

Name \_\_\_\_\_

## Unit 2 Study Guide

### Proportional Relationships

#### Ratios - 6.RP.1

|   |  |
|---|--|
| 1) Twenty students tried out for the basketball team. Seven were selected. What is the ratio of students selected to those trying out?  | 2) Jamie sells 25 adult tickets, 21 student tickets, and 8 discount tickets for the school dance. Write the three ways to show the ratio of discount tickets to adult tickets.   |
| 3) A bag contains only blue and red marbles. There are 12 blue marbles and 16 red marbles in the bag.<br>a) What is the ratio of red marbles to total marbles in the bag?<br><br>b) What is the ratio of blue marbles to red marbles? | 4) There are 18 students who play the clarinet and 9 who play the flute.<br>a) What is the ratio of students who play the flute to those who play the clarinet?<br><br>b) What is the ratio of students who play the clarinet to the total students? |

#### Unit Rate - 6.RP.2

|  |  |
|--|--|
| 5) Donald paid \$35.60 for 8 tickets. How much did he pay per ticket?<br><br>7) Fred has 96 marbles to share with 12 friends. How many marbles per friend?<br><br>9) Janice paid \$6 for 15 inches of ribbon. What was the cost of one inch of ribbon? | 6) The bus can travel 456 miles on one tank of gas. If the gas tank holds 24 gallons, what is the unit rate for miles per gallon?<br><br>8) Susan drove 429 miles in 6 hours. How many miles did she drive per hour? |
|--|--|

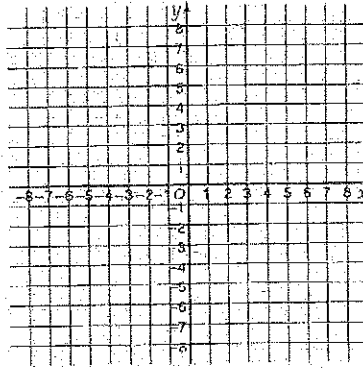
## Measurement Conversions - MCC6.RP.3d

|   |  |
|---|--|
| <p>19) A computer monitor measures 1.5 feet in length. How many inches long is the monitor? (1 ft. = 12 in.)</p>              | <p>20) Mrs. Brown is 66 inches tall. What is her height in feet?</p>   |
| <p>21) We need 144 cups of punch for a party. How many pint pitchers can we fill for serving our guests?<br/>(1 pt = 2 c)</p> | <p>22) A bottle of juice has a capacity of 1,250 milliliters. What is an equivalent measure in liters?</p>             |
| <p>23) Jennifer needs ten milliliters of medication. What is her dosage in liters?</p>  | <p>24) Mark's baseball bat measures 0.8 meter. What is the equivalent measure in centimeters?</p>                      |
| <p>25) A baby weighed 8 pounds at birth. About how many kilograms did it weigh at birth?<br/>(1 pound = 0.454 kg)</p>         | <p>26) Jamie purchased 14 gallons of gasoline. How many liters of gasoline did he purchase?<br/>(1 gal. = 3.785 L)</p> |

# Using the Coordinate Plane

Name \_\_\_\_\_

- 1) In mathematics, we use a grid to locate points. The \_\_\_\_\_ is formed by the perpendicular intersection of two number lines, called \_\_\_\_\_.
- 2) The horizontal axis (left to right) is called the \_\_\_\_\_.
- 3) The vertical axis (up and down) is called the \_\_\_\_\_.
- 4) The two number lines cross at the \_\_\_\_\_.
- 5) The intersection of the two number lines forms four \_\_\_\_\_.



- 6) We name each point on the grid with two numbers (coordinates). The two numbers must be in a certain order; therefore, they are called \_\_\_\_\_.
- 7) The \_\_\_\_\_ always goes first and tells how far to move left or right.
- 8) The \_\_\_\_\_ always goes second and tells how far to move up or down.

X comes before Y in the alphabet, too!

- 9) To plot (or graph) a point:

Step 1: Begin at the \_\_\_\_\_ ( , ).

Step 2: Move \_\_\_\_\_ (for positive) or \_\_\_\_\_ (for negative) the number of spaces indicated by the x-coordinate.

Step 3: Move \_\_\_\_\_ (for positive) or \_\_\_\_\_ (for negative) the number of spaces indicated by the y-coordinate.

Step 4: Place a dot at the intersection and label the point with a capital letter (if applicable).

- 10) To find the ordered pair of a point:

Step 1: Begin at the \_\_\_\_\_.

Step 2: Move to the right or left until you are below the point and record that number as the x-coordinate.

Step 3: Move up or down until you reach the point and record that number as the y-coordinate.

- 11) Plot the following ordered pairs on the coordinate plane above:

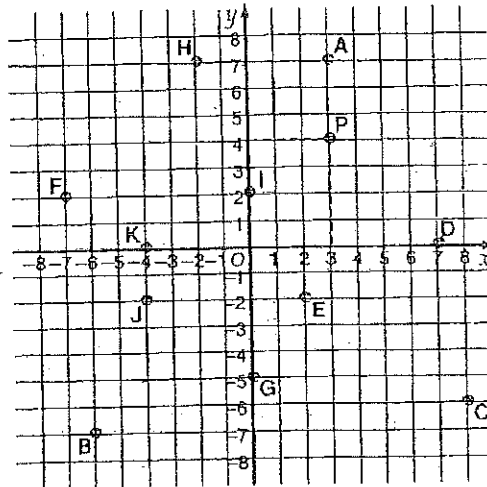
A (3, 3)    B (-1, 2)    C (-4, -1)    D (3, -2)    E (0, 5)    H (-6, 0)

Name \_\_\_\_\_

## Graphing Ordered Pairs

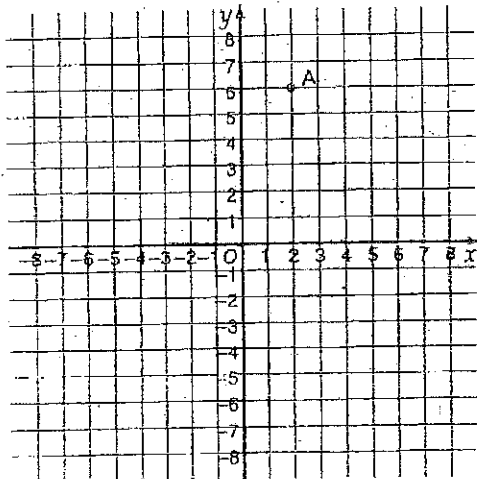
Find each point on the graph. Then write the ordered pairs.

1. P (3, 4)    I (\_\_\_\_, \_\_\_\_)
2. E (\_\_\_\_, \_\_\_\_)    B (\_\_\_\_, \_\_\_\_)
3. D (\_\_\_\_, \_\_\_\_)    G (\_\_\_\_, \_\_\_\_)
4. H (\_\_\_\_, \_\_\_\_)    K (\_\_\_\_, \_\_\_\_)
5. J (\_\_\_\_, \_\_\_\_)    A (\_\_\_\_, \_\_\_\_)
6. C (\_\_\_\_, \_\_\_\_)    F (\_\_\_\_, \_\_\_\_)

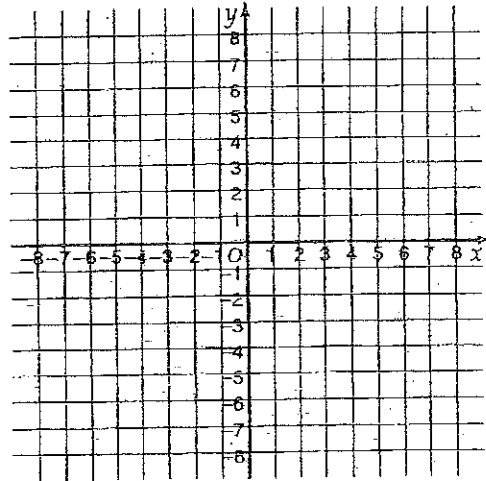


Plot and label each point on the graph provided.

1. A (2, 6)
- B (3, -5)
- C (-5, 3)
- D (-4, -6)
- E (0, 1)



2. F (-5, -8)
- G (0, 8)
- H (-8, 0)
- I (0, -7)
- J (0, 0)



# Plotting Points

Connect each of the following ordered points.

$(x, y) = (0, -1)$

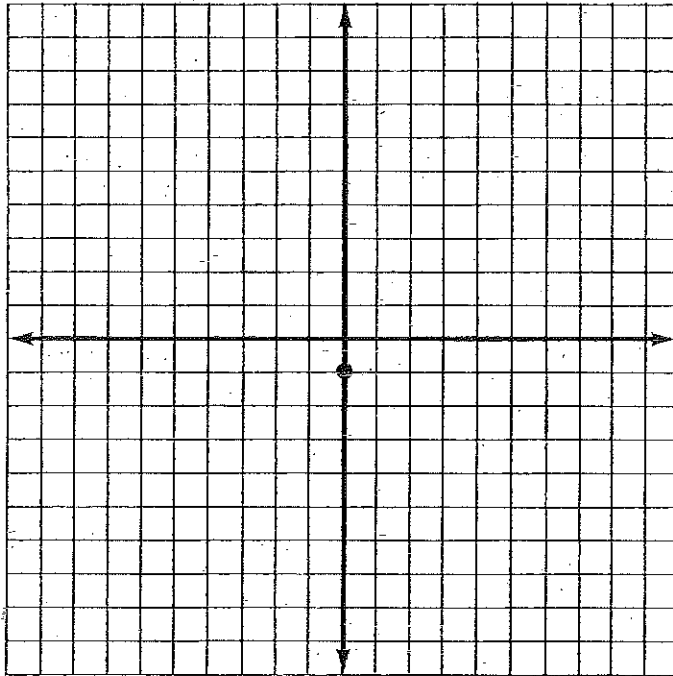
vertical move
⇒⇒⇒
down one

horizontal move
⇒⇒⇒
no move

## "Ancient History"

Start at  $(0, -1)$

- |           |            |
|-----------|------------|
| $(1, -1)$ | $(0, 3)$   |
| $(1, -3)$ | $(-1, 4)$  |
| $(3, -3)$ | $(-2, 3)$  |
| $(3, -1)$ | $(-3, 4)$  |
| $(5, 0)$  | $(-4, 3)$  |
| $(8, 0)$  | $(-5, 1)$  |
| $(7, 1)$  | $(-8, 2)$  |
| $(9, 0)$  | $(-5, 0)$  |
| $(8, 2)$  | $(-3, -1)$ |
| $(5, 1)$  | $(-3, -3)$ |
| $(4, 3)$  | $(-1, -3)$ |
| $(3, 4)$  | $(-1, -1)$ |
| $(2, 3)$  | $(0, -1)$  |
| $(1, 4)$  | End        |



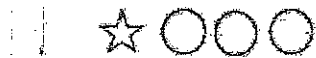
# Unit 2 Vocabulary & Introduction

## RATIOS

*Definition:*

A ratio is a \_\_\_\_\_  
of \_\_\_\_\_ or  
more numbers.

*Example:*



The ratio of stars to  
circles is 2 to 3.

*YOU SHOULD KNOW:*

There are \_\_\_\_\_ ways to  
write a ratio.

- 1) \_\_\_\_\_
- 2) \_\_\_\_\_
- 3) \_\_\_\_\_

## RATES

*Definition:*

A rate is a \_\_\_\_\_  
comparing two  
numbers with different  
\_\_\_\_\_.

*Example:*

A car travels 100 miles in 2 hours.

$$\frac{100 \text{ miles}}{2 \text{ hours}}$$

*YOU SHOULD KNOW:*

A \_\_\_\_\_ rate tells  
the rate in lowest  
terms, or the amount  
for \_\_\_\_\_.

Ex.  $\frac{100 \text{ miles}}{2 \text{ hours}} = \frac{50 \text{ miles}}{1 \text{ hour}}$

## PROPORTIONS

*Definition:*

A proportion is an  
\_\_\_\_\_ showing two ratios are  
\_\_\_\_\_.

*Example:*

$$\frac{10}{25} = \frac{40}{100}$$

*YOU SHOULD KNOW:*

Two ratios are equal  
if you can multiply or  
divide the numerator  
& denominator by the  
\_\_\_\_\_ number  
and get the other  
numerator &  
denominator.

# Ratios

Name \_\_\_\_\_

RP.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

1) Ratios are usually written as a \_\_\_\_\_, in \_\_\_\_\_.  
\_\_\_\_\_. However, a fraction represents \_\_\_\_\_ of a \_\_\_\_\_, whereas a ratio is a \_\_\_\_\_ of two quantities.

2) What is the ratio of:

- a) girls to boys in our class?
- b) girls to total students?
- c) total students to boys?
- d) students wearing glasses to students not wearing glasses?
- e) students with black hair to total students?

3) In a class of 30 students, 16 of them are boys.

- a) What is the ratio of boys to total students?
- b) What is the ratio of boys to girls?

4) Write the following ratios in simplest form:

a) 21:49

b) 48:10

c) 25:75

d) 18:12

e) 6:15

5) Find the missing value to form equivalent ratios. (Hint: Look at the relationship between the numerators or denominators of which you have both.)

a)  $\frac{6}{15} = \frac{2}{\square}$

b)  $\frac{10}{25} = \frac{\square}{5}$

c)  $\frac{25}{100} = \frac{1}{\square}$

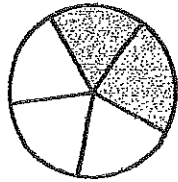
d)  $\frac{9}{3} = \frac{\square}{1}$

6) Two equal ratios are called a \_\_\_\_\_.

Name \_\_\_\_\_

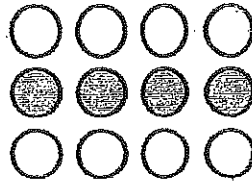
Write the ratio 3 different ways.

1. \_\_\_ gray parts to \_\_\_ total parts



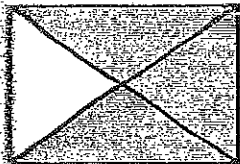
:

2. \_\_\_ gray circles to \_\_\_ total circles



:

3. \_\_\_ gray parts to \_\_\_ total parts



:

4. \_\_\_ gray circles to \_\_\_ white circles



:

Write an equivalent ratio. Circle each ratio that is in simplest form.

5.  $\frac{4}{5} \times \frac{2}{2} = \frac{\square}{\square}$

6.  $\frac{6}{9} \div \frac{\square}{\square} = \frac{\square}{\square}$

$\frac{4}{5}$  and \_\_\_\_\_ are equivalent.

7.

|  |   |   |    |    |
|--|---|---|----|----|
|  | 3 | 6 |    | 15 |
|  | 4 |   | 12 |    |

8.

|   |   |  |    |    |
|---|---|--|----|----|
| ★ |   |  | 15 | 20 |
| ★ | 6 |  |    | 24 |

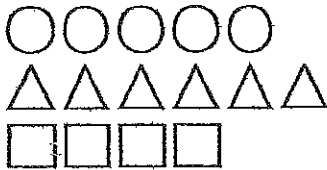
$\frac{3}{4} = \frac{6}{\square}$        $\frac{3}{4} = \frac{15}{\square}$

$\frac{20}{24} = \frac{\square}{6}$        $\frac{20}{24} = \frac{15}{\square}$

★ Look at the page. Draw a circle around a ratio that is equivalent to 1/3.



Write ratios to describe the pictures.

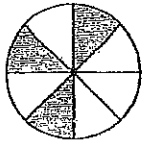


1 circles to shapes  
\_\_\_\_\_

2 triangles to circles  
\_\_\_\_\_

3 circles to squares  
\_\_\_\_\_

4 squares to triangles  
\_\_\_\_\_



5 shaded parts to total parts  
\_\_\_\_\_

6 shaded parts to white parts  
\_\_\_\_\_

Write an equivalent ratio for each. Circle each ratio that is in simplified form.

7  $\frac{2}{6} =$  \_\_\_\_\_

8  $\frac{1}{5} =$  \_\_\_\_\_

9  $\frac{12}{24} =$  \_\_\_\_\_

10  $\frac{3}{4} =$  \_\_\_\_\_

11  $\frac{16}{18} =$  \_\_\_\_\_

12  $\frac{4}{6} =$  \_\_\_\_\_

13  $\frac{2}{10} =$  \_\_\_\_\_

14  $\frac{12}{16} =$  \_\_\_\_\_

15  $\frac{5}{8} =$  \_\_\_\_\_

16  $\frac{2}{3} =$  \_\_\_\_\_

17  $\frac{12}{20} =$  \_\_\_\_\_

18  $\frac{25}{30} =$  \_\_\_\_\_



Tell how you know that two ratios are equivalent.

Use the information to write a ratio in simplest form.

1 The class has 14 boys, 12 girls, and 1 teacher.

boys to girls \_\_\_\_\_ : \_\_\_\_\_

girls to boys \_\_\_\_\_ : \_\_\_\_\_

teachers to students \_\_\_\_\_ : \_\_\_\_\_

2 The recipe has 10 tomatoes, 6 cucumbers, and 3 peppers.

tomatoes to peppers \_\_\_\_\_ : \_\_\_\_\_

cucumbers to tomatoes \_\_\_\_\_ : \_\_\_\_\_

peppers to cucumbers \_\_\_\_\_ : \_\_\_\_\_

3 The school has 550 students, 30 teachers, and 10 administrators.

administrators to teachers \_\_\_\_\_ : \_\_\_\_\_

teachers to students \_\_\_\_\_ : \_\_\_\_\_

administrators to students \_\_\_\_\_ : \_\_\_\_\_

4 The math team has 11 boys, 10 girls, and 1 coach.

boys to girls \_\_\_\_\_ : \_\_\_\_\_

girls to boys \_\_\_\_\_ : \_\_\_\_\_

coaches to students \_\_\_\_\_ : \_\_\_\_\_

Use the information to write a ratio in simplest form.

|   |    |   |    |    |
|---|----|---|----|----|
| ● | 2  | 4 |    | 10 |
| ▲ | 10 |   | 30 |    |

|   |   |    |    |
|---|---|----|----|
| ★ |   | 12 | 16 |
| ★ | 6 |    | 24 |

5  $\frac{1}{3} =$  \_\_\_\_\_

8  $\frac{2}{10} =$  \_\_\_\_\_

9  $\frac{35}{40} =$  \_\_\_\_\_

10  $\frac{5}{10} =$  \_\_\_\_\_

11  $\frac{12}{18} =$  \_\_\_\_\_

12  $\frac{14}{28} =$  \_\_\_\_\_

13  $\frac{3}{9} =$  \_\_\_\_\_

14  $\frac{2}{3} =$  \_\_\_\_\_

15  $\frac{4}{5} =$  \_\_\_\_\_

16  $\frac{9}{12} =$  \_\_\_\_\_

17  $\frac{75}{100} =$  \_\_\_\_\_

18  $\frac{80}{84} =$  \_\_\_\_\_

Explain the steps you take to write the ratio 5 : 25 in simplest form.

**Solve.**

- 1 A fruit salad recipe calls for 9 cups of berries and 6 cups of peaches. What is the ratio of peaches to berries?
- 2 The pancakes contain 1 cup of milk, 1 cup of flour, and 2 eggs. What is the ratio of milk to flour?
- 
- 3 There are 25 students in the class. Ten students have sports practice after school. What is the ratio of students that do have practice, to those that do not?
- 4 The baby nursery has 2 nurses for every 10 babies. What is the nurse to baby ratio?
- 
- 5 The island has 600 bicycles and 900 people. What is the bicycle to person ratio?
- 6 The movie multiplex has four bathrooms and 16 theaters. What is the bathroom to theater ratio?

**Circle the letter for the correct answer.**

- 7 Emi buys 14 balloons. Three are red, four are white, and the rest are blue. What is the ratio of blue balloons to the total number of balloons?
- a) 11:14  
b) 2:1  
c)  $\frac{1}{2}$   
d)  $\frac{4}{14}$
- 8 The cafeteria sold 200 grilled cheese sandwiches, 100 tacos, and 150 grilled chicken salads. What is the ratio of grilled chicken salads sold to the total number of lunches sold?
- a) 1:2  
b) 2:1  
c) 15:300  
d) 1:3

# RP.1 - Ratios

## EXAMPLES

12 to 14

$$\frac{12}{14} = \frac{12 \div 2}{14 \div 2} \\ = \frac{6}{7}$$

18 to 12

$$\frac{18}{12} = \frac{18 \div 6}{12 \div 6} \\ = \frac{3}{2}$$

**Exercise A** Write each ratio as a fraction in simplest form.

1. 12 to 20

6. 14 to 21

11. 8 to 2

2. 18 to 21

7. 21 to 14

12. 9 to 12

3. 12 to 8

8. 8 to 36

13. 20 to 24

4. 4 to 6

9. 15 to 19

14. 16 to 12

5. 12 to 15

10. 6 to 15

15. 8 to 19

stop

A ratio compares two amounts, such as two coins.

**Exercise B** Write a ratio to compare each of the following. Express it in simplest form.

16. 150 miles to 5 hours

17. 1 quarter to 1 nickel

18. 5 cans of soup for 85¢

19. 15 miles on 8 gallons

20. \$44.35 in 5 hours

21. 1 fifty-cent piece to 1 dime

22. 4 hits for 6 times at bat

23. 12 apples to 4 oranges

24. 26 minutes to 2 hours

25. 4 days to 2 weeks

## PROBLEM SOLVING



**Exercise C** Solve these problems. Give the answers in simplest form.

26. In a music collection, 45 CDs contain jazz music, 25 CDs contain rock music and 75 CDs contain country music.
- What is the ratio of rock to jazz?
  - What is the ratio of jazz to country?
  - What is the ratio of jazz to total?
  - What is the ratio of rock to country?
  - What is the ratio of country to total?

27. In a class of 14 students, 6 students are male.
- What is the ratio of male to total?
  - What is the ratio of total to male?
  - What is the ratio of female students to the total number of students in the class?
  - What is the ratio of female to male?
  - What is the ratio of male to female?

**Ratio**

A ratio compares two numbers. Ratios can be written in one of the following ways:

- 2 to 3
- 2:3
- $\frac{2}{3}$

**Example**

What is the ratio of stars to moons and the ratio of moons to stars?



There are 5 stars and 3 moons. The ratio of stars to moons is written as 5 to 3, 5:3, or  $\frac{5}{3}$ . The ratio of moons to stars is written as 3 to 5, 3:5, or  $\frac{3}{5}$ .

**Practice**

Directions: Use the drawing to answer Numbers 1 through 3.



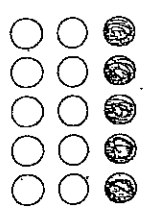
1. What is the ratio of shaded suns to the total number of suns? \_\_\_\_\_
2. What is the ratio of unshaded suns to the total number of suns? \_\_\_\_\_
3. What is the ratio of shaded suns to unshaded suns? \_\_\_\_\_

Directions: Use the drawing to answer Numbers 4 and 5.



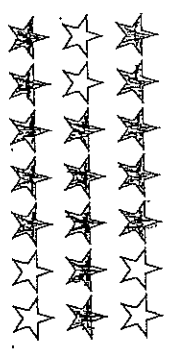
4. What is the ratio of pears to apples? \_\_\_\_\_
5. What is the ratio of apples to pears? \_\_\_\_\_

6. What is the ratio of shaded circles to the total number of circles in the picture?



- A.  $\frac{1}{3}$
- B.  $\frac{2}{5}$
- C.  $\frac{1}{2}$
- D.  $\frac{2}{3}$

7. What is the ratio of unshaded stars to shaded stars in the picture?



- A.  $\frac{2}{3}$
- B.  $\frac{2}{7}$
- C.  $\frac{5}{7}$
- D.  $\frac{7}{21}$

8. What is the ratio of shaded squares to the total number of squares in the grid?



- A. 77 to 23
- B. 23 to 77
- C. 23 to 100
- D. 77 to 100

9. There are 20 computers at the school library and 80 sixth-grade students. What is the ratio of computers to sixth-grade students?

- A. 1 to 2
- B. 1 to 4
- C. 3 to 4
- D. 6 to 9

10. A serving of chips contains 160 calories. 100 of them come from fat. What is the ratio of fat calories to total calories?

11. There are 30 students on the math team and 14 of them are girls. What is the ratio of girls to boys on the math team?

# Transparency 4.1A

Stretching and Shrinking

## Girl With Fish

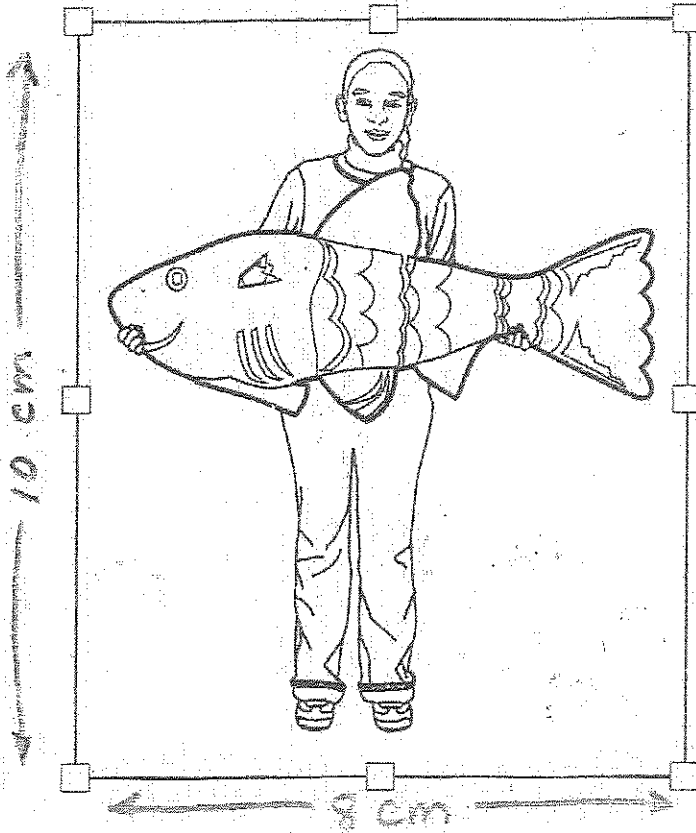
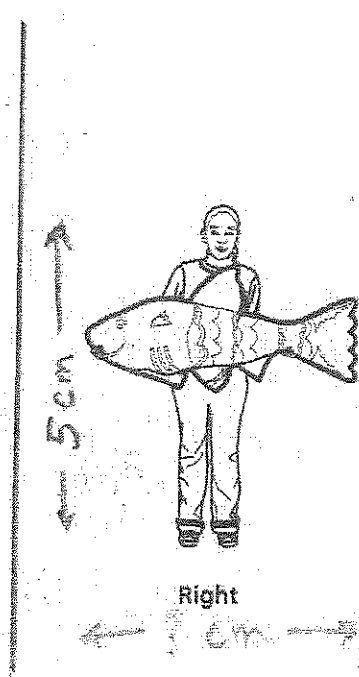
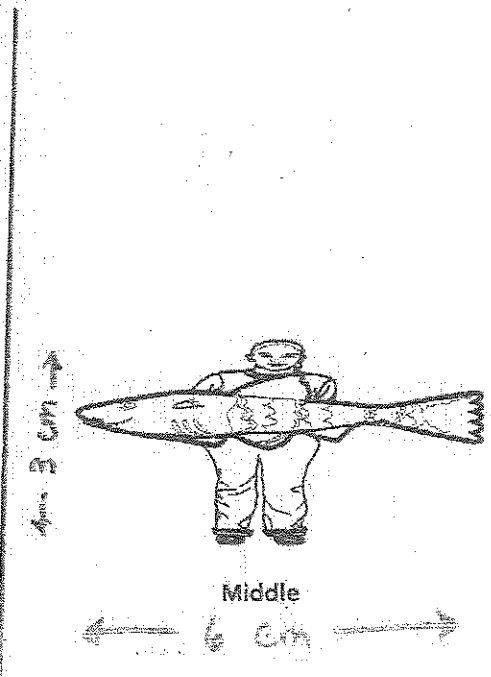
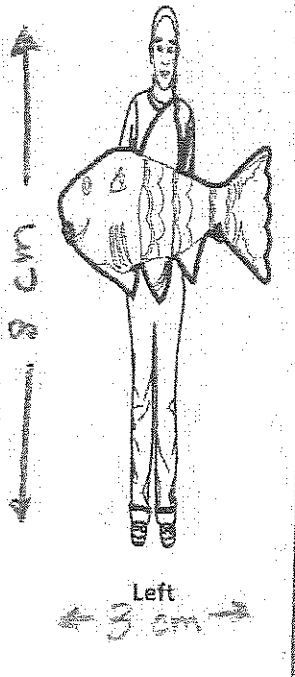


Image Information

| Figure   | Height (cm) | Width (cm) | Height to Width Ratio |
|----------|-------------|------------|-----------------------|
| Original | 10          | 8          | 10 to 8               |
| Left     | 8           | 3          | 8 to 3                |
| Middle   | 3           | 6          | 3 to 6                |
| Right    | 5           | 4          | 5 to 4                |

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# Proportions

RP.3a - Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

## I. A proportion is two equal \_\_\_\_\_.

### Example 1

$$\text{"6 is to 9 as 4 is to 6"} \quad \frac{6}{9} = \frac{4}{6}$$

There are two ways to determine if this is a proportion:

a) Are they equivalent ratios?

$\frac{6}{9}$  simplifies to \_\_\_\_\_ and

$\frac{4}{6}$  simplifies to \_\_\_\_\_

b) Are their cross-products equal?

### Example 2

$$\text{"3 is to 4 as 6 is to 7"} \quad \frac{3}{4} = \frac{6}{7}$$

a) Are they equivalent ratios?

b) Are their cross-products equal?

## II. We can use the properties of a proportion to solve for a missing value:

A) Compare both \_\_\_\_\_ OR both \_\_\_\_\_.

B) Determine what was done to one to get the other (multiplication or division).

C) Do the \_\_\_\_\_ to the other number, so the ratios will be \_\_\_\_\_.

Examples:

1)  $\frac{4}{5} = \frac{x}{50}$

4)  $\frac{56}{x} = \frac{7}{9}$

**Hint:** It helps to look toward the side with the missing value.

2)  $\frac{7}{20} = \frac{x}{60}$

5)  $\frac{x}{21} = \frac{6}{7}$

3)  $\frac{15}{5} = \frac{3}{x}$

6)  $\frac{x}{5} = \frac{30}{75}$

## III. If you can't find a relationship between the corresponding numbers in a proportion, reduce (simplify) the known ratio.

Examples:

1)  $\frac{16}{20} = \frac{x}{25}$

2)  $\frac{5}{10} = \frac{3}{x}$

3)  $\frac{x}{27} = \frac{4}{6}$

4)  $\frac{28}{49} = \frac{8}{x}$

5)  $\frac{16}{18} = \frac{24}{x}$

6)  $\frac{x}{108} = \frac{44}{72}$

Name \_\_\_\_\_

## Solving Proportions

To solve each proportion:

- 1) Find a relationship between the numerators or denominators.
- 2) Multiply or divide by the same number so that the ratios will be equal.
- 3) If there is no relationship, simplify the known ratio first.
- 4) Write the value of the variable on the line provided.

1.  $\frac{3}{n} = \frac{5}{15}$  \_\_\_\_\_

2.  $\frac{3}{5} = \frac{n}{25}$  \_\_\_\_\_

3.  $\frac{3}{25} = \frac{n}{50}$  \_\_\_\_\_

4.  $\frac{45}{20} = \frac{y}{4}$  \_\_\_\_\_

5.  $\frac{6}{x} = \frac{42}{63}$  \_\_\_\_\_

6.  $\frac{8}{40} = \frac{6}{x}$  \_\_\_\_\_

7.  $\frac{4}{5} = \frac{d}{35}$  \_\_\_\_\_

8.  $\frac{17}{34} = \frac{n}{10}$  \_\_\_\_\_

9.  $\frac{n}{8} = \frac{12}{16}$  \_\_\_\_\_

10.  $\frac{13}{4} = \frac{52}{y}$  \_\_\_\_\_

11.  $\frac{12}{w} = \frac{8}{14}$  \_\_\_\_\_

12.  $\frac{60}{75} = \frac{r}{5}$  \_\_\_\_\_

13.  $\frac{x}{24} = \frac{4}{6}$  \_\_\_\_\_

14.  $\frac{16}{m} = \frac{32}{24}$  \_\_\_\_\_

15.  $\frac{2}{m} = \frac{5}{30}$  \_\_\_\_\_

16.  $\frac{30}{y} = \frac{3}{9}$  \_\_\_\_\_

17.  $\frac{8}{35} = \frac{n}{350}$  \_\_\_\_\_

18.  $\frac{x}{5} = \frac{18}{30}$  \_\_\_\_\_

19.  $\frac{x}{40} = \frac{15}{24}$  \_\_\_\_\_

20.  $\frac{5}{16} = \frac{m}{32}$  \_\_\_\_\_

21.  $\frac{1}{2} = \frac{x}{40}$  \_\_\_\_\_

22.  $\frac{p}{5} = \frac{144}{60}$  \_\_\_\_\_

23.  $\frac{7}{4} = \frac{n}{48}$  \_\_\_\_\_

24.  $\frac{11}{99} = \frac{8}{x}$  \_\_\_\_\_



Name \_\_\_\_\_

## Writing Proportions

There are two ways to set up a proportion. The thing to remember is that "partners" must be close enough to "hold hands." The way you set up the first ratio determines how to set up the second, so always include the units.

|  |   |
|--|---|
| 1) If four ounces of juice contain 50 calories. How many calories do 14 ounces contain?      | 6) The ratio of men to women employees at the Widget Factory is 3 to 1. If there are 300 men employed, how many women are employed? |
| 2) A lion has 12 heartbeats in 16 seconds. How many heartbeats does he have in 60 seconds?   | 7) At the Copy Shoppe, 18 copies cost \$1.08. How much will 40 copies cost?   |
| 3) If 18 plums weigh 54 ounces, how many ounces do 27 plums weigh?                           | 8) If 40 nails can hold 5 rafters, how many rafters can 96 nails hold?  |
| 4) There are 32 addresses on 2 pages of the address book. How many addresses are on 9 pages? | 9) If 2 quarts of milk fill 8 cups, how many cups does 5 quarts fill?   |
| 5) There are 360 inches of tape on 3 spools. How many inches of tape are on 10 spools?       | 10) Three ounces of orange juice cost \$1.65. How much will five ounces cost?   |

Name \_\_\_\_\_

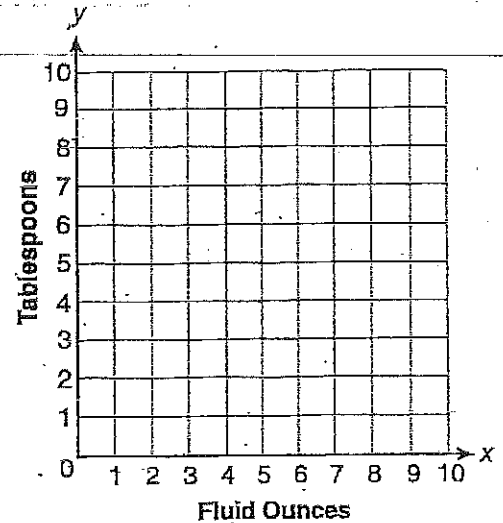
## Tables & Graphs Notes

**RP.3a** - Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

1. The table below shows the relationship between tablespoons and fluid ounces. Use your knowledge of equivalent ratios to complete the table.

For example:  $\frac{1}{2} = \frac{2}{n}$  ( $\frac{1}{2}$  is the known ratio.)

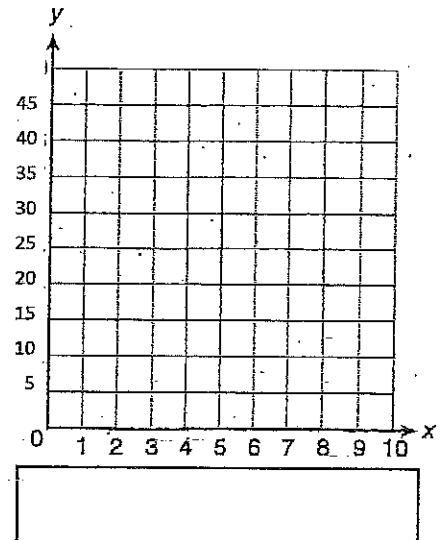
| Fluid Ounces<br>(f) | Tablespoons<br>(t) | (x, y) |
|---------------------|--------------------|--------|
| 1                   | 2                  |        |
| 2                   |                    |        |
|                     | 8                  |        |
| 5                   |                    |        |



2. Graph the relationship.  
 3. What rule (equation) represents the table and graph?  $t = \underline{\hspace{2cm}}$

4. The table below shows the relationship between the number of hours Edna worked babysitting and how much money she earned. Use your knowledge of equivalent ratios to complete the table.

| Hours<br>Worked (h) | Dollars<br>Earned (d) | (x, y) |
|---------------------|-----------------------|--------|
| 2                   |                       |        |
| 3                   | 21                    |        |
|                     | 35                    |        |
| 6                   |                       |        |

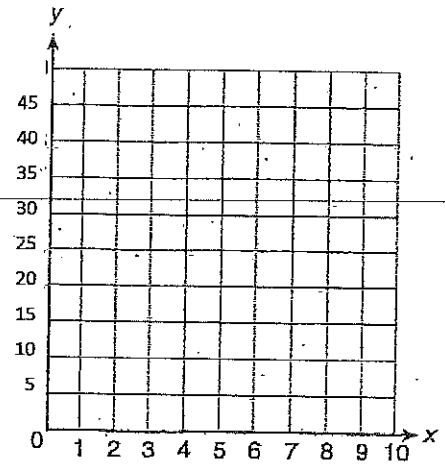


5. Label both axes and graph the relationship.  
 6. What rule (equation) represents the table and graph?  $d = \underline{\hspace{2cm}}$

## Tables & Graphs Practice

7. The table below shows the relationship between pounds of beef and the number of servings. Use your knowledge of equivalent ratios to complete the table.

| Pounds of Beef (p) | Servings (s) | (x, y) |
|--------------------|--------------|--------|
| 1                  | 5            |        |
| 3                  |              |        |
|                    | 20           |        |
| 7                  |              |        |

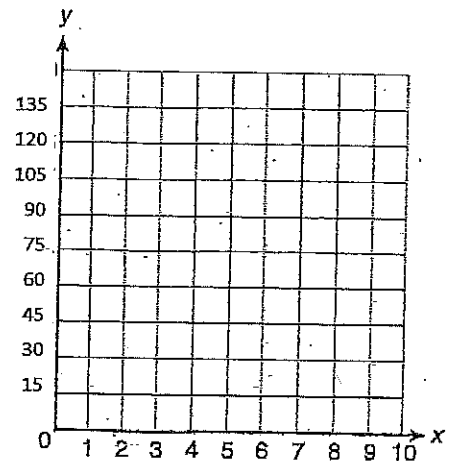


8. Label both axes and graph the relationship.

9. What rule (equation) represents the table and graph?  $s =$  \_\_\_\_\_

10. The table below shows the relationship between miles driven and the number of hours. Use your knowledge of equivalent ratios to complete the table.

| Hours (h) | Total Miles Driven (m) | (x, y) |
|-----------|------------------------|--------|
|           | 40                     |        |
| 3         | 60                     |        |
| 4         |                        |        |
| 6         |                        |        |



11. Label both axes and graph the relationship.

12. What rule (equation) represents the table and graph?  $m =$  \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_

## Unit Rate

RP.2 – Understand the concept of a unit rate  $a/b$  associated with a ratio  $a:b$  with  $b$  not equal to zero, and use rate language in the context of a ratio relationship.

### Vocabulary

- 1) Remember: A ratio is a comparison of two quantities that have the \_\_\_\_\_ units of measure.
- 2) A rate is a comparison of two quantities that have \_\_\_\_\_ units of measure.
- 3) A *unit* rate is a comparison of two quantities in which the second term (or denominator) is \_\_\_\_\_.

### Use a proportion to find each unit rate.

1) Earning \$91 in 14 hours

4) Traveling 372 miles in 6 hours

2) Paying \$13.14 for 12 gallons of gas

5) Using 570 gallons of gas in 60 minutes

3) \$0.54 for a 4-ounce candy bar

6) Typing 592 words in 8 minutes

- 7) Discount Mart has 6-packs of juice for \$0.90. Super Store has 8-packs of the same size juice cartons for \$1.12. Find each unit rate and determine which is the better buy.



6-pack  
\$0.90



8-pack  
\$1.12

## Ratios and Rates (RP.2)

Name \_\_\_\_\_

When the denominator of a rate is 1, we call the rate a unit rate. We usually use the key word "per" or the division symbol ( / ) to indicate a unit rate. For example: If a student earns \$7.65 per hour, it is the same as \$7.65/hour, and means \$7.65 for every hour of work.

Find the unit rate for the following:

|  |   |
|--|---|
| <p>1. Drivers travel 150 miles in 60 laps at the Daytona International Speedway. How long is the track (1 lap)?</p>                            | <p>2. A meal costs \$55 for 20 people. What is the average cost per person?</p>   |
| <p>3. Which is the better deal: 3 cans of soda for \$1.27 or 5 cans of soda for \$1.79</p>   | <p>4. Which is the better deal: 10 pounds of hamburger for \$4.99 or 5 pounds of hamburger for \$2.49</p>                                 |
| <p>5. A Ford Taurus is traveling 300 miles in 5 hours. A Honda Pilot is traveling 250 miles in 4 hours. Which vehicle is traveling faster?</p> | <p>6. A horse is traveling 450 yards in 40 seconds. An ostrich is traveling 406 feet in 35 seconds. Which animal is traveling faster?</p> |

Name \_\_\_\_\_

Date \_\_\_\_\_

# Measurements in My Life

Directions: Label each picture with the measurement it represents and fill in the missing conversion rate.

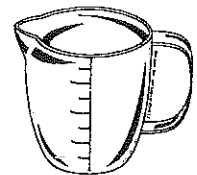
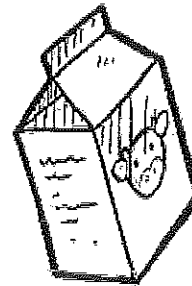
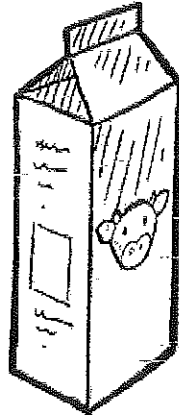
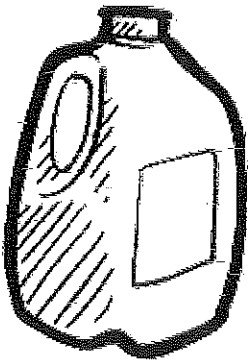
## Capacity

1 cup (c) = \_\_\_\_\_ fluid ounces (fl oz)

1 pint (pt) = \_\_\_\_\_ cups (c)

1 quart (qt) = \_\_\_\_\_ pints (pt)

1 gallon (gal) = \_\_\_\_\_ quarts (qt)



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

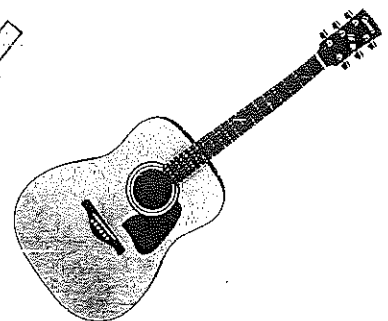
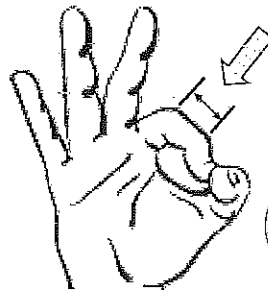
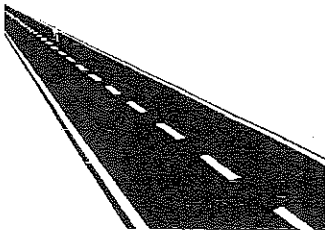
\_\_\_\_\_

## Length

1 foot = \_\_\_\_\_ inches (in)

1 yard (yd) = \_\_\_\_\_ feet

1 mile = \_\_\_\_\_ feet (ft)



\_\_\_\_\_

\_\_\_\_\_

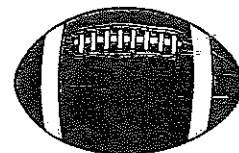
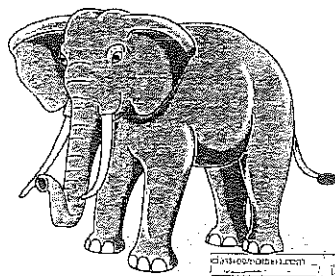
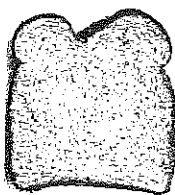
\_\_\_\_\_

\_\_\_\_\_

## Weight

1 pound (lb) = \_\_\_\_\_ ounces (oz)

1 ton (T) = \_\_\_\_\_ pounds (lbs)



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name \_\_\_\_\_

Date \_\_\_\_\_

# Measurements in My Life

Write or draw examples of objects where the unit stated would be an appropriate unit of measure.

|          |             |       |      |       |        |
|----------|-------------|-------|------|-------|--------|
| Weight   | Ounce       | Pound | Ton  |       |        |
|          |             |       |      |       |        |
| Capacity | Fluid Ounce | Cup   | Pint | Quart | Gallon |
|          |             |       |      |       |        |
| Length   | Inch        | Foot  | Yard | Mile  |        |
|          |             |       |      |       |        |

**Capacity:**

1 cup (c) = \_\_\_\_\_ fluid-ounces (fl oz)

1 pint (pt) = \_\_\_\_\_ cups (c)

1 quart (qt) = \_\_\_\_\_ pints (pt)

1 gallon (gal) = \_\_\_\_\_ quarts (qt)

**Weight:**

1 pound (lb) = \_\_\_\_\_ ounces (oz)

1 ton (T) = \_\_\_\_\_ pounds (lbs)

**Length:**

1 foot = \_\_\_\_\_ inches (in)

1 yard (yd) = \_\_\_\_\_ feet

1 mile = \_\_\_\_\_ feet (ft)

Name \_\_\_\_\_

## Customary Measurement Conversions

**RP.3d** - Given a conversion factor, use ratio reasoning to convert measurement units within one system of measurement and between two systems of measurements (customary & metric); manipulate and transform units appropriately when multiplying or dividing quantities.

### Examples (large to small units):

1) 5 feet = \_\_\_\_\_ in.

2) 3 pounds = \_\_\_\_\_ oz.

3) 9 gal. = \_\_\_\_\_ quarts

You try:

4) 6 yards = \_\_\_\_\_ ft.

5) 4 tons = \_\_\_\_\_ lbs.

6) 15 quarts = \_\_\_\_\_ pints

Examples (combination):

7) 3 ft. 14 in = \_\_\_\_\_ in.

8) 2 lb. 14 oz. = \_\_\_\_\_ oz.

9) 7 gal. 2 qt. = \_\_\_\_\_ qts.

You try:

10) 5 yd. 2 ft = \_\_\_\_\_ ft.

11) 3 lb. 8 oz. = \_\_\_\_\_ oz.

12) 2 qts. 9 pt. = \_\_\_\_\_ pt.



**Customary Measurement Conversions (cont.)**  
**Examples (small to large units):**

13) 48 in. = \_\_\_\_\_ feet

14) 80 oz. = \_\_\_\_\_ lb.

15) 64 fl. oz. = \_\_\_\_\_ c

You try:

16) 24 ft. = \_\_\_\_\_ yd

17) 10,000 lb. = \_\_\_\_\_ T

18) 18 cups = \_\_\_\_\_ pt

Examples (combination):

19) 10 ft. = \_\_\_\_\_ yd. \_\_\_\_\_ ft.

20) 28,000 lb = \_\_\_\_\_ T \_\_\_\_\_ lb

21) 25 c = \_\_\_\_\_ pt \_\_\_\_\_ c

You try:

22) 14 ft. = \_\_\_\_\_ yd. \_\_\_\_\_ ft.

23) 20 oz = \_\_\_\_\_ lb \_\_\_\_\_ oz

24) 7 qt = \_\_\_\_\_ gal \_\_\_\_\_ qt

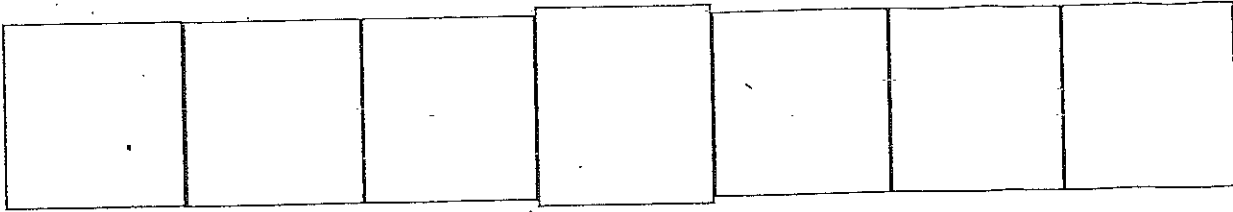
25) Adult male giraffes may grow nearly 17 feet tall. How many yards is that?

26) One kitten weighs 71 ounces and another kitten weighs 77 ounces. What is their combined weight in pounds?

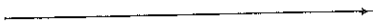
27) A door is 3 feet 9 inches wide. How wide is the door in inches?

# Metric Conversions

Mnemonic:



To convert from large to small units, move decimal point to the right or multiply.



To convert from small to large units, move decimal point to the left or divide.



|                         |                       |
|-------------------------|-----------------------|
| Large to Small:         | 9) 0.2 mm = _____ cm  |
| 1) 0.135 g = _____ mg   | 10) 650 m = _____ km  |
| 2) 40 L = _____ mL      | 11) 55 cm = _____ m   |
| 3) 6.14 km = _____ m    | 12) 0.6 m = _____ km  |
| 4) 0.5176 m = _____ cm  | 13) 15 mm = _____ cm  |
| 5) 567.3 kg = _____ g   | 14) 4700 mg = _____ g |
| 6) 70.216 cm = _____ mm |                       |
| 7) 5 g = _____ mg       |                       |
| Small to Large:         |                       |
| 8) 640 mL = _____ L     |                       |

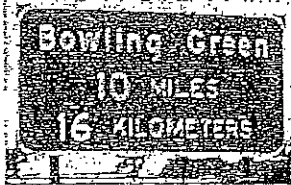
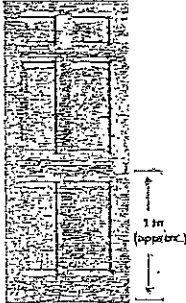

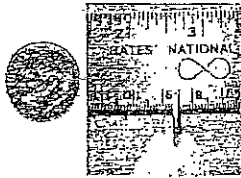
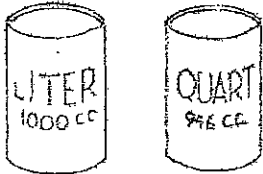
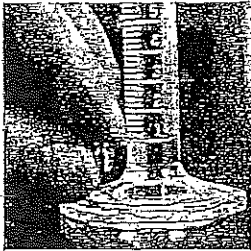



15) The average shower uses 19 liters of water per minute. If you take a five-minute shower, how many kiloliters of water will you use?

16) The world's longest model train has 650 cars and is 0.695 km long. How many meters long is the train?

17) A hippopotamus is so large that it has a stomach 304.8 cm long. How long is this in meters?

18) A world-record grapefruit had a mass of 3,068 g. What was its mass in kilograms?

# Metric Measurements

|                              | Kilometer (km)  | Meter (m)   | Centimeter (cm)  | Millimeter (mm)   |
|------------------------------|---|---|--|---|
| Length<br>(distance)         |    |    |  |  |
| Capacity<br>(liquid measure) |    |  |  |   |
| Mass<br>(weight)             | 1 kilogram <br>1 pound  |  |  |   |

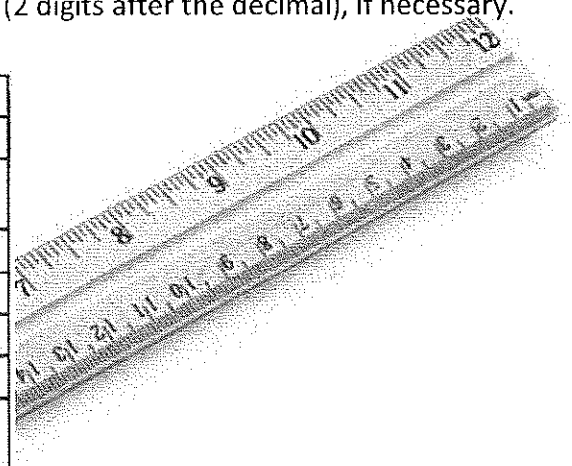
RP.3d - Given a conversion factor, use ratio reasoning to convert measurement units within one system of measurement and between two systems of measurements (customary & metric); manipulate and transform units appropriately when multiplying or dividing quantities.

## Convert Between Measurement Systems (RP.3d)

Directions: Use the relationships in the tables below to convert measures between customary and metric units. You may use a calculator, but show your work and circle your answer. Round to the nearest hundredth (2 digits after the decimal), if necessary.

| Customary Units | Metric Units                         |
|-----------------|--------------------------------------|
| 1 inch          | 2.54 centimeters                     |
| 1 foot          | 30.48 centimeters<br>or 0.3048 meter |
| 1 yard          | 0.914 meter                          |
| 1 mile          | 1.609 kilometers                     |
| 1 ounce         | 28.350 grams                         |
| 1 pound         | 454 grams<br>or 0.454 kilogram       |
| 1 fluid ounce   | 29.574 milliliters                   |
| 1 quart         | 0.946 liter                          |
| 1 gallon        | 3.785 liters                         |

| Metric Units | Customary Units                |
|--------------|--------------------------------|
| 1 centimeter | 0.394 inch                     |
| 1 meter      | 3.281 feet<br>or 1.093 yards   |
| 1 kilometer  | 0.621 mile                     |
| 1 gram       | 0.035 ounce                    |
| 1 kilogram   | 2.205 pounds                   |
| 1 milliliter | 0.034 fluid ounce              |
| 1 liter      | 1.057 quart<br>or 0.264 gallon |



|  |   |   |
|--|---|---|
| 1) 6 quarts ≈ _____ liters   | 2) 6 inches ≈ _____ cm  | 3) 4 grams ≈ _____ ounces   |
| 4) The longest track event at the Olympics is the 50-km walk. How long is the race in miles? | 5) A football player weighs 109 kilograms. About how many pounds does he weigh?         | 6) A school poster is 95 cm tall. How tall is the poster in inches?               |
| 7) A tree is 80 feet tall. What is the approximate height of the tree in meters?             | 9) Jamie purchased 14 gallons of gasoline. How many liters of gasoline did he purchase? | 10) A marathon is approximately 26.2 miles. How long is a marathon in kilometers? |
| 8) About how tall is the tree in kilometers?   |   |   |

# Convert Between Measurement Systems

**RP.3d** - Given a conversion factor, use ratio reasoning to convert measurement units within one system of measurement and between two systems of measurements (customary & metric); manipulate and transform units appropriately when multiplying or dividing quantities.

**Directions:** Use the relationships in the tables below to convert measures between customary and metric units. Round to the nearest hundredth (2 digits after the decimal), if necessary.

**Examples:**

1) 7 inches  $\approx$  \_\_\_\_\_ cm

2) 9 meters  $\approx$  \_\_\_\_\_ feet

| Customary Units | Metric Units                         |
|-----------------|--------------------------------------|
| 1 inch          | 2.54 centimeters                     |
| 1 foot          | 30.48 centimeters<br>or 0.3048 meter |
| 1 yard          | 0.914 meter                          |
| 1 mile          | 1.609 kilometers                     |
| 1 ounce         | 28.350 grams                         |
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| 1 centimeter | 0.394 inch                     |
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| 1 kilometer  | 0.621 mile                     |
| 1 gram       | 0.035 ounce                    |
| 1 kilogram   | 2.2 pounds                     |
| 1 milliliter | 0.034 fluid ounce              |
| 1 liter      | 1.057 quart<br>or 0.264 gallon |

**Practice:**

|   |  |  |
|---|--|--|
| 3) 3 gallons $\approx$ _____ liters   | 4) 6 yards $\approx$ _____ meters  | 5) 2 liter $\approx$ _____ gallons   |
| 6) A notebook computer has a mass of 2.25 kilograms. About how many pounds does the notebook weigh? | 7) A bottle of water contains 64 fluid ounces of water. About how many milliliters of water does the bottle contain?<br><br>About how many liters would that be? | 8) A bakery uses 900 grams of peaches in a cobbler. About how many ounces of peaches does the bakery use in a cobbler? |
| 9) A typical student ruler 12 inches long. How long would it be in centimeters?                     | 10) A baby weighed 7 pounds at birth. About how many kilograms did it weigh at birth?  | 11) Approximately how many miles is a 5-kilometer race?  |

RP.3c – Find a percent of a quantity as a rate per 100 (e.g. 30% of a quantity means 30/100 times the quantity); given a percent, solve problems involving finding the whole given a part and the part given the whole.

Name: \_\_\_\_\_

## Percent Proportions

$$\frac{\%}{100} = \frac{\text{is}}{\text{of}}$$

"part" out of  
the "whole"

| Find the part, given the whole and the percent. | Find the whole, given the part and the percent. |
|---|---|
| 1) What is 45% of 80?                           | 6) 50% of what number is 60?                    |
| 2) What is 35% of 700?                          | 7) 60% of what number is 72?                    |
| 3) What is 5% of 400?                           | 8) 80% of what number is 56?                    |
| 4) Find 75% of 20.                              | 9) 19 is 25% of what number?                    |
| 5) Find 25% of 60.                              | 10) 15 is 30% of what number?                   |

## Percent Proportion Applications

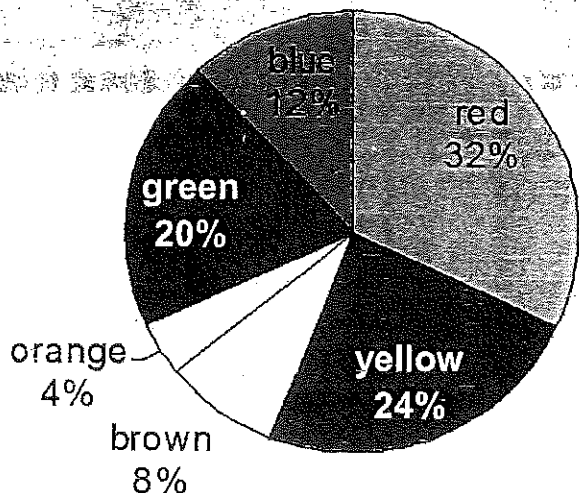
|   |   |
|---|---|
| <p>Find the whole, given the part and the percent.</p> <p>11) The park department planted 60 maple trees last month. This was 25% of the total trees planted. How many maple trees did they plant last month?</p> | <p>Find the part, given the whole and the percent.</p> <p>16) The total bill at Jake's Crab Shack comes to \$40. Paul wants to leave a 15% tip. How much money will he have to leave for the tip?</p> |
| <p>12) Bill has paid 60% of the cost of his stereo. He has paid \$180. How much did his stereo cost?</p>  | <p>17) Paul has a coupon for 25% off at a sporting goods store. He finds a fishing pole that he wants for \$36.44. How much is his coupon worth?</p>  |
| <p>13) A factory is operating at 80% of capacity and 244 cases are being produced each hour. How many total cases is the factory capable of producing each hour?</p>  | <p>18) 70% of the school voted to change the lunch room rules. If 600 children voted, how many wanted to change the lunch room rules?</p>   |
| <p>14) Students are seated at 441 of the cafeteria seats, but the cafeteria is only 70% full. How many students can the cafeteria seat?</p>   | <p>19) Max bought a bag of 75 lollipops for a party. If 60% of the lollipops are cherry flavored, how many cherry lollipops are in the bag?</p>   |
| <p>15) In one year, Lacey earned 10% interest on her investment. If she earned \$15, how much was her investment?</p>   | <p>20) Jan paid \$11.50 for breakfast. How much should she leave for the waitress if she wants to leave a 20% tip?</p>  |

Name: \_\_\_\_\_

## Using Percents (RP.3c)

Use the circle graphs to help you solve the following problems.

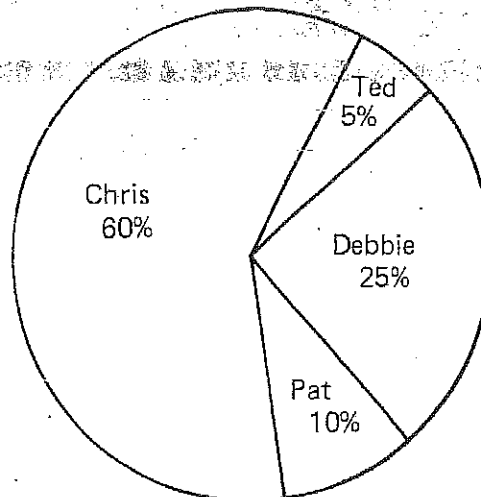
Candy Color Distribution



The circle graph above shows the distribution of candies in a bag.

- There were 25 candies in the bag. How many candies were
  - Red?
  - Yellow?
  - Orange?
  - Brown?

School Election



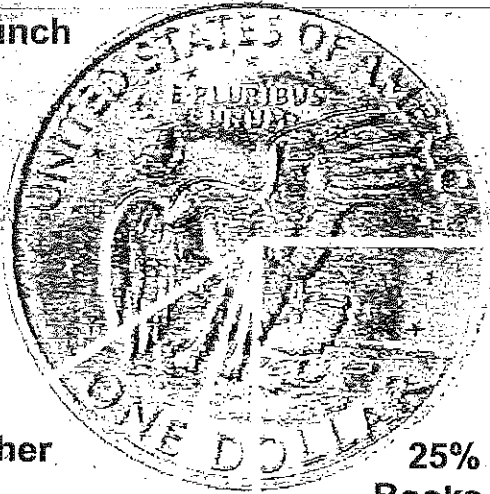
The circle graph above shows the results of a recent school election.

- 240 students voted in the election. How many students voted for
  - Ted?
  - Debbie?
  - Pat?
  - Chris?



### Melanie's Budget

60% Lunch



10% Other

5% Supplies

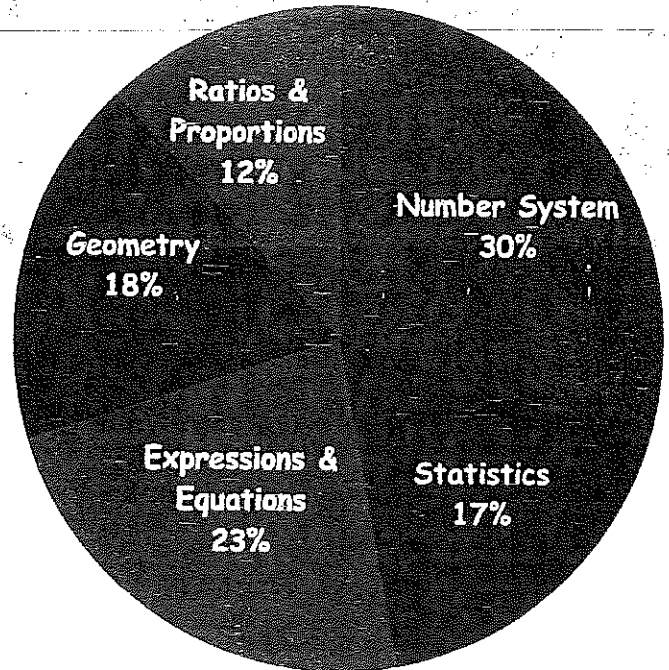
25% Books

The circle graph above shows how Melanie spends her money.

3. Melanie spends \$5 each week. About how much money does she spend for

- a. Lunch?
- b. Books?
- c. Supplies?
- d. Other things?

### Georgia Milestones Domain Weights



The circle graph above shows the domain weights for the 6th grade math portion of the Georgia Milestones.

4. There are 64 operational questions\*  
How many questions are related to

- a. The Number System?
- b. Ratios & Proportions?
- c. Expression & Equations?
- d. Geometry?

\*73 total, but 9 are field test questions