

UNITS OF MEASUREMENT

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Units of Measurements

Friday, June 30, 2017

3:09 PM

SI Units to Know

The standard units are kg not g, and meter for length

<u>Physical Quantity</u>	<u>Name of Unit</u>	<u>Abbreviation</u>
Mass	kilogram	kg
Length	meter	m
Time	second	s
Temperature	kelvin	K
Electric current	ampere	A
Amount of substance	mole	mol

Meter is denoted by a small _____

Prefixes

Memorize Mega (capital M) down through pico.

Prefix	Symbol	Meaning	Exponent
mega-	M	1,000,000	10^6
kilo-	K	1,000	10^3
hecto-	H	100	10^2
deka-	da	10	10^1
deci-	d	0.1	10^{-1}
centi-	c	0.01	10^{-2}
milli-	m	0.001	10^{-3}
micro-	μ	0.000001	10^{-6}
nano-	n	0.000000001	10^{-9}
pico-	p	0.000000000001	10^{-12}
femto	f	0.00000000000001	10^{-15}

atto-	a	0.0000000000000000001	10^{-18}
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Volume

Not a fundamental SI unit; derived from length

Two important relationships to know:

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

$$1 \text{ L} = 1 \text{ dm}^3$$

Mass vs. Weight

Mass is the amount of matter in an object.

Weight is a measure of the force of gravity acting on an object's mass.

Density

Common density units =

Temperature

An expression of the **average** kinetic energy contained within a sample.

For most chemistry problems centigrade *must* be converted to Kelvin:

Practice Problems:

1. A metric unit for length is
 - a. gram
 - b. milliliter
 - c. yard
 - d. kilometer

2. Order the four metric prefixes from *smallest to largest*
 - a. nano-< milli-< centi-< kilo-
 - b. milli-< nano-< centi-< kilo-
 - c. kilo-< centi-< nano- < milli-
 - d. kilo-< centi-< milli- < nano-

1. 8.1 kilogram(s) contains this many grams
 - a. $8.1 \times 10^2 \text{ g}$
 - b. $8.1 \times 10^3 \text{ g}$
 - c. 81 g
 - d. 0.81g

2. Convert 0.3980 m to mm.
 - a. 398.0 mm
 - b. $3.90 \times 10^{-3} \text{ mm}$

- c. $3.980 \times 10^{-4} \text{ mm}$
- d. 0.03980 mm