

Name: _____

Converting Measurement Units

In “All Dried Up” on page 6, you used unit rates to find how much water is required to grow various fruits and vegetables. A special type of unit rate is measurement conversion. You can use measurement conversions to express amounts in different standard units.

EXAMPLE:

To make chocolate chip cookies, you need 2 tablespoons of milk. How many teaspoons is this?

STEP 1: Choose a conversion rate based on the information in the problem.

$$1 \text{ tablespoon} = 3 \text{ teaspoons}$$

STEP 2: Multiply the amount you want to convert by a unit rate. The unit rate should have the original unit in the denominator and the desired unit in the numerator.

$$\frac{2 \text{ tablespoons}}{1} \times \frac{3 \text{ teaspoons}}{1 \text{ tablespoon}}$$

STEP 3: Solve the expression.

$$\frac{2 \text{ tablespoons}}{1} \times \frac{3 \text{ teaspoons}}{1 \text{ tablespoon}} = 6 \text{ teaspoons}$$

So 2 tablespoons = 6 teaspoons.

Measurement Conversions

DISTANCE	VOLUME	WEIGHT
1 inch = 2.54 centimeters	1 tablespoon = 3 teaspoons	1 ounce = 28.35 grams
1 foot = 12 inches	1 pint = 2 cups	1 pound = 16 ounces
1 mile = 5,280 feet	1 quart = 2 pints	1 kilogram = 2.2 pounds
1 mile = 1.61 kilometers	1 gallon = 4 quarts	1 kilogram = 1,000 grams

YOUR TURN 

- 1.** How many quarts are in 5 gallons?
- 2.** How many ounces are in 12 pounds?
- 3.** A serving of cheese is 1.5 ounces. About how many grams is this? Round your answer to the nearest tenth.
- 4.** A fence around the perimeter of a small farm is 2.5 miles long. How many feet of fencing is this?
- 5A.** How many centimeters are in 20 inches?
- B.** About how many feet are in 200 centimeters? Round your answer to the nearest tenth.

Name: _____

Thirsty Crops

In “All Dried Up” on page 6, you used unit rates to find the amounts of water needed to grow certain crops. Use what you learned to answer five more unit rate questions about the water required to grow given amounts of different fruits, veggies, and nuts in California. Round your answers to the nearest tenth when necessary.

ESTIMATED WATER REQUIRED TO GROW SELECT CROPS IN CALIFORNIA	
Crop	Water Required
 Almonds	1.1 gallons per almond
 Walnuts	4.9 gallons per walnut
 Grapes	3.12 gallons per ounce
 Strawberries	1.24 gallons per ounce
 Lettuce	0.85 gallons per ounce
 Tomatoes	0.95 gallons per ounce
 Broccoli	2.44 gallons per ounce
 Asparagus	20.32 gallons per ounce

SOURCE: L.A. TIMES; CREDITS: ISTOCKPHOTO.COM (ALMONDS, WALNUTS); BRAND X PICTURES/GETTY IMAGES (BROCCOLI, ASPARAGUS); STOCKDISC/GETTY IMAGES (ALL OTHER PHOTOS)

YOUR TURN

- One serving of asparagus is about 3 ounces. How much water would you need to produce 4 servings?
- A recipe for walnut cake calls for 3.5 ounces of walnuts. If there are about 14 walnuts in 1 ounce, how much water is needed to produce enough nuts for the cake?
- How much more water would you need to grow 2 pounds of broccoli than the same amount of lettuce? (Hint: There are 16 ounces in 1 pound.)

- How much water is needed to grow the ingredients of a salad that contains 1 pound of lettuce, 25 almonds, 8 ounces of tomato, and 6 ounces of broccoli?
- How could you alter this salad so that your selected ingredients are more mindful in terms of water conservation?
- A 2-acre grape farm yields 8 tons of grapes per acre in one harvest. There are 2,000 pounds in a ton, and 16 ounces in a pound. How much water did the farm need to produce its total yield of grapes?