

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

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

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

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

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

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

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

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

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

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

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

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

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

Solve.

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

14. Angie and her friends ate $\frac{3}{4}$ of a pizza. Her brother Joe ate $\frac{2}{3}$ 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. $\frac{4}{9} \cdot \frac{3}{8}$

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

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

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

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

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

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

Solve.

7. A recipe calls for the following ingredients.

3 c flour _____

 $\frac{1}{2}$ t salt _____ $\frac{3}{4}$ c sugar _____

4 c fruit _____

2 T butter _____

To make $\frac{2}{3}$ 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 $\frac{2}{3}$ of the broccoli part and $\frac{1}{4}$ 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?

LESSON

4-1

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

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

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

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

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

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

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

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

Solve. The first one is done for you.

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

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

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

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

LESSON**4-1****Applying GCF and LCM to Fraction Operations****Reteach****How to Multiply a Fraction by a Fraction**

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

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

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

$$\frac{6 \div 6}{24 \div 6} = \frac{1}{4}$$

Multiply numerators.

Multiply denominators.

Divide by the greatest common factor (GCF).

The GCF of 6 and 24 is 6.

How to Add or Subtract Fractions

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

$$\frac{25}{30} + \frac{22}{30}$$

$$\frac{25}{30} + \frac{22}{30} = \frac{47}{30}$$

$$= 1 \frac{17}{30}$$

Rewrite over the least common multiple (LCM).

The least common multiple of 6 and 15 is 30.

Add the numerators.

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

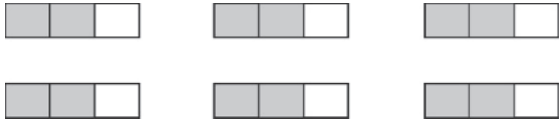
LESSON
4-1

Applying GCF and LCM to Fraction Operations

Reading Strategies: Use Graphic Aids

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

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



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.

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



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



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

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

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

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

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

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

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

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

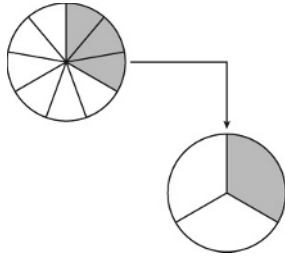
9. $\frac{9}{10} + \frac{1}{4}$

LESSON
4-1

Applying GCF and LCM to Fraction Operations

Success for English Learners

Problem 1



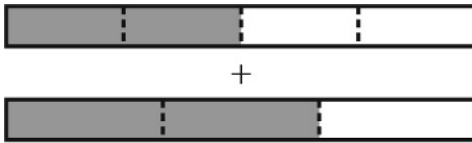
$$\frac{3}{1} \cdot \frac{1}{9} = \frac{3}{9}$$

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

The GCF of 3 and 9 is 3.

Problem 2

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

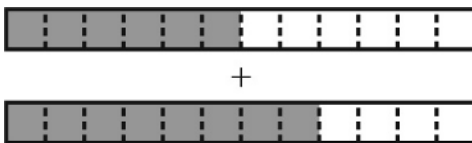


2 of 4 parts

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 take to multiply fractions to the steps you take to add fractions.

2. Explain how using the greatest common factor and the least common multiple helps you to multiply, and add or subtract fractions.

LESSON

4-2

Dividing Fractions

Practice and Problem Solving: A/B

Find the reciprocal.

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

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

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

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

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

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

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

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

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

Divide. Write each answer in simplest form.

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

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

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

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

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

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

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

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

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

Solve.

19. Mrs. Marks has $\frac{3}{4}$ pound of cheese to use making sandwiches.She uses about $\frac{1}{32}$ 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 $\frac{1}{14}$ of a stone. A cat weighs $\frac{3}{4}$ stone. How many pounds does the cat weigh?

21. Typographers measure font sizes in units called *points*. One point is equal to $\frac{1}{72}$ inch. Esmeralda is typing a research paper on her computer. She wants the text on the title page to be $\frac{1}{2}$ inch tall. What font size should she use?

LESSON
4-2**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. $\frac{2}{3} \div \frac{3}{2}$ _____

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?

$$4 \div \frac{3}{16} = 4 \cdot \frac{16}{3} = \frac{64}{3} = 21\frac{1}{3} \text{ packages}$$

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
4-2**Dividing Fractions****Reteach**

Two numbers are reciprocals if their product is 1.

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

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

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

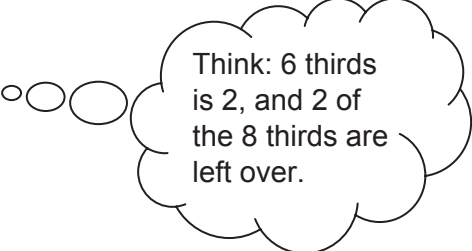
So, you can use reciprocals to divide by fractions.

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

First, rewrite the expression as a multiplication expression.

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

$$\begin{aligned} \frac{2}{3} \div \frac{1}{4} &= \frac{2}{3} \cdot \frac{4}{1} \\ &= \frac{8}{3} \\ &= 2\frac{2}{3} \end{aligned}$$



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

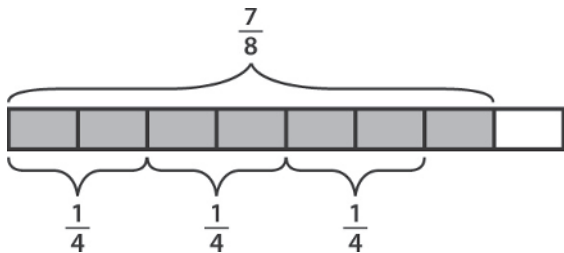
8. $\frac{1}{8} \div \frac{1}{2}$

LESSON
4-2

Dividing Fractions

Reading Strategies: Use Models

Bar models can help you picture dividing by fractions.



What is $\frac{7}{8} \div \frac{1}{4}$? Think: How many one-fourths are in $\frac{7}{8}$?

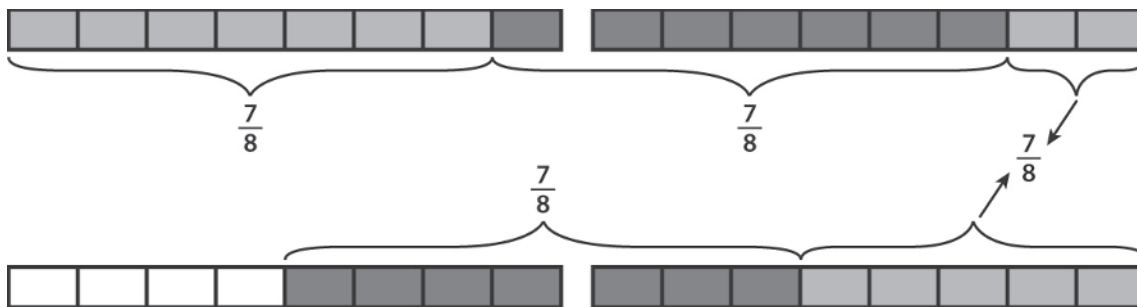
Use the picture to answer each question.

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.



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? _____

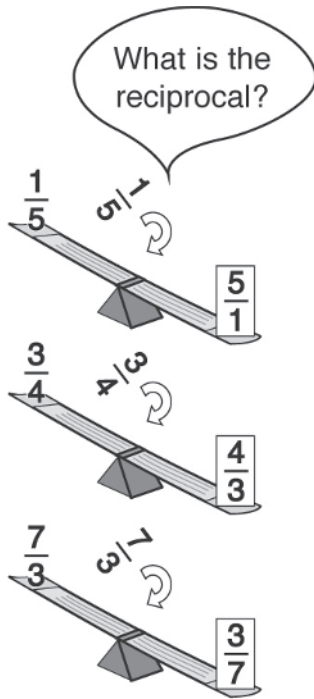
6. Compare the multiplication and division examples. What do you notice about the answer you get when you divide by $\frac{1}{4}$ or multiply by 4?

LESSON
4-2

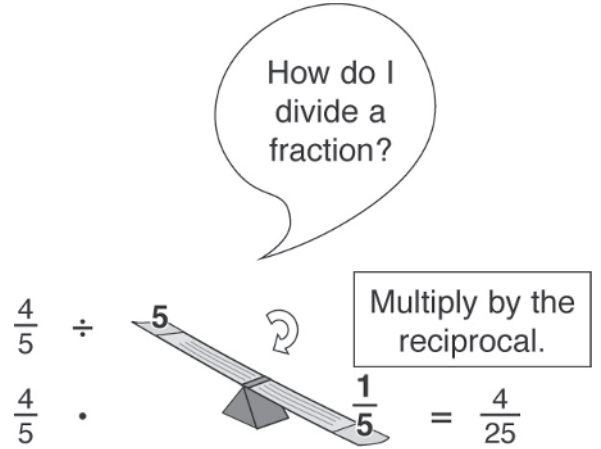
Dividing Fractions

Success for English Learners

Problem 1



Problem 2



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

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

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

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

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

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

Divide. Write each answer in simplest form.

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

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

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

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

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

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

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

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

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

Write each situation as a division problem. Then solve.

16. A concrete patio is $5\frac{2}{3}$ feet wide. It has an area of $36\frac{5}{6}$ 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 $13\frac{3}{4}$ inches.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

LESSON
4-3

Dividing Mixed Numbers

Reading Strategies: Use a Model

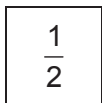
A model is useful for dividing mixed numbers.

The Smith family has a $2\frac{1}{2}$ -foot-long sandwich to share. Each

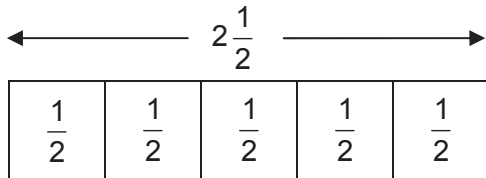
$\frac{1}{2}$ -foot of the sandwich serves one person. How many $\frac{1}{2}$ -foot servings are in this sandwich?

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

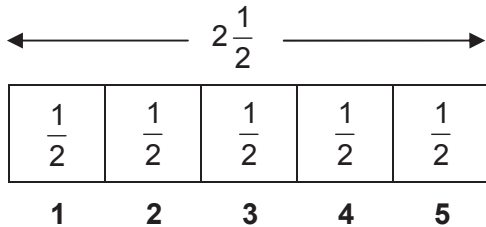
Step 1: Draw a square and label it $\frac{1}{2}$.



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



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



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.

$$\begin{aligned} 2\frac{3}{4} &= 2 + \frac{3}{4} \\ &= \frac{8}{4} + \frac{3}{4} \\ &= \frac{11}{4} \end{aligned}$$

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

Flip it!

$$\frac{11}{4} \begin{array}{c} \nearrow \\ \searrow \end{array} \frac{4}{11}$$

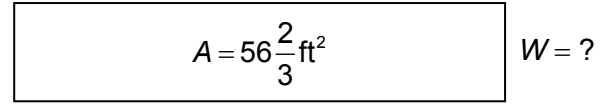
How can I tell this is right?

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

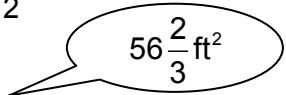


Problem 2

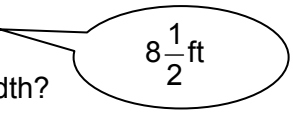
How wide is the rectangle?



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



What is the area?



What is the length?

How can I find the width?

Divide the area by the length.

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

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?

LESSON

4-4

Solving Multistep Problems with Fractions and Mixed Numbers**Practice and Problem Solving: A/B**

Solve. Show your work.

1. After a holiday dinner, there are $3\frac{1}{3}$ apple pies left and $2\frac{5}{6}$ pumpkin pies left.

a. How much more apple pie than pumpkin pie is left?

b. Tom ate $\frac{1}{2}$ of the leftovers. How much pie in all did he eat?

2. An angelfish was $1\frac{1}{2}$ inches long when it was bought. Now it is $2\frac{1}{3}$ inches long.

a. How much has the angelfish grown? _____

b. An inch is $\frac{1}{12}$ of a foot. How much has the angelfish grown in feet? _____

3. There was a 6 square-foot piece of wrapping paper for a birthday present. It takes $3\frac{3}{8}$ square feet of the paper to wrap the present. How many pieces of 6 square-foot paper are needed to wrap 3 of these presents?

4. Today, a bicycle rider rode her bike $5\frac{1}{2}$ miles. Yesterday, she rode $6\frac{1}{4}$ miles. The difference in length between the two rides is what fraction of the longer ride?

5. A survey by the state health department found that the average person ate 208 pounds of vegetables last year and $125\frac{5}{8}$ pounds of fruit. What fraction of the total pounds of fruit and vegetables do the pounds of fruits represent?

LESSON
4-4**Solving Multistep Problems with Fractions and Mixed Numbers**
Practice and Problem Solving: C**Solve. Show your work.**

1. One wintry week a ski town got $15\frac{1}{2}$ inches of snow. On Monday the town got $2\frac{3}{4}$ inches; on Tuesday it got $1\frac{1}{2}$ times as much; and on Wednesday it got $\frac{7}{8}$ inch. How much snow did the town get the rest of the week?
-

2. Laura was making a recipe that said the ingredients were for 6 people, but she needed to make it for 8 people. The recipe called for $2\frac{2}{3}$ cups of milk and $\frac{1}{4}$ cup of oil. How many cups of these liquid ingredients did she need for 8 people?
-

3. Brian decided to make the same recipe in Exercise 2 for 4 people. How many cups of these liquid ingredients did he need? Explain two ways you could find the answer.
-
-

4. A fence around a square garden is made up of 4 equal-sized pieces that are each $5\frac{1}{2}$ feet long. Matt decided to make the sides $2\frac{1}{2}$ times longer. How much fencing does he need in all?
-

5. Pedro spent $2\frac{1}{5}$ hours on his math homework and half as long on his science homework one weekend. If his English and social studies homework took $\frac{7}{8}$ as long, how much time did he spend on homework that weekend?
-

6. Ken spent $\frac{1}{5}$ of his allowance on a movie, $\frac{3}{8}$ on snacks, and $\frac{2}{7}$ on games. If his allowance was \$20, how much did Ken have left?
-

LESSON

4-4

Solving Multistep Problems with Fractions and Mixed Numbers**Practice and Problem Solving: D**

Solve. Show your work. The first one is done for you.

1. After a party, there is $\frac{1}{3}$ apple pie left and $\frac{5}{6}$ pumpkin pie left.

a. How much more pumpkin pie than apple pie is left?

$$\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6} \text{ or } \frac{1}{2} \text{ pie}$$

b. Terri ate $\frac{1}{3}$ of the leftover pies. How much pie did she eat?

2. An angelfish was $1\frac{1}{2}$ inches long when it was bought. Now it is $2\frac{1}{2}$ inches long.

a. How much has the angelfish grown? _____

b. An inch is $\frac{1}{12}$ of a foot. How much has the angelfish grown in feet? _____

3. There was a 6 square-foot piece of wrapping paper for a present. It takes $3\frac{1}{8}$ square feet of paper to wrap the present. How many pieces of 6-foot-square paper are needed to wrap 2 presents?
-

4. Today, a bicycle rider rode her bike $5\frac{1}{2}$ miles. Yesterday, she rode 6 miles. What fraction of the total of the two rides is the longer ride?
-

5. A survey by the state health department found that the average person ate 208 pounds of vegetables last year and $125\frac{5}{8}$ pounds of fruit. How many pounds of vegetables and fruits did the average person eat per month? [Hint: Remember that 1 month is $\frac{1}{12}$ of a year.]
-

LESSON

4-4

Solving Multistep Problems with Fractions and Mixed Numbers**Reteach**

In order to solve some problems involving mixed numbers, you will have to rewrite the mixed number as a whole number and an improper

fraction. For example, $2\frac{1}{3}$ can be rewritten as $1\frac{4}{3}$. The two numbers

are the same because $2\frac{1}{3} = 1 + 1\frac{1}{3} = \frac{3}{3} + 1\frac{1}{3} = 1 + \frac{3}{3} + \frac{1}{3}$.

This step is necessary when subtracting mixed numbers as shown here.

Example

After an office party, $4\frac{1}{3}$ pizzas are left. A day later, there are $1\frac{5}{6}$ pizzas left. How much pizza was eaten during the day after the party? One third of the pizza eaten on the day after the party was pepperoni. How much of the day-old pizza eaten was pepperoni?

Solution:

First, change the denominator to the common denominator of 6:

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

Then, write the subtraction problem: $4\frac{2}{6} - 1\frac{5}{6}$

Since the fraction with 4 is less than the fraction with 1, write

$4\frac{2}{6}$ as $1 + 3\frac{2}{6}$ and write 1 as $\frac{6}{6}$ so that the subtraction problem

becomes $3\frac{8}{6} - 1\frac{5}{6}$.

Subtract the whole numbers and subtract the numerators of the fractions:

$3\frac{8}{6} - 1\frac{5}{6} = 2 + \frac{3}{6}$ or $2\frac{1}{2}$; $2\frac{1}{2}$ pizzas were eaten during the next day. Of

these, $\frac{1}{3}$ were pepperoni. So: $2\frac{1}{2} \cdot \frac{1}{3} = \frac{5}{2} \cdot \frac{1}{3} = \frac{5}{6}$.

On the second day, $\frac{5}{6}$ of a pepperoni pizza was eaten.

Solve by rewriting the mixed number that is being subtracted.

1. A deli ordered $6\frac{1}{2}$ wheels of cheese. Over the weekend, $3\frac{5}{8}$ wheels of cheese were sold. On Tuesday another $1\frac{3}{4}$ wheels were sold. How much cheese was left for Wednesday?

LESSON

4-4

Solving Multistep Problems with Fractions and Mixed Numbers**Reading Strategies: Compare and Contrast**

When you solve problems with fractions, mixed numbers, and whole numbers, it can be helpful to compare and contrast different methods of solving the problems. The example shows two ways to solve a problem involving a mixed number and a whole number.

Example

A carpet store puts 40 square yards of outdoor carpet on sale. After the sale, they have $10\frac{1}{3}$ square yards of carpet left. How much did they sell?

Of the carpet sold, half was green. How many square feet of green carpet did they sell?

Method 1 Estimation can be used to solve this problem without converting the 40 yards to a fraction and a mixed number. Forty yards less 10 yards is 30 yards. However, the real difference is one third of a yard less than 30 yards. Thirty yards less one third of a yard is 29 yards and a fraction. What fraction? One third from one whole leaves two thirds. So, the amount of carpet sold is 29 yards and two thirds of a yard or $29\frac{2}{3}$ square yards. Half of $29\frac{2}{3}$ square yards is about 15 square yards or $14\frac{1}{2}$ square yards plus $\frac{1}{3}$ square yard. So, they sold $14\frac{5}{6}$ square yards of green carpet.

Method 2 Change 40 yards to 39 yards and one yard. Write one yard as thirds: three thirds. So, the problem becomes $39 + \frac{3}{3}$ minus $10\frac{1}{3}$. Subtract the whole numbers: $39 - 10 = 29$. Subtract the fractions. Since the fractions have the same denominators, the numerators can be subtracted:

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

Add 29 and $\frac{2}{3}$ to get $29\frac{2}{3}$ yards.

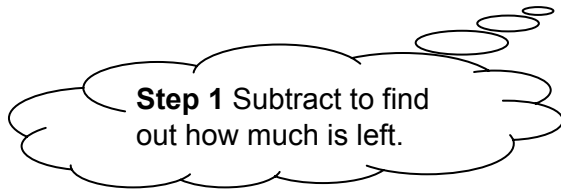
Then multiply $29\frac{2}{3}$ by $\frac{1}{2}$ to get $14\frac{5}{6}$ square yards.

Answer the question.

1. Which of the two methods of doing the problem in the example do you prefer and why?

LESSON
4-4**Solving Multistep Problems with Fractions and Mixed Numbers**
*Success for English Learners***Problem 1a**

Sarai has a piece of ribbon that is $6\frac{1}{3}$ yards long. She cuts off a piece that is $2\frac{5}{6}$ yards long. How much ribbon is left?



Rewrite the fraction:

$$6\frac{1}{3} - 2\frac{5}{6} = 6\frac{2}{6} - 2\frac{5}{6} = 3\frac{3}{6} \text{ or } 3\frac{1}{2} \text{ yards}$$

Problem 1b

Sarai wants to use $\frac{1}{2}$ of a $3\frac{1}{2}$ -yard piece of ribbon to wrap a present. How much ribbon will she use?

$$\begin{aligned} 3\frac{1}{2} \cdot \frac{1}{2} &= \frac{7}{2} \cdot \frac{1}{2} \\ &= \frac{7}{4} \text{ or} \\ &= 1\frac{3}{4} \text{ yards} \end{aligned}$$

1. Why is 6 the common denominator in Problem 1a?

2. What operations did you use to solve Problems 1a and 1b?

Operations with Fractions**Challenge**

The table shows the length and width of 4 rug designs that a carpet store stocks. Use the table to answer problems 1–2.

Rug Design	Length (ft)	Width (ft)
Classic	$8\frac{1}{2}$	$10\frac{3}{4}$
Deco	$10\frac{3}{4}$	$9\frac{3}{8}$
Solid	$7\frac{2}{5}$	$8\frac{3}{5}$
Modern	$10\frac{3}{5}$	$9\frac{1}{2}$

1. The price of each rug is found by multiplying the area of the rug (length times width) by the price per square foot. The price for all 4 rug designs listed above is \$8 per square foot. Which rug is the most expensive? How much does it cost?

2. Pauline orders a custom rug. She wants a rug that is the same final price as the Deco but the same width as the Modern. What is the length of the rug Pauline wants to purchase? Explain.

Solve.

3. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \dots, \frac{99}{100}$

In the list above, each fraction after the first is obtained by adding 1 to both the numerator and denominator of the fraction before it.

For example, the first fraction is $\frac{1}{2}$. To get the second fraction, add

1 to 1 and to 2: $\frac{1+1}{2+1} = \frac{2}{3}$. This pattern continues to $\frac{99}{100}$. What is

the product of the fractions in the list above? What pattern can help you find the product quickly?

LESSON
5-1**Dividing Whole Numbers****Practice and Problem Solving: A/B**

Estimate each quotient by rounding the dividend and the divisor to the largest place value.

1. $585 \div 13$

2. $2,756 \div 53$

3. $22,528 \div 98$

4. $7,790 \div 210$

5. $17,658 \div 360$

6. $916 \div 320$

Find each quotient using long division. Show your work.

7.
$$\begin{array}{r} \overline{29 \overline{) 1,334}} \end{array}$$

8.
$$\begin{array}{r} \overline{92 \overline{) 20,884}} \end{array}$$

9.
$$\begin{array}{r} \overline{25 \overline{) 18,175}} \end{array}$$

Find each quotient and remainder using long division. Show your work.

10.
$$\begin{array}{r} \overline{18 \overline{) 2,902}} \end{array}$$

11.
$$\begin{array}{r} \overline{64 \overline{) 34,680}} \end{array}$$

12.
$$\begin{array}{r} \overline{215 \overline{) 52,245}} \end{array}$$

Solve.

13. At the museum, there were 4,050 students in attendance from a total of 15 different school districts. What was the average attendance from each school district?

14. The Appalachian Trail is about 2,175 miles long. If a hiker averages 12 miles each day, how long will it take her to hike the length of the trail?

LESSON
5-1

Dividing Whole Numbers

Practice and Problem Solving: C

Estimate each quotient by rounding the dividend and the divisor to the largest place value. Then estimate each quotient by rounding the dividend and divisor to the nearest 10.

1. $585 \div 13$

2. $2,756 \div 53$

3. $22,528 \div 98$

4. $7,790 \div 210$

5. $17,658 \div 360$

6. $916 \div 320$

Answer the question.

7. In Exercises 1–6, which method of estimating usually gave you an estimated quotient closer to the quotient?

Each quotient is given with the remainder in decimal form. What is the remainder for each in fraction form?

8.
$$\begin{array}{r} 161.\bar{2} \\ 18 \overline{)2,902} \end{array}$$

9.
$$\begin{array}{r} 541.875 \\ 64 \overline{)34,680} \end{array}$$

10.
$$\begin{array}{r} 243.065116 \\ 215 \overline{)52,259} \end{array}$$

Solve.

11. One weekend, 5,780 people saw a new movie at 17 different theaters. Each theater sold tickets at \$7.50 a piece. Assuming that each theater received the same number of moviegoers, how much did each theater make?

12. The Appalachian Trail is about 2,175 miles long.

- a. If Katia averages 18 miles each day, how long will it take her to hike the length of the trail?

- b. Katia's friend Joelle joins her for the last quarter portion of the hike. How many full days will Joelle hike?

LESSON
5-1

Dividing Whole Numbers

Practice and Problem Solving: D

Estimate the quotients by filling in the blanks. The first one is done for you.

1. $345 \div 28$

345 rounds to 3 hundreds.

28 rounds to 3 tens.

Quotient estimate:

 300 ÷ 30, or about 10

2. $1,711 \div 105$

1,711 rounds to _____ thousands.

105 rounds to _____ hundred.

Quotient estimate:

3. $715 \div 24$

4. $2,315 \div 95$

Use long division to find the quotients and remainders by writing numbers in the boxes. The first one is done for you.

5.

$$\begin{array}{r}
 \boxed{2}\boxed{1} \\
 15 \overline{) 325} \\
 \underline{\boxed{3}\boxed{0}} \\
 \boxed{2}\boxed{5} \\
 \underline{\boxed{1}\boxed{5}} \\
 \boxed{1}\boxed{0}
 \end{array}$$

6.

$$\begin{array}{r}
 \boxed{}\boxed{} \\
 23 \overline{) 764} \\
 \underline{} \\
 4 \\
 \underline{} \\
 \\
 \underline{} \\

 \end{array}$$

7.

$$\begin{array}{r}
 \\
 41 \overline{) 1875} \\
 \underline{} \\
 5 \\
 \underline{} \\

 \end{array}$$

8.

$$\begin{array}{r}
 \\
 36 \overline{) 8441} \\
 \underline{} \\
 4 \\
 \underline{} \\
 1 \\
 \underline{} \\

 \end{array}$$

LESSON
5-1

Dividing Whole Numbers

Reteach

Division is used to separate a quantity into a given number of equal parts.

It is also used to separate a quantity into parts of a specific size.

A **division algorithm** breaks division with greater numbers into a series of lesser divisions. Follow the steps for each lesser division:

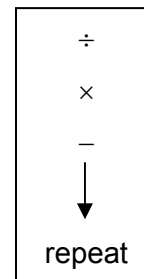
Step 1: Divide and write the number in the first correct place in the quotient.

Step 2: Multiply the divisor by the number in the quotient.

Step 3: Subtract.

Step 4: Bring down the next digit in the dividend.

Repeat these steps until there are no digits from the dividend left to bring down.



Jon bought a package of 792 labels. There are 24 sheets of labels in the package.

How many labels are on each sheet?

$$24 \overline{)792}$$

Divide to find the number of labels per sheet.

$$792 \text{ labels} \div 24 \text{ sheets}$$

Problem 1

$$24 \overline{)792} \begin{array}{l} \boxed{33} \\ -72 \\ \hline 72 \\ -72 \\ \hline 0 \end{array}$$

Divide. $79 \div 24 = 3$. Place 3 in the tens place.

Multiply. $24 \times 3 = 72$

Subtract. $79 - 72 = 7$

Bring down the next digit in the dividend: 2.

Problem 2

$$\begin{array}{r} 72 \\ -72 \\ \hline 0 \end{array}$$

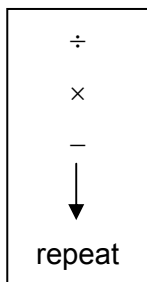
Repeat the process.

Divide. $72 \div 24 = 3$. Place 3 in the ones place.

Multiply. $24 \times 3 = 72$

Subtract. $72 - 72 = 0$

$792 \div 24 = 33$. There are 33 labels on each sheet.



Use the 4-step process to do the division.

- The art teacher has a box of 473 markers. She wants to distribute them evenly among 11 tables. How many markers will she put on each table?

Divide: $47 \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Multiply: $11 \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Subtract: $47 - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Bring down the .

Repeat the steps.

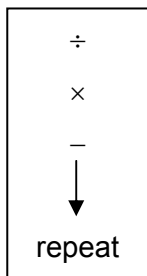
Divide: $\underline{\hspace{2cm}} \div \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Multiply: $\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Subtract: $\underline{\hspace{2cm}} - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$

Answer: markers

$$11 \overline{)473} \begin{array}{l} -44 \\ \hline 33 \\ -33 \\ \hline 0 \end{array}$$



LESSON
5-1**Dividing Whole Numbers****Reading Strategies: Build Vocabulary**

Division is the act of separating something into equal parts. This means that the parts of a problem include a total, the number of groups, and the number of items in one group. These three parts are named the dividend, divisor, and quotient.

The number that represents the total or what is being separated, is the **dividend**.

Identify the number that is the dividend for each situation.

1. Gina has a collection of 645 stamps. She stores the stamps on pages that each holds 15 stamps.

2. Karl wants to fill a storage case that he uses to hold his miniature toy cars. The case has 5 racks that will hold 120 cars.

Unlike the dividend, the *divisor* and *quotient* can take on multiple roles. They can each represent the number of groups or the number of items in the group. When the **divisor** is the number of groups, the **quotient** is the number of items in each group. When the **divisor** is the size of the group, the **quotient** is the number of groups. These differences do not change the way you compute the quotient, it simply changes the meaning of the quotient.

Answer each question. Explain your answer.

3. In Question 1, does the number 15 represent the number of groups or the number of items in a group?

4. In Question 2, does the number 5 represent the number of groups or the number of items in a group?

Find each quotient. Does the quotient represent the number of groups or the number of items in a group?

5. Gina has a collection of 645 stamps. She stores the stamps on pages that each holds 15 stamps. How many pages are in Gina's collection?

6. Karl uses a storage case to hold his miniature toy cars. The case has 5 racks that will hold 120 cars. How many cars will each of the 5 racks hold?

LESSON
5-1

Dividing Whole Numbers

Success for English Learners

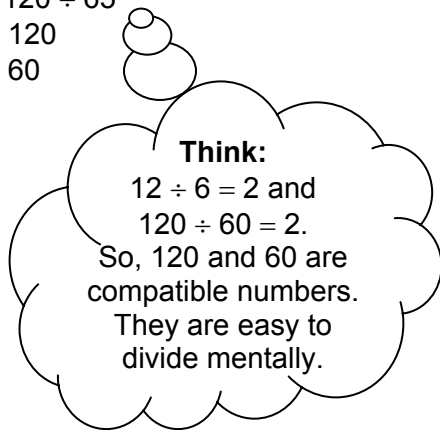
Problem 1

Step 1

Estimate $120 \div 65$

$120 \rightarrow 120$

$65 \rightarrow 60$



Step 2

$120 \div 65 = 120 \div 60$

$120 \div 60 = 2$

So, the quotient is **about 2**.

Check your estimate.

$120 \div 65 = 1.846$

So, 1.846 is close to 2.

Problem 2

Divide 235 by 17.

$$\begin{array}{r} 13 \\ 17 \overline{)235} \\ \underline{-17} \\ 65 \\ \underline{-51} \\ 14 \end{array}$$

- Step 1**
- Divide **23** by **17**. What do you get?
 - **1** with 6 left over.
 - Write the **1** in the quotient.
 - Multiply **1** times **17**.
 - Write **17** below the **23**.
 - Subtract **17** from **23**.
- Step 2**
- Write the **6** and bring down the **5**.
 - What do you get? **65**.
- Step 3**
- Divide **65** by **17**. What do you get?
 - **3** with **14** left over.
 - Write the **3** in the quotient.
- Step 4**
- Write the answer:
 - **$235 \div 17 = 13 \text{ R } 14$**

1. In Problem 1, is the estimate an *underestimate* or an *overestimate*?

2. Why are 150 and 50 compatible numbers?

3. In Problem 2, write the answer in Step 4 with a whole number and a fraction.

LESSON
5-2**Adding and Subtracting Decimals****Practice and Problem Solving: A/B****Find each sum or difference.**

1. $1.5 + 2.3$

2. $8.9 - 5.1$

3. $2.5 + 1.3 + 4.1$

4. $7.25 + 8.75$

5. $8.16 - 7.72$

6. $3.3 + 4.5 + 2.6$

7. $8.9 + 3.05$

8. $10.64 - 8.8$

9. $4.1 + 0.35 + 6.564$

Solve.

10. Marcus is 1.5 meters tall. His sister is 0.1 meter taller than Marcus. Their father is 0.2 meter taller than his sister. How tall is their father?

11. Jennifer brought \$24.75 to the baseball game. She spent \$12.45 on drinks and snacks. How much money does she have left over?

Find the missing digit.

$$\begin{array}{r} 12. \quad 7.089 \\ + 2.\square13 \\ \hline 9.502 \end{array}$$

$$\begin{array}{r} 13. \quad 16.594 \\ - \square.175 \\ \hline 11.419 \end{array}$$

$$\begin{array}{r} 14. \quad 6.2\square67 \\ + 9.75 \\ \hline 15.9867 \end{array}$$

Solve.

15. A gourmet pizza café sells three sizes of pizzas. If you buy all three sizes, it costs \$46.24. A medium pizza costs \$15.75 and a large pizza costs \$17.50. How much does the small pizza cost?

16. A carpenter has three sheets of plywood that are each 6.85 feet long. A 3.4-foot piece is cut from one sheet and 0.5-foot piece is cut from another sheet. How many feet of plywood is left in all?

LESSON
5-2

Adding and Subtracting Decimals

Practice and Problem Solving: C

Write each fraction as a decimal.

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

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

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

4. $5\frac{5}{18}$

5. What is a common feature of all of the decimals in Exercises 1–4?

Add or subtract as indicated.

6. $0.333\dots$
 $+ 0.666\dots$

7. $0.121212\dots$
 $+ 0.454545\dots$

8. $3.456456\dots$
 $- 1.345345\dots$

Solve.

9. Write $0.333\dots$ as a fraction.

10. Write $0.666\dots$ as a fraction.

$n =$ _____

$n =$ _____

$10n =$ _____

$10n =$ _____

$9n =$ _____; $n =$ _____

$9n =$ _____; $n =$ _____

11. Write $0.343434\dots$ as a fraction.

12. Write $1.432432\dots$ as a fraction.

$n =$ _____

$n =$ _____

$100n =$ _____

$1,000n =$ _____

$99n =$ _____; $n =$ _____

$999n =$ _____; $n =$ _____

13. Why are the decimals in Exercises 11 and 12 multiplied by 100 and 1,000, respectively?

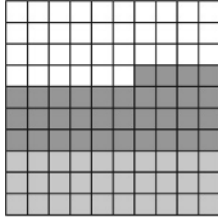
LESSON
5-2

Adding and Subtracting Decimals

Practice and Problem Solving: D

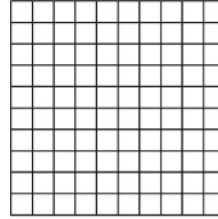
Shade the grid to find each sum. The first one is done for you.

1. $0.3 + 0.34$



0.64

2. $0.15 + 0.19$



Estimate the answer. The first one is done for you.

3. 12.05 is about 12
 $+ 27.6$ is about 28
39.65 or about 40

4. 34.5 is about _____
 $- 17.7$ is about _____
 _____ or about _____

Fill in the digits and find the answer. The first one is done for you.

5. $47.65 + 8.059$

	4	7	.	6	5	
+		8	.	0	5	9
	5	5	.	7	0	9

55.709

6. $77.5 + 23.87$

			.		
+			.		
			.		

Find the sum or difference. Use any of the methods in this lesson.

The first one is done for you.

7. $105.6 - 78.25$

105.60
 $- 78.25$
27.35

27.35

8. $13.2 + 0.5 + 200.6$

LESSON

5-2

Adding and Subtracting Decimals

Reteach

You can use a place-value chart to help you add and subtract decimals.

Add 1.4 and 0.9.

	Tens	Ones	Tenths	Hundredths	Thousandths
+		1	4		
		0	9		

So, $1.4 + 0.9 = 2.3$.

Subtract 2.4 from 3.1.

	Tens	Ones	Tenths	Hundredths	Thousandths
-		3	1		
		2	4		

So, $3.1 - 2.4 = 0.7$.

Find each sum or difference.

1.

	Tens	Ones	Tenths	Hundredths	Thousandths
+		2	6		
		1	1	5	

2.

	Tens	Ones	Tenths	Hundredths	Thousandths
-		2	5	3	
		1	7		

3. $4.3 + 1.4$

	Tens	Ones	Tenths	Hundredths	Thousandths
+					

4. $14.4 - 3.8$

	Tens	Ones	Tenths	Hundredths	Thousandths
-					

5. $7.3 + 8.5$

	Tens	Ones	Tenths	Hundredths	Thousandths
+					

6. $12.34 - 6.9$

	Tens	Ones	Tenths	Hundredths	Thousandths
-					

Estimate the answers to Exercises 3–6 by rounding to the nearest whole number. Compare your estimate to the exact answers.

7. $4.3 + 1.4$

8. $14.4 - 3.8$

9. $7.3 + 8.5$

10. $12.34 - 6.9$

LESSON
5-2

Adding and Subtracting Decimals

Reading Strategies: Use a Graphic Organizer

Writing decimals in a place-value grid helps you line up decimal points to add or subtract decimals.

	Ones	Tenths	Hundredths
	1	4	0
	5	3	8
+	2	7	0
	9	4	8

$$\begin{array}{r}
 1.40 \text{ Add zeros as place holders.} \\
 5.38 \\
 + 2.70 \\
 \hline
 9.48 \text{ Place decimal point in answer.}
 \end{array}$$

	Tens	Ones	Tenths	Hundredths
		2	8	0
		6	3	0
-		2	1	7
	2	1	7	5

- How does the place-value grid help you add or subtract?

- Place these numbers on the place-value grid below: 3.25, 1.06, 2.9.
- Place this problem on the place-value grid below: 23.8–7.2.

	Ones	Tenths	Hundredths
+			

	Tens	Ones	Tenths	Hundredths
-				

- Add the numbers on the place-value grid in Exercise 2. What is the sum?

- Subtract the numbers on the place-value grid in Exercise 3. What is the difference?

- For which numbers did you add zero as a place holder?

LESSON
5-2

Adding and Subtracting Decimals

Success for English Learners

Problem 1

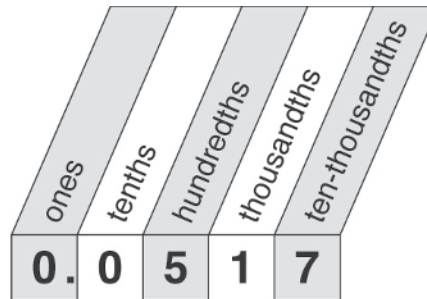
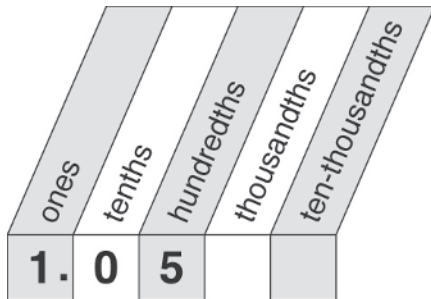
Place value charts can help you add or subtract decimals.

Example

Add 1.05 and 0.0517.

Solution

Look at the place value charts for the numbers.



When you add, you line up the decimal points:

$$\begin{array}{r}
 1.05 \\
 + 0.0517 \\
 \hline
 1.1017
 \end{array}$$

Problem 2

Add 0.12 and 0.50.

First, line up the decimal points:

$$\begin{array}{r}
 0.12 \\
 + 0.50 \\
 \hline
 \end{array}$$

Second, add the numbers in each place. **0**, **6**, and **2**

Third, write the answer: **0.62**

1. In Problem 1, how would *read* the decimal point if you are saying the number words?

2. What happens to the value of the sum or difference of numbers if you do not align their decimal points?

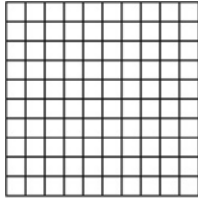
LESSON
5-3

Multiplying Decimals

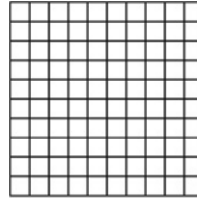
Practice and Problem Solving: A/B

Show the decimal multiplication on the grids. Find the product.

1. 0.2×0.6 _____



2. 0.3×0.7 _____



Draw an area model to represent the multiplication problems below. Find the product.

3. $1.2 \times 3.3 =$ _____

4. $4.1 \times 2.1 =$ _____

Multiply.

5.
$$\begin{array}{r} 0.1 \\ \times 0.2 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 0.9 \\ \times 6 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 0.3 \\ \times 0.8 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 1.6 \\ \times 2.9 \\ \hline \end{array}$$

9. $1.5 \times 0.41 =$

10. $0.24 \times 2.68 =$

11. $3.13 \times 4.69 =$

12. $5.48 \times 15.12 =$

Solve.

13. Each basket can hold 2.5 pounds of apples. How many pounds can 7 baskets hold?

14. Canvas cloth costs \$7.50 per square meter. How much will 3.5 square meters of canvas cost?

LESSON

5-3

Multiplying Decimals**Practice and Problem Solving: C**

Estimate each product to the nearest whole number. Then, find the product.

1. 0.7×0.85

2. 3.05×1.95

3. 0.55×2.3

4. 4.699×1.74

5. 10.37×5.086

6. 5.593×19.71

Compare using $<$ or $>$ without calculating the product.

7. 2.4×3.8 ○ 3.5×2.8

8. 6.28×3.82 ○ 3.3×6.84

Solve.

9. A forestry service biologist has time to study insect infestation in an area of 50 square kilometers. On the forest service map, the scale is 1 centimeter equals 1 kilometer. The four possible sectors available for study appear as rectangles on the map. Complete the table by calculating the map area of each sector.

Sector	Map Dimensions (cm)	Map Area (cm ²)
A	2.5×5.8	
B	3.7×2.1	
C	4.7×3.5	
D	4.2×2.8	

- a. How can you calculate the actual area of each sector?

- b. Does the biologist have time to study all four areas? Explain why or why not?

- c. What combinations of three sectors could the scientist study?

- d. Which combination of sectors maximizes the area to be studied? Explain why.

LESSON
5-3

Multiplying Decimals

Practice and Problem Solving: D

Multiply. The first one is done for you.

$$\begin{array}{r} 1. \quad 0.5 \\ \times 3 \\ \hline 1.5 \end{array}$$

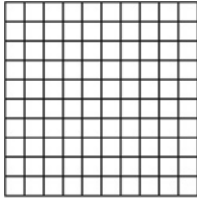
$$\begin{array}{r} 2. \quad 4 \\ \times 0.8 \\ \hline \end{array}$$

$$\begin{array}{r} 3. \quad 9 \\ \times 0.7 \\ \hline \end{array}$$

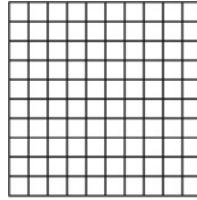
$$\begin{array}{r} 4. \quad 0.25 \\ \times 3 \\ \hline \end{array}$$

Show the decimal multiplication on the grids. Do not solve.

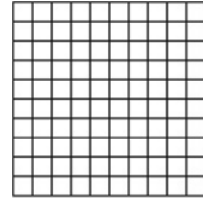
5. 0.1×0.7



6. 0.4×0.8



7. 0.3×0.7



Name the number of decimal places.

$$\begin{array}{r} 8. \quad 2.4 \leftarrow \text{ _____ } \text{ decimal places} \\ \times 0.83 \leftarrow \text{ _____ } \text{ decimal places} \\ \hline \text{Answer} \leftarrow \text{ _____ } \text{ total decimal places} \end{array}$$

$$\begin{array}{r} 9. \quad 0.456 \leftarrow \text{ _____ } \text{ decimal places} \\ \times 2.4 \leftarrow \text{ _____ } \text{ decimal places} \\ \hline \text{Answer} \leftarrow \text{ _____ } \text{ total decimal places} \end{array}$$

Multiply. The first one is done for you.

$$\begin{array}{r} 10. \quad 7.15 \\ \times 2.5 \\ \hline 3575 \\ \hline 1430 \\ \hline 17.875 \end{array}$$

$$\begin{array}{r} 11. \quad 4.36 \\ \times 1.2 \\ \hline \end{array}$$

Solve.

12. A cabinetmaker buys 3.5 liters of oak varnish. The varnish costs \$4.95 per liter.

a. Write a multiplication expression for this purchase.

b. How much does 3 liters of varnish cost? _____

c. How much does 0.5 liters of varnish cost? _____

d. What is the total cost of 3.5 liters of varnish? _____

LESSON
5-3

Multiplying Decimals

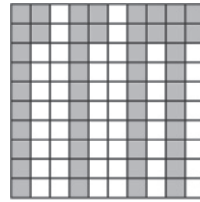
Reteach

You can use a model to help you multiply a decimal by a whole number.

Find the product of 0.12 and 4.

Use a 10-by-10 grid. Shade 4 groups of 12 squares.

Count the number of shaded squares. Since you have shaded 48 of the 100 squares, $0.12 \times 4 = 0.48$.



Find each product.

1. 0.23×3

2. 0.41×2

3. 0.01×5

4. 0.32×2

5. 0.15×3

6. 0.42×2

7. 0.04×8

8. 0.22×4

You can also use a model to help you multiply a decimal by a decimal.

Find the product of 0.8 and 0.4.

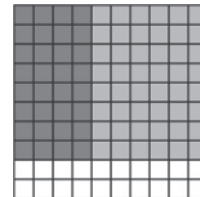
Step 1 Shade 8 tenths of the figure.

Step 2 Shade darker 4 tenths of the shaded area.

Step 3 How many squares have you shaded twice?

You have twice shaded 32 of the squares.

So, $0.8 \times 0.4 = 0.32$.



Find each product.

9. 0.2×0.8

10. 0.7×0.9

11. 0.5×0.5

12. 0.3×0.6

13. 0.5×0.2

14. 0.4×0.4

15. 0.1×0.9

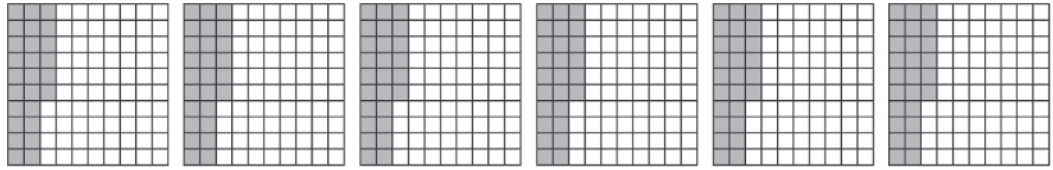
16. 0.4×0.7

LESSON
5-3

Multiplying Decimals

Reading Strategies: Use Graphic Aids

Each grid has 26 of 100 squares shaded to represent 0.26.



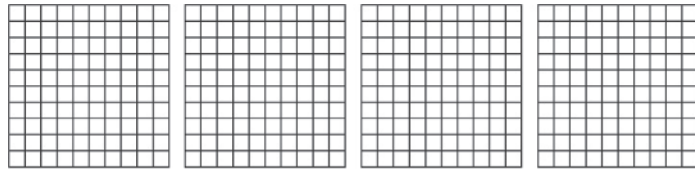
You can add the decimals to find out how much of the grids are shaded.

← $0.26 + 0.26 + 0.26 + 0.26 + 0.26 + 0.26 = 1.56$

Or, you can multiply the shading of one grid by 6.

← $0.26 \times 6 = 1.56$

Use the grids for Exercises 1 to 5.



1. Shade the grids so that each one represents 0.89.
2. Write an addition expression to represent the shaded grids.

3. Evaluate your addition expression to find the sum.

4. Write a multiplication expression to represent the shaded grids.

5. Evaluate your multiplication expression to find the product.

LESSON
5-3

Multiplying Decimals

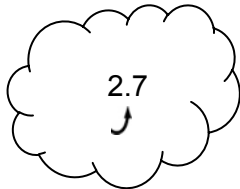
Success for English Learners

Problem 1

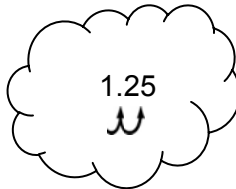
How many decimal places are in each number?

2.7 1.25 23

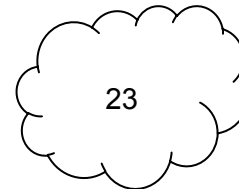
Start at the decimal point. Count the digits to its right.



one decimal place



two decimal places



no decimal place

Problem 2

Multiply: 1.2×1.6

1.2	→	1 decimal place	1.2
1.6	→	1 decimal place	<u>× 1.6</u>
			72
			<u>+ 120</u>
		$1 + 1 = 2$ decimal places →	1.92

1. How do you find the decimal place in the product of two decimals?

2. To place the decimal point in the product of two decimals, do you move the decimal point to the left or to the right?

3. After you place the decimal point in a product of two decimals, how do you tell if the answer is reasonable?

Is each product reasonable? Write *yes* or *no*. If no, give a reasonable estimate.

4. $0.8 \times 3 = 0.12$

5. $5.2 \times 6.7 = 34.84$

6. $2.4 \times 3 = 72$

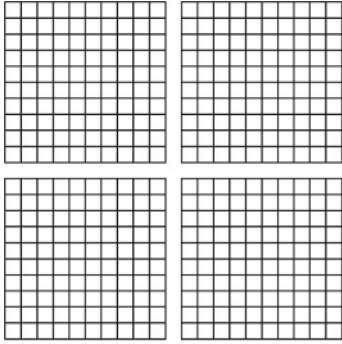
LESSON
5-4

Dividing Decimals

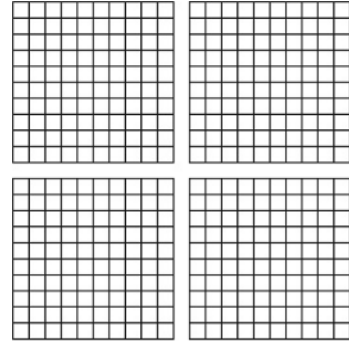
Practice and Problem Solving: A/B

Use decimal grids to find each quotient. First, shade the grid. Then, separate the model to show the correct number of equal parts.

1. $3.6 \div 1.2$



2. $3.27 \div 3$



Find each quotient.

3. $9.5 \overline{)142.5}$

4. $3 \overline{)39.6}$

5. $2 \overline{)10.88}$

6. $10.5 \div 1.5$

7. $9.75 \div 1.3$

8. $37.5 \div 2.5$

Estimate each quotient to the nearest whole number. Then, find the actual quotient.

9. $0.9 \overline{)3.78}$

10. $2.5 \overline{)36}$

11. $0.25 \overline{)7}$

12. $9.5 \overline{)142.5}$

Solve.

13. A camera attached to a telescope photographs a star's image once every 0.045 seconds. How many complete images can the camera capture in 3 seconds?

14. A geologist noticed that land along a fault line moved 24.8 centimeters over the past 175 years. On average, how much did the land move each year?

LESSON
5-4

Dividing Decimals

Practice and Problem Solving: C

Estimate the quotient. Then find the exact quotient.

1. $8.4 \div 2.4$

Estimate:

Exact Quotient:

2. $13.75 \div 2.25$

Estimate:

Exact Quotient:

3. $5.45 \div 0.5$

Estimate:

Exact Quotient:

Compare using $<$, $>$, or $=$ without calculating the quotient.

4. $0.05 \overline{)3}$ $0.005 \overline{)3}$

5. $1.9 \overline{)4.7}$ $19 \overline{)4.7}$

6. $0.35 \overline{)0.78}$ $0.35 \overline{)7.8}$

7. $1.2 \overline{)34}$ $0.12 \overline{)3.4}$

Solve.

8. Acme Hardware is introducing a new product called Greener Cleaner. Complete the table by finding the cost per milliliter for each size based on the sales price. One liter is 1,000 milliliters.

Size	Amount of Liquid	Sale Price	Price per Milliliter
Small	250 milliliters	\$4.50	
Medium	500 milliliters	\$9.95	
Large	1 liter	\$16.95	

- a. Write an expression using $<$ or $>$ to compare the three containers by price per milliliter.

- b. What is the least expensive way to buy 1,500 milliliters of Green Cleaner? Write an expression to represent your choice and evaluate.

- c. What is the most expensive way to buy 1,500 milliliters of Green Cleaner? Write an expression to represent your choice and evaluate.

LESSON
5-4**Dividing Decimals*****Practice and Problem Solving: D*****Find each quotient. The first one is done for you.**

1. $2.8 \div 4$

$$\underline{\quad 0.7 \quad}$$

2. $1.8 \div 2$

$$\underline{\hspace{2cm}}$$

3. $3.6 \div 6$

$$\underline{\hspace{2cm}}$$

4. $7.2 \div 9$

$$\underline{\hspace{2cm}}$$

5. $0.15 \div 3$

$$\underline{\hspace{2cm}}$$

6. $4.8 \div 8$

$$\underline{\hspace{2cm}}$$

Find each quotient. The first one is done for you.

7. $2.4 \div 0.4$

$$\underline{\quad 6 \quad}$$

8. $1.4 \div 0.2$

$$\underline{\hspace{2cm}}$$

9. $4.8 \div 0.6$

$$\underline{\hspace{2cm}}$$

10. $3.3 \div 0.3$

$$\underline{\hspace{2cm}}$$

11. $2.6 \div 1.3$

$$\underline{\hspace{2cm}}$$

12. $7.2 \div 1.2$

$$\underline{\hspace{2cm}}$$

Solve.

13. At the grocery store, a six-pack of bottled water costs \$2.88.
How much does each bottle cost?

14. It rained 2.79 inches in July. What was the average daily rainfall in July? (Hint: July has 31 days.)

15. Over several months, a meteorologist recorded a total snowfall of 8.6 centimeters. During this period, the average monthly snowfall was 4.3 centimeters. For how many months did the meteorologist collect measurements of the snowfalls?

16. Almonds cost \$3.49 per pound. A bag of almonds costs \$6.95.
To the nearest whole pound, about how many pounds of almonds are in the bag?

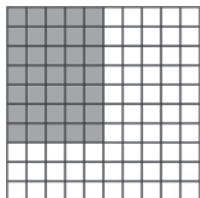
LESSON
5-4

Dividing Decimals

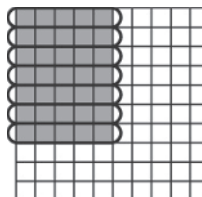
Reteach

You can use decimal grids to help you divide by whole numbers.

To divide 0.35 by 7, first shade in a decimal grid to show thirty-five hundredths.



$0.35 \div 7$ means “divide 0.35 into 7 equal groups.” Show this on the decimal grid.



The number of units in each group is the quotient.

So, $0.35 \div 7 = 0.05$.

Find each quotient.

1. $0.6 \div 5$

2. $0.78 \div 6$

3. $0.32 \div 4$

4. $0.99 \div 0.0033$

You can use powers of 10 to help you divide a decimal by a decimal.

Divide 0.048 by 0.12.

Notice that 0.12 has two decimal places.

To make this a whole number, multiply by 100.

$$0.048 \div 0.12 \longrightarrow 0.12 \cdot 100 = 12 \quad 0.048 \cdot 100 = 4.8$$

Then divide.

$4.8 \div 12$

Step 1: Divide as you would with a whole number.

$$\begin{array}{r} 0.4 \\ 12 \overline{)4.8} \end{array}$$

Step 2: Think $48 \div 12 = 4$.

$$\begin{array}{r} 48 \\ \underline{48} \\ 0 \end{array}$$

Step 3: Place the decimal point in the quotient.
Add a zero as necessary.

So, $0.048 \div 0.12 = 0.4$.

Find each quotient.

5. $0.4 \overline{)0.08}$

6. $0.9 \overline{)0.63}$

7. $0.008 \overline{)0.4}$

8. $0.04 \overline{)0.032}$

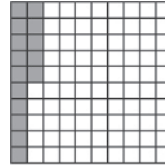
LESSON
5-4

Dividing Decimals

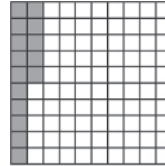
Reading Strategies: Use Graphic Aids

You can use a hundreds grid to show division with decimals.

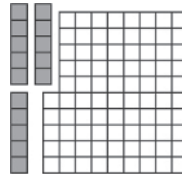
The grid shows 0.15.



$0.15 \div 3$ means “separate 0.15 into 3 equal groups.”



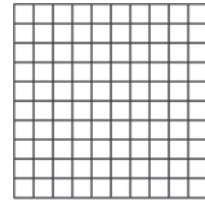
$0.15 \div 3$ makes 3 equal groups of 0.05.



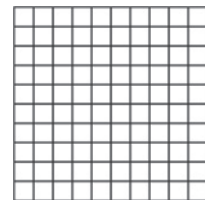
$0.15 \div 3 = 0.05$

Use the grids to complete 1–8.

1. Shade 0.60 of the grid at right.
2. Divide the shaded area into 3 equal sections.
3. Write a decimal that represents each section. _____
4. Write a division problem for your model.



5. Shade 0.72 of the grid at right.
6. Divide the shaded area into 8 equal sections.
7. Write a decimal that represents each section. _____
8. Write a division problem for your model.



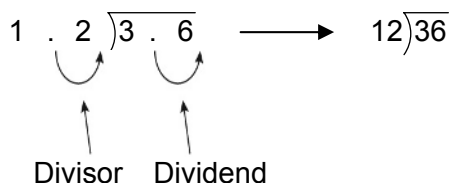
LESSON
5-4

Dividing Decimals

Success for English Learners

Problem 1

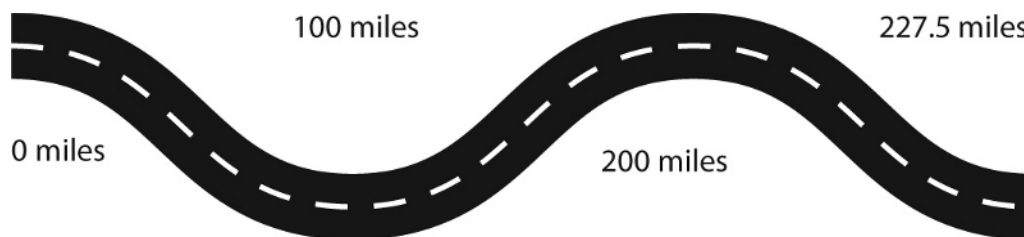
Find $3.6 \div 1.2$.



Remember: To multiply by 10, move the decimal point 1 place to the right.

Problem 2

Sari's car goes 17.5 miles for every gallon of gas.
How many gallons of gas does Sari's car use to go 227.5 miles?



$$\begin{array}{r} 13.0 \\ 17.5 \overline{)227.5} \end{array}$$

1. What is the quotient in Problem 1?

2. Does the quotient in Problem 1 have a remainder? How do you know?

3. Write another question to go with Problem 2. Solve.

LESSON
5-5**Applying Operations with Rational Numbers****Practice and Problem Solving: A/B****Solve.**

1. Four friends equally shared the cost of supplies for a picnic. The supplies cost \$12.40. How much did each pay?

2. Twenty people are going by van to a movie. Each van seats 8 people. How many vans are needed to take everyone?

3. Plastic forks come in packs of 6. You need 40 forks for a party. How many packs of forks should you buy?

4. Kesha spent a total of \$9.60 on new shoelaces. Each pair cost \$1.20. How many pairs of shoelaces did she buy?

5. Horses are measured in units called hands. One inch equals $\frac{1}{4}$ hand. The average Clydesdale is $17\frac{1}{5}$ hands tall. What is this height in inches? In feet?

6. A banana bread recipe calls for $\frac{3}{4}$ cup butter. One tablespoon equals $\frac{1}{16}$ cup. How many tablespoons of butter are needed to make the banana bread?

7. Cindy works part-time and earns \$5.75 an hour. One year she worked 50 weeks and averaged 12.4 hours of work per week. About how much money did she earn that year?

8. At a gymnastics competition, Joey scored 9.4, 9.7, 9.9, and 9.8. Carlos scored 9.5, 9.2, 9.7, and 9.6. Who had the greater average score? By how many points was his score greater?

9. A granola recipe calls for $2\frac{1}{3}$ cups of almonds. A bag of almonds contains 2 cups. To make $2\frac{1}{2}$ batches of granola, Ali buys 5 bags of almonds. How many cups of almonds will he have left over?

10. At a zoo, 3 pandas eat a total of $181\frac{1}{2}$ pounds of bamboo shoots each day. The male panda eats 3 times as much as the baby. The female eats twice as much as the baby. How many pounds of bamboo shoots does the female panda eat?

LESSON
5-5

Applying Operations with Rational Numbers

Practice and Problem Solving: C

Solve.

- Sandy makes linen scarves that are $\frac{7}{8}$ of a yard long. How many scarves can she make from 156 feet of fabric?

- A small rug is 36 inches long. Its width is $\frac{2}{3}$ of its length. What is the width of the rug in feet?

- Four friends split equally a lunch bill of \$36.96 plus 20% tip. How much did each person pay?

- Jade spent \$37.60 on groceries. $\frac{4}{5}$ of that total was spent on vegetables. How much was spent on other items?

- In January, Gene watched 5 movies. Their lengths are shown in the table. How many hours did Gene spend watching movies? _____

Movie	Length (min)
A	147.8
B	119.7
C	156.4
D	158.3
E	112.9

What was the average length of a movie in hours?

Which movies were longer than the average? _____

- Derrick's garden is $18\frac{1}{2}$ feet long. He plants bulbs $\frac{3}{8}$ of a foot apart. How many bulbs can Derrick plant in one row?

Derrick plants three rows of bulbs that cost \$0.79 each.

How much does he spend on bulbs? _____

- Yin's cellphone plan costs \$30 a month. She used 12.5 hours in May.

What was her cost per minute? _____

Yin's average call lasted 3.25 minutes. How much did an average call cost? _____

About how many calls did Yin make in May? _____

LESSON
5-5
Applying Operations with Rational Numbers
Practice and Problem Solving: D

Solve each problem. The first one has been done for you.

1. A hiking trail is $\frac{9}{10}$ mile long. There are 7 markers evenly posted along the trail to direct hikers. This results in 6 spaces of the same length between the markers. How far apart are the markers?

$$\frac{3}{20} \text{ of a mile}$$

2. Tomas is saving \$17.00 each week to buy a new sewing machine that costs \$175.50. How many weeks will he have to save to have enough money to buy the sewing machine?

3. Sequins come in packs of 75. Agnes uses 12 sequins on each costume. If she has one pack of sequins, how many costumes can she make?

4. Jessie pays \$2.19 each month for an annual subscription to *Sewing* magazine. She receives 12 magazines annually. How much does Jessie pay for an annual subscription?

5. Lisa's family drove 830.76 miles to visit her grandparents. Lisa calculated that they used 30.1 gallons of gas. How many miles per gallon did the car average?

6. Jamal spent \$6.75 on wire. Wire costs \$0.45 per foot. How many feet of wire did Jamal buy?

7. In England, mass is measured in units called stones. One pound equals $\frac{1}{14}$ of a stone. A cat has a mass of $\frac{3}{4}$ stone. What is its mass in pounds?

8. Dan uses $6\frac{1}{4}$ cups of flour to make pita bread for his family. The recipe calls for $2\frac{1}{2}$ cups. How many batches of the pita bread recipe did he make?

9. Shari used a total of 67.5 yards of cotton material to make costumes for the play. Each costume used 11.25 yards of cloth. How many costumes did Shari make?

10. Mike earned \$11.76 per hour for working 23.5 hours last week. How much money did Mike earn last week?

LESSON

5-5

Applying Operations with Rational Numbers**Reteach**

When a word problem involves fractions or decimals, use these four steps to help you decide which operation to use.

Tanya has $13\frac{1}{2}$ feet of ribbon. To giftwrap boxes, she needs to cut it into $\frac{7}{8}$ -foot lengths. How many lengths can Tanya cut?

Step 1	Read the problem carefully. What is asked for?	The number of lengths is asked for.
Step 2	Think of a simpler problem that includes only whole numbers.	Tanya has 12 feet of ribbon. She wants to cut it into 2-foot lengths. How many lengths can she cut?
Step 3	How would you solve the simpler problem?	Divide 12 by 2. Tanya can cut 6 lengths.
Step 4	Use the same reasoning with the original problem.	Divide $13\frac{1}{2}$ by $\frac{7}{8}$. Tanya can cut 15 lengths.

Tell whether you should multiply or divide. Then solve the problem.

1. Jan has \$37.50. Tickets to a concert cost \$5.25 each.
How many tickets can Jan buy?

2. Jon has \$45.00. He plans to spend $\frac{4}{5}$ of his money on sports equipment. How much will he spend?

3. Ricki has 76.8 feet of cable. She plans to cut it into 7 pieces.
How long will each piece be?

4. Roger has $2\frac{1}{2}$ cups of butter. A recipe for a loaf of bread requires $\frac{3}{4}$ cup of butter. How many loaves can Roger bake?

LESSON
5-5**Applying Operations with Rational Numbers****Reading Strategies: Analyze Information**

Word problems contain information that helps you choose which operation to use. Look for clues to help you decide whether to multiply or divide.

Read the problem carefully.

What is given? What are you asked to find?

Given	Asked to Find	Operation
a whole	a fractional part	Multiply by the fraction.
a whole and the number of parts	the size of the parts	Divide.
a whole and the size of a part	the number of parts	Divide.

Identify the information given and what you are asked to find.

Tell whether to multiply or divide. Then solve the problem.

1. A pumpkin weighs 31.3 pounds. It is split into 3 equal pieces.
What does each part weigh?

Given: _____

Find: _____

Operation and solution: _____

2. A pumpkin weighs $22\frac{2}{3}$ pounds. What does $\frac{1}{6}$ of it weigh?

Given: _____

Find: _____

Operation and solution: _____

3. A pumpkin weighs $42\frac{1}{3}$ pounds. A grocer wants to cut it into pieces weighing $2\frac{1}{2}$ pounds each. How many pieces can he cut?

Given: _____

Find: _____

Operation and solution: _____

LESSON
5-5

Applying Operations with Rational Numbers

Success for English Learners

Problem 1

What does that mean?

$0.75 \div 5.$

It tells you to write the numbers in this format. Then divide.

$$5 \overline{)0.75} \quad \Rightarrow \quad \begin{array}{r} 0.15 \\ 5 \overline{)0.75} \end{array}$$

Problem 2

How do we share the cost?

Receipt \$11.61

We have to divide the cost by 3.

We each need to pay \$3.87.

$$\begin{array}{r} 3.87 \\ 3 \overline{)11.61} \end{array}$$

Total Cost: \$11.61

1. How do you know where to place the decimal point in the quotient in Problem 1?

2. How can you determine if your answer to Problem 2 is correct?

MODULE
5**Operations with Decimals****Challenge**

Divya is cooking dinner. She goes to the market to buy ingredients. The price per pound of different ingredients is shown in the table below.

Ingredient	Price (per lb)
Beef	\$10.65
Onions	\$2.49
Potatoes	\$3.29
Tomatoes	\$8.45
Asparagus	\$4.99

Divya's recipe calls for 3.25 pounds of beef, 0.65 pounds of onions, 0.2 pounds of potatoes, 0.15 pounds of tomatoes, and 0.33 pounds of asparagus.

1. How much will Divya pay for all the ingredients in the recipe? Show your work.

2. Divya decides to make a vegetarian version of the recipe. To do this she replaces beef with 2.5 pounds of chickpeas and 1.75 pounds of lentils. At the market, chickpeas cost \$2.49 per pound and lentils cost \$3.59 per pound. How much money does Divya save by making the vegetarian version of her meal? Show your work.

3. Divya also wants to make fruit smoothies for dessert. She purchases a container of rice milk for \$3.49, two pounds of strawberries at \$4.99 per pound, and six bananas at \$0.75 each. How much did Divya spend on dessert? Show your work.

UNIT 2: Number Operations

MODULE 4 Operations with Fractions

LESSON 4-1

Practice and Problem Solving: A/B

- $\frac{4}{7}$
- $\frac{1}{2}$
- $\frac{4}{15}$
- 20
- 12
- 9
- $1\frac{1}{10}$
- $\frac{4}{15}$
- $\frac{3}{4}$
- $\frac{5}{12}$
- $4\frac{19}{24}$
- $1\frac{23}{45}$
- 3 h
- $\frac{1}{6}$ of a pizza

Practice and Problem Solving: C

- $\frac{1}{6}$
- $\frac{1}{6}$
- 14
- $1\frac{3}{10}$
- $1\frac{13}{30}$

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

7. flour: 2 c; butter : $1\frac{1}{3}$ T; fruit: $2\frac{2}{3}$ c; sugar:

$\frac{1}{2}$ c; salt: $\frac{1}{3}$ t

8. $\frac{11}{24}$ of the pizza

9. the least common denominator

Practice and Problem Solving: D

- $\frac{1}{2}$
- $\frac{3}{5}$
- 15
- $\frac{23}{30}$
- $1\frac{1}{20}$
- $1\frac{2}{5}$
- 6 oz
- 20 h
- $\frac{1}{9}$ c

Reteach

- $\frac{7}{12}$
- $\frac{2}{9}$
- $\frac{1}{2}$
- $2\frac{2}{5}$
- $\frac{1}{3}$
- $\frac{2}{7}$
- $1\frac{7}{36}$

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

9. $1\frac{19}{60}$

Reading Strategies

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

2. 6

3. $6 \cdot \frac{2}{3} = \frac{12}{3} = 4$

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

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

6. $1\frac{4}{7}$

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

8. $\frac{29}{36}$

9. $1\frac{3}{20}$

Success for English Learners

1. When multiplying, you multiply numerators, then denominators. When adding, you change the fractions to fractions with a common denominator and then add the numerators.
2. When multiplying, the GCF helps simplify. When adding or subtracting, the LCM as denominator lets you use smaller numbers.

LESSON 4-2**Practice and Problem Solving: A/B**

1. $\frac{7}{5}$

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

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

4. 10

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

6. $\frac{14}{13}$

7. $\frac{12}{7}$

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

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

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

11. $1\frac{5}{16}$

12. $1\frac{1}{5}$

13. $\frac{1}{12}$

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

15. $2\frac{7}{9}$

16. $1\frac{1}{9}$

17. $1\frac{1}{24}$

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

19. 24 sandwiches

20. $10\frac{1}{2}$ lb

21. 36 points

Practice and Problem Solving: C

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

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

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

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

5. $\frac{9}{8}$; greater
6. $\frac{4}{13}$; less
7. It is greater than 1.
8. It is less than 1.
9. 1
10. $1\frac{1}{4}$
11. $1\frac{11}{24}$
12. $2\frac{2}{9}$
13. $\frac{5}{6}$
14. $\frac{45}{49}$
15. $\frac{11}{15}$
16. They are greater than 1.
17. They are less than 1.
18. 14; $7\frac{1}{2}$ min

Practice and Problem Solving: D

1. $\frac{3}{2}$
2. $\frac{9}{7}$
3. $\frac{5}{8}$
4. $\frac{9}{1}$
5. $\frac{10}{9}$
6. $\frac{10}{3}$
7. $\frac{7}{4}$
8. $\frac{1}{8}$
9. $\frac{7}{6}$

10. $1\frac{1}{2}$
11. $1\frac{1}{20}$
12. $1\frac{1}{9}$
13. $\frac{9}{25}$
14. $\frac{7}{9}$
15. $\frac{21}{25}$
16. $1\frac{1}{6}$
17. $1\frac{3}{8}$
18. $\frac{13}{14}$
19. $\frac{16}{3}$; 64; $21\frac{1}{3}$; $21\frac{1}{3}$
20. 9 in.
21. $\frac{1}{5}$ h

Reteach

1. $\frac{1}{4} \cdot \frac{3}{1} = \frac{3}{4}$
2. $\frac{1}{2} \cdot \frac{4}{1} = 2$
3. $\frac{3}{8} \cdot \frac{2}{1} = \frac{6}{8} = \frac{3}{4}$
4. $\frac{1}{3} \cdot \frac{4}{3} = \frac{4}{9}$
5. $\frac{2}{5}$
6. $\frac{1}{4}$
7. $\frac{5}{16}$
8. $\frac{1}{4}$

Reading Strategies

1. $3; \frac{1}{2}$
2. $\frac{7}{8} \cdot 4 = 3\frac{1}{2}$
3. 3
4. $\frac{4}{8}; \frac{1}{2}$
5. $3\frac{1}{2}$
6. The answer is the same.

Success for English Learners

1. To find the reciprocal of a fraction you swap or make the numerator the denominator and the denominator the numerator.
2. Find the reciprocal of $\frac{1}{3}$ which is $\frac{3}{1}$.
Multiply $\frac{5}{8}$ by $\frac{3}{1}$. $\frac{5}{8} \cdot \frac{3}{1} = \frac{15}{8}$.
Then simplify: $\frac{15}{8} = 1\frac{7}{8}$
3. The product of any fraction and its reciprocal is 1.
Sample answer: $\frac{2}{3} \cdot \frac{3}{2} = \frac{6}{6} = 1$

LESSON 4-3

Practice and Problem Solving: A/B

1. $\frac{2}{21}; \frac{21}{2} \times \frac{2}{21} = 1$
2. $\frac{7}{45}; \frac{45}{7} \times \frac{7}{45} = 1$
3. $\frac{9}{26}; \frac{26}{9} \times \frac{9}{26} = 1$
4. $\frac{4}{61}; \frac{61}{4} \times \frac{4}{61} = 1$
5. $\frac{3}{29}; \frac{29}{3} \times \frac{3}{29} = 1$
6. $\frac{8}{61}; \frac{61}{8} \times \frac{8}{61} = 1$
7. $\frac{24}{55}$

8. $1\frac{1}{13}$
9. $1\frac{3}{5}$
10. $1\frac{17}{19}$
11. $1\frac{16}{19}$
12. $\frac{22}{63}$
13. $4\frac{20}{39}$
14. $2\frac{16}{145}$
15. $1\frac{25}{62}$
16. $36\frac{5}{6} \div 5\frac{2}{3} = 6\frac{1}{2}$; No, the slab is not long enough for a 7-ft picnic table since $36\frac{5}{6} \div 5\frac{2}{3} = 6\frac{1}{2}$ ft.
17. $225 \div 13\frac{3}{4} = 16\frac{4}{11}$; The space is wide enough, but since $225 \div 13\frac{3}{4} = 16\frac{4}{11}$ in. and $16\frac{4}{11} > 16$, the space is not long enough to fit the mirror.
18. $16\frac{1}{5} \div 5\frac{2}{5}$; 3 costumes

Practice and Problem Solving: C

1. 21 in.
2. He can make 5 pillowcases, and will have $2\frac{11}{12}$ yd left over.
3. He has hiked $3\frac{11}{12}$ mi.
4. She can make 2 bows.
5. $\frac{1}{6}$ oz
6. He can make 14 more bowls. He can make a total of $15\frac{5}{8} \div \frac{7}{10}$ or 22 bowls in all. $22 - 8 = 14$.

Practice and Problem Solving: D

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

$$2. \frac{(5 \times 7) + 3}{7} = \frac{38}{7}; \frac{7}{38}$$

$$3. \frac{(1 \times 9) + 8}{9} = \frac{17}{9}; \frac{9}{17}$$

$$4. \frac{(14 \times 4) + 1}{4} = \frac{57}{4}; \frac{4}{57}$$

$$5. \frac{(8 \times 3) + 2}{3} = \frac{26}{3}; \frac{3}{26}$$

$$6. \frac{(6 \times 8) + 5}{8} = \frac{53}{8}; \frac{8}{53}$$

$$7. \frac{21}{40}$$

$$8. 1\frac{1}{6}$$

$$9. 1\frac{11}{12}$$

$$10. \frac{11}{12}$$

$$11. 9\frac{3}{5} \div 2\frac{2}{5} = \frac{48}{5} \div \frac{12}{5} = \frac{48}{5} \times \frac{5}{12} = \frac{48}{12} = 4;$$

4 vests

$$12. 20\frac{5}{6} \div 3\frac{1}{2} = \frac{125}{6} \div \frac{7}{2} = \frac{125}{6} \times \frac{2}{7}$$
$$= \frac{250}{42} = 5\frac{40}{42} = 5\frac{20}{21}; 5\frac{20}{21} \text{ ft long}$$

Reteach

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

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

$$3. \frac{3}{32}$$

$$4. \frac{18}{5} \div \frac{9}{4}$$

$$\frac{18}{5} \times \frac{4}{9}$$

$$\frac{72}{45} = \frac{8}{5} = 1\frac{3}{5}$$

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

$$\frac{3}{2} \times \frac{4}{5}$$

$$\frac{12}{10} = \frac{6}{5} = 1\frac{1}{5}$$

$$6. \frac{5}{12} \div \frac{15}{8}$$

$$\frac{5}{12} \times \frac{8}{15}$$

$$\frac{40}{180} = \frac{2}{9}$$

$$7. 6\frac{1}{4}$$

$$8. \frac{7}{16}$$

$$9. 1\frac{2}{3}$$

Reading Strategies

1. Draw a single square and label it $\frac{1}{2}$.

2. to find the number of $\frac{1}{2}$ -ft servings in

$$2\frac{1}{2} \text{ ft.}$$

3. 5

4. 5

Success for English Learners

1. Sample answer: When you divide mixed numbers, you have to change the divisor to its reciprocal and multiply.

2. Change all mixed numbers to improper fractions.

3. You know that $8 \times 7 = 56$, and the area of the rectangle is greater than 56. Since

$$8\frac{1}{2} \times 7 \text{ is greater than } 56, \text{ then the width}$$

would need to be approximately 7 feet.

LESSON 4-4

Practice and Problem Solving: A/B

1. a. $3\frac{1}{3} - 2\frac{5}{6} = 3\frac{2}{6} - 2\frac{5}{6} = \frac{3}{6} = \frac{1}{2}$;

$\frac{1}{2}$ more apple pie than pumpkin pie is left.

b. $1\frac{2}{3}$ apple pie plus $1\frac{5}{12}$ pumpkin pie,
so $3\frac{1}{12}$ pies in all.

2. a. $2\frac{1}{3} - 1\frac{1}{2} = 2\frac{2}{6} - 1\frac{3}{6} = \frac{5}{6}$; $\frac{5}{6}$ of an inch

b. $\frac{5}{6} \times \frac{1}{12} = \frac{5}{72}$; $\frac{5}{72}$ ft

3. $3 \times 3\frac{3}{8} = 3 \times \frac{27}{8} = \frac{81}{8} = 10\frac{1}{8}$ ft²,

$10\frac{1}{8} \div 6 = \frac{81}{8} \times \frac{1}{6} = \frac{27}{8} \times \frac{1}{2} = \frac{27}{16} = 1\frac{11}{16}$;

2 sheets are needed

4. The difference is $\frac{3}{4}$ mi;

$\frac{3}{4} \div 6 = \frac{1}{4} = \frac{3}{4} \times \frac{4}{25} = \frac{3}{25}$

5. $208 + 125\frac{5}{8} = 333\frac{5}{8}$;

$\frac{125\frac{5}{8}}{333\frac{5}{8}} = \frac{\frac{1005}{8}}{\frac{2669}{8}} = \frac{1005}{2669}$ or about $\frac{2}{5}$

Practice and Problem Solving: C

1. $2\frac{3}{4} + \left(1\frac{1}{2}\right)\left(2\frac{3}{4}\right) + \frac{7}{8} = 7\frac{3}{4}$;

$15\frac{1}{2} - 7\frac{3}{4} = 7\frac{3}{4}$ in.

2. $\frac{8}{6} = 1\frac{1}{3}$, $\left(1\frac{1}{3}\right)\left(2\frac{2}{3} + \frac{1}{4}\right) =$

$\frac{4}{3} \left(\frac{8}{3} + \frac{1}{4}\right) = \frac{4}{3} \left(\frac{32}{12} + \frac{3}{12}\right) =$

$\frac{4}{3} \left(\frac{35}{12}\right) = \frac{35}{9} = 3\frac{8}{9}$ c

3. He could multiply Laura's answer by $\frac{1}{2}$ since $\frac{4}{8} = \frac{1}{2}$ or he could find $\frac{4}{6}$ or $\frac{2}{3}$ of the sum of the two liquid

ingredients; $1\frac{17}{18}$ c

4. $\frac{11}{2} \times 4 \times \frac{5}{2} = 55$ ft

5. $2\frac{1}{5} + 1\frac{1}{10} = 3\frac{3}{10}$, $\frac{33}{10} \times \frac{7}{8} = \frac{231}{80} = 2\frac{71}{80}$

$3\frac{3}{10} + 2\frac{71}{80} = 6\frac{15}{80} = 6\frac{3}{16}$ h

6. $\frac{1}{5} + \frac{3}{8} + \frac{2}{7} = \frac{241}{280}$,

$\frac{241}{280} \times 20 = \frac{4820}{280} = 17.21$; $20 - 17.21 = 2.79$;
\$2.79 left

Practice and Problem Solving: D

1. a. $\frac{5}{6} - \frac{1}{3} = \frac{5}{6} - \frac{2}{6} = \frac{3}{6}$ or $\frac{1}{2}$ pie

b. $\frac{5}{6} + \frac{1}{3} = \frac{5}{6} + \frac{2}{6} = \frac{7}{6}$; $\frac{7}{6} \cdot \frac{1}{3} = \frac{7}{18}$;

Terri ate $\frac{7}{18}$ of the pies.

2. a. 1 in.

b. $\frac{1}{12}$ ft

3. $3\frac{1}{8} + 3\frac{1}{8} = 6\frac{1}{4}$; it will take 2 pieces.

4. $5\frac{1}{2} + 6 = 11\frac{1}{2}$; $\frac{6}{11\frac{1}{2}} = \frac{6}{\frac{23}{2}} = 6 \cdot \frac{2}{23} = \frac{12}{23}$

$$5. 208 + 125\frac{5}{8} = 333\frac{5}{8}; 333\frac{5}{8} \cdot \frac{1}{12} = \frac{2669}{8} \cdot \frac{1}{12} = \frac{2669}{96} = 27\frac{77}{96} \text{ lb}$$

Reteach

$$1. 3\frac{5}{8} + 1\frac{3}{4} = 5\frac{3}{8}; 6\frac{1}{2} - 5\frac{3}{8} = 1\frac{1}{8}; 1\frac{1}{8}$$

Reading Strategies

- Answers will vary. Students who are good at estimating answers may prefer Method 1, whereas students who prefer a more-formal method of solving problems may prefer the Method 2.

Success for English Learners

- The common denominator or LCM of 2 and 3 is 6.
- To solve 1a, subtraction
To solve 1b, multiplication

MODULE 4 Challenge

- Find the prices of the rugs by multiplying the area of each rug by \$8.

Type of Rug	Length (ft)	Width (ft)	Area (ft ²)	Price (\$)
Classic	$8\frac{1}{2}$	$10\frac{3}{4}$	$91\frac{3}{8}$	\$731.00
Deco	$10\frac{3}{4}$	$9\frac{3}{8}$	$100\frac{25}{32}$	\$806.25
Solid	$7\frac{2}{5}$	$8\frac{3}{5}$	$63\frac{16}{25}$	\$509.12
Modern	$10\frac{3}{5}$	$9\frac{1}{2}$	$100\frac{7}{10}$	\$805.60

$$\text{Classic} = \frac{17}{2} \times \frac{43}{4} = 91\frac{3}{8} \times \$8 = \$731.00$$

$$\begin{aligned} \text{Deco} &= \frac{43}{4} \times \frac{75}{8} = \frac{3225}{32} = 100\frac{25}{32} \\ &= 100.78125 \times 8 = \$806.25 \end{aligned}$$

$$\text{Solid} = \frac{37}{5} \times \frac{43}{5} = 63.64 \times 8 = \$509.12$$

$$\text{Modern} = \frac{53}{5} \times \frac{19}{2} = 100.7 \times 8 = \$805.60$$

The Deco rug is the most expensive. It costs \$806.25.

$$2. \text{ The area of the Deco is } 100\frac{25}{32} \text{ sq ft.}$$

$$\text{Divide that by } 9\frac{1}{2} = 10\frac{185}{304} \text{ or } 10.61 \text{ ft long.}$$

$$3. \text{ The product will be } \frac{1}{100} \text{ if the last fraction}$$

$$\text{written in the pattern is } \frac{99}{100}. \text{ The 99 in}$$

the previous fraction's denominator will cross-cancel with the 99 in the last fraction's numerator and you will be left with $\frac{1}{100}$.

MODULE 5 Operations with Decimals

LESSON 5-1

Practice and Problem Solving: A/B

- 60
- 60
- 200
- 40
- 50
- 3

$$7. \begin{array}{r} 46 \\ 29 \overline{)1334} \\ \underline{-116} \\ 174 \\ \underline{-174} \\ 0 \end{array}$$

$$8. \begin{array}{r} 227 \\ 92 \overline{)20884} \\ \underline{-184} \\ 248 \\ \underline{-184} \\ 644 \\ \underline{-644} \\ 0 \end{array}$$

$$9. \begin{array}{r} 727 \\ 25 \overline{)18175} \\ \underline{-175} \\ 67 \\ \underline{-50} \\ 175 \\ \underline{-175} \\ 0 \end{array}$$

$$\begin{array}{r} 161 \\ 10. 18 \overline{)2902} \\ \underline{-18} \\ 110 \\ \underline{-108} \\ 22 \\ \underline{-18} \\ 4 \end{array}$$

161 R 4 or $161\frac{2}{9}$

$$\begin{array}{r} 541 \\ 11. 64 \overline{)34680} \\ \underline{-320} \\ 268 \\ \underline{-256} \\ 120 \\ \underline{-64} \\ 56 \end{array}$$

541 R 56 or $541\frac{7}{8}$

$$\begin{array}{r} 243 \\ 12. 215 \overline{)52,245} \\ \underline{-430} \\ 924 \\ \underline{-860} \\ 645 \\ \underline{-645} \\ 0 \end{array}$$

13. 270 students per district

14. about 181 days (181.25)

Practice and Problem Solving: C

1. 60; 59

2. 60; 55.2

3. 200; 225.3

4. 40; 37.0952381

5. 50; 49.0 $\overline{5}$

6. 3; 2.875

7. Estimating to the nearest 10 usually gave a closer estimate.

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

9. $\frac{7}{8}$

$$10. \frac{14}{215}$$

11. \$2,550.00

12. a. about 120.8 days

b. 30 days

Practice and Problem Solving: D

1. 3; 3; $300 \div 30$, or about 10

2. 2; 1; $2,000 \div 100$, or about 20

3. about 35

4. about 20

5.

		2	1	
1	5	3	2	5
		3	0	
		2	5	
		1	5	
		1	0	

Quotient: 21 R 10

6.

		3	3	
2	3	7	6	4
		6	9	
		7	4	
		6	9	
		0	5	

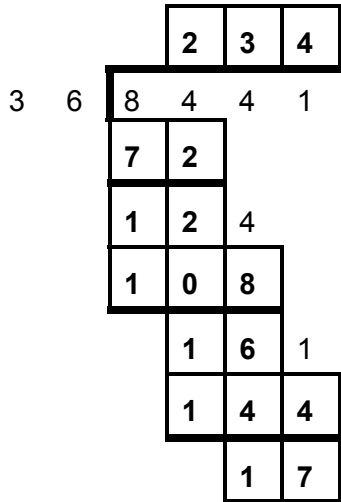
Quotient: 33 R 5

7.

		4	5		
4	1	1	8	7	5
		1	6	4	
		2	3	5	
		2	0	5	
		3	0		

Quotient: 45 R 30

8.



Quotient: 234 R 17

Reteach

$$\begin{array}{r}
 43 \\
 11 \overline{)473} \\
 \underline{-44} \\
 33 \\
 \underline{-33} \\
 0
 \end{array}$$

Divide: $47 \div 11 = 4$

Multiply: $11 \times 4 = 44$

Subtract: $47 - 44 = 3$

Bring down the 3.

Repeat the steps.

Divide: $33 \div 11 = 3$

Multiply: $3 \times 11 = 33$

Subtract: $33 - 33 = 0$

Answer: 43 markers

Reading Strategies

1. 645
2. 120
3. number of items in a group
4. number of groups
5. 43; number of groups
6. 24; number of items in a group

Success for English Learners

1. An overestimate, since $2 > 1.846$.
2. Compatible numbers are easy to add, subtract, multiply, or divide.

3. $13\frac{14}{17}$

LESSON 5-2

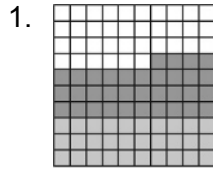
Practice and Problem Solving: A/B

1. 3.8
2. 3.8
3. 7.9
4. 16
5. 0.44
6. 10.4
7. 11.95
8. 1.84
9. 11.014
10. 1.8 m
11. \$12.30
12. 4
13. 5
14. 3
15. \$12.99
16. 16.65 ft

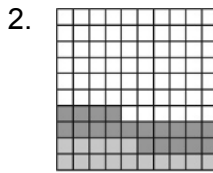
Practice and Problem Solving: C

1. 0.666...
2. 1.1666...
3. 3.111...
4. 5.2777...
5. They all have repeating digits.
6. 0.999...
7. 0.575757...
8. 2.111111...
9. 0.333...; 3.333...; 3; $\frac{1}{3}$
10. 0.666...; 6.666...; 6; $\frac{2}{3}$
11. 0.3434...; 34.3434...; 34; $\frac{34}{99}$
12. 1.432432...; 1432.432432...; 1431; $1\frac{16}{37}$
13. Decimals that repeat every decimal place are multiplied by 10. Decimals that repeat every two and three places are multiplied by 100 and 1,000, respectively.

Practice and Problem Solving: D



0.64



0.34

3. 12; 28; 40; 39.65

4. 35; 18; 17; 16.8

5.

	4	7	•	6	5	
+		8	•	0	5	9
	5	5	•	7	0	9

6.

		7	7	•	5	
+		2	3	•	8	7
	1	0	1	•	3	7

7. 27.35

8. 214.3

Reteach

1. 3.75

2. 0.83

3. 4.3, 1.4; 5.7

4. 1.44, 3.8; 10.6

5. 7.3, 8.5; 15.8

6. 12.34, 6.9; 5.44

7. 5, 5.7; underestimate

8. 10; 10.6; underestimate

9. 16; 15.8; overestimate

10. 5; 5.44; underestimate

Reading Strategies

1. It aligns the place values in numbers that are being added or subtracted by lining up the decimal points in the numbers.

2.

	Ones	Tenths	Hundredths
	3	2	5
	1	0	6
+	2	9	0

3.

	Tens	Ones	Tenths	Hundredths
	2	3	8	2
		7	2	0
-				

4. 7.21

5. 16.62

6. 2.9 as 2.90 and 7.2 as 7.20

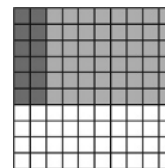
Success for English Learners

1. The decimal point is read as “and.” For example, “1.05” would be read as “one and five hundredths”
2. The answer will differ from the correct answer, sometimes very little and other times by a lot, depending on how far off the decimal placement is in a problem.

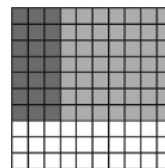
LESSON 5-3

Practice and Problem Solving: A/B

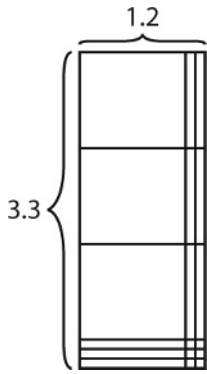
1. 0.12;



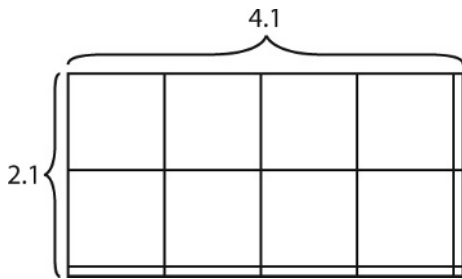
2. 0.21;



3. 3.96



4. 8.61



5. 0.02

6. 5.4

7. 0.24

8. 4.64

9. 0.615

10. 0.6432

11. 14.6797

12. 82.8576

13. 17.5 lb

14. \$26.25

Practice and Problem Solving: C

1. 1×1 or 1; 0.595

2. 3×2 or 6; 5.9475

3. 1×2 or 2; 1.265

4. 5×2 or 10; 8.17626

5. 10×5 or 50; 52.74182

6. 6×20 or 120; 110.23803

7. 2×4 or 8; 4×3 or 12; so, $2.4 \times 3.8 < 3.5 \times 2.8$

8. 6×4 or 24; 3×7 or 21; so, $6.28 \times 3.82 > 3.3 \times 6.84$

9.

Sector	Map Dimensions (cm)	Map Area (cm ²)
A	2.5×5.8	14.5
B	3.7×2.1	7.77
C	4.7×3.5	16.45
D	4.2×2.8	11.76

a. Change cm² to km².

b. No; The total area is: $14.5 + 7.77 + 16.45 + 11.76 = 50.48$ km² which is greater than 50 km².

c. Sectors A, B, and C; Sectors A, B, and D; Sectors A, B, and D; and Sectors B, C and D.

d. The sum of Sectors A, C, and D is 42.71 km². Since these sectors have the greatest areas, their sum maximizes the area studied.

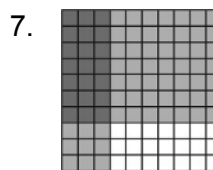
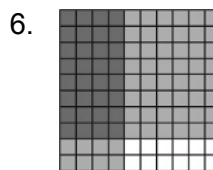
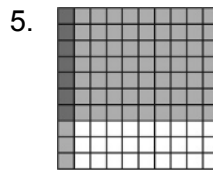
Practice and Problem Solving: D

1. 1.5

2. 3.2

3. 6.3

4. 0.75



8. 1; 2; 3

9. 3; 1; 4

10. 17.875

11. 5.232

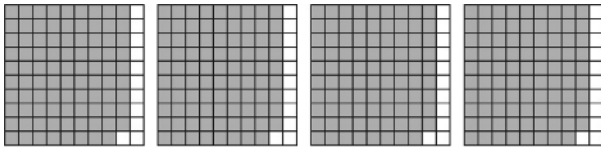
12. a. $3.5 \times \$4.95$
 b. \$14.85
 c. \$2.475 or \$2.48
 d. $\$14.85 + \$2.48 = \$17.33$

Reteach

1. 0.69
2. 0.82
3. 0.05
4. 0.64
5. 0.45
6. 0.84
7. 0.32
8. 0.88
9. 0.16
10. 0.63
11. 0.25
12. 0.18
13. 0.1
14. 0.16
15. 0.09
16. 0.28

Reading Strategies

1.



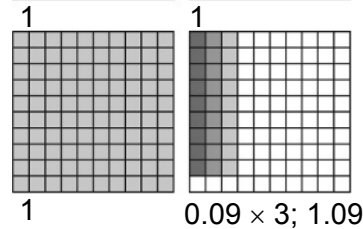
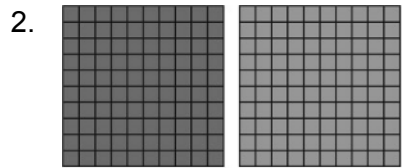
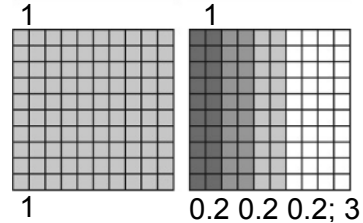
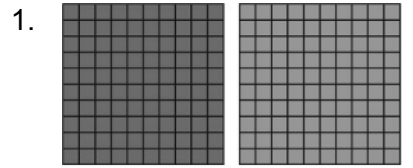
2. $0.89 + 0.89 + 0.89 + 0.89$
3. $0.89 + 0.89 + 0.89 + 0.89 = 3.56$
4. 4×0.89 or 0.89×4
5. $4 \times 0.89 = 3.56$ or $0.89 \times 4 = 3.56$

Success for English Learners

1. Add the decimal places in the factors.
2. left
3. Use estimation and compare it to your answer.
4. no; $1 \times 3 = 3$
5. yes
6. no; $2 \times 3 = 6$

LESSON 5-4

Practice and Problem Solving: A/B



3. 15
 4. 13.2
 5. 5.44
 6. 7
 7. 7.5
 8. 15
 9. About 4; 4.2
 10. Between 12 and 18; 14.4
 11. About 30; 28
 12. About 14; 15
 13. 66 images; the exact answer, $66\frac{2}{3}$, means that last image would not be completely captured.
 14. About 0.142 centimeters per year (or a little over a millimeter per year).
- ### Practice and Problem Solving: C
1. Estimate: $8 \div 2 = 4$; Exact Quotient: 3.5
 2. Estimate: $14 \div 2 = 7$; Exact Quotient: 6.111111 or 6.11...
 3. Estimate: $55 \div 5 = 11$; Exact Quotient: 10.9
 4. <

5. >
6. <
7. =
- 8.

Size	Amount of Liquid	Sale Price	Price per Milliliter
Small	250 milliliters	\$4.50	\$0.018 per mL
Medium	500 milliliters	\$9.95	\$0.0199 per mL
Large	1 liter	\$16.95	\$0.01695 per mL

- a. $0.01695 < 0.018 < 0.0199$ or $0.0199 > 0.018 > 0.01695$
- b. One 1 L and two 250 mL bottles;
 $\$16.95 + (2 \times \$4.50) = \$25.95$
- c. The most expensive way to buy 1,500 mL of the cleaner is to buy three 500 mL bottles, which would be $3(\$9.95) = \29.85 .

Practice and Problem Solving: D

1. 0.7
2. 0.9
3. 0.6
4. 0.8
5. 0.05
6. 0.6
7. 6
8. 7
9. 8
10. 11
11. 2
12. 6
13. \$0.48 or 48 cents
14. 0.09 in.
15. 2 months
16. 2 lb

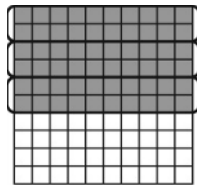
Reteach

1. 0.12
2. 0.13
3. 0.08

4. 300
5. 0.2
6. 0.7
7. 50
8. 0.8

Reading Strategies

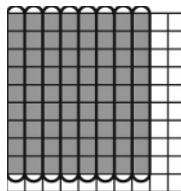
1–2.



3. 0.20

$$4. 0.60 \div 3 = 0.20 = 0.2 \text{ or } 3 \overline{)0.60} = 0.20 = 0.2$$

5–6.



7. 0.09

$$8. 0.72 \div 8 = 0.09 \text{ or } 8 \overline{)0.72} = 0.09$$

Success for English Learners

1. 3
2. No; 12 divides 36 evenly with no remainder.
3. Answers will vary. Sample answer: How much gas will Sari's car use to travel 332.5 miles? ($332.5 \div 17.5 = 19$) e.g. what is the miles per gallon rate for the total trip?

LESSON 5-5

Practice and Problem Solving: A/B

1. \$3.10
2. 3 vans
3. 7 packs
4. 8 pairs
5. $68\frac{4}{5}$ in.; $5\frac{11}{15}$ ft
6. 12 T

7. \$3,565
8. Joey; 0.2 points
9. $4\frac{1}{6}$ c
10. $60\frac{1}{2}$ lb

Practice and Problem Solving: C

1. 59 scarves
2. 2 ft
3. \$11.09
4. \$7.52
5. 11.585 h; 2.317 h; A, C, D
6. 49; \$116.13
7. \$0.04; \$0.13; 230

Practice and Problem Solving: D

1. $\frac{3}{20}$ mi
2. 11 weeks
3. 6 costumes
4. \$26.28
5. 27.6 mpg
6. 15 ft
7. $10\frac{1}{2}$ lb
8. $2\frac{1}{2}$ batches
9. 6 costumes
10. \$276.36

Reteach

1. divide; 7 tickets
2. multiply; \$36.00
3. divide; 10.97 ft
4. divide; 3

Reading Strategies

1. pumpkin's weight of 31.3 lb and that there are 3 parts; weight of 1 part; divide; 10.43 lb

2. pumpkin's weight of $22\frac{2}{3}$ lb; $\frac{1}{6}$ of weight; multiply; $3\frac{7}{9}$ lb
3. pumpkin's weight of $42\frac{1}{3}$ lb and that each piece will be $2\frac{1}{2}$ lb; number of pieces; divide; 16 pieces

Success for English Learners

1. You place the decimal point right above the decimal point in the number that is being divided.
2. Multiply the answer by 3, and see if it equals \$11.61.

MODULE 5 Challenge

1. Multiply the price of each ingredient by the quantity given, then add.
 Beef: $\$10.65 \times 3.25 = \34.61 ;
 Onion: $\$2.49 \times 0.65 = \1.62 ;
 Potatoes: $\$3.29 \times 0.2 = \0.66 ;
 Tomatoes: $\$8.45 \times 0.15 = \1.27 ;
 Asparagus: $\$4.99 \times 0.33 = \1.65 ;
 Total cost: $\$34.61 + \$1.62 + \$0.66 + \$1.27 + \$1.65 = \39.81 .
2. Subtract the price of beef from the original total: $\$39.81 - \$34.61 = \$5.20$
 Add the price of the chickpeas and lentils. Multiply the price of each ingredient by the quantity given, then add.
 Chickpeas: $\$2.49 \times 2.5 = \6.23 ; Lentils: $\$3.59 \times 1.75 = \6.28
 The new total price is $\$5.20 + \$6.23 + \$6.28 = \17.71
 Divya saves $\$39.81 - \$17.71 = \$22.10$ by making the vegetarian version of her meal.
3. $\$3.49 + 2 \times \$4.99 + 6 \times \$0.75 = \17.97 . She will spend \$17.97 on dessert.