

Measurement - Customary Units

In the United States, we use the customary units of measurement system. These units include the linear units of inches, feet, yards, miles; the weight units of ounces, pounds, tons; the capacity units of fluid ounces, cups, pints, quarts, and gallons; and time units of seconds, minutes, hours, days, weeks, months, and years.

We will learn to convert, add, and subtract within the customary units measurement system.

Customary Units Conversion Chart

Customary Units Conversions

Customary Units Computations

Customary Units – Conversion Charts

Use these customary unit equivalences to make conversions, to add measurements, and to subtract measurements.

Units of length – inch, foot, yard, mile	
1 foot (ft)	12 inches (in)
1 yard (yd)	3 ft or 36 in
1 mile (mi)	1760 yd or 5280 ft

Units of weight – ounce, pound, ton	
1 pound (lb)	16 ounces (oz)
1 ton (T)	2000 lb

Units of capacity – ounce, cup, pint, quart, gallon	
1 cup (c)	8 fluid ounces (fl oz)
1 pint (pt)	2 c
1 quart (qt)	2 pt
1 gallon (gal)	4 qt

Units of time – seconds, minutes, hour, day, week, month, year	
1 minute (min)	60 seconds (s)
1 hour (hr)	60 min
1 day (d)	24 hr
1 week (wk)	7 d
1 year (y)	52 wk, 12 months (mo), 365 d

Customary Units - Conversions

To express a **larger unit as a smaller unit**, *multiply* by the conversion factor.

Find how many ounces are in *7 pounds*.

$$7 \text{ lb} \times 16 = 112 \text{ oz} \quad (1 \text{ lb} = 16 \text{ oz})$$

Find how many inches are in *5 feet 4 inches*.

$$5 \text{ feet} \times 12 = 60 \text{ inches} + 4 \text{ extra inches makes } 64 \text{ inches.} \quad (1 \text{ ft} = 12 \text{ in})$$

To express a **smaller unit as a larger unit**, *divide* by the conversion factor.

Find how many gallons make *16 quarts*.

$$16 \text{ qt} \div 4 = 4 \text{ gal} \quad (1 \text{ gal} = 4 \text{ qt})$$

Find how many miles are in *12,000 feet*.

$$12,000 \text{ feet} \div 5280 = 2 \text{ miles } 1440 \text{ feet.}$$

$$\begin{array}{r} 2 \\ 5280 \overline{)12000} \\ \underline{10560} \\ 1440 \end{array}$$

Customary Units - Computations

Add

$$\begin{array}{r}
 5 \text{ feet } 7 \text{ inches} \\
 + 2 \text{ feet } 8 \text{ inches} \\
 \hline
 7 \text{ feet } 15 \text{ inches}
 \end{array}
 \begin{array}{l}
 \textit{Simplify} \\
 \rightarrow 7 \text{ feet } 15 \text{ in} = 7 \text{ feet} + 12 \text{ in} + 3 \text{ in} \\
 7 \text{ feet } 15 \text{ in} = 7 \text{ feet} + 1 \text{ ft} + 3 \text{ in}
 \end{array}$$

8 feet 3 inches ←

Subtract

Since **22** is smaller than 45, borrow to get 5 hr 82 min

$$\begin{array}{r}
 6 \text{ hr } 22 \text{ min} = 5 \text{ hr } 82 \text{ min} \\
 - 3 \text{ hr } 45 \text{ min} = 3 \text{ hr } 45 \text{ min} \\
 \hline
 2 \text{ hr } 37 \text{ min}
 \end{array}
 \begin{array}{l}
 \rightarrow 6 \text{ hr } 22 \text{ min} = 5 \text{ hr} + 1 \text{ hr} + 22 \text{ min} = \\
 5 \text{ hr} + 60 \text{ min} + 22 \text{ min} = \\
 5 \text{ hr} + 82 \text{ min}
 \end{array}$$