

Counted Numbers	Defined Equalities	
	Metric System	U.S. System
8 doughnuts	1 L = 1000 mL	1 ft = 12 in.
2 baseballs	1 m = 100 cm	1 qt = 4 cups
5 capsules	1 kg = 1000 g	1 lb = 16 oz

1 **kilometer** (1 km) = **1000** meters ($1000 \text{ m} = 10^3 \text{ m}$)

1 **kiloliter** (1 kL) = **1000** liters ($1000 \text{ L} = 10^3 \text{ L}$)

1 **kilogram** (1 kg) = **1000** grams ($1000 \text{ g} = 10^3 \text{ g}$)

TABLE 2.5 Metric and SI Prefixes

Prefix	Symbol	Numerical Value	Scientific Notation	Equality
Prefixes That Increase the Size of the Unit				
tera	T	1 000 000 000 000	10^{12}	1 Ts = 1×10^{12} s 1 s = 1×10^{-12} Ts
giga	G	1 000 000 000	10^9	1 Gm = 1×10^9 m 1 m = 1×10^{-9} Gm
mega	M	1 000 000	10^6	1 Mg = 1×10^6 g 1 g = 1×10^{-6} Mg
kilo	k	1 000	10^3	1 km = 1×10^3 m 1 m = 1×10^{-3} km
Prefixes That Decrease the Size of the Unit				
deci	d	0.1	10^{-1}	1 dL = 1×10^{-1} L 1 L = 10 dL
centi	c	0.01	10^{-2}	1 cm = 1×10^{-2} m 1 m = 100 cm
milli	m	0.001	10^{-3}	1 ms = 1×10^{-3} s 1 s = 1×10^3 ms
micro	μ^*	0.000 001	10^{-6}	1 μg = 1×10^{-6} g 1 g = 1×10^6 μg
nano	n	0.000 000 001	10^{-9}	1 nm = 1×10^{-9} m 1 m = 1×10^9 nm
pico	p	0.000 000 000 001	10^{-12}	1 ps = 1×10^{-12} s 1 s = 1×10^{12} ps

$$1 \text{ m} = 100 \text{ cm} = 1 \times 10^2 \text{ cm}$$

$$1 \text{ m} = 1000 \text{ mm} = 1 \times 10^3 \text{ mm}$$

$$1 \text{ cm} = 10 \text{ mm} = 1 \times 10^1 \text{ mm}$$

$$1 \text{ L} = 10 \text{ dL} = 1 \times 10^1 \text{ dL}$$

$$1 \text{ L} = 1000 \text{ mL} = 1 \times 10^3 \text{ mL}$$

$$1 \text{ dL} = 100 \text{ mL} = 1 \times 10^2 \text{ mL}$$

$$1 \text{ mL} = 1000 \mu\text{L (mcL)} = 1 \times 10^3 \mu\text{L (mcL)}$$

$$1 \text{ cm}^3 = 1 \text{ cc} = 1 \text{ mL}$$

$$1 \text{ kg} = 1000 \text{ g} = 1 \times 10^3 \text{ g}$$

$$1 \text{ g} = 1000 \text{ mg} = 1 \times 10^3 \text{ mg}$$

$$1 \text{ mg} = 1000 \mu\text{g (mcg)} = 1 \times 10^3 \mu\text{g (mcg)}$$

TABLE 2.7 Some Common Equalities

Quantity	Metric (SI)	U.S.	Metric-U.S.
Length	1 km = 1000 m	1 ft = 12 in.	2.54 cm = 1 in. (exact)
	1 m = 1000 mm	1 yd = 3 ft	1 m = 39.4 in.
	1 cm = 10 mm	1 mi = 5280 ft	1 km = 0.621 mi
Volume	1 L = 1000 mL	1 qt = 4 cups	946 mL = 1 qt
	1 dL = 100 mL	1 qt = 2 pt	1 L = 1.06 qt
	1 mL = 1 cm ³	1 gal = 4 qt	473 mL = 1 pt
	1 mL = 1 cc*		5 mL = 1 t (tsp)* 15 mL = 1 T (tbsp)*
Mass	1 kg = 1000 g	1 lb = 16 oz	1 kg = 2.20 lb
	1 g = 1000 mg		454 g = 1 lb
	1 mg = 1000 mcg*		
Time	1 h = 60 min	1 h = 60 min	
	1 min = 60 s	1 min = 60 s	

$$1 \text{ kg} = 2.20 \text{ lb}$$

The corresponding conversion factors are

$$\frac{2.20 \text{ lb}}{1 \text{ kg}} \quad \text{and} \quad \frac{1 \text{ kg}}{2.20 \text{ lb}}$$

85 km = 1 h	$\frac{85 \text{ km}}{1 \text{ h}}$ and $\frac{1 \text{ h}}{85 \text{ km}}$	The 85 km is measured: It has two significant figures. The 1 h is exact.
Equality	Conversion Factors	Significant Figures or Exact
85 km = 1 h	$\frac{85 \text{ km}}{1 \text{ h}}$ and $\frac{1 \text{ h}}{85 \text{ km}}$	The 85 km is measured: It has two significant figures. The 1 h is exact.

One tablet contains 500 mg of vitamin C.

1 tablet = 500 mg of vitamin C	$\frac{500 \text{ mg vitamin C}}{1 \text{ tablet}}$ and $\frac{1 \text{ tablet}}{500 \text{ mg vitamin C}}$	The 500 mg is measured: It has one significant figure. The 1 tablet is exact.
Equality	Conversion Factors	Significant Figures or Exact

$$\text{Density} = \frac{\text{mass of substance}}{\text{volume of substance}}$$