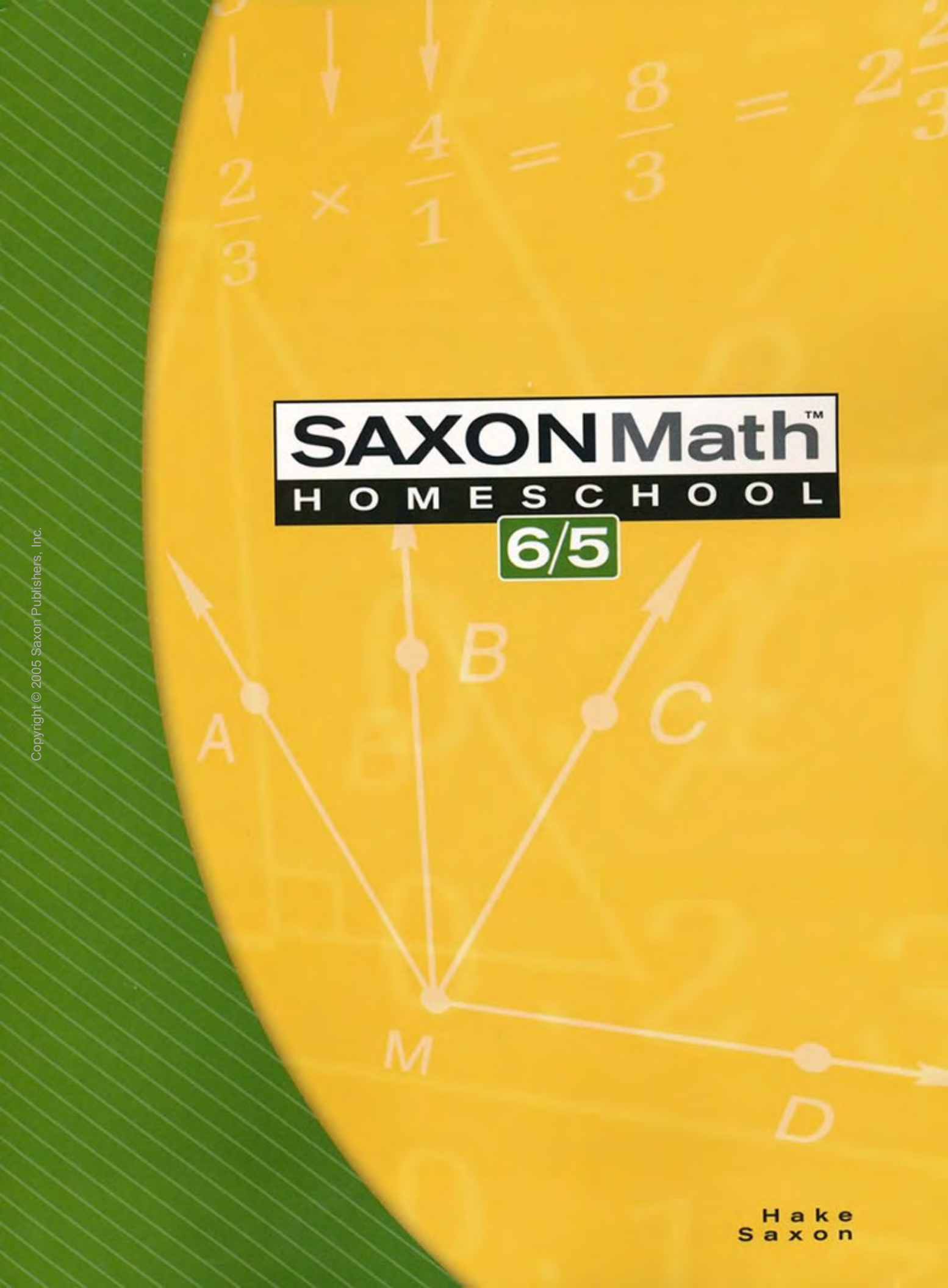


CONTENTS

LETTER FROM AUTHOR STEPHEN HAKE

Dear Student,

We study mathematics because of its importance to our lives. Our study schedule, our trip to the store, the preparation of our meals, and many of the games we play involve mathematics. You will find that the word problems in this book are often drawn from everyday experiences.

As you grow into adulthood, mathematics will become even more important. In fact, your future in the adult world may depend on the mathematics you have learned. This book was written to help you learn mathematics and to learn it well. For this to happen, you must use the book properly. As you work through the pages, you will see that similar problems are presented over and over again. ***Solving each problem day after day is the secret to success.***

Your book is made up of daily lessons and investigations. Each lesson has four parts. The first part is a Warm-Up that includes practice of basic facts and mental math. These exercises improve your speed, accuracy, and ability to do math "in your head." The Warm-Up also includes a problem-solving exercise to familiarize you with strategies for solving complicated problems. The second part of the lesson is the New Concept. This section introduces a new mathematical concept and presents examples that use the concept. In the next section, the Lesson Practice, you have a chance to solve problems involving the new concept. The problems are lettered a, b, c, and so on. The final part of the lesson is the Mixed Practice. This problem set reviews previously taught concepts and prepares you for concepts that will be taught in later lessons. Solving these problems helps you remember skills and concepts for a long time.

Investigations are variations of the daily lesson that often involve activities. Investigations contain their own set of questions instead of a problem set.

Remember, solve every problem in every practice set, every problem set, and every investigation. Do not skip problems. With honest effort, you will experience success and true learning that will stay with you and serve you well in the future.

Stephen Hake
Temple City, California

PROGRAM COMPONENTS

Saxon Math 6/5—Homeschool consists of three components: 1) textbook, 2) Tests and Worksheets, and 3) Solutions Manual. **Before using the program, please ensure that you have each component.**

Textbook

The *Saxon Math 6/5—Homeschool* textbook is divided into 120 lessons and 12 investigations. The textbook also contains appendix topics that can be presented at the teacher's discretion, supplemental practice problems for remediation, an illustrated glossary, and a comprehensive index.

Tests and Worksheets

The *Saxon Math 6/5—Homeschool Tests and Worksheets* booklet provides all the worksheets and tests needed by one student to complete the program. It also contains the following recording forms for students to show their work and for parents to track student progress:

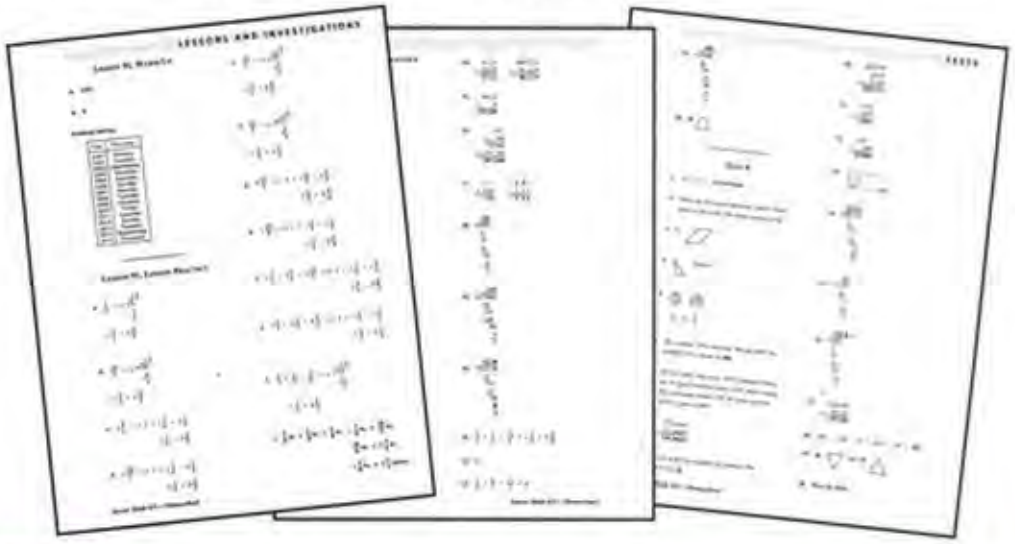
- Recording Form A: Facts Practice
- Recording Form B: Lesson Worksheet
- Recording Form C: Mixed Practice Solutions
- Recording Form D: Scorecard
- Recording Form E: Test Solutions

Directions for using the recording forms are provided in the Program Overview (below), as well as in the introduction to the Tests and Worksheets booklet.

Note: The recording forms are blackline masters that should be photocopied, as they may be used more than once.

Solutions Manual

The *Saxon Math 6/5—Homeschool Solutions Manual* contains step-by-step solutions to all textbook and test exercises.



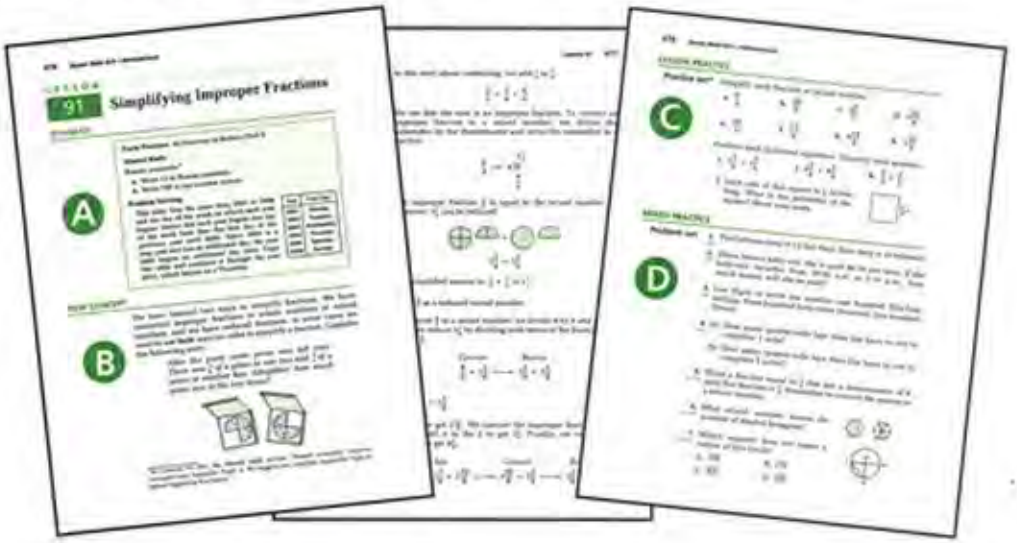
PROGRAM OVERVIEW

Saxon Math 6/5—Homeschool contains three types of math "sessions": lessons, investigations, and tests. Concepts are introduced and reviewed in a carefully planned sequence. **It is therefore crucial to complete all the lessons and investigations in *Saxon Math 6/5—Homeschool* in the given order.** If lessons are skipped or presented out of sequence, students will encounter problems on the tests and in the problem sets that they might not be equipped to solve.

By completing one lesson, investigation, or test per day, you can finish the entire program in thirty-one or thirty-two weeks. However, faster or slower paces may be appropriate, depending on students' individual learning styles.

Lessons

Each of the program's 120 lessons is divided into four sections: Warm-Up, New Concept(s), Lesson Practice, and Mixed Practice. Below we show a lesson from the textbook.



A Warm-Up (10–15 minutes)

The Warm-Up promotes mental math and problem-solving skills and sets the tone for the day's instruction. It consists of three activities:

Facts Practice: Begin the Warm-Up with the suggested Facts Practice Test (found in the Tests and Worksheets). Facts Practice covers content students should be able to recall immediately or to calculate quickly. Have your student write his or her answers directly on the test. Make Facts Practice an event by timing the exercise—emphasizing speed helps automate the recall of basic facts. Because each test is encountered multiple times, encourage your student to improve upon previous timed performances. *The time limit for Facts Practice should be five minutes or less.* After the test, quickly read aloud the answers from the Solutions Manual as your student checks his or her answers. If desired, Facts Practice scores and times can be tracked on Recording Form A (from the Tests and Worksheets) or in a math notebook. The time invested in Facts Practice is repaid in students' ability to work more quickly.

Mental Math: Follow Facts Practice with Mental Math. Read the problems aloud while your student follows along. Have your student perform the calculations mentally and write the answers on a copy of Recording Form B or on blank paper. (*Note:* Students should **not** use pencil and paper to perform the calculations.) Mental math ability pays lifelong benefits and improves markedly with practice. *Complete the Mental Math activity in two to three minutes.* Mental Math answers are provided in the Solutions Manual.

Problem Solving: Finish the Warm-Up with the daily Problem Solving exercise. Problem Solving promotes critical-thinking skills and offers opportunities for students to use such strategies as drawing diagrams and pictures, making lists, acting out situations, and working backward. If the Problem Solving exercise presents difficulties for your student, you are encouraged to suggest strategies for tackling the problem, referring to the Solutions Manual as necessary. Students may write their answers on Recording Form B and check off the strategies they used in solving the exercise. *Most Problem Solving exercises can be solved in a few minutes.*

Note: In the Warm-Up to Lesson 118, Facts Practice, Mental Math, and Problem Solving are replaced with a symmetry activity.

B New Concept(s) (5–15 minutes for most lessons)

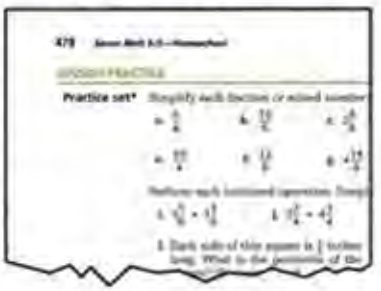
After completing the Warm-Up, present the New Concept(s). In this section you will find the new instructional increment as well as example problems to work through with your student. Important vocabulary terms are highlighted in color, and each of these terms is defined in the textbook's glossary. It is recommended that you read through the New Concept(s) before presenting a lesson to become familiar with the content. Because students learn most effectively by actually working math problems, keep the presentation of the New Concept(s) brief. This will maximize the time your student has to solve problems in the Lesson Practice and Mixed Practice problem sets (which are described in the next sections).

Some lessons involve activities that require the use of household items. Refer to page xxi for a list of necessary materials and the lessons in which they are used. Certain lessons also call for students to use Activity Sheets (see example at right). Activity Sheets are referenced in the textbook and can be found in the Tests and Worksheets booklet.

C Lesson Practice (5–10 minutes)

The Lesson Practice provides practice on the New Concept. Closely monitor student work on the Lesson Practice problems, providing immediate feedback as appropriate. Have your student solve **all** the problems in the Lesson Practice before proceeding to the next section of the lesson. Answers may be written on Recording Form B or on blank paper. If your student has difficulty with the Lesson Practice, you may wish to reteach the relevant examples in the New Concept section in order to identify the particular aspect of the concept that is causing problems.

Some Lesson Practice sets are marked with an asterisk (see example at right). An asterisk indicates that additional problems on the lesson's concept appear in the Supplemental Practice section of the textbook's appendix. Supplemental Practice problems are intended for remediation. Assign your student these problems only if he or she has difficulty with a concept several lessons after it is presented.



D Mixed Practice (20–40 minutes)

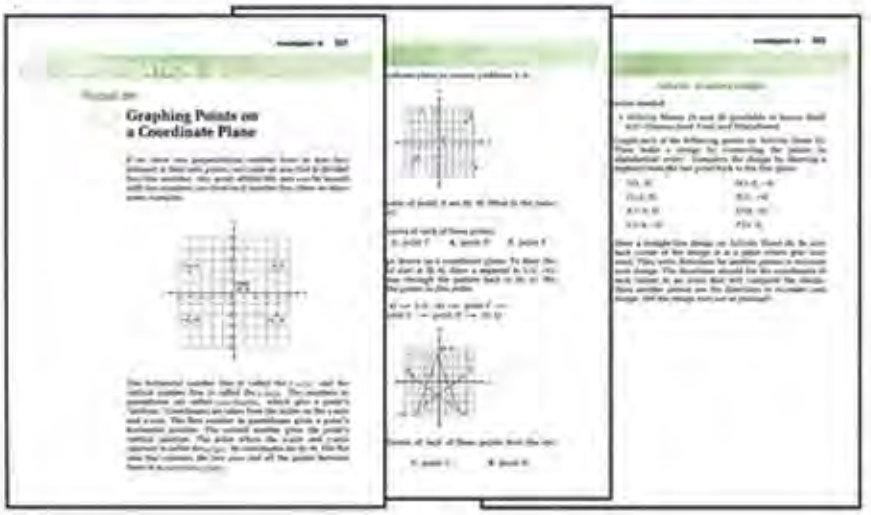
The Mixed Practice is the fourth and most important component of the lesson. This section contains twenty-five to thirty problems that prepare students for upcoming lessons, allow them to work with several strands of mathematics concurrently, and provide them with the distributed practice that promotes long-term retention of concepts. **Have your student work independently on the Mixed Practice, and ensure that no problem is skipped.** Students may show their work on a copy of Recording Form C or on blank paper.

If your student encounters difficulty with Mixed Practice problems, have him or her refer to the Lesson Reference Numbers that appear in parentheses below each problem number. Lesson Reference Numbers indicate which lessons explain concepts relevant to the problems they label. Because many problems involve multiple concepts, more than one reference number might be given for a problem.

At the end of the math period, check your student's work, referring to the Solutions Manual as necessary. If there are incorrect answers, help your student identify which solution steps led to the errors. Then have the student rework the problems to achieve the correct answers. If desired, track the completion of your student's daily assignments on Recording Form D.

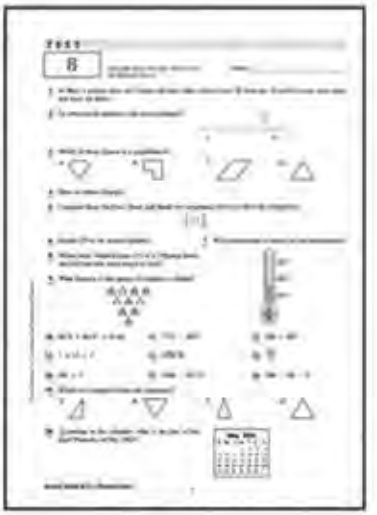
Investigations

Following every tenth lesson is an investigation. Investigations are in-depth treatments of concepts that often involve activities. Because of the length of investigations, no Warm-Up or Mixed Practice is included. As with lessons, investigations might call for students to use Activity Sheets, which can be found in the Tests and Worksheets booklet.



Tests

Twenty-three cumulative tests are provided in *Saxon Math 6/5—Homeschool.* The problems on the tests are similar to those in the textbook, and the tests are scheduled so that students have about five days to practice concepts before being assessed on them. For detailed information regarding when to give each test, refer to the Testing Schedule in the Tests and Worksheets booklet.



Begin each test day with Facts Practice. The appropriate Facts Practice Test is specified at the top of the scheduled cumulative test (see example at right). After the Facts Practice, administer the cumulative test. Have your student show his or her work and record his or her answers on a copy of Recording Form E. The textbook should not be used during the test.

After the test, compare each student answer to the one given in the Solutions Manual. Note any incorrect answers, and review the test with your student. Determine whether errors were caused by computational mistakes or conceptual misunderstandings. If necessary, stress to your student that computational errors can be prevented by writing neatly and by checking the work. If he or she misunderstands a concept, be sure to address the misunderstanding promptly. Work through textbook examples that demonstrate the concept (identify the appropriate lesson by referring to the Lesson Reference Numbers on the test), and assign additional practice problems for the student to solve. (Check for additional practice problems in the textbook's appendix.)

LESSON

1 Sequences • Digits

WARM-UP

Facts Practice: 100 Addition Facts (Test A)†

Mental Math: Count by tens from 10 to 100. Count by hundreds from 100 to 1000.

a. 3 + 3	b. 30 + 30	c. 300 + 300
d. 40 + 50	e. 200 + 600	f. 50 + 50
g. 20 + 20 + 20	h. 500 + 500 + 500	

Problem Solving:

The counting numbers are 1, 2, 3, 4, and so on. How many one-digit counting numbers are there?

NEW CONCEPTS

Sequences

Counting is a math skill that we learn early in life. Counting by ones, we say the numbers

1, 2, 3, 4, 5, 6, ...

These numbers are called counting numbers. We can also count by a number other than one. Below we show the first five numbers for counting by twos and the first five numbers for counting by fives.

2, 4, 6, 8, 10, ...

5, 10, 15, 20, 25, ...

An ordered list of numbers forms a sequence. Each member of the sequence is a term. The three dots mean that the sequence continues even though the numbers are not written. We can study a sequence to discover its counting pattern, or rule. The rule can be used to find more terms in the sequence.

Example 1 What are the next three terms in this counting sequence?

3, 6, 9, 12, _____, _____, _____, ...

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

Solution The pattern is "Count up by threes." To find the next three terms, we may count up by threes, or we may count up by ones and emphasize every third term (one, two, *three*, four, five, *six*, ...). Either way, we find that the next three terms are **15, 18,** and **21.**

Example 2 Describe the rule for this counting sequence. What is the next term in the sequence?

56, 49, 42, _____, ...

Solution This sequence counts down. We find that the rule for this sequence is **"Count down by sevens."** Counting down by seven from 42 gives us **35.**

Digits There are ten digits in our number system. They are 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. The number 385 has three digits, and the last digit is 5. The number 148,567,896,094 has twelve digits, and the last digit is 4.

Example 3 The number 186,000 has how many digits?

Solution The number 186,000 has **six digits.**

Example 4 What is the last digit of 26,348?

Solution The number 26,348 has five digits. The last digit is **8.**

LESSON PRACTICE

Practice set Describe the rule for each counting sequence. Then write the next three terms in the sequence.

a. 6, 8, 10, _____, _____, _____, ...

b. 7, 14, 21, _____, _____, _____, ...

c. 4, 8, 12, _____, _____, _____, ...

d. 21, 18, 15, _____, _____, _____, ...

e. 45, 40, 35, _____, _____, _____, ...

f. 12, 18, 24, _____, _____, _____, ...

How many digits are in each of these numbers?

g. 36,756 **h.** 8002 **i.** 1,287,495

What is the last digit of each of these numbers?

j. 17 **k.** 3586 **l.** 654,321

MIXED PRACTICE

Problem set Write the next term in each counting sequence:

1. 10, 15, 20, _____, ... **2.** 56, 49, 42, _____, ...

3. 8, 16, 24, _____, ... **4.** 18, 27, 36, 45, _____, ...

5. 24, 21, 18, _____, ... **6.** 32, 28, 24, 20, _____, ...

Write the missing term in each counting sequence:

7. 7, 14, _____, 28, 35, ... **8.** 40, _____, 30, 25, 20, ...

9. 20, _____, 28, 32, 36, ... **10.** 24, 32, _____, 48, ...

11. _____, 36, 30, 24, ... **12.** 21, 28, _____, 42, ...

Describe the rule for each counting sequence, and write the next three terms:

13. 3, 6, 9, 12, _____, _____, _____, ...

14. 8, 16, 24, _____, _____, _____, ...

15. 6, 12, 18, _____, _____, _____, ...

16. 40, 35, 30, _____, _____, _____, ...

17. 18, 21, 24, _____, _____, _____, ...

18. 9, 18, 27, _____, _____, _____, ...

19. What word names an ordered list of numbers?

How many digits are in each number?

20. 186,000 **21.** 73,842 **22.** 30,004,091

What is the last digit of each number?

23. 26,348 **24.** 347 **25.** 9,675,420

LESSON

12 Lines • Number Lines • Tally Marks

WARM-UP

Facts Practice: 100 Subtraction Facts (Test B)

Mental Math: Count up and down by 25's between 0 and 300.
Count up and down by 50's between 0 and 500.

a. 6500 + 500	b. 1000 − 500	c. 75 + 75
d. 750 + 750	e. 460 − 400	f. 380 − 180
g. 20 + 30 − 5	h. 16 − 8 + 4 − 2 + 1	

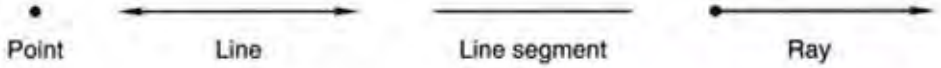
Problem Solving:

Lance, Molly, and José lined up side by side for a picture. Then they changed their order. Then they changed their order again. List all the possible side-by-side arrangements Lance, Molly, and José could make.

NEW CONCEPTS

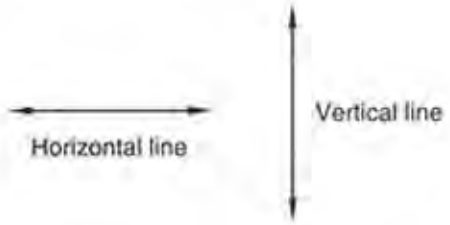
Lines

In mathematics we study numbers. We also study shapes such as circles, squares, and triangles. The study of shapes is called **geometry.** The simplest figures in geometry are the **point** and the **line.** A line does not end. Part of a line is called a **line segment** or just a *segment.* A line segment has two endpoints. A **ray** (sometimes called a *half line*) begins at a point and continues without end. Here we illustrate a point, a line, a segment, and a ray. The arrowheads on the line and the ray show the directions in which those figures continue without end.



Lines, rays, and segments can be **horizontal, vertical,** or **oblique.** The term *horizontal* comes from the word *horizon.* When we look into the distance, the horizon is the line where the earth and sky seem to meet. A horizontal line is level with

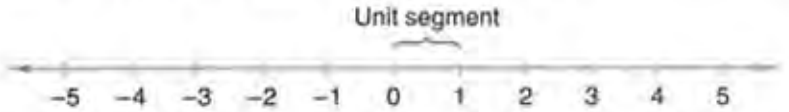
the horizon, extending left and right. A vertical line extends up and down.



A line or segment that is neither horizontal nor vertical is oblique. An oblique line appears to be slanted.

Oblique lines

Number lines By carefully marking and numbering a line, we can make a number line. **A number line shows numbers at a certain distance from zero.** On the following number line, the distance from 0 to 1 is a segment of a certain length, which we call a *unit segment*. The distance from 0 to 5 is five unit segments. The arrowheads show that the number line continues in both directions. Numbers to the left of zero are called **negative numbers.** We read the minus sign by saying "negative," so we read –3 as "negative three." The small marks above each number are **tick marks.**



The numbers shown on the number line above are called **integers.** Integers include all the counting numbers, the negatives of all the counting numbers, and the number zero.

Example 1 This sequence counts down by ones. Write the next six numbers in the sequence, and say the numbers aloud.

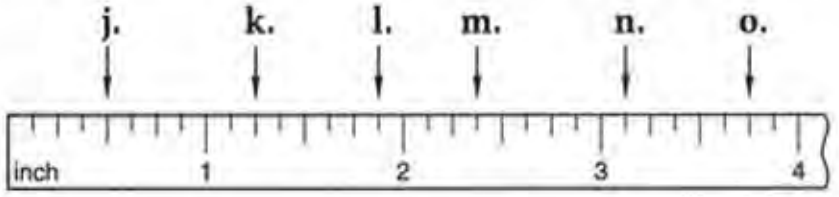
5, 4, 3, ...

Solution The next six numbers in the sequence are

2, 1, 0, –1, –2, –3

We read these numbers as "two, one, zero, negative one, negative two, negative three."

For problems **j–o,** name the mark on the ruler to which each arrow is pointing.



Use an inch ruler to measure each segment to the nearest eighth of an inch.

p. _____

q. _____

r. _____

s. Is $6\frac{1}{8}$ inches closer to 6 inches or 7 inches?

t. Round $5\frac{7}{8}$ inches to the nearest inch.

MIXED PRACTICE

Problem set

1. (32) Draw a quadrilateral that has four right angles.

2. (13) In her pocket Sallie has 3 pennies, 2 nickels, a dime, 3 quarters, and a half dollar. How much money is in Sallie's pocket?

For problems 3–5, write an equation and find the answer.

3. (21) One hundred thirty-eight children climbed on three buses to go to the zoo. If the same number of children were on each bus, how many children were on each bus?

4. (44) The distance across a nickel is about 2 centimeters. Two centimeters is how many millimeters?

5. (35) How many years were there from 1776 to 1976?

6. (40) Three friends want to share five oranges equally. How many oranges should each friend receive?

23. (75) The multiplication $3 \times \frac{1}{2}$ means $\frac{1}{2} + \frac{1}{2} + \frac{1}{2}$. So $3 \times \frac{1}{2}$ equals what mixed number?

Use the information and the table below to answer problems 24 and 25.

Mr. and Mrs. Minick took their children, Samantha and Douglas, to a movie. Ticket prices are shown in the table.

Movie Ticket Prices

Adults	$9.00
Ages 9–12	$4.50
Under 9	$3.75

24. (11, Inv. 5) Samantha is 12 years old and Douglas is 8 years old. What is the total cost of all four tickets?

25. (23, Inv. 5) Before 5 p.m., adult tickets are half price. How much money would the Minicks save by going to the movie before 5 p.m. instead of after 5 p.m.?

26. (63) Which of these figures is an illustration of an object that "takes up space"?

A.  B.  C.  D. 

27. (62, 72) Estimate the area of a room that is 14 ft 2 in. long and 10 ft 3 in. wide.

28. (Inv. 8) The pie chart at right shows how a family's monthly expenses are divided.

(a) Which expense consumes about one third of the budget?

(b) About what fraction of the budget does food consume?

29. (45, 73) What is the perimeter of a rhombus with sides 2.4 centimeters long?

30. (78) Light travels about 186,000 miles in one second. Write that number in expanded notation using powers of 10.

We have shaded 2 whole circles and $\frac{1}{3}$ of a circle. Now we divide each whole circle into thirds and count the total number of thirds.

$$\frac{3}{3} + \frac{3}{3} + \frac{1}{3} = \frac{7}{3}$$

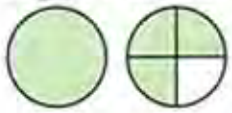
We see that seven thirds are shaded. So an improper fraction equal to $2\frac{1}{3}$ is $\frac{7}{3}$.

It is not necessary to draw a picture. We could remember that each whole is $\frac{3}{3}$. So the 2 of $2\frac{1}{3}$ is equal to $\frac{3}{3} + \frac{3}{3}$, which is $\frac{6}{3}$. Then we add $\frac{6}{3}$ to $\frac{1}{3}$ and get $\frac{7}{3}$.

LESSON PRACTICE

Practice set* For problems **a–c**, name the number of shaded circles as an improper fraction and as a mixed number.

a.



b.

c.

Change each mixed number to an improper fraction:

d. $4\frac{1}{2}$ **e.** $1\frac{2}{3}$ **f.** $2\frac{3}{4}$ **g.** $3\frac{1}{8}$

MIXED PRACTICE

Problem set

1. (50) On a five-day trip the Jansens drove 1400 miles. What was the average number of miles the Jansens drove on each of the five days?

2. (62) Estimate the product of 634 and 186 by rounding both numbers to the nearest hundred before multiplying.

3. (71, 79) (a) $\frac{1}{10} = \frac{\square}{100}$

   (b) What percent equals the fraction $\frac{1}{10}$?