

Converting Units within a Given System of Measure

Converting Units

To **convert** from one type of unit to another, multiply by a convenient form of the number one.

One

$$\text{Example: } 2 \text{ ft} = 2 \cancel{\text{ft}} \left(\frac{12 \cancel{\text{in.}}}{1 \cancel{\text{ft}}} \right) = 24 \text{ in.}$$



Common Unit Conversions

	U.S. Customary	Metric
Distance:	1 mi = 5280 ft 1 yd = 3 ft 1 ft = 12 in.	1 km = 1000 m 1 m = 100 cm 1 cm = 10 mm
Volume/Capacity:	1 gal = 4 qt 1 qt = 4 cups 1 cup = 8 fl oz	1 L = 1000 mL
Weight/Mass:	1 lb = 16 oz	1 kg = 1000 g

EXAMPLE 3 Converting Units

How many seconds are in a calendar year of 365 days?

SOLUTION

At first, this question might seem overwhelming. But, you can find the answer by simply multiplying by three carefully chosen forms of the number one.

$$\begin{aligned}
 365 \text{ days} &= (365 \cancel{\text{days}}) \left(\frac{24 \cancel{\text{hr}}}{1 \cancel{\text{day}}} \right) \left(\frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} \right) \left(\frac{60 \text{ sec}}{1 \cancel{\text{min}}} \right) \\
 &= 31,536,000 \text{ sec}
 \end{aligned}$$

There are 31,536,000 seconds in a calendar year of 365 days.

Study Tip

A day is the length of time it takes Earth to complete one revolution about its axis. The fact that a solar year is not a whole number of days has perplexed calendar makers for many centuries.

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A *solar year* is the time it takes Earth to complete one revolution of its orbit about the Sun. A solar year is 365.24218967 days. How many more seconds are in a solar year than in a calendar year?

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