

Metric Conversions

core metric prefixes

mega	Kilo	hecto	deca	base unit	deci	centi	milli	micro
M	k	h	da	g, m	d	c	m	μ mu
10^6	10^3	10^2	10^1		10^{-1}	10^{-2}	10^{-3}	10^{-6}
					$(\frac{1}{10^1})$	$(\frac{1}{10^2})$	$(\frac{1}{10^3})$	$(\frac{1}{10^6})$

$\xrightarrow{\times 10^? \text{ (move dec to right)}}$
 $\xleftarrow{\div 10^? \text{ (move dec to left)}}$

Ways to do Metric Conversions

1. Slide the decimal OK, but not always convenient.

$$\underline{52.8} \text{ mg} = 0.0000528 \text{ kg} \\ (5.28 \times 10^{-5} \text{ kg})$$

$$\underline{0.792} \text{ km} = 79200 \text{ cm}$$

$$\underline{425} \text{ nm} = 0.000000425 \text{ m}$$

2. Use the prefix (if you are converting to the base unit)

$$685 \text{ nm} = 685 \times 10^{-9} \text{ m} \\ \uparrow \\ \times 10^{-9} = 685 \times 10^{-7} \text{ m}$$

$$85.3 \text{ Tm} = 85.3 \times 10^{12} \text{ m} \\ \uparrow \\ \text{tera} \\ 10^{12} \\ = 8.53 \times 10^{13} \text{ m}$$

$$0.00291 \text{ } \mu\text{C} = 0.00291 \times 10^{-6} \text{ C} \\ \uparrow \\ 10^{-6} \\ \boxed{2.91 \times 10^{-9} \text{ C}}$$

3. Factor Label Method (use conversion factors)

Convert 582 km to 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:

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

↑ what you need to find
↑ what you start with

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

Convert 95 km/h to m/s:

$$95 \times 1000 \div (60 \times 60)$$

$$? \frac{\text{m}}{\text{s}} = 95 \frac{\text{km}}{\text{h}} \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) \left(\frac{1 \text{ h}}{60 \text{ min}} \right) \left(\frac{1 \text{ min}}{60 \text{ s}} \right)$$

$$? \frac{\text{m}}{\text{s}} = 26 \text{ m/s} \quad \left(\frac{1 \text{ h}}{3600 \text{ s}} \right)$$