7.1 Review of Basic Fraction Concepts

Objective To review fractions as parts of a whole (ONE), fractions on number lines, and uses of fractions.

1 Teaching the Lesson

Key Concepts and Skills
- Identify fractions as equal parts of a whole or the ONE and solve problems involving fractional parts of regions. [Number and Numeration Goal 2]
- Identify equivalent fractions and mixed numbers. [Number and Numeration Goal 5]
- Identify a triangle, hexagon, trapezoid, and rhombus. [Geometry Goal 2]
- Find fractions and mixed numbers on number lines. [Patterns, Functions, and Algebra Goal 1]

Key Activities
Students review the meaning and uses of fractions. They draw various pattern-block shapes and color a fractional part of each shape.

Ongoing Assessment: Recognizing Student Achievement
Use journal page 186. [Number and Numeration Goal 2]

Key Vocabulary
whole (or ONE or unit) ♦ mixed number ♦ denominator ♦ numerator ♦ "whole" box

Materials
Math Journal 2, pp. 185–187
Student Reference Book, p. 43
pattern blocks (optional) ♦ straightedge ♦ calculator ♦ slate

2 Ongoing Learning & Practice

Playing Product Pile-Up
Student Reference Book, p. 259
per group: 8 each of number cards 1–10 (from 2 Everything Math Decks, if available)
Students maintain automaticity with multiplication facts.

Math Boxes 7-1
Math Journal 2, p. 188
Students practice and maintain skills through Math Box problems.

Study Link 7-1
Math Masters, p. 203
Students practice and maintain skills through Study Link activities.

3 Differentiation Options

READINESS
Creating a Number-Line Model for Fractions
Math Masters, pp. 204 and 205
scissors ♦ tape
Students locate fractions on a number line.

ENRICHMENT
Constructing an Equilateral Triangle
Math Masters, p. 206
compass ♦ straightedge ♦ scissors ♦ crayons or colored pencils ♦ tape
Students construct an equilateral triangle using a compass and straightedge.

ENRICHMENT
Naming Fractional Parts of a Region
Geometry Template or pattern blocks ♦ crayons or colored pencils
Students make designs with pattern blocks and label each block as a fraction of the design.

ELL SUPPORT
Building a Math Word Bank
Differentiation Handbook, p. 140
Students add the terms numerator and denominator to their Math Word Banks.

Advance Preparation
Teacher’s Reference Manual, Grades 4–6 pp. 17, 18, 60–63
Getting Started

Mental Math and Reflexes
Have students name the next three multiples in a sequence.
Suggestions:

- 5, 10, 15, ... 20, 25, 30
- 8, 10, 12, ... 14, 16, 18
- 12, 15, 18, ... 21, 24, 27
- 16, 20, 24, ... 28, 32, 36
- 24, 30, 36, ... 42, 48, 54
- 9, 18, 27, ... 36, 45, 54

Math Message
List three ways that fractions are used outside of your math class.

1 Teaching the Lesson

Math Message Follow-Up
(Student Reference Book, p. 43)

Ask students to share their examples. Then have students read Student Reference Book, page 43 to find other uses of fractions.

Tell students that in this lesson they will review fractions as parts of wholes, measures, and counts.

Links to the Future
The use of fractions in rate and ratio comparisons is addressed in Unit 12 of Fourth Grade Everyday Mathematics.

Reviewing Fraction Ideas and Notation

Write several fractions on the board, and remind students of the following:

- A fraction is always a fraction of something—for example, $\frac{1}{2}$ of an orange or $\frac{3}{5}$ of a mile. This “something” is called the whole, or ONE; for measures and counts, it is the unit.
- The parts into which the whole is divided must be the same size—they must be “fair shares.”
- The common fraction notation is $\frac{a}{b}$, but fractions can also be written with a slash: $a/b$.
- Numbers such as $2\frac{1}{2}$ and $1\frac{3}{5}$ are called mixed numbers.
- The number below the fraction bar is called the denominator. It names the number of equal parts into which the whole is divided.
The number above the fraction bar is called the **numerator**. It names the number of parts under consideration. For example, if Sue ate \( \frac{2}{3} \) of a pizza, the pizza is the “whole.” The fraction \( \frac{2}{3} \) tells us that the pizza was divided into three equal parts, and Sue ate two of them.

To support English language learners, label the **numerator** and **denominator** of each fraction written on the board.

### Identifying Fractional Parts of Pattern-Block Shapes

*(Math Journal 2, pp. 185 and 186)*

Students use a straightedge to divide each shape on journal pages 185 and 186 into a specified number of equal parts and color a fraction of the shape.

Do Problem 1 with the class. Remind students that the whole (or ONE) is the hexagon. Call students’ attention to the “whole” box, which is used to write the name of the whole. As they work on Problems 2–7, students record the name of each item in the “whole” box. Have students complete Problem 8 independently.

**NOTE** You might ask students to identify a fraction that could describe the colored parts of the shapes in Problem 6 on journal page 186. \( \frac{3}{5} \) Repeat this procedure for Problem 7. \( \frac{5}{6} \) The term improper fraction is sometimes used to describe a fraction with a numerator that is greater than or equal to its denominator.

When students have finished, explain that it is sometimes useful to write fractions and mixed numbers as sums. This is called **decomposing** a fraction or mixed number. For example, \( \frac{4}{5} \) can be decomposed into the sum \( \frac{1}{5} + \frac{3}{5} \) or the sum \( \frac{2}{5} + \frac{2}{5} \).

Ask students to decompose each fraction or mixed number in Problems 5, 6, and 7 into a sum of fractions. Sample answers:

- **Problem 5:** \( \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6} \)
- **Problem 6:** \( \frac{3}{5} + \frac{2}{3} = \frac{15}{15} \)
- **Problem 7:** \( \frac{2}{3} + \frac{1}{3} + \frac{1}{3} = \frac{2}{3} \)

Pose additional fractions for students to decompose.

**Ongoing Assessment: Recognizing Student Achievement**

*Use journal page 186, Problem 8 to assess students’ understanding of fractions as equal parts of a whole. Students are making adequate progress if their responses note that Grace did not divide the hexagon into 3 equal parts. Some students’ responses may include correct ways to shade \( \frac{5}{6} \) of the hexagon.*
Identifying Fractional Parts of Number Lines
(Math Journal 2, p. 187)

In Problems 9–14 on journal page 187, students write fractions and mixed numbers for points on number lines. Number-line problems reinforce the concept that fractions and decimals can be used to name numbers between whole numbers.

Entering Fractions and Mixed Numbers on a Calculator
(Math Journal 2, p. 187)

Lead students through the appropriate steps to enter fractions and mixed numbers on their calculators.

To enter \( \frac{3}{4} \):
- On a TI-15, press 3 \( \frac{}{4} \).
- On a Casio \( fx-55 \), press 3 \( \frac{}{4} \).

To enter \( 4\frac{7}{8} \):
- On a TI-15, press 4 \( \frac{}{} \) 7 \( \frac{}{8} \).
- On a Casio \( fx-55 \), press 4 \( \frac{}{} \) 7 \( \frac{}{8} \).

Have students practice using their calculators to enter the fractions and mixed numbers on journal page 187.

Ongoing Learning & Practice

Playing Product Pile-Up
(Student Reference Book, p. 259)

Students play Product Pile-Up to maintain automaticity with multiplication facts. See Lesson 4-3 for additional information.

Math Boxes 7-1
(Math Journal 2, p. 188)

Mixed Practice Math Boxes in this lesson are paired with Math Boxes in Lesson 7-3. The skill in Problem 6 previews Unit 8 content.

Writing/Reasoning Have students write a response to the following: How did you determine whether the angle in Problem 2 was obtuse or acute? Sample answer: The measure of angle \( POL \) is greater than 90 degrees, so it is obtuse.

Lesson 7-1 573
**Study Link 7·1**  
*(Math Masters, p. 203)*

**Home Connection** Students identify fractional parts of shapes and number lines.

### 3 Differentiation Options

#### READINESS

**Creating a Number-Line Model for Fractions**  
*(Math Masters, pp. 204 and 205)*

To provide experience locating fractions on a number line, have students create a Fraction Number-Line Poster.

Students cut out the fraction strips on *Math Masters*, page 204. The top strip shows a number line from 0 to 1. It represents the whole, or the ONE. Have students tape it exactly over the strip on *Math Masters*, page 205.

Ask students to fold the “Halves” strip in half, make a mark where the crease meets the number line, and label it $\frac{1}{2}$. Have students tape it to the strip on *Math Masters*, page 205.

Ask students to fold, label, and tape the remaining strips. Have them choose how to fold and label the last strip.

For each strip, have students begin with their finger on the 0 and count each fractional part until they count to one. This way, they count the number of intervals, not the number of marks.

Discuss how the number-line model is different from the region and set models for fractions. Ask: *Can you think of places in the everyday world where fraction number lines are found?* Sample answers: Rulers and measuring cups

**NOTE** The Fraction Number-Line Poster is also used in the Readiness activity in Lesson 7-7.
**Lesson 7**

**Constructing an Equilateral Triangle** *(Math Masters, p. 206)*

To apply students’ understanding of fractions as equal parts of a whole, have them construct an equilateral triangle using a compass and straightedge. They cut out the triangle and divide it into six equal parts.

Possible strategy: Put two vertices together, and fold the triangle in half. Unfold it. Repeat the process twice, using a different pair of vertices each time.

**Naming Fractional Parts of a Region** *(Math Masters, p. 205)*

Art Link: To apply students’ understanding of the whole, have them use pattern blocks (hexagon, trapezoid, wide rhombus, and triangle) or the Geometry Template to draw and color a design (whole). Ask students to write the fraction of the design each shape represents. Students should compare their designs and note that the amount represented by a fraction depends on the whole, or the ONE.

For example:

![Fractional Parts of a Region](image)

**Building a Math Word Bank** *(Differentiation Handbook, p. 140)*

To provide language support for fractions, have students use the Word Bank Template found on *Differentiation Handbook*, page 140. Ask students to write the terms *numerator* and *denominator*, draw pictures relating to each term, and write other related words. See the *Differentiation Handbook* for more information.

**Enrichment Activity**

**Constructing an Equilateral Triangle**

1. Draw line segment $AB$.
2. Place the anchor of the compass on $A$ and the pencil on $B$. Without changing the compass opening, make an arc above the line segment.
3. Place the anchor on $B$. Keeping the same compass opening, make a second arc that crosses the first arc. Label the point where the two arcs cross as $C$.
4. Draw line segments $AC$ and $BC$.

Use your compass and straightedge to construct a very large equilateral triangle on a separate sheet of paper. Cut out your triangle. Divide it into 6 equal parts. Color 1/6 of it. Tape your triangle on the back of this sheet.