

Chemistry 101

Reference/Help Sheet - Units

Common Metric Prefixes

prefix	numerical meaning	scientific notation	symbol
deci	$\frac{1}{10}$	10^{-1}	d
centi	$\frac{1}{100}$	10^{-2}	c
milli	$\frac{1}{1000}$	10^{-3}	m
micro	$\frac{1}{1,000,000}$	10^{-6}	μ
nano	$\frac{1}{1,000,000,000}$	10^{-9}	n
pico	$\frac{1}{1,000,000,000,000}$	10^{-12}	p
deka	10	10^1	D
kilo	1000	10^3	k
mega	1,000,000	10^6	M
giga	1,000,000,000	10^9	G

Common Equalities for Conversion Factors (metric)

Metric

1 cm = 10 mm
 1 m = 100 cm
 1 m = 1000 mm
 1 km = 1000 m

1 mL = 1 cm³ (also cc)
 1 dL = 100 mL
 1 L = 10 dL
 1 L = 1000 mL

1 g = 1000 mg
 1 kg = 1000 g
 1 mg = 1000 μ g

U.S.

1 ft = 12 in
 1 yard = 3 ft
 1 mile = 5280 ft

1 cup = 8 fl oz
 1 pint = 2 cups
 1 qt = 4 cups = 2 pints
 1 gallon = 4 qts

1 lb = 16 oz

Metric-U.S.

1 in = 2.54 cm
 1 yd = 0.914 m
 1 km = 0.621 miles

1 kg = 2.20 lb
 454 g = 1 lb
 1 ton = 907.2 kg
 1 grain = 0.000065 kg

946 mL = 1 qt
 0.946 L = 1 qt
 1 L = 1.06 qt

Example: During a glucose tolerance test, the serum glucose concentration of a patient was found to be 139 mg/dL. Convert the concentration to grams per liter.

- *Unit Plan:* $mg/dL \xrightarrow{dL \rightarrow L} mg/L \xrightarrow{mg \rightarrow g} g/L$
- *We have the following equalities:*

$$10 \text{ dL} = 1 \text{ L} \quad \text{and} \quad 1000 \text{ mg} = 1 \text{ g}$$

- *We can use these to make conversion factors and convert to our final units:*

$$\frac{139 \text{ mg}}{dL} \times \frac{\overbrace{10 \text{ dL}}^{dL \rightarrow L}}{1 \text{ L}} \times \frac{1 \text{ g}}{\underbrace{1000 \text{ mg}}_{gm \rightarrow g}} = \frac{1.39 \text{ g}}{L}$$