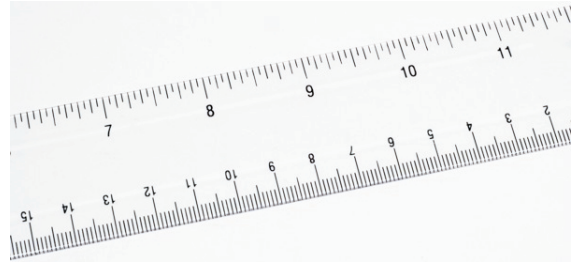


# Using English, Metric, and Apothecary Measurements

**Y**OU PROBABLY MEASURE things every day. You may weigh yourself on the bathroom scale, measure  $\frac{1}{2}$  cup of milk for a recipe, or measure new curtains for your windows. In the United States, people typically use the English system. There are, however, many uses for the metric system, especially in the health care system. In this unit, you will learn about the different types of measurements and how to convert from one system to the other.



## Objective:



Demonstrate measurement conversions.

## Key Terms:



apothecary system  
English system  
metric system

## Understanding Measurements

Items purchased at a store may have the amount listed in the English or the metric system. Some products may even have both measurements listed. However, it is beneficial for people to know how to convert from one measurement to another.

## THE ENGLISH SYSTEM

The **English system** is an age-old American system of measurement. The English liquid volume units include ounce, pint, quart, and gallon. In the English system, 1 pint (pt.) equals 16 fluid ounces (fl. oz.); 2 pints equals 1 quart (qt.); and 4 quarts equals 1 gallon (gal.). In dry measurements, 16 ounces equals 1 pound (lb.). Other household measurements are 1 teaspoon, which equals  $\frac{1}{6}$  fluid ounce; 1 tablespoon, which equals 3 teaspoons; and 1 cup, which equals 8 fluid ounces.

## THE METRIC SYSTEM

The **metric system** is a system of measurement used largely in Europe and other countries. In the metric system, 1 cubic centimeter (cc) equals 1000 cubic millimeters or one milliliter. In addition, 1000 cc equals 1 liter, while 30 cc equals 1 ounce. In metric weights, 1 grain (gr) equals 0.0648 grams (g); 1 ounce equals 28.35 g; 1 pound equals 453.6 g; and 2.2 pounds equals 1 kilogram (kg).

## LINEAR MEASUREMENTS

Health care professionals use linear measurements to find a patient's height and the length or circumference of various body parts. It is sometimes necessary to convert the measurements from English to metric units or vice versa.

In English linear measurements, 12 inches equals 1 foot, and 3 feet equals one yard. One inch equals 2.54 centimeters in metric units. Conversely, 1 centimeter equals 0.3937 inches. One foot equals 30.48 centimeters. Once you learn these conversion factors, you can easily convert English measurements into metric units and back again. For example, suppose a patient is 5 feet 6 inches tall, but you need to find the height in centimeters.

First, find the height in inches:  $(5 \times 12) + 6 = 66$  inches.

Then multiply the total number of inches by the conversion factor of 2.54.  $66 \times 2.54 = 167.64$ .

The patient's height is 167.64 centimeters.

## APOTHECARY SYSTEM

The **apothecary system** is an almost obsolete system once commonly used in pharmaceutical preparations. Units of measurement are grains (gr) for weight and minims (m) for vol-



**FIGURE 1.** Medical professionals may measure a baby's weight in English units of pounds and ounces or in metric units of grams.

## FURTHER EXPLORATION...

### ONLINE CONNECTION: Conversion Quiz

Health care professionals need to be able to do conversions when taking measurements, dispensing medications, and performing other duties. Make a list of the common conversion factors supplied in this unit. Using that knowledge, visit the following Web site to take a conversion quiz. Answer the questions that might be faced by a nurse on the job. How do you measure up?

<http://www.unc.edu/~bangel/quiz/testmet.htm>

ume. One teaspoon equals the apothecary measurement of 60 grains, while 60 minims equals 5 milliliters.

## Summary:



There are two basic systems of measurements used in the health care industry. The English system is an age-old American system of measurement. It uses units such as pounds, inches, feet, pints, and tablespoons. The metric system is a system of measurement used largely in Europe and other countries. It uses units such as centimeters, liters, and grams. It is possible to convert measurements from one system to the other by using equations. The apothecary system is becoming obsolete, but it is still used in some pharmacy preparations.

## Checking Your Knowledge:



1. What units of measure are used in the English system?
2. What units of measure are used in the metric system?
3. What are some common equivalencies?
4. How are inches converted to centimeters?
5. What is the apothecary system?

## Expanding Your Knowledge:



Interview a nurse or other health practitioner. Ask about the measurements that are commonly used in the health care field. Are those measurements typically English, metric, or a mix of both? Perhaps professionals use both measurements for various purposes. For instance, hospital records may require a baby's weight to be listed in grams, but the doctor tells the parents the newborn's weight in pounds and ounces. Find out as much as you can about measuring devices used in the occupation.

## Web Links:



### Apothecary/Metric Equivalents

<http://www.healthline.com/natstandardcontent/alt-apothecarymetric-equivalents>

### Measurement Conversion Calculators

<http://www.asknumbers.com/>

### History of the English System

<http://www.think-metric.com/English.html>