

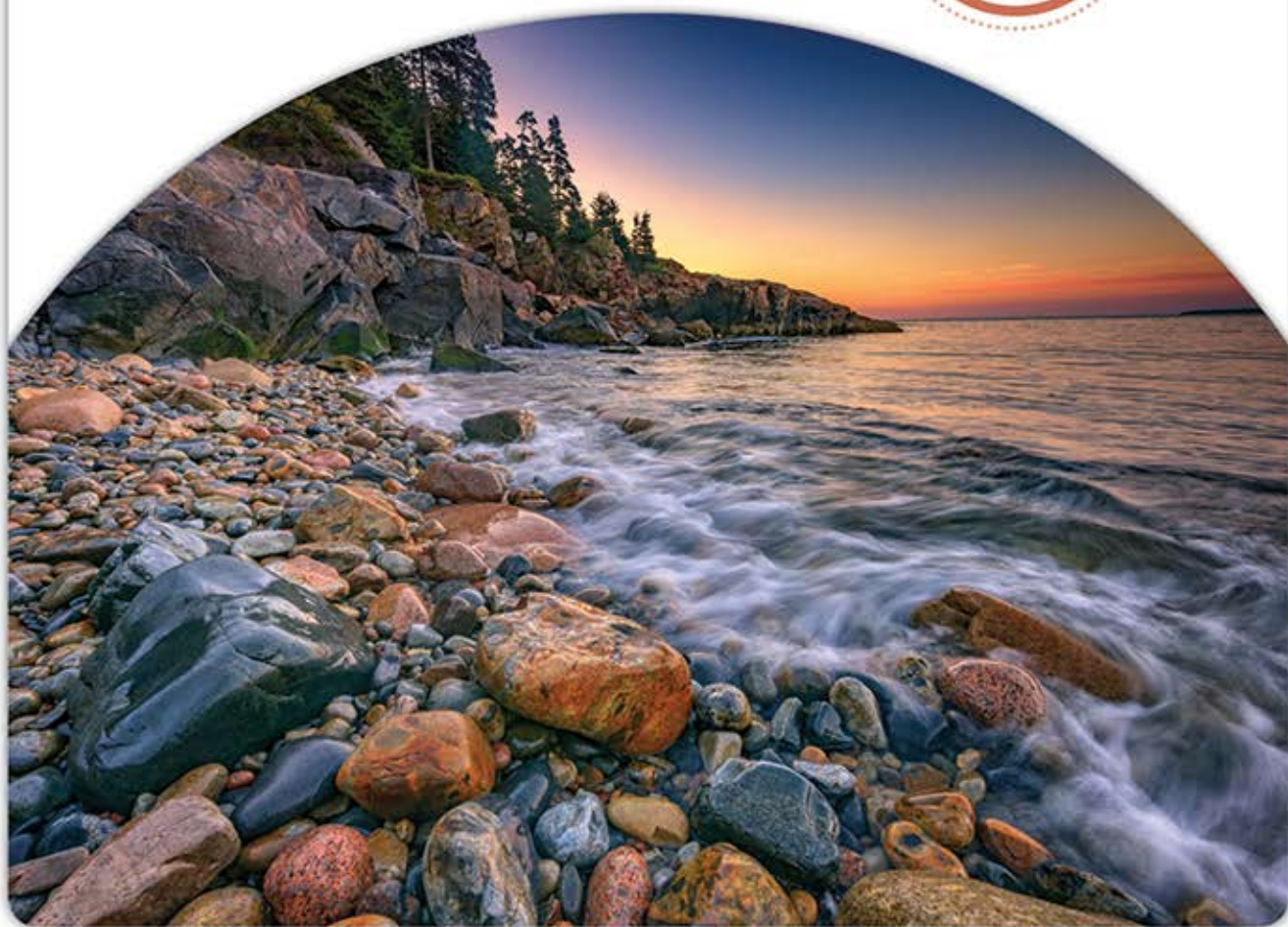
Teacher Edition

Revised Edition

Performance Coach[™] Mathematics



4



triumphlearning[™]

Coach[®]

Performance Coach[™]

CONTENTS

Triumph Learning and Today’s Classroom	iv
Program Implementation	vi
Student Experience	x
Teacher Experience	xii
ELL Strategies	xvi
Standards for Mathematical Practice	xviii
DOMAIN 1: OPERATIONS AND ALGEBRAIC THINKING	1
Lesson 1 Multiplication Equations	2
Lesson 2 Solving Problems with Multiplication and Division	4
Lesson 3 Multi-Step Word Problems	6
Lesson 4 Interpreting Remainders in Word Problems	8
Lesson 5 Factors and Multiples	10
Lesson 6 Number and Shape Patterns	12
DOMAIN 2: NUMBER AND OPERATIONS IN BASE TEN	15
Lesson 7 Understanding Place Value for Whole Numbers	16
Lesson 8 Comparing Whole Numbers	18
Lesson 9 Rounding Whole Numbers	20
Lesson 10 Adding and Subtracting Whole Numbers	22
Lesson 11 Multiplying Whole Numbers	24
Lesson 12 Dividing Whole Numbers	26
DOMAIN 3: NUMBER AND OPERATIONS—FRACTIONS	29
Lesson 13 Equivalent Fractions	30
Lesson 14 Comparing Fractions	32
Lesson 15 Adding and Subtracting Fractions	34
Lesson 16 Decomposing Fractions and Mixed Numbers	36
Lesson 17 Adding and Subtracting Mixed Numbers	38
Lesson 18 Solving Problems with Fractions	40
Lesson 19 Multiplying a Whole Number by a Fraction	42
Lesson 20 Solving Problems: Multiplying Whole Numbers by Fractions	44
Lesson 21 Adding Fractions with Denominators of 10 and 100	46

Lesson 22	Understanding Decimals	48
Lesson 23	Comparing Decimals	50
DOMAIN 4: MEASUREMENT AND DATA		53
Lesson 24	Units of Measure	54
Lesson 25	Converting Customary Units of Measure	56
Lesson 26	Converting Metric Units of Measure	58
Lesson 27	Solving Measurement Problems	60
Lesson 28	Perimeter and Area	62
Lesson 29	Line Plots	64
Lesson 30	Understanding Angles	66
Lesson 31	Measuring and Drawing Angles	68
Lesson 32	Adding and Subtracting Angle Measures	70
DOMAIN 5: GEOMETRY		73
Lesson 33	Drawing Figures	74
Lesson 34	Classifying Two-Dimensional Figures	76
Lesson 35	Lines of Symmetry	78
Appendix A: Answer Key		A1
Appendix B: Glossary		B1
Appendix C: Math Tools		C1
Appendix D: Mathematics Skills Correlations		D1

Adding and Subtracting Fractions

Student Edition pages 150–157

LESSON OVERVIEW

Objectives

Students will:

- Add and subtract fractions with like denominators by using fraction strips
- Add and subtract fractions with like denominators by using number lines

Discussion Questions

- MP7** Why must the denominators be the same when adding or subtracting fractions?
- MP2** When would the sum of two fractions with the same denominator have a sum of 1?
- MP1** How can a missing addend be found if the sum and the other addend are known?

Materials

- Math Tool: Fraction Strips, p. C10
- Math Tool: Number Lines, p. C8
- Math Tool: Fraction and Decimal Number Lines (blank), p. C12
- colored pencils
- construction paper

Differentiation

Lesson Support Help students prepare the number lines with the correct fraction labels for each tick mark before starting this lesson. The blank number lines can be used to model fifths and tenths.

Lesson Extension Have students find all the missing numbers in problem 5 and then prepare fraction strip models to demonstrate that their answer is correct.

1 GETTING THE IDEA

Lesson Opener

Review the meaning of *numerator* and *denominator*.

Discus how addition involves putting quantities together and subtraction involves taking quantities apart. Ask: *How is $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$ related to $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$?* (They belong to the same fact family.) *Using the idea of fact families, what do you think $\frac{3}{4} - \frac{2}{4}$ equals?* ($\frac{1}{4}$)

Tape 4 congruent pieces of rectangular construction paper on the board, end to end. Each piece of paper should be labeled with " $\frac{1}{4}$." Draw a frame around each piece of paper with chalk and label

each rectangle " $\frac{1}{4}$." Explain that this model shows one whole. Remove 2 pieces of paper. Ask: *What fraction do these two represent?* ($\frac{2}{4}$) Add a third piece of paper. Ask: *What addition equation could you write to represent this?* ($\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$) Now remove one of the three pieces of paper. Ask: *What subtraction equation could you write to represent what I did just now?* ($\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$) Students' answers will give you an opportunity to assess their understanding of the concepts needed to move successfully into adding and subtracting fractions.

▲ ELL Support The cognate for fraction in Spanish is *fracción* (noun).

The cognate for denominator in Spanish is *denominador* (noun).

The cognate for numerator in Spanish is *numerador* (noun).

► Examples 1 and 2

Have students use fraction strips to model the sum and the difference as you discuss the steps in these examples. Be sure that students understand that in Example 1, each shaded section represents $\frac{1}{5}$ and not 1. Otherwise, students may think that $\frac{1}{5} + \frac{3}{5} = 4$. Then discuss the steps in each example. Ask: *Why do you think we only add the numerators and not the denominators? Why do you think we only subtract the numerators and not the denominators?*

► Example 3

Have students use number lines to model the sum of these two fractions that have denominators of 10. Assist students in getting their blank number lines labeled correctly from 0 to 1. Work with students to make sure they correctly locate $\frac{3}{10}$ on the number line. Then use curved arrows to show how to add $\frac{2}{10}$. Draw a curved arrow from $\frac{3}{10}$ to $\frac{4}{10}$ while saying “ $\frac{1}{10}$.” Draw another curved arrow from $\frac{4}{10}$ to $\frac{5}{10}$ while saying “ $\frac{2}{10}$.” Then discuss the sum and write the equation beneath the number. Then ask: *How could you use your number line to find $\frac{5}{10} - \frac{2}{10}$?*

▲ Journal Prompt MP4 How does the denominator of the fractions being added or subtracted help you decide how to label your number line?

2 COACHED EXAMPLE

Provide students with fraction strips to help them understand the model for this problem. Ask: *What fraction should we model first in this problem? ($\frac{7}{8}$) How can you model this fraction by using fraction strips? (Show 7 eighths.) Have students shade 7 eighths on the student page. What number is being subtracted? ($\frac{3}{8}$) How can we show subtraction by using fraction strips? (Separate the strips into 3 eighths and 5 eighths.) Have students model this on the student page. How do we find the difference by using fraction strips? (Count the number of shaded sections on the part of the strip that remains after the 3 sections*

have been removed.) To extend this example, use a number line to solve the same problem as a class and have students show how to use a “fact family” to check their answer.

▲ Common Errors Students may subtract $\frac{3}{8}$ from $\frac{8}{8}$ since the fraction strip model shows $\frac{8}{8}$ before being shaded. Suggest that students shade $\frac{7}{8}$, making sure that the label $\frac{1}{8}$ is still visible on each section, and then cut their fraction strip into 8 parts. Have students take the 7 shaded eighths and separate 3 from that group, leaving 4 of the eighths.

For answers, see Appendix A.

3 LESSON PRACTICE

Problems 1–4 would be good problems for quickly checking students’ understanding of the concepts taught in this lesson. For problem 7, point out that to be greater than $\frac{1}{2}$, the numerator needs to be more than half of the denominator. For problem 9, suggest that students draw their own number line model

before analyzing the one given in the problem. Provide students with Math Tool: Fraction Strips for problem 5 if they need additional help.

For answers, see Appendix A.