

THE ENGLISH SYSTEM

English Measurement System

This title may be a little misleading, because there's the Imperial system (adopted in 1824) in the UK and US Customary Unit (adopted in 1832). We're focusing primarily on US measurements here, although there is often overlap. These units of measure developed over time and primarily came from Roman and Anglo-Saxon units. Surprisingly, the official definition of these units is now based on the metric system.

Length

The four units of length in everyday use are the inch, foot, yard, and mile. There are a couple of others that pop up rarely, like the hand, span, or furlong. Officially, 1 yd = 0.9144 m (International Yard and Pound Agreement of 1958).

- 1 inch (in) is approximately 2.54 cm
- 1 foot (ft) is 12 inches
- 1 yard (yd) is 3 feet
- 1 mile (mi) is 1760 yards, or 5280 feet

- 1 hand is 4 inches (used in measuring the height of horses)
- 1 span is 9 inches
- 1 furlong is 220 yards, or 660 feet (1/8 mile)

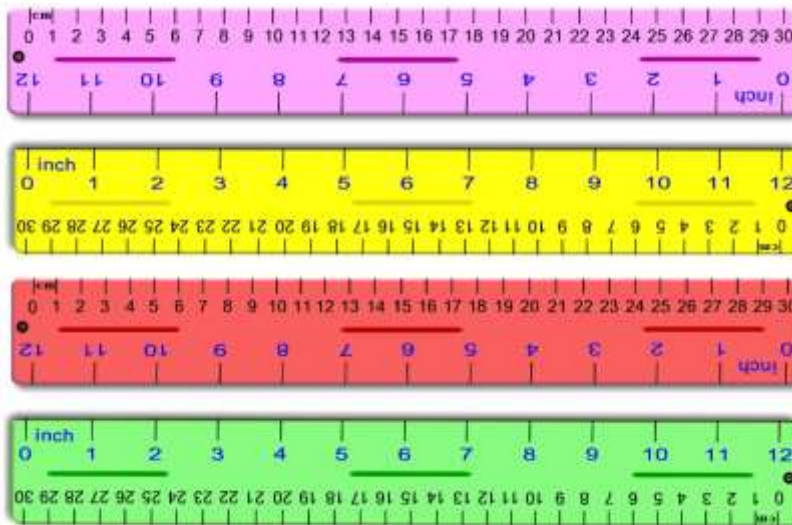


Figure 1: Inches to Centimeters
<https://creazilla.com/media/digital-illustration/1684229/cm-inches-in>
CC0 1.0

Area

Area tends to be in square units of length (square inches, square feet, etc.), with the exception of the acre.

1 in² is a square with 1 inch sides. Approximately $(2.54)^2 = 6.45$ cm²

1 ft² is a square with 1 foot sides. $(12)^2 = 144$ in²

1 yd² is a square with 1 yard sides. $(3)^2 = 9$ ft²

1 mi² is a square with 1 mi sides. $(1760)^2 = 3,097,600$ yd²

1 acre = 43,560 ft², which is approximately 208.7 feet per side

Volume

Cubic inches, feet, and yards are commonly used for measuring volume. In addition, there is another set of measurements used for dry volume and solid volume.

1 in³ is a cube with 1 inch sides. Approximately $(2.54)^3 = 16.39$ cm³ or 16.39 mL

1 ft³ is a cube with 1 foot sides. $(12)^3 = 1728$ in³

1 yd³ is a cube with 1 yard sides. $(3)^3 = 27$ ft³

1 mi³ is a cube with 1 mile sides. $(1760)^3 = 545,177,600$ yd³

Fluid volume uses measures like teaspoons, cups, gallons.

1 teaspoon (tsp) is approximately 3.70 mL

1 tablespoons (tbsp) is 3 teaspoons

1 fluid ounce (fl oz) is 2 tablespoons

1 cup (c) is 8 fluid ounces

1 pint (pt) is 2 cups

1 quart (qt) is 2 pints

1 gallon (gal) is 4 quarts

1 hogshead is 63 gallons

You may encounter something like Gallon Man (below) to help students remember relationships between cups, pints, quart, and gallons.

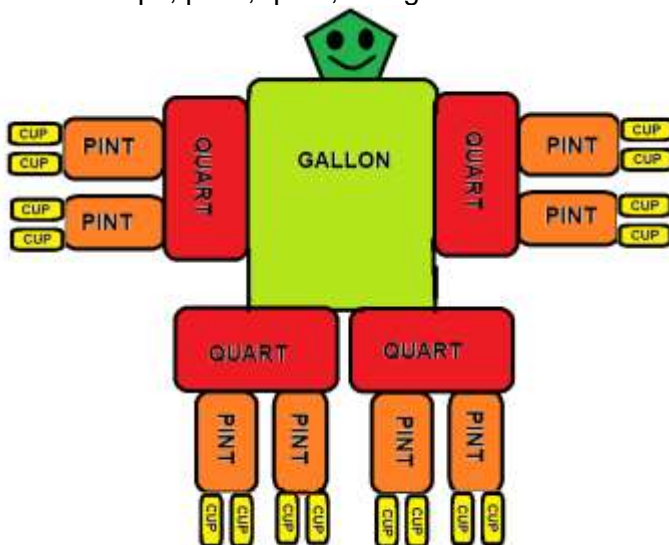


Figure 2: Gallon Man

Dry volume is separate, although the names are similar.

1 pint (pt) is approximately 33.6 in³ (or 0.55 L)

1 quart (qt) is 2 pints

1 gallon (gal) is 4 quarts

1 peck (pk) is 2 gallons

1 bushel (bu) is 4 pecks

Mass and Weight

The most common units for weight is ounces (not fluid), pounds, and tons.

1 grain (gr) is 1/7000 pound, or approximately 64.80 mg

1 dram (dr) is 27 11/32 grains

1 ounce (oz) is 16 drams (approx. 28.35 g)

1 pound (lb) is 16 ounces

1 ton (short) is 2,000 pounds

1 ton (long) is 2,240 pounds

Temperature

Degrees Fahrenheit are most commonly used for temperature. Water freezes at 32°F (0°C) and boils at 212°F (100°C). The conversion formula is $F = \frac{9}{5}C + 32$.