

# Converting Customary Units of Length

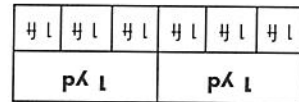
Name \_\_\_\_\_

Retaching  
13-1

How to change a length measurement from one unit to another:

Converting a length measurement from a smaller unit to a larger unit

6 feet = \_\_\_\_\_ yards



**Think:** If I measure the same length

using a larger unit, I will need a smaller number of units.

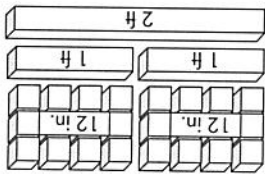
**Operation:** Divide.

You know 3 ft = 1 yd.

Find  $6 \div 3$ ; 6 ft = 2 yd

Converting a length measurement from a larger unit to a smaller unit

2 feet = \_\_\_\_\_ inches



**Think:** If I measure the same length using a smaller unit, I will need a larger number of units.

**Operation:** Multiply.

You know 1 ft = 12 in.

Find  $2 \times 12$ ; 2 ft = 24 in.

Relationships Among Customary Units of Length			
Inch	Foot	Yard	Mile
12 in. =	1 ft		
36 in. =	3 ft =	1 yd	
5,280 ft =	1,760 yd =		1 mi

Complete.

1. 5 ft = \_\_\_\_\_ in.

3. 108 in. = \_\_\_\_\_ ft

5. 2 ft 3 in. = \_\_\_\_\_ in.

2. 3 mi = \_\_\_\_\_ ft

4. 72 in. = \_\_\_\_\_ yd

6. 45 in. = \_\_\_\_\_ yd \_\_\_\_\_ in.

7. Which is the greater length, 2 yards or 5 feet?

8. **Estimation** A creek runs along a distance of 16,300 feet. About how many miles long is the creek?

Name \_\_\_\_\_

# Converting Customary Units of Length

Convert each unit.

- 12 yd = \_\_\_\_\_ in.
- 30 ft = \_\_\_\_\_ yd
- 75 ft = \_\_\_\_\_ in.
- 10 ft 7 in. = \_\_\_\_\_ in.
- 6 mi = \_\_\_\_\_ ft
- 2 mi = \_\_\_\_\_ yd

Write  $>$ ,  $=$ , or  $<$  for each  $\bigcirc$ .

- 64 in.  $\bigcirc$  5 ft
- 2 mi  $\bigcirc$  3,333 yd
- 36 yd 2 ft  $\bigcirc$  114 ft 2 in.

The Statue of Liberty was a gift to the United States from the people of France. Some of the dimensions of the statue are shown here.

Measurements of the Statue of Liberty	
Height from base of statue to the torch	151 ft 1 in.
Length of hand	16 ft 5 in.
Length of index finger	8 ft
Length of nose	4 ft 6 in.
Thickness of right arm	12 ft

- What is the height, from the base of the statue to the torch, in inches?
- What is the thickness of the statue's right arm in yards?

- Which measure is less than 435 inches?  
 A 37 ft      B 36 ft 10 in.      C 12 yd 3 in.      D 12 ft 3 in.
- Explain how you can find the number of feet in 40 yards.

# Converting Customary Units of Capacity

How to change a capacity measurement from one unit to another

<p>Converting a capacity measurement from a smaller unit to a larger unit</p> <div style="text-align: center;"> <p>4 pints = _____ quarts</p> </div> <p>Think: If I measure the same capacity using a larger unit, I will need a smaller number of units.</p> <p>Operation: Divide.</p> <p>You know 2 pt = 1 qt.</p> <p>Find <math>4 \div 2</math>; 4 pt = 2 qt</p>	<p>Converting a capacity measurement from a larger unit to a smaller unit</p> <div style="text-align: center;"> <p>2 gallons = _____ quarts</p> </div> <p>Think: If I measure the same capacity using a smaller unit, I will need a larger number of units.</p> <p>Operation: Multiply.</p> <p>You know 1 gal = 4 qt.</p> <p>Find <math>2 \times 4</math>; 2 gal = 8 qt</p>
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Relationships Among Customary Units of Capacity			
Ounce	Cup	Pint	Quart
8 fl oz = 1 c	2 c = 1 pt	2 pt = 1 qt	4 qt = 1 gal

Complete.

1. 16 fl oz = \_\_\_\_\_ c
2. 8 gal = \_\_\_\_\_ qt
3. 10 c = \_\_\_\_\_ pt
4. 6 qt = \_\_\_\_\_ pt
5. **Estimation** A vat has a capacity of 642 fl oz. Estimate its capacity in cups.

# Converting Customary Units of Capacity

Name \_\_\_\_\_

Practice  
13-2

Convert each unit.

1. 2 qt = \_\_\_\_\_ pt
2. 5 c = \_\_\_\_\_ pt
3. 3 gal = \_\_\_\_\_ pt
4. 96 fl oz = \_\_\_\_\_ c
5. 4 qt = \_\_\_\_\_ c
6. 9 pt = \_\_\_\_\_ c

Solve.

7. 
$$\begin{array}{r} 5 \text{ c } 4 \text{ fl oz} \\ - 4 \text{ c } 3 \text{ fl oz} \\ \hline \end{array}$$
8. 
$$\begin{array}{r} 7 \text{ gal } 2 \text{ qt} \\ + 3 \text{ gal } 1 \text{ qt} \\ \hline \end{array}$$
9. 
$$\begin{array}{r} 6 \text{ qt } 1 \text{ pt} \\ - 2 \text{ qt } 1 \text{ pt} \\ \hline \end{array}$$

10. **Estimation** Estimate the number of pints in 445 ounces.

11. If you needed only 1 c of milk, what is your best choice at the grocery store—a quart container, a pint container, or a  $\frac{1}{2}$  gal container?

12. Which of the following is equivalent to 1 c?

- A 4 fl oz      B 2 pt      C 8 fl oz      D 4 qt

13. **Writing to Explain** Explain how you would convert a measurement given in ounces into pints.

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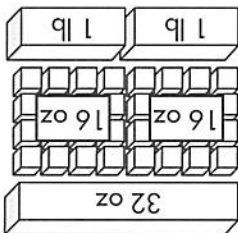
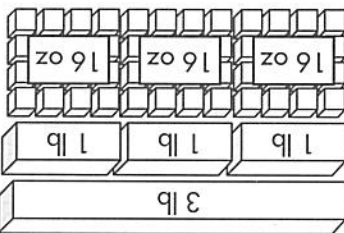


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# Converting Customary Units of Weight

Name \_\_\_\_\_

How to change a weight measurement from one unit to another:

<p>Converting a weight measurement from a smaller unit to a larger unit</p> <p>32 ounces = _____ pounds</p>  <p><b>Think:</b> If I measure the same weight using a larger unit, I will need a smaller number of units.</p> <p><b>Operation:</b> Divide.</p> <p>You know 16 oz = 1 lb.</p> <p>Find <math>32 \div 16</math>; <math>32 \text{ oz} = 2 \text{ lb}</math></p>	<p>Converting a weight measurement from a larger unit to a smaller unit</p> <p>3 pounds = _____ ounces</p>  <p><b>Think:</b> If I measure the same weight using a smaller unit, I will need a larger number of units.</p> <p><b>Operation:</b> Multiply.</p> <p>You know 1 lb = 16 oz.</p> <p>Find <math>3 \times 16</math>; <math>3 \text{ lb} = 48 \text{ oz}</math></p>
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<b>Relationships Between Customary Units of Weight</b>		
Ounce	=	16 oz
Pound	=	1 lb
Ton	=	2,000 lb
	=	1 T

Convert each unit of measurement.

1. 4 T = \_\_\_\_\_ lb
2. 5 lb = \_\_\_\_\_ oz
3. 48 oz = \_\_\_\_\_ lb
4. 6,000 lb = \_\_\_\_\_ T
5. 3,000 lb  1 T
6. 272 oz  20 lb

**7. Estimation** A candy maker buys a bar of chocolate weighing 162 ounces. About how many pounds does the bar weigh?

# Converting Customary Units of Weight

Name \_\_\_\_\_

Convert each unit of measurement.

1.  $8\text{ T} =$  \_\_\_\_\_ lb  
 2.  $2\frac{1}{2}\text{ lb} =$  \_\_\_\_\_ oz  
 3.  $4,000\text{ lb} =$  \_\_\_\_\_ T  
 Compare. Use  $>$ ,  $<$ , or  $=$ .

4.  $1,500\text{ lb}$    $2\text{ T}$   
 5.  $16\text{ lb}$    $16\text{ oz}$   
 6.  $1,600\text{ oz}$    $10\text{ lb}$   
 7.  $3\text{ T}$    $5,999\text{ lb}$   
 8.  $8\text{ oz}$    $\frac{1}{2}\text{ lb}$   
 9.  $19\text{ lb}$    $300\text{ oz}$   
 10.  $8\text{ oz}$    $\frac{2}{1}\text{ lb}$

11. How many ounces of potatoes are in a 5-pound bag of potatoes?

12. Did you know that there is litter in outer space? Humans exploring space have left behind bags of trash, bolts, gloves, and pieces of satellites. There are currently about 4,000,000 pounds of litter in orbit around Earth. About how many tons of space litter is this?

13. Karla bought 2 pounds of red beads,  $1\frac{4}{3}$  pounds of green beads, and 10 ounces of string at the craft store. How much do Karla's supplies weigh in all?

14. Which of the following is equivalent to  $92\frac{2}{1}$  pounds?

- A 1,472 oz    B 1,480 oz    C 1,479 oz    D 1,488 oz

15. How much is  $3\frac{2}{1}$  pounds written as a combination of whole pounds and whole ounces? Explain how you found your answer.

# Converting Metric Units of Length

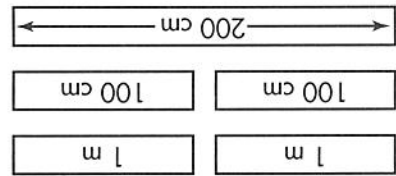
13-4  
Reteaching

Name \_\_\_\_\_

How to change a length measurement from one metric unit to another:

Converting a length from a smaller to a larger metric unit

200 centimeters = \_\_\_\_\_ meters



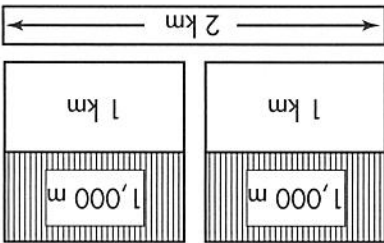
**Think:** If I measure the same length using a larger unit, I will need a smaller number of units.

**Operation:** Divide.

You know  $100 \text{ cm} = 1 \text{ m}$ .

Find  $200 \div 100$ ;  $200 \text{ cm} = 2 \text{ m}$

2 kilometers = \_\_\_\_\_ meters



**Think:** If I measure the same length using a smaller unit, I will need a larger number of units.

**Operation:** Multiply.

You know  $1 \text{ km} = 1,000 \text{ m}$ .

Find  $2 \times 1,000$ ;  $2 \text{ km} = 2,000 \text{ m}$

Relationships Among Metric Units of Length					
Kilometer		Meter	Centimeter	Millimeter	
1 km	=	1,000 m			
		1 m	=	100 cm	= 1,000 mm
				1 cm	= 10 mm

Complete.

1.  $80 \text{ mm} =$  \_\_\_\_\_ cm

2.  $234 \text{ cm} =$  \_\_\_\_\_ mm

3.  $2 \text{ m} =$  \_\_\_\_\_ mm

4.  $14,000 \text{ mm} =$  \_\_\_\_\_ m

5. Which is shorter, 60 meters or 600 centimeters? \_\_\_\_\_

6. Is 3.2 meters equal to 320 millimeters? Explain.

# Converting Metric Units of Length

Convert each unit.

1. 25 m = \_\_\_\_\_ cm
2. 345 cm = \_\_\_\_\_ m
3. 4.5 m = \_\_\_\_\_ cm
4. 10 m = \_\_\_\_\_ mm
5. 987 mm = \_\_\_\_\_ cm
6. 4,000 mm = \_\_\_\_\_ cm
7. 4.2 km = \_\_\_\_\_ m
8. 3 km = \_\_\_\_\_ m
9. List three measurements with different units that are equal to 5 meters.

Write  $>$ ,  $=$ , or  $<$  for each  $\bigcirc$ .

10. 12 cm  $\bigcirc$  98 mm
11. 3 km  $\bigcirc$  5,000 m
12. 800 cm  $\bigcirc$  8 m
13. 38.5 mm  $\bigcirc$  10 cm
14. 9,000 cm  $\bigcirc$  2 km
15. 1,000,000 mm  $\bigcirc$  100 m

Mount Saint Helens, a volcano, erupted on May 18, 1980. Before the eruption, Mount St. Helens was 2,950 meters high. After the eruption, it was 2,550 meters high.

16. What is the difference in height of Mount St. Helens before and after the eruption, expressed in meters?  
\_\_\_\_\_
17. Before the eruption, how many kilometers high was Mount St. Helens?  
\_\_\_\_\_

18. Which of the following is equal to 2 meters?

- A 200 mm      B 20 cm      C 200 km      D 2,000 mm

19. Explain how you would convert 4 m to millimeters.



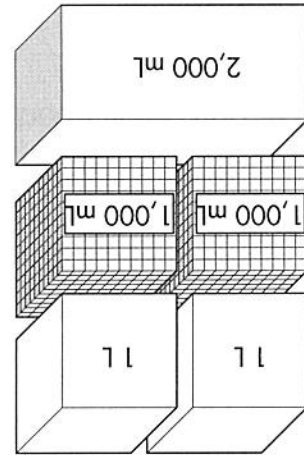
# Converting Metric Units of Capacity

13-5  
Reteaching

How to change a capacity measurement from one metric unit to another:

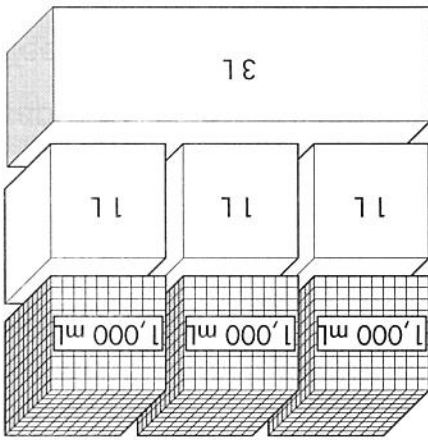
Converting a capacity from a smaller to a larger metric unit

2,000 milliliters = \_\_\_\_\_ liters



Converting a capacity from a larger to a smaller metric unit

3 liters = \_\_\_\_\_ milliliters



Think: If I measure the same capacity using a larger unit, I will need a smaller number of units.

Operation: Divide.

You know 1,000 mL = 1 L.

Find  $2,000 \div 1,000$ ;  $2,000 \text{ mL} = 2 \text{ L}$

Think: If I measure the same capacity using a smaller unit, I will need a larger number of units.

Operation: Multiply.

You know 1 L = 1,000 mL.

Find  $3 \times 1,000$ ;  $3 \text{ L} = 3,000 \text{ mL}$

Relationships Between Metric Units of Capacity			
1 Liter	=	1,000 mL	
1 Liter	=	_____	Millimeter

Complete.

1. 6 L = \_\_\_\_\_ mL

2. 4,000 mL = \_\_\_\_\_ L

3. 8,000 mL = \_\_\_\_\_ L

4. 91,000 mL = \_\_\_\_\_ L

**Estimation** Circle the capacity that is most reasonable for each container.

5. soup bowl

2 L or 300 mL

6. bathtub

200 L or 34,000 mL

# Converting Metric Units

## of Mass

Convert each unit of measurement.

1. 15,000 g = \_\_\_\_\_ kg
2. 285 kg = \_\_\_\_\_ g
3. 5,000 mg = \_\_\_\_\_ g
4. 7,000 g = \_\_\_\_\_ kg
5. 490,000 g = \_\_\_\_\_ kg
6. 648 g = \_\_\_\_\_ mg

7. Order the following masses from least to greatest:  
500 g, 50 kg, 5,000 mg

Compare. Use  $<$ ,  $>$ , or  $=$ .

8. 55,000 mg  5 kg
9. 20 g  2 kg
10. 11 g  1,100 mg
11. 4,000 mg  4 g
12. What is the value of  $x$ ?  
40,000 mg =  $10x$  g
13. A recipe that serves two people calls for 1,600 milligrams of baking soda. You want to make enough for 10 people. How much baking soda will you need, in grams?
14. You want to convert 1 kilogram to milligrams. You already know that 1 kilogram = 1,000 grams. Explain how knowing that 1 gram = 1,000 milligrams can help you.

A 400  
B 40  
C 4  
D 0.4

Name \_\_\_\_\_

# Problem Solving: Multiple-Step Problems

13-7  
Reteaching

Kyle hiked 10 miles on Saturday. He hiked half as many miles on Sunday. How many total yards did Kyle hike?

1. What am I asked to find?

2. What is the hidden question?

3. What is the answer to the hidden question?

4. What else do you need to do?

4. Convert from miles to yards

1. Total yards hiked

2. Number of miles hiked on Sunday

3. 5 miles

**Solve.**

*Think: to convert from larger units to smaller units, use multiplication.*

You know 1 mi = 1,760 yd. How many yd is 10 mi? \_\_\_\_\_

How many yd is 5 mi? \_\_\_\_\_

How many yd is 15 mi? \_\_\_\_\_

So, Kyle hiked a total of \_\_\_\_\_

**1. Mental Math** Kendra biked 10 kilometers on Monday. She biked twice that many km on Tuesday. How many total meters did she bike? What hidden question do you need to answer? Show your work.

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Name \_\_\_\_\_

## Problem Solving: Multiple-Step Problems

Answer the hidden question or questions. Then solve.

1. Isabel took 24 minutes to run around the track 6 times. John took 3 minutes to run around the track once. Which student was running faster?

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2. Nancy is saving \$2 from her allowance every week. Marco is saving \$1 the first week, \$2 the second week, \$3 the third week, and so on. At the end of 10 weeks, who will have saved more money? How much more?

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3. For every 3 cans of vegetables purchased, you get 1 free can. Tessie went home with 32 cans of vegetables. How many did she have to pay for?

- A 32      B 24      C 16      D 8

4. **Writing to Explain** Badal has  $120 \text{ cm}^3$  of water. He wants to pour it into a rectangular vase that is 4 cm high, 4 cm wide, and 5 cm long. Can he pour all the water into the vase? Explain.

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