

Nutrition Facts	
Serving Size 1 oz (28g/about 18 chips)	
Servings Per Container 7	
Amount Per Serving	
Calories 150	Calories from Fat 80
% Daily Value*	
Total Fat 9g	14%
Saturated Fat 1g	5%
Polyunsaturated Fat 1g	
Monounsaturated Fat 7g	
Cholesterol 0mg	0%
Sodium 160mg	7%

Figure 17 Nutrition labels often have some measurements listed in grams and milligrams.

Calculating How many grams are in 160 milligrams?

The easiest way to convert from one unit of measurement to another is to use conversion factors. A conversion factor is a ratio of equivalent measurements that is used to convert a quantity expressed in one unit to another unit. Suppose you want to convert the height of Mount Everest, 8848 meters, into kilometers. Based on the prefix *kilo-*, you know that 1 kilometer is 1000 meters. This ratio gives you two possible conversion factors.

$$\frac{1 \text{ km}}{1000 \text{ m}} \quad \frac{1000 \text{ m}}{1 \text{ km}}$$

Since you are converting from meters to kilometers, the number should get smaller. Multiplying by the conversion factor on the left yields a smaller number.

$$8848 \text{ m} \times \frac{1 \text{ km}}{1000 \text{ m}} = 8.848 \text{ km}$$

Notice that the meter units cancel, leaving you with kilometers (the larger unit).

To convert 8.848 kilometers back into meters, multiply by the conversion factor on the right. Since you are converting from kilometers to meters, the number should get larger.

$$8.848 \text{ km} \times \frac{1000 \text{ m}}{1 \text{ km}} = 8848 \text{ m}$$

In this case, the kilometer units cancel, leaving you with meters.

Quick Lab

Comparing Precision

Materials

3 plastic bottles of different sizes, beaker, graduated cylinder

Procedure



1. Draw a data table with three rows and three columns. Label the columns Estimate, Beaker, and Graduated Cylinder.
2. Record your estimate of the volume of a plastic bottle in your data table. Then, fill the bottle with water and pour the water into the beaker. Read and record the volume of the water.
3. Pour the water from the beaker into the graduated cylinder. Read and record the volume of water.
4. Repeat Steps 2 and 3 with two other plastic bottles.

Analyze and Conclude

1. **Analyzing Data** Review your volume measurements for one of the bottles. How many significant figures does the volume measured with the beaker have? How many significant figures does the volume measured with the graduated cylinder have?
2. **Comparing and Contrasting** Which provided a more precise measurement—the beaker or the graduated cylinder?
3. **Inferring** How could you determine the accuracy of your measurements?