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PRIMARY ARITHMETIC

FOR GRADED SCHOOLS

BY

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PREFACE

THIS Primary Arithmetic is intended to cover the work of the first four years. It is divided into three parts.

Part One includes the work ordinarily done during the *first and second years.*

Part Two includes the work of the *third year.* It is devoted mainly to the presentation of the elementary facts and tables of arithmetic.

The text-book should be placed in the hands of the pupil when he enters upon the work found in Part Two.

Part Three covers the work of the *fourth year.* Its purpose is to give a mastery of the fundamental operations, and, through the study of problems, to develop the ability to use these operations in a practical way.

The aim of this course is twofold: first, to give the child mathematical skill, second, to give him mathematical power.

To these ends attention is invited to the following:

1. The prominence given to drill intended to give skill, and the frequency of systematic reviews.
2. The Study of Problems intended to give mathematical power.
3. The plan which provides an easy treatment of each subject before the complete treatment of it.
4. The easy steps in gradation.
5. The emphasis given to business arithmetic.
6. The appeal made to observation as a stimulus to mathematical thought.

In many schools the unit of classification is the half year. With this in view, the subject matter in the third and fourth years has been separated into two parts. The easy treatment of topics covers the first half of the year, and the more complete treatment the second half.

SAMUEL HAMILTON.

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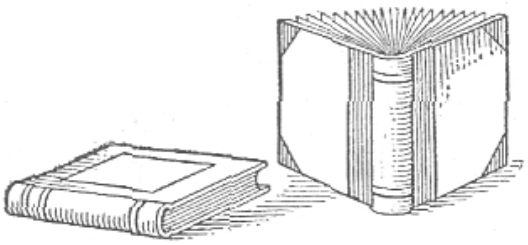
PRIMARY ARITHMETIC

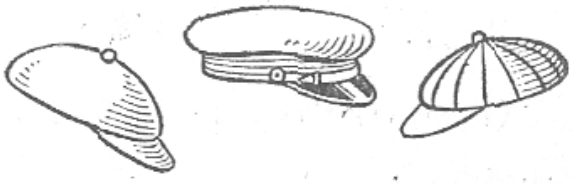
PART I—FIRST AND SECOND YEARS

COUNTING NUMBERS TO TEN



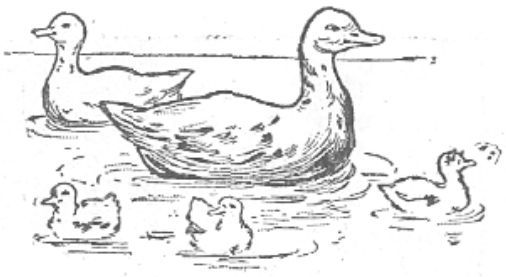
How many books are there in this picture?

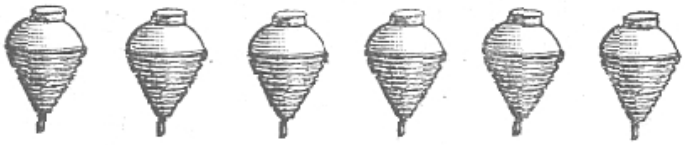
Count the caps. How many more caps are there than books?



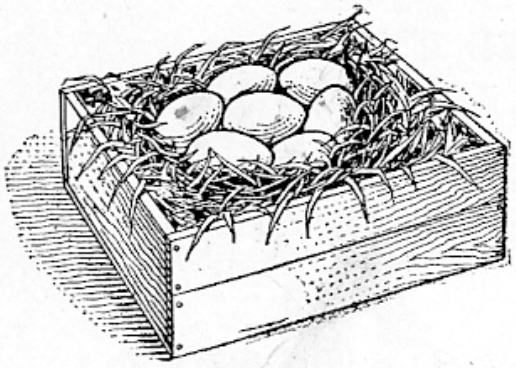
Count the bells. How many are there? Think that you hear them ring 1, 2, 3, 4.

How many ducks do you see in this picture? Tell a story about them.

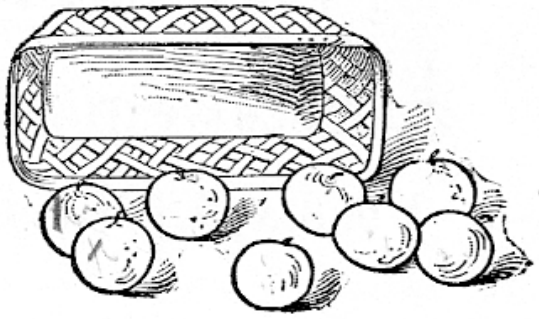




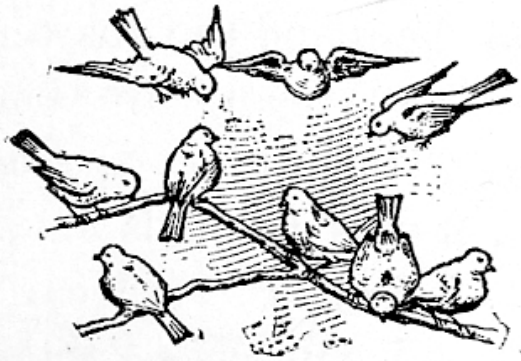
If Rob has as many tops as you see in this picture, how many has he?



One day I saw seven eggs in a nest. How many are there in this one?



Count the apples. How many more apples are there than eggs?

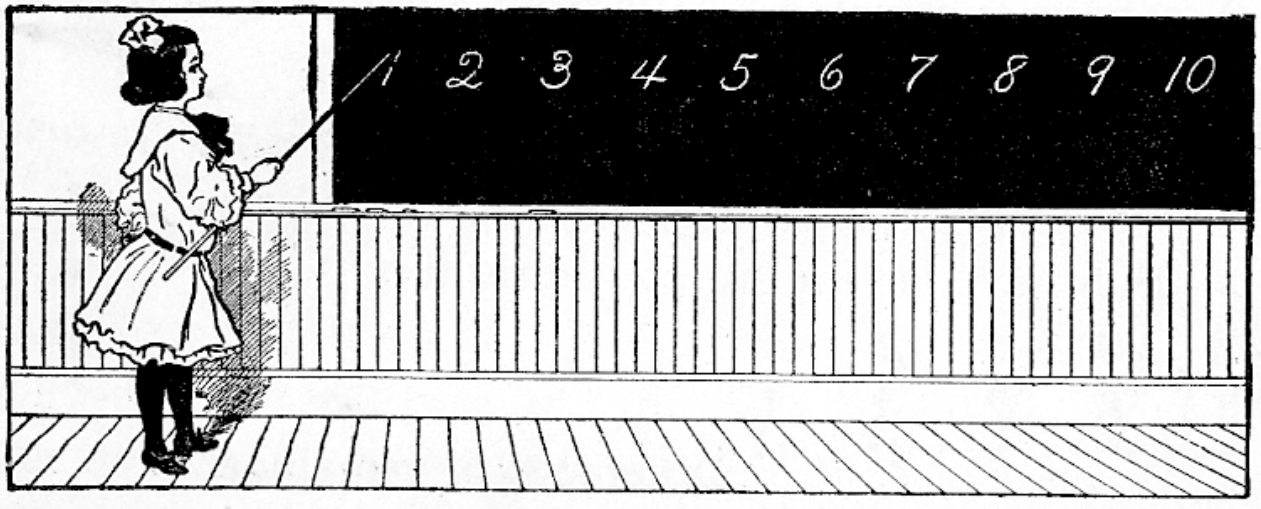


Count the number of birds that you see in this picture.

Here are ten balls. Count these balls.

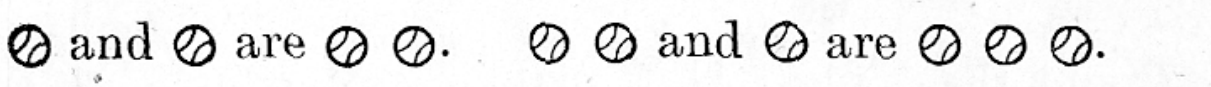
You have named ten numbers and you can write them either in words or in figures.

naught	one	two	three	four	five	six	seven	eight	nine	ten
0	1	2	3	4	5	6	7	8	9	10



THE NUMBERS TWO AND THREE

$2 = \begin{matrix}1\\1\end{matrix}$	$3 = \begin{matrix}1\\2\end{matrix}$	Three 1's



1. 1 ball and 1 ball are how many balls?

1 ball + 1 ball = 2 balls.

When you unite 2 and 1 you **add** them and the answer, 3, is called the **sum**.

The sign + is read **and** or **plus**. The sign = is read **equal** or **equals**. 2 + 1 = 3 is read 2 plus 1 equals 3.

2.

1	1	2	1 top	2 cups	1 car
+2	+1	+1	+2 tops	+1 cup	+2 cars

Sum

3. John had 3 balls and lost one of them. How many balls had he left?

3 balls − 1 ball = 2 balls.

4. How many more balls are 3 balls than 2 balls?

3 balls less 2 balls = 1 ball.

You have **subtracted** 2 balls from 3 balls. The answer, 1 ball, is the **difference** or **remainder**.

The sign − is read **minus** or **less**. 3 − 2 = 1 is read 3 minus 2 equals 1.

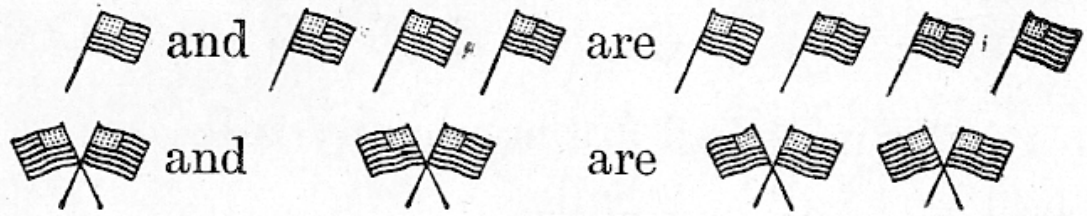
5. Subtract, beginning at the right:

3	3	3	2	1
1	3	2	1	1

Difference or remainder.

THE NUMBER FOUR

4 =	1	2	Four 1's
	3	1	Two 2's



1. Draw flags to show the following:

3 flags + 1 flag = ? 4 flags − 1 flag = ?

2 flags + 2 flags = ? 4 flags − 3 flags = ?

2. Count the flags by 2's. Two 2's = ?

3. How many times must 2 flags be taken to have 4 flags?

4. 2 flags taken two times are —— flags.

5. How many times must 1 flag be taken to have 4 flags. 4 times 1 flag = —— flags.

6. 2 × 2 flags = —— flags.

The sign × is read **time** or **times**.

Give answers, reading across the page:

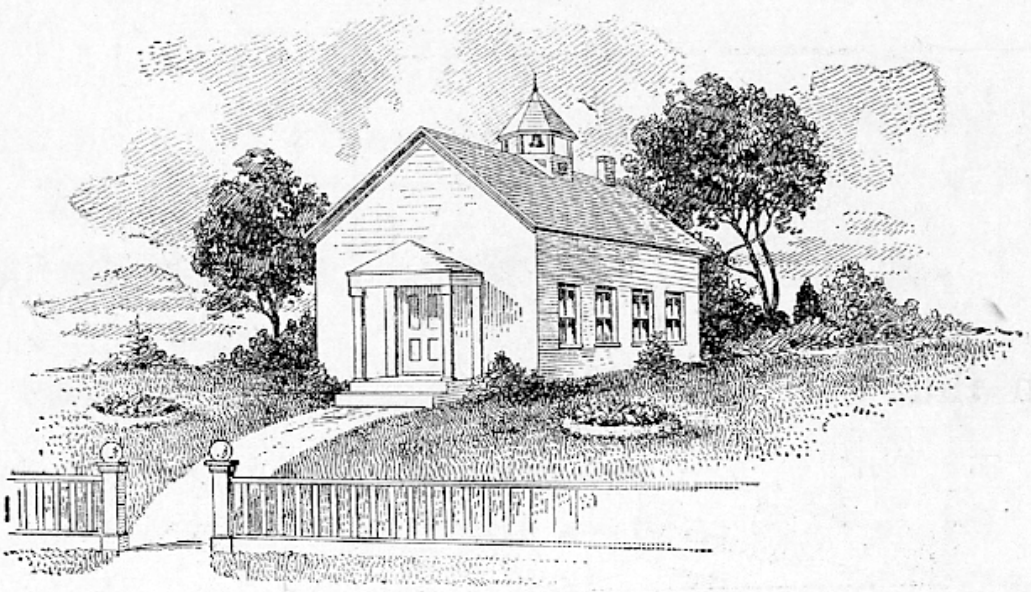
7.	1 × 1	2 × 1	1 × 2	2 × 2	3 × 1
8.	1 × 3	1 × 4	4 × 1	2 + 2	3 + 1
9.	1 + 2	4 − 1	4 − 2	4 − 3	1 + 3

10. 2 × 2 rings = —— 3 × 1 box = ——

11. 1 × 3 balls = —— 2 × 2 books = ——

12. 4 × 1 pencil = —— 1 × 4 tables = ——

PRACTICAL WORK



1. Count the windows that you see in the picture.
2. How many panes are there in each window?
3. Count the large trees on the school grounds.
4. How many flower plots are there?
5. The porch has —— posts.
6. Count the panels in the door.
7. The glass in each window cost one dollar. How much did all the glass cost?
8. Mary lives 2 miles from the school. If she should walk to and from the building, how many miles would she walk every day?
9. James recited twice in the morning and twice in the afternoon. How many times did he recite?
10. 2 books and 2 books = —— books.
11. 2 times 2 pencils = —— pencils.
12. 4 books less 1 book = —— books.

LIQUID MEASURES

For this exercise a set of liquid measures should be used.

1. Fill the pint measure with water and empty it into the quart measure. Do this a second time. You have shown that **2 pints equal a quart.**

2. A quart is how many times a pint? A pint is what part of a quart?

3. Show by measuring with the quart measure that **4 quarts equal a gallon.**

4. A gallon is how many times a quart? A quart is what part of a gallon?

5. How many times can the teacher fill Mary's half-pint milk bottle from the pint measure?

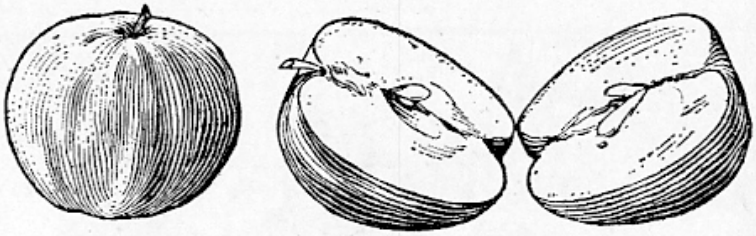
6. Clare gets a pint of milk each morning and evening. How many pints does he get in two days?

7. Clare pays 2 cents for a pint of milk. How much does he pay for 2 pints?

8. Raymond delivers, each day, 4 quart bottles of milk. How many gallons does he deliver?

9. Henry goes to the store for 2 quarts of molasses. How many pints does he get?

HALVES, THIRDS, AND FOURTHS

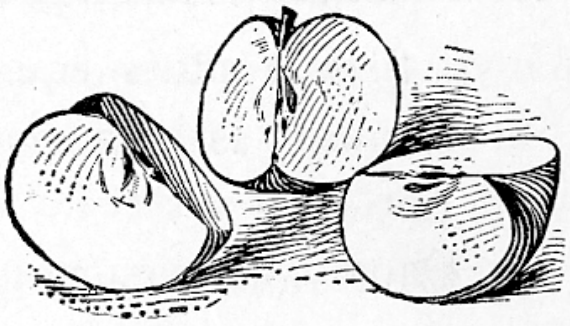


1. Cut an apple into 2 equal parts. What is one part called?

2. Into how many halves can an apple be cut? an orange? a pie?

One half of 1 is written $\frac{1}{2}$.

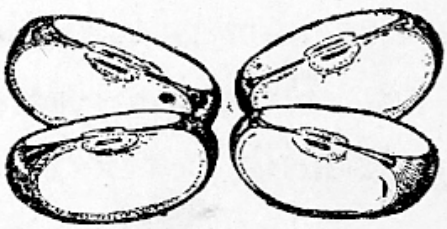
3. $\frac{1}{2}$ of 2 oranges = — orange; $\frac{1}{2}$ of 4 oranges = — oranges.



4. Cut an apple into 3 equal parts. What is 1 part called?

One third of 1 is written $\frac{1}{3}$.

5. $\frac{1}{3}$ of 3 pennies = ? $\frac{1}{2}$ of 4 splints = ?



6. Cut an apple into 4 equal parts. Each part is named one fourth, or one quarter.

One fourth of 1 is written $\frac{1}{4}$.

7. How many fourths of an apple make a whole apple?

8. Write in figures: one half; one third; one fourth.

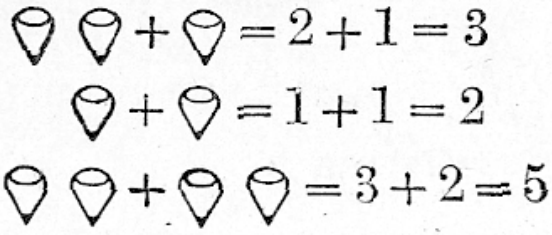
9. Find $\frac{1}{2}$ of 4 cents; $\frac{1}{3}$ of 3 cents; $\frac{1}{2}$ of 2 cents.

10. Find $\frac{1}{2}$ of 4; $\frac{1}{3}$ of 3; $\frac{1}{2}$ of 2; $\frac{1}{2}$ of 1; $\frac{1}{4}$ of 4.

11. Draw a circle showing halves; another showing thirds; one showing fourths.

THE NUMBER FIVE

$5 = \begin{matrix} 1 & 2 \\ 4 & 3 \end{matrix}$ Five 1's



$2 + 1 = 3$

$1 + 1 = 2$

$3 + 2 = 5$

1. Draw tops to show the following:

4 tops + 1 top = ?	5 tops − 1 top = ?
3 tops + 2 tops = ?	5 tops − 3 tops = ?
1 top + 4 tops = ?	5 tops − 4 tops = ?

2. Count by 1's to 5. 1 in 5, —— times.

3. Give sums. Make problems:

2	1	3	2	4	1	1	4	2	3
3	4	1	2	1	3	2	0	1	2

4. Subtract. Make problems:

5	3	5	5	4	5	4	5	2	4
3	1	4	1	3	2	1	5	2	2

5. Give at sight:

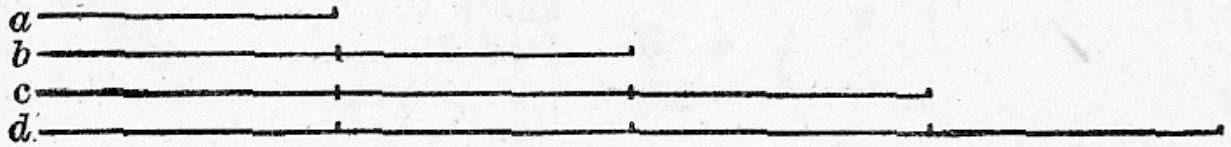
$3 + 2$	$5 - 4$	$5 \div 5$	5×1	$4 + 1$
$\frac{1}{2}$ of 4	$\frac{1}{3}$ of 3	$\frac{1}{4}$ of 4	$\frac{1}{2}$ of 2	2×2

6. James spent 2 cents for a cake and 3 cents for an orange. How many cents did he spend?

7. Mary had 5 chickens. She gave two to her cousin. How many chickens had she left?

COMPARISON

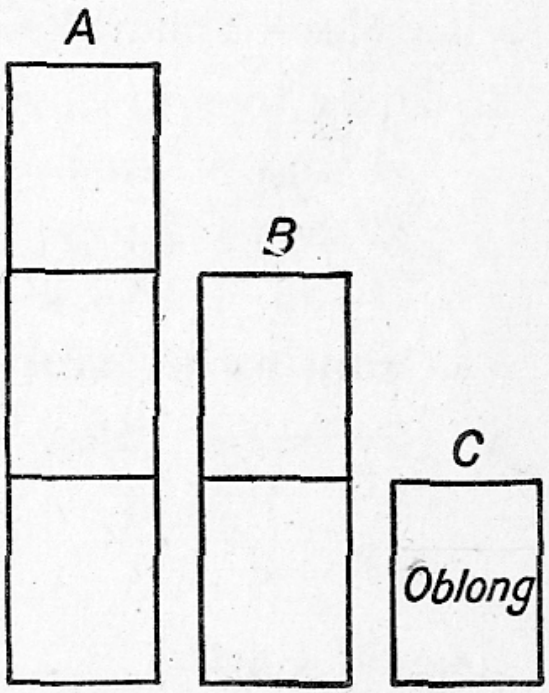
1. Which line is the shortest? the longest?



2. Which lines are shorter than *c*?

3. Which line is one half as long as *b*?

4. Which line is one fourth as long as *d*?



5. *A* is how many times as large as *C*?

6. How many times larger than *C* is *B*?

7. Are *A*, *B*, and *C* of the same width? How many square corners has each one?

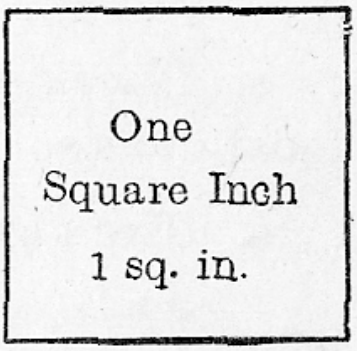
8. How many sides of *A* have the same length?

9. How many oblongs are there in *B*?

10. How many **equal sides** has this figure? how many square corners?

11. What is the name of the figure? How long is each side?

12. How many inches is it around the square?



13. One inch is what part of two inches?

14. Two inches are what part of 4 inches?

THE NUMBER SIX

6 =	1	2	3	Six 1's
	5	4	3	Three 2's, Two 3's

1. Show with marbles the combinations that form 6.

5 marbles + 1 marble = ? 6 marbles − 4 marbles = ?
3 marbles + 3 marbles = ? 6 marbles − 1 marble = ?
2 marbles + 4 marbles = ? 6 marbles − 3 marbles = ?

2. Add:

2	1	2	4	3	5	3	4	0	2
4	5	3	1	3	1	2	2	6	2

3. Fill in the blank spaces:

( )	( )	( )	( )	( )	( )	( )	(5)	(6)	( )
5	2	4	3	3	3	2	1	6	1
6	5	6	6	5	4	6	6	6	5

4. Subtract:

6	5	6	6	6	4	5	6	6	5
6	2	3	1	5	3	5	2	4	3

5. Place six marbles in two equal groups; in three equal groups.

6. Give answers at sight:

3×2	2×3	6×1	$6 - 4$
$\frac{1}{2}$ of 6	$\frac{1}{3}$ of 3	$\frac{1}{4}$ of 4	$\frac{1}{3}$ of 6
$2+2+2=?$	$3+3=?$		$1+3+2=?$
$3+2+1=?$	1 in 6, — times?		$3+1+2=?$

THE NUMBER SEVEN

7 =	1	2	3	Seven 1's
	6	5	4	

1. Show with blocks the combinations that form 7.

5 blocks + 2 blocks = ?
6 blocks + 1 block = ?
3 blocks + 4 blocks = ?
7 blocks − 5 blocks = ?
7 blocks − 3 blocks = ?
7 blocks − 2 blocks = ?

2. Add:

2	3	4	5	6	1	2	3	5	2
3	4	3	1	1	6	5	3	2	4

3. From 7 take 3; take 5; 2; 6; 1; 4; 7.

4. 2 in 7, —— times and —— over.
3 in 7, —— times and —— over.
4 in 7, —— time and —— over.
5 in 7, —— time and —— over.

5. Add 3 to 1; to 4; to 2; to 3.

6. Add 2 to 2; to 1; to 5; to 4; to 3.

7. Find:

2 + 3 + 1 = ?
3 + 2 + ? = 7
4 + 1 + ? = 6
3 + 3 + 1 = ?
7 − 5 − 1 = ?
1 + 3 + 2 = ?

8. Name the days of the week. How many are there?

9. Charles had 7 dollars. He gave three dollars to his sister. How many dollars had he left?

THE NUMBER EIGHT

8 =	1	2	3	4	Eight 1's
	7	6	5	4	Four 2's
					Two 4's

1. Illustrate the combinations that make 8.

7 plums + 1 plum = ? 8 plums − 7 plums = ?
5 plums + 3 plums = ? 8 plums − 4 plums = ?
2 plums + 6 plums = ? 8 plums − 6 plums = ?

2. Count to 8 by 2's. ? × 2 = 8 ? ? × 4 = 8 ?

Add up, then down:

3.

4	3	5	2	7	1	6	5	4	6
4	5	2	6	1	7	1	3	3	2

4.

3	4	2	2	1	3	0	1	2	3
2	3	5	3	3	0	2	6	2	1
1	1	1	3	4	5	6	1	4	4

5. Subtract:

8	8	6	8	8	7	8	8	8	8
3	7	3	1	6	5	4	8	5	2

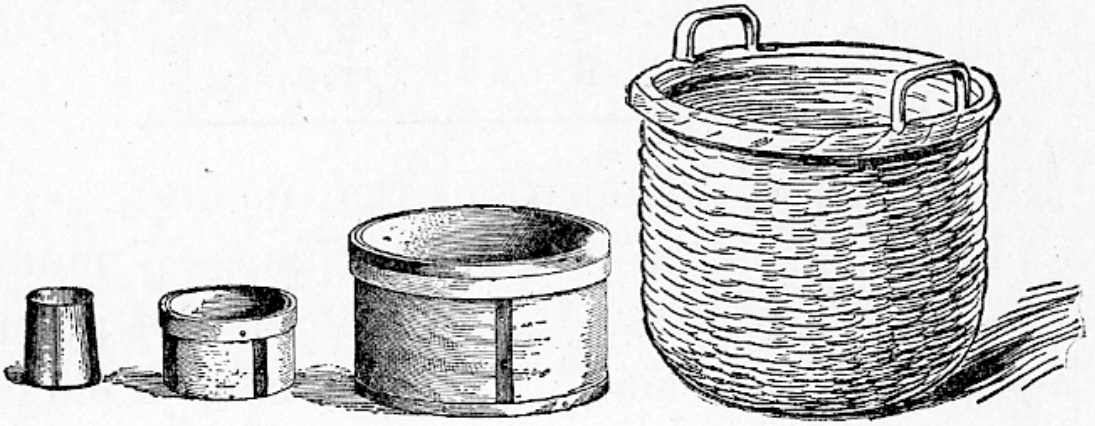
6. In 8 blocks, how many groups of 2's are there?

1 time 2 = ? How many groups are there?
2 times 2 = ? 2 is contained in 4, —— times.
3 times 2 = ? 2 is contained in 6, —— times.
4 × 2 = ? 2 is contained in 8, —— times.

7. Give answers at sight:

4 + 4	5 + 3	8 ÷ 4	$\frac{1}{2}$ of 8	8 − 5
2 × 4	2 + 6	3 + 5	$\frac{1}{4}$ of 8	8 − 7

DRY MEASURES



PINT QUART PECK BUSHEL

1. Name articles that you can purchase by the peck or by the bushel.

2. Why are these measures called "dry measures"?

3. The smallest dry measure shown in the picture is called a **pint.** Fill a pint measure with sand and empty it into the quart measure. Do this again. Is the quart measure now full? You have shown that **2 pints equal a quart.**

4. What part of a quart is a pint?

5. Show by measurement, as in example 3, that **8 quarts equal a peck.** A quart is what part of a peck?

6. Show as before that **4 pecks equal a bushel.** A peck is what part of a bushel?

7. A bushel is how many times a peck? A peck is how many times a quart?

8. Subtract:

8 qt.	7 qt.	8 pk.	6 pt.	8 bu.
4 qt.	3 qt.	3 pk.	4 pt.	5 bu.

THE NUMBER NINE

9 =	1	2	3	4	Nine 1's
	8	7	6	5	Three 3's

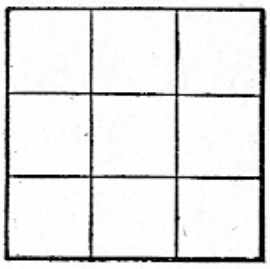
Add:

1.

4	2	3	7	1	6	5	4	8	3
5	7	5	2	8	3	4	4	1	6

2. From 9 take 8; take 7; 6; 5; 3; 2; 4; 1; 9.

3. Draw and cut out a 3-inch square. Place your ruler at the edges and mark the inches.



Fold the paper to show 9 square inches.

How many rows of square inches are there?

Count the rows of square inches, thus:

1 time 3 square inches = ? $1 \times 3 = ?$

2 times 3 square inches = ? $2 \times 3 = ?$

3 times 3 square inches = ? $3 \times 3 = ?$

4. Find:

$\frac{1}{3}$ of 3 sq. inches.	$3 + 6$	$4 \times 2, +1 = ?$	$3 \times 3 = ?$
$\frac{1}{3}$ of 6 sq. inches.	$4 + 5$	$5 + 4 = ?$	$2 + 5 + ? = 9.$
$\frac{1}{3}$ of 9 sq. inches.	$6 + 3$	$\frac{1}{3}$ of $9 = ?$	$? + 4 + 4 = 9.$

5. Fill the blank spaces:

( )	( )	( )	( )	( )	( )	( )	( )	( )
+3	+2	+4	+6	+5	+5	+7	+4	+8
9	9	9	9	9	8	9	8	9

6.

9	9	9	9	9	9	9	9	9
−8	−9	−1	−5	−6	−2	−3	−7	−4