



Converting units

Change the unit without changing the quantity.



1 Why convert?



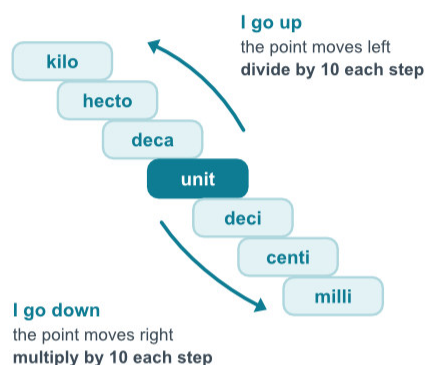
Converting means writing the same quantity with a different unit. The number changes, but the quantity itself stays exactly the same.

2 The method in 4 steps

- 1 Identify the unit you start with and the unit you need.
- 2 Find the factor between the two units.
- 3 Multiply or divide the number.
- 4 Check that the answer is a sensible size.

3 The prefixes and the staircase

Prefix	Symbol	Factor	Example
kilo	k	$\times 1\,000$	1 km = 1 000 m
hecto	h	$\times 100$	1 hm = 100 m
deca	da	$\times 10$	1 dam = 10 m
(unit)	—	$\times 1$	1 m = 1 m
deci	d	$\times 0.1$	1 dm = 0.1 m
centi	c	$\times 0.01$	1 cm = 0.01 m
milli	m	$\times 0.001$	1 mL = 0.001 L



4 The conversions you need

Length	1 km = 1 000 m	1 m = 100 cm	1 cm = 10 mm
Mass	1 kg = 1 000 g	1 g = 1 000 mg	
Volume	1 L = 1 000 mL	1 L = 1 dm ³	1 mL = 1 cm ³
Time	1 h = 60 min	1 min = 60 s	1 h = 3 600 s
Speed	1 m/s = 3.6 km/h		
Density	1 g/cm ³ = 1 000 kg/m ³		
Energy	1 kJ = 1 000 J	1 kWh = 1 000 Wh	

5 Worked examples

2.5 km into m $\rightarrow 2.5 \times 1\,000 = 2\,500\text{ m}$

350 mL into L $\rightarrow 350 \div 1\,000 = 0.35\text{ L}$

90 min into h $\rightarrow 90 \div 60 = 1.5\text{ h}$

0.42 kg into g $\rightarrow 0.42 \times 1\,000 = 420\text{ g}$

15 m/s into km/h $\rightarrow 15 \times 3.6 = 54\text{ km/h}$



Two traps to watch for

Compound units : For a speed or a density, convert each quantity before you calculate:
a speed in km/h needs to convert the distance in km and the time in h.

Volumes : On the staircase, one step is 10 for lengths, but 1 000 for volumes:
1 dm³ = 1 000 cm³.



Check before handing it in

- ✓ I have identified both units
- ✓ My answer is a sensible size

- ✓ I have used the right factor
- ✓ I have written the symbol of the final unit

