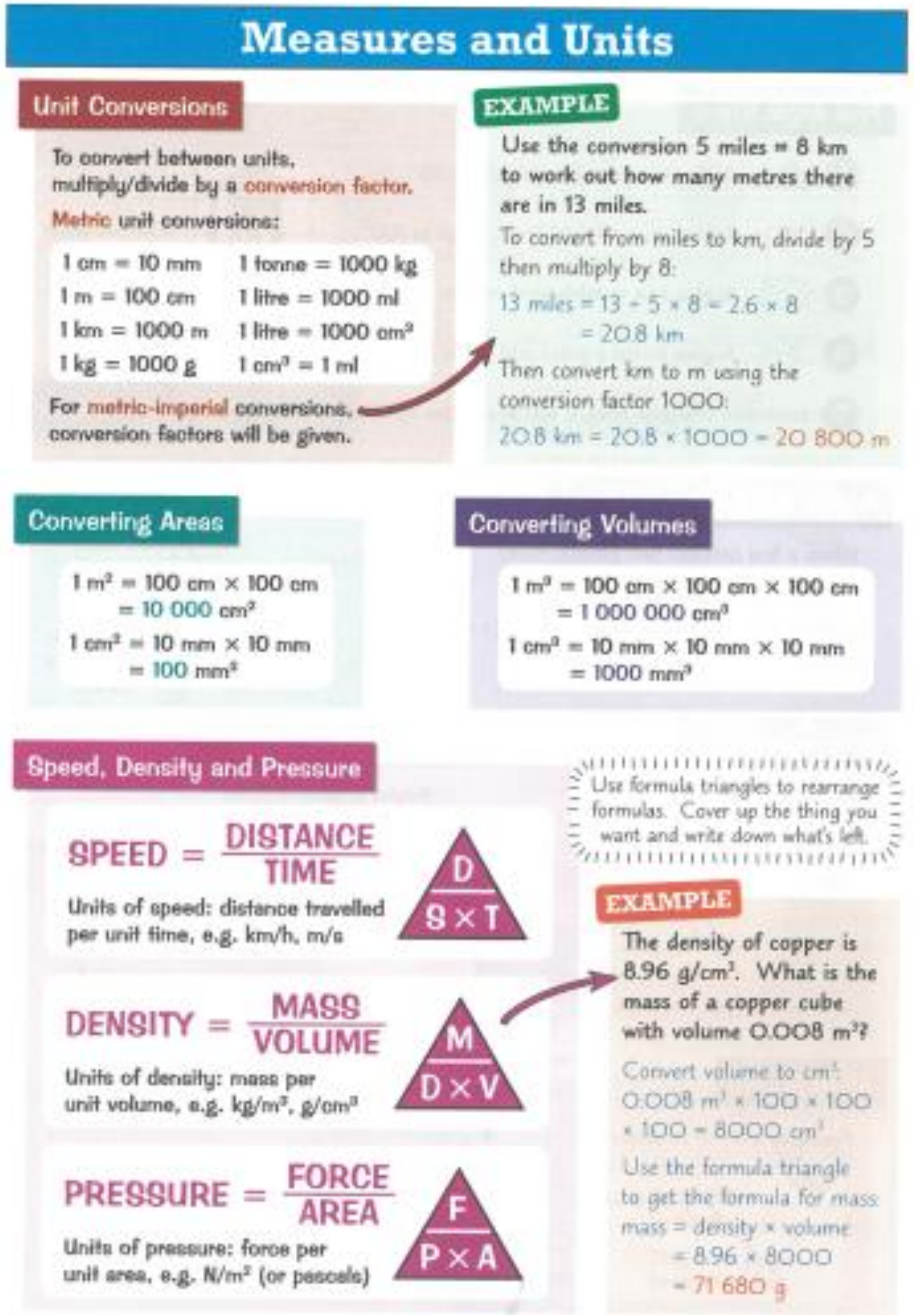

Measures and Units

Unit Conversions

To convert between units, multiply/divide by a conversion factor.

Metric unit conversions:

1 cm = 10 mm
1 tonne = 1000 kg
1 m = 100 cm
1 litre = 1000 ml
1 km = 1000 m
1 litre = 1000 cm^3
1 kg = 1000 g
1 cm^3 = 1 ml

For metric-imperial conversions, conversion factors will be given.

EXAMPLE

Use the conversion 5 miles = 8 km to work out how many metres there are in 13 miles.

To convert from miles to km, divide by 5 then multiply by 8:

13 miles = 13 ÷ 5 × 8 = 2.6 × 8
= 20.8 km

Then convert km to m using the conversion factor 1000:

20.8 km = 20.8 × 1000 = 20 800 m

Converting Areas

1 m^2 = 100 cm × 100 cm
= 10 000 cm^2

1 cm^2 = 10 mm × 10 mm
= 100 mm^2

Converting Volumes

1 m^3 = 100 cm × 100 cm × 100 cm
= 1 000 000 cm^3

1 cm^3 = 10 mm × 10 mm × 10 mm
= 1000 mm^3

Speed, Density and Pressure

$$\text{SPEED} = \frac{\text{DISTANCE}}{\text{TIME}}$$

Units of speed: distance travelled per unit time, e.g. km/h, m/s

$$\text{DENSITY} = \frac{\text{MASS}}{\text{VOLUME}}$$

Units of density: mass per unit volume, e.g. kg/m^3, g/cm^3

$$\text{PRESSURE} = \frac{\text{FORCE}}{\text{AREA}}$$

Units of pressure: force per unit area, e.g. N/m^2 (or pascals)

Use formula triangles to rearrange formulas. Cover up the thing you want and write down what's left.

EXAMPLE

The density of copper is 8.96 g/cm^3. What is the mass of a copper cube with volume 0.008 m^3?

Convert volume to cm^3:
0.008 m^3 × 100 × 100 × 100 = 8000 cm^3

Use the formula triangle to get the formula for mass:
mass = density × volume
= 8.96 × 8000
= 71 680 g