

Name \_\_\_\_\_

Date \_\_\_\_\_

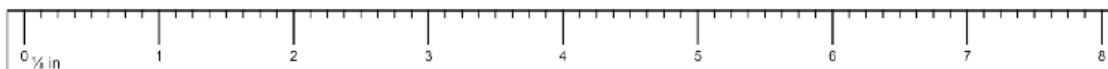
1. Estimate the length of your pencil to the nearest inch. \_\_\_\_\_
2. Using a ruler, measure your pencil strip to the nearest  $\frac{1}{2}$  inch, and mark the measurement with an X above the ruler below. Construct a line plot of your classmates' pencil measurements.



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.

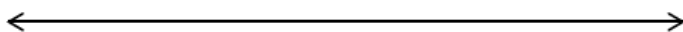


5. Use all three of your line plots to complete the following:
- a. Compare the three plots, and write one sentence that describes how the plots are alike and one sentence that describes how they are different.
- b. What is the difference between the measurements of the longest and shortest pencils on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

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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	$\frac{1}{8}$

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1. Draw a line plot for the following data measured in inches:

$$1\frac{1}{2}, 2\frac{3}{4}, 3, 2\frac{3}{4}, 2\frac{1}{2}, 2\frac{3}{4}, 3\frac{3}{4}, 3, 3\frac{1}{2}, 2\frac{1}{2}, 3\frac{1}{2}$$

2. Explain how you decided to divide your wholes into fractional parts and how you decided where your number scale should begin and end.

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

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

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1. Draw a picture that shows the division expression. Then, write an equation and solve.

a.  $3 \div 9$

b.  $4 \div 3$

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

a.  $21 \div 8 = \underline{\quad}$

b.  $\frac{7}{4} = \underline{\quad} \div \underline{\quad}$

c.  $4 \div 9 = \underline{\quad}$

d.  $1\frac{2}{7} = \underline{\quad} \div \underline{\quad}$

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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	$\frac{5}{4}$	$1\frac{1}{4}$	$4 \overline{) 5 \frac{1}{4}}$ $\underline{-4}$ $1$ Check $4 \times 1\frac{1}{4} = 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4} + 1\frac{1}{4}$ $= 4 + \frac{4}{4}$ $= 4 + 1$ $= 5$
b. $3 \div 2$	___ halves $\div 2$ = ___ halves		$1\frac{1}{2}$	
c. ___ $\div$ ___	24 fourths $\div 4$ = 6 fourths			$4 \overline{) 6}$
d. $5 \div 2$		$\frac{5}{2}$	$2\frac{1}{2}$	



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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}  $ <div style="display: inline-block; vertical-align: top; margin-left: 20px;">                     Check  <math>3 \times 1\frac{1}{3} = 1\frac{1}{3} + 1\frac{1}{3} + 1\frac{1}{3}</math>  <math>= 3 + \frac{3}{3}</math>  <math>= 3 + 1</math>  <math>= 4</math> </div>
b. $\underline{\quad} \div \underline{\quad}$	$\underline{\quad}$ fifths $\div 5$ = $\underline{\quad}$ fifths		$2\frac{2}{5}$	
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.
- a. 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.
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  - b. 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.
- a. How many boxes will be needed for Polly to bring all the cupcakes to the party? Explain how you know.
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  
  - b. 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?

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A baker made 9 cupcakes, each a different type. Four people want to share them equally. How many cupcakes will each person get?

Fill in the chart to show how to solve the problem.

Division Expression	Unit Forms	Fractions and Mixed numbers	Standard Algorithm

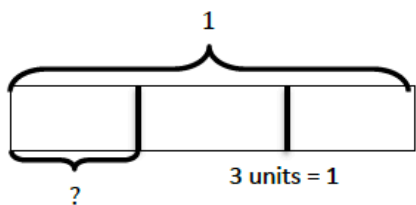
Draw to show your thinking:

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



3 units = 1

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. $\underline{\quad} \div \underline{\quad}$	$\frac{55}{10}$		$  \begin{array}{r}  \overline{\quad} \\  \underline{\quad}  \end{array}  $
d. $\underline{\quad} \div \underline{\quad}$	$\frac{32}{40}$		$  \begin{array}{r}  40 \overline{) 32}  \end{array}  $

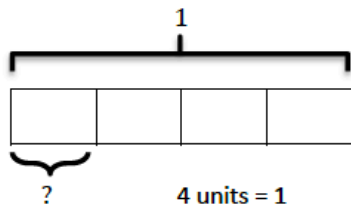
3. Greg spent \$4 on 5 packs of sport cards.
- How much did Greg spend on each pack?
  
  
  
  
  
  
  
  
  
  
  - If Greg spent half as much money and bought twice as many packs of cards, how much did he spend on each pack? Explain your thinking.
4. Five pounds of birdseed is used to fill 4 identical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

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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 unit =  $1 \div 4$

$= \frac{1}{4}$

Check:

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

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

$= \frac{4}{4}$

$= 1$

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

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}  \phantom{0} \\  \phantom{0} \overline{) 3} \\  \phantom{0} \phantom{0}  \end{array}  $
c. $\underline{\quad} \div \underline{\quad}$	$\frac{7}{2}$		$  \begin{array}{r}  3 \\  2 \overline{) 7} \\  \phantom{2} \phantom{0}  \end{array}  $
d. $\underline{\quad} \div \underline{\quad}$	$\frac{81}{90}$		$  \begin{array}{r}  \phantom{0} \\  \phantom{0} \overline{) 81} \\  \phantom{0} \phantom{0}  \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.

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Matthew and his 3 siblings are weeding a flower bed with an area of 9 square yards. If they share the job equally, how many square yards of the flower bed will each child need to weed? Use a tape diagram to show your thinking.



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?

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1. When someone donated 14 gallons of paint to Rosendale Elementary School, the fifth grade decided to use it to paint murals. They split the gallons equally among the four classes.
  - a. How much paint did each class have to paint their mural?
  - b. How much paint will three classes use? Show your thinking using words, numbers, or pictures.
  - c. If 4 students share a 30-square-foot wall equally, how many square feet of the wall will be painted by each student?
  - d. What fraction of the wall will each student paint?

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.

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A grasshopper covered a distance of 5 yards in 9 equal hops. How many yards did the grasshopper travel on each hop?

a. Draw a picture to support your work.

b. How many yards did the grasshopper travel after hopping twice?

## A

Number Correct: \_\_\_\_\_

## Divide Whole Numbers

1.	$1 \div 2 =$	
2.	$1 \div 3 =$	
3.	$1 \div 8 =$	
4.	$2 \div 2 =$	
5.	$2 \div 3 =$	
6.	$3 \div 3 =$	
7.	$3 \div 4 =$	
8.	$3 \div 10 =$	
9.	$3 \div 5 =$	
10.	$5 \div 5 =$	
11.	$6 \div 5 =$	
12.	$7 \div 5 =$	
13.	$9 \div 5 =$	
14.	$2 \div 3 =$	
15.	$4 \div 4 =$	
16.	$5 \div 4 =$	
17.	$7 \div 4 =$	
18.	$4 \div 2 =$	
19.	$5 \div 2 =$	
20.	$10 \div 5 =$	
21.	$11 \div 5 =$	
22.	$13 \div 5 =$	

23.	$6 \div 2 =$	
24.	$7 \div 2 =$	
25.	$8 \div 8 =$	
26.	$9 \div 8 =$	
27.	$15 \div 8 =$	
28.	$8 \div 4 =$	
29.	$11 \div 4 =$	
30.	$15 \div 2 =$	
31.	$24 \div 5 =$	
32.	$17 \div 4 =$	
33.	$20 \div 3 =$	
34.	$13 \div 6 =$	
35.	$30 \div 7 =$	
36.	$27 \div 8 =$	
37.	$49 \div 9 =$	
38.	$29 \div 6 =$	
39.	$47 \div 7 =$	
40.	$53 \div 8 =$	
41.	$67 \div 9 =$	
42.	$59 \div 6 =$	
43.	$63 \div 8 =$	
44.	$71 \div 9 =$	

# B

Number Correct: \_\_\_\_\_

Improvement: \_\_\_\_\_

## Divide Whole Numbers

1.	$1 \div 3 =$	
2.	$1 \div 4 =$	
3.	$1 \div 10 =$	
4.	$5 \div 5 =$	
5.	$5 \div 6 =$	
6.	$3 \div 3 =$	
7.	$3 \div 7 =$	
8.	$3 \div 10 =$	
9.	$3 \div 4 =$	
10.	$4 \div 4 =$	
11.	$5 \div 4 =$	
12.	$2 \div 2 =$	
13.	$3 \div 2 =$	
14.	$4 \div 5 =$	
15.	$10 \div 10 =$	
16.	$11 \div 10 =$	
17.	$13 \div 10 =$	
18.	$10 \div 5 =$	
19.	$11 \div 5 =$	
20.	$13 \div 5 =$	
21.	$4 \div 2 =$	
22.	$5 \div 2 =$	

23.	$15 \div 5 =$	
24.	$16 \div 5 =$	
25.	$6 \div 6 =$	
26.	$7 \div 6 =$	
27.	$11 \div 6 =$	
28.	$6 \div 3 =$	
29.	$8 \div 3 =$	
30.	$13 \div 2 =$	
31.	$23 \div 5 =$	
32.	$15 \div 4 =$	
33.	$19 \div 4 =$	
34.	$19 \div 6 =$	
35.	$31 \div 7 =$	
36.	$37 \div 8 =$	
37.	$50 \div 9 =$	
38.	$17 \div 6 =$	
39.	$48 \div 7 =$	
40.	$51 \div 8 =$	
41.	$68 \div 9 =$	
42.	$53 \div 6 =$	
43.	$61 \div 8 =$	
44.	$70 \div 9 =$	

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1. Find the value of each of the following.



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

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

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



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

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

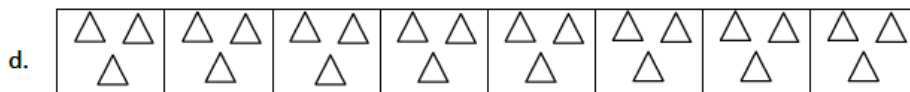
$$\frac{3}{3} \text{ of } 15 =$$



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

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

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



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

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

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

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

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

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?



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1. Find the value of each of the following.

a.

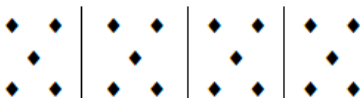


$$\frac{1}{3} \text{ of } 12 =$$

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

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

b.



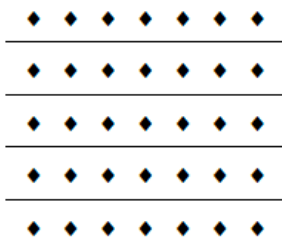
$$\frac{1}{4} \text{ of } 20 =$$

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

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

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

c.



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

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

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

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

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

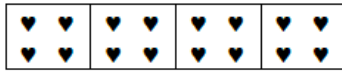
$$\frac{6}{5} \text{ of } 35 =$$

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?

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1. Find the value of each of the following.



a.  $\frac{1}{4}$  of 16 =

b.  $\frac{3}{4}$  of 16 =

2. Out of 18 cookies,  $\frac{2}{3}$  are chocolate chip. How many of the cookies are chocolate chip?

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

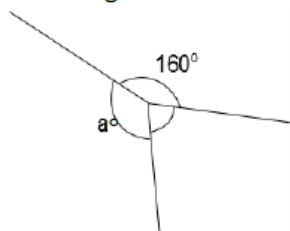
i.  $\frac{2}{3}$  of a number is 10. What's the number?

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?

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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?

Name \_\_\_\_\_

Date \_\_\_\_\_

Solve using a tape diagram.

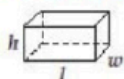
a.  $\frac{3}{5}$  of 30

b.  $\frac{3}{5}$  of a number is 30. What's the number?

- c. Mrs. Johnson baked 2 dozen cookies. Two-thirds of the cookies were oatmeal. How many oatmeal cookies did Mrs. Johnson bake?



## 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

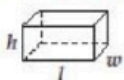
1 liter = 1,000 milliliters

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

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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

Name \_\_\_\_\_

Date \_\_\_\_\_

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.

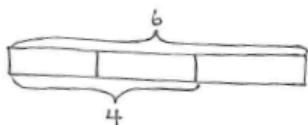
Example:  $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{4 \times 2}{3} = \frac{8}{3}$

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

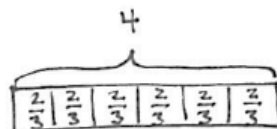
b.  $\frac{14}{5} + \frac{14}{5} =$

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.  $\frac{3}{10} \times 1,000$

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

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

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

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 \_\_\_\_\_

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

Example:  $\frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4$

$\frac{2}{3} \times 6 = \frac{2 \times \cancel{6}^2}{\cancel{3}_1} = 4$

a.  $\frac{2}{3} \times 15$

$\frac{2}{3} \times 15$

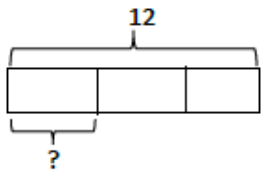
b.  $\frac{5}{4} \times 12$

$\frac{5}{4} \times 12$

Name \_\_\_\_\_

Date \_\_\_\_\_

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> $\frac{1}{2} \text{ yard} = \frac{1}{2} \times 1 \text{ yard}$ $= \frac{1}{2} \times 3 \text{ feet}$ $= \frac{3}{2} \text{ feet}$ $= 1\frac{1}{2} \text{ feet}$	<p>b. <math>\frac{1}{3}</math> foot = _____ inches</p> $\frac{1}{3} \text{ foot} = \frac{1}{3} \times 1 \text{ foot}$ $= \frac{1}{3} \times 12 \text{ inches}$ $=$ 
<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>

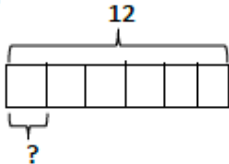
2. Mrs. Lang told her class that the class's pet hamster is  $\frac{1}{4}$  ft in length. How long is the hamster in inches?
3. At the market, Mr. Paul bought  $\frac{7}{8}$  lb of cashews and  $\frac{3}{4}$  lb of walnuts.
- How many ounces of cashews did Mr. Paul buy?
  - How many ounces of walnuts 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. Convert. Show your work using a tape diagram or an equation. The first one is done for you.

<p>a. <math>\frac{1}{4}</math> 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. <math>\frac{1}{6}</math> foot = _____ inches</p> $\frac{1}{6} \text{ foot} = \frac{1}{6} \times 1 \text{ foot}$ $= \frac{1}{6} \times 12 \text{ inches}$ $=$ 
<p>c. <math>\frac{3}{4}</math> year = _____ months</p>	<p>d. <math>\frac{3}{5}</math> meter = _____ centimeters</p>
<p>e. <math>\frac{5}{12}</math> hour = _____ minutes</p>	<p>f. <math>\frac{2}{3}</math> 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. Express 36 minutes as a fraction of an hour: 36 minutes = \_\_\_\_\_ hour

2. Solve.

a.  $\frac{2}{3}$  feet = \_\_\_\_\_ inches

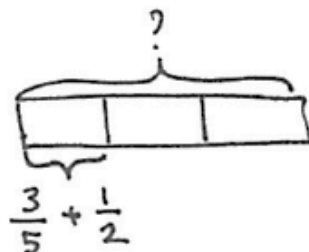
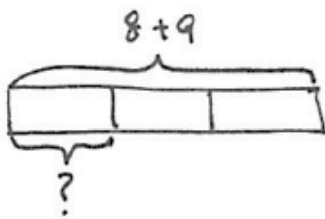
b.  $\frac{2}{5}$  m = \_\_\_\_\_ cm

c.  $\frac{5}{6}$  year = \_\_\_\_\_ months

Name \_\_\_\_\_

Date \_\_\_\_\_

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



2. Write an expression to match, and 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 give the same product as  $\frac{4}{5} \times 7$ . Explain how you know.

$$4 \div (7 \times 5) \quad 7 \div 5 \times 4 \quad (4 \times 7) \div 5 \quad 4 \div (5 \times 7) \quad 4 \times \frac{7}{5} \quad 7 \times \frac{4}{5}$$

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

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

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.

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.

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	$\frac{1}{4}$

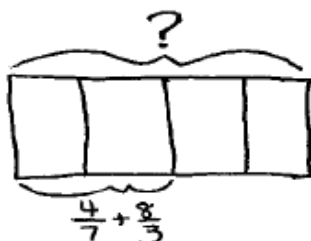
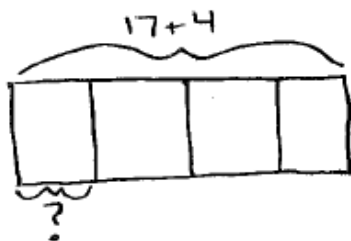
d. Display the data from the table in a line plot.

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

Name \_\_\_\_\_

Date \_\_\_\_\_

1. 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. Rewrite these expressions using words.

a.  $\frac{3}{4} \times \left(2\frac{2}{5} - \frac{5}{6}\right)$

b.  $2\frac{1}{4} + \frac{8}{3}$

2. Write an expression, and then solve.

Three less than one-fourth of the product of eight thirds and nine