

METRIC SYSTEM AND CONVERSION

Basic Units: Metric

(or SI - International System of Units)

Length:	Meter	m
Volume:	liter	l or L
Weight:	gram	g

Prefix	Abrv	Number of Basic Units	
giga-	G	10^9	
mega-	M	10^6	
kilo-	k	10^3	or 1000
hecto-	h	10^2	or 100
Deca-	da	10^1	or 10
Basic Unit	m, L, g	10^0	or 1
deci-	d	10^{-1}	or 0.1
Centi-	c	10^{-2}	or 0.01
Milli-	m	10^{-3}	or 0.001
micro-	μ or mc	10^{-6}	or 0.000001
Nano-	n	10^{-9}	

Note: $1 \text{ cm}^3 = 1 \text{ mL}$

Units: Standard/US Customary

Length:	foot, yard, mile	ft, yd, mi
Volume:	ounce, cup, quart, gallon	oz, c, qt, gal
Weight:	ounce, pound, ton	oz, lb, ton

Relationship between Metric and US Systems

Volume	Weight/Mass	Distance
1 mL = 0.034 oz	1 g = 0.035 oz	1 cm = 0.394 in
1 L = 1.06 qt	1 kg = 2.202 lb	1 m = 3.281 ft
1 L = 0.264 gal	1 Mg (ton) = 2200 lb	1 m = 1.094 yd
1 tsp = 5 mL		1 km = 0.621 mi
1 oz = 29.57 mL	1 oz = 28.35 g	1 in = 2.54 cm
1 qt = 0.9464 L	1 lb = 0.454 kg	1 ft = 0.305 m
1 gal = 3.785 L		1 mi = 1.609 km

Temperature: °F and °C

To find °C when °F is given: $C = \frac{(5/9)(F-32)}{1.8}$

To find °F when °C is given: $F = \frac{(9/5)C + 32}{1.8}$

Format for metric prefixes and values (basic units: m=meter, L=liter, g=gram)

1,000 x 1 m, L, g	100 x 1 m, L, g	10 x 1 m, L, g	1 or basic unit	1/10 a m, L, g	1/100 a m, L, g	1/1,000 a m, L, g	1/1,000,000 m, L, g
10^3	10^2	10^1	10^0	10^{-1}	10^{-2}	10^{-3}	10^{-6}
k	h	da	m, L, g	d	c	m	μ or mc

Converting within the Metric System

When converting from **larger** (left) to **smaller** (right), move decimal that number of places to the **RIGHT**. Example: 8.0 kilograms to grams (larger to smaller weight). From k to g = 3 places. Move decimal 3 places to the right. Answer: 8.0 kilograms = 8,000 grams

When converting from **smaller** (right) to **larger** (left), move decimal that number of places to the **LEFT**. Example: 450 milliliters to deciliters (smaller to larger volume). From ml to dl = 2 places. Move decimal 2 places to the left. Answer: 450 ml = 4.5 dl