SCIENCE FOUNDATIONS

Metric conversions

Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how you switch between grams and kilograms in a recipe, or kilometres and metres on a road sign, without getting the amount wrong by a factor of a thousand. A cook scaling a recipe from grams to kilograms needs the same amount of flour, just written in bigger units. A runner tracking a 5 kilometre race in metres needs to know it is 5000 metres, not 500. Knowing metric conversions tells you how to move between units safely, so a simple unit change never turns into a costly mistake.



Rule

Metric conversions: the metric system is built on powers of ten.

Kilo means 1000, centi means $\frac{1}{100}$, and milli means $\frac{1}{1000}$, so converting is multiplying or dividing by a power of ten, which moves the decimal point.

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Worked examples

EXAMPLE 1

Q Convert 2.5 km to metres.

SOLUTION

Find the step: kilo means 1000, so 1 km is 1000 m.

Multiply by 1000, moving the decimal three places right.

Write the answer with the new unit.

The result is 2500 m.

EXAMPLE 2

Q Convert 750 mL to litres.

SOLUTION

Find the step: milli means 0.001, so 1000 mL is 1 L.

Divide by 1000, moving the decimal three places left.

Write the answer with the new unit.

The result is 0.75 L.

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Practice questions

1 How many metres in 3 km?

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2 Convert 1.5 km to centimetres.

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3 A student converts 1.5 L to millilitres and writes 0.0015 mL. What did they do wrong?

- **A** They divided by 1000 instead of multiplying by 1000.
- **B** They multiplied by 100 instead of 1000.
- **C** They used the wrong unit for volume.
- **D** Nothing, 0.0015 mL is correct.

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4 Convert 500 cm to metres.

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5 **Convert 2500 g to kilograms.**

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6 **Convert 0.5 m to centimetres.**

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7 **How many mm in 4 cm?**

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8 **A road is 1.2 km long. A runner has run 800 m. How many metres are left to run?**

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9 **Which is bigger: 1 km or 1000 m?**

A They are equal

B 1 km is bigger

C 1000 m is bigger

D 1 km is 10 times bigger

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10

Which unit would you use to measure the mass of a car: grams or kilograms? Why?

A Grams, because smaller units are always more precise.

B Kilograms, because grams would give a huge, awkward number.

C Either, because grams and kilograms are the same size.

D Millilitres, because a car holds fuel.

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ANSWER KEY

1. 3000 m

2. 150000 cm

3. They divided by 1000 instead of multiplying by 1000.

4. 5 m

5. 2.5 kg

6. 50 cm

7. 40 mm

8. 400 m

9. They are equal

10. Kilograms, because grams would give a huge, awkward number.

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