



A Story of Units

**Pleasanton**  
UNIFIED SCHOOL DISTRICT

**Mathematics Curriculum**



# **GRADE 5 • MODULE 4**

**Multiplication and Division of Fractions and  
Decimal Fractions**

## **PROBLEM SETS**

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Video tutorials: <http://bit.ly/eurekapusd>

Info for parents: <http://bit.ly/pusdmath>



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**GRADE 5 • MODULE 4**

## Multiplication and Division of Fractions and Decimal Fractions

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Name \_\_\_\_\_

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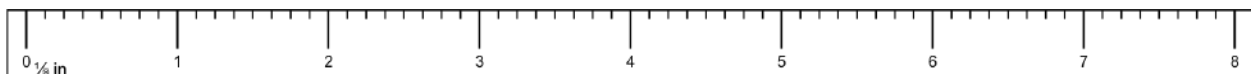
1. Estimate the length of your pencil to the nearest inch. \_\_\_\_\_
2. Using a ruler, measure your pencil strip to the nearest  $\frac{1}{2}$  inch and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.



3. Using a ruler, measure your pencil strip to the nearest  $\frac{1}{4}$  inch and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.



4. Using a ruler, measure your pencil strip to the nearest  $\frac{1}{8}$  inch and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.



5. Use all three of your line plots to complete the following.
- Compare the three plots, and write one sentence that describes how the plots are alike and one sentence that describes how they are different.
  - What is the difference between the measurements of the longest and shortest pencils on each of the three line plots?
  - Write a sentence describing how you could create a more precise ruler to measure your pencil strip.

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1. Draw a picture to show the division. Write a division expression using unit form. Then, express your answer as a fraction. The first one is partially done for you.

a.  $1 \div 5 = 5 \text{ fifths} \div 5 = 1 \text{ fifth} = \frac{1}{5}$

b.  $3 \div 4$

c.  $6 \div 4$

2. Draw to show how 2 children can equally share 3 cookies. Write an equation, and express your answer as a fraction.

3. Carly and Gina read the following problem in their math class.

*Seven cereal bars were shared equally by 3 children. How much did each child receive?*

Carly and Gina solve the problem differently. Carly gives each child 2 whole cereal bars, and then divides the remaining cereal bar between the 3 children. Gina divides all the cereal bars into thirds and shares the thirds equally among the 3 children.

- a. Illustrate both girls' solutions.

- b. Explain why they are both right.

4. Fill in the blanks to make true number sentences.

a.  $2 \div 3 = \underline{\quad}$

b.  $15 \div 8 = \underline{\quad}$

c.  $11 \div 4 = \underline{\quad}$

d.  $\frac{3}{2} = \underline{\quad} \div \underline{\quad}$

e.  $\frac{9}{13} = \underline{\quad} \div \underline{\quad}$

f.  $1\frac{1}{3} = \underline{\quad} \div \underline{\quad}$

Name \_\_\_\_\_

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1. Fill in the chart. The first one is done for you.

Division Expression	Unit Forms	Improper Fraction	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $5 \div 4$	20 fourths $\div 4$ = 5 fourths	$\frac{5}{4}$	$1\frac{1}{4}$	<div> <math display="block">\begin{array}{r} 1\frac{1}{4} \\ 4 \overline{) 5} \\ \underline{-4} \\ 1 \end{array}</math> <div>Check</div> <math display="block">4 \times 1\frac{1}{4} = 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4}</math> <math display="block">= 4 + \frac{4}{4}</math> <math display="block">= 4 + 1</math> <math display="block">= 5</math> </div>
b. $3 \div 2$	___ halves $\div 2$ = ___ halves		$1\frac{1}{2}$	
c. ___ $\div$ ___	24 fourths $\div 4$ = 6 fourths			$4 \overline{) 6}$
d. $5 \div 2$		$\frac{5}{2}$	$2\frac{1}{2}$	



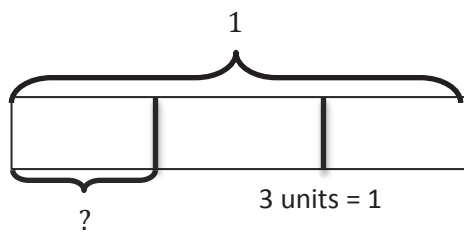
2. A principal evenly distributes 6 reams of copy paper to 8 fifth-grade teachers.
  - a. How many reams of paper does each fifth-grade teacher receive? Explain how you know using pictures, words, or numbers.
  
  
  
  
  
  
  
  
  
  
  - b. If there were twice as many reams of paper and half as many teachers, how would the amount each teacher receives change? Explain how you know using pictures, words, or numbers.
  
  
  
  
  
  
  
  
  
  
3. A caterer has prepared 16 trays of hot food for an event. The trays are placed in warming boxes for delivery. Each box can hold 5 trays of food.
  - a. How many warming boxes are necessary for delivery if the caterer wants to use as few boxes as possible? Explain how you know.
  
  
  
  
  
  
  
  
  
  
  - b. If the caterer fills a box completely before filling the next box, what fraction of the last box will be empty?

Name \_\_\_\_\_

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1. Draw a tape diagram to solve. Express your answer as a fraction. Show the multiplication sentence to check your answer. The first one is done for you.

a.  $1 \div 3 = \frac{1}{3}$



1 unit =  $1 \div 3$

$= \frac{1}{3}$

$$\begin{array}{r} 0 \frac{1}{3} \\ 3 \overline{) 1} \\ \underline{- 0} \\ 1 \end{array}$$

Check:  $3 \times \frac{1}{3}$   
 $= \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$   
 $= \frac{3}{3}$   
 $= 1$

b.  $2 \div 3 = \underline{\hspace{1cm}}$

c.  $7 \div 5 = \underline{\hspace{1cm}}$

d.  $14 \div 5 = \underline{\hspace{1cm}}$

2. Fill in the chart. The first one is done for you.

Division Expression	Fraction	Between which two whole numbers is your answer?	Standard Algorithm
a. $13 \div 3$	$\frac{13}{3}$	4 and 5	$  \begin{array}{r}  4 \frac{1}{3} \\  3 \overline{) 13} \\  \underline{-12} \\  1  \end{array}  $
b. $6 \div 7$		0 and 1	$  \begin{array}{r}  7 \overline{) 6}  \end{array}  $
c. $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}$	$\frac{55}{10}$		$  \begin{array}{r}  \overline{\hspace{1cm}} \\  \overline{\hspace{1cm}}  \end{array}  $
d. $\underline{\hspace{1cm}} \div \underline{\hspace{1cm}}$	$\frac{32}{40}$		$  \begin{array}{r}  40 \overline{) 32}  \end{array}  $

3. Greg spent \$4 on 5 packs of sport cards.
  - a. How much did Greg spend on each pack?
  
  
  
  
  
  
  
  
  
  
  - b. If Greg spent half as much money and bought twice as many packs of cards, how much did he spend on each pack? Explain your thinking.
  
  
  
  
  
  
  
  
  
  
4. Five pounds of birdseed is used to fill 4 identical bird feeders.
  - a. What fraction of the birdseed will be needed to fill each feeder?
  
  
  
  
  
  
  
  
  
  
  - b. How many pounds of birdseed are used to fill each feeder? Draw a tape diagram to show your thinking.
  
  
  
  
  
  
  
  
  
  
  - c. How many ounces of birdseed are used to fill three birdfeeders?

Name \_\_\_\_\_

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1. A total of 2 yards of fabric is used to make 5 identical pillows. How much fabric is used for each pillow?
2. An ice-cream shop uses 4 pints of ice cream to make 6 sundaes. How many pints of ice cream are used for each sundae?
3. An ice-cream shop uses 6 bananas to make 4 identical sundaes. How many bananas are used in each sundae? Use a tape diagram to show your work.

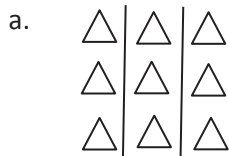
4. Julian has to read 4 articles for school. He has 8 nights to read them. He decides to read the same number of articles each night.
- How many articles will he have to read per night?
  - What fraction of the reading assignment will he read each night?
5. 40 students shared 5 pizzas equally. How much pizza will each student receive? What fraction of the pizza did each student receive?
6. Lillian had 2 two-liter bottles of soda, which she distributed equally between 10 glasses.
- How much soda was in each glass? Express your answer as a fraction of a liter.

- b. Express your answer as a decimal number of liters.
- c. Express your answer as a whole number of milliliters.
7. The Calef family likes to paddle along the Susquehanna River.
- a. They paddled the same distance each day over the course of 3 days, traveling a total of 14 miles. How many miles did they travel each day? Show your thinking in a tape diagram.
- b. If the Calefs went half their daily distance each day, but extended their trip to twice as many days, how far would they travel?

Name \_\_\_\_\_

Date \_\_\_\_\_

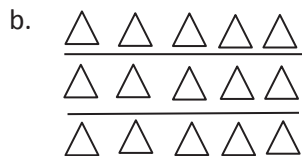
1. Find the value of each of the following.



$$\frac{1}{3} \text{ of } 9 =$$

$$\frac{2}{3} \text{ of } 9 =$$

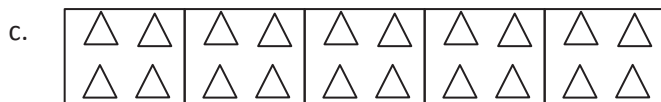
$$\frac{3}{3} \text{ of } 9 =$$



$$\frac{1}{3} \text{ of } 15 =$$

$$\frac{2}{3} \text{ of } 15 =$$

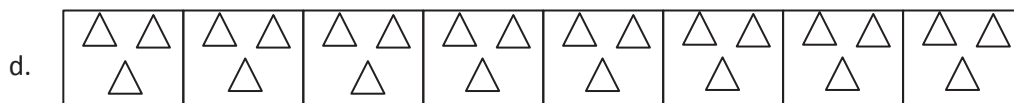
$$\frac{3}{3} \text{ of } 15 =$$



$$\frac{1}{5} \text{ of } 20 =$$

$$\frac{4}{5} \text{ of } 20 =$$

$$\frac{5}{5} \text{ of } 20 = 20$$



$$\frac{1}{8} \text{ of } 24 =$$

$$\frac{6}{8} \text{ of } 24 =$$

$$\frac{3}{8} \text{ of } 24 =$$

$$\frac{7}{8} \text{ of } 24 =$$

$$\frac{4}{8} \text{ of } 24 =$$



2. Find  $\frac{4}{7}$  of 14. Draw a set and shade to show your thinking.
3. How does knowing  $\frac{1}{8}$  of 24 help you find three-eighths of 24? Draw a picture to explain your thinking.
4. There are 32 students in a class. Of the class,  $\frac{3}{8}$  of the students bring their own lunches. How many students bring their lunches?
5. Jack collected 18 ten dollar bills while selling tickets for a show. He gave  $\frac{1}{6}$  of the bills to the theater and kept the rest. How much money did he keep?

Name \_\_\_\_\_

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1. Solve using a tape diagram.

a.  $\frac{1}{3}$  of 18

b.  $\frac{1}{3}$  of 36

c.  $\frac{3}{4} \times 24$

d.  $\frac{3}{8} \times 24$

e.  $\frac{4}{5} \times 25$

f.  $\frac{1}{7} \times 140$

g.  $\frac{1}{4} \times 9$

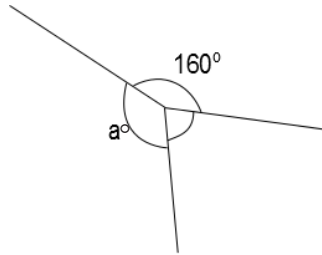
h.  $\frac{2}{5} \times 12$

i.  $\frac{2}{3}$  of a number is 10. What's the number?

j.  $\frac{3}{4}$  of a number is 24. What's the number?

2. Solve using tape diagrams.

- a. There are 48 students going on a field trip. One-fourth are girls. How many boys are going on the trip?



- b. Three angles are labeled below with arcs. The smallest angle is  $\frac{3}{8}$  as large as the  $160^\circ$  angle. Find the value of angle  $a$ .

- c. Abbie spent  $\frac{5}{8}$  of her money and saved the rest. If she spent \$45, how much money did she have at first?

- d. Mrs. Harrison used 16 ounces of dark chocolate while baking. She used  $\frac{2}{5}$  of the chocolate to make some frosting and used the rest to make brownies. How much more chocolate did Mrs. Harrison use in the brownies than in the frosting?

Name \_\_\_\_\_

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1. Laura and Sean find the product of  $\frac{2}{3} \times 4$  using different methods.

*Laura:* It's 2 thirds of 4.

*Sean:* It's 4 groups of 2 thirds.

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

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

Use words, pictures, or numbers to compare their methods in the space below.

2. Rewrite the following addition expressions as fractions as shown in the example.

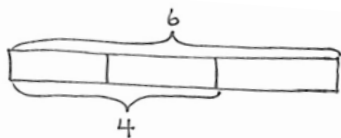
Example:  $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3}$

a.  $\frac{7}{4} + \frac{7}{4} + \frac{7}{4} =$

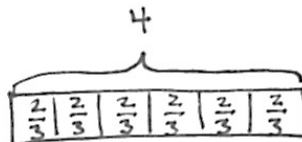
b.  $\frac{14}{5} + \frac{14}{5} =$

c.  $\frac{4}{7} + \frac{4}{7} + \frac{4}{7} =$

3. Solve and model each problem as a fraction of a set and as repeated addition.



Example:  $\frac{2}{3} \times 6 = 2 \times \frac{6}{3} = 2 \times 2 = 4.$



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

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

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

b.  $\frac{3}{5} \times 10$

$10 \times \frac{3}{5}$

4. Solve each problem in two different ways as modeled in the example.

Example:  $6 \times \frac{2}{3} = \frac{6 \times 2}{3} = \frac{3 \times 2 \times 2}{3} = \frac{3 \times 4}{3} = 4$

$6 \times \frac{2}{3} = \frac{\overset{2}{\cancel{6}} \times 2}{\underset{1}{\cancel{3}}} = 4$

a.  $14 \times \frac{3}{7}$

$14 \times \frac{3}{7}$

b.  $\frac{3}{4} \times 36$

$\frac{3}{4} \times 36$

c.  $30 \times \frac{13}{10}$

$30 \times \frac{13}{10}$

d.  $\frac{9}{8} \times 32$

$\frac{9}{8} \times 32$

5. Solve each problem any way you choose.

a.  $\frac{1}{2} \times 60$

$\frac{1}{2}$  minute = \_\_\_\_\_ seconds

b.  $\frac{3}{4} \times 60$

$\frac{3}{4}$  hour = \_\_\_\_\_ minutes

c.  $\frac{3}{10} \times 1000$

$\frac{3}{10}$  kilogram = \_\_\_\_\_ grams

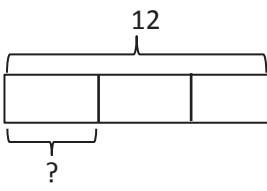
d.  $\frac{4}{5} \times 100$

$\frac{4}{5}$  meter = \_\_\_\_\_ centimeters

Name \_\_\_\_\_

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1. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

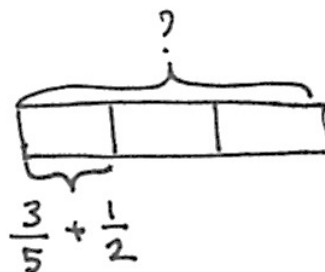
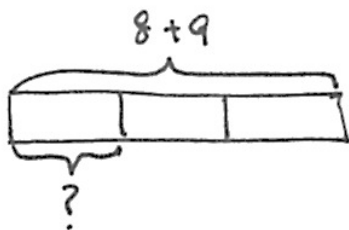
<p>a. <math>\frac{1}{2}</math> yard = <math>1\frac{1}{2}</math> feet</p> <p><math>\frac{1}{2}</math> yard = <math>\frac{1}{2} \times 1</math> yard</p> <p><math>= \frac{1}{2} \times 3</math> feet</p> <p><math>= \frac{3}{2}</math> feet</p> <p><math>= 1\frac{1}{2}</math> feet</p>	<p>b. <math>\frac{1}{3}</math> foot = _____ inches</p> <p><math>\frac{1}{3}</math> foot = <math>\frac{1}{3} \times 1</math> foot</p> <p><math>= \frac{1}{3} \times 12</math> inches</p> <p>=</p> 
<p>c. <math>\frac{5}{6}</math> year = _____ months</p>	<p>d. <math>\frac{4}{5}</math> meter = _____ centimeters</p>
<p>e. <math>\frac{2}{3}</math> hour = _____ minutes</p>	<p>f. <math>\frac{3}{4}</math> yard = _____ inches</p>

2. Mrs. Lang told her class that the class's pet hamster is  $\frac{1}{4}$  ft in length. How long is the hamster in inches?
3. At the market, Mr. Paul bought  $\frac{7}{8}$  lb of cashews and  $\frac{3}{4}$  lb of walnuts.
- How many ounces of cashews did Mr. Paul buy?
  - How many ounces of walnuts did Mr. Paul buy?
  - How many more ounces of cashews than walnuts did Mr. Paul buy?
  - If Mrs. Toombs bought  $1\frac{1}{2}$  pounds of pistachios, who bought more nuts, Mr. Paul or Mrs. Toombs? How many ounces more?
4. A jewelry maker purchased 20 inches of gold chain. She used  $\frac{3}{8}$  of the chain for a bracelet. How many inches of gold chain did she have left?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Write expressions to match the diagrams. Then, evaluate.



2. Write an expression to match, then evaluate.

a.  $\frac{1}{6}$  the sum of 16 and 20.

b. Subtract 5 from  $\frac{1}{3}$  of 23.

c. 3 times as much as the sum of  $\frac{3}{4}$  and  $\frac{2}{6}$ .

d.  $\frac{2}{5}$  of the product of  $\frac{5}{6}$  and 42.

e. 8 copies of the sum of 4 thirds and 2 more.

f. 4 times as much as 1 third of 8.



3. Circle the expression(s) that gives the same product as  $\frac{4}{5} \times 7$ . Explain how you know.

$4 \div (7 \times 5)$

$7 \div 5 \times 4$

$(4 \times 7) \div 5$

$4 \div (5 \times 7)$

$4 \times \frac{7}{5}$

$7 \times \frac{4}{5}$

4. Use  $<$ ,  $>$ , or  $=$  to make true number sentences without calculating. Explain your thinking.

a.  $4 \times 2 + 4 \times \frac{2}{3}$    $3 \times \frac{2}{3}$

b.  $\left(5 \times \frac{3}{4}\right) \times \frac{2}{5}$    $\left(5 \times \frac{3}{4}\right) \times \frac{2}{7}$

c.  $3 \times \left(3 + \frac{15}{12}\right)$    $(3 \times 3) + \frac{15}{12}$

5. Collette bought milk for herself each month and recorded the amount in the table below. For (a–c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

- a. She bought  $\frac{1}{4}$  of July's total in June.

Month	Amount (in gallons)
January	3
February	2
March	$1\frac{1}{4}$
April	
May	$\frac{7}{4}$
June	
July	2
August	1
September	
October	$\frac{1}{4}$

- b. She bought  $\frac{3}{4}$  as much in September as she did in January and July combined.

- c. In April, she bought  $\frac{1}{2}$  gallon less than twice as much as she bought in August.

- d. Display the data from the table in a line plot.

- e. How many gallons of milk did Collette buy from January to October?

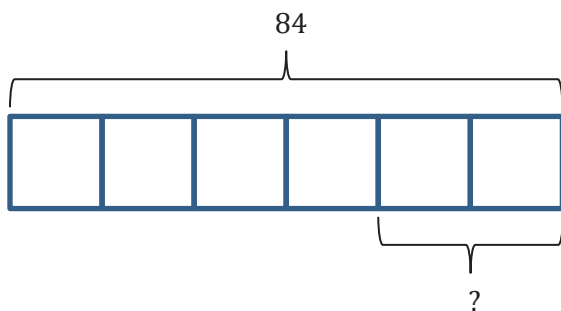
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Kim and Courtney share a 16-ounce box of cereal. By the end of the week, Kim has eaten  $\frac{3}{8}$  of the box, and Courtney has eaten  $\frac{1}{4}$  of the box of cereal. What fraction of the box is left?

2. Mathilde has 20 pints of green paint. She uses  $\frac{2}{5}$  of it to paint a landscape and  $\frac{3}{10}$  of it while painting a clover. She decides that, for her next painting, she will need 14 pints of green paint. How much more paint will she need to buy?

3. Jack, Jill, and Bill each carried a 48-ounce bucket full of water down the hill. By the time they reached the bottom, Jack's bucket was only  $\frac{3}{4}$  full, Jill's was  $\frac{2}{3}$  full, and Bill's was  $\frac{1}{6}$  full. How much water did they spill altogether on their way down the hill?
4. Mrs. Diaz makes 5 dozen cookies for her class. One-ninth of her 27 students are absent the day she brings the cookies. If she shares the cookies equally among the students who are present, how many cookies will each student get?
5. Create a story problem about a fish tank for the tape diagram below. Your story must include a fraction.



Name \_\_\_\_\_

Date \_\_\_\_\_

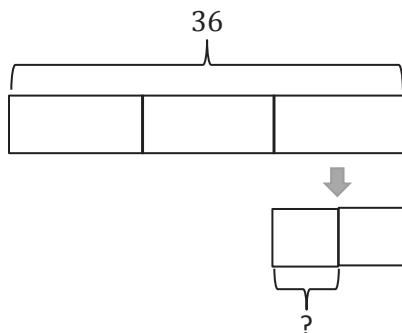
1. A baseball team played 32 games and lost 8. Katy was the catcher in  $\frac{5}{8}$  of the winning games and  $\frac{1}{4}$  of the losing games.
  - a. What fraction of the games did the team win?
  
  
  
  
  
  
  
  
  
  
  - b. In how many games did Katy play catcher?
  
  
  
  
  
  
  
  
  
  
2. In Mrs. Elliott's garden,  $\frac{1}{8}$  of the flowers are red,  $\frac{1}{4}$  of them are purple, and  $\frac{1}{5}$  of the remaining flowers are pink. If there are 128 flowers, how many flowers are pink?

3. Lillian and Darlene plan to get their homework finished within one hour. Darlene completes her math homework in  $\frac{3}{5}$  hour. Lillian completes her math homework with  $\frac{5}{6}$  hour remaining. Who completes her homework faster and by how many minutes?

Bonus: Give the answer as a fraction of an hour.

4. Create and solve a story problem about a baker and some flour whose solution is given by the expression  $\frac{1}{4} \times (3 + 5)$ .

5. Create and solve a story problem about a baker and 36 kilograms of an ingredient that is modeled by the following tape diagram. Include at least one fraction in your story.



6. Of the students in Mr. Smith's fifth grade class,  $\frac{1}{3}$  were absent on Monday. Of the students in Mrs. Jacobs' class,  $\frac{2}{5}$  were absent on Monday. If there were 4 students absent in each class on Monday, how many students are in each class?

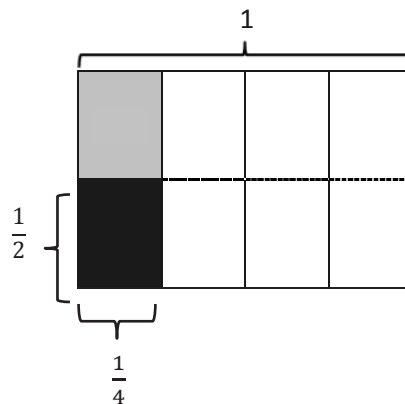
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Solve. Draw a rectangular fraction model to show your thinking. Then, write a multiplication sentence. The first one has been done for you.

- a. Half of  $\frac{1}{4}$  pan of brownies =  $\frac{1}{8}$  pan of brownies

$$\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$



- b. Half of  $\frac{1}{3}$  pan of brownies = \_\_\_\_\_ pan of brownies

- c. A fourth of  $\frac{1}{3}$  pan of brownies = \_\_\_\_\_ pan of brownies

- d.  $\frac{1}{4}$  of  $\frac{1}{4}$

- e.  $\frac{1}{2}$  of  $\frac{1}{6}$



2. Draw rectangular fraction models of  $3 \times \frac{1}{4}$  and  $\frac{1}{3} \times \frac{1}{4}$ . Compare multiplying a number by 3 and by 1 third.
3.  $\frac{1}{2}$  of Ila's workspace is covered in paper.  $\frac{1}{3}$  of the paper is covered in yellow sticky notes. What fraction of Ila's workspace is covered in yellow sticky notes? Draw a picture to support your answer.
4. A marching band is rehearsing in rectangular formation.  $\frac{1}{5}$  of the marching band members play percussion instruments.  $\frac{1}{2}$  of the percussionists play the snare drum. What fraction of all the band members play the snare drum?
5. Marie is designing a bedspread for her grandson's new bedroom.  $\frac{2}{3}$  of the bedspread is covered in race cars and the rest is striped.  $\frac{1}{4}$  of the stripes are red. What fraction of the bedspread is covered in red stripes?

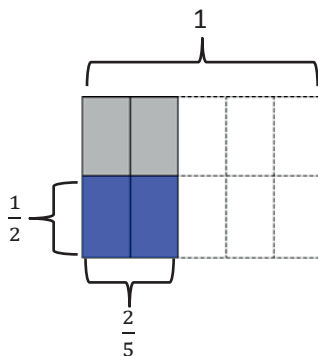
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a number sentence. An example has been done for you.

Example:

$$\frac{1}{2} \text{ of } \frac{2}{5} = \frac{1}{2} \text{ of } 2 \text{ fifths} = 1 \text{ fifth}$$



$$\frac{1}{2} \times \frac{2}{5} = \frac{2}{10} = \frac{1}{5}$$

a.  $\frac{1}{3}$  of  $\frac{3}{4} = \frac{1}{3}$  of \_\_\_\_ fourths = \_\_\_\_ fourth

b.  $\frac{1}{2}$  of  $\frac{4}{5} = \frac{1}{2}$  of \_\_\_\_ fifths = \_\_\_\_ fifths

c.  $\frac{1}{2}$  of  $\frac{2}{2} =$

d.  $\frac{2}{3}$  of  $\frac{1}{2} =$

e.  $\frac{1}{2} \times \frac{3}{5} =$

f.  $\frac{2}{3} \times \frac{1}{4} =$

2.  $\frac{5}{8}$  of the songs on Harrison's music player are hip-hop.  $\frac{1}{3}$  of the remaining songs are rhythm and blues. What fraction of all the songs are rhythm and blues? Use a tape diagram to solve.
3. Three-fifths of the students in a room are girls. One-third of the girls have blond hair. One-half of the boys have brown hair.
- What fraction of all the students are girls with blond hair?
  - What fraction of all the students are boys without brown hair?
4. Cody and Sam mowed the yard on Saturday. Dad told Cody to mow  $\frac{1}{4}$  of the yard. He told Sam to mow  $\frac{1}{3}$  of the remainder of the yard. Dad paid each of the boys an equal amount. Sam said, "Dad, that's not fair! I had to mow one-third and Cody only mowed one-fourth!" Explain to Sam the error in his thinking. Draw a picture to support your reasoning.

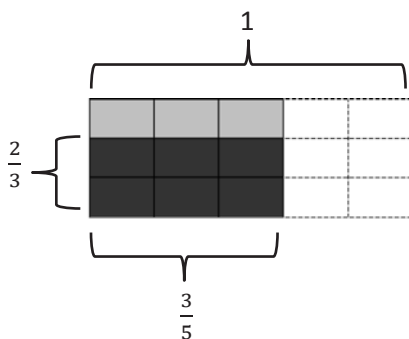
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence. The first one is done for you.

a.  $\frac{2}{3}$  of  $\frac{3}{5}$

$$\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$$



b.  $\frac{3}{4}$  of  $\frac{4}{5} =$

c.  $\frac{2}{5}$  of  $\frac{2}{3} =$

d.  $\frac{4}{5} \times \frac{2}{3} =$

e.  $\frac{3}{4} \times \frac{2}{3} =$

2. Multiply. Draw a rectangular fraction model if it helps you, or use the method in the example.

Example:  $\frac{6}{7} \times \frac{5}{8} = \frac{\overset{3}{\cancel{6}} \times 5}{7 \times \underset{4}{\cancel{8}}} = \frac{15}{28}$

a.  $\frac{3}{4} \times \frac{5}{6} =$

b.  $\frac{4}{5} \times \frac{5}{8} =$

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

d.  $\frac{4}{9} \times \frac{3}{10}$

3. Phillip's family traveled  $\frac{3}{10}$  of the distance to his grandmother's house on Saturday. They traveled  $\frac{4}{7}$  of the remaining distance on Sunday. What fraction of the total distance to his grandmother's house was traveled on Sunday?
4. Santino bought a  $\frac{3}{4}$  pound bag of chocolate chips. He used  $\frac{2}{3}$  of the bag while baking. How many pounds of chocolate chips did he use while baking?
5. Farmer Dave harvested his corn. He stored  $\frac{5}{9}$  of his corn in one large silo and  $\frac{3}{4}$  of the remaining corn in a small silo. The rest was taken to market to be sold.
- a. What fraction of the corn was stored in the small silo?
- b. If he harvested 18 tons of corn, how many tons did he take to market?

Name \_\_\_\_\_

Date \_\_\_\_\_

Solve and show your thinking with a tape diagram.

1. Mrs. Onusko made 60 cookies for a bake sale. She sold  $\frac{2}{3}$  of them and gave  $\frac{3}{4}$  of the remaining cookies to the students working at the sale. How many cookies did she have left?
2. Joakim is icing 30 cupcakes. He spreads mint icing on  $\frac{1}{5}$  of the cupcakes and chocolate on  $\frac{1}{2}$  of the remaining cupcakes. The rest will get vanilla icing. How many cupcakes have vanilla icing?
3. The Booster Club sells 240 cheeseburgers.  $\frac{1}{4}$  of the cheeseburgers had pickles,  $\frac{1}{2}$  of the remaining burgers had onions, and the rest had tomato. How many cheeseburgers had tomato?

4. DeSean is sorting his rock collection.  $\frac{2}{3}$  of the rocks are metamorphic and  $\frac{3}{4}$  of the remainder are igneous rocks. If the 3 rocks left over are sedimentary, how many rocks does DeSean have?
5. Milan puts  $\frac{1}{4}$  of her lawn-mowing money in savings and uses  $\frac{1}{2}$  of the remaining money to pay back her sister. If she has \$15 left, how much did she have at first?
6. Parks is wearing several rubber bracelets.  $\frac{1}{3}$  of the bracelets are tie-dye,  $\frac{1}{6}$  are blue, and  $\frac{1}{3}$  of the remainder are camouflage. If Parks wears 2 camouflage bracelets, how many bracelets does he have on?
7. Ahmed spent  $\frac{1}{3}$  of his money on a burrito and a water bottle. The burrito cost 2 times as much as the water. The burrito cost \$4, how much money does Ahmed have left?

Name \_\_\_\_\_

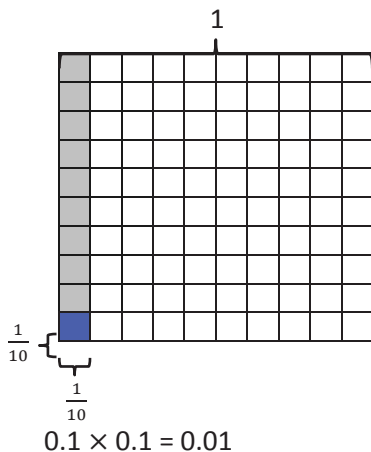
Date \_\_\_\_\_

1. Multiply and model. Rewrite each expression as a multiplication sentence with decimal factors. The first one is done for you.

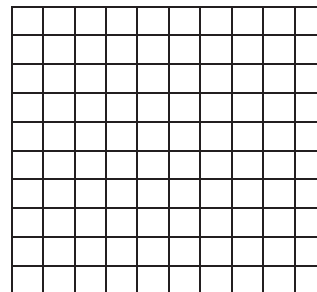
a.  $\frac{1}{10} \times \frac{1}{10}$

$$= \frac{1 \times 1}{10 \times 10}$$

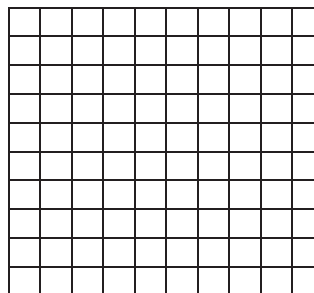
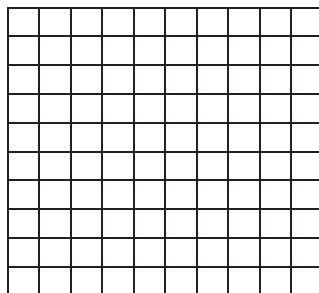
$$= \frac{1}{100}$$



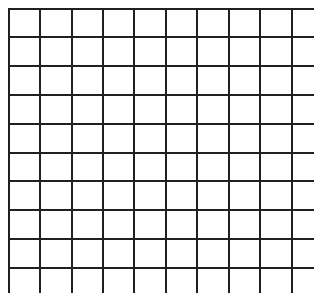
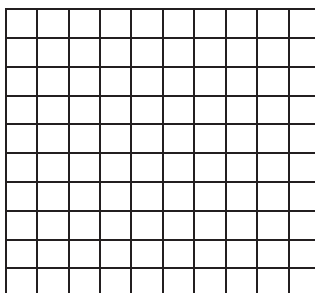
b.  $\frac{4}{10} \times \frac{3}{10}$



c.  $\frac{1}{10} \times 1.4$



d.  $\frac{6}{10} \times 1.7$





2. Multiply. The first few are started for you.

$$\begin{aligned} \text{a. } 5 \times 0.7 &= \underline{\hspace{2cm}} \\ &= 5 \times \frac{7}{10} \\ &= \frac{5 \times 7}{10} \\ &= \frac{35}{10} \\ &= 3.5 \end{aligned}$$

$$\begin{aligned} \text{b. } 0.5 \times 0.7 &= \underline{\hspace{2cm}} \\ &= \frac{5}{10} \times \frac{7}{10} \\ &= \frac{5 \times 7}{10 \times 10} \\ &= \end{aligned}$$

$$\begin{aligned} \text{c. } 0.05 \times 0.7 &= \underline{\hspace{2cm}} \\ &= \frac{5}{100} \times \frac{7}{10} \\ &= \frac{\underline{\hspace{1cm}} \times \underline{\hspace{1cm}}}{100 \times 10} \\ &= \end{aligned}$$

$$\text{d. } 6 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{e. } 0.6 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{f. } 0.06 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{g. } 1.2 \times 4 = \underline{\hspace{2cm}}$$

$$\text{h. } 1.2 \times 0.4 = \underline{\hspace{2cm}}$$

$$\text{i. } 0.12 \times 0.4 = \underline{\hspace{2cm}}$$

3. A boy scout has a length of rope measuring 0.7 meter. He uses 2 tenths of the rope to tie a knot at one end. How many meters of rope are in the knot?
4. After just 4 tenths of a 2.5 mile race was completed, Lenox took the lead and remained there until the end of the race.
- a. How many miles did Lenox lead the race?
- b. Reid, the second place finisher, developed a cramp with 3 tenths of the race remaining. How many miles did Reid run without a cramp?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Multiply using both fraction form and unit form. Check your answer by counting the decimal places. The first one is done for you.

$$\begin{array}{l}
 \text{a. } 2.3 \times 1.8 = \frac{23}{10} \times \frac{18}{10} \\
 = \frac{23 \times 18}{100} \\
 = \frac{414}{100} \\
 = 4.14
 \end{array}$$

$$\begin{array}{r}
 \phantom{2}3 \text{ tenths} \\
 \times \phantom{2}18 \text{ tenths} \\
 \hline
 184 \\
 + 230 \\
 \hline
 414 \text{ hundredths}
 \end{array}$$

$$\begin{array}{r}
 \phantom{2}3 \text{ tenths} \\
 \times \phantom{2}9 \text{ tenths} \\
 \hline
 \phantom{00}
 \end{array}$$

c.  $6.6 \times 2.8 =$

d.  $3.3 \times 1.4 =$

2. Multiply using fraction form and unit form. Check your answer by counting the decimal places. The first one is done for you.

$$\begin{array}{l}
 \text{a. } 2.38 \times 1.8 = \frac{238}{100} \times \frac{18}{10} \\
 = \frac{238 \times 18}{1,000} \\
 = \frac{4,284}{1,000} \\
 = 4.284
 \end{array}$$

$$\begin{array}{r}
 \phantom{2}38 \text{ hundredths} \\
 \times \phantom{2}18 \text{ tenths} \\
 \hline
 1904 \\
 + 2380 \\
 \hline
 4,284 \text{ thousandths}
 \end{array}$$

$$\begin{array}{r}
 \phantom{2}37 \text{ hundredths} \\
 \times \phantom{2}9 \text{ tenths} \\
 \hline
 \phantom{00}
 \end{array}$$

c.  $6.06 \times 2.8 =$

d.  $3.3 \times 0.14 =$

2. Solve using the standard algorithm. Show your thinking about the units of your product. The first one is done for you.

a.  $3.2 \times 0.6 = 1.92$

b.  $3.2 \times 1.2 = \underline{\hspace{2cm}}$

$$\begin{array}{r} 3 \text{ 2 tenths} \\ \times \text{ 6 tenths} \\ \hline 1 \text{ 9 2 hundredths} \end{array}$$

$$\frac{32}{10} \times \frac{6}{10} = \frac{32 \times 6}{100}$$

$$\begin{array}{r} 3 \text{ 2 tenths} \\ \times \text{ 1 2 tenths} \\ \hline \end{array}$$

c.  $8.31 \times 2.4 = \underline{\hspace{2cm}}$

d.  $7.50 \times 3.5 = \underline{\hspace{2cm}}$

3. Carolyn buys 1.2 pounds of chicken breast. If each pound of chicken breast costs \$3.70, how much will she pay for the chicken breast?

4. A kitchen measures 3.75 meters by 4.2 meters.

- a. Find the area of the kitchen.

- b. The area of the living room is one and a half times that of the kitchen. Find the total area of the living room and the kitchen.

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Convert. Express your answer as a mixed number, if possible. The first one is done for you.

<p>a. <math>2 \text{ ft} = \frac{2}{3} \text{ yd}</math></p> <p><math>2 \text{ ft} = 2 \times 1 \text{ ft}</math></p> <p><math>= 2 \times \frac{1}{3} \text{ yd}</math></p> <p><math>= \frac{2}{3} \text{ yd}</math></p>	<p>b. <math>4 \text{ ft} = \text{_____} \text{ yd}</math></p> <p><math>4 \text{ ft} = 4 \times 1 \text{ ft}</math></p> <p><math>= 4 \times \text{_____} \text{ yd}</math></p> <p><math>= \text{_____} \text{ yd}</math></p> <p><math>=</math></p>
<p>c. <math>7 \text{ in} = \text{_____} \text{ ft}</math></p>	<p>d. <math>13 \text{ in} = \text{_____} \text{ ft}</math></p>
<p>e. <math>5 \text{ oz} = \text{_____} \text{ lb}</math></p>	<p>f. <math>18 \text{ oz} = \text{_____} \text{ lb}</math></p>

2. Regina buys 24 inches of trim for a craft project.
  - a. What fraction of a yard does Regina buy?
  - b. If a whole yard of trim costs \$6, how much did Regina pay?
3. At Yo-Yo Yogurt, the scale says that Sara has 8 ounces of vanilla yogurt in her cup. Her father's yogurt weighs 11 ounces. How many pounds of frozen yogurt did they buy altogether? Express your answer as a mixed number.
4. Pheng-Xu drinks 1 cup of milk every day for lunch. How many gallons of milk does he drink in 2 weeks?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Convert. Show your work. Express your answer as a mixed number. (Draw a tape diagram if it helps you.) The first one is done for you.

<p>a. <math>2\frac{2}{3}</math> yd = <u>8</u> ft</p> <p><math>2\frac{2}{3}</math> yd = <math>2\frac{2}{3} \times 1</math> yd</p> <p><math>= 2\frac{2}{3} \times 3</math> ft</p> <p><math>= \frac{8}{3} \times 3</math> ft</p> <p><math>= \frac{24}{3}</math> ft</p> <p><math>= 8</math> ft</p>	<p>b. <math>1\frac{1}{2}</math> qt = _____ gal</p> <p><math>1\frac{1}{2}</math> qt = <math>1\frac{1}{2} \times 1</math> qt</p> <p><math>= 1\frac{1}{2} \times \frac{1}{4}</math> gal</p> <p><math>= \frac{3}{2} \times \frac{1}{4}</math> gal</p> <p><math>=</math></p>
<p>c. <math>4\frac{2}{3}</math> ft = _____ in</p>	<p>d. <math>9\frac{1}{2}</math> pt = _____ qt</p>
<p>e. <math>3\frac{3}{5}</math> hr = _____ min</p>	<p>f. <math>3\frac{2}{3}</math> ft = _____ yd</p>

2. Three dump trucks are carrying topsoil to a construction site. Truck A carries 3,545 lb, Truck B carries 1,758 lb, and Truck C carries 3,697 lb. How many tons of topsoil are the 3 trucks carrying altogether?
3. Melissa buys  $3\frac{3}{4}$  gallons of iced tea. Denita buys 7 quarts more than Melissa. How much tea do they buy altogether? Express your answer in quarts.
4. Marvin buys a hose that is  $27\frac{3}{4}$  feet long. He already owns a hose at home that is  $\frac{2}{3}$  the length of the new hose. How many total yards of hose does Marvin have now?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Fill in the blanks. The first one has been done for you.

a.  $\frac{1}{4} \times 1 = \frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$

b.  $\frac{3}{4} \times 1 = \frac{3}{4} \times - = \frac{21}{28}$

c.  $\frac{7}{4} \times 1 = \frac{7}{4} \times - = \frac{35}{20}$

d. Use words to compare the size of the product to the size of the first factor.

2. Express each fraction as an equivalent decimal.

a.  $\frac{1}{4} \times \frac{25}{25} =$

b.  $\frac{3}{4} \times \frac{25}{25} =$

c.  $\frac{1}{5} \times - =$

d.  $\frac{4}{5} \times - =$

e.  $\frac{1}{20}$

f.  $\frac{27}{20}$

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

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

i.  $\frac{24}{25}$

j.  $\frac{93}{50}$

k.  $2\frac{6}{25}$

l.  $3\frac{31}{50}$



3. Jack said that if you take a number and multiply it by a fraction, the product will always be smaller than what you started with. Is he correct? Why or why not? Explain your answer, and give at least two examples to support your thinking.
4. There is an infinite number of ways to represent 1 on the number line. In the space below, write at least four expressions multiplying by 1. Represent *one* differently in each expression.
5. Maria multiplied by 1 to rename  $\frac{1}{4}$  as hundredths. She made factor pairs equal to 10. Use her method to change one-eighth to an equivalent decimal.

$$\text{Maria's way: } \frac{1}{4} = \frac{1}{2 \times 2} \times \frac{5 \times 5}{5 \times 5} = \frac{5 \times 5}{(2 \times 5) \times (2 \times 5)} = \frac{25}{100} = 0.25$$

$$\frac{1}{8} =$$

Paulo renamed  $\frac{1}{8}$  as a decimal, too. He knows the decimal equal to  $\frac{1}{4}$ , and he knows that  $\frac{1}{8}$  is half as much as  $\frac{1}{4}$ . Can you use his ideas to show another way to find the decimal equal to  $\frac{1}{8}$ ?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Solve for the unknown. Rewrite each phrase as a multiplication sentence. Circle the scaling factor and put a box around the number of meters.

a.  $\frac{1}{2}$  as long as 8 meters = \_\_\_\_\_ meters

b. 8 times as long as  $\frac{1}{2}$  meter = \_\_\_\_\_ meters

2. Draw a tape diagram to model each situation in Problem 1, and describe what happened to the number of meters when it was multiplied by the scaling factor.

a.

b.

3. Fill in the blank with a numerator or denominator to make the number sentence true.

a.  $7 \times \frac{\quad}{4} < 7$

b.  $\frac{7}{\quad} \times 15 > 15$

c.  $3 \times \frac{\quad}{5} = 3$

4. Look at the inequalities in each box. Choose a single fraction to write in all three blanks that would make all three number sentences true. Explain how you know.

a.

$\frac{3}{4} \times \underline{\quad} > \frac{3}{4}$

$2 \times \underline{\quad} > 2$

$\frac{7}{5} \times \underline{\quad} > \frac{7}{5}$

b.

$\frac{3}{4} \times \underline{\quad} < \frac{3}{4}$

$2 \times \underline{\quad} < 2$

$\frac{7}{5} \times \underline{\quad} < \frac{7}{5}$

5. Johnny says multiplication always makes numbers bigger. Explain to Johnny why this isn't true. Give more than one example to help him understand.
6. A company uses a sketch to plan an advertisement on the side of a building. The lettering on the sketch is  $\frac{3}{4}$  inch tall. In the actual advertisement, the letters must be 34 times as tall. How tall will the letters be on the building?
7. Jason is drawing the floor plan of his bedroom. He is drawing everything with dimensions that are  $\frac{1}{12}$  of the actual size. His bed measures 6 ft by 3 ft, and the room measures 14 ft by 16 ft. What are the dimensions of his bed and room in his drawing?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Fill in the blank using one of the following scaling factors to make each number sentence true.

1.021	0.989	1.00
-------	-------	------

- a.  $3.4 \times \underline{\hspace{2cm}} = 3.4$       b.  $\underline{\hspace{2cm}} \times 0.21 > 0.21$       c.  $8.04 \times \underline{\hspace{2cm}} < 8.04$
- 2.
- a. Sort the following expressions by rewriting them in the table.

The product is less than the boxed number:	The product is greater than the boxed number:

$$\boxed{13.89} \times 1.004$$

$$\boxed{602} \times 0.489$$

$$\boxed{102.03} \times 4.015$$

$$\boxed{0.3} \times 0.069$$

$$\boxed{0.72} \times 1.24$$

$$\boxed{0.2} \times 0.1$$

- b. Explain your sorting by writing a sentence that tells what the expressions in each column of the table have in common.

3. Write a statement using one of the following phrases to compare the value of the expressions. Then, explain how you know.

*is slightly more than*    *is a lot more than*    *is slightly less than*    *is a lot less than*

- a.  $4 \times 0.988$  \_\_\_\_\_ 4
- b.  $1.05 \times 0.8$  \_\_\_\_\_ 0.8
- c.  $1,725 \times 0.013$  \_\_\_\_\_ 1,725
- d.  $989.001 \times 1.003$  \_\_\_\_\_ 1.003
- e.  $0.002 \times 0.911$  \_\_\_\_\_ 0.002
4. During science class, Teo, Carson, and Dhakir measure the length of their bean sprouts. Carson's sprout is 0.9 times the length of Teo's, and Dhakir's is 1.08 times the length of Teo's. Whose bean sprout is the longest? The shortest? Explain your reasoning.

5. Complete the following statements, then use decimals to give an example of each.

- $a \times b > a$  will always be true when  $b$  is...
  
  
  
  
  
  
  
  
  
  
- $a \times b < a$  will always be true when  $b$  is...

Name \_\_\_\_\_

Date \_\_\_\_\_

1. A vial contains 20 mL of medicine. If each dose is  $\frac{1}{8}$  of the vial, how many mL is each dose? Express your answer as a decimal.
2. A container holds 0.7 liters of oil and vinegar.  $\frac{3}{4}$  of the mixture is vinegar. How many liters of vinegar are in the container? Express your answer as both a fraction and a decimal.
3. Andres completed a 5-km race in 13.5 minutes. His sister's time was  $1\frac{1}{2}$  times longer than his time. How long, in minutes, did it take his sister to run the race?

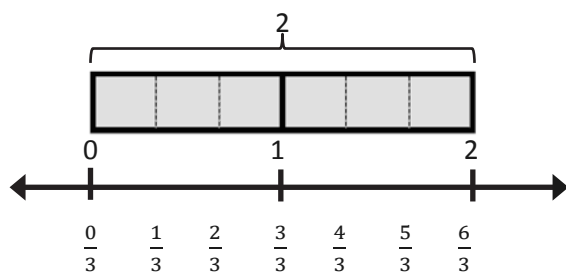
4. A clothing factory uses 1,275.2 meters of cloth a week to make shirts. How much cloth is needed to make  $3\frac{3}{5}$  times as many shirts?
5. There are  $\frac{3}{4}$  as many boys as girls in a class of fifth-graders. If there are 35 students in the class, how many are girls?
6. Ciro purchased a concert ticket for \$56. The cost of the ticket was  $\frac{4}{5}$  the cost of his dinner. The cost of his hotel was  $2\frac{1}{2}$  times as much as his ticket. How much did Ciro spend altogether for the concert ticket, hotel, and dinner?

Name \_\_\_\_\_

Date \_\_\_\_\_

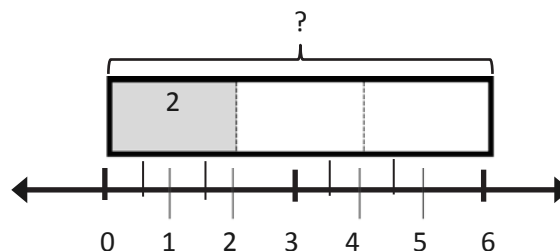
1. Draw a tape diagram and a number line to solve. You may draw the model that makes the most sense to you. Fill in the blanks that follow. Use the example to help you.

Example:  $2 \div \frac{1}{3} = \underline{6}$



There are 3 thirds in 1 whole.

There are 6 thirds in 2 wholes.



If 2 is  $\frac{1}{3}$ , what is the whole? 6

a.  $4 \div \frac{1}{2} = \underline{\hspace{2cm}}$

There are      halves in 1 whole.

There are      halves in 4 wholes.

If 4 is  $\frac{1}{2}$ , what is the whole?             

b.  $2 \div \frac{1}{4} = \underline{\hspace{2cm}}$

There are      fourths in 1 whole.

There are      fourths in 2 wholes.

If 2 is  $\frac{1}{4}$ , what is the whole?             

c.  $5 \div \frac{1}{3} = \underline{\hspace{2cm}}$

There are      thirds in 1 whole.

There are      thirds in 5 wholes.

If 5 is  $\frac{1}{3}$ , what is the whole?             

d.  $3 \div \frac{1}{5} = \underline{\hspace{2cm}}$

There are      fifths in 1 whole.

There are      fifths in 3 wholes.

If 3 is  $\frac{1}{5}$ , what is the whole?



2. Divide. Then, multiply to check.

a. $5 \div \frac{1}{2}$	b. $3 \div \frac{1}{2}$	c. $4 \div \frac{1}{5}$	d. $1 \div \frac{1}{6}$
e. $2 \div \frac{1}{8}$	f. $7 \div \frac{1}{6}$	g. $8 \div \frac{1}{3}$	h. $9 \div \frac{1}{4}$

3. For an art project, Mrs. Williams is dividing construction paper into fourths. How many fourths can she make from 5 pieces of construction paper?

4. Use the chart below to answer the following questions.

**Donnie's Diner Lunch Menu**

Food	Serving Size
Hamburger	$\frac{1}{3}$ lb
Pickles	$\frac{1}{4}$ pickle
Potato chips	$\frac{1}{8}$ bag
Chocolate milk	$\frac{1}{2}$ cup

- a. How many hamburgers can Donnie make with 6 pounds of hamburger meat?
- b. How many pickle servings can be made from a jar of 15 pickles?
- c. How many servings of chocolate milk can he serve from a gallon of milk?
5. Three gallons of water fills  $\frac{1}{4}$  of the elephant's pail at the zoo. How much water does the pail hold?

Name \_\_\_\_\_

Date \_\_\_\_\_

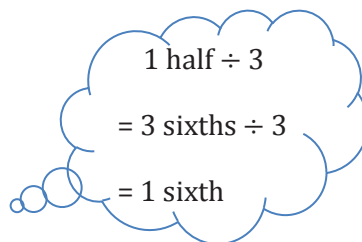
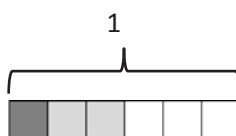
1. Draw a model or tape diagram to solve. Use the thought bubble to show your thinking. Write your quotient in the blank. Use the example to help you.

Example:

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



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



a.  $\frac{1}{3} \div 2 =$  \_\_\_\_\_

b.  $\frac{1}{3} \div 4 =$  \_\_\_\_\_

c.  $\frac{1}{4} \div 2 = \underline{\hspace{2cm}}$

d.  $\frac{1}{4} \div 3 = \underline{\hspace{2cm}}$

2. Divide. Then, multiply to check.

a. $\frac{1}{2} \div 7$	b. $\frac{1}{3} \div 6$	c. $\frac{1}{4} \div 5$	d. $\frac{1}{5} \div 4$
e. $\frac{1}{5} \div 2$	f. $\frac{1}{6} \div 3$	g. $\frac{1}{8} \div 2$	h. $\frac{1}{10} \div 10$

3. Tasha eats half her snack and gives the other half to her two best friends for them to share equally. What portion of the whole snack does each friend get? Draw a picture to support your response.
4. Mrs. Appler used  $\frac{1}{2}$  gallon of olive oil to make 8 identical batches of salad dressing.
- How many gallons of olive oil did she use in each batch of salad dressing?
  - How many cups of olive oil did she use in each batch of salad dressing?
5. Mariano delivers newspapers. He always puts  $\frac{3}{4}$  of his weekly earnings in his savings account, and then divides the rest equally into 3 piggy banks for spending at the snack shop, the arcade, and the subway.
- What fraction of his earnings does Mariano put into each piggy bank?
  - If Mariano adds \$2.40 to each piggy bank every week, how much does Mariano earn per week delivering papers?



4. A pallet holding 5 identical crates weighs  $\frac{1}{4}$  ton.
- How many tons does each crate weigh? Draw a picture to support your response.
  - How many pounds does each crate weigh?
5. Faye has 5 pieces of ribbon, each 1 yard long. She cuts each ribbon into sixths.
- How many sixths will she have after cutting all the ribbons?
  - How long will each of the sixths be in inches?

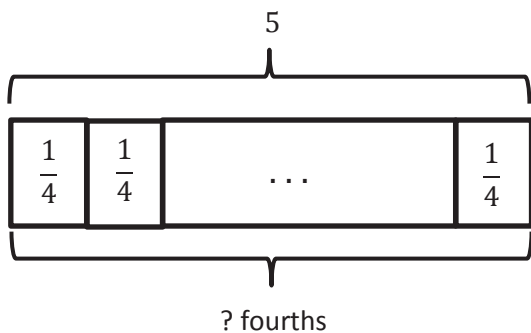
6. A glass pitcher is filled with water.  $\frac{1}{8}$  of the water is poured equally into 2 glasses.
- What fraction of the water is in each glass?
  - If each glass has 3 fluid ounces of water in it, how many fluid ounces of water were in the full pitcher?
  - If  $\frac{1}{4}$  of the remaining water is poured out of the pitcher to water a plant, how many cups of water are left in the pitcher?



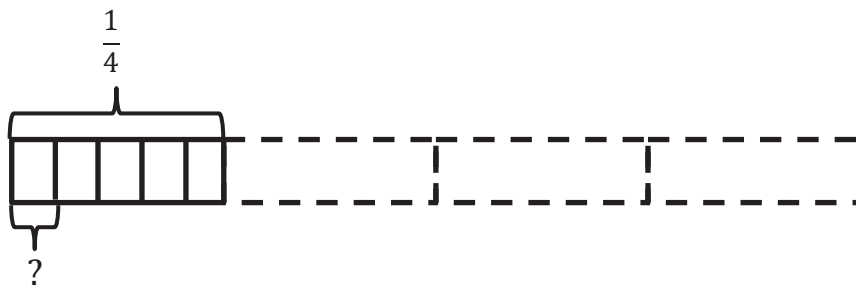
Name \_\_\_\_\_

Date \_\_\_\_\_

1. Create and solve a division story problem about 5 meters of rope that is modeled by the tape diagram below.



2. Create and solve a story problem about  $\frac{1}{4}$  pound of almonds that is modeled by the tape diagram below.



3. Draw a tape diagram and create a word problem for the following expressions, and then solve.

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

b.  $\frac{1}{3} \div 4$

c.  $\frac{1}{4} \div 3$

d.  $3 \div \frac{1}{5}$

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Divide. Rewrite each expression as a division sentence with a fraction divisor, and fill in the blanks. The first one is done for you.

Example:  $2 \div 0.1 = 2 \div \frac{1}{10} = 20$

There are 10 tenths in 1 whole.

There are 20 tenths in 2 wholes.

a.  $5 \div 0.1 =$

There are \_\_\_\_\_ tenths in 1 whole.

There are \_\_\_\_\_ tenths in 5 wholes.

b.  $8 \div 0.1 =$

There are \_\_\_\_\_ tenths in 1 whole.

There are \_\_\_\_\_ tenths in 8 wholes.

c.  $5.2 \div 0.1 =$

There are \_\_\_\_\_ tenths in 5 wholes.

There are \_\_\_\_\_ tenths in 2 tenths.

There are \_\_\_\_\_ tenths in 5.2

d.  $8.7 \div 0.1 =$

There are \_\_\_\_\_ tenths in 8 wholes.

There are \_\_\_\_\_ tenths in 7 tenths.

There are \_\_\_\_\_ tenths in 8.7

e.  $5 \div 0.01 =$

There are \_\_\_\_\_ hundredths in 1 whole.

There are \_\_\_\_\_ hundredths in 5 wholes.

f.  $8 \div 0.01 =$

There are \_\_\_\_\_ hundredths in 1 whole.

There are \_\_\_\_\_ hundredths in 8 wholes.

g.  $5.2 \div 0.01 =$

There are \_\_\_\_\_ hundredths in 5 wholes.

There are \_\_\_\_\_ hundredths in 2 tenths.

There are \_\_\_\_\_ hundredths in 5.2

h.  $8.7 \div 0.01 =$

There are \_\_\_\_\_ hundredths in 8 wholes.

There are \_\_\_\_\_ hundredths in 7 tenths.

There are \_\_\_\_\_ hundredths in 8.7

2. Divide.

a. $6 \div 0.1$	b. $18 \div 0.1$	c. $6 \div 0.01$
d. $1.7 \div 0.1$	e. $31 \div 0.01$	f. $11 \div 0.01$
g. $125 \div 0.1$	h. $3.74 \div 0.01$	i. $12.5 \div 0.01$

3. Yung bought \$4.60 worth of bubble gum. Each piece of gum cost \$0.10. How many pieces of bubble gum did Yung buy?
4. Cheryl solved a problem:  $84 \div 0.01 = 8,400$ .  
Jane said, "Your answer is wrong because when you divide, the quotient is always smaller than the whole amount you start with, for example,  $6 \div 2 = 3$  and  $100 \div 4 = 25$ ." Who is correct? Explain your thinking.
5. The U.S. Mint sells 2 ounces of American Eagle gold coins to a collector. Each coin weighs one-tenth of an ounce. How many gold coins were sold to the collector?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Rewrite the division expression as a fraction and divide. The first two have been started for you.

<p>a. <math>2.7 \div 0.3 = \frac{2.7}{0.3}</math></p> <p><math>= \frac{2.7 \times 10}{0.3 \times 10}</math></p> <p><math>= \frac{27}{3}</math></p> <p><math>= 9</math></p>	<p>b. <math>2.7 \div 0.03 = \frac{2.7}{0.03}</math></p> <p><math>= \frac{2.7 \times 100}{0.03 \times 100}</math></p> <p><math>= \frac{270}{3}</math></p> <p><math>=</math></p>
<p>c. <math>3.5 \div 0.5 =</math></p>	<p>d. <math>3.5 \div 0.05 =</math></p>
<p>e. <math>4.2 \div 0.7 =</math></p>	<p>f. <math>0.42 \div 0.07 =</math></p>

g. $10.8 \div 0.9 =$	h. $1.08 \div 0.09 =$
i. $3.6 \div 1.2 =$	j. $0.36 \div 0.12 =$
k. $17.5 \div 2.5 =$	l. $1.75 \div 0.25 =$

2.  $15 \div 3 = 5$ . Explain why it is true that  $1.5 \div 0.3$  and  $0.15 \div 0.03$  have the same quotient.

3. Mr. Volok buys 2.4 kg of sugar for his bakery.
- a. If he pours 0.2 kg of sugar into separate bags, how many bags of sugar can he make?
- b. If he pours 0.4 kg of sugar into separate bags, how many bags of sugar can he make?
4. Two wires, one 17.4 meters long and one 7.5 meters long, were cut into pieces 0.3 meters long. How many such pieces can be made from both wires?
5. Mr. Smith has 15.6 pounds of oranges to pack for shipment. He can ship 2.4 pounds of oranges in a large box and 1.2 pounds in a small box. If he ships 5 large boxes, what is the minimum number of small boxes required to ship the rest of the oranges?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Estimate, and then divide. An example has been done for you.

$$78.4 \div 0.7 \approx 770 \div 7 = 110$$

$$= \frac{78.4}{0.7}$$

$$= \frac{78.4 \times 10}{0.7 \times 10}$$

$$= \frac{784}{7}$$

$$= 112$$

$$\begin{array}{r} 112 \\ 7 \overline{) 784} \\ \underline{-7} \phantom{0} \\ 8 \phantom{0} \\ \underline{-7} \phantom{0} \\ 14 \\ \underline{-14} \\ 0 \end{array}$$

a.  $53.2 \div 0.4 \approx$

b.  $1.52 \div 0.8 \approx$

2. Estimate, and then divide. The first one has been done for you.

$$7.32 \div 0.06 \approx 720 \div 6 = 120$$

$$= \frac{7.32}{0.06}$$

$$= \frac{7.32 \times 100}{0.06 \times 100}$$

$$= \frac{732}{6}$$

$$= 122$$

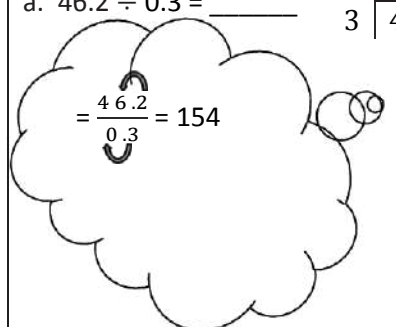
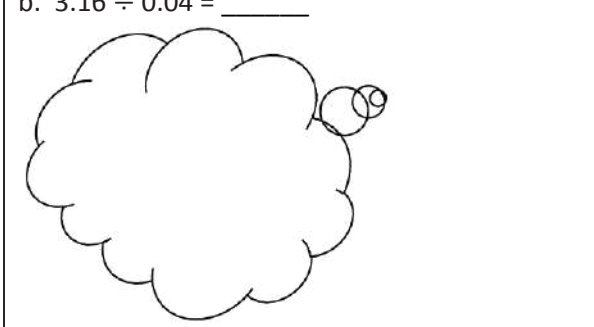
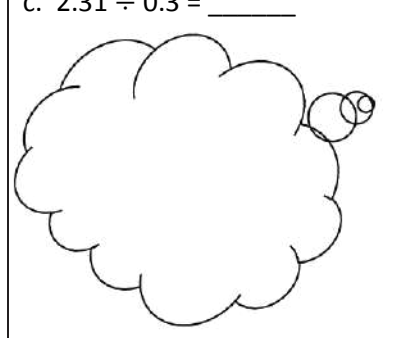
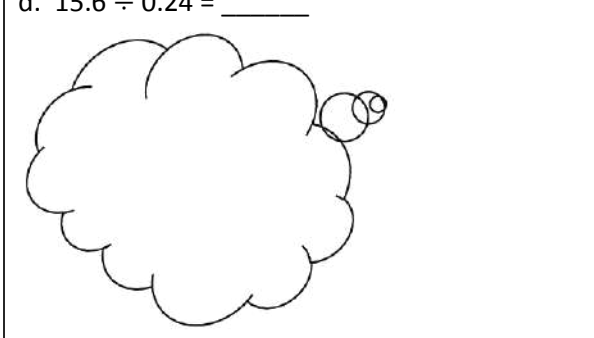
$$\begin{array}{r} 122 \\ 6 \overline{) 732} \\ \underline{-6} \phantom{0} \\ 13 \phantom{0} \\ \underline{-12} \phantom{0} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

a.  $9.42 \div 0.03 \approx$

b.  $39.36 \div 0.96 \approx$



3. Solve using the standard algorithm. Use the thought bubble to show your thinking as you rename the divisor as a whole number.

<p>a. <math>46.2 \div 0.3 = \underline{\hspace{2cm}}</math>     <math>3 \overline{) 462}</math></p> 	<p>b. <math>3.16 \div 0.04 = \underline{\hspace{2cm}}</math></p> 
<p>c. <math>2.31 \div 0.3 = \underline{\hspace{2cm}}</math></p> 	<p>d. <math>15.6 \div 0.24 = \underline{\hspace{2cm}}</math></p> 

4. The total distance of a race is 18.9 km.
- If volunteers set up a water station every 0.7 km, including one at the finish line, how many stations will they have?
  - If volunteers set up a first aid station every 0.9 km, including one at the finish line, how many stations will they have?
5. In a laboratory, a technician combines a salt solution contained in 27 test tubes. Each test tube contains 0.06 liter of the solution. If he divides the total amount into test tubes that hold 0.3 liter each, how many test tubes will he need?

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Circle the expression equivalent to *the sum of 3 and 2 divided by  $\frac{1}{3}$* .

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

$$3 + (2 \div \frac{1}{3})$$

$$(3 + 2) \div \frac{1}{3}$$

$$\frac{1}{3} \div (3 + 2)$$

2. Circle the expression(s) equivalent to *28 divided by the difference between  $\frac{4}{5}$  and  $\frac{7}{10}$* .

$$28 \div \left(\frac{4}{5} - \frac{7}{10}\right)$$

$$\frac{28}{\frac{4}{5} - \frac{7}{10}}$$

$$\left(\frac{4}{5} - \frac{7}{10}\right) \div 28$$

$$28 \div \left(\frac{7}{10} - \frac{4}{5}\right)$$

3. Fill in the chart by writing an equivalent numerical expression.

a.	Half as much as the difference between $2\frac{1}{4}$ and $\frac{3}{8}$ .	
b.	The difference between $2\frac{1}{4}$ and $\frac{3}{8}$ divided by 4.	
c.	A third of the sum of $\frac{7}{8}$ and 22 tenths.	
d.	Add 2.2 and $\frac{7}{8}$ , and then triple the sum.	

4. Compare expressions 3(a) and 3(b). Without evaluating, identify the expression that is greater. Explain how you know.

5. Fill in the chart by writing an equivalent expression in word form.

a.		$\frac{3}{4} \times (1.75 + \frac{3}{5})$
b.		$\frac{7}{9} - (\frac{1}{8} \times 0.2)$
c.		$(1.75 + \frac{3}{5}) \times \frac{4}{3}$
d.		$2 \div (\frac{1}{2} \times \frac{4}{5})$

6. Compare the expressions in 5(a) and 5(c). Without evaluating, identify the expression that is less. Explain how you know.

7. Evaluate the following expressions.

a.  $(9 - 5) \div \frac{1}{3}$

b.  $\frac{5}{3} \times (2 \times \frac{1}{4})$

c.  $\frac{1}{3} \div (1 \div \frac{1}{4})$

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

e. Half as much as  $(\frac{3}{4} \times 0.2)$

f. 3 times as much as the quotient of 2.4 and 0.6

8. Choose an expression below that matches the story problem, and write it in the blank.

$$\frac{2}{3} \times (20 - 5)$$

$$(\frac{2}{3} \times 20) - (\frac{2}{3} \times 5)$$

$$\frac{2}{3} \times 20 - 5$$

$$(20 - \frac{2}{3}) - 5$$

- a. Farmer Green picked 20 carrots. He cooked  $\frac{2}{3}$  of them, and then gave 5 to his rabbits. Write the expression that tells how many carrots he had left.

Expression: \_\_\_\_\_

- b. Farmer Green picked 20 carrots. He cooked 5 of them, and then gave  $\frac{2}{3}$  to his rabbits. Write the expression that tells how many carrots the rabbits will get.

Expression: \_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

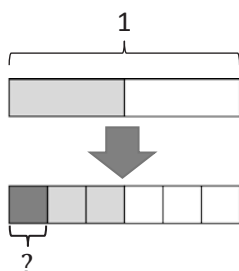
1. Ms. Hayes has  $\frac{1}{2}$  liter of juice. She distributes it equally to 6 students in her tutoring group.
  - a. How many liters of juice does each student get?
  
  
  
  
  
  
  
  
  
  
  - b. How many more liters of juice will Ms. Hayes need if she wants to give each of the 24 students in her class the same amount of juice found in Part (a)?
  
2. Lucia has 3.5 hours left in her workday as a car mechanic. Lucia needs  $\frac{1}{2}$  of an hour to complete one oil change.
  - a. How many oil changes can Lucia complete during the rest of her workday?
  
  
  
  
  
  
  
  
  
  
  - b. Lucia can complete two car inspections in the same amount of time it takes her to complete one oil change. How long does it take her to complete one car inspection?
  
  
  
  
  
  
  
  
  
  
  - c. How many inspections can she complete in the rest of her workday?

3. Carlo buys \$14.40 worth of grapefruit. Each grapefruit costs \$0.80.
- How many grapefruit does Carlo buy?
  - At the same store, Kahri spends one-third as much money on grapefruits as Carlo. How many grapefruits does she buy?
4. Studies show that a typical giant hummingbird can flap its wings once in 0.08 of a second.
- While flying for 7.2 seconds, how many times will a typical giant hummingbird flap its wings?
  - A ruby-throated hummingbird can flap its wings 4 times faster than a giant hummingbird. How many times will a ruby-throated hummingbird flap its wings in the same amount of time?

5. Create a story context for the following expression.

$$\frac{1}{3} \times (\$20 - \$3.20)$$

6. Create a story context about painting a wall for the following tape diagram.





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Video tutorials: <http://bit.ly/eurekapusd>

Info for parents: <http://bit.ly/pusdmath>