**LESSON 4-1**

# Applying GCF and LCM to Fraction Operations

*Practice and Problem Solving: A/B*

**Multiply. Use the greatest common factor to write each answer in simplest form.**

1. $\dfrac{2}{3} \cdot \dfrac{6}{7}$

2. $\dfrac{3}{4} \cdot \dfrac{2}{3}$

3. $\dfrac{8}{21} \cdot \dfrac{7}{10}$

_____

_____

_____

4. $24 \cdot \dfrac{5}{6}$

5. $32 \cdot \dfrac{3}{8}$

6. $21 \cdot \dfrac{3}{7}$

_____

_____

_____

**Add or subtract. Use the least common multiple as the denominator.**

7. $\dfrac{4}{15} + \dfrac{5}{6}$

8. $\dfrac{5}{12} - \dfrac{3}{20}$

9. $\dfrac{3}{5} + \dfrac{3}{20}$

_____

_____

_____

10. $\dfrac{5}{8} - \dfrac{5}{24}$

11. $3\dfrac{5}{12} + 1\dfrac{3}{8}$

12. $2\dfrac{9}{10} - 1\dfrac{7}{18}$

_____

_____

_____

**Solve.**

13. Louis spent 12 hours last week practicing guitar. If $\dfrac{1}{4}$ of the time was spent practicing chords, how much time did Louis spend practicing chords?

_____

14. Angie and her friends ate $\dfrac{3}{4}$ of a pizza. Her brother Joe ate $\dfrac{2}{3}$ of what was left. How much of the original pizza did Joe eat?

_____

# LESSON 4-1  Applying GCF and LCM to Fraction Operations

***Practice and Problem Solving: C***

**Multiply. Use the greatest common factor to write each answer in simplest form.**

1. $\dfrac{4}{9} \cdot \dfrac{3}{8}$

2. $\dfrac{7}{9} \cdot \dfrac{3}{14}$

3. $18 \cdot \dfrac{7}{9}$

_____   _____   _____

**Add or subtract. Use the least common multiple as the denominator.**

4. $\dfrac{7}{15} + \dfrac{5}{6}$

5. $1\dfrac{7}{12} - \dfrac{3}{20}$

6. $\dfrac{2}{5} + \dfrac{7}{20}$

_____   _____   _____

**Solve.**

7. A recipe calls for the following ingredients.

   3 c flour _____    $\dfrac{1}{2}$ t salt _____

   $\dfrac{3}{4}$ c sugar _____    4 c fruit _____

   2 T butter _____

   To make $\dfrac{2}{3}$ of the recipe, how much of each ingredient should you use? Write the revised amount on the line next to each ingredient.

8. Half of a pizza was broccoli and half was mushroom. George ate $\dfrac{2}{3}$ of the broccoli part and $\dfrac{1}{4}$ of the mushroom part. How much of the pizza did he eat?

   _____

9. What else could you call the least common multiple in an addition or subtraction problem involving fractions?

   _____

Name _____ Date _____ Class_____

# Applying GCF and LCM to Fraction Operations
## *Practice and Problem Solving: D*

**Multiply. Use the greatest common factor to write each answer in simplest form. The first one is done for you.**

1. $\dfrac{2}{3} \cdot \dfrac{3}{4}$

$$\dfrac{2}{3} \cdot \dfrac{3}{4} = \dfrac{6}{12} = \dfrac{1}{2}$$

2. $\dfrac{12}{15} \cdot \dfrac{3}{4}$

3. $24 \cdot \dfrac{5}{8}$

**Add or subtract. Use the least common multiple as the denominator. The first one is done for you.**

4. $\dfrac{11}{12} - \dfrac{3}{20}$

5. $\dfrac{3}{5} + \dfrac{9}{20}$

6. $\dfrac{11}{15} + \dfrac{2}{3}$

**Solve. The first one is done for you.**

7. Lyza used 24 ounces of spaghetti to make a recipe. If she wanted to make $\dfrac{1}{4}$ as much, how much spaghetti should she use?

$$\dfrac{1}{4} \cdot 24 = 6; \ 6 \text{ ounces}$$

8. Noah spent 25 hours working on his car. He spent $\dfrac{4}{5}$ of his time working on the transmission. How much time did Noah spend working on the transmission?

9. Miguel made lemonade. He mixed $\dfrac{1}{3}$ cup of lemon juice with $\dfrac{4}{9}$ cup of water. How much more water than lemon juice did Miguel use?

| LESSON | **Applying GCF and LCM to Fraction Operations** |
|--------|--------|
| **4-1** | *Reteach* |

**How to Multiply a Fraction by a Fraction**

$$\frac{2}{3} \cdot \frac{3}{8}$$

$\frac{2}{3} \cdot \frac{3}{8} = \frac{6}{\phantom{24}}$     Multiply numerators.

$\frac{2}{3} \cdot \frac{3}{8} = \frac{6}{24}$     Multiply denominators.

$\frac{6 \div 6}{24 \div 6} = \frac{1}{4}$     Divide by the greatest common factor (GCF).

The GCF of 6 and 24 is 6.

**How to Add or Subtract Fractions**

$$\frac{5}{6} + \frac{11}{15}$$

$\frac{25}{30} + \frac{22}{30}$     Rewrite over the least common multiple (LCM).

The least common multiple of 6 and 15 is 30.

$\frac{25}{30} + \frac{22}{30} = \frac{47}{30}$     Add the numerators.

$= 1\frac{17}{30}$     If the sum is an improper fraction, rewrite

it as a mixed number.

**Multiply. Use the greatest common factor.**

1. $\frac{3}{4} \cdot \frac{7}{9}$

2. $\frac{2}{7} \cdot \frac{7}{9}$

3. $\frac{7}{11} \cdot \frac{22}{28}$

_____

_____

_____

4. $8 \cdot \frac{3}{10}$

5. $\frac{4}{9} \cdot \frac{3}{4}$

6. $\frac{3}{7} \cdot \frac{2}{3}$

_____

_____

_____

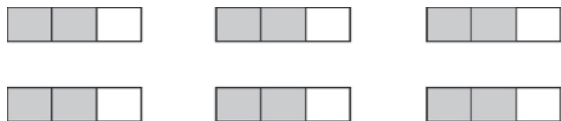**Add or subtract. Use the least common multiple.**

7. $\frac{7}{9} + \frac{5}{12}$

8. $\frac{21}{24} - \frac{3}{8}$

9. $\frac{11}{15} + \frac{7}{12}$

_____

_____

_____

Name _____ Date _____ Class_____

# Applying GCF and LCM to Fraction Operations
## *Reading Strategies: Use Graphic Aids*

You can find the answer to $6 \cdot \dfrac{2}{3}$ using fraction strips and multiplication.

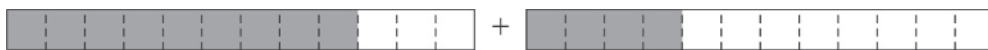$6 \cdot \dfrac{2}{3} = \dfrac{12}{3}$

1.  What fractional part of each fraction strip is shaded? _____

2.  How many of these fraction strips are there? _____

3.  Write a multiplication equation for this picture. _____

You can use fraction strips to find the least common multiple.

$\dfrac{3}{4} + \dfrac{1}{3}$

$+$

$\dfrac{3}{4} + \dfrac{1}{3} = \dfrac{9}{12} + \dfrac{4}{12}$

$+$

So, $\dfrac{3}{4} + \dfrac{1}{3} = \dfrac{13}{12} = 1\dfrac{1}{12}$.

**Find the products. Use the greatest common factor. Write each answer in simplest form.**

4.  $6 \cdot \dfrac{1}{9}$

5.  $3 \cdot \dfrac{5}{9}$

6.  $2 \cdot \dfrac{11}{14}$

_____    _____    _____

**Find the sums. Use the least common multiple. Write each answer in simplest form.**

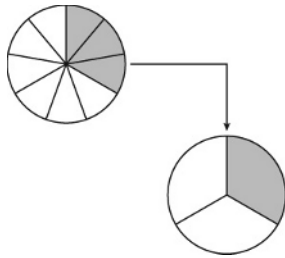7.  $\dfrac{1}{4} + \dfrac{5}{12}$

8.  $\dfrac{2}{9} + \dfrac{7}{12}$

9.  $\dfrac{9}{10} + \dfrac{1}{4}$

_____    _____    _____

**LESSON 4-1**

# Applying GCF and LCM to Fraction Operations

*Success for English Learners*

## Problem 1

$$\frac{3}{1} \cdot \frac{1}{9} = \frac{3}{9}$$

The GCF of 3 and 9 is 3.

$$\frac{3 \div 3}{9 \div 3} = \frac{1}{3}$$

## Problem 2

$$\frac{2}{4} + \frac{2}{3}$$

2 of **4 parts**

+

2 of **3 parts**

THINK:
What is the LCM
of 4 and 3?

$$\frac{2}{4} + \frac{2}{3} = \frac{6}{12} + \frac{8}{12} = \frac{14}{12}$$

+

The LCM
of 4 and
3 is 12.

$$\frac{2}{4} + \frac{2}{3} = \frac{14}{12} = \frac{7}{6}$$

1. Compare the steps you do to multiply fractions with the steps you do to add fractions.

   _____

   _____

   _____

2. How do the greatest common factor and the least common multiple help you when multiplying and adding or subtracting fractions?

   _____

   _____

**LESSON**
**4-2**

# Dividing Fractions

*Practice and Problem Solving: A/B*

**Find the reciprocal.**

1. $\dfrac{5}{7}$ _____

2. $\dfrac{3}{4}$ _____

3. $\dfrac{3}{5}$ _____

4. $\dfrac{1}{10}$ _____

5. $\dfrac{4}{9}$ _____

6. $\dfrac{13}{14}$ _____

7. $\dfrac{7}{12}$ _____

8. $\dfrac{3}{10}$ _____

9. $\dfrac{5}{8}$ _____

**Divide. Write each answer in simplest form.**

10. $\dfrac{5}{6} \div \dfrac{1}{2}$ _____

11. $\dfrac{7}{8} \div \dfrac{2}{3}$ _____

12. $\dfrac{9}{10} \div \dfrac{3}{4}$ _____

13. $\dfrac{3}{4} \div 9$ _____

14. $\dfrac{6}{9} \div \dfrac{6}{7}$ _____

15. $\dfrac{5}{6} \div \dfrac{3}{10}$ _____

16. $\dfrac{5}{6} \div \dfrac{3}{4}$ _____

17. $\dfrac{5}{8} \div \dfrac{3}{5}$ _____

18. $\dfrac{21}{32} \div \dfrac{7}{8}$ _____

**Solve.**

19. Mrs. Marks has $\dfrac{3}{4}$ pound of cheese to use making sandwiches.

She uses about $\dfrac{1}{32}$ pound of cheese on each sandwich. How many

sandwiches can she make with the cheese she has?

_____

20. In England, mass is measured in units called *stones*. One pound

equals $\dfrac{1}{14}$ of a stone. A cat weighs $\dfrac{3}{4}$ stone. How many pounds does

the cat weigh?

_____

21. Typographers measure font sizes in units called *points*. One point is

equal to $\dfrac{1}{72}$ inch. Esmeralda is typing a research paper on her

computer. She wants the text on the title page to be $\dfrac{1}{2}$ inch tall. What

font size should she use?

_____

Name _____  Date _____  Class_____

# Dividing Fractions

*Practice and Problem Solving: C*

**Find the reciprocal. Tell whether it is greater or less than 1.**

1. $\frac{3}{7}$

2. $\frac{3}{4}$

3. $\frac{8}{5}$

_____    _____    _____

4. $\frac{1}{11}$

5. $\frac{8}{9}$

6. $\frac{13}{4}$

_____    _____    _____

7. If a fraction is less than 1, what do you know about its reciprocal?

_____

8. If a fraction is greater than 1, what do you know about its reciprocal?

_____

9. What is the product of a number and its reciprocal? _____

**Divide. Write each answer in simplest form.**

10. $\frac{5}{6} \div \frac{2}{3}$ _____

11. $\frac{7}{8} \div \frac{3}{5}$ _____

12. $\frac{8}{9} \div \frac{2}{5}$ _____

13. $\frac{2}{3} \div \frac{4}{5}$ _____

14. $\frac{5}{7} \div \frac{7}{9}$ _____

15. $\frac{3}{5} \div \frac{9}{11}$ _____

**Answer each question.**

16. In problems 10–12, the dividend is greater than the divisor. What do you know about the quotients?

_____

17. In questions 13–15, the divisor is greater than the dividend. What do you know about the quotients?

_____

18. Jonathan has $1\frac{3}{4}$ hours to practice guitar. If he spends $\frac{1}{8}$ hour on each song, how many songs can Jonathan practice? For how many minutes does he practice each song?

_____

**LESSON**
**4-2**

# Dividing Fractions

*Practice and Problem Solving: D*

**Find the reciprocal. The first one is done for you.**

1. $\frac{2}{3}$ ___$\frac{3}{2}$___

2. $\frac{7}{9}$ _____

3. $\frac{8}{5}$ _____

4. $\frac{1}{9}$ _____

5. $\frac{9}{10}$ _____

6. $\frac{3}{10}$ _____

7. $\frac{4}{7}$ _____

8. $\frac{8}{1}$ _____

9. $\frac{6}{7}$ _____

**Divide. Write each answer in simplest form. The first one is done for you.**

10. $\frac{3}{4} \div \frac{1}{2}$

$\frac{3}{4} \cdot \frac{2}{1} = \frac{6}{4} = 1\frac{1}{2}$

11. $\frac{7}{10} \div \frac{2}{3}$

_____

12. $\frac{5}{6} \div \frac{3}{4}$

_____

13. $\frac{3}{10} \div \frac{5}{6}$

_____

14. $\frac{5}{9} \div \frac{5}{7}$

_____

15. $\frac{7}{10} \div \frac{5}{6}$

_____

16. $\frac{7}{8} \div \frac{3}{4}$

_____

17. $\frac{11}{12} \div \frac{2}{3}$

_____

18. $\frac{5}{7} \div \frac{10}{13}$

_____

**Solve. The first one has been started for you.**

19. Each package of dried fruit contains $\frac{3}{16}$ of a pound. Mr. Lopez has

    4 pounds of dried fruit. How many packages can he fill?

    $4 \div \frac{3}{16} = 4 \cdot$ _____ $= \frac{}{3}$ _____   _____ packages

20. One inch is $\frac{1}{12}$ of a foot. Eunice has a puppy that is $\frac{3}{4}$ of a foot tall.
    How many inches tall is her puppy?

    _____

21. One minute is $\frac{1}{60}$ of an hour. What part of an hour is 12 minutes?

    _____

| LESSON | **Dividing Fractions** |
|:---:|:---|
| **4-2** | *Reteach* |

Two numbers are reciprocals if their product is 1.

$\frac{2}{3}$ and $\frac{3}{2}$ are reciprocals because $\frac{2}{3} \cdot \frac{3}{2} = \frac{6}{6} = 1$.

Dividing by a number is the same as multiplying by its reciprocal.

$$\frac{1}{4} \div \frac{1}{2} = \frac{1}{2} \longrightarrow \frac{1}{4} \cdot \frac{2}{1} = \frac{1}{2}$$

So, you can use reciprocals to divide by fractions.

Find $\frac{2}{3} \div \frac{1}{4}$.

First, rewrite the expression as a multiplication expression.

Use the reciprocal of the divisor: $\frac{1}{4} \cdot \frac{4}{1} = 1$.

$$\frac{2}{3} \div \frac{1}{4} = \frac{2}{3} \cdot \frac{4}{1}$$
$$= \frac{8}{3}$$
$$= 2\frac{2}{3}$$

Think: 6 thirds is 2, and 2 of the 8 thirds are left over.

**Rewrite each division expression as a multiplication expression. Then find the value of the expression. Write each answer in simplest form.**

1. $\frac{1}{4} \div \frac{1}{3}$    2. $\frac{1}{2} \div \frac{1}{4}$    3. $\frac{3}{8} \div \frac{1}{2}$    4. $\frac{1}{3} \div \frac{3}{4}$

_____    _____    _____    _____

**Divide. Write each answer in simplest form.**

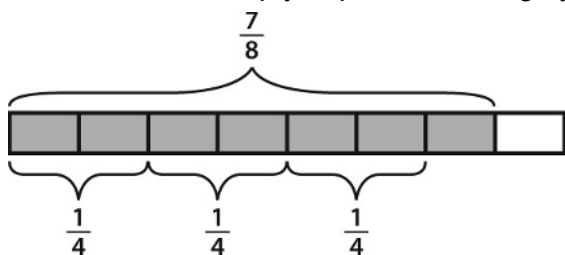5. $\frac{1}{5} \div \frac{1}{2}$    6. $\frac{1}{6} \div \frac{2}{3}$    7. $\frac{1}{8} \div \frac{2}{5}$    8. $\frac{1}{8} \div \frac{1}{2}$

_____    _____    _____    _____

**LESSON 4-2**

# Dividing Fractions

## *Reading Strategies: Use Models*

Bar models can help you picture dividing by fractions.



$\frac{7}{8}$

$\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$

What is $\frac{7}{8} \div \frac{1}{4}$? Think: How many one-fourths are in $\frac{7}{8}$?
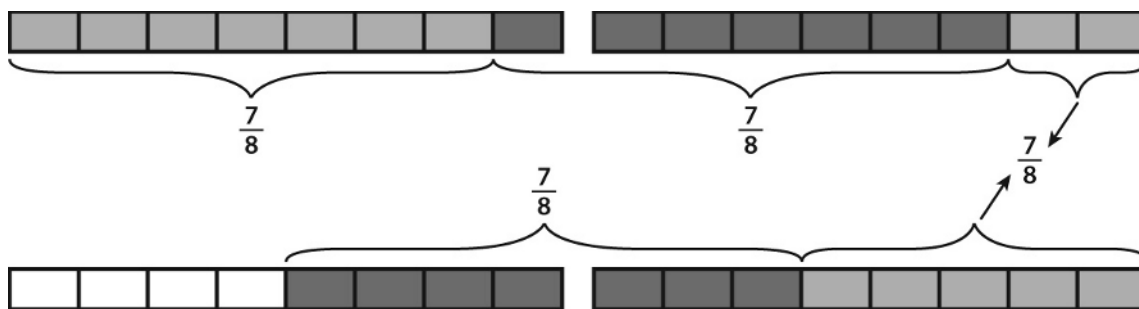
**Use the picture to answer each question.**

1. How many whole groups of $\frac{1}{4}$ are in $\frac{7}{8}$? _____

   What fraction of a group of $\frac{1}{4}$ is left? _____

2. $\frac{7}{8} \div \frac{1}{4}$ = _____

Instead of dividing, multiply by the reciprocal. Think: $\frac{7}{8}$ four times.



$\frac{7}{8}$   $\frac{7}{8}$   $\frac{7}{8}$

$\frac{7}{8}$

**Use the picture to answer each question.**

3. How many whole bars are shaded? _____

4. How many additional eighths of a bar are shaded? _____

   What is this fraction in simplest form? _____

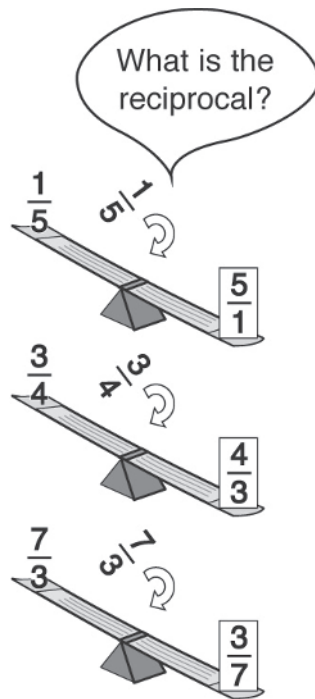5. All together, how many bars are shaded? _____

6. Compare the multiplication and division examples. What do you notice

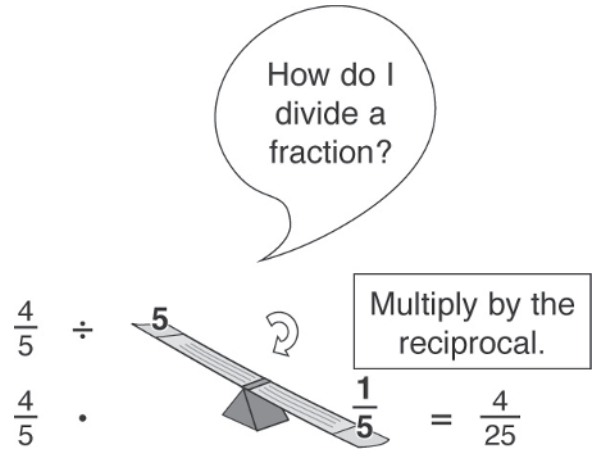   about the answer you get when you divide by $\frac{1}{4}$ or multiply by 4?

   _____

**LESSON 4-2**

# Dividing Fractions

***Success for English Learners***

## Problem 1

What is the reciprocal?

$\frac{1}{5}$  $\frac{1}{5}$  →  $\frac{5}{1}$

$\frac{3}{4}$  $\frac{3}{4}$  →  $\frac{4}{3}$

$\frac{7}{3}$  $\frac{7}{3}$  →  $\frac{3}{7}$

## Problem 2

How do I divide a fraction?

Multiply by the reciprocal.

$\frac{4}{5} \div 5$

$\frac{4}{5} \cdot \frac{1}{5} = \frac{4}{25}$

---

1. How do you find the reciprocal of a fraction?

   _____

   _____

2. Explain the steps you follow to divide $\frac{5}{8}$ by $\frac{1}{3}$.

   _____

   _____

3. You multiply any fraction times its reciprocal. What is the product?
   Give an example.

   _____

   _____

## LESSON 4-3  Dividing Mixed Numbers

### *Practice and Problem Solving: A/B*

**Find the reciprocal. Show that the product of the mixed number and its reciprocal is 1.**

1. $10\dfrac{1}{2}$

2. $6\dfrac{3}{7}$

3. $2\dfrac{8}{9}$

_____

_____

_____

4. $15\dfrac{1}{4}$

5. $9\dfrac{2}{3}$

6. $7\dfrac{5}{8}$

_____

_____

_____

**Divide. Write each answer in simplest form.**

7. $\dfrac{8}{10} \div 1\dfrac{5}{6}$

8. $2 \div 1\dfrac{6}{7}$

9. $3\dfrac{3}{5} \div 2\dfrac{1}{4}$

_____

_____

_____

10. $4\dfrac{1}{2} \div 2\dfrac{3}{8}$

11. $5\dfrac{5}{6} \div 3\dfrac{1}{6}$

12. $\dfrac{11}{12} \div 2\dfrac{5}{8}$

_____

_____

_____

13. $1\dfrac{9}{13} \div \dfrac{3}{8}$

14. $6\dfrac{4}{5} \div 3\dfrac{2}{9}$

15. $9\dfrac{2}{3} \div 6\dfrac{8}{9}$

_____

_____

_____

**Write each situation as a division problem. Then solve.**

16. A concrete patio is $5\dfrac{2}{3}$ feet wide. It has an area of $36\dfrac{5}{6}$ square feet.

    Is the concrete slab long enough to fit a 7-foot picnic table without placing the table along the diagonal of the patio? Explain.

    _____

17. The area of a mirror is 225 square inches, and its width is $13\dfrac{3}{4}$ inches.

    Will the mirror fit in a space that is 15 inches by 16 inches? Explain.

    _____

18. Barney has $16\dfrac{1}{5}$ yards of fabric. To make an elf costume, he needs

    $5\dfrac{2}{5}$ yards of fabric. How many costumes can Barney make?

    _____

**LESSON**
**4-3**

# Dividing Mixed Numbers

*Practice and Problem Solving: C*

**Solve.**

1. Vanessa buys a strip of 25 postage stamps. The strip of stamps is

   $21\frac{7}{8}$ inches long. How long is a strip after Vanessa uses 1 stamp?

   _____

2. Hasan has $18\frac{3}{4}$ yards of fabric. It takes $3\frac{1}{6}$ yards to make a

   pillowcase. Hasan plans to make as many pillowcases as he can.
   How many yards of fabric will be left over?

   _____

3. Takafumi is hiking on a path that is $5\frac{7}{8}$ miles long. There are

   6 markers evenly posted along the path. Takafumi arrives at the
   4th marker. How many miles has he hiked so far?

   _____

4. Yuki has a ribbon that is $11\frac{1}{4}$ feet long. She divides it into pieces that

   are each $1\frac{7}{8}$ feet long. She uses three pieces to make a bow. How

   many bows can she make in all?

   _____

5. Mrs. Lemke has $10\frac{2}{3}$ ounces of fertilizer for her plants. She plans to

   use $\frac{3}{4}$ ounce of fertilizer on each plant. After she puts fertilizer on as

   many plants as she can, how much fertilizer will be left over?

   _____

6. Gabriel has $15\frac{5}{8}$ pounds of clay. He will use $\frac{7}{10}$ pound to make each

   bowl. After making 8 bowls, Gabriel wonders how many more bowls he
   can make. How many more bowls can he make? Explain how you
   know.

   _____

   _____

   _____

**LESSON 4-3**

# Dividing Mixed Numbers

## *Practice and Problem Solving: D*

**Show how to write each mixed number as an improper fraction. Then find the reciprocal. The first one is done for you.**

1. $9\frac{1}{2}$

$$\frac{(9 \times 2) + 1}{2} = \frac{19}{2}$$

**The reciprocal is $\frac{2}{19}$.**

2. $5\frac{3}{7}$

3. $1\frac{8}{9}$

4. $14\frac{1}{4}$

5. $8\frac{2}{3}$

6. $6\frac{5}{8}$

**Divide. Write each answer in simplest form. The first one is done for you.**

7. $\frac{7}{10} \div 1\frac{2}{6}$

$$\frac{7}{10} \div \frac{8}{6} = \frac{7}{10} \times \frac{6}{8} = \frac{42}{80} = \frac{21}{40}$$

8. $2 \div 1\frac{5}{7}$

9. $4\frac{3}{5} \div 2\frac{2}{5}$

10. $\frac{11}{12} \div 1\frac{3}{4}$

**Write a division expression for each problem. Then solve. The first one is done for you.**

11. Larry has $9\frac{3}{5}$ yards of fabric. He will use $2\frac{2}{5}$ yards to make each vest. How many vests can Larry make?

$$9\frac{3}{5} \div 2\frac{2}{5} = \frac{48}{5} \div \frac{12}{5} = \frac{48}{5} \times \frac{5}{12} = \frac{48}{12} = 4$$ Larry can make __**4**__ vests.

12. A patio has an area of $20\frac{5}{6}$ ft², and the width is $3\frac{1}{2}$ feet. What is the length of the patio?

_____ The patio is _____ feet long.

LESSON
4-3

# Dividing Mixed Numbers
## *Reteach*

Two numbers are **reciprocals** if their product is 1.

$\frac{7}{3}$ and $\frac{3}{7}$ are reciprocals because $\frac{7}{3} \times \frac{3}{7} = 1$.

Write a mixed number as an improper fraction to find its reciprocal.

$2\frac{3}{4}$ and $\frac{4}{11}$ are reciprocals because $2\frac{3}{4} = \frac{11}{4}$ and $\frac{11}{4} \times \frac{4}{11} = 1$.

To find $2\frac{3}{4} \div 1\frac{3}{4}$, first rewrite the mixed numbers as improper fractions.

$\frac{11}{4} \div \frac{7}{4}$

Next, rewrite the expression as a multiplication expression and replace the divisor with its reciprocal.

$\frac{11}{4} \times \frac{4}{7}$

Solve. Write your answer in simplest form.

$2\frac{3}{4} \div 1\frac{3}{4} = \frac{11}{4} \div \frac{7}{4} = \frac{11}{4} \times \frac{4}{7} = \frac{11}{7} = 1\frac{4}{7}$

**Find the reciprocal.**

1. $\frac{9}{14}$

2. $3\frac{1}{2}$

3. $10\frac{2}{3}$

_____   _____   _____

**Complete the division. Write each answer in simplest form.**

4. $3\frac{3}{5} \div 2\frac{1}{4}$

$= \frac{18}{5} \div \frac{}{4}$

$= \frac{}{5} \times \frac{}{9}$

_____

5. $1\frac{1}{2} \div 1\frac{1}{4}$

$= \frac{3}{2} \div \frac{}{4}$

$= \frac{}{} \times \frac{}{}$

_____

6. $\frac{5}{12} \div 1\frac{7}{8}$

$= \frac{}{12} \div \frac{}{8}$

$= \frac{}{} \times \frac{}{}$

_____

7. $3\frac{1}{8} \div \frac{1}{2}$

_____

8. $1\frac{1}{6} \div 2\frac{2}{3}$

_____

9. $2 \div 1\frac{1}{5}$

_____

Name _____ Date _____ Class_____

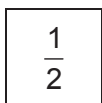# Dividing Mixed Numbers

### *Reading Strategies: Use a Model*

A model is useful for dividing mixed numbers.

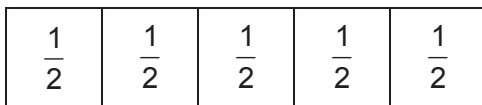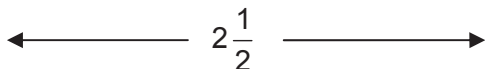The Smith family has a $2\frac{1}{2}$-foot-long sandwich to share. Each $\frac{1}{2}$-foot of the sandwich serves one person. How many $\frac{1}{2}$-foot servings are in this sandwich?
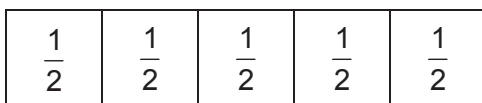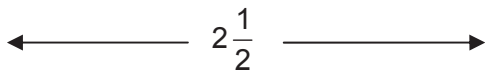
Find $2\frac{1}{2} \div \frac{1}{2}$.

**Step 1:** Draw a square and label it $\frac{1}{2}$.

$\boxed{\frac{1}{2}}$

**Step 2:** Draw a row of these squares until they add up to $2\frac{1}{2}$.

$\longleftarrow \quad 2\frac{1}{2} \quad \longrightarrow$

| $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ |
|---|---|---|---|---|

**Step 3:** Count the number of squares needed to reach $2\frac{1}{2}$.

$\longleftarrow \quad 2\frac{1}{2} \quad \longrightarrow$

| $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ | $\frac{1}{2}$ |
|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** |

1. How do you represent a single serving?

   _____

2. Why draw a row of servings until they add up to $2\frac{1}{2}$?

   _____

3. How many $\frac{1}{2}$-foot servings does the Smith family have?

   _____

4. What is $2\frac{1}{2} \div \frac{1}{2}$? _____

**LESSON 4-3**

# Dividing Mixed Numbers

*Success for English Learners*

## Problem 1

What is the reciprocal of $2\frac{3}{4}$?

Write the mixed number as an improper fraction.

$$2\frac{3}{4} = 2 + \frac{3}{4}$$
$$= \frac{8}{4} + \frac{3}{4}$$
$$= \frac{11}{4}$$

What is the reciprocal of $\frac{11}{4}$?

*Flip it!*
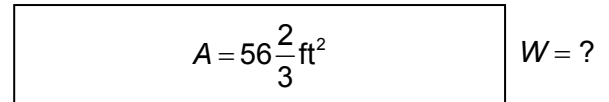
$$\frac{11}{4} \diagdown\diagup \frac{4}{11}$$

How can I tell this is right?

$$\frac{11}{4} \times \frac{4}{11} = \frac{44}{44} = 1$$

**Wow! The product is 1.**

## Problem 2

How wide is the rectangle?

| $A = 56\frac{2}{3}\text{ft}^2$ | $W = ?$ |

$l = 8\frac{1}{2}\text{ft}$

What is the area? $56\frac{2}{3}\text{ft}^2$

What is the length? $8\frac{1}{2}\text{ft}$

How can I find the width?

**Divide the area by the length.**

$$56\frac{2}{3} \div 8\frac{1}{2} = \frac{170}{3} \div \frac{17}{2}$$
$$= \frac{170}{3} \times \frac{2}{17}$$
$$= \frac{\overset{10}{\cancel{170}} \times 2}{3 \times \cancel{17}_1}$$
$$= \frac{20}{3} \text{ or } 6\frac{2}{3}$$

The width is $6\frac{2}{3}$ ft.

1. How is dividing mixed numbers different from multiplying mixed numbers?

   _____

   _____

2. What is the first step to divide mixed numbers?

   _____

3. Why would you expect the width of the rectangle to be about 7 ft?

   _____

   _____