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 Activities

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

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 Vocabulary

whole (or ONE or unit) • mixed number • denominator • numerator • "whole" box

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

materials

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

2 Ongoing Learning & Practice

Students play *Product Pile-Up* to develop automaticity with multiplication facts.

Students practice and maintain skills through Math Boxes and Study Link activities.

materials

- ☐ *Math Journal 2,* p. 188
- ☐ *Student Reference Book,* p. 259
- ☐ Study Link Master (*Math Masters,* p. 203)
- ☐ per group: 8 each of number cards 1–10 (from 2 Everything Math Decks, if available)

3 Differentiation Options

READINESS

Students create a Fraction Number-Line Poster.

ENRICHMENT

Students construct equilateral triangles.

ENRICHMENT

Students make designs with pattern blocks and label each block as a fraction of the design.

ELL SUPPORT

Students add *numerator* and *denominator* to their Math Word Banks.

materials

- ☐ Teaching Masters (*Math Masters,* pp. 204–206)
- ☐ *Differentiation Handbook*
- ☐ pattern blocks, Geometry Template
- ☐ compass; straightedge; scissors; tape; crayons or colored pencils

Technology

Assessment Management System
Journal page 186, Problem 8
See the **iTLG.**

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

●●● 56, 48, 40, ... 32, 24, 16
54, 45, 36, ... 27, 18, 9
56, 49, 42, ... 35, 28, 21

Math Message

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

1 Teaching the Lesson

Math Message Follow-Up

SMALL-GROUP ACTIVITY

(*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

WHOLE-CLASS ACTIVITY

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.

Student Page

Fractions

Here are some other examples of uses of fractions:

- Study the recipe shown at the right. Many of the amounts listed in the recipe include fractions.

Jambalaya
- $\frac{3}{4}$ cup rice
- 4 ounces each of sausage and chicken
- 4 cups peppers
- $1\frac{1}{2}$ cups chopped onions
- $1\frac{1}{2}$ tablespoons chopped thyme
- $\frac{1}{8}$ teaspoon salt

- A movie critic gave the film *Finding Nemo* a rating of $3\frac{1}{2}$ stars (on a scale of 0 to 4 stars).

Finding Nemo

- This spinner has $\frac{1}{3}$ of the circle colored red, $\frac{1}{4}$ colored blue, and $\frac{5}{12}$ colored green.

If we spin the spinner many times, it will land on red about $\frac{1}{3}$ of the time. It will land on blue about $\frac{1}{4}$ of the time. And it will land on green about $\frac{5}{12}$ of the time.

The probability that the spinner will land on a color that is *not* green is $\frac{7}{12}$.

- If a map includes a **scale,** you can use the scale to estimate real-world distances. The scale on the map shown here is given as 1:10,000. This means that every distance on the map is $\frac{1}{10,000}$ of the real-world distance. A 1 centimeter distance on the map stands for a real-world distance of 10,000 centimeters (100 meters).

Lake Place, Rt 150 E., 2nd St., 3rd St., Rock Creek, Alexander Ave., Rock Rd., Mansfield Park, Scale 1:10,000, 100 m, 0, 1 cm

- Fractions are often used to describe clothing sizes. For example, women's shoes come in sizes 3, $3\frac{1}{2}$, 4, $4\frac{1}{2}$, and so on, up to 14.

Part of a size chart for women's shoes is shown at the right. It gives the recommended shoe size for women whose feet are between 9 and 10 inches long.

Size Chart for Women's Shoes

Heel-to-toe length (in.)	Size
$8\frac{15}{16}$ to $9\frac{1}{16}$	6
$9\frac{2}{16}$ to $9\frac{3}{16}$	$6\frac{1}{2}$
$9\frac{4}{16}$ to $9\frac{6}{16}$	7
$9\frac{7}{16}$ to $9\frac{9}{16}$	$7\frac{1}{2}$
$9\frac{10}{16}$ to $9\frac{11}{16}$	8
$9\frac{12}{16}$ to $9\frac{14}{16}$	$8\frac{1}{2}$
$9\frac{15}{16}$ to $10\frac{1}{16}$	9

***Student Reference Book,* p. 43**

Student Page

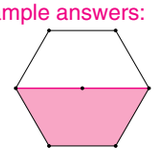
Date Time

LESSON 7•1 **Fraction Review**

Divide each shape into equal parts. Color a fraction of the parts. Write the name of the "whole" in the **"whole" box.**

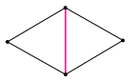
Sample answers:

1. Whole: hexagon



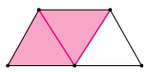
Divide the hexagon into 2 equal parts. Color $\frac{1}{2}$ of the hexagon.

2. Whole: rhombus



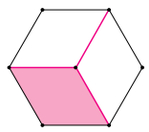
Divide the rhombus into 2 equal parts. Color $\frac{0}{2}$ of the rhombus.

3. Whole: trapezoid



Divide the trapezoid into 3 equal parts. Color $\frac{2}{3}$ of the trapezoid.

4. Whole: hexagon



Divide the hexagon into 3 equal parts. Color $\frac{1}{3}$ of the hexagon.

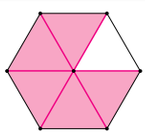
***Math Journal 2,* p. 185**

Student Page

Date Time

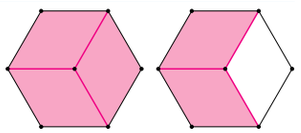
LESSON 7•1 **Fraction Review** *continued*

5. Whole: hexagon



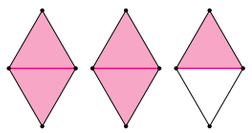
Divide the hexagon into 6 equal parts. Color $\frac{5}{6}$ of the hexagon.

6. Whole: hexagon



Divide each hexagon into thirds. Color $1\frac{2}{3}$ hexagons.

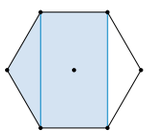
7. Whole: rhombus



Divide each rhombus into 2 equal parts. Color $2\frac{1}{2}$ rhombuses.

8. Grace was asked to color $\frac{2}{3}$ of a hexagon. This is what she did. What is wrong?

Sample answer: She did not divide the hexagon into 3 equal parts.



***Math Journal 2,* p. 186**

▷ 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

PARTNER ACTIVITY

(*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.

Adjusting the Activity

ELL

Encourage students to model the problems with pattern blocks.

AUDITORY • KINESTHETIC • TACTILE • VISUAL

Ongoing Assessment: Recognizing Student Achievement

Journal page 186 Problem 8

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 $\frac{2}{3}$ of the hexagon.

[Number and Numeration Goal 2]

Identifying Fractional Parts of Number Lines

PARTNER ACTIVITY

(*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.

Adjusting the Activity

ELL

Have students refer to their Fraction Number-Line Poster. See the optional Readiness activity in Part 3.

AUDITORY ◆ KINESTHETIC ◆ TACTILE ◆ VISUAL

Entering Fractions and Mixed Numbers on a Calculator

WHOLE-CLASS ACTIVITY

(*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 [n] 4 [d].
- On a Casio *fx*-55, press 3 [b/c] 4.

To enter $4\frac{7}{8}$:

- On a TI-15, press 4 [Unit] 7 [n] 8 [d].
- On a Casio *fx*-55, press 4 [a] 7 [b/c] 8.

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

2 Ongoing Learning & Practice

Playing *Product Pile-Up*

SMALL-GROUP ACTIVITY

(*Student Reference Book,* p. 259)

Students play *Product Pile-Up* to develop automaticity with multiplication facts. See Lesson 4-3 for additonal information.

Math Boxes 7•1

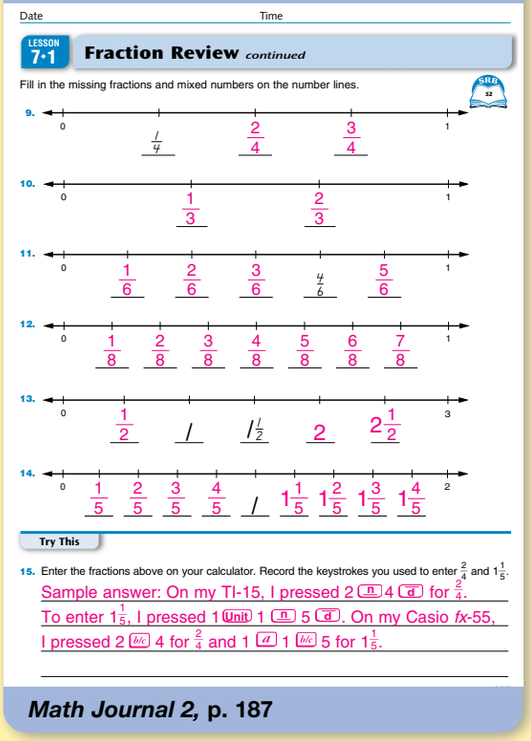
INDEPENDENT ACTIVITY

(*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.

Student Page



Date Time

LESSON 7•1 **Fraction Review** *continued*

Fill in the missing fractions and mixed numbers on the number lines.

9. 0, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$, 1

10. 0, $\frac{1}{3}$, $\frac{2}{3}$, 1

11. 0, $\frac{1}{6}$, $\frac{2}{6}$, $\frac{3}{6}$, $\frac{4}{6}$, $\frac{5}{6}$, 1

12. 0, $\frac{1}{8}$, $\frac{2}{8}$, $\frac{3}{8}$, $\frac{4}{8}$, $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, 1

13. 0, $\frac{1}{2}$, /, /, 2, $2\frac{1}{2}$, 3

14. 0, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, /, $1\frac{1}{5}$, $1\frac{2}{5}$, $1\frac{3}{5}$, $1\frac{4}{5}$, 2

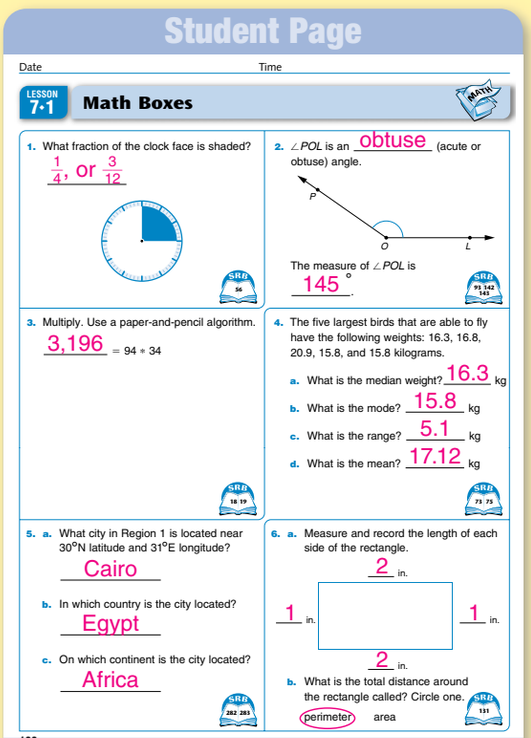
Try This

15. Enter the fractions above on your calculator. Record the keystrokes you used to enter $\frac{2}{4}$ and $1\frac{1}{5}$.

Sample answer: On my TI-15, I pressed 2 [n] 4 [d] for $\frac{2}{4}$. To enter $1\frac{1}{5}$, I pressed 1 [Unit] 1 [n] 5 [d]. On my Casio *fx*-55, I pressed 2 [b/c] 4 for $\frac{2}{4}$ and 1 [a] 1 [b/c] 5 for $1\frac{1}{5}$.

***Math Journal 2,* p. 187**

Student Page



Date Time

LESSON 7•1 **Math Boxes**

1. What fraction of the clock face is shaded? $\frac{1}{4}$, or $\frac{3}{12}$

2. $\angle POL$ is an obtuse (acute or obtuse) angle.

The measure of $\angle POL$ is 145°.

3. Multiply. Use a paper-and-pencil algorithm.

3,196 = 94 × 34

4. The five largest birds that are able to fly have the following weights: 16.3, 16.8, 20.9, 15.8, and 15.8 kilograms.

a. What is the median weight? 16.3 kg

b. What is the mode? 15.8 kg

c. What is the range? 5.1 kg

d. What is the mean? 17.12 kg

5. a. What city in Region 1 is located near 30°N latitude and 31°E longitude? Cairo

b. In which country is the city located? Egypt

c. On which continent is the city located? Africa

6. a. Measure and record the length of each side of the rectangle.

2 in., 1 in., 1 in., 2 in.

b. What is the total distance around the rectangle called? Circle one.

perimeter area

***Math Journal 2,* p. 188**

Study Link Master

Name Date Time

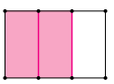
STUDY LINK 7•1 **Fractions**

1. Divide the circle into 6 equal parts. Color $\frac{5}{6}$ of the circle.

Whole
circle

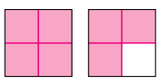
2. Divide the rectangle into 3 equal parts. Shade $\frac{2}{3}$ of the rectangle.

Whole
rectangle



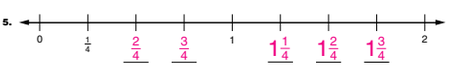
3. Divide each square into fourths. Color $1\frac{3}{4}$ of the squares.

Whole
square



Fill in the missing fractions and mixed numbers on the number lines.

4. 

5. 

Practice

6. 854 + 267 = 1,121
7. 6,033 = 3,398 + 2,635
8. 5,619 = 6,374 − 755
9. 5,947 − 3,972 = 1,975

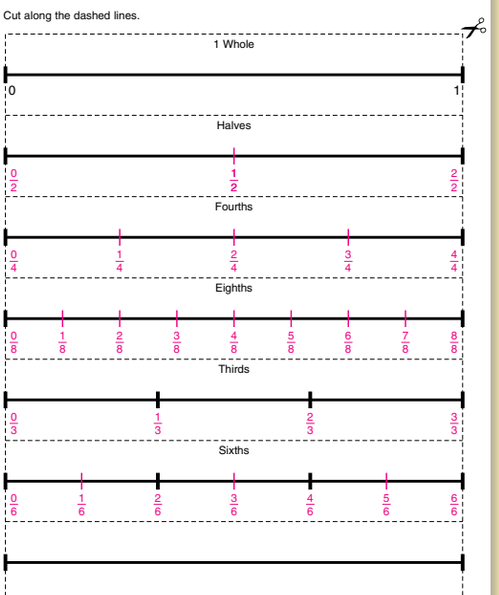
Math Masters, p. 203

Teaching Master

Name Date Time

LESSON 7•1 **Fraction Strips**

Cut along the dashed lines.



Math Masters, p. 204

Study Link 7•1

INDEPENDENT ACTIVITY

(*Math Masters,* p. 203)

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

3 Differentiation Options

READINESS

SMALL-GROUP ACTIVITY

15–30 Min

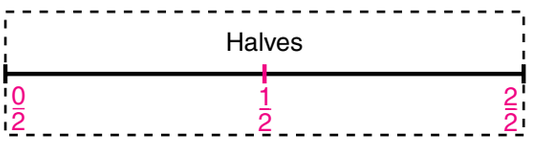
Creating a Number-Line Model for Fractions

(*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.



Number-line model for halves

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.

ENRICHMENT

INDEPENDENT ACTIVITY

5–15 Min

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.

ENRICHMENT

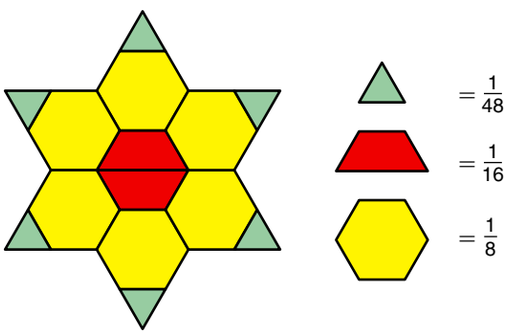
INDEPENDENT ACTIVITY

15–30 Min

Naming Fractional Parts of a Region

Portfolio Ideas

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:*



ELL SUPPORT

SMALL-GROUP ACTIVITY

5–15 Min

Building a Math Word Bank

(*Differentiation Handbook*)

To provide language support for fractions, have students use the Word Bank Template found in the *Differentiation Handbook.* 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.

Teaching Master

Name Date Time

LESSON 7•1 **Fraction Number-Line Poster**

1 Whole
Halves
Fourths
Eighths
Thirds
Sixths

Math Masters, p. 205

Teaching Master

Name Date Time

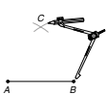
LESSON 7•1 **Constructing an Equilateral Triangle**

An **equilateral triangle** is a triangle in which all 3 sides are the same length. Here is one way to construct an equilateral triangle using a compass and straightedge.

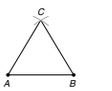
Step 1: Draw line segment *AB*.

Step 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.

Step 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*.



Step 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 $\frac{1}{6}$ of it. Tape your triangle on the back of this sheet.

Math Masters, p. 206