LIST OF MATERIALS

The following materials are used throughout *Saxon Math 5/4—Homeschool*. We suggest you acquire these materials before beginning the program.

- inch/centimeter ruler
  (*Note:* A ruler that shows both customary and metric scales is preferred. However, separate customary and metric rulers are acceptable.)
- compass (for drawing circles)
- scissors

Certain lessons and investigations contain activities that call for additional materials. Refer to the following list before beginning the specified lessons/investigations.

Investigation 2

- dollar bill
- meterstick (optional)
- yardstick (optional)

Lesson 40

- empty, clean plastic or paper containers of the following sizes: 1 gallon, 1 half gallon, 1 quart, 1 pint, 1 cup, and 1 liter (or 2 liters)
- supply of water
- funnel

Investigation 4

- calculator
- envelope or zip-top plastic bag
- digital stopwatch

Lesson 41 (Warm-Up)

- calendar

Lesson 79

- small, rectangular mirror

Lesson 81

- 3-by-5-in. rectangle of unlined paper

Investigation 9

- colored pencils or markers (optional)
- envelope or zip-top plastic bag

Lesson 98

- closed, rectangular box (such as a tissue box)

Lesson 100

- glue or tape
- cereal box

Investigation 10

- 4 dot cubes

Lesson 102

- meterstick (or centimeter ruler)

Investigation 11

- yardstick or tape measure

Lesson 111

- masking tape
- yardstick

LESSON

1 Review of Addition • Addition Stories • Missing Addends, Part 1

WARM-UP

Facts Practice: 100 Addition Facts (Test A)†

Mental Math:

Add ten to a number:

a. $\begin{array}{r} 20 \\ +\ 10 \\ \hline \end{array}$ **b.** $\begin{array}{r} 34 \\ +\ 10 \\ \hline \end{array}$ **c.** $\begin{array}{r} 10 \\ +\ 53 \\ \hline \end{array}$

d. 5 + 10 **e.** 25 + 10 **f.** 10 + 8

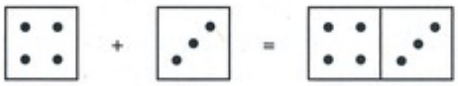
Patterns:

Count by twos from 2 through 40 as you list the numbers in a column on your paper. Study the list. Which digits appear as final digits? Which digits do not appear as final digits?

NEW CONCEPTS

Review of addition

Addition is the combining of two groups into one group. For example, when we count the dots on the top faces of a pair of dot cubes (dice), we are adding.



The numbers that are added are called **addends.** The answer is called the **sum.** The expression 4 + 3 = 7 is a **number sentence.** A number sentence is a complete sentence that uses numbers and symbols instead of words. Here we show two ways to add 4 and 3:

$$\begin{array}{rl} 4 & \text{addend} \\ +\ 3 & \text{addend} \\ \hline 7 & \text{sum} \end{array} \qquad \begin{array}{rl} 3 & \text{addend} \\ +\ 4 & \text{addend} \\ \hline 7 & \text{sum} \end{array}$$

†For instructions on how to use the Warm-up activities, please consult the preface.

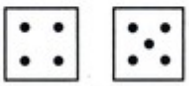
Notice that if the order of the addends is changed, the sum remains the same. This property of addition is true for any two numbers and is called the **commutative property of addition.** **When we add two numbers, either number may be first.**

$$4 + 3 = 7 \qquad 3 + 4 = 7$$

When we add zero to a number, the number is not changed. This property of addition is called the **identity property of addition.** If we start with a number and add zero, the sum is identical to the starting number.

$$4 + 0 = 4 \qquad 9 + 0 = 9 \qquad 0 + 7 = 7$$

Example 1 Write a number sentence for this picture:



Solution A number sentence for the picture is **4 + 5 = 9.** The number sentence **5 + 4 = 9** is also correct.

When adding three numbers, the numbers may be added in any order. Here we show six ways to add 4, 3, and 5. Each way the answer is 12.

4	4	3	3	5	5
3	5	4	5	4	3
+ 5	+ 3	+ 5	+ 4	+ 3	+ 4
12	12	12	12	12	12

Example 2 Show six ways to add 1, 2, and 3.

Solution We can form two number sentences that begin with the addend 1.

$$\mathbf{1 + 2 + 3 = 6} \qquad \mathbf{1 + 3 + 2 = 6}$$

We can form two number sentences that begin with the addend 2.

$$\mathbf{2 + 1 + 3 = 6} \qquad \mathbf{2 + 3 + 1 = 6}$$

We can form two number sentences that begin with the addend 3.

$$\mathbf{3 + 1 + 2 = 6} \qquad \mathbf{3 + 2 + 1 = 6}$$

Addition stories Many word problems tell a story. Some stories are about **putting things together.** Look at this story:

John had 5 marbles. He bought 7 more marbles.
Now John has 12 marbles.

There is a pattern to this story. John had **some** marbles. Then he bought **some more** marbles. When he put the marbles together, he found the **total** number of marbles. **"Some and some more"** stories like this have an addition pattern.

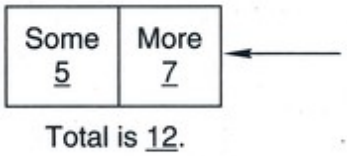
PATTERN	PROBLEM
Some	5 marbles
+ Some more	+ 7 marbles
Total	12 marbles

Here we show the pattern written sideways.

PATTERN: Some + some more = total

PROBLEM: 5 marbles + 7 marbles = 12 marbles

Here we show a diagram for the story:



Example 3 Miguel saw 8 ducks. Then he saw 7 more ducks. How many ducks did Miguel see in all?

Solution This problem follows the idea of "some and some more." We show the addition pattern below.

PATTERN: Some + some more = total

PROBLEM: 8 ducks + 7 ducks = 15 ducks

We find the total number by adding 8 and 7. Miguel saw **15 ducks** in all.

Example 4 Samantha saw rabbits in the field. She saw 5 rabbits in the east field. She saw 3 rabbits in the west field. She saw 4 rabbits in the north field. How many rabbits did Samantha see in all?

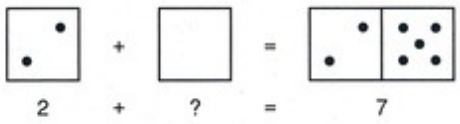
Solution In this story there are three addends.

PATTERN	PROBLEM
Some	5 rabbits
Some more	3 rabbits
+ Some more	+ 4 rabbits
Total	12 rabbits

Samantha saw **12 rabbits** in all.

Missing addends, part 1

Some of the problems in this book will have an addend missing. When one addend is missing and the sum is given, the problem is to find the missing addend. Can you figure out the missing addend in this number sentence?



Since we know that $2 + 5 = 7$, the missing addend is 5. We will often use a letter to represent a missing number, as we see in the example below.

Example 5 Find each missing addend:

(a) $\begin{array}{r} 4 \\ +\ N \\ \hline 7 \end{array}$ (b) $B + 6 = 10$

Solution (a) The letter N stands for a missing addend. Since $4 + 3 = 7$, the letter N stands for the number **3** in this number sentence.

(b) In this problem the letter B is used to stand for the missing addend. Since $4 + 6 = 10$, the letter B stands for the number **4.**

LESSON PRACTICE

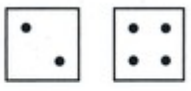
Practice set Add:

a. $5 + 6$ **b.** $6 + 5$ **c.** $8 + 0$

d. $4 + 8 + 6$ **e.** $4 + 5 + 6$

f. Diane ran 5 laps in the morning. She ran 8 laps in the afternoon. How many laps did she run in all?

g. Write two number sentences for this picture to show the commutative property:



h. Show six ways to add 1, 3, and 5.

Find each missing addend:

i. $7 + N = 10$ **j.** $A + 8 = 12$

LESSON

120 Adding and Subtracting Mixed Numbers with Different Denominators

WARM-UP

Facts Practice: 90 Division Facts (Test J)

Mental Math:

Find the stated percent of 100:

a. 75% of 100 **b.** 70% of 100 **c.** 100% of 100

Review:

d. 20 × 23 **e.** \$20.00 − \$12.75 **f.** 127 + 35

Roman numerals:

g. Write MCM in our number system.

h. Write XCIX in our number system.

Patterns:

Find the next eight numbers in this sequence:

$\frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, 1, \_\_\_, \_\_\_, \_\_\_, \_\_\_, \_\_\_, \_\_\_, \_\_\_, \_\_\_, \ldots$

NEW CONCEPT

To add or subtract mixed numbers, we first make sure the fractions have common denominators.

Example 1 Add: $4\frac{1}{6} + 2\frac{1}{2}$

Solution The denominators of the fractions are not the same. We can rename $\frac{1}{2}$ so that it has a denominator of 6 by multiplying $\frac{1}{2}$ by $\frac{3}{3}$. Then we add, remembering to reduce the fraction part of our answer.

$$\begin{array}{r} 4\frac{1}{6} = 4\frac{1}{6} \\ +\ 2\frac{1}{2} = 2\frac{3}{6} \\ \hline 6\frac{4}{6} = \mathbf{6\frac{2}{3}} \end{array}$$

Example 2 Subtract: $5\frac{3}{4} - 3\frac{5}{8}$

Solution We first rewrite the problem so that the fractions have common denominators. We can rename $\frac{3}{4}$ so that it has a denominator of 8 by multiplying $\frac{3}{4}$ by $\frac{2}{2}$. Then we subtract.

$$\begin{array}{r} 5\frac{3}{4} = 5\frac{6}{8} \\ -\ 3\frac{5}{8} = 3\frac{5}{8} \\ \hline \mathbf{2\frac{1}{8}} \end{array}$$

LESSON PRACTICE

Practice set Add. Reduce when possible.

a. $3\frac{1}{2} + 1\frac{1}{4}$

b. $4\frac{3}{4} + 1\frac{1}{8}$

c. $4\frac{1}{5} + 1\frac{3}{10}$

d. $6\frac{1}{6} + 1\frac{1}{3}$

Subtract. Reduce when possible.

e. $3\frac{7}{8} - 1\frac{1}{4}$

f. $2\frac{3}{5} - 2\frac{1}{10}$

g. $6\frac{7}{12} - 1\frac{1}{6}$

h. $4\frac{3}{4} - 1\frac{1}{2}$

MIXED PRACTICE

Problem set

1. (40) The Martins drank 11 gallons of milk each week. How many quarts of milk did they drink each week?

2. (95) Sixty fleas leaped onto Rover as he ran through the field. If one fourth of them perished from flea powder, how many survived? Draw a picture to illustrate the problem.

3. (Inv. 2, Inv. 3) (a) What is the area of this square?

(b) What is the perimeter of the square?

c. \$5.20

d. \$3.02

Now we will use bills and coins to represent decimal numbers that are not money amounts. Below we show an example of money representing the number 4.23 (four and twenty-three hundredths).

Use bills and coins to represent these decimal numbers:

e. 3.42 (three and forty-two hundredths)

f. 0.24 (twenty-four hundredths)

g. 12.03 (twelve and three hundredths)

h. 1.3 (one and three tenths)