

CONVERSIONS FOR CHEMISTRY

English System

12 inches = 1 foot
3 feet = 1 yard
36 inches = 1 yard
4 quarts = 1 gallon
2 pints = 1 quart
16 ounces = 1 pound (dry measure)
16 ounces = 1 pint (fluid measure)
2 cups = 1 pint
1 mile = 5280 feet = 1760 yards

<u>Metric prefixes</u>	<u>Power of ten</u>	<u>Abbreviation</u>
pico- = .000000000001	1×10^{-12}	p
nano- = .000000001	1×10^{-9}	n
micro- = .000001	1×10^{-6}	μ
milli- = .001	1×10^{-3}	m
centi- = .01	1×10^{-2}	c
deci- = .1	1×10^{-1}	d
kilo- = 1000	1×10^3	k
mega- = 1,000,000	1×10^6	M
giga- = 1,000,000,000	1×10^9	G
tera- = 1,000,000,000,000	1×10^{12}	T

The textbook uses cm^3 in place of mL and dm^3 in place of L. The conversions are as follows:

$$1 \text{ cm}^3 = 1 \text{ mL} \qquad 1 \text{ dm}^3 = 1 \text{ L} \qquad 1000 \text{ cm}^3 = 1 \text{ dm}^3$$

Metric based units consist of a prefix followed by the base unit. The base units are meter, liter, gram and second.

Here is an example of using the metric system to represent a measurement that is 4.37 meters

$$4.37 \text{ meters} = .00437 \text{ kilometers} = 437 \text{ centimeters} = 4370 \text{ millimeters}$$

The following are several examples of the use of multiples of 10 and their prefixes:

$$1 \text{ nanometer} = 1 \text{ nm} = 10^{-9} \text{ m} \qquad 1 \text{ micrometer} = 1 \mu\text{m} = 10^{-6} \text{ m}$$

$$1 \text{ millimeter} = 1 \text{ mm} = 10^{-3} \text{ m} \qquad 1 \text{ centimeter} = 1 \text{ cm} = 10^{-2} \text{ m}$$

$$1 \text{ kilometer} = 1 \text{ km} = 10^3 \text{ m} \qquad 1 \text{ microgram} = 1 \mu\text{g} = 10^{-9} \text{ kg}$$

$$1 \text{ milligram} = 1 \text{ mg} = 10^{-6} \text{ kg} \qquad 1 \text{ gram} = 1 \text{ g} = 10^{-3} \text{ kg}$$

$$1 \text{ picosecond} = 1 \text{ ps} = 10^{-12} \text{ s} \qquad 1 \text{ gigabyte} = 10^9 \text{ bytes}$$

$$1 \text{ m} = 100 \text{ cm} = 1000 \text{ mm}$$

$$1 \text{ L} = 1000 \text{ mL}$$

$$1 \text{ g} = 1000 \text{ mg}$$

There are also several capacity units that you recognize:

1 liter = 1 L = 1000 mL = 1 dm^3 and 1 mL = 10^{-3} L = 1 cm^3 . The density of water is commonly accepted as 1.000 g/mL. The density of water varies with temperature.

These common English to metric conversions may be helpful along the way:

$$2.54 \text{ cm} = 1 \text{ inch}$$

$$946 \text{ mL} = 1 \text{ quart}$$

$$1 \text{ m}^2 = 10,000 \text{ cm}^2$$