



A Story of Units

Pleasanton
UNIFIED SCHOOL DISTRICT

Mathematics Curriculum



Grade 5 • MODULE 4

Multiplication and Division of Fractions and
Decimal Fractions

Homework

Video tutorials: <http://embarc.online>

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

Version 3



Table of Contents

GRADE 5 • MODULE 4

Multiplication and Division of Fractions and Decimal Fractions

Module Overview	2
Topic A: Line Plots of Fraction Measurements	14
Topic B: Fractions as Division	27
Topic C: Multiplication of a Whole Number by a Fraction	85
Topic D: Fraction Expressions and Word Problems.....	138
Mid-Module Assessment and Rubric	186
Topic E: Multiplication of a Fraction by a Fraction	197
Topic F: Multiplication with Fractions and Decimals as Scaling and Word Problems.....	311
Topic G: Division of Fractions and Decimal Fractions.....	369
Topic H: Interpretation of Numerical Expressions	475
End-of-Module Assessment and Rubric	506
Answer Key	524

Name _____

Date _____

A meteorologist set up rain gauges at various locations around a city and recorded the rainfall amounts in the table below. Use the data in the table to create a line plot using $\frac{1}{8}$ inches.



- Which location received the most rainfall?
- Which location received the least rainfall?
- Which rainfall measurement was the most frequent?
- What is the total rainfall in inches?

Location	Rainfall Amount (inches)
1	$\frac{1}{8}$
2	$\frac{3}{8}$
3	$\frac{3}{4}$
4	$\frac{3}{4}$
5	$\frac{1}{4}$
6	$1\frac{1}{4}$
7	$\frac{1}{8}$
8	$\frac{1}{4}$
9	1
10	$\frac{1}{8}$

Name _____

Date _____

1. Draw a picture to show the division. Express your answer as a fraction.

a. $1 \div 4$

b. $3 \div 5$

c. $7 \div 4$

2. Using a picture, show how six people could share four sandwiches. Then, write an equation and solve.

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

a. $2 \div 7 = \underline{\quad}$

b. $39 \div 5 = \underline{\quad}$

c. $13 \div 3 = \underline{\quad}$

d. $\frac{9}{5} = \underline{\quad} \div \underline{\quad}$

e. $\frac{19}{28} = \underline{\quad} \div \underline{\quad}$

f. $1\frac{3}{5} = \underline{\quad} \div \underline{\quad}$

Name _____

Date _____

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

Division Expression	Unit Forms	Improper Fractions	Mixed Numbers	Standard Algorithm (Write your answer in whole numbers and fractional units. Then check.)
a. $4 \div 3$	12 thirds $\div 3$ = 4 thirds	$\frac{4}{3}$	$1\frac{1}{3}$	$ \begin{array}{r} 1\frac{1}{3} \\ 3 \overline{) 4} \\ \underline{-3} \\ 1 \end{array} $ Check $3 \times 1\frac{1}{3} = 1\frac{1}{3} + 1\frac{1}{3} + 1\frac{1}{3}$ $= 3 + \frac{3}{3}$ $= 3 + 1$ $= 4$
b. $\underline{\quad} \div \underline{\quad}$	$\underline{\quad}$ fifths $\div 5$ = $\underline{\quad}$ fifths		$1\frac{2}{5}$	
c. $\underline{\quad} \div \underline{\quad}$	$\underline{\quad}$ halves $\div 2$ = $\underline{\quad}$ halves			$2 \overline{) 7}$
d. $7 \div 4$		$\frac{7}{4}$		

2. A coffee shop uses 4 liters of milk every day.
- If there are 15 liters of milk in the refrigerator, after how many days will more milk need to be purchased? Explain how you know.

 - If only half as much milk is used each day, after how many days will more milk need to be purchased?
3. Polly buys 14 cupcakes for a party. The bakery puts them into boxes that hold 4 cupcakes each.
- How many boxes will be needed for Polly to bring all the cupcakes to the party? Explain how you know.

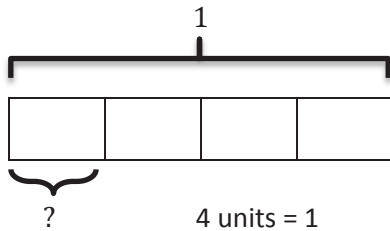
 - If the bakery completely fills as many boxes as possible, what fraction of the last box is empty? How many more cupcakes are needed to fill this box?

Name _____

Date _____

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

a. $1 \div 4 = \frac{1}{4}$



$$1 \text{ unit} = 1 \div 4$$

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

Check:

$$\begin{array}{r} 0 \frac{1}{4} \\ 4 \overline{) 1} \\ \underline{- 0} \\ 1 \end{array}$$

$$\begin{aligned} & 4 \times \frac{1}{4} \\ &= \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} \\ &= \frac{4}{4} \\ &= 1 \end{aligned}$$

b. $4 \div 5 = \underline{\quad}$

c. $8 \div 5 = \underline{\quad}$

d. $14 \div 3 = \underline{\quad}$

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. $16 \div 5$	$\frac{16}{5}$	3 and 4	$ \begin{array}{r} 3 \frac{1}{5} \\ 5 \overline{) 16} \\ \underline{-15} \\ 1 \end{array} $
b. $\underline{\quad} \div \underline{\quad}$	$\frac{3}{4}$	0 and 1	$ \begin{array}{r} \\ \overline{) 3} \\ \end{array} $
c. $\underline{\quad} \div \underline{\quad}$	$\frac{7}{2}$		$ \begin{array}{r} \\ \overline{) 7} \\ \end{array} $
d. $\underline{\quad} \div \underline{\quad}$	$\frac{81}{90}$		$ \begin{array}{r} \\ \overline{) 81} \\ \end{array} $

3. Jackie cut a 2-yard spool into 5 equal lengths of ribbon.
- What is the length of each ribbon in yards? Draw a tape diagram to show your thinking.

 - What is the length of each ribbon in feet? Draw a tape diagram to show your thinking.
4. Baa Baa, the black sheep, had 7 pounds of wool. If he separated the wool equally into 3 bags, how much wool would be in 2 bags?
5. An adult sweater is made from 2 pounds of wool. This is 3 times as much wool as it takes to make a baby sweater. How much wool does it take to make a baby sweater? Use a tape diagram to solve.

2. Craig bought a 3-foot-long baguette and then made 4 equally sized sandwiches with it.
- What portion of the baguette was used for each sandwich? Draw a visual model to help you solve this problem.
 - How long, in feet, is one of Craig's sandwiches?
 - How many inches long is one of Craig's sandwiches?
3. Scott has 6 days to save enough money for a \$45 concert ticket. If he saves the same amount each day, what is the minimum amount he must save each day in order to reach his goal? Express your answer in dollars.

Name _____

Date _____

1. Find the value of each of the following.

a.

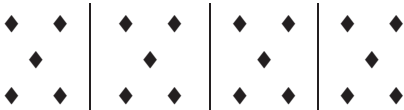


$$\frac{1}{3} \text{ of } 12 =$$

$$\frac{2}{3} \text{ of } 12 =$$

$$\frac{3}{3} \text{ of } 12 =$$

b.



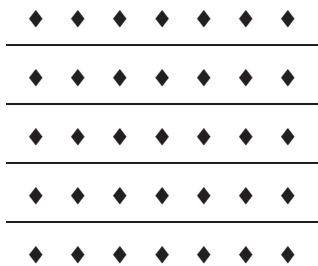
$$\frac{1}{4} \text{ of } 20 =$$

$$\frac{3}{4} \text{ of } 20 =$$

$$\frac{2}{4} \text{ of } 20 =$$

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

c.



$$\frac{1}{5} \text{ of } 35 =$$

$$\frac{3}{5} \text{ of } 35 =$$

$$\frac{5}{5} \text{ of } 35 =$$

$$\frac{2}{5} \text{ of } 35 =$$

$$\frac{4}{5} \text{ of } 35 =$$

$$\frac{6}{5} \text{ of } 35 =$$

2. Find $\frac{2}{3}$ of 18. Draw a set and shade to show your thinking.
3. How does knowing $\frac{1}{5}$ of 10 help you find $\frac{3}{5}$ of 10? Draw a picture to explain your thinking.
4. Sara just turned 18 years old. She spent $\frac{4}{9}$ of her life living in Rochester, NY. How many years did Sara live in Rochester?
5. A farmer collected 12 dozen eggs from her chickens. She sold $\frac{5}{6}$ of the eggs at the farmers' market and gave the rest to friends and neighbors.
- a. How many dozen eggs did the farmer give away? How many eggs did she give away?
- b. She sold each dozen for \$4.50. How much did she earn from the eggs she sold?

Name _____

Date _____

1. Solve using a tape diagram.

a. $\frac{1}{4}$ of 24

b. $\frac{1}{4}$ of 48

c. $\frac{2}{3} \times 18$

d. $\frac{2}{6} \times 18$

e. $\frac{3}{7} \times 49$

f. $\frac{3}{10} \times 120$

g. $\frac{1}{3} \times 31$

h. $\frac{2}{5} \times 20$

i. $\frac{1}{4} \times 25$

j. $\frac{3}{4} \times 25$

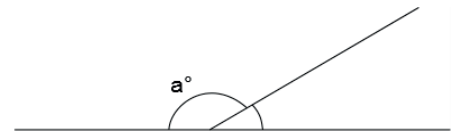
k. $\frac{3}{4}$ of a number is 27. What's the number?

l. $\frac{2}{5}$ of a number is 14. What's the number?

2. Solve using tape diagrams.

- a. A skating rink sold 66 tickets. Of these, $\frac{2}{3}$ were children's tickets, and the rest were adult tickets. What total number of adult tickets were sold?

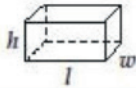
- b. A straight angle is split into two smaller angles as shown. The smaller angle's measure is $\frac{1}{6}$ that of a straight angle. What is the value of angle a ?



- c. Annabel and Eric made 17 ounces of pizza dough. They used $\frac{5}{8}$ of the dough to make a pizza and used the rest to make calzones. What is the difference between the amount of dough they used to make pizza and the amount of dough they used to make calzones?

- d. The New York Rangers hockey team won $\frac{3}{4}$ of their games last season. If they lost 21 games, how many games did they play in the entire season?

Grade 5 Mathematics Reference Sheet

FORMULAS

Right Rectangular Prism

Volume = lwh

Volume = Bh

CONVERSIONS

1 centimeter = 10 millimeters

1 meter = 100 centimeters = 1,000 millimeters

1 kilometer = 1,000 meters

1 gram = 1,000 milligrams

1 kilogram = 1,000 grams

1 pound = 16 ounces

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

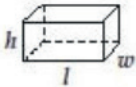
1 liter = 1,000 milliliters

1 kiloliter = 1,000 liters

1 mile = 5,280 feet

1 mile = 1,760 yards

Grade 5 Mathematics Reference Sheet

FORMULAS

Right Rectangular Prism

Volume = lwh

Volume = Bh

CONVERSIONS

1 centimeter = 10 millimeters

1 meter = 100 centimeters = 1,000 millimeters

1 kilometer = 1,000 meters

1 gram = 1,000 milligrams

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1 pound = 16 ounces

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

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1 gallon = 4 quarts

1 liter = 1,000 milliliters

1 kiloliter = 1,000 liters

1 mile = 5,280 feet

1 mile = 1,760 yards

Name _____

Date _____

1. Rewrite the following expressions as shown in the example.

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

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

b. $\frac{13}{5} + \frac{13}{5}$

c. $\frac{9}{4} + \frac{9}{4} + \frac{9}{4}$

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

$$\text{Example: } \frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4 \quad \frac{2}{3} \times 6 = \frac{2 \times \cancel{6}^2}{\cancel{3}_1} = 4$$

a. $\frac{3}{4} \times 16$

$\frac{3}{4} \times 16$

b. $\frac{4}{3} \times 12$

$\frac{4}{3} \times 12$

c. $40 \times \frac{11}{10}$

$40 \times \frac{11}{10}$

d. $\frac{7}{6} \times 36$

$\frac{7}{6} \times 36$

e. $24 \times \frac{5}{8}$

$24 \times \frac{5}{8}$

f. $18 \times \frac{5}{12}$

$18 \times \frac{5}{12}$

g. $\frac{10}{9} \times 21$

$\frac{10}{9} \times 21$

3. Solve each problem any way you choose.

a. $\frac{1}{3} \times 60$

$\frac{1}{3}$ minute = _____ seconds

b. $\frac{4}{5} \times 60$

$\frac{4}{5}$ hour = _____ minutes

c. $\frac{7}{10} \times 1000$

$\frac{7}{10}$ kilogram = _____ grams

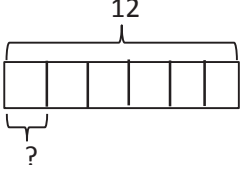
d. $\frac{3}{5} \times 100$

$\frac{3}{5}$ meter = _____ centimeters

Name _____

Date _____

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

<p>a. $\frac{1}{4}$ yard = <u>9</u> inches</p> $\frac{1}{4} \text{ yard} = \frac{1}{4} \times 1 \text{ yard}$ $= \frac{1}{4} \times 36 \text{ inches}$ $= \frac{36}{4} \text{ inches}$ $= 9 \text{ inches}$	<p>b. $\frac{1}{6}$ foot = _____ inches</p> $\frac{1}{6} \text{ foot} = \frac{1}{6} \times 1 \text{ foot}$ $= \frac{1}{6} \times 12 \text{ inches}$ $=$ 
<p>c. $\frac{3}{4}$ year = _____ months</p>	<p>d. $\frac{3}{5}$ meter = _____ centimeters</p>
<p>e. $\frac{5}{12}$ hour = _____ minutes</p>	<p>f. $\frac{2}{3}$ yard = _____ inches</p>

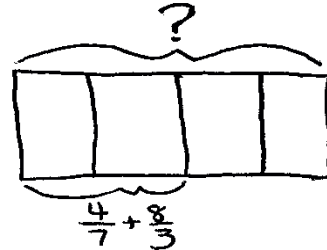
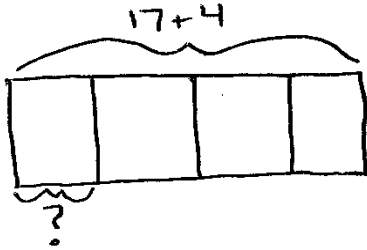
2. Michelle measured the length of her forearm. It was $\frac{3}{4}$ of a foot. How long is her forearm in inches?

3. At the market, Ms. Winn bought $\frac{3}{4}$ lb of grapes and $\frac{5}{8}$ lb of cherries.
- How many ounces of grapes did Ms. Winn buy?
 - How many ounces of cherries did Ms. Winn buy?
 - How many more ounces of grapes than cherries did Ms. Winn buy?
 - If Mr. Phillips bought $1\frac{3}{4}$ pounds of raspberries, who bought more fruit, Ms. Winn or Mr. Phillips? How many ounces more?
4. A gardener has 10 pounds of soil. He used $\frac{5}{8}$ of the soil for his garden. How many pounds of soil did he use in the garden? How many pounds did he have left?

Name _____

Date _____

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



2. Circle the expression(s) that give the same product as $6 \times \frac{3}{8}$. Explain how you know.

$8 \div (3 \times 6)$

$3 \div 8 \times 6$

$(6 \times 3) \div 8$

$(8 \div 6) \times 3$

$6 \times \frac{8}{3}$

$\frac{3}{8} \times 6$

3. Write an expression to match, and then evaluate.

a. $\frac{1}{8}$ the sum of 23 and 17

b. Subtract 4 from $\frac{1}{6}$ of 42.

c. 7 times as much as the sum of $\frac{1}{3}$ and $\frac{4}{5}$


d. $\frac{2}{3}$ of the product of $\frac{3}{8}$ and 16


e. 7 copies of the sum of 8 fifths and 4

f. 15 times as much as 1 fifth of 12

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

a. $\frac{2}{3} \times (9 + 12)$  $15 \times \frac{2}{3}$

b. $(3 \times \frac{5}{4}) \times \frac{3}{5}$  $(3 \times \frac{5}{4}) \times \frac{3}{8}$

b. $6 \times (2 + \frac{32}{16})$  $(6 \times 2) + \frac{32}{16}$

5. Fantine bought flour for her bakery each month and recorded the amount in the table to the right. For (a)–(c), write an expression that records the calculation described. Then, solve to find the missing data in the table.

- a. She bought $\frac{3}{4}$ of January's total in August.
- b. She bought $\frac{7}{8}$ as much in April as she did in October and July combined.

Month	Amount (in pounds)
January	3
February	2
March	$1\frac{1}{4}$
April	
May	$\frac{9}{8}$
June	
July	$1\frac{1}{4}$
August	
September	$\frac{11}{4}$
October	$\frac{3}{4}$

- c. In June, she bought $\frac{1}{8}$ pound less than three times as much as she bought in May.
- d. Display the data from the table in a line plot.
- e. How many pounds of flour did Fantine buy from January to October?

Name _____

Date _____

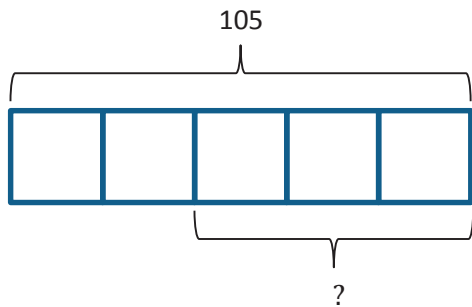
1. Jenny's mom says she has an hour before it's bedtime. Jenny spends $\frac{1}{3}$ of the hour texting a friend and $\frac{1}{4}$ of the time brushing her teeth and putting on her pajamas. She spends the rest of the time reading her book. How many minutes did Jenny read?

2. A-Plus Auto Body is painting designs on a customer's car. They had 18 pints of blue paint on hand. They used $\frac{1}{2}$ of it for the flames and $\frac{1}{3}$ of it for the sparks. They need $7\frac{3}{4}$ pints of blue paint to paint the next design. How many more pints of blue paint will they need to buy?

3. Giovanna, Frances, and their dad each carried a 10-pound bag of soil into the backyard. After putting soil in the first flower bed, Giovanna's bag was $\frac{5}{8}$ full, Frances's bag was $\frac{2}{5}$ full, and their dad's was $\frac{3}{4}$ full. How many pounds of soil did they put in the first flower bed altogether?

4. Mr. Chan made 252 cookies for the Annual Fifth Grade Class Bake Sale. They sold $\frac{3}{4}$ of them, and $\frac{3}{9}$ of the remaining cookies were given to PTA. members. Mr. Chan allowed the 12 student helpers to divide the cookies that were left equally. How many cookies will each student get?

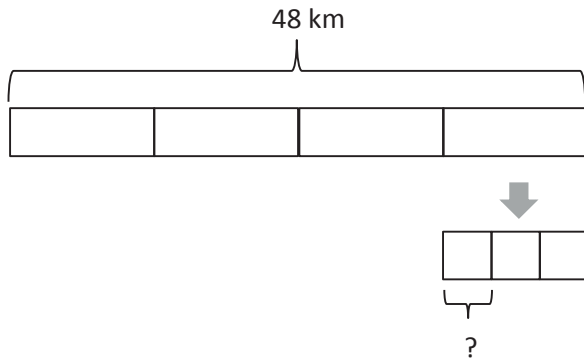
5. Using the tape diagram below, create a story problem about a farm. Your story must include a fraction.



3. In an auditorium, $\frac{1}{6}$ of the students are fifth graders, $\frac{1}{3}$ are fourth graders, and $\frac{1}{4}$ of the remaining students are second graders. If there are 96 students in the auditorium, how many second graders are there?
4. At a track meet, Jacob and Daniel compete in the 220 m hurdles. Daniel finishes in $\frac{3}{4}$ of a minute. Jacob finishes with $\frac{5}{12}$ of a minute remaining. Who ran the race in the faster time?

Bonus: Express the difference in their times as a fraction of a minute.

5. Create and solve a story problem about a runner who is training for a race. Include at least one fraction in your story.



6. Create and solve a story problem about two friends and their weekly allowance whose solution is given by the expression $\frac{1}{5} \times (12 + 8)$.

Name _____

Date _____

1. Solve. Draw a rectangular fraction model to show your thinking.

a. Half of $\frac{1}{2}$ cake = _____ cake.

b. One-third of $\frac{1}{2}$ cake = _____ cake.

c. $\frac{1}{4}$ of $\frac{1}{2}$

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

e. $\frac{1}{3} \times \frac{1}{3}$

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

2. Noah mows $\frac{1}{2}$ of his property and leaves the rest wild. He decides to use $\frac{1}{5}$ of the wild area for a vegetable garden. What fraction of the property is used for the garden? Draw a picture to support your answer.
3. Fawn plants $\frac{2}{3}$ of the garden with vegetables. Her son plants the remainder of the garden. He decides to use $\frac{1}{2}$ of his space to plant flowers, and in the rest, he plants herbs. What fraction of the entire garden is planted in flowers? Draw a picture to support your answer.
4. Diego eats $\frac{1}{5}$ of a loaf of bread each day. On Tuesday, Diego eats $\frac{1}{4}$ of the day's portion before lunch. What fraction of the whole loaf does Diego eat before lunch on Tuesday? Draw a rectangular fraction model to support your thinking.

Name _____

Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking.

a. $\frac{1}{2}$ of $\frac{2}{3} = \frac{1}{2}$ of _____ third(s) = _____ third(s)

b. $\frac{1}{2}$ of $\frac{4}{3} = \frac{1}{2}$ of _____ third(s) = _____ third(s)

c. $\frac{1}{3}$ of $\frac{3}{5} =$

d. $\frac{1}{2}$ of $\frac{6}{8} =$

e. $\frac{1}{3} \times \frac{4}{5} =$

f. $\frac{4}{5} \times \frac{1}{3} =$

2. Sarah has a photography blog. $\frac{3}{7}$ of her photos are of nature. $\frac{1}{4}$ of the rest are of her friends. What fraction of all of Sarah's photos is of her friends? Support your answer with a model.

Name _____

Date _____

1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence.

a. $\frac{2}{3}$ of $\frac{3}{4} =$

b. $\frac{2}{5}$ of $\frac{3}{4} =$

c. $\frac{2}{5}$ of $\frac{4}{5} =$

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

2. Multiply. Draw a rectangular fraction model if it helps you.

a. $\frac{5}{6} \times \frac{3}{10}$

b. $\frac{3}{4} \times \frac{4}{5}$

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

d. $\frac{3}{4} \times \frac{5}{12}$

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

f. $\frac{3}{7} \times \frac{2}{9}$

3. Every morning, Halle goes to school with a 1-liter bottle of water. She drinks $\frac{1}{4}$ of the bottle before school starts and $\frac{2}{3}$ of the rest before lunch.
- What fraction of the bottle does Halle drink after school starts but before lunch?
 - How many milliliters are left in the bottle at lunch?
4. Moussa delivered $\frac{3}{8}$ of the newspapers on his route in the first hour and $\frac{4}{5}$ of the rest in the second hour. What fraction of the newspapers did Moussa deliver in the second hour?
5. Rose bought some spinach. She used $\frac{3}{5}$ of the spinach on a pan of spinach pie for a party and $\frac{3}{4}$ of the remaining spinach for a pan for her family. She used the rest of the spinach to make a salad.
- What fraction of the spinach did she use to make the salad?
 - If Rose used 3 pounds of spinach to make the pan of spinach pie for the party, how many pounds of spinach did Rose use to make the salad?

Name _____

Date _____

Solve and show your thinking with a tape diagram.

1. Anthony bought an 8-foot board. He cut off $\frac{3}{4}$ of the board to build a shelf and gave $\frac{1}{3}$ of the rest to his brother for an art project. How many inches long was the piece Anthony gave to his brother?

2. Riverside Elementary School is holding a school-wide election to choose a school color. Five-eighths of the votes were for blue, $\frac{5}{9}$ of the remaining votes were for green, and the remaining 48 votes were for red.

a. How many votes were for blue?

b. How many votes were for green?

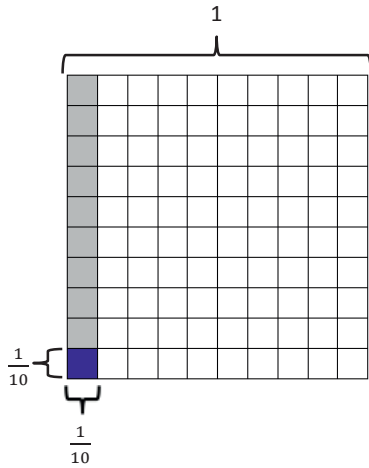
- c. If every student got one vote, but there were 25 students absent on the day of the vote, how many students are there at Riverside Elementary School?
- d. Seven-tenths of the votes for blue were made by girls. Did girls who voted for blue make up more than or less than half of all votes? Support your reasoning with a picture.
- e. How many girls voted for blue?

Name _____

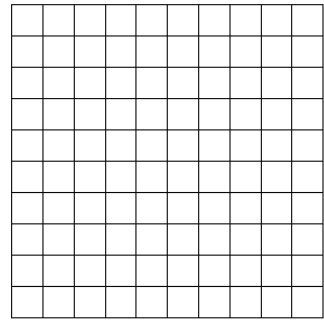
Date _____

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

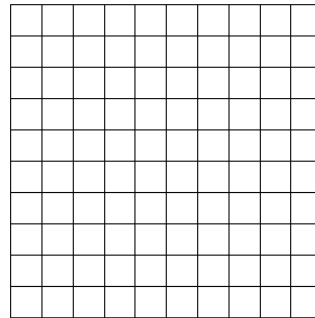
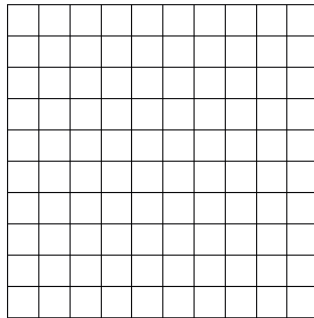
a. $\frac{1}{10} \times \frac{1}{10}$
 $= \frac{1 \times 1}{10 \times 10}$
 $= \frac{1}{100}$
 $0.1 \times 0.1 = 0.01$



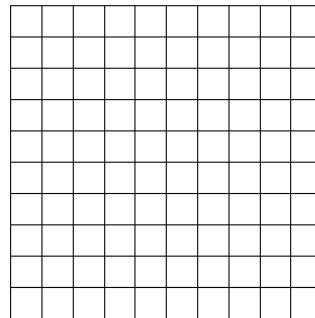
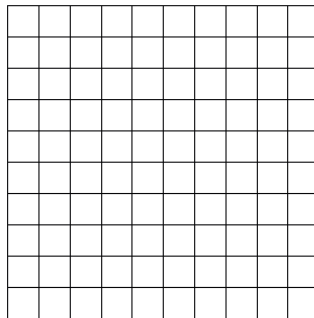
b. $\frac{6}{10} \times \frac{2}{10}$



c. $\frac{1}{10} \times 1.6$



d. $\frac{6}{10} \times 1.9$



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

$$\begin{aligned} \text{a. } 4 \times 0.6 &= \underline{\hspace{2cm}} \\ &= 4 \times \frac{6}{10} \\ &= \frac{4 \times 6}{10} \\ &= \frac{24}{10} \\ &= 2.4 \end{aligned}$$

$$\begin{aligned} \text{b. } 0.4 \times 0.6 &= \underline{\hspace{2cm}} \\ &= \frac{4}{10} \times \frac{6}{10} \\ &= \frac{4 \times 6}{10 \times 10} \\ &= \end{aligned}$$

$$\begin{aligned} \text{c. } 0.04 \times 0.6 &= \underline{\hspace{2cm}} \\ &= \frac{4}{100} \times \frac{6}{10} \\ &= \frac{_ \times _}{100 \times 10} \\ &= \end{aligned}$$

$$\text{d. } 7 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{e. } 0.7 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{f. } 0.07 \times 0.3 = \underline{\hspace{2cm}}$$

$$\text{g. } 1.3 \times 5 = \underline{\hspace{2cm}}$$

$$\text{h. } 1.3 \times 0.5 = \underline{\hspace{2cm}}$$

$$\text{i. } 0.13 \times 0.5 = \underline{\hspace{2cm}}$$

3. Jennifer makes 1.7 liters of lemonade. If she pours 3 tenths of the lemonade in the glass, how many liters of lemonade are in the glass?

4. Cassius walked 6 tenths of a 3.6-mile trail.

a. How many miles did Cassius have left to hike?

b. Cameron was 1.3 miles ahead of Cassius. How many miles did Cameron hike already?

Name _____

Date _____

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

a. $3.3 \times 1.6 = \frac{33}{10} \times \frac{16}{10}$

$$= \frac{33 \times 16}{100}$$

$$= \frac{528}{100}$$

$$= 5.28$$

$$\begin{array}{r} 33 \text{ tenths} \\ \times 16 \text{ tenths} \\ \hline 198 \\ + 330 \\ \hline 528 \text{ hundredths} \end{array}$$

b. $3.3 \times 0.8 =$

$$\begin{array}{r} 33 \text{ tenths} \\ \times 8 \text{ tenths} \\ \hline \end{array}$$

c. $4.4 \times 3.2 =$

d. $2.2 \times 1.6 =$

2. Multiply using fraction form and unit form. The first one is partially done for you.

a. $3.36 \times 1.4 = \frac{336}{100} \times \frac{14}{10}$

$$= \frac{336 \times 14}{1,000}$$

$$= \frac{4,704}{1,000}$$

$$= 4.704$$

$$\begin{array}{r} 336 \text{ hundredths} \\ \times 14 \text{ tenths} \\ \hline \end{array}$$

b. $3.35 \times 0.7 =$

$$\begin{array}{r} 335 \text{ hundredths} \\ \times 7 \text{ tenths} \\ \hline \end{array}$$

c. $4.04 \times 3.2 =$

d. $4.4 \times 0.16 =$

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

a. $3.2 \times 0.6 = 1.92$

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

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

b. $2.3 \times 2.1 = \underline{\hspace{2cm}}$

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

c. $7.41 \times 3.4 = \underline{\hspace{2cm}}$

d. $6.50 \times 4.5 = \underline{\hspace{2cm}}$

4. Erik buys 2.5 pounds of cashews. If each pound of cashews costs \$7.70, how much will he pay for the cashews?

5. A swimming pool at a park measures 9.75 meters by 7.2 meters.

a. Find the area of the swimming pool.

b. The area of the playground is one and a half times that of the swimming pool. Find the total area of the swimming pool and the playground.

Name _____

Date _____

1. Convert. Express your answer as a mixed number, if possible.

a. $2 \text{ ft} = \frac{2}{3} \text{ yd}$ $2 \text{ ft} = 2 \times 1 \text{ ft}$ $= 2 \times \frac{1}{3} \text{ yd}$ $= \frac{2}{3} \text{ yd}$	b. $6 \text{ ft} = \text{_____ yd}$ $6 \text{ ft} = 6 \times 1 \text{ ft}$ $= 6 \times \text{_____ yd}$ $= \text{_____ yd}$
c. $5 \text{ in} = \text{_____ ft}$	d. $14 \text{ in} = \text{_____ ft}$
e. $7 \text{ oz} = \text{_____ lb}$	f. $20 \text{ oz} = \text{_____ lb}$
g. $1 \text{ pt} = \text{_____ qt}$	h. $4 \text{ pt} = \text{_____ qt}$

2. Marty buys 12 ounces of granola.
 - a. What fraction of a pound of granola did Marty buy?

 - b. If a whole pound of granola costs \$4, how much did Marty pay?

3. Sara and her dad visit Yo-Yo Yogurt again. This time, the scale says that Sara has 14 ounces of vanilla yogurt in her cup. Her father's yogurt weighs half as much. How many pounds of frozen yogurt did they buy altogether on this visit? Express your answer as a mixed number.

4. An art teacher uses 1 quart of blue paint each month. In one year, how many gallons of paint will she use?

Name _____

Date _____

1. Convert. Show your work. Express your answer as a mixed number. The first one is done for you.

<p>a. $2\frac{2}{3}$ yd = <u>8</u> ft</p> $2\frac{2}{3} \text{ yd} = 2\frac{2}{3} \times 1 \text{ yd}$ $= 2\frac{2}{3} \times 3 \text{ ft}$ $= \frac{8}{3} \times 3 \text{ ft}$ $= \frac{24}{3} \text{ ft}$ $= 8 \text{ ft}$	<p>b. $1\frac{1}{4}$ ft = _____ yd</p> $1\frac{1}{4} \text{ ft} = 1\frac{1}{4} \times 1 \text{ ft}$ $= 1\frac{1}{4} \times \frac{1}{3} \text{ yd}$ $= \frac{5}{4} \times \frac{1}{3} \text{ yd}$ $=$
<p>c. $3\frac{5}{6}$ ft = _____ in</p>	<p>d. $7\frac{1}{2}$ pt = _____ qt</p>
<p>e. $4\frac{3}{10}$ hr = _____ min</p>	<p>f. 33 months = _____ years</p>

Name _____

Date _____

1. Fill in the blanks.

a. $\frac{1}{3} \times 1 = \frac{1}{3} \times \frac{3}{3} = \frac{\quad}{9}$

b. $\frac{2}{3} \times 1 = \frac{2}{3} \times \frac{\quad}{\quad} = \frac{14}{21}$

c. $\frac{5}{2} \times 1 = \frac{5}{2} \times \frac{\quad}{\quad} = \frac{25}{\quad}$

d. Compare the first factor to the value of the product.

2. Express each fraction as an equivalent decimal. The first one is partially done for you.

a. $\frac{3}{4} \times \frac{25}{25} = \frac{3 \times 25}{4 \times 25} = \frac{\quad}{100} =$

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

c. $\frac{2}{5} \times \frac{\quad}{\quad} =$

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

e. $\frac{3}{20}$

f. $\frac{25}{20}$

g. $\frac{23}{25}$

h. $\frac{89}{50}$

i. $3\frac{11}{25}$

j. $5\frac{41}{50}$

3. $\frac{6}{8}$ is equivalent to $\frac{3}{4}$. How can you use this to help you write $\frac{6}{8}$ as a decimal? Show your thinking to solve.
4. A number multiplied by a fraction is not always smaller than the original number. Explain this and give at least two examples to support your thinking.
5. Elise has $\frac{3}{4}$ of a dollar. She buys a stamp that costs 44 cents. Change both numbers into decimals, and tell how much money Elise has after paying for the stamp.

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. $\frac{1}{3}$ as long as 6 meters = _____ meter(s)

b. 6 times as long as $\frac{1}{3}$ meter = _____ meter(s)

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. $5 \times \frac{\quad}{3} > 5$

b. $\frac{6}{\quad} \times 12 < 12$

c. $4 \times \frac{\quad}{5} = 4$

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.

$\frac{2}{3} \times \underline{\quad} > \frac{2}{3}$

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

$\frac{5}{3} \times \underline{\quad} > \frac{5}{3}$

b.

$\frac{2}{3} \times \underline{\quad} < \frac{2}{3}$

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

$\frac{5}{3} \times \underline{\quad} < \frac{5}{3}$

5. Write a number in the blank that will make the number sentence true.
- a. $3 \times \underline{\hspace{1cm}} < 1$
- b. Explain how multiplying by a whole number can result in a product less than 1.
6. In a sketch, a fountain is drawn $\frac{1}{4}$ yard tall. The actual fountain will be 68 times as tall. How tall will the fountain be?
7. In blueprints, an architect's firm drew everything $\frac{1}{24}$ of the actual size. The windows will actually measure 4 ft by 6 ft and doors measure 12 ft by 8 ft. What are the dimensions of the windows and the doors in the drawing?

Name _____

Date _____

- 1.
- 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:

$$\boxed{12.5} \times 1.989$$

$$\boxed{828} \times 0.921$$

$$\boxed{321.46} \times 1.26$$

$$\boxed{0.007} \times 1.02$$

$$\boxed{2.16} \times 1.11$$

$$\boxed{0.05} \times 0.1$$

- b. What do the expressions in each column have in common?
2. 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. 14×0.999 _____ 14

b. 1.01×2.06 _____ 2.06

c. $1,955 \times 0.019$ _____ 1,955

- d. Two thousand \times 1.0001 _____ two thousand
- e. Two-thousandths \times 0.911 _____ two-thousandths

3. Rachel is 1.5 times as heavy as her cousin, Kayla. Another cousin, Jonathan, weighs 1.25 times as much as Kayla. List the cousins, from lightest to heaviest, and explain your thinking.

4. Circle your choice.

a. $a \times b > a$

For this statement to be true, b must be **greater than 1** **less than 1**

Write two expressions that support your answer. Be sure to include one decimal example.

b. $a \times b < a$

For this statement to be true, b must be **greater than 1** **less than 1**

Write two expressions that support your answer. Be sure to include one decimal example.

3. A community bike ride offers a short 5.7-mile ride for children and families. The short ride is followed by a long ride, $5\frac{2}{3}$ times as long as the short ride, for adults. If a woman bikes the short ride with her children and then the long ride with her friends, how many miles does she ride altogether?
4. Sal bought a house for \$78,524.60. Twelve years later he sold the house for $2\frac{3}{4}$ times as much. What was the sale price of the house?

5. In the fifth grade at Lenape Elementary School, there are $\frac{4}{5}$ as many students who do not wear glasses as those who do wear glasses. If there are 60 students who wear glasses, how many students are in the fifth grade?
6. At a factory, a mechanic earns \$17.25 an hour. The president of the company earns $6\frac{2}{3}$ times as much for each hour he works. The janitor at the same company earns $\frac{3}{5}$ as much as the mechanic. How much does the company pay for all three employees' wages for one hour of work?

Name _____

Date _____

1. Draw a tape diagram and a number line to solve. Fill in the blanks that follow.

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

There are ____ thirds in 1 whole.

There are ____ thirds in 3 wholes.

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

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

There are ____ fourths in 1 whole.

There are ____ fourths in __ wholes.

If 3 is $\frac{1}{4}$, what is the whole? _____

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

There are ____ thirds in 1 whole.

There are ____ thirds in __ wholes.

If 4 is $\frac{1}{3}$, what is the whole? _____

d. $5 \div \frac{1}{4} =$ _____

There are ____ fourths in 1 whole.

There are ____ fourths in __ wholes.

If 5 is $\frac{1}{4}$, what is the whole? _____

2. Divide. Then, multiply to check.

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

3. A principal orders 8 sub sandwiches for a teachers' meeting. She cuts the subs into thirds and puts the mini-subs onto a tray. How many mini-subs are on the tray?

4. Some students prepare 3 different snacks. They make $\frac{1}{8}$ pound bags of nut mix, $\frac{1}{4}$ pound bags of cherries, and $\frac{1}{6}$ pound bags of dried fruit. If they buy 3 pounds of nut mix, 5 pounds of cherries, and 4 pounds of dried fruit, how many of each type of snack bag will they be able to make?

Name _____

Date _____

1. Solve and support your answer with a model or tape diagram. Write your quotient in the blank.

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

b. $\frac{1}{3} \div 6 =$ _____

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

d. $\frac{1}{5} \div 2 =$ _____

2. Divide. Then, multiply to check.

a. $\frac{1}{2} \div 10$	b. $\frac{1}{4} \div 10$	c. $\frac{1}{3} \div 5$	d. $\frac{1}{5} \div 3$
e. $\frac{1}{8} \div 4$	f. $\frac{1}{7} \div 3$	g. $\frac{1}{10} \div 5$	h. $\frac{1}{5} \div 20$

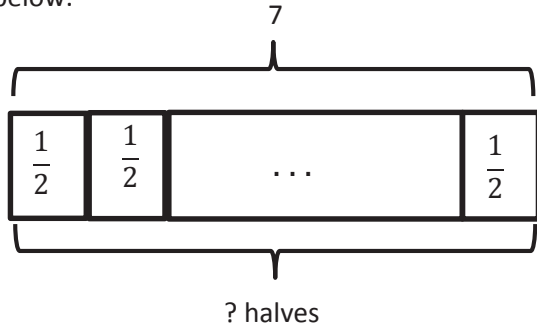
3. Teams of four are competing in a quarter-mile relay race. Each runner must run the same exact distance. What is the distance each teammate runs?
4. Solomon has read $\frac{1}{3}$ of his book. He finishes the book by reading the same amount each night for 5 nights.
- a. What fraction of the book does he read each of the 5 nights?
- b. If he reads 14 pages on each of the 5 nights, how long is the book?

- b. Write the amount of water in each glass in milliliters.
4. Drew has 4 pieces of rope 1 meter long each. He cuts each rope into fifths.
- a. How many fifths will he have after cutting all the ropes?
- b. How long will each of the fifths be in centimeters?

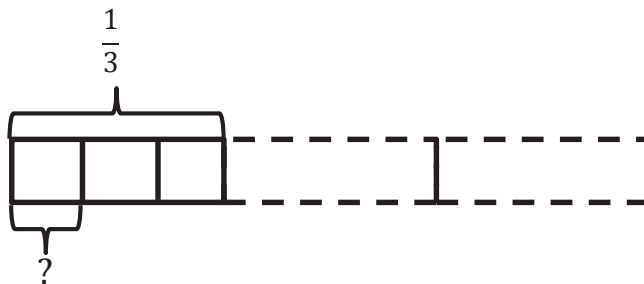
Name _____

Date _____

1. Create and solve a division story problem about 7 feet of rope that is modeled by the tape diagram below.



2. Create and solve a story problem about $\frac{1}{3}$ pound of flour that is modeled by the tape diagram below.



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

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

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

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

d. $3 \div \frac{1}{10}$

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: $4 \div 0.1 = 4 \div \frac{1}{10} = 40$

There are 10 tenths in 1 whole.

There are 40 tenths in 4 wholes.

a. $9 \div 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 9 wholes.

b. $6 \div 0.1$

There are _____ tenths in 1 whole.

There are _____ tenths in 6 wholes.

c. $3.6 \div 0.1$

There are _____ tenths in 3 wholes.

There are _____ tenths in 6 tenths.

There are _____ tenths in 3.6.

d. $12.8 \div 0.1$

There are _____ tenths in 12 wholes.

There are _____ tenths in 8 tenths.

There are _____ tenths in 12.8.

e. $3 \div 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 3 wholes.

f. $7 \div 0.01$

There are _____ hundredths in 1 whole.

There are _____ hundredths in 7 wholes.

g. $4.7 \div 0.01$

There are _____ hundredths in 4 wholes.

There are _____ hundredths in 7 tenths.

There are _____ hundredths in 4.7.

h. $11.3 \div 0.01$

There are _____ hundredths in 11 wholes.

There are _____ hundredths in 3 tenths.

There are _____ hundredths in 11.3.

2. Divide.

a. $2 \div 0.1$	b. $23 \div 0.1$	c. $5 \div 0.01$
d. $7.2 \div 0.1$	e. $51 \div 0.01$	f. $31 \div 0.1$
g. $231 \div 0.1$	h. $4.37 \div 0.01$	i. $24.5 \div 0.01$

3. Giovanna is charged \$0.01 for each text message she sends. Last month, her cell phone bill included a \$12.60 charge for text messages. How many text messages did Giovanna send?

4. Geraldine solved a problem: $68.5 \div 0.01 = 6,850$.

Ralph said, "This is wrong because a quotient can't be greater than the whole you start with. For example, $8 \div 2 = 4$ and $250 \div 5 = 50$." Who is correct? Explain your thinking.

5. The price for an ounce of gold on September 23, 2013, was \$1,326.40. A group of 10 friends decide to equally share the cost of 1 ounce of gold. How much money will each friend pay?

Name _____

Date _____

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

<p>a. $2.4 \div 0.8 = \frac{2.4}{0.8}$</p> $= \frac{2.4 \times 10}{0.8 \times 10}$ $= \frac{24}{8}$ <p>=</p>	<p>b. $2.4 \div 0.08 = \frac{2.4}{0.08}$</p> $= \frac{2.4 \times 100}{0.08 \times 100}$ $= \frac{240}{8}$ <p>=</p>
<p>c. $4.8 \div 0.6$</p>	<p>d. $0.48 \div 0.06$</p>
<p>e. $8.4 \div 0.7$</p>	<p>f. $0.84 \div 0.07$</p>

g. $4.5 \div 1.5$

h. $0.45 \div 0.15$

i. $14.4 \div 1.2$

j. $1.44 \div 0.12$

2. Leann says $18 \div 6 = 3$, so $1.8 \div 0.6 = 0.3$ and $0.18 \div 0.06 = 0.03$. Is Leann correct? Explain how to solve these division problems.

3. Denise is making bean bags. She has 6.4 pounds of beans.
- If she makes each bean bag 0.8 pounds, how many bean bags will she be able to make?

 - If she decides instead to make mini bean bags that are half as heavy, how many can she make?
4. A restaurant's small salt shakers contain 0.6 ounces of salt. Its large shakers hold twice as much. The shakers are filled from a container that has 18.6 ounces of salt. If 8 large shakers are filled, how many small shakers can be filled with the remaining salt?

Name _____

Date _____

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

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

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

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

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

$$= 112$$

$$7 \overline{) 784}$$

$$\underline{-7} $$

$$8$$

$$\underline{-7} $$

$$14$$

$$\underline{-14}$$

$$0$$

a. $61.6 \div 0.8 \approx$

b. $5.74 \div 0.7 \approx$

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

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

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

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

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

$$= 122$$

$$6 \overline{) 732}$$

$$\underline{-6} $$

$$13$$

$$\underline{-12} $$

$$12$$

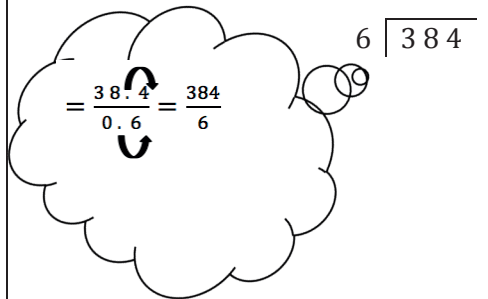
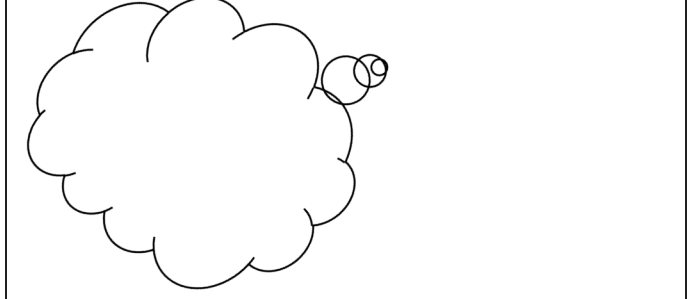
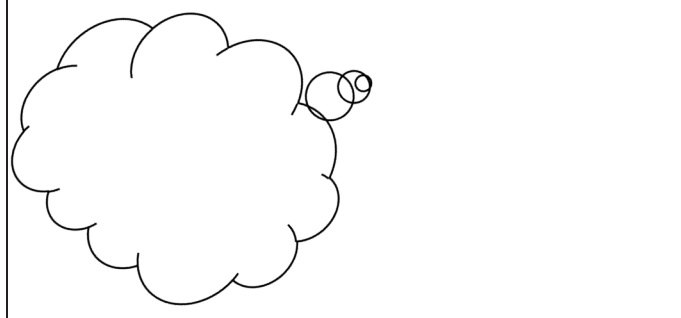
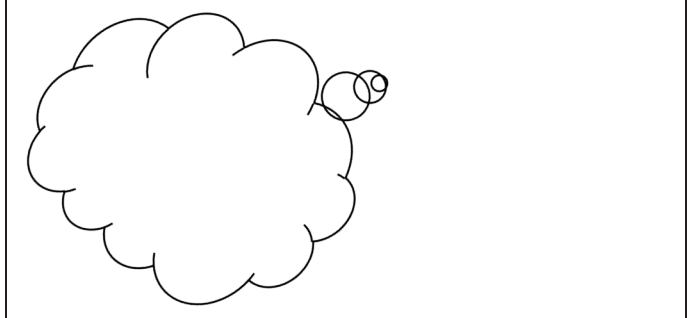
$$\underline{-12}$$

$$0$$

a. $4.74 \div 0.06 \approx$

b. $19.44 \div 0.54 \approx$

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. $38.4 \div 0.6 = \underline{\hspace{2cm}}$</p> 	<p>b. $7.52 \div 0.08 = \underline{\hspace{2cm}}$</p> 
<p>c. $12.45 \div 0.5 = \underline{\hspace{2cm}}$</p> 	<p>d. $5.6 \div 0.16 = \underline{\hspace{2cm}}$</p> 

4. Lucia is making a 21.6 centimeter beaded string to hang in the window. She decides to put a green bead every 0.4 centimeters and a purple bead every 0.6 centimeters. How many green beads and how many purple beads will she need?
5. A group of 14 friends collects 0.7 pound of blueberries and decides to make blueberry muffins. They put 0.05 pound of berries in each muffin. How many muffins can they make if they use all the blueberries they collected?

Name _____

Date _____

1. Circle the expression equivalent to *the difference between 7 and 4, divided by a fifth*.

$7 + (4 \div \frac{1}{5})$

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

$(7-4) \div \frac{1}{5}$

$\frac{1}{5} \div (7-4)$

2. Circle the expression(s) equivalent to *42 divided by the sum of $\frac{2}{3}$ and $\frac{3}{4}$* .

$(\frac{2}{3} + \frac{3}{4}) \div 42$

$(42 \div \frac{2}{3}) + \frac{3}{4}$

$42 \div (\frac{2}{3} + \frac{3}{4})$

$\frac{42}{\frac{2}{3} + \frac{3}{4}}$

3. Fill in the chart by writing the equivalent numerical expression or expression in word form.

	Expression in word form	Numerical expression
a.	A fourth as much as the sum of $3\frac{1}{8}$ and 4.5	
b.		$(3\frac{1}{8} + 4.5) \div 5$
c.	Multiply $\frac{3}{5}$ by 5.8; then halve the product	
d.		$\frac{1}{6} \times (4.8 - \frac{1}{2})$
e.		$8 - (\frac{1}{2} \div 9)$

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

5. Evaluate the following expressions.

a. $(11 - 6) \div \frac{1}{6}$

b. $\frac{9}{5} \times (4 \times \frac{1}{6})$

c. $\frac{1}{10} \div (5 \div \frac{1}{2})$

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

e. 50 divided by the difference between $\frac{3}{4}$ and $\frac{5}{8}$

6. Lee is sending out 32 birthday party invitations. She gives 5 invitations to her mom to give to family members. Lee mails a third of the rest, and then she takes a break to walk her dog.

a. Write a numerical expression to describe how many invitations Lee has already mailed.

b. Which expression matches how many invitations still need to be sent out?

$$32 - 5 - \frac{1}{3}(32 - 5)$$

$$\frac{2}{3} \times 32 - 5$$

$$(32 - 5) \div \frac{1}{3}$$

$$\frac{1}{3} \times (32 - 5)$$

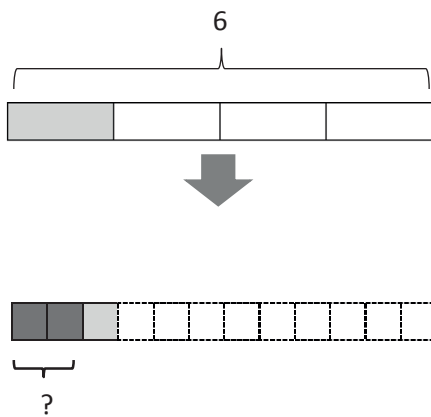
3. Ms. Geronimo has a \$10 gift certificate to her local bakery.
- If she buys a slice of pie for \$2.20 and uses the rest of the gift certificate to buy chocolate macaroons that cost \$0.60 each, how many macaroons can Ms. Geronimo buy?
 - If she changes her mind and instead buys a loaf of bread for \$4.60 and uses the rest to buy cookies that cost $1\frac{1}{2}$ times as much as the macaroons, how many cookies can she buy?

4. Create a story context for the following expressions.

a. $(5\frac{1}{4} - 2\frac{1}{8}) \div 4$

b. $4 \times (\frac{4.8}{0.8})$

5. Create a story context for the following tape diagram.







Video tutorials: <http://embarc.online>
Info for parents: <http://bit.ly/pusdmath>