

METRIC UNITS & PREFIXES:

In the metric system, everything is measured in 10's and in powers of 10. Capital letters are used for prefixes that are greater than 1 while lowercase and Greek letters are for prefixes less than 1. The below prefixes are used in the metric system:

M = Mega = 1,000,000 of something

K = Kilo = 1,000 of something

H = Hecto = 100 of something

D = Deca = 10 of something

d = deci = $\frac{1}{10}$ of something

c = centi = $\frac{1}{100}$ of something

m = milli = $\frac{1}{1000}$ of something

μ = micro = $\frac{1}{1,000,000}$ of something (*one millionth*; μ = Greek letter mu)

n = nano = $\frac{1}{1,000,000,000}$ of something (*one billionth*)

One way to remember the prefixes from **Kilo** to **milli** is to remember the phrase: "**K**ing **H**enry **D**runk **d**ark **c**hocolate **m**ilk." (*Pardon the grammar!*)

You often have to convert back and forth between the prefixes. The below examples will show how to do this:

1. Convert **15 Km**(kilometers) to meters. Note that there are 1000 meters per kilometer. Write this in mathematical notation as shown: $\frac{1000 \text{ meters}}{1 \text{ kilometer}}$. "Per" means a

division bar. You need to position $\frac{1000 \text{ meters}}{1 \text{ kilometer}}$ so that the kilometers cancel out and

the unit you want is on the top. Multiply or divide if necessary. The conversion is

carried out below: $\frac{15 \text{ kilometers}}{1} \cdot \frac{1000 \text{ meters}}{1 \text{ kilometer}} = \frac{15 \text{ Km}}{1} \cdot \frac{1000 \text{ meters}}{1 \text{ Km}} = \underline{\underline{15,000 \text{ meters}}}$.

2. Convert 90 nm(nanometers) to cm(centimeters).

$\frac{90 \text{ nanometers}}{1} \cdot \frac{1 \text{ meter}}{1,000,000,000 \text{ nanometers}} \cdot \frac{100 \text{ centimeters}}{1 \text{ meter}} =$

$\frac{9000}{1,000,000,000} = \frac{9 \times 10^3}{1 \times 10^9} = \underline{\underline{9 \times 10^{-6} \text{ centimeters}}} = \underline{\underline{.000009 \text{ centimeters}}}$