CSMP Mathematics for the Intermediate Grades Part III

Blacklines

Note: This packet contains blackline masters for home activities, parent letters, and numerous activities that coordinate with *CSMP Mathematics for the Intermediate Grades, Part III*. There are no limits to the number of times these blacklines may be reproduced.

The Home Activity section begins with an introductory letter to parents/guardians. Subsequent home activities may be reproduced and cut off, one at a time, and sent home as appropriate. Then there are blacklines to coordinate with lessons in the five strands, N, L, G, P, and W organized in order, by strand. Following these are generic blacklines and forms for lesson notes.

McREL

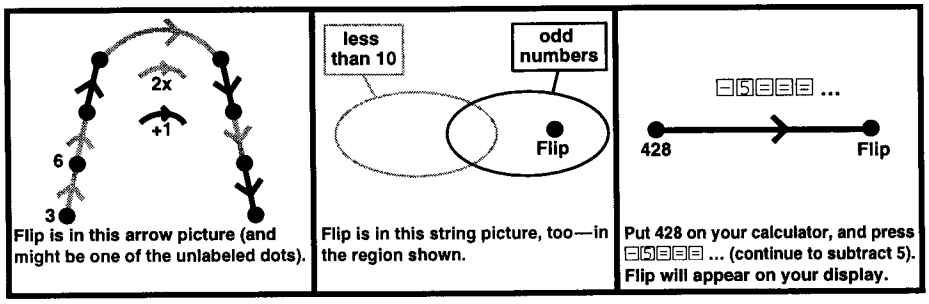
A LETTER TO PARENTS ABOUT *CSMP*

The *Comprehensive School Mathematics Program* (*CSMP*) is the mathematics program we use in your child's class. It is difficult to describe in a letter *CSMP*'s rich and exciting way of teaching mathematics. This, however, is a short introduction to *CSMP* and an invitation for you to visit your child's math class.

CSMP is different because it uses several "picture" languages. These languages make it easy for children to understand some very interesting but complex mathematical ideas. Students enjoy using these picture languages. At times during the year, we will send more information about these languages with examples from our *CSMP* lessons.

The developers of *CSMP* believe that mathematics is more than just arithmetic and that students learn best when they are solving interesting problems. They believe that students should understand, enjoy, and use their skills instead of just practicing them. With *CSMP*, students use their arithmetic skills while they play number games, solve detective stories, or build number "roads."

CSMP students use these clues to find Flip. Can you?



Children learn mathematical ideas and skills in different ways and at different times. For this reason *CSMP* teachers do not stick to one topic until everyone has learned it. Instead, the many concepts and skills are taught several times during the year. Students learn something during each lesson and master each skill when they are able.

In our math classes students participate in lessons with the whole class at times, with a smaller group at other times, and sometimes by themselves. Students are encouraged to talk about their ideas and to find different ways of solving a problem. The student workbooks and worksheets have easy, average, and hard pages so that all children can work on problems that are right for them.

Your child may be using a calculator for some math lessons. Calculators do not replace the need for arithmetic skills, but they do provide interesting mental arithmetic exercises. Students will use calculators to explore mathematical concepts and number patterns, or to practice math facts. They may also use calculators on problems involving tedious calculations or particularly difficult numbers.

We hope you will visit a *CSMP* math class soon. It can be an exciting experience.

Sincerely,

P.S. Flip, the secret number, is 13.

IG-III HOME ACTIVITIES

Dear Parent/Guardian:

Activities that accompany various lessons in our mathematics program (*CSMP Mathematics for the Intermediate Grades)* will be sent home with your child periodically. They will be called "Home Activities" rather than "homework," because we hope you will use them as an opportunity to become involved with your child in learning more about the *CSMP* tools, methods, and skills.

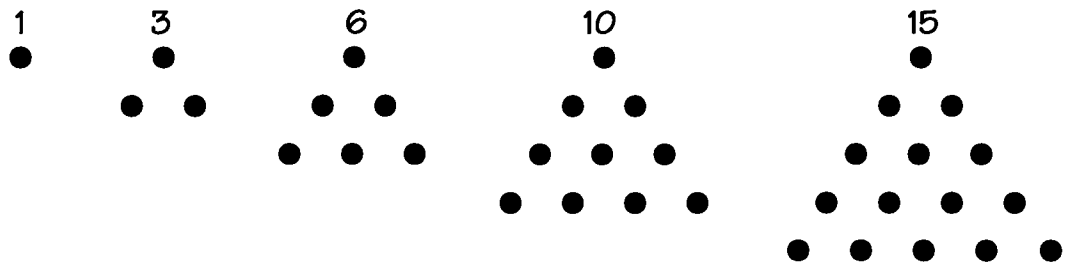
Some home activities will be follow-up or practice for a class lesson; others will be for enrichment or extension. Please keep all the activities and materials in the envelope provided. Some materials may be used more than once, and you may want to refer back to previous activities.

Sincerely,

N5

Do you know what numbers are triangular?

Ask your child to tell you about triangular numbers, as he or she learned about them in math class. The name *triangular numbers* comes from a triangular pattern we can make with a number of dots. The first few triangular numbers are these:

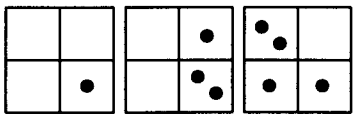


Work with your child to list the next ten or more triangular numbers. Look for patterns and use a calculator if you like.

N10

In mathematics class, we sometimes play a game called *Minicomputer Golf.* You can play this game with your child at home.

Start with a number on the Minicomputer using several checkers, and set a target or goal. For example:



Goal: 1000

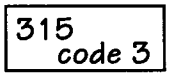
Rules: Players take turns moving just one checker from the square it's on to any other square.

A move should take the number on the Minicomputer toward the goal.

The move that reaches the goal exactly is the winning move.

N15

Your child is bringing home a description of how to decipher a code 3 message. The message tells which bridges Boris assigns each of his assistants to watch. Ask your child about the spies and bridges story, and see if you can decipher this message.



N24

Try to solve this problem with your child.

Build an arrow road from 1 to 30. Try to use fewer than ten of these arrows; 2x and +0.5.

N27

In our work with fractions we sometimes count by halves (or thirds or fourths). You can try this at home with your child. For example, start at 0 and count by thirds: $\frac{1}{3}$, $\frac{2}{3}$, 1, $1\frac{1}{3}$, $1\frac{2}{3}$, 2, ...
You may like to take turns saying the next number in the count and predicting which of you will say 5.

N35

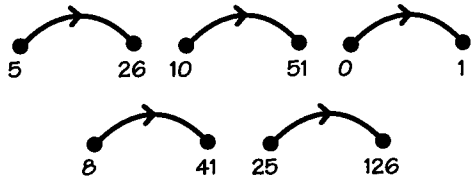
In mathematics class, we sometimes play a game called *Guess My Rule*. There are many variations of the game. Here are some examples:

- Guess the rule for a sequence of numbers —a rule says what number comes next in the sequence.

  3 4 7 11 18 ...

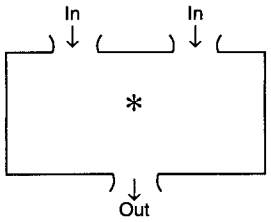
  Rule: Add the two preceding numbers to get the next number in the sequence.

- Guess the rule for an arrow (relation).



  Rule: Multiply by 5 and then add 1.

- Guess the rule for an operation—this can be described as a machine in which you put two numbers in, the machine operates on them, and then one number comes out.



4 * 2 = 10
3 * 6 = 24
1 * 3 = 6

2 * 4 = 12
6 * 3 = 21
3 * 1 = 4

Rule: The operation (machine) multiplies the two numbers and then adds the second number.
or
The machine adds 1 to the first number and then multiples by the second number.

Note: Sometimes there will be more than one rule that "works" for the information given thus far. Players still try to guess the rule, and we give more clues until they do.

Ask your child to play *Guess My Rule*. Sometimes you be the rule-maker, and sometimes let your child be the rule-maker while you try to guess the rule.

L1

In mathematics class we sometimes play *The String Game* with numbers. In this game properties of numbers are used as labels for the strings. You can help your child review some of these properties by working with him or her to list the following:

- positive prime numbers
- multiples of 4 (positive and negative)
- positive divisors of 24

L11

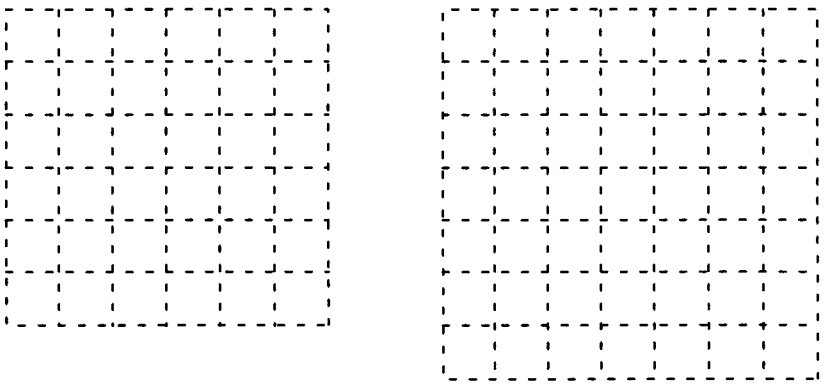
Your child is bringing home a coded message. First ask about how to use the tree in decoding the message, and then work with your child to decode it.

G1

With help from your child, find some objects around the house to measure in centimeters and in inches. First estimate length and then find an actual measurement. You may like to make this a contest to see who can give the best estimate of a measurement.

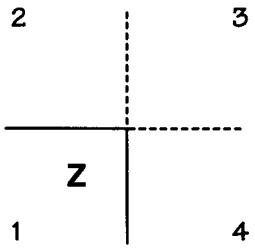
G2

Your child is bringing home some worksheets that were used in a math lesson on aquarium designs. Ask your child to explain what restrictions were put on aquarium designs, and then try to solve problems similar to those on the worksheets for a 6-by-6 square and for a 7-by-7 square



G8

In mathematics class we have been investigating ideas of symmetry. Ask your child to help you make a double (hinged) mirror. Lay two rectangular mirrors facedown and touching side-to-side. Place a piece of sturdy packing tape across them to form a hinge. Then place the double mirror on the solid line segments below, so that it forms a square corner (or right angle).



Place objects in region 1, and observe what they look like in the other three regions as created by mirror images. Try to find some shapes or numbers that fit in each of the five categories of this chart. A letter example for each category is given below.

Different images in all four regions	Same images in only regions 1 and 2	Same images in only regions 1 and 3	Same images in only regions 1 and 4	Same images in all four regions
L	B	Z	Y	X

G12

Your child is bringing home a worksheet from a math lesson on area and perimeter. Ask your child to tell you about the farmer's problem of building an animal pen with several sections. The farmer wants to run one side along the river, and he has 100 m of fence to build the rest. Let your child explain how to find the largest possible area. You may like to solve a similar problem with a different length of fence.

P4

In mathematics class we decoded a secret message using a chart that showed the frequency of use of letters in English; that is, how often letters occur in the written English language. Another application of letter use frequency is to help solve puzzles like cryptograms. If you enjoy solving cryptograms, find one in a puzzle book or the newspaper and work with your child to solve it.

Note: Cryptograms (cryptoquips or other such names) are coded substitution messages in which each letter used stands for another letter throughout the message.

W6

Your child is bringing home a story-workbook that we used in mathematics class, *Number 1 000's Dream*. Let him or her tell you about the story, or read it together. You may like to invent other exercises for 1 000 on the Minicomputer.

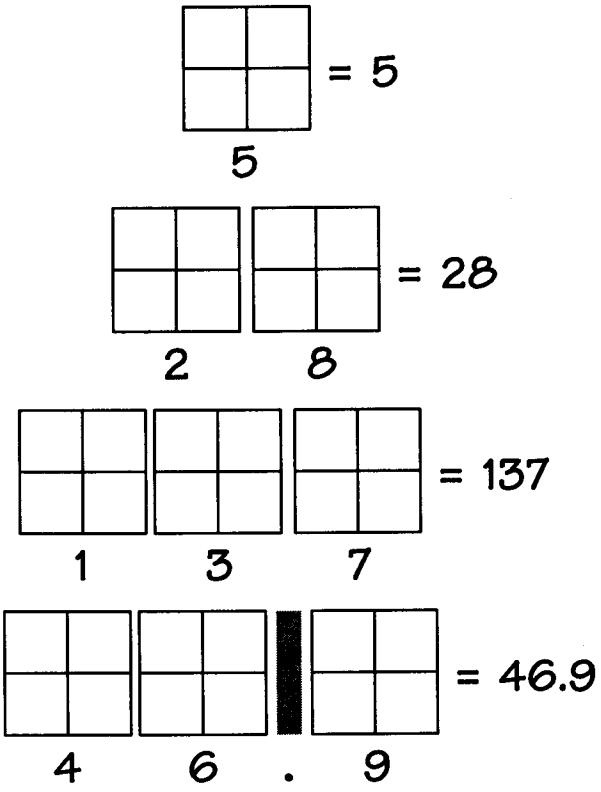
N1(a)

Dear Parent/Guardian:

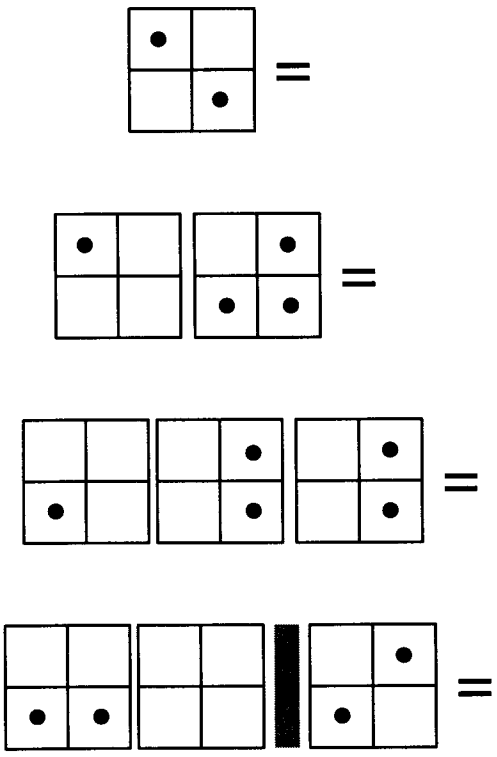
Your child has been learning to use the Papy Minicomputer in mathematics. This simple abacus allows children to become familiar with numbers. Using the Minicomputer, they work on concepts of addition, subtraction, multiplication, and division somtimes before they are able to do the calculations routinely. Also, the Minicomputer is used to do mental arithmetic and to investigate how numbers work. In some games using the Minicomputer, its structure gives a role to strategic thinking. The back of this page explains how the Minicomputer models our usual decimal system and works with place-value concepts.

Ask your child to tell you about the colors of the squares on our classroom Minicomputer. Then ask him or her to show you how to put numbers on the Minicomputer and read them. Objects such as pennies, dried beans, game chips, or paper clips may serve as checkers.

Put these numbers on the Minicomputer.



Read the number on the Minicomputer.



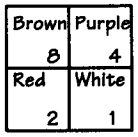
As the year progresses, you and your child can use the Minicomputer to solve a variety of problems. We hope you find this information helpful.

Sincerely,

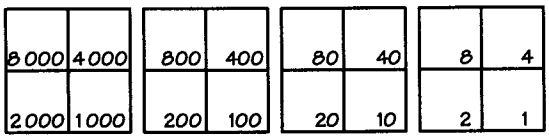
N1(b)

THE PAPY MINICOMPUTER

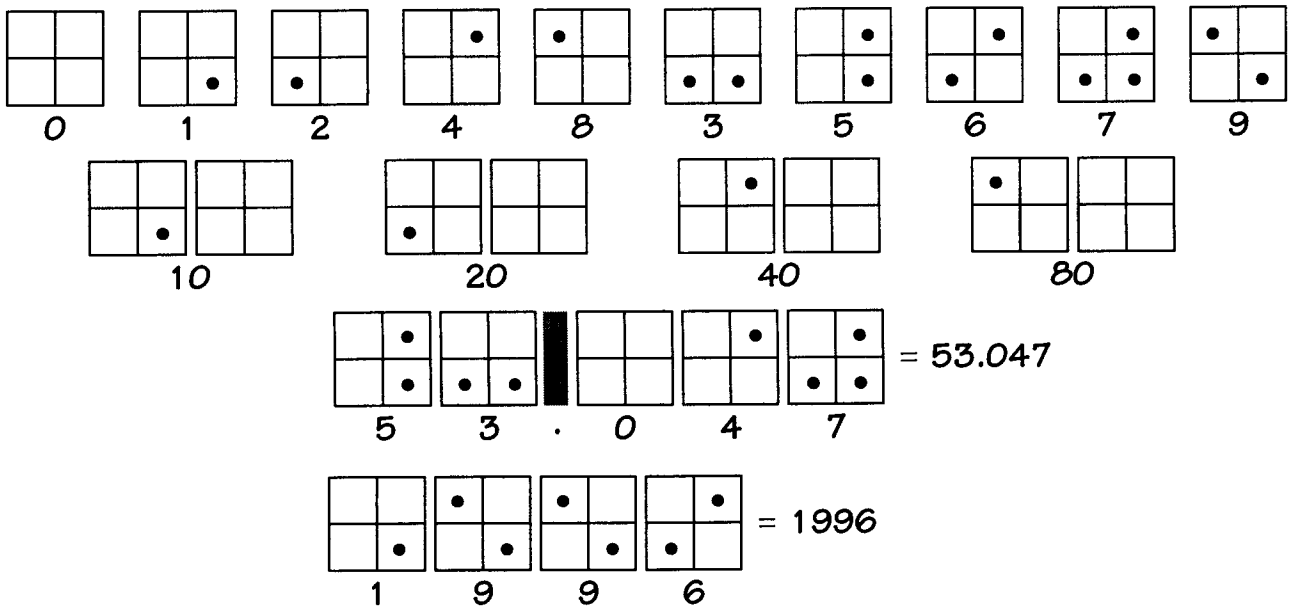
The Papy Minicomputer, a kind of abacus, models the positional structure of our system of numbers and hence lends itself as a powerful tool in arithmetic. The Minicomputer consists of brightly colored boards and a set of checkers. Each square has a numerical value.† These are the values on the ones board.



As you move to the next board to the left, you have the tens board with corresponding values; the next board to the left is the hundreds board with corresponding values; and so on.



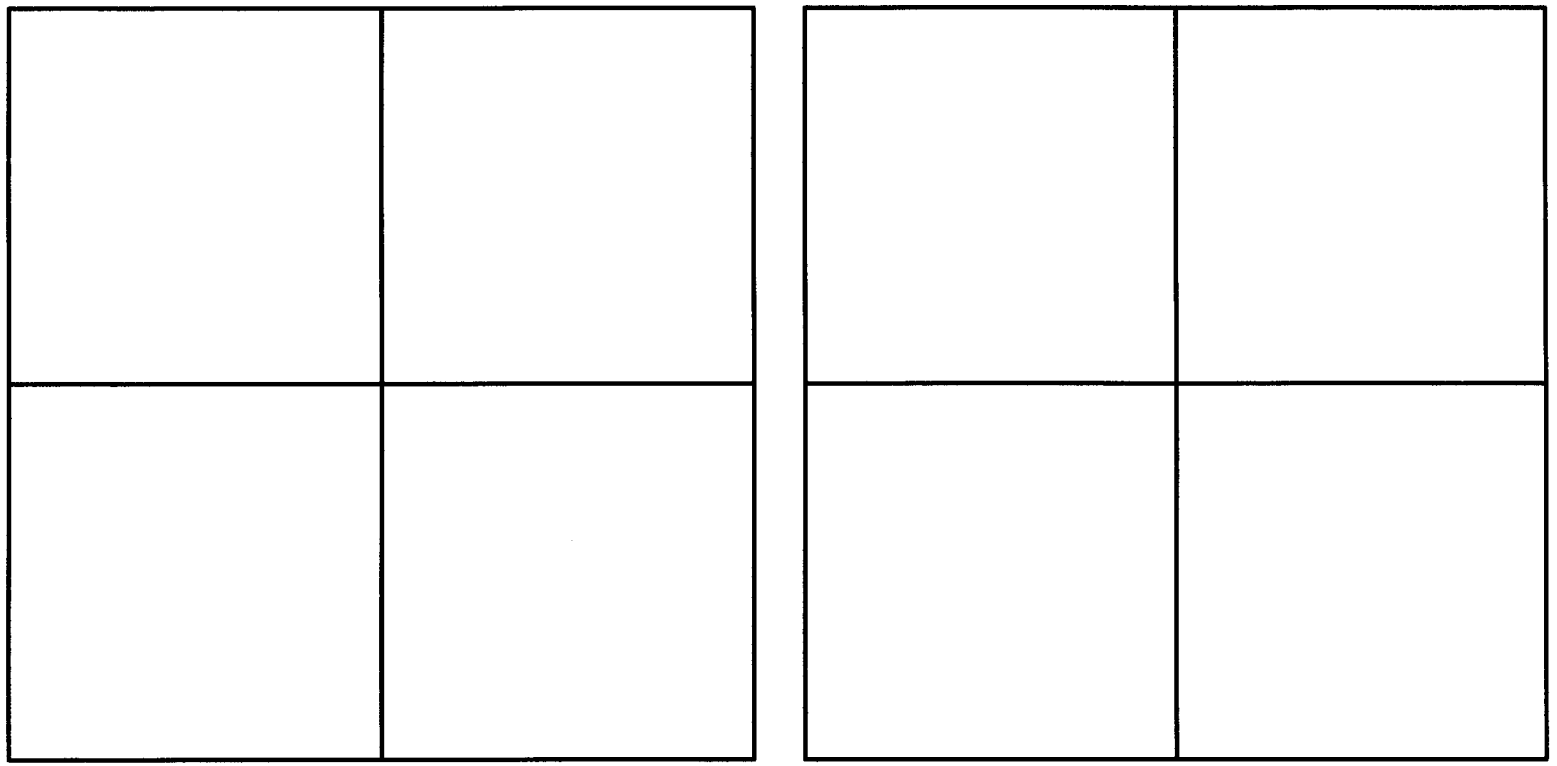
A number is put on the Minicomputer by placing checkers on its squares. A checker assumes the value of the square it is on. If several checkers are on the Minicomputer, the number is the sum of the values of the checkers. A number can be put on the Minicomputer in a variety of ways, but the representation that uses at most one checker on each square and uses checkers to represent a digit 9 or less is usually the easiest to read. In this case, we say that the number is in *standard configuration.* Standard configurations for the numbers 1–9 become as familiar to the students as the usual numerals so that they no longer need to do mental calculations for such configurations.

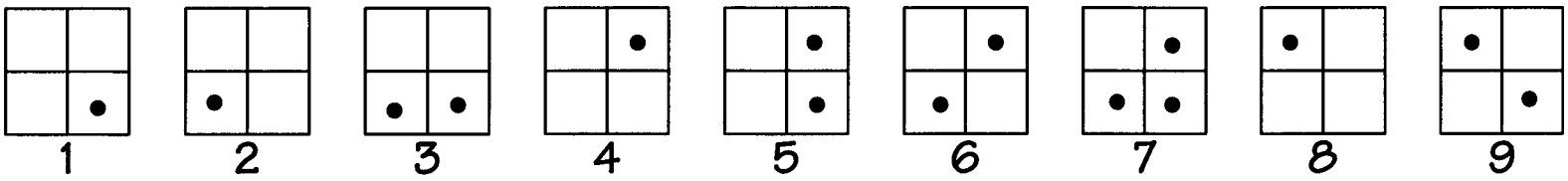


†The values of the squares are not written on the boards; learning them is part of becoming acquainted with the Minicomputer.

N1(c)

Papy Minicomputer





N3

Dear Parent/Guardian:

Developing mental arithmetic skills is just as important as paper and pencil arithmetic skills, so we incorporate mental arithmetic often in our math lessons. Mental arithmetic is important because it enables your child to recall math facts, to be aware of number patterns in arithmetic, and to review a variety of concepts.

You, too, can work on mental arithmetic with your child at home. It can be done whenever you have a free moment with your child—in the car, during a walk, at the dinner table, or before bedtime. Try to make your mental arithmetic activities short and fast-moving. Here are some sample sequences of math facts.

8 + 7 = ?	37 + 10 = ?	10 − 3 = ?	3 × 6 = ?	3 × 7 = ?
18 + 7 = ?	37 + 8 = ?	12 − 5 = ?	3 × 10 = ?	6 × 7 = ?
8 + 17 = ?	37 + 100 = ?	15 − 8 = ?	3 × 16 = ?	12 × 7 = ?
18 + 17 = ?	37 + 98 = ?	25 − 18 = ?	3 × 116 = ?	12 × 14 = ?

Another mental arithmetic game is the Number Line Game. To play, choose a secret number between 100 and 500. Let your child guess your number. After each guess, respond by saying, "My secret number is more (or less) than ____ (the guess)." Your child should use this information to make a next guess until the secret number is discovered. Sometimes let your child choose the number while you guess.

To play another game, select a number and take turns making up facts for that number. For example, suppose you select the number 50. Some facts for 50 would be 47 + 3, 2 x 25, 300 ÷ 6, 75 – 25, ¼ x 200, and so on.

Many counting activities are also good mental arithmetic. For example, practice counting by threes, fives, tens, and so on. Vary the counting by sometimes starting at a number other than 0 or by counting backward.

Have fun practicing mental arithmetic!

Sincerely,

N4

Dear Parent/Guardian:

The learning of basic number facts is an important part of any mathematics program. We work on this in many ways:

- using concrete objects to model numbers and number combinations;
- counting by various numbers;
- labeling dots in arrow pictures;
- solving problems that require number facts;
- making connections (related facts) and observing patterns; and
- playing games with numbers.

You will find that your child is being encouraged to recall basic number facts in some of the home activities we suggest and in a variety of problems in workbooks.

As you work with your child, you can encourage the learning of basic facts. Look for interesting ways to do this. For example, calculators and computer programs are fun for some while others will like flashcards or mental games. Most children like to use numbers in real and meaningful family tasks. We will try to make other suggestions in our home activities. Home practice on basic number facts, like any skill, is important.

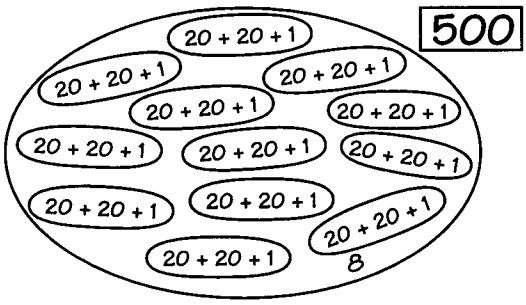
Sincerely,

N11

Dear Parent/Guardian:

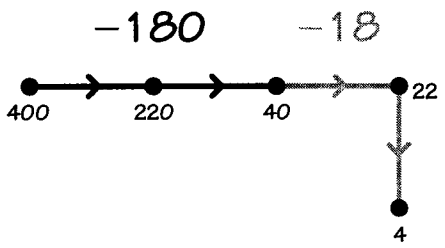
We often work on division in our math class; however, we have not yet finalized a routine paper/pencil algorithm for division. The following are examples of some division experiences your child has had. Please do not expect proficiency with a paper/pencil long division method yet, even though the record we keep looks like a long division calculation. At this time we are still working on division concepts and understanding the division process. These experiences will contribute to understanding a routine step-by-step method.

Example 1. Share 500 stamps among 12 children.



41 R = 8
12)500
− 240 (20 each)
260
− 240 (20 each)
20
− 12 (1 each)
8

Example 2. How many packages of 18 can be filled with 400?



22 R = 4
18)400
− 180 (10 packages)
220
− 180 (10 packages)
40
− 36 (2 packages)
4

Example 3. Patterns

56 ÷ 7 = 8
560 ÷ 7 = 80
5 600 ÷ 7 = 800

170 ÷ 5 = 34
175 ÷ 5 = 35
185 ÷ 5 = 37

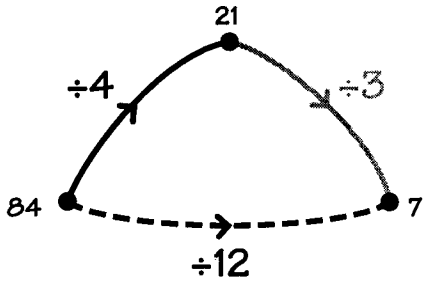
45 ÷ 15 = 3
90 ÷ 15 = 6
135 ÷ 15 = 9
270 ÷ 15 = 18

$7\overline{)42}$ 6 $\quad 7\overline{)43}$ 6 R = 1 $\quad 7\overline{)44}$ 6 R = 2 $\quad 7\overline{)45}$ 6 R = 3

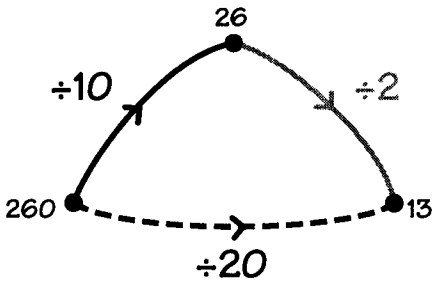
$7\overline{)46}$ 6 R = 4 $\quad 7\overline{)47}$ 6 R = 5 $\quad 7\overline{)48}$ 6 R = 6 $\quad 7\overline{)49}$ 7

(over)

Example 4. Composition



84 ÷ 12 = 7



260 ÷ 20 = 13

You may like to do some similar division problems with your child. Let your child help decide how many to give to each person, how many packages to fill at one time, what pattern to use, or what composition to use.

Sincerely,

N14

Dear Parent/Guardian:

We will be using calculators at school to enhance many of our math lessons. Calculators are useful tools that can help us work on mental arithmetic skills (especially memorization of facts), pattern recognition, and problem-solving strategies.

You may want to use a calculator with your child at home. The following are examples of calculator activities we do in math lessons and are ones you may like to try with your child. In each case, we describe the activity or give just one sample problem.

- Turn on the calculator and check that 0 is on the display. Cover the display. Press 6 × 3 + 4 ÷ 2 =. Ask what will be on the display, and then check.
- Use the calculator to solve addition, subtraction, or multiplication problems. In this case, you may first estimate a solution and then use the calculator to check how close your estimate was.

Note: For the remaining examples you will need a calculator with an automatic constant feature.

- Teach the calculator to count by fours using the following steps:
  1) Put on the starting number.
  2) Press + 4.
  3) Then press = = = and so on.

  Describe the sequence of numbers you see on the display. Occasionally, predict the next number or the number you will see if you press = six more times.
- Teach the calculator to count backward by fives using these steps:
  1) Put on the starting number (for example, 102).
  2) Press − 5.
  3) Then press = = = and so on.
- Teach the calculator a secret rule and let your child try to guess the rule. For example:

Rule	**To Prepare the Calculator**
Subtract 5	Press 5 − 5 =
Multiply by 7	Press 7 × 0 =
Add 4	Press − 4 + 4 =
Divide by 8	Press 0 ÷ 8 =

  Each time you put a number on the display of the calculator and press =, the calculator will show a new number—the result of using the rule on your number. In this mode the calculator may be used to practice facts. For example, when the calculator is prepared as above to multiply by 7, you can use it to practice 7x facts.

We hope you and your child enjoy using a calculator for these and other activities.

Sincerely,

N18

Dear Parent/Guardian:

We are continuing to use paper/pencil methods (algorithms) for addition, subtraction, and multiplication in our math class, mostly as we solve interesting problems. The puzzles below are designed to focus on understanding the methods. In problem situations, games, and puzzles, we hope to review, maintain, and extend our understanding of addition, subtraction, and multiplication concepts. In fact we believe that earlier experiences with concrete objects, with the Minicomputer, with mental arithmetic, and so on have made the paper/pencil method mostly just another way of recording. The algorithm suggests we use a sequence of steps, and those earlier experiences help us understand reasons for the steps. At this time our instruction emphasizes the meaningful use of addition, subtraction, and multiplication in problem contexts. Home practice will further help your child.

In doing calculations at home, remember that the paper/pencil method is only one. Sometimes we might better use mental methods or a calculator or a number pattern. We hope that a variety of methods will help children develop the ability to check their work and recognize reasonable answers. We hope also that paper/pencil will not inhibit a child's desire and/or ability to estimate, do mental arithmetic, use patterns, and so on. Calculation should be a tool for solving interesting problems rather than simply a chore done for its own sake.

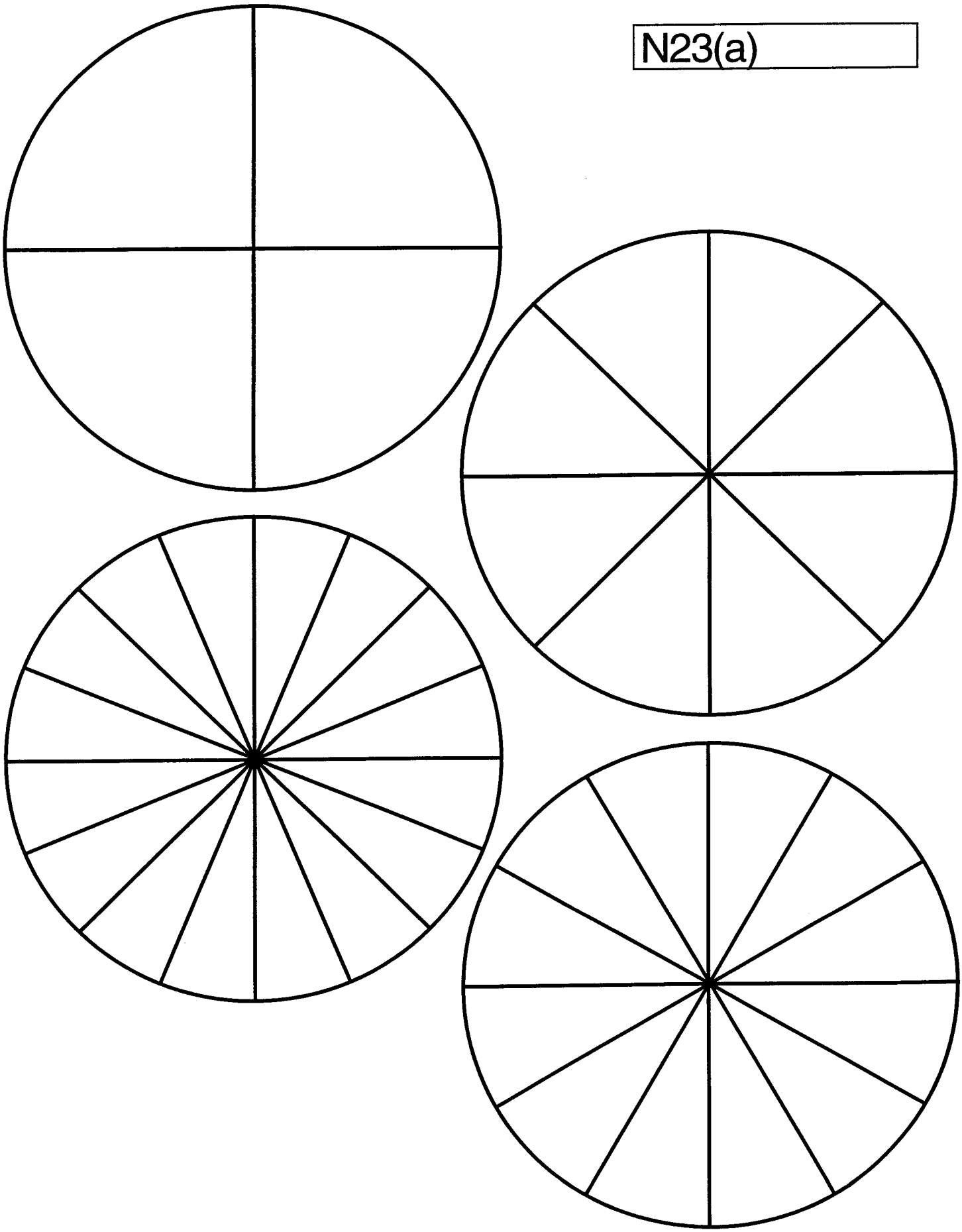
Sincerely,

Algorithm Puzzles

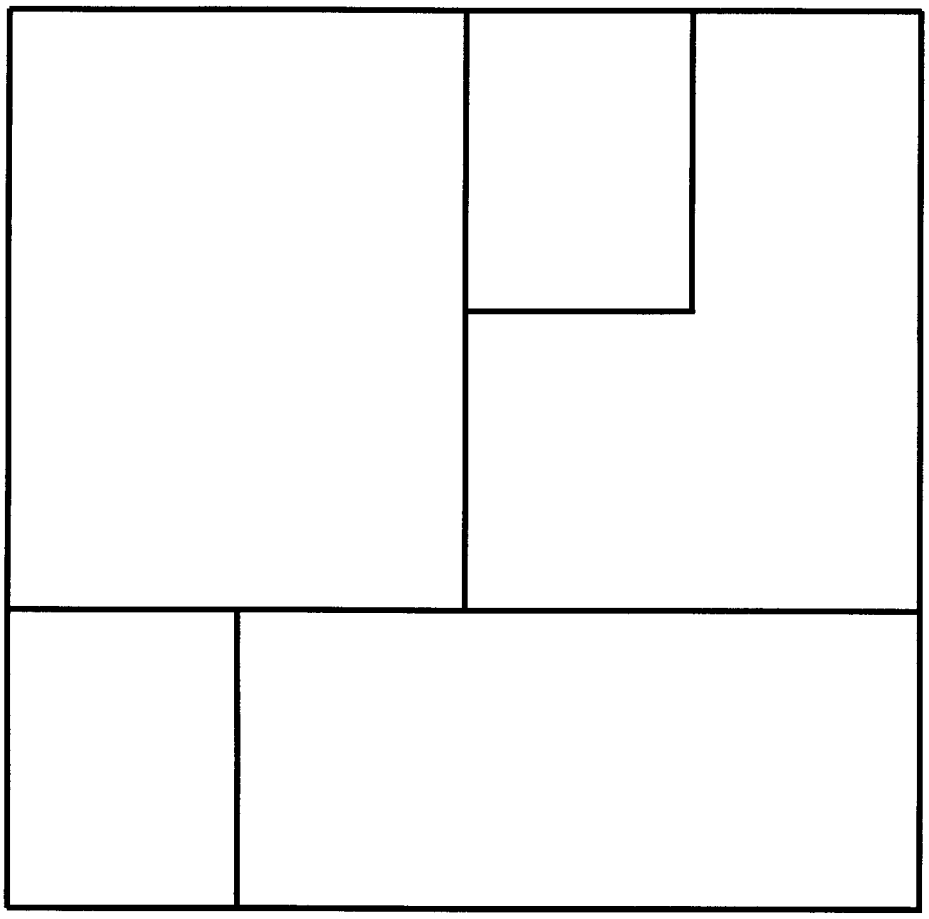
Fill in the boxes with one-digit numbers.

72□ +1□5 □71	395 +□□9 52□	□34 +6□□ 802	1□84 +□52□ 59□6
9□3 −□56 42□	□□5 −47□ 318	□4□ −1□2 276	6□81 −□93□ 21□6
□3□ x 5 2180	6□ x 7 □□2	2□4 x□ □22	□54 x□ 9□4

N23(a)



N23(b)



L1

Dear Parent/Guardian:

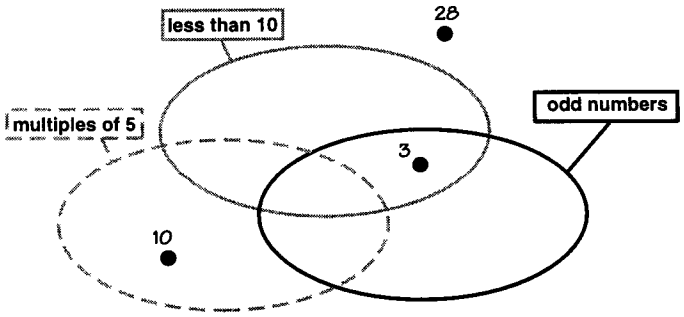
We use what *CSMP* calls the "language of strings" (or Venn diagrams) for classification in some of our math lessons. In earlier grades students learned to recognize this language by using actual loops of colored string or yarn. Now it is mostly a picture language.

Using strings to classify helps students organize ideas while developing an understanding of concepts. Basically, the strings sort objects according to various attributes. An object is either in or out of a string. See the examples below.

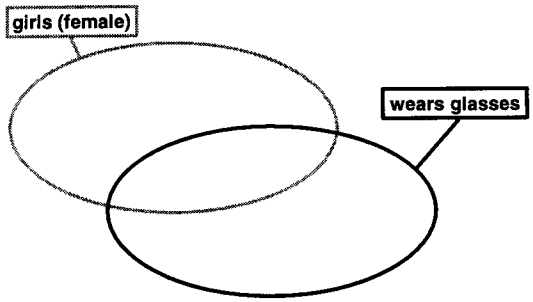
String pictures give us a way of recording and communicating about classifications. The ability to classify, reason, and extract information from classifications is an important skill for everyday life and particularly in understanding mathematics. The picture language of strings can help young minds to think logically and creatively, as well as to report their thinking, long before they have advanced verbal skills.

Here are a few examples of the use of strings in *CSMP*. Ask your child to help you do the following:

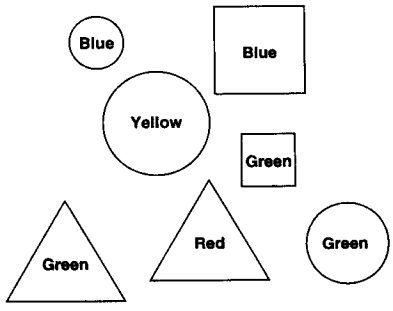
Place these numbers in the picture: 1 5 17 25 8 0 12

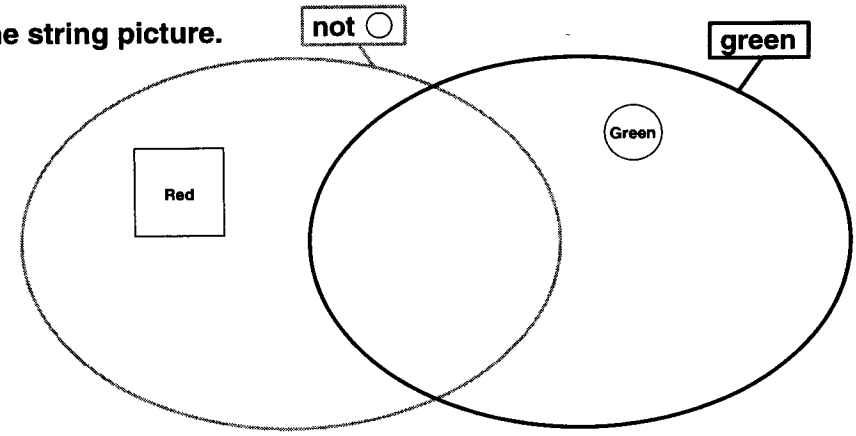


Place a dot for each member of your family.



Place these attribute blocks in the string picture.





We hope you enjoy working with string pictures.

Sincerely,

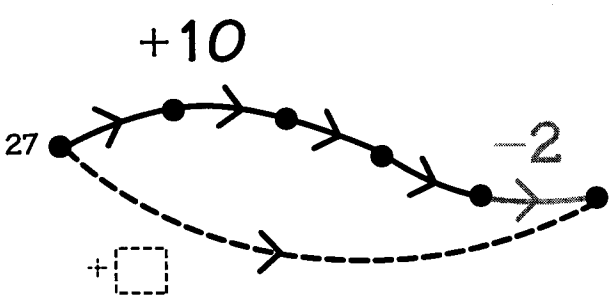
L2

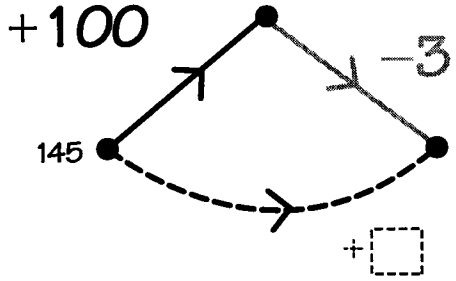
Dear Parent/Guardian:

We use arrows and arrow pictures in many of our math lessons. Since arrows are used everywhere in our daily lives—signals, advertisements, directions, and so on—why not use them in mathematics?

Arrow diagrams are an important teaching aid in our mathematics program because they are a pictorial way of showing relationships. Relations play a central role in mathematics, and arrows provide a vivid and concrete way to understand them.

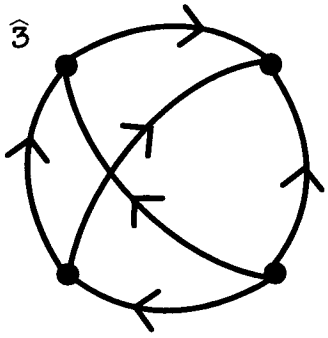
Here are a few examples of the way arrows picture relationships. Ask your child to help you label the dots or an arrow.



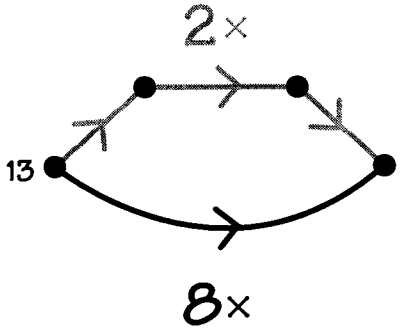


Label the dots with these numbers.

$\widehat{10}$ 10 6.5 $\widehat{3}$



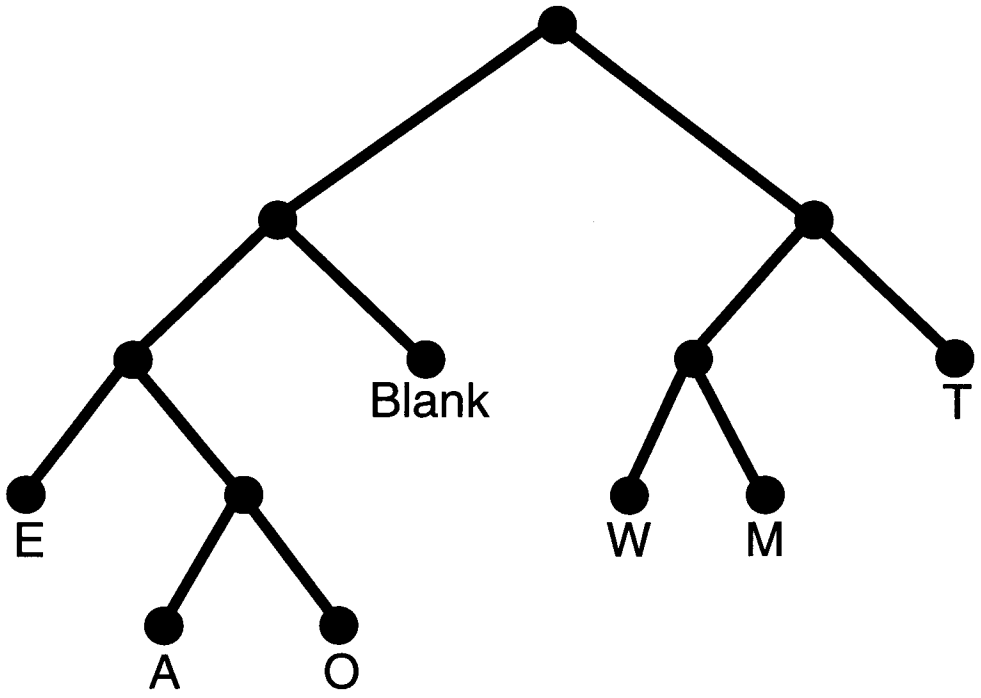
is more than →



We hope you can see from these examples that arrow pictures are fun to use in mathematics. Watch for many other uses of arrows on the papers that your child brings home.

Sincerely,

L11

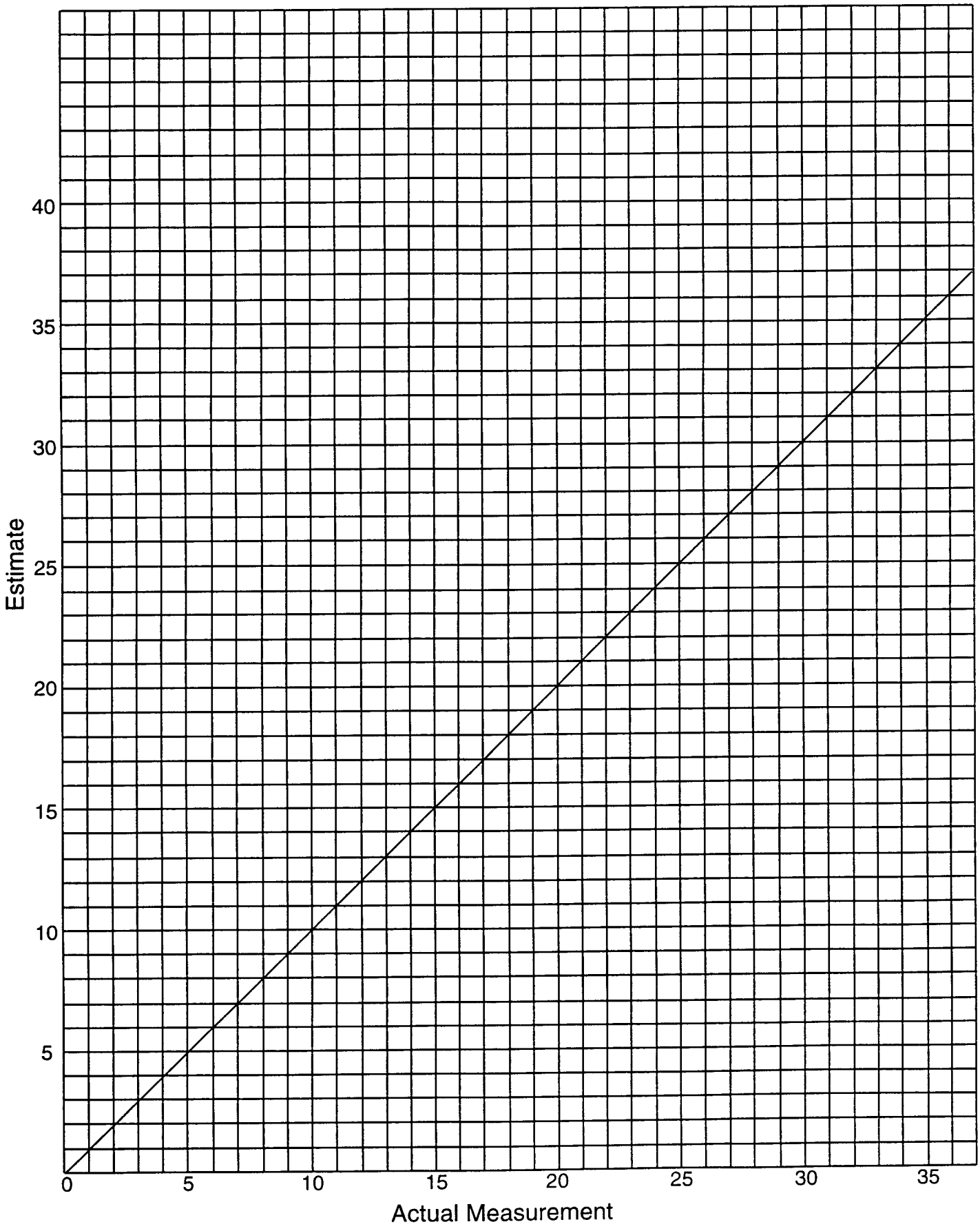


1010000001101101000010010110111100011

G1(a)

Object	Estimate	Actual Measurement
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Length of _____	cm	cm
Perimeter of _____	cm	cm
Perimeter of _____	cm	cm
Perimeter of _____	cm	cm
Perimeter of _____	cm	cm
Perimeter of _____	cm	cm

G1(b)


Estimate
40
35
30
25
20
15
10
5
0
5
10
15
20
25
30
35
Actual Measurement

P4(a)

CODE

A	B	C	D	E	F	G	H	I
Q	S	U	W	Z	R	T	V	X

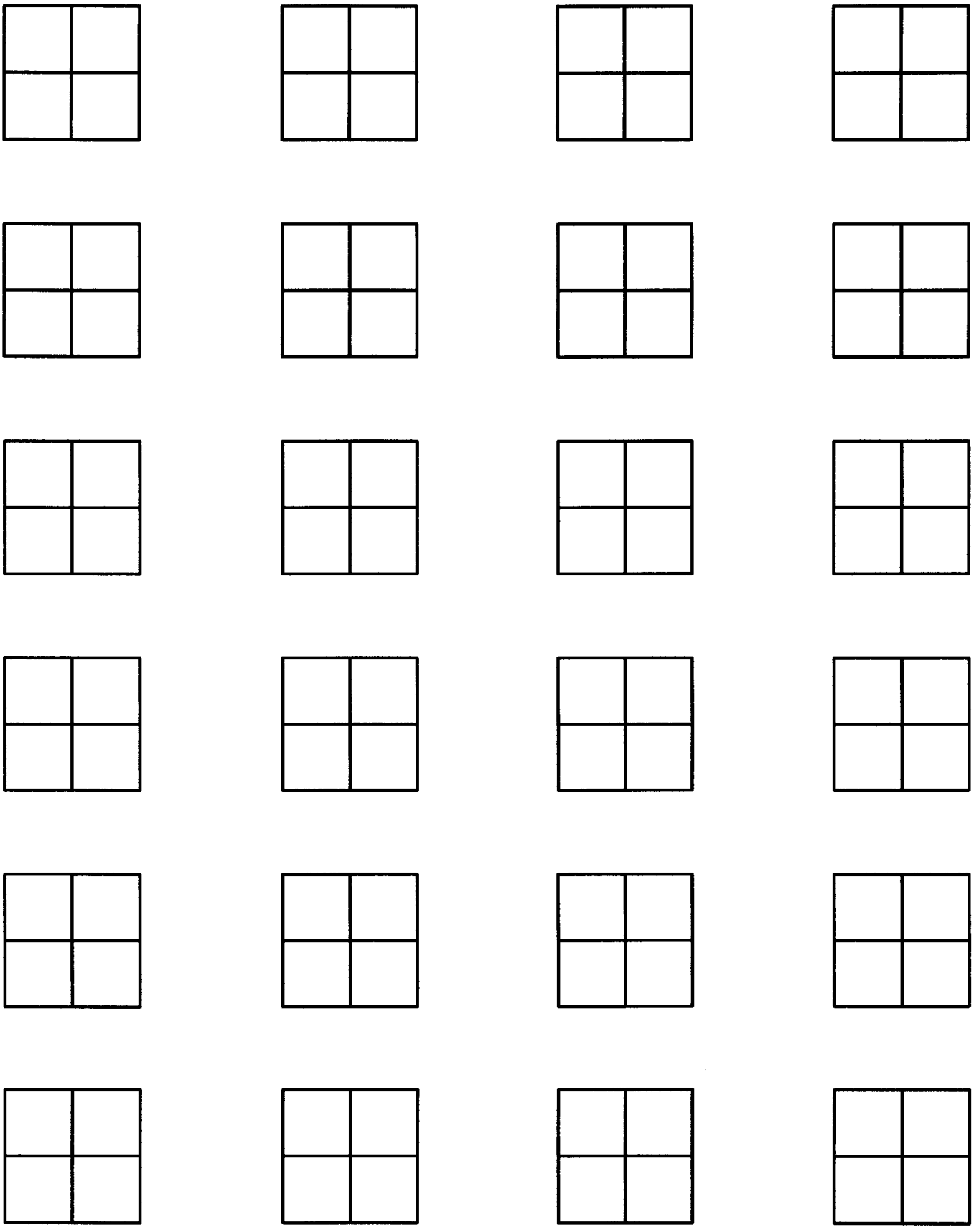
J	K	L	M	N	O	P	Q	R
Y	A	B	C	L	M	N	O	P

S	T	U	V	W	X	Y	Z
K	J	I	H	G	F	D	E

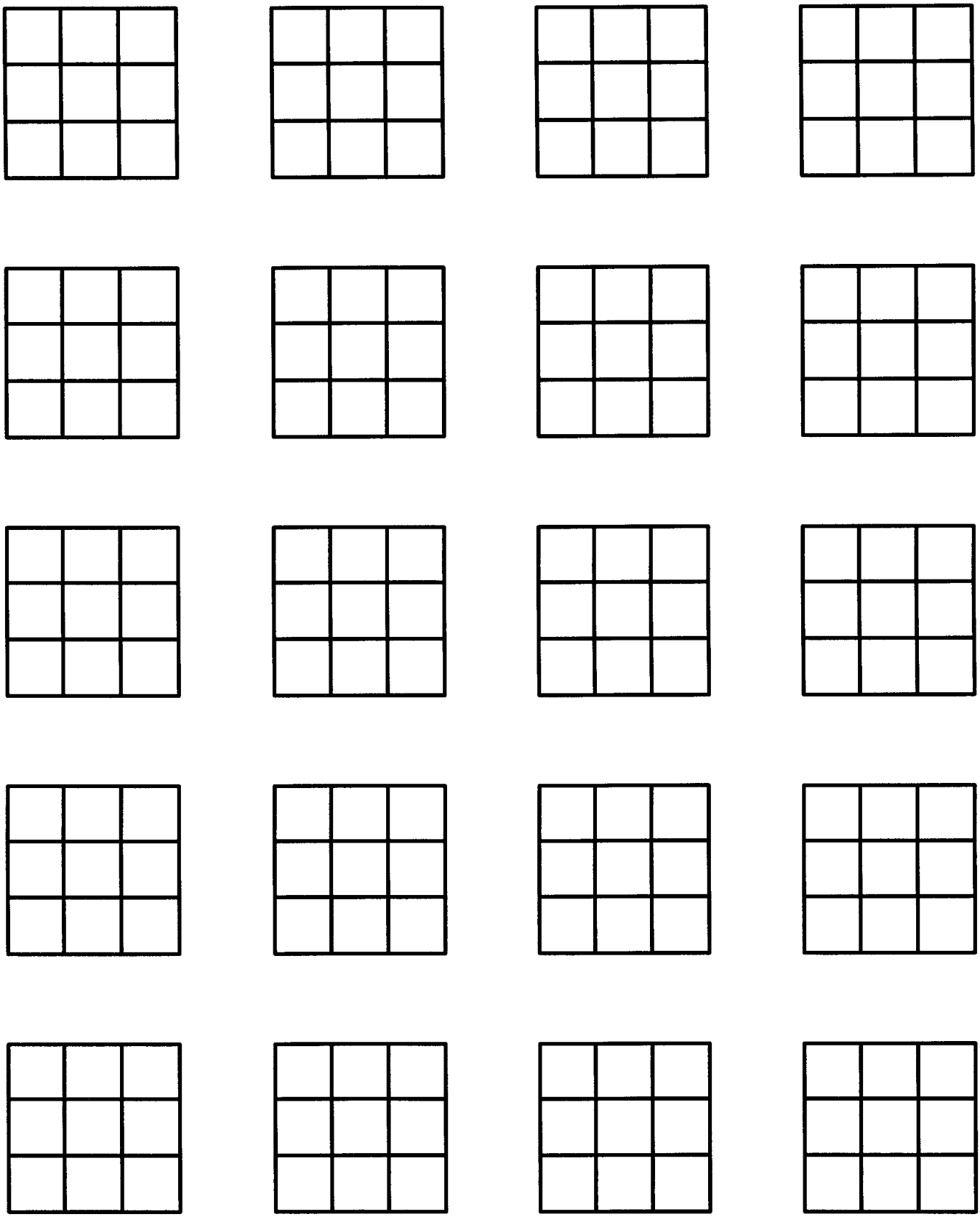
P4(b)

Letter	Frequency in English	Letter	Frequency in Message
E	12.3		
T	9.6		
A	8.1		
O	7.9		
N , I	7.2		
S	6.6		
R	6.0		
H	5.1		
L	4.0		
D	3.7		
C, U	3.2		
F, P, M	2.3		
W, Y	1.9		
B, G	1.6		
V	0.9		
K	0.5		
Q, X	0.2		
J, Z	0.1		
	per 100		

P7



P8



W4(a)

Variety of Problems #1
(15-6914R)

Student Name _____
Date _____

			Responses
Arrows	p.2	(x2, +9)	11 _____
	p.8	(addition, subtraction, composition)	9 _____
	p.16	(–8, –12, composition)	9 _____
	p.21	(÷4, 3x)	12 _____
	p.23	(calculator relations)	2 _____
	p.25	(calculator relations)	4 _____
	p.28	(3x, –7)	6 _____
	p.31	(+20, –9, +7, compositions)	4 _____
Minicomputers	p.9	(weighted checkers)	8 _____
	p.24	(weighted checkers)	7 _____
Strings	p.4	(pos. divisors, odd, prime, less than)	8 _____
	p.15	(*String Game* with numbers)	14 _____
	p.22	(logical thinking with numbers)	8 _____
	p.30	(divisors)	15 _____
Calculations with +, –, x, ÷	p.14	(add., subt., mult., decimals)	6 _____
	p.26	(story problems)	2 _____
	p.29	(counting and prob. story problems)	26 _____
Fractions	p.17	(fractions on num. line, comparison)	12 _____
Geometry and Measurement	p.6	(length, comparisons)	9 _____
	p.18	(area)	4 _____
Detective Stories	p.5	(arrow picture, Minicomputer)	10 _____
	p.7	(Minicomputer, string picture)	7 _____
	p.10	(Minicomputer, string picture)	5 _____
	p.20	(calculator sentence and relation)	13 _____
	p.27	(string picture, calculator relation)	3 _____
	p.32	(calc. relations, multiples, squares)	16 _____
Number Sense/Combinations	p.3	(number line)	7 _____
	p.11	(binary abacus)	4 _____
	p.12	(counting triangles)	8 _____
	p.13	(counting patterns)	12 _____
	p.19	(numbers in paragraphs)	7 _____

W4(b)

Dear Parent/Guardian:

With this letter, we are sending home your child's *Variety of Problems #1* Workbook. It contains pages with problems from various areas of our mathematics curriculum. During the past couple weeks, the students have been working independently in this booklet.

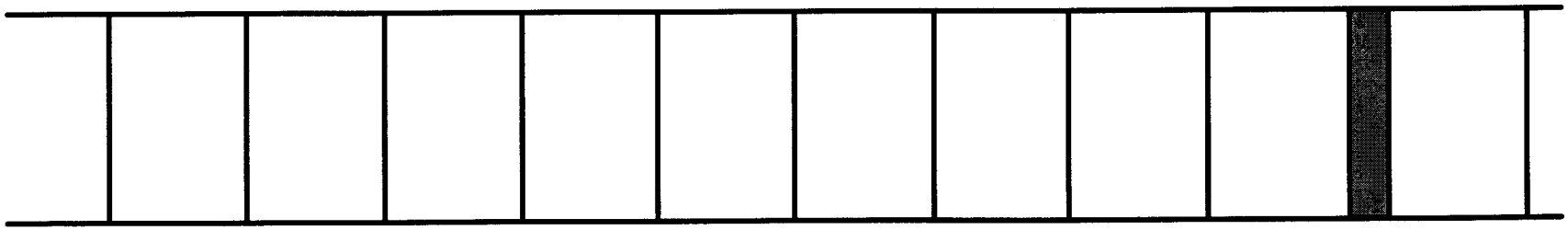
Please be aware that the workbook pages become progressively more difficult. Time constraints and individual understanding, skills, and experiences will influence how much of the booklet a student completes. We do not expect every student to complete every page, especially since the last one-third of the booklet is designed for extra challenge. You may wish to discuss pages that were difficult for your child or practice some of these concepts at home.

Other workbooks will be sent home later in the year. These should give you an idea of some of the topics and concepts being introduced in our mathematics curriculum as well as help you monitor your child's progress.

Sincerely,

Binary Abacus

Two checkers on a board
trade for
one checker on the next board to the left.



W5

W8

Variety of Problems #2
(15-6922R)

Student Name _____
Date _____

			Responses
Arrows	p.3	(+9 fishing for numbers)	12 _____
	p.5	(x and ÷ returns)	5 _____
	p.13	(10x, ÷10)	9 _____
	p.15	(composition)	10 _____
	p.20	(composition)	15 _____
	p.24	(arrow roads)	4 _____
	p.26	(10x, +4)	9 _____
	p.30	(calculator relations)	4 _____
Minicomputer/Abaci	p.14	(dynamics)	4 _____
	p.19	(binary abacus)	5 _____
Strings	p.2	(more than, less than)	5 _____
	p.22	(*String Game* with numbers)	12 _____
	p.28	(*String Game* with numbers)	16 _____
Calculations with +, –, x, ÷	p.8	(mult. and add. story problems)	2 _____
	p.11	(mult., add., and subt.)	11 _____
	p.16	(division story problem)	5 _____
	p.17	(multiplication and division)	10 _____
	p.18	(story problems)	2 _____
	p.25	(⊕ and ⊗)	10 _____
	p.29	(story problems)	3 _____
Geometry and Measurement	p.4	(length of zigzags)	3 _____
	p.10	(length and division)	7 _____
	p.24	(area)	4 _____
	p.31	(squares)	1 _____
Detective Stories	p.6	(Minicomputer, string picture)	6 _____
	p.27	(¾x, addition sentence)	27 _____
	p.32	(calculator relations, squares)	19 _____
Number Sense/Combinations	p.7	(decimal)	4 _____
	p.9	(even, odd)	9 _____
	p.12	(drawing and reading graphs)	16 _____
	p.21	(story problem)	1 _____

W10

Variety of Problems #3
(15-6930R)

Student Name _____
Date _____

			Responses
Arrows	p.2	(–7, 3x)	13 _____
	p.4	(various arrows)	15 _____
	p.7	(wipe-out)	7 _____
	p.8	(decimal distance)	6 _____
	p.12	(fraction times)	7 _____
	p.13	(composition patterns)	13 _____
	p.18	(addition of fractions)	8 _____
	p.24	(fraction times)	7 _____
	p.28	(3x, –8)	10 _____
	p.29	(decimal distance)	7 _____
Minicomputer/Abaci	p.3	(weighted and negative checkers)	8 _____
	p.6	(weighted checkers)	7 _____
Strings	p.15	(*String Game* with numbers)	12 _____
	p.25	(logical reasoning)	6 _____
	p.27	(positive divisors)	16 _____
Calculations with +, –, x, ÷	p.10	(addition, subtraction, multiplication)	4 _____
	p.16	(division, patterns)	13 _____
	p.19	(division story problem)	9 _____
	p.22	(product of 30)	7 _____
	p.27	(story problems)	5 _____
	p.30	(expressions for numbers)	5 _____
	p.31	(product of 18)	9 _____
Fractions	p.14	(fractional parts of shapes)	12 _____
Geometry and Measurement	p.11	(area)	20 _____
	p.17	(length story problem)	4 _____
	p.20	(length, perimeter)	11 _____
Detective Stories	p.5	(string picture, –5 arrow)	8 _____
	p.21	(arrow picture, calc. relations)	14 _____
	p.26	(arrow roads, Minicomputer)	7 _____
	p.32	(pos. divisors, squares, calc. relations)	10 _____
Number Sense/Combinations	p.9	(decimal number line)	10 _____

W13

Variety of Problems #4
(15-6948R)

Student Name _____
Date _____

			Responses
Arrows	p.3	(is a positive divisor of)	8 _____
	p.5	(x3, +7)	6 _____
	p.9	(÷10)	6 _____
	p.13	(wipe-out)	5 _____
	p.17	(division composition)	12 _____
	p.21	(fraction times and composition)	8 _____
	p.23	(arrow roads)	3 _____
	p.25	($3x_{20}$)	16 _____
	p.29	(arrow roads)	3 _____
	p.31	(x some whole number)	15 _____
Minicomputer/Abaci	p.19	(dynamics)	4 _____
	p.26	(binary abacus)	6 _____
Strings	p.12	(*String Game* with numbers)	12 _____
	p.24	(story problem with strings)	2 _____
	p.27	(positive divisors)	8 _____
Calculations with +, –, x, ÷	p.8	(parentheses)	6 _____
	p.10	(division)	14 _____
	p.15	(algorithm puzzles)	11 _____
	p.18	(story problems and average)	17 _____
	p.22	(match names)	6 _____
Fractions	p.14	(fraction story problem)	5 _____
	p.16	(fractional parts of shapes)	6 _____
	p.20	(locate on number line)	13 _____
Geometry and Measurement	p.4	(length)	10 _____
	p.6	(symmetry)	3 _____
	p.11	(fill up with shapes)	3 _____
Detective Stories	p.2	(Minicomputer, string picture)	7 _____
	p.28	(arrow road, Minicomputer, squares)	2 _____
	p.30	(x_{20})	6 _____
	p.32	(calc. relations, Minicomputer)	13 _____
Number Sense/Combinations	p.7	(decimal comparisons)	9 _____

W15

Variety of Problems #5
(15-6955R)

Student Name _____
Date _____

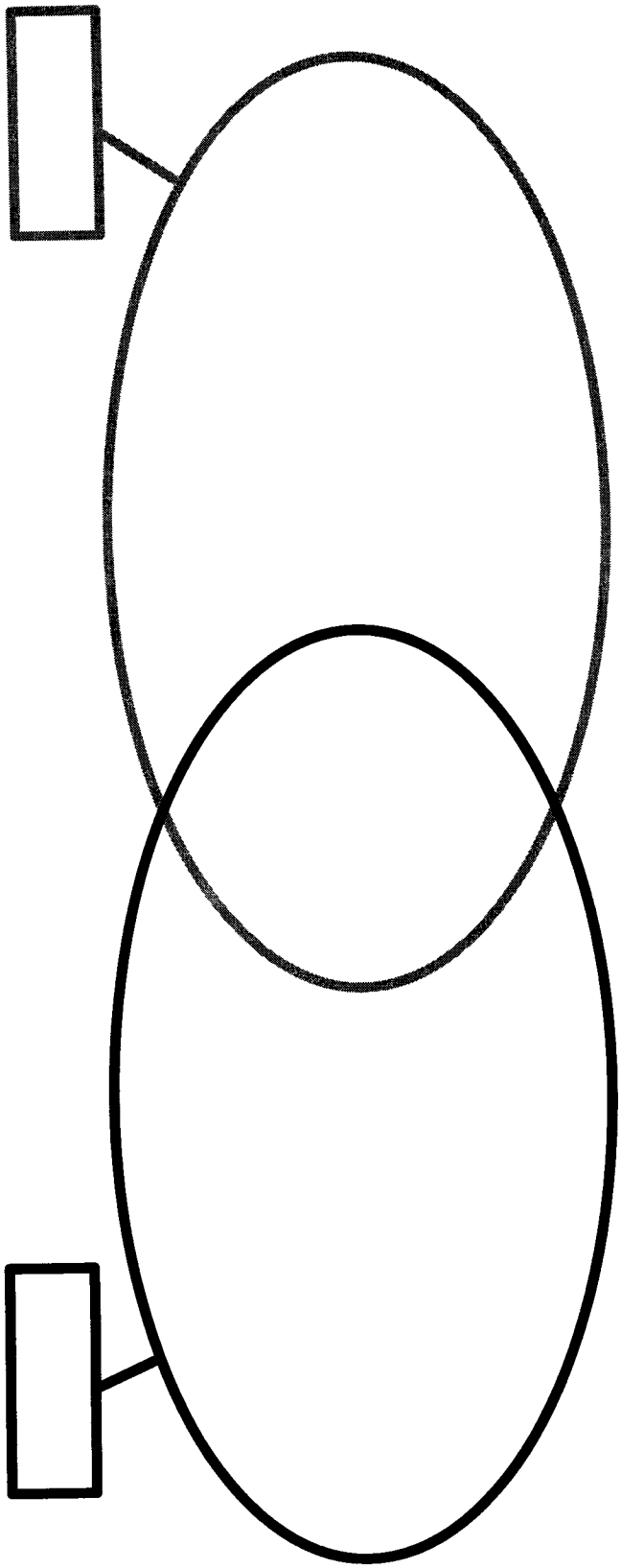
		Responses
Arrows	p.2 (+20, ÷3)	15
	p.14 (fraction times)	9
	p.16 ($6x_{10}$)	10
	p.18 (+ prime numbers)	8
	p.21 (+, –, x, ÷ arrows)	16
	p.22 (2x, +0.5 arrow road)	8
	p.24 (x whole number, +32 patterns)	15
	p.28 (arrow roads with decimals)	14
	p.30 ($4x_{20}$)	16
Minicomputer/Abaci	p.4 (binary abacus)	4
	p.25 (base three abacus)	8
Strings	p.8 (positive divisors)	19
	p.10 (String Game with numbers)	12
	p.17 (divisors, multiples, order)	8
Calculations with +, –, x, ÷	p.12 (division)	9
	p.13 (algorithm puzzles)	20
	p.19 (product of 48)	8
	p.20 (story problems)	4
	p.26 (story problems)	2
	p.32 (facts in puzzle)	24
Fractions	p.9 (fractional parts of shapes)	10
	p.23 (fractional parts of shapes, addition)	10
Geometry and Measurement	p.7 (symmetry)	4
	p.11 (length story problem)	12
Detective Stories	p.3 (Minicomputer, arrow picture)	7
	p.6 (Minicomputer, string picture)	7
	p.27 (calculator relations)	13
	p.31 (calculator relations)	2
Number Sense/Combinations	p.5 (num. line, midpoints, trisection pts.)	10
	p.15 (reading graphs)	7
	p.29 (story problem, average)	6

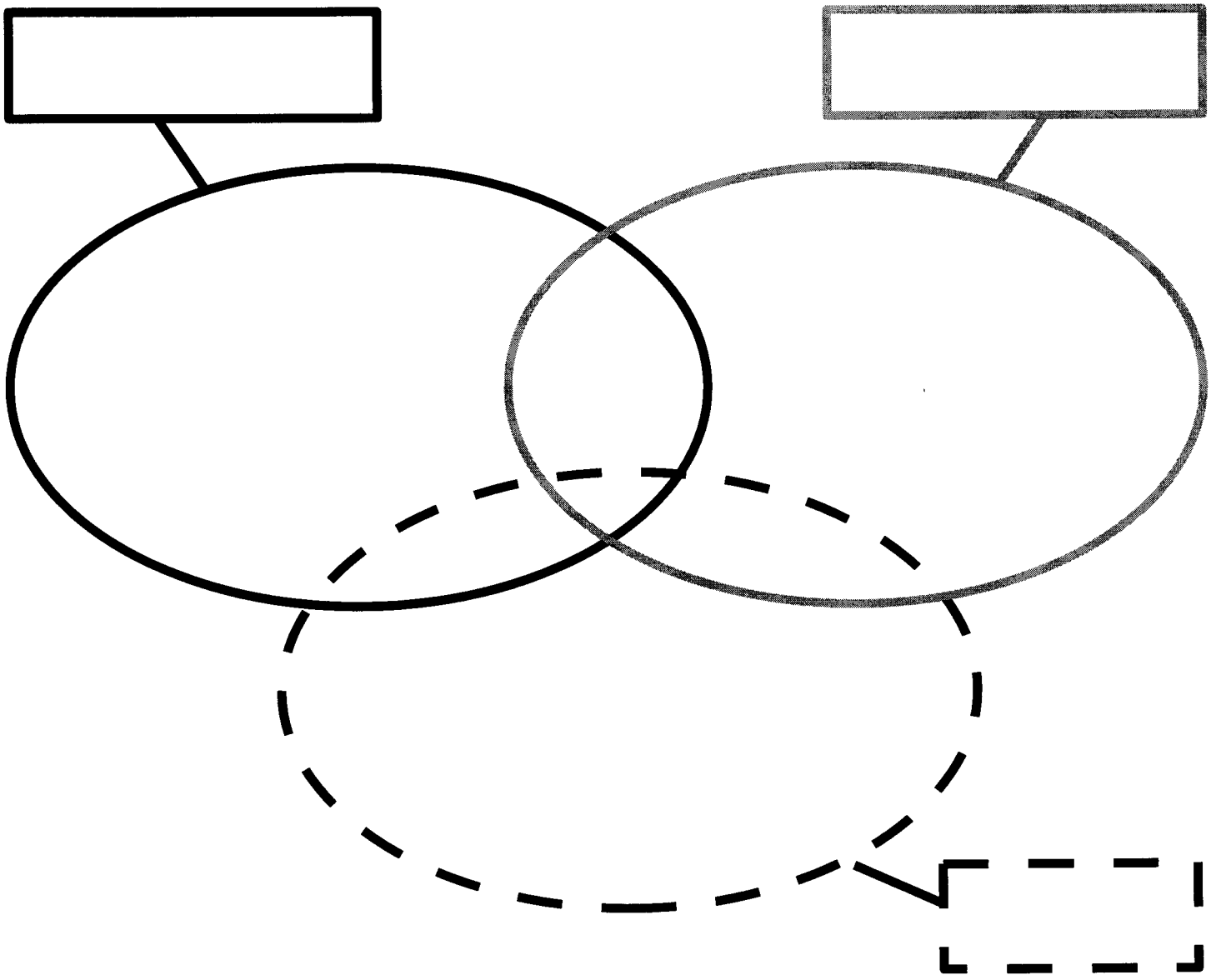
0–109 Numeral Chart

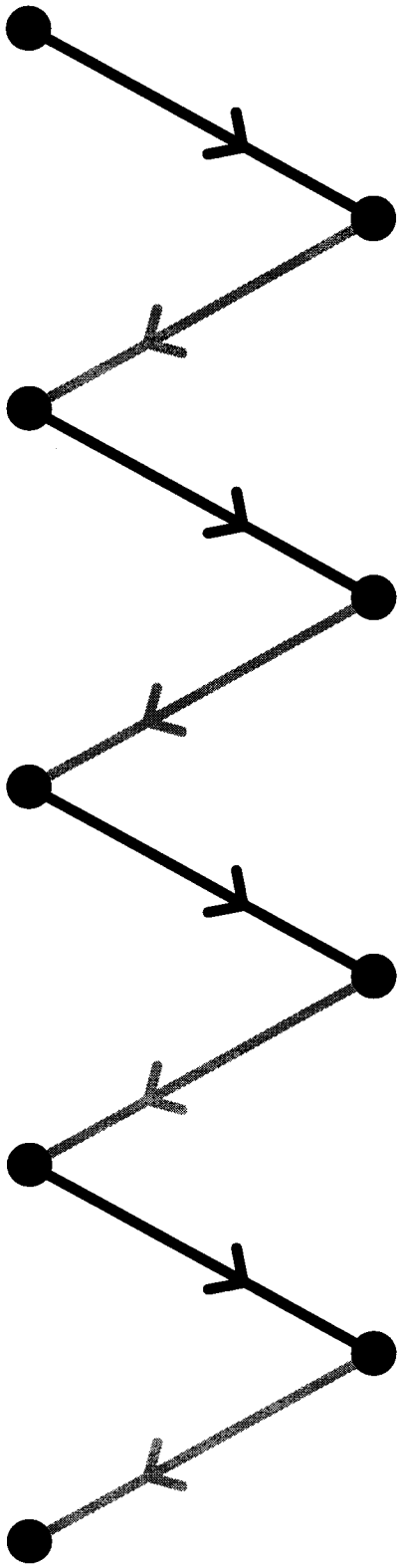
0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108	109

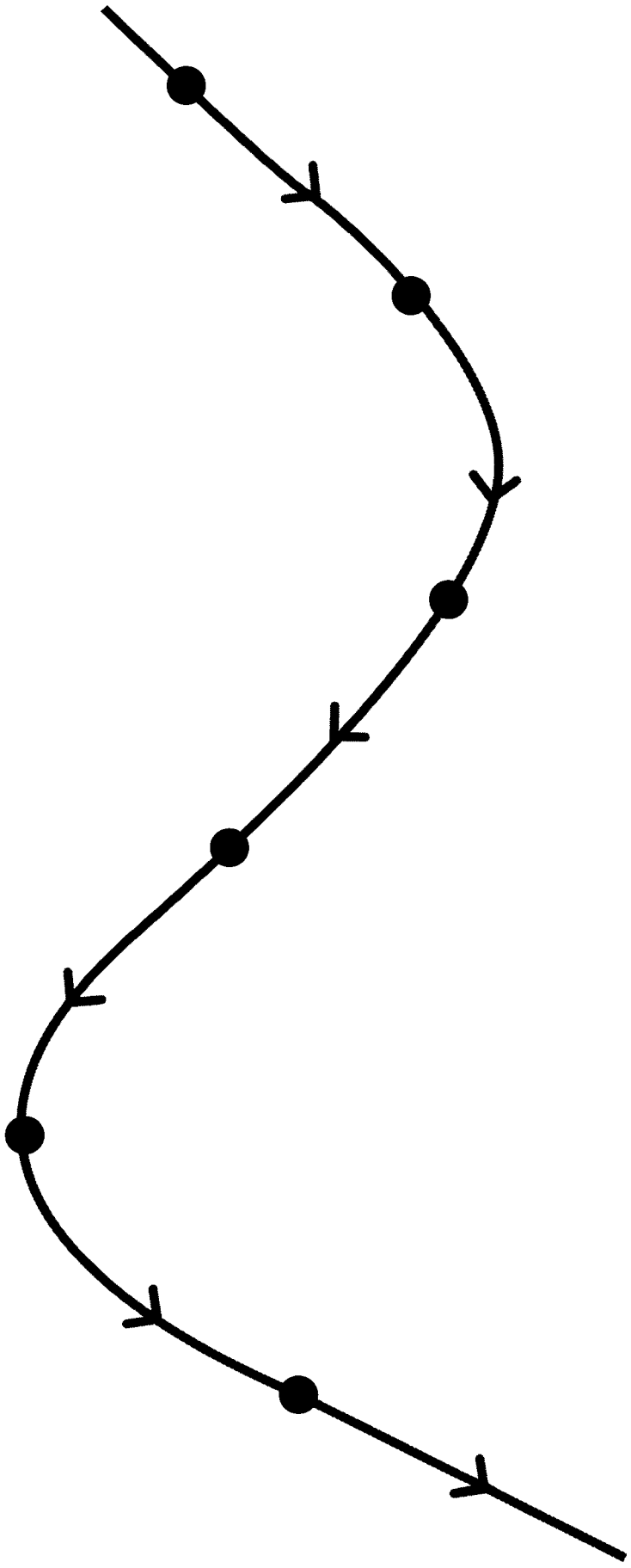
Multiplication Table

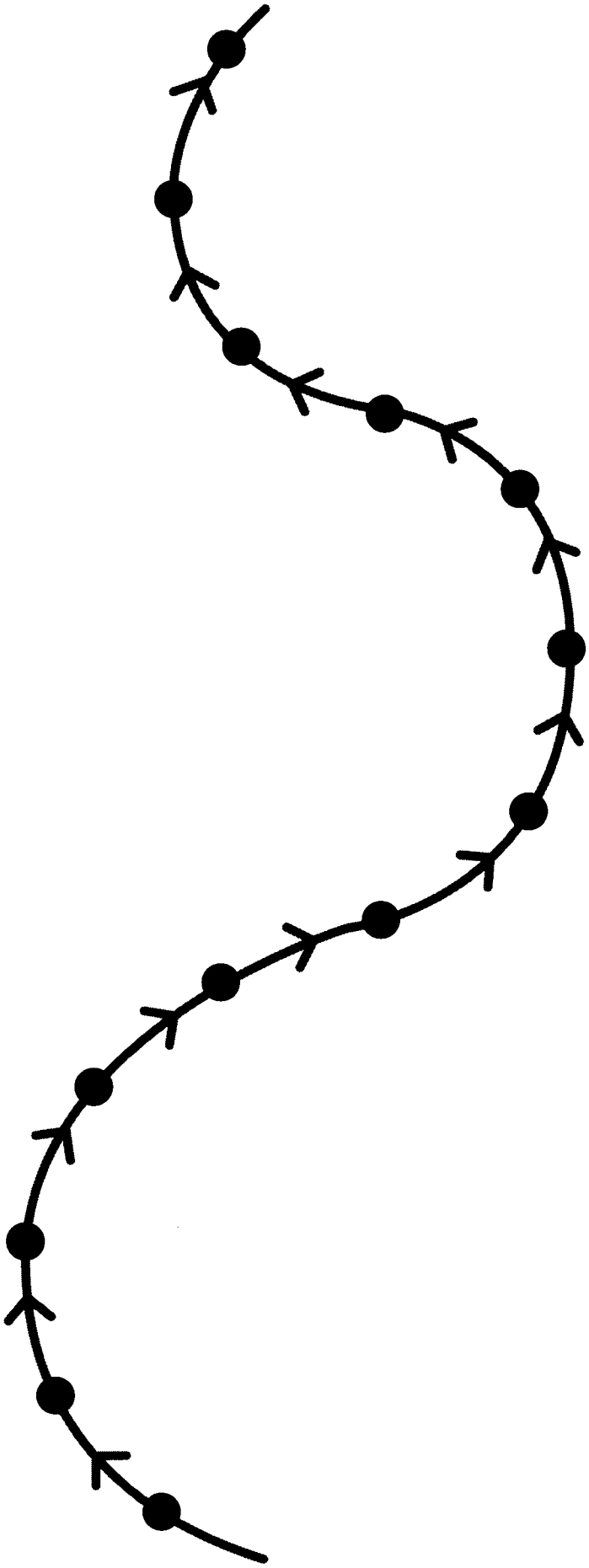
1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

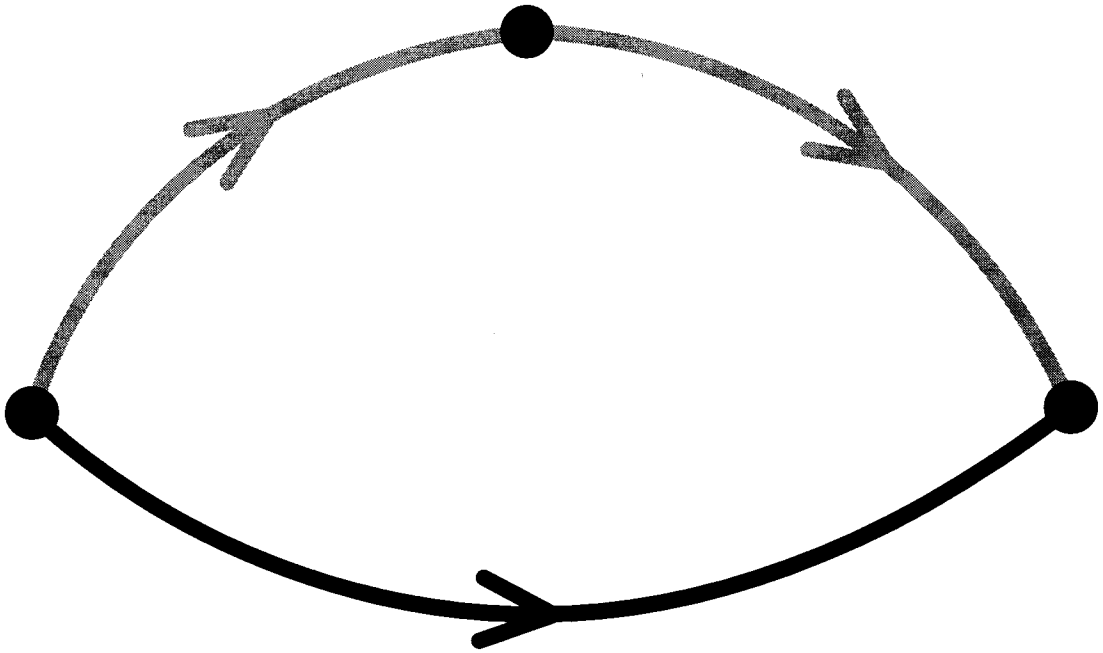


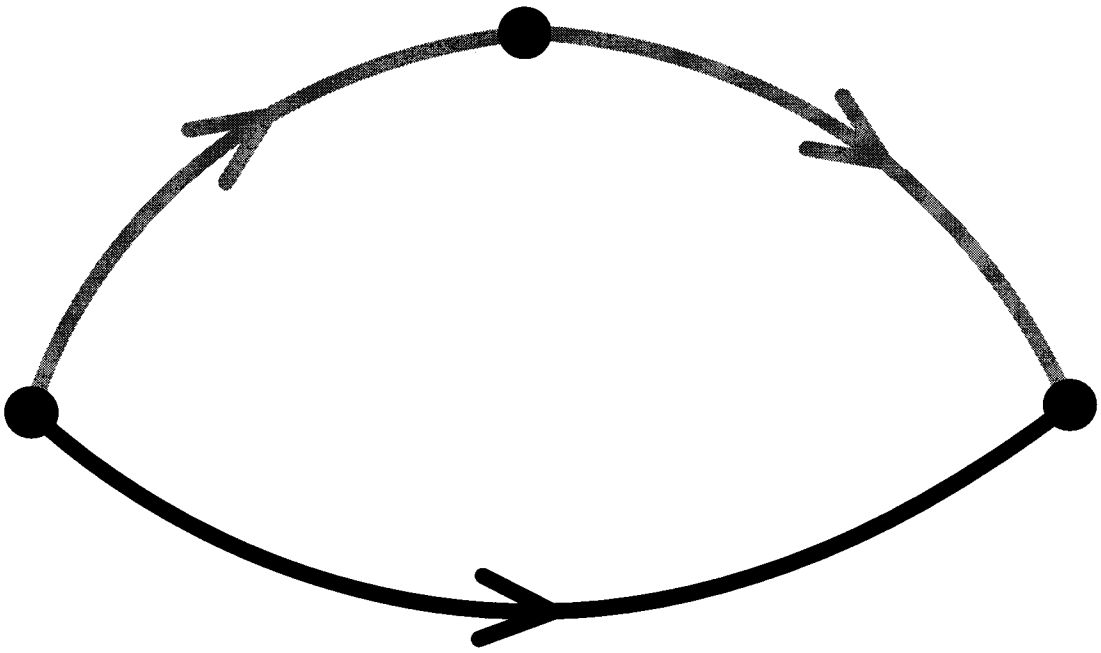


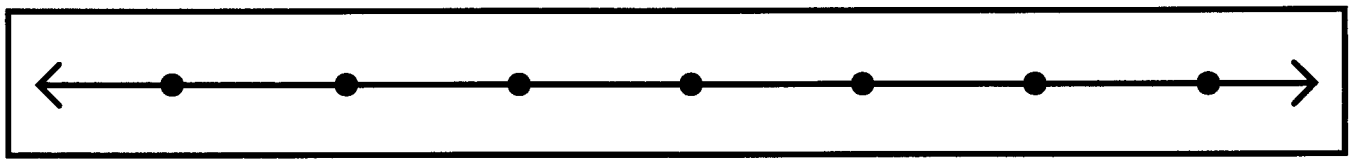


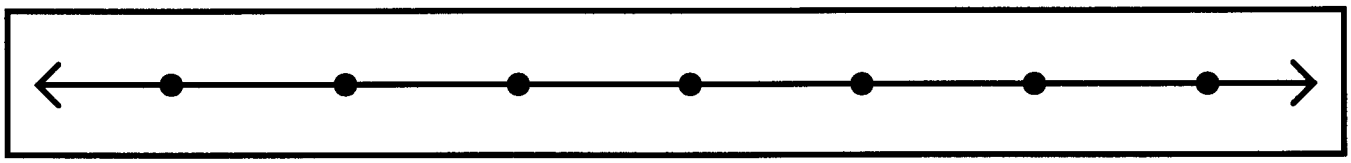


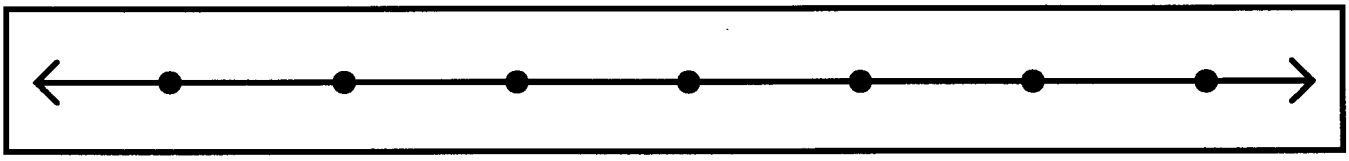


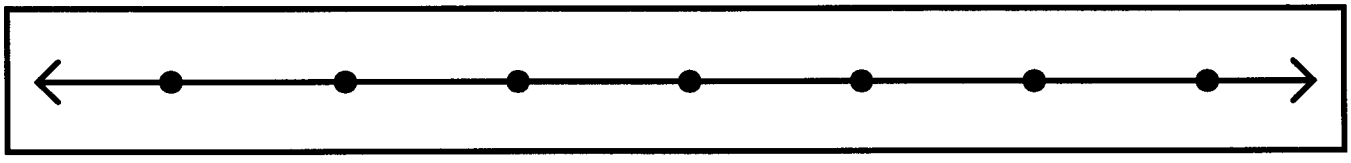


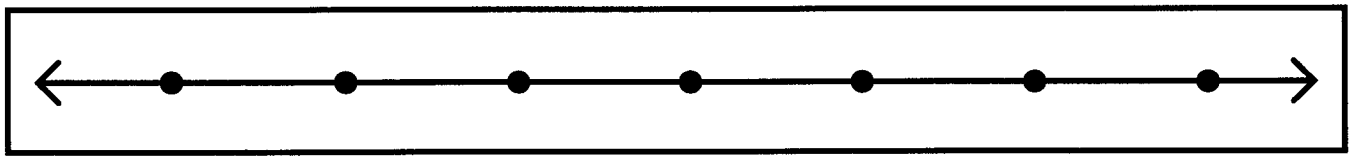


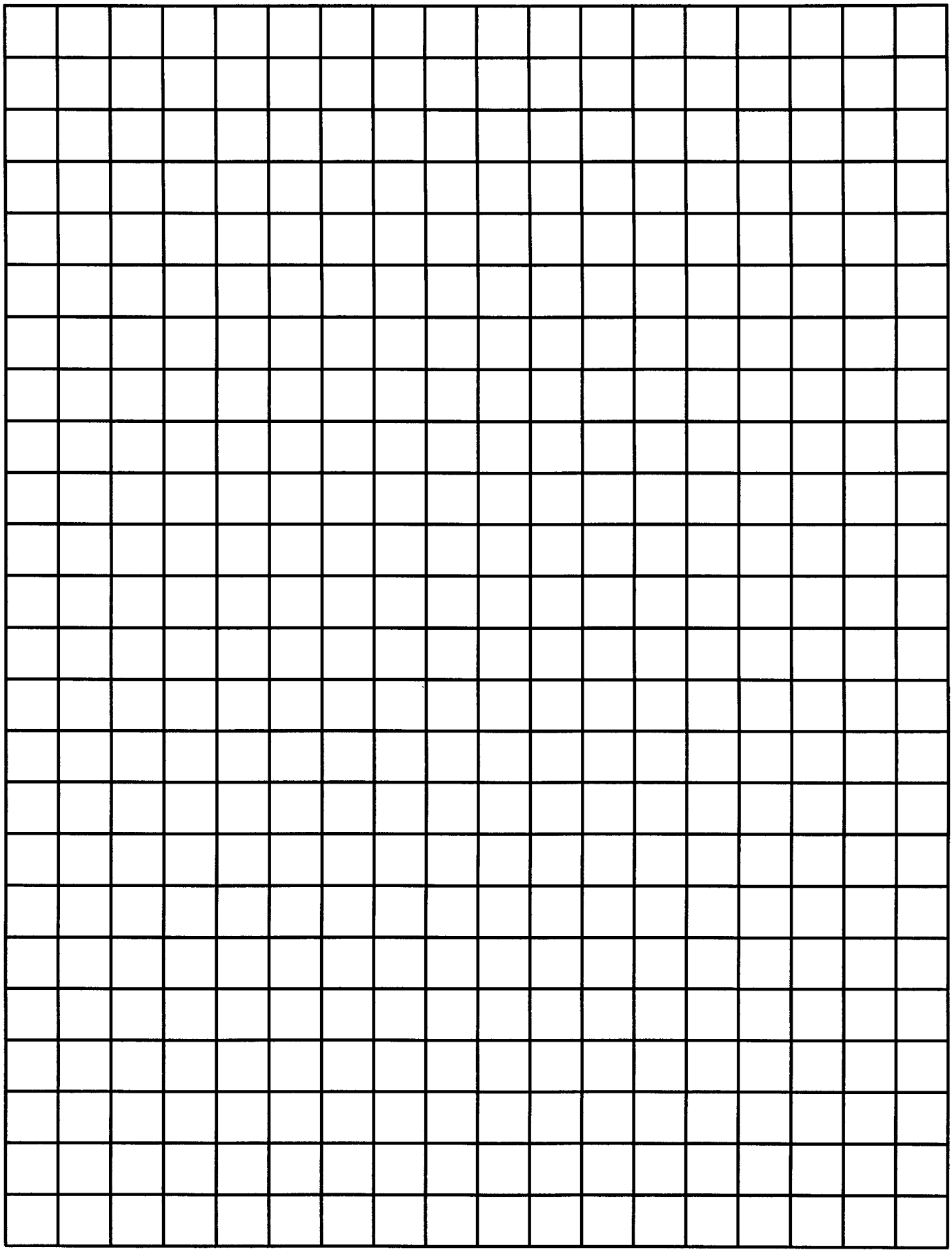


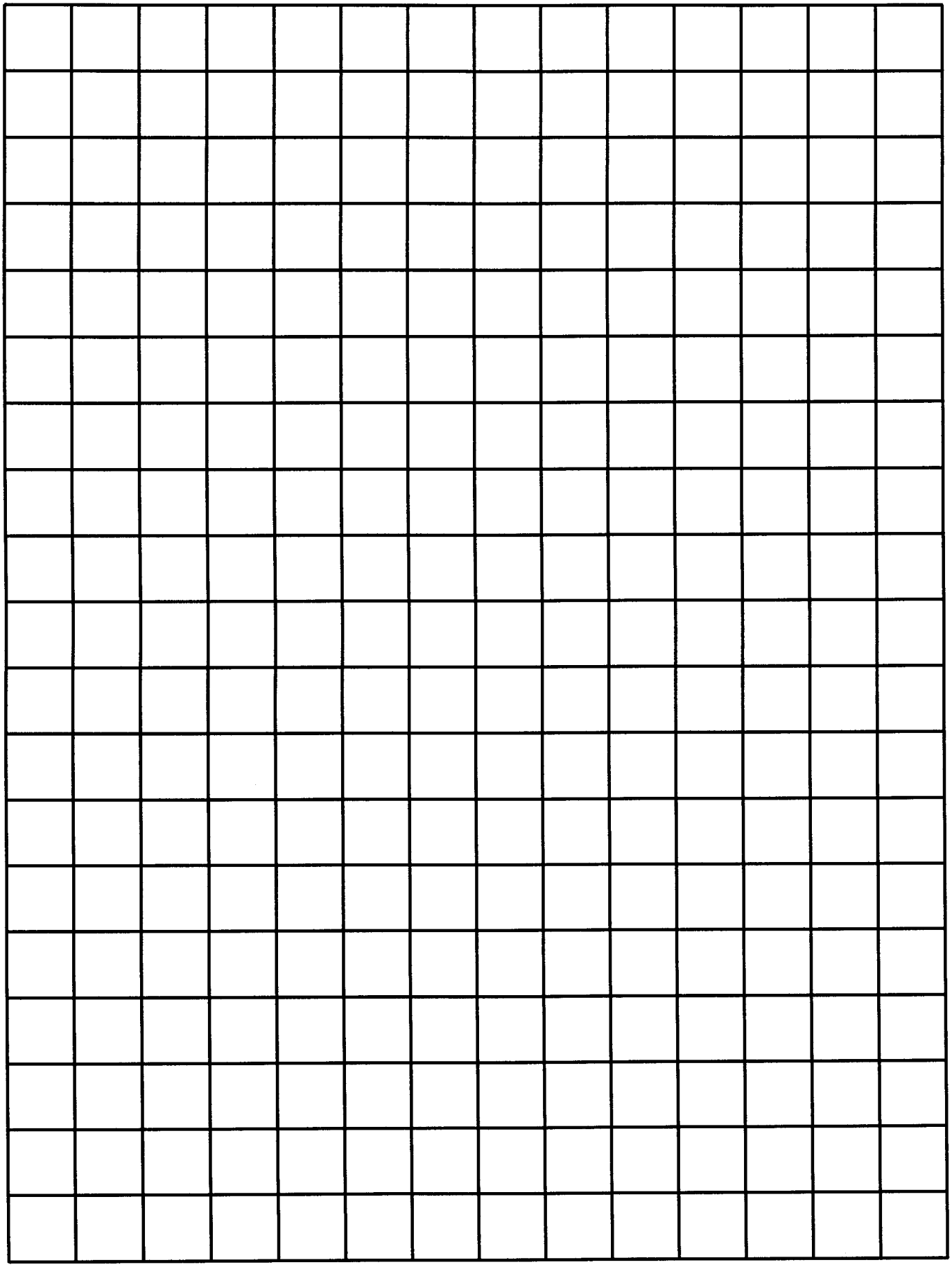


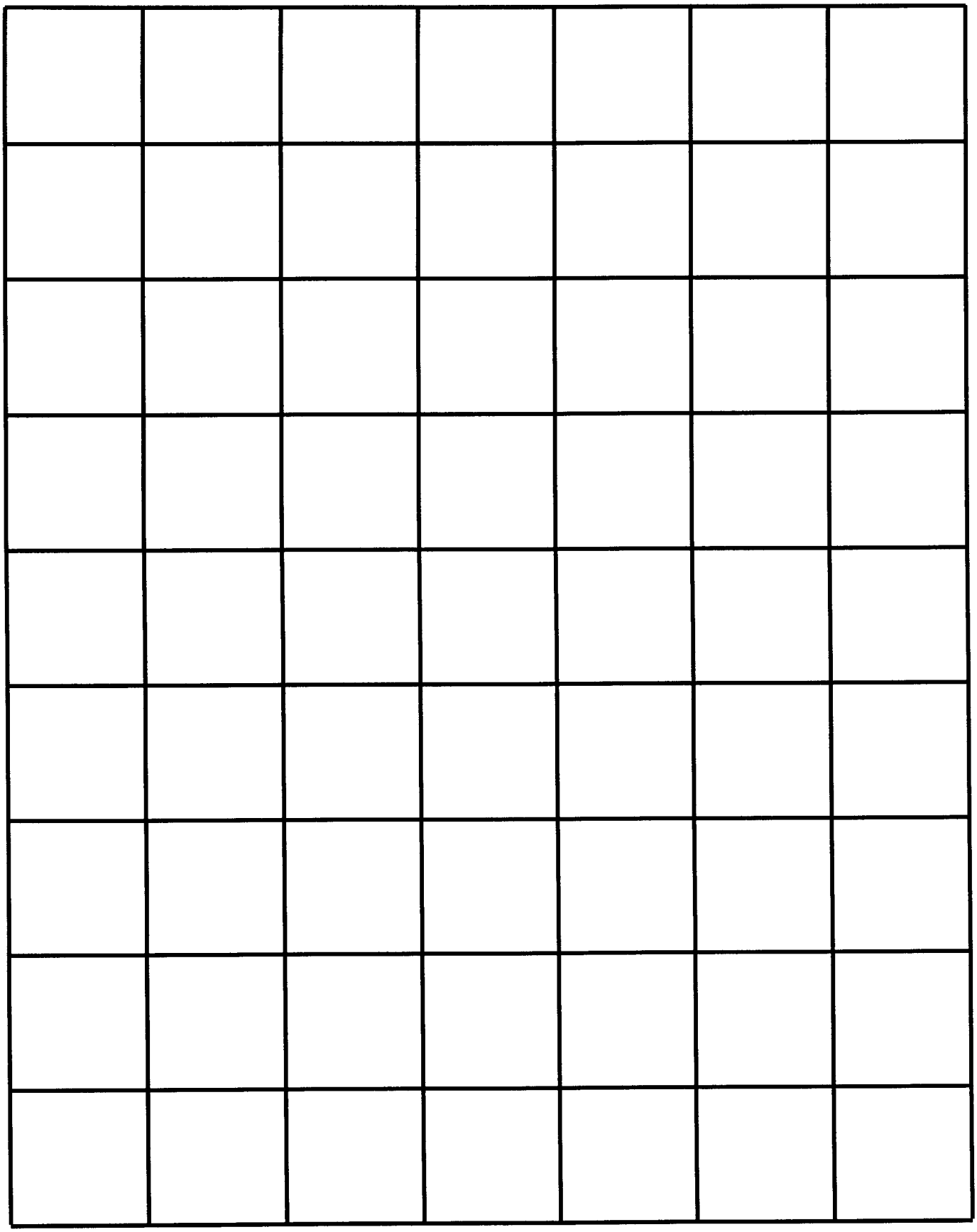


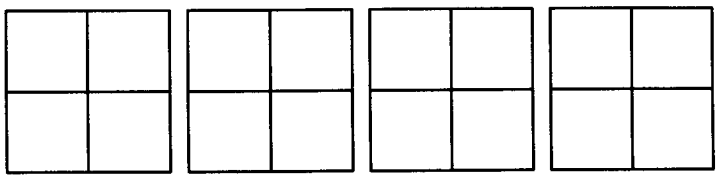


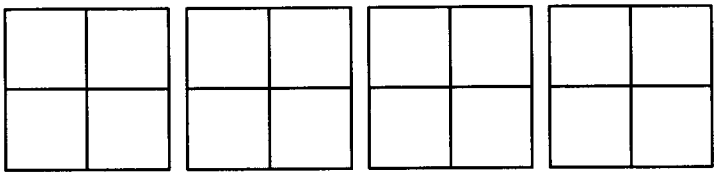


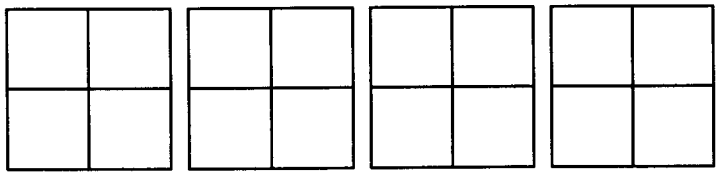


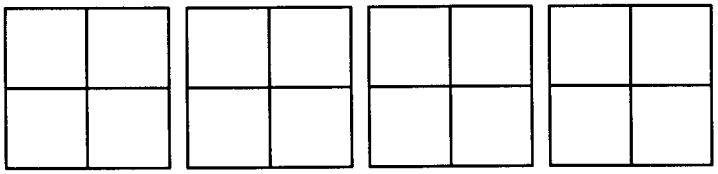


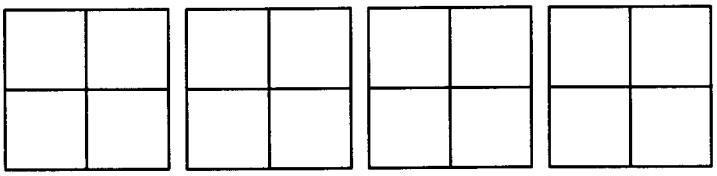


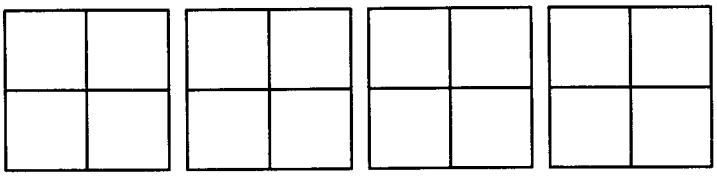


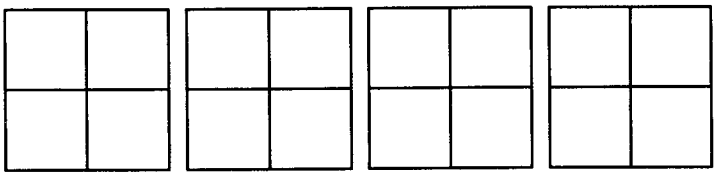


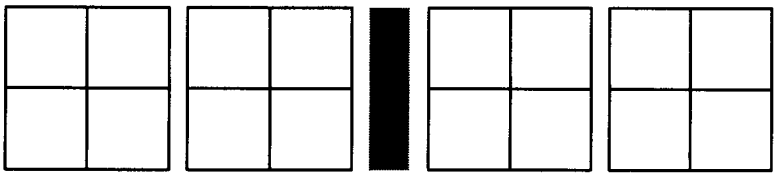






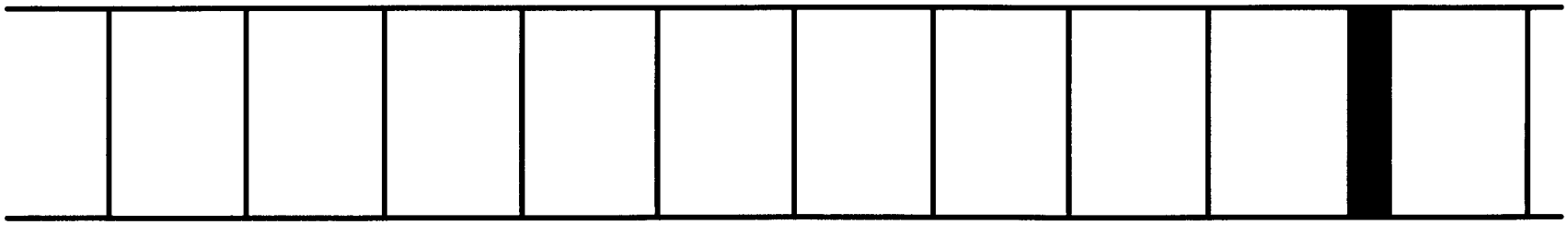






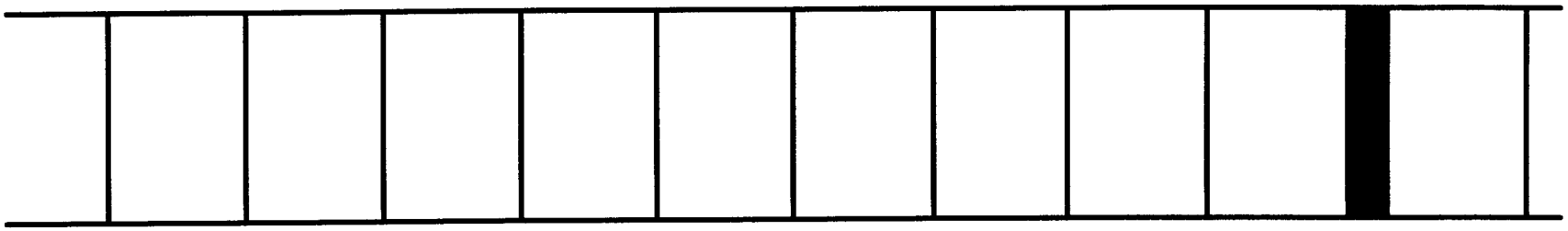
Base Three Abacus

Three checkers on a board
trade for
one checker on the next board to the left.



Base Five Abacus

Five checkers on a board
trade for
one checker on the next board to the left.



Name _____ Date _____

Lesson Notes

Things I learned in the math lesson today:

An example:

Name _____ Date _____

Lesson Notes

Things I need to remember from the math lesson today:

Definitions:

Name _____ Date _____

Lesson Notes

Make up your own problem and find a solution. Show the steps and work that you need to do.

Name _____ Date _____

Lesson Notes

Explain in your own words what we did in the math lesson today.