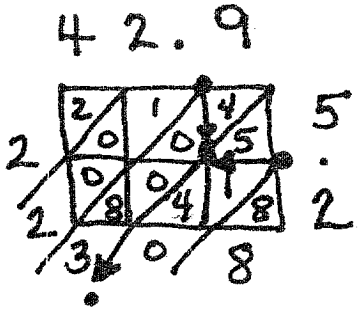
34 x 16

Take one number from your problem (ex.: 34) and repeatedly halve it in a vertical column until you get to 1. When an odd number is halved (as in the case of 17), only the whole-number portion of the quotient is recorded. Take the other number from your problem (16) and, in a vertical column beside the first column, repeatedly double it, until you have every number in the first column matched. Then, any righthand entry paired with an even number on the left is discarded. The remaining numbers in the righthand column are added to provide the product of the two original numbers.

~~34~~	~~16~~
17	32
~~8~~	~~64~~
~~4~~	~~128~~
~~2~~	~~256~~
1	+ 512
	544

Lattice Multiplication of Decimals Algorithm

The lattice method can be used to multiply decimals. Simply find the intersection of the decimal points along the horizontal and vertical lines; then slide it down its diagonal.



42.9 x 5.2

223.08

Division Algorithm

This guess-and-check method allows students repeatedly to subtract convenient numbers fro the dividend and then total all the amounts that have been subtracted.

13⟌1528	100
-1300	
228	10
-130	
98	2
-26	
72	4
-52	
20	1
-13	
7	117 r. 7

Motivation Menu

When the Mid-continent Regional Educational Laboratory held "school improvement" workshops in several states, participating teachers contributed ideas that they've used successfully to motivate students. The following list is adapted from their "menu."

Recognition/Reward

Teaching Others
Attention
Happy-Grams
Stickers
Peer-Tutoring
Pat on the Back
Special Jobs
Complimentary Comments
Happy Notes to Parents
Daily Helpers
Tangible Rewards
Specific Praise
One-to-One Counseling
Smiles
Laughter
Special Table in Lunchroom
Pictures Displayed with Biographies
Artwork Displayed in Local Businesses
Good Behavior Coupons-Raffle Certificates
Phone Call Home
Display of Class Work
Taking Work to Show Principal
Talent Show (Parents, Teachers, Students)
Art Show
Hobby Display
First in Line
"I Got Caught Being Good" T-Shirt Awards

Special Projects

Making Books
School Newspaper
Special Lunch or Dinner with Decorations
School T-Shirts
"Helping Projects"
Canned Food Drive
Mentors from the Community
Adopt-a-Grandparent

Days & Special Events

Friendship Day
Crazy Hat or Special Hat Day
T-Shirt Day
School Colors Day
Everybody-Wear-Red-Day
Everyone-Compliment-Someone Day (e.g., give 3 compliments; learn to accept compliments)
Everyone-Do-Something-Nice Day
Halloween (teachers in costume, too) & Costume Parade
Clash Day or Mismatch Day
Storybook Character Day

Contests/Competitions/Goals

Drawing
Math Contests
Spelling Bee
Games
Earn Free Time
Tournament
Faculty Sports Contest
Interschool Competition
Points
Spelling Week
Bingo
Design School Flag, Insignia, Newsletter, Mascot
PTA Membership Competition
Jeopardy
Spelling Monopoly
Student of the Month
Individual Competition
Time-test Winner for Breaking Own Record
Challenge
Candy Bar Question
Intramurals
"Whiz-a-matic Machine" Quiz Show (teams of students develop test items from their own current-events reading)

Everybody Can Participate

Songfests
Art Fests
Field Days
Non-Competitive Games, Skiing, Skating
Grade-Level Lunches with Principal
"Birthdays" Party Honoring Birthdays (Parents Invited)
Board Work
Schoolwide Breakfast
Free After-School Movies
Popcorn Party
Review Teams for Tests
Mini-Courses
Book club
Birthday Club
Read-a-thon

Suspend the Rules

Free Time
Special Privileges
Write on Hands—to Show Last Year's Teacher
Mascot Travels from Room to Room
Sit-Where-You-Want in Lunchroom Day
Outside Play Time
Lunch Out
Take Work to Principal
Shirttail Day
Gum in Class
Crib Notes for Tests

Parents

Parent Volunteer Program
Parent Luncheon
Phone Call Home
Happy Note to Parents
Parent-Teacher Cookout
"Birthdays" Party
Grade-Level Family Night Dinner and Program
Parent-Teacher-Student conferences
Ask Mom/Dad for Information

"Extra" and Fun

A Surprise
Films
School Assemblies
Concert
Reading Corners
Change Classrooms (e.g., on April 1)
School Sing-Along
Outside Play Time
Plays
Field Trips
Special Guest Day
Parent Day Luncheon
Staff Recognition Day
Lunch with Teacher
Skating Parties
Spring Carnival
Computer Time for Time on Task
Lunchtime Dances

Taxonomy Verb List

Knowledge - Recall the basic facts. The simple level of thinking	tell, list, show, find, label, say, recite, check, locate, choose, select, name, identify, read, write, match, cite, count, define, draw, indicate, name, point, quote, recognize, record, relate, repeat, state, tabulate, and trace
Comprehension - Understanding the idea is the key	translate, retell, define, interpret, outline, expand, reward, qualify, alter, change, spell-out, account for, associate, classify compare, compute, contrast, describe, differentiate, discuss, distinguish, explain, estimate, express, locate, interpolate, predict, report, and restate
Application - Using facts to find solutions to problems	solve, adopt, use, try, relate, illustrate, diagram, construct, employ, report, interview, record, apply, calculate, complete, demonstrate, dramatize, employ, examine, illustrate, interpret, locate, interpolate, operate, order, predict, practice, relate, report, restate, review, schedule, sketch, solve, translate and utilize
Analysis - Examining parts in relationship to the whole	breakdown, uncover, look in to, dissect, examine, take apart, classify, simplify, inspect, categorize compare, contrast, analyze, appraise, contract, criticize, debate, detect, diagram, differentiate, distinguish, experiment, infer, inspect, inventory, question, separate and summarize
Synthesis - Creating new or original ideas for products	invent, compose, combine, reorganize, develop, blend, form, originate, reorder, produce, design, predict, arrange, assemble, collect, construct, create, generalize, integrate, manage, organize, plan, prepare, prescribe, propose and specify
Evaluation - Judging the value of ideas or products	translate, debate, evaluate, grade, select, reject, determine, judge, criticize, recommend, rank, editorialize, appraise, assess, choose, critique, estimate, measure, rank, rate, revise, score, and test

[Verb Index Page] [Misc. Verb List] [Subject Verb List]
[Student Teacher/Education Major] [iloveteaching homepage]

COPY FOR CLASS
GINA

MANIPULATIVES TO CONCEPTS
[I have this stuff—when do I use it?]

Manipulative	Concepts
Algebra tiles	Integers, equations, inequalities, polynomials, similar terms, factoring, estimation
Attribute blocks	Sorting, classifying, investigation of size shape, color, logical reasoning, sequencing, patterns, symmetry, similarity, congruence, thinking skills, geometry, organization of date.
Balance scale	Weight, mass, equality, inequality, equations, operations on whole numbers, estimation, measurement
Base-ten blocks	Place value, operations on whole numbers, decimals, decimal-fractional-percent equivalencies comparing, ordering, classification, sorting, number concepts, square and cubic numbers, area perimeter, metric measurement, polynomials
Calculators	Problems with large numbers, problem solving, interdisciplinary problems, real life problems, patterns, counting, number concepts, estimation, equality, inequality, fact strategies, operations on whole numbers, decimals, fractions
Capacity containers	Measurement, capacity, volume, estimation
Clocks	Time, multiplication, fractions, modular arithmetic, measurement
Color tiles	Color, shape, patterns, estimation, counting, number concepts, equality, inequality, operations on whole numbers & fractions, probability, measurement, area, perimeter, surface area, even & odd numbers, prime & composite numbers, ratio, proportion, percent, integers, squares & cubic numbers, numbers, spatial visualization
Compasses	Constructions, angle measurement
Cubes	Number concepts, counting, place value, fact strategies-especially turnaround facts, classification, sorting, colors, patterns, square and cubic numbers, equality, inequalities, averages, ratio, proportion, percent, symmetry, spatial visualization, area, perimeter, volume, surface area, Transformational geometry, operation on whole numbers & fractions, even & odd numbers, prime & composite numbers, probability
Cusinaire rods	Classification, sorting, ordering, counting, number concepts, comparisons, fractions ratios Proportion, place value, patterns, even & odd numbers, prime & composite numbers, logical Reasoning, estimation, operations on whole numbers
Decimal Squares	Decimals – place value, comparing, ordering, operations, classification, sorting, number concepts
Dominoes	Counting, number concepts, fact, classification, sorting, patterns, logical reasoning, equality, inequality, percent, perimeter, area
Factor Blocks	Primes, composites, factors, multiples, least common multiple greatest common factor

Fractional Models	Fractions- meaning, recognition, classification, sorting, comparing, ordering, number concepts Equivalence, operations, perimeter, area, percent probability
Geoboards	Size, shape, counting, area, perimeter, circumference, symmetry, fractions, coordinate geometry, slopes, angles, Pythagorean Theorem, estimation, percent, similarity, congruence, rotations, reflections, translations, classification, sorting, square numbers, polygons, spatial visualizations, logical reasoning
Geometrical solids	Shape, size, relationships between area & volume, volume, classification, sorting, measurement spatial visualization
Math Balance invicta, number	Equality, inequality, operations on whole numbers, open sentences, equations, place value, fact strategies, measurement, logical reasoning
Miras	Symmetry, similarity, congruence, reflections, rotations, translations, angles, parallel & perpendicular lines, constructions
Money	Money, change, comparisons, counting, classifications, sorting, equality, inequality, operations on whole numbers, decimals, fractions, probability, fact strategies, number concepts
Number cubes	Counting, number concepts, fact strategies, mental math, operations on whole numbers, fractions, decimals, probability, generation of problems, logical reasoning
Numeral cards	Counting, classification, sorting, comparisons, equality, inequality, order, fact strategies, number concepts, operations on whole numbers, fractions, decimals, logical reasoning, patterns, odd and even numbers, prime and composite numbers
Pattern Block	Patterns, one to one correspondence, sorting, classification, size, shape, color, geometric relationships, symmetry, similarity, congruence, area, perimeter, reflections, rotations, translations, problem solving, logical reasoning, fractions, spatial visualization, tessellations, angles, ratios, proportions
Polyhedra models	Shape, size, classifications, sorting, polyhedra, spatial visualization
Protractors	Constructions, angle measurement
Rulers Tape measures	Measurement, area, perimeter, constructions, estimation, operations on whole numbers, volume
Spinners	Counting, number concepts, operations on whole numbers, decimals, fractions, fact strategies, mental math, logical reasoning, probability, generation of problems
Tangrams	Geometric concepts, spatial visualization, logical reasoning, fractions, similarity, congruence, area, perimeter, ratio, proportion, angles, classification, sorting, patterns, symmetry, reflections, translations, rotations
Ten-frames	Temperature, integers, measurement
Two-color counters	Counting, comparing, sorting, classification, number concepts, fact strategies, even & odd numbers equality, inequality, operations, ratio, proportions, probability, integers

CONCEPTS TO MANIPULATIVES
[What can I use to reinforce this concept?]

Concept	Manipulative
Angles	Protractors, compasses, geoboards, Miras, rulers, tangrams, pattern blocks
Area	Geoboards, color tiles, base-ten blocks, decimal squares, cubes, tangrams, pattern blocks, rulers, fractional models
Classification	Attribute blocks, cubes, pattern blocks, tangrams, 2-color counters, Cuisenaire rods, dominoes, geometric solids
Constructions	Compasses, protractors, rulers, miras
Coordinate geometry	Geoboards
Counting	Cubes, 2-color counters, color tiles, Cuisenaire rods, dominoes, numeral cards, spinners, 10-frames, number cubes, money calculators
Decimals	Decimal squares, base-ten blocks, money , calculators, number cubes, numeral cards, spinners
Equations/inequalities Equality/ inequality Equivalence	Algebra tiles, math balance, calculators, 10 –frames, balance scale, color tiles, dominoes, money, numeral cards, 2-color counters, cubes, Cuisenaire rods, decimal squares, fraction models
Estimation	Color tiles, geoboards, balance scale, capacity containers, rulers, Cuisenaire rods, calculators
Fact strategies	10-frames, 2-color counters, dominoes, cubes, numeral cards, spinners, number cubes, money, math balance, calculators
Factoring	Algebra tiles
Fractions	Fractional models, pattern blocks, base-ten materials, geoboards, clocks, color tiles, cubes, Cuisenaire rods, money, tangrams, calculators, number cubes, spinners, 2-color counters, decimal squares, numerical cards
Integers	2-color counters, algebra tiles, thermometers, color tiles
Logical reasoning	Attribute blocks Cuisenaire rods, dominoes, pattern blocks, tangrams, number cubes, spinners, geoboards
Measurement	Balance scale, math balance, rulers, capacity containers, thermometers, clocks, geometric solids, base-ten materials, color tiles
Mental math	10-frames, dominoes, number cubes, spinners
Number concepts	Cubes, 2-color counters, spinners, number cubes, calculators, dominoes, numeral cards, base ten materials, Cuisenaire rods, fractional models, decimal squares
Odd, even Prime composite	Color tiles, cubes, Cuisenaire rods, numeral cards, 2-color counters, factor blocks
Patterns	Pattern blocks, attribute blocks, tangrams, calculators, cubes, color tiles, Cuisenaire rods, dominoes, numeral cards, 10-frames

Percent	Base-ten material, decimal squares, color tiles, cubes, geoboards, fractional models
Perimeter/Circumference	Geoboards, color tiles, tangrams, pattern blocks, rulers, base-ten materials, cubes, fractional circles, decimal squares
Place value	Base-ten materials, decimal squares, 10 frames, Cuisenaire rods, math balance, cubes, 2-color counters
Polynomials	Algebra tiles, base-ten materials
Probability	Spinners, number cubes, fractional models, money, color tiles, cubes,2-color counters
Pythagorean Theorem	Geoboards
Ratio/proportion	Color tiles, cubes, Cuisenaire rods, tangrams, pattern blocks, 2-color counters
Similarity/congruence	Geoboards, attribute blocks, pattern blocks, tangrams, miras
Size/shape/color	Attribute blocks, cubes, color tiles, geoboards, geometric solids, pattern blocks, tangrams Polyhedra models
Spatial visualization	Tangrams, pattern blocks, geoboards, geometric solids, polyhedra models, cubes, color tiles
Square/cubic numbers	Color tiles, cubes, base-ten materials, geoboards
Surface area	Color tiles, cubes
Symmetry	Geoboards, pattern blocks, tangrams, miras, cubes, attribute blocks
Tessellations	Pattern blocks, attribute blocks
Transformational geometric translations, Rotations, reflections	Geoboards, cubes, miras, pattern blocks, tangrams
Volume	Capacity containers, cubes, geometric solids, rulers
Whole numbers	Base-ten materials, balance scale, number cubes, spinners, color tiles, cubes, math balance, money , numeral cards, dominoes, rulers, calculators, 10-frames, Cuisenaire rods, clocks, 2-color counters