Name_____ Date _____

Fair Game Review

Estimate the product or quotient.

1. 91×17

2. 57×29

3. $83 \div 18$

4. $204 \div 9$

5. $152 \div 31$

6. 13×78

7. 32×51

8. $651 \div 49$

9. There are 546 people attending a charity event. You are baking cookies to give away. Each batch makes 48 cookies. Estimate the number of batches you need to make so that each person gets one cookie.

Big Ideas Math Green **29**
Record and Practice Journal

Name _____ Date _____

Find the product or quotient.

10.   351
       × 15

11.   187
       × 27

12. 9)‾333‾

13. 3)‾474‾

14. A bleacher row can seat 14 people. The bleachers are filled to capacity with 1330 people at a soccer game. How many rows of bleachers does the soccer field have?

Name_____ Date_____

Essential Question What does it mean to multiply fractions?

1 ACTIVITY: Multiplying Fractions

Work with a partner. A bottle of water is $\frac{1}{2}$ full. You drink $\frac{2}{3}$ of the water.

How much of the bottle of water do you drink?

THINK ABOUT THE QUESTION: To help you think about this question, rewrite the question.

Words: What is $\frac{2}{3}$ of $\frac{1}{2}$?   **Numbers:** $\frac{2}{3} \times \frac{1}{2} = ?$

Here is one way to get the answer.

- **Draw** a segment to represent a length of $\frac{1}{2}$.

- **Show** how to divide $\frac{1}{2}$ into three equal parts.

- **Rewrite** $\frac{1}{2}$ as a fraction whose numerator is divisible by 3.

- Each part is $\frac{1}{6}$ of the bottle of water, and you drank two of them. Written

    as multiplication, you have $\frac{2}{3} \times \frac{1}{2} = $ _____.

You drank _____ of the bottle of water.

Name _____ Date _____

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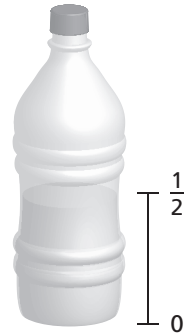
2 **ACTIVITY:** Multiplying Fractions

A park has a playground that is $\frac{3}{4}$ of its width and $\frac{4}{5}$ of its length. What fraction of the park is covered by the playground?

Fold a piece of paper horizontally into fourths and shade three of the fourths to represent $\frac{3}{4}$.

Fold the paper vertically into fifths and shade $\frac{4}{5}$ of the paper another color.

Count the total number of squares. This number is the denominator.
The numerator is the number of squares shaded with both colors.

$\frac{3}{4} \times \frac{4}{5} =$ _____ $=$ _____. So, _____ of the park is covered by the playground.
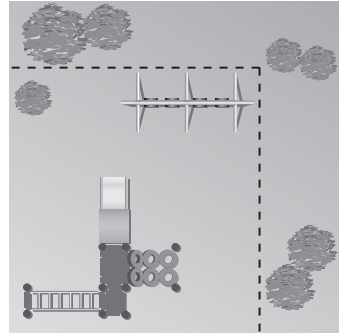
Inductive Reasoning

Work with a partner. Complete the table by using a model or folding paper.

	Exercise	Verbal Expression	Answer
1	3. $\frac{2}{3} \times \frac{1}{2}$		
2	4. $\frac{3}{4} \times \frac{4}{5}$		
	5. $\frac{2}{3} \times \frac{5}{6}$		
	6. $\frac{1}{6} \times \frac{1}{4}$		
	7. $\frac{2}{5} \times \frac{1}{2}$		
	8. $\frac{5}{8} \times \frac{4}{5}$		

2.1 **Multiplying Fractions** (continued)

What Is Your Answer?

9. IN YOUR OWN WORDS What does it mean to multiply fractions?

10. STRUCTURE Write a general rule for multiplying fractions.

Name _____ Date _____

Multiply. Write the answer in simplest form.

1. $\dfrac{1}{6} \times \dfrac{5}{8}$

2. $\dfrac{7}{9} \times 3$

3. $\dfrac{8}{9} \times \dfrac{3}{5}$

4. $\dfrac{7}{8} \times 2\dfrac{1}{3}$

5. $7 \times 3\dfrac{9}{14}$

6. $5\dfrac{5}{9} \times 2\dfrac{7}{10}$

7. You reserve $\dfrac{2}{5}$ of the seats on a tour bus. You are able to fill $\dfrac{5}{8}$ of the seats you reserve. What fraction of the seats on the bus are you able to fill?

8. A triangle has a base of $5\dfrac{2}{3}$ inches and a height of 3 inches. What is the area of the triangle?

Name_____ Date _____

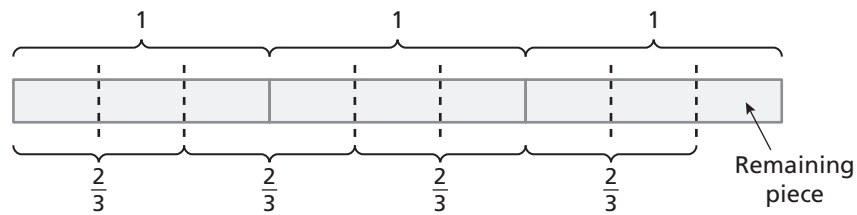## 2.2 Dividing Fractions
For use with Activity 2.2

Essential Question How can you divide by a fraction?

1 ACTIVITY: Dividing by a Fraction

Work with a partner. Write the division problem and solve it using a model.

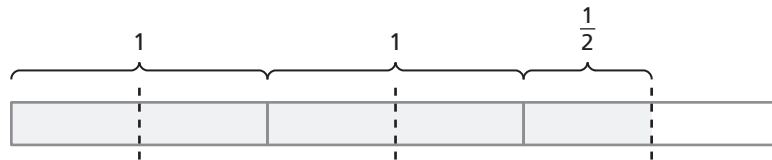**a.** How many two-thirds are in three?

The division problem is _____.

How many groups of $\dfrac{2}{3}$ are in 3? _____

The remaining piece represents _____ of $\dfrac{2}{3}$.

So, there are _____ groups of $\dfrac{2}{3}$ in 3.

So, _____ ÷ _____ = _____.

b. How many halves are in five halves?

c. How many four-fifths are in eight?

2.2 **Dividing Fractions (continued)**

    d. How many one-thirds are in seven halves?

    e. How many three-fourths are in five halves?

2 **ACTIVITY:** Using Tables to Recognize a Pattern

Work with a partner.

    a. Complete each table.

Division Table		Multiplication Table	
$8 \div 16$		$8 \times \dfrac{1}{16}$	
$8 \div 8$		$8 \times \dfrac{1}{8}$	
$8 \div 4$		$8 \times \dfrac{1}{4}$	
$8 \div 2$		$8 \times \dfrac{1}{2}$	
$8 \div 1$		8×1	
$8 \div \dfrac{1}{2}$		8×2	
$8 \div \dfrac{1}{4}$		8×4	
$8 \div \dfrac{1}{8}$		8×8	

2.2   **Dividing Fractions** (continued)

    b. Describe the relationship between the numbers in the right column of the division table and the numbers in the right column of the multiplication table.

    c. Describe the relationship between the shaded numbers in the division table and the shaded numbers in the multiplication table.

    d. **STRUCTURE** Make a conjecture about how you can use multiplication to divide by a fraction.

    e. Test your conjecture using the problems in Activity 1.

What Is Your Answer?

    3. **IN YOUR OWN WORDS** How can you divide by a fraction? Give an example.

    4. How many halves are in a fourth? Explain how you found your answer.

Name _____ Date _____

Complete the statement.

1. $\dfrac{3}{8} \times$ _____ $= 1$

2. $7 \times$ _____ $= 1$

3. $3 \div$ _____ $= 36$

4. $\dfrac{4}{9} \div$ _____ $= 12$

Evaluate the expression.

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

6. $\dfrac{3}{8} \div \dfrac{5}{8}$

7. $6 \div \dfrac{2}{5}$

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

9. $\dfrac{1}{3} + \dfrac{4}{7} \div \dfrac{3}{10}$

10. $\dfrac{7}{8} \bullet \dfrac{4}{5} \div \dfrac{7}{20}$

11. In a jewelry store, rings make up $\dfrac{5}{9}$ of the inventory. Earrings make up $\dfrac{4}{15}$ of the inventory. How many times greater is the ring inventory than the earring inventory?
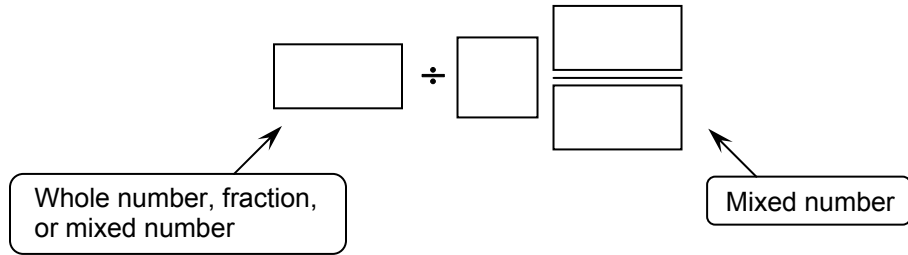
2.3 Dividing Mixed Numbers
For use with Activity 2.3

Essential Question How can you model division by a mixed number?

---

1 ACTIVITY: Writing a Story

Work with a partner. Think of a story that uses division by a mixed number.

$$\boxed{} \div \boxed{}\ \boxed{}$$

Whole number, fraction, or mixed number

Mixed number

a. Write your story. Then draw pictures for your story.

**b.** Solve the division problem and use the answer in your story. Include a diagram of the division problem.

There are many possible stories. Here is one that uses $6 \div 1\frac{1}{2}$.

Joe goes on a camping trip with his aunt, his uncle, and three cousins. They leave at 5:00 P.M. and drive 2 hours to the campground.
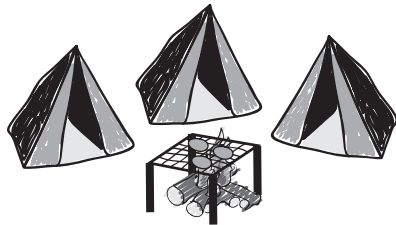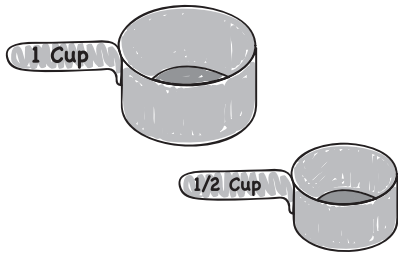
Joe helps his uncle put up three tents. His aunt cooks hamburgers on a grill that is over a fire.

In the morning, Joe tells his aunt that he is making pancakes. He decides to triple the recipe so there will be plenty of pancakes for everyone. A single recipe uses 2 cups of water, so he needs a total of 6 cups.

Pancake Mix
Recipe:
2 cups water
2 cups pancake mix
1/4 cup oil
1 egg
1/4 teaspoon salt
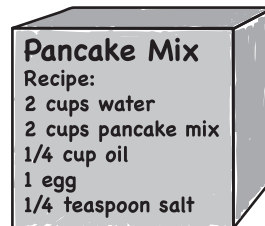
2.3 **Dividing Mixed Numbers** (continued)

Joe's aunt has a 1-cup measuring cup and a ½-cup measuring cup. The water faucet is about 50 yards from the campsite. Joe tells his cousins that he can get 6 cups of water in only 4 trips.

When his cousins ask him how he knows that, he uses a stick to draw a diagram in the dirt. Joe says, "This diagram shows that there are four 1½s in 6." In other words,
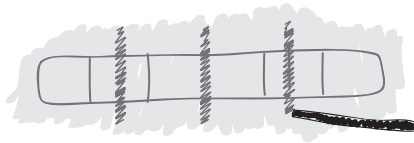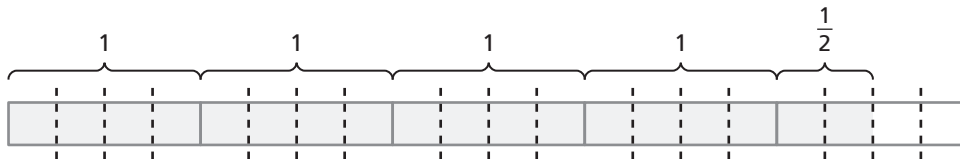
$$6 \div 1\frac{1}{2} = 4.$$

2 **ACTIVITY:** Dividing Mixed Numbers

Work with a partner. Write the division problem and solve it using a model.

  a. How many three-fourths are in four and one-half?

  b. How many five-sixths are in three and one-third?

2.3 **Dividing Mixed Numbers** (continued)

   c. How many three-eighths are in three and three-fourths?

   d. How many one and one-halves are in six?

   e. How many one and one-fifths are in five?

   f. How many one and one-fourths are in four and one-half?

   g. How many two and one-thirds are in five and five-sixths?

What Is Your Answer?

   3. IN YOUR OWN WORDS How can you model division by a mixed number?

   4. Can you think of another method you can use to obtain your answers in Activity 2?

Name _____ Date _____

Divide. Write the answer in simplest form.

1. $4\dfrac{1}{6} \div 5$

2. $\dfrac{5}{8} \div 5\dfrac{3}{4}$

3. $8\dfrac{1}{6} \div 2\dfrac{1}{24}$

4. $2\dfrac{3}{10} \div 3\dfrac{3}{5}$

5. $6\dfrac{6}{7} \div 3\dfrac{3}{5}$

6. $3\dfrac{3}{5} \div 6\dfrac{6}{7}$

Evaluate the expression.

7. $4\dfrac{7}{12} \div \dfrac{3}{4} \times \dfrac{3}{11}$

8. $9 \div 8\dfrac{1}{10} - \dfrac{5}{9}$

9. $5\dfrac{7}{8} \times \left(2\dfrac{4}{5} \div 7\right)$

10. At a road race, you have $60\dfrac{3}{4}$ feet available for a water station. Your tables are $6\dfrac{3}{4}$ feet long. How many tables can you line up for the water station?
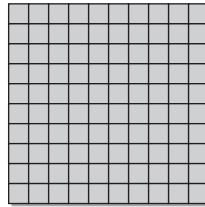
2.4 Adding and Subtracting Decimals
For use with Activity 2.4

Essential Question   How can you add and subtract decimals?

Base ten blocks can be used to model numbers.*

1 one	1 tenth	1 hundredth

---

1   ACTIVITY: Modeling a Sum

Work with a partner. Use base ten blocks to find the sum.

a. 1.23 + 0.87

Which base ten blocks do you need to model the numbers in the sum?
How many of each do you need? Draw a sketch of your model.

How many of each base ten block do you have when you combine the blocks?

_____ ones   _____ tenths   _____ hundredths

How many of each base ten block do you have when you trade the blocks?

_____ ones   _____ tenths   _____ hundredths

So, 1.23 + 0.87 = _____.

b. 1.25 + 1.35   **c.** 2.14 + 0.92   **d.** 0.73 + 0.86

*Cut-outs are available in the back of the Record and Practice Journal.
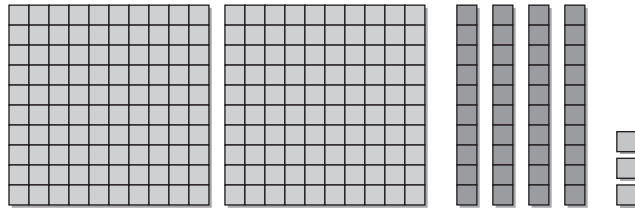
2.4 **Adding and Subtracting Decimals** (continued)

2 **ACTIVITY:** Modeling a Difference

Work with a partner. Use base ten blocks to find the difference.

  a. 2.43 − 0.73

   Which number is shown by the
   model?

   Circle the portion of the model
   that represents 0.73.

   So, 2.43 − 0.73 = _____.

  b. 1.86 − 1.26   **c.** 3.72 − 0.5   **d.** 1.58 − 0.09

3 **ACTIVITY:** Making a Conjecture

Work with a partner.

  a. Find each sum or difference.

   123 + 87   125 + 135   214 + 92   73 + 86

   243 − 73   186 − 126   372 − 50   158 − 9

  b. How are the numerical expressions in part (a) related to the numerical
   expressions in Activities 1 and 2? How are the sums and differences related?

  c. **STRUCTURE** There is a relationship between adding and subtracting
   decimals and adding and subtracting whole numbers. What conjecture
   can you make about this relationship?

2.4 **Adding and Subtracting Decimals** (continued)

4 **ACTIVITY:** Using a Place Value Chart

Work with a partner. Use the place value chart to find the sum or difference.

Place Value Chart

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones	and	tenths	hundredths	thousandths	ten-thousandths	hundred-thousandths	millionths
							•						
							•						
							•						

a. $16.05 + 2.94$

b. $7.421 + 92.55$

c. $38.72 - 8.61$

d. $64.968 - 51.167$

What Is Your Answer?

5. MODELING Describe two real-life examples of when you would need to add and subtract decimals.

6. IN YOUR OWN WORDS How can you add and subtract decimals?

Name _____ Date _____

Add.

1. $3.02 + 1.67$

2. $1.4 + 8.68$

3. $11.514 + 4.29$

4. $15.71 + 12.643$

5. $9.562 + 21.764$

6. $15.602 + 2.47$

Subtract.

7. $2.64 - 1.52$

8. $4.023 - 3.146$

9. $7.87 - 5.152$

10. $16.045 - 12.63$

11. $17.1 - 11.457$

12. $5.18 - 2.487$

13. You buy a movie for $19.99 and a set of earphones for $12.49. How much is the bill before taxes?

2.5 Multiplying Decimals
For use with Activity 2.5

Essential Question How can you multiply decimals?

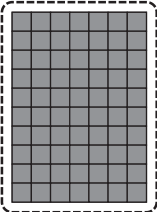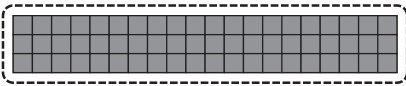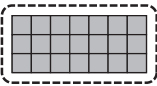**1** **ACTIVITY:** Multiplying Decimals Using a Rectangle
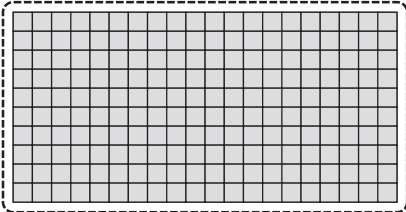
Work with a partner. Use a rectangle to find the product.

a. $2.7 \bullet 1.3$

Arrange base ten blocks to form a rectangle of length 2.7 units and width 1.3 units. Sketch your model.

The area of the rectangle represents the product.

Find the total area represented by each grouping of base ten blocks.

Area = [   ] units^2 Area = [   ] units^2

Area = [   ] units^2 Area = [   ] units^2

The area of the rectangle is

_____ + _____ + _____ + _____ = _____ units^2.

So, $2.7 \bullet 1.3 =$ _____.

2.5 **Multiplying Decimals** (continued)

    b. $1.8 \bullet 1.1$ **c.** $4.6 \bullet 1.2$ **d.** $3.2 \bullet 2.4$

2   **ACTIVITY:** Multiplying Decimals Using an Area Model

Work with a partner. Use an area model to find the product. Explain your reasoning.

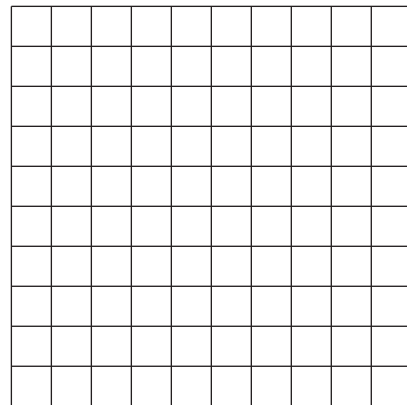   **a.** $0.8 \bullet 0.5$

    Use the 10-by-10 square grid.

    Shade 8 rows of the grid to represent 0.8.

    Shade 5 columns of the grid to represent 0.5. Use a different color.

    Because _____ hundredths are shaded with

    both colors, the product is $\dfrac{}{100}$ = _____.

    So, $0.8 \bullet 0.5 =$_____.

    b. $0.3 \bullet 0.5$ **c.** $0.7 \bullet 0.6$ **d.** $0.2 \bullet 0.9$

2.5 **Multiplying Decimals** (continued)

3 **ACTIVITY:** Making a Conjecture

Work with a partner.

a. Find each product.

27 • 13	18 • 11	46 • 12	32 • 24

8 • 5	3 • 5	7 • 6	2 • 9

b. How are the numerical expressions in part (a) related to the numerical expressions in Activities 1 and 2? How are the products related?

c. **STRUCTURE** What conjecture can you make about the relationship between multiplying decimals and multiplying whole numbers?

What Is Your Answer?

4. **IN YOUR OWN WORDS** How can you multiply decimals?

Name _____ Date _____

Multiply. Use estimation to check your answer.

1.   0.5
       $\times\ 4$

2.   3.8
       $\times\ 6$

3.   2.1
       $\times\ 11$

4.   0.8
       $\times 0.6$

5.   0.003
       $\times\ 0.09$

6.   8.91
       $\times 1.26$

7. You earn $7.80 an hour working as a dog sitter. You work 12.5 hours during the weekend. How much money do you make?

8. You use a microscope to look at bacteria that is 0.0034 millimeter long. The microscope magnifies the bacteria 430 times. How long does the bacteria appear to be when you look at it through the microscope?

Name_____ Date _____

2.6 Dividing Decimals
For use with Activity 2.6

Essential Question How can you use base ten blocks to model decimal division?

1 ACTIVITY: Dividing Decimals

Work with a partner. Use base ten blocks to model the division.

a. $2.4 \div 0.6$

Begin by modeling 2.4 with base ten blocks. Sketch your model.

How many of each base ten block did you use?

_____ ones   _____ tenths   _____ hundredths

Next, think of the division problem $2.4 \div 0.6$ as the question,

"How can you divide 2.4 into groups of 0.6 ?"

Rearrange the model for 2.4 into groups of 0.6. Sketch your model.

There are _____ groups of 0.6. So, $2.4 \div 0.6 =$ _____.

2.6 **Dividing Decimals** (continued)

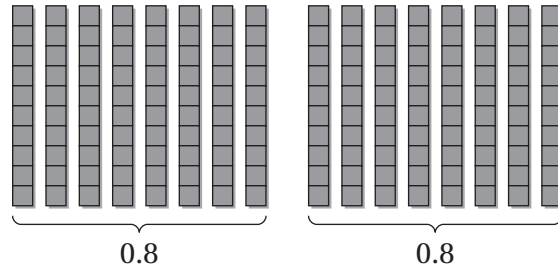**b.** $1.8 \div 2$ **c.** $3.9 \div 3$

d. $2.8 \div 0.7$ **e.** $3.2 \div 0.4$

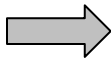**f.** Write and solve the division problem
represented by the model.

0.8   0.8

2 **ACTIVITY:** Dividing Decimals
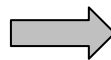
Work with a partner. Use base ten blocks to model the division.

a. $0.3 \div 0.06$

Model 0.3.   ⟹   Replace tenths
with hundredths.   ⟹   How many 0.06s are in
0.3? Divide hundredths
into groups of 0.06.

There are _____ groups of 0.06. So, $0.3 \div 0.06 =$ _____ .

b. $0.2 \div 0.04$ **c.** $0.6 \div 0.01$

d. $0.16 \div 0.08$ **e.** $0.28 \div 0.07$
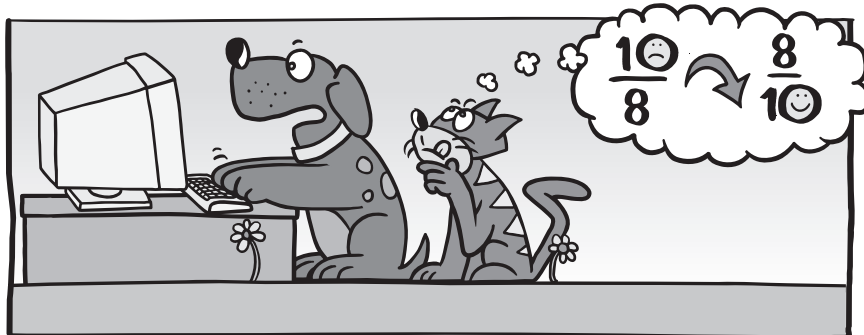
2.6 **Dividing Decimals** (continued)

What Is Your Answer?

3. **IN YOUR OWN WORDS** How can you use base ten blocks to model decimal division? Use examples from Activity 1 and Activity 2 as part of your answer.

4. **WRITING** Newton's poem is about dividing fractions. Write a poem about dividing decimals.

"When you must divide a fraction, do this very simple action: Flip what you're dividing BY, and then it's easy—multiply!"

5. Think of your own cartoon about dividing decimals. Draw your cartoon.

Name _____ Date _____

Divide. Check your answer.

1. $3\overline{)18.6}$

2. $6\overline{)46.8}$

3. $4\overline{)7.6}$

4. $24.5 \div 7$

5. $0.096 \div 8$

6. $15.65 \div 5$

7. $3.1\overline{)17.36}$

8. $6.4\overline{)43.52}$

9. $7.05\overline{)8.46}$

10. $9.24 \div 15.4$

11. $7.06 \div 0.353$

12. $0.015 \div 0.003$

13. It costs $859.32 to have a school dance.

    a. How many tickets must be sold to cover the cost?

School Dance

October 28th
Tickets $8

    b. How many tickets must be sold to make a $980.68 profit?