



Metric Conversions

Use these tables to help you convert between metric units:

Linear units (metres for distance, grams for mass, litres for capacity, . . .)

————— Move decimal 1 place to the RIGHT for each step down —————→

1000 ($\times 10^3$) kilo- (km)	100 ($\times 10^2$) hecto- (hm)	10 ($\times 10^1$) deca- (dam)	1 ($\times 10^0$) (m)	0.1 ($\times 10^{-1}$) deci- (dm)	0.01 ($\times 10^{-2}$) centi- (cm)	0.001 ($\times 10^{-3}$) milli- (mm)
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←————— Move decimal 1 place to the LEFT for each step up —————

Square units (square metres for area, . . .)

————— Move decimal 2 places to the RIGHT for each step down —————→

1 000 000 ($\times 10^6$) km ²	10 000 ($\times 10^4$) hm ²	100 ($\times 10^2$) dam ²	1 ($\times 10^0$) m ²	0.01 ($\times 10^{-2}$) dm ²	0.000 1 ($\times 10^{-4}$) cm ²	0.000 001 ($\times 10^{-6}$) mm ²
	hectare (ha)	are (a)	centare (ca)			

←————— Move decimal 2 places to the LEFT for each step up —————

Cubic units (cubic metres for volume, . . .)

————— Move decimal 3 places to the RIGHT for each step down —————→

1 000 000 000 ($\times 10^9$) km ³	1 000 000 ($\times 10^6$) hm ³	1000 ($\times 10^3$) dam ³	1 ($\times 10^0$) m ³	0.001 ($\times 10^{-3}$) dm ³	0.000 001 ($\times 10^{-6}$) cm ³	0.000 000 001 ($\times 10^{-9}$) mm ³
			kilolitre (kL)	litre (L)	millilitre (mL)	

←————— Move decimal 3 places to the LEFT for each step up —————

Example 1: Convert: 355 cg = _____ g

Solution:

Method 1: By Moving Decimals

1. Look at the chart. We are starting at **cg**, and we are going to the base unit, **g**. This is 2 steps to the left.
2. We move the decimal place in the number 2 places to the left.

$$355. \quad \leftarrow \quad 3.55$$

3. The answer is: 355 cg = 3.55 g

Method 2: By Using Conversion Factors

1. Create a fraction that represents the conversion you want to do, here centigrams to grams. Put the unit you're converting *from* on the bottom. (1 cg = 0.01 g, so 100 cg = 1 g)
2. Multiply the measurement by this fraction. The units should cancel.

$$355 \text{ cg} \times \frac{1 \text{ g}}{100 \text{ cg}} = 3.55 \text{ g}$$



Other conversions:

1 kg of water = 1 L (by definition)
1 L = 1000 cm³ = 1 dm³ = 0.001 m³

1 tonne (1 t) = 1000 kg

1 cm³ = 1 mL

EXERCISES

Convert the following:

A. Distance

- | | |
|------------------------|-------------------------|
| 1) 15.2 mm = _____ cm | 6) 0.05 m = _____ cm |
| 2) 65 cm = _____ m | 7) 19 cm = _____ mm |
| 3) 24.2 mm = _____ m | 8) 0.000 1 m = _____ mm |
| 4) 22 m = _____ km | 9) 530 cm = _____ km |
| 5) 0.007 km = _____ cm | 10) 0.2 km = _____ m |

B. Mass

- | | |
|-----------------------|-----------------------|
| 1) 125 mg = _____ g | 6) 0.32 g = _____ mg |
| 2) 12.2 kg = _____ g | 7) 5000 g = _____ kg |
| 3) 0.02 cg = _____ mg | 8) 0.04 cg = _____ mg |
| 4) 50 cg = _____ g | 9) 5500 kg = _____ t |
| 5) 1978 g = _____ cg | 10) 1.5 t = _____ kg |

C. Area

- | | |
|--|---|
| 1) 1.5 cm ² = _____ mm ² | 6) 0.04 mm ² = _____ cm ² |
| 2) 0.52 m ² = _____ cm ² | 7) 400 cm ² = _____ m ² |
| 3) 12 500 m ² = _____ ha | 8) 15 km ² = _____ ha |
| 4) 9.7 km ² = _____ m ² | 9) 572.5 m ² = _____ km ² |
| 5) 0.2 ha = _____ m ² | 10) 0.5 ha = _____ km ² |

D. Volume/Capacity

- | | |
|---|---|
| 1) 0.07 cm ³ = _____ mm ³ | 6) 25 mL = _____ L |
| 2) 2.75 m ³ = _____ cm ³ | 7) 25 000 cm ³ = _____ m ³ |
| 3) 82.5 mL = _____ cm ³ | 8) 8.8 L = _____ cm ³ |
| 4) 5250 L = _____ kL | 9) 1 500 000 m ³ = _____ km ³ |
| 5) 4750 cm ³ = _____ L | 10) 720 mL = _____ cm ³ |

SOLUTIONS

- A. (1) 1.52 cm (2) 0.65 m (3) 0.0242 m (4) 0.022 km (5) 700 cm (6) 5 cm
(7) 190 mm (8) 0.1 mm (9) 0.0053 km (10) 200 m
- B. (1) 0.125 g (2) 12 200 g (3) 0.2 mg (4) 0.5 g (5) 197 800 cg (6) 320 mg
(7) 5 kg (8) 0.4 mg (9) 5.5 t (10) 1500 kg
- C. (1) 150 mm² (2) 5200 cm² (3) 1.25 ha (4) 9 700 000 m² (5) 2000 m²
(6) 0.000 4 cm² (7) 0.04 m² (8) 1500 ha (9) 0.000 572 5 km² (10) 0.005 km²
- D. (1) 70 mm³ (2) 2 750 000 cm³ (3) 82.5 cm³ (4) 5.25 kL (5) 4.75 L (6) 0.025 L
(7) 0.025 m³ (8) 8800 cm³ (9) 0.001 5 km³ (10) 720 cm³

