Metric Conversions

mega	kilo	hecto	deca	base unit	deci	centi	milli	micro
M	k	h	da	s, m, L	d	c	m	μ
10^6	10^3	10^2	10^1	10^0	10^{-1}	10^{-2}	10^{-3}	10^{-6}
					$\left(\frac{1}{10}\right)$	$\left(\frac{1}{10^2}\right)$	$\left(\frac{1}{10^3}\right)$	$\left(\frac{1}{10^6}\right)$

$\times 10^?$ (move dec right) →

← $\div 10^?$ (move dec left)

Ways to do metric conversions

1. Slide the decimal ..... OK, but sometimes not very convenient!

$52.8\ mg = 0.0000528\ kg$

$0.792\ km = 79200\ cm$

$425\ nm = 0.000\,000\,425\ m \quad (4.25 \times 10^{-7}\ m)$

9 dec. places to the left

2. Use the prefix (this is good if your are converting to the base unit)

$685\ nm = 685 \times 10^{-9}\ m$ (n)

$10^{-9} \quad = 6.85 \times 10^{-7}\ m$

$85.3\ Tm = 85.3 \times 10^{12}\ m$

$= 8.53 \times 10^{13}\ m$

$0.00291\ \mu C = 0.00291 \times 10^{-6}\ C$

$= 2.91 \times 10^{-9}\ C$

3. Factor Label Method (use conversion factors)

Convert 582 km to m

need a conversion factor that relates m to km

$1\text{ km} = 1000\text{ m}$

$$?\text{ m} = 582\text{ km}\left(\frac{1000\text{ m}}{1\text{ km}}\right)$$

$?\text{ m} = 582000\text{ m}$

Convert 381 km to cm

$$?\text{ cm} = 381\text{ km}\left(\frac{1000\text{ m}}{1\text{ km}}\right)\left(\frac{100\text{ cm}}{1\text{ m}}\right)$$

$?\text{ cm} = 38100000\text{ cm}$

Convert: $105\frac{\text{km}}{\text{h}} \longrightarrow \frac{\text{m}}{\text{s}}$

$$?\ \frac{\text{m}}{\text{s}} = 105\frac{\text{km}}{\text{h}}\left(\frac{1000\text{ m}}{1\text{ km}}\right)\left(\frac{1\text{ h}}{60\text{ min}}\right)\left(\frac{1\text{ min}}{60\text{ s}}\right)$$

$$?\ \frac{\text{m}}{\text{s}} \doteq 29.2\ \frac{\text{m}}{\text{s}}$$