# Conversion Factors: teacher script

RP09-V1 · RP09 Convert with a conversion factor · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 87 seconds as a video.

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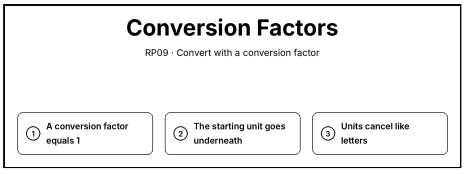
**01**




**Say.** Conversion factors. A conversion factor equals 1. The unit you start with goes underneath. Then the units cancel, like letters.

**Draw.** Write the title “Conversion Factors” and the steps: 1. A conversion factor equals 1; 2. The starting unit goes underneath; 3. Units cancel like letters.

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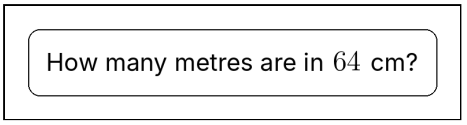
**02**




**Say.** How many metres are in 64 centimetres?

**Draw.** Clear the board. Write “How many metres are in 64 cm?” in a box at the top.

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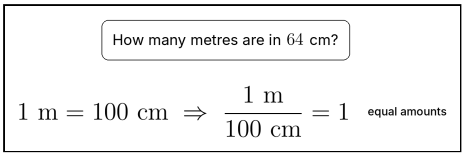
**03**




**Say.** One metre is 100 centimetres, so 1 metre over 100 centimetres equals 1.

**Draw.** Write 1 m = 100 cm ⇒ 1 m/(100 cm) = 1 on the next line. Beside it, write “equal amounts”.

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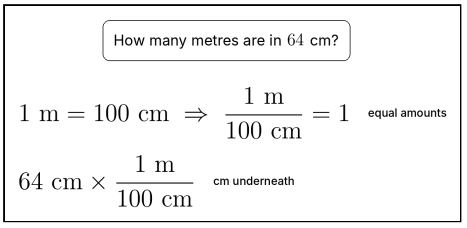
**04**




**Say.** Centimetres go underneath, so they cancel.

**Draw.** Write 64 cm × 1 m/(100 cm) on the next line. Beside it, write “cm underneath”.

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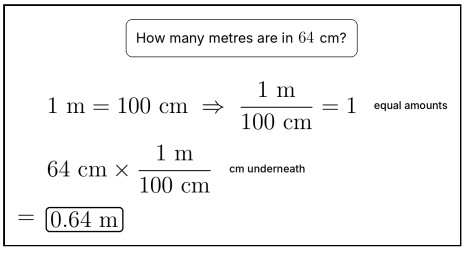
**05**




**Say.** 64 divided by 100 is 0.64 metres.

**Draw.** Write = 0.64 m and box it on the next line.

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**06**

Trap $64\ \text{cm} \to \text{m}$

$\times\ 64 \times 100 = 6400\ \text{m}$

$\checkmark\ \ 64 \div 100 = 0.64\ \text{m}$

**Say.** Watch for the trap: the factor upside down. A metre is bigger than a centimetre, so there are fewer metres: 0.64, not 6400.

**Draw.** Clear the board. Write “Trap” and 64 cm \to m. Below, write 64 × 100 = 6400 m and cross it out ×. Then write 64 ÷ 100 = 0.64 m with a tick ✓.

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**07**

A soda has $450$ calories per litre. How many calories are in $250$ mL?

**Say.** A soda has 450 calories per litre. How many calories are in 250 millilitres?

**Draw.** Clear the board. Write “A soda has 450 calories per litre. How many calories are in 250 mL?” in a box at the top.

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**08**

A soda has $450$ calories per litre. How many calories are in $250$ mL?

$$250\ \text{mL} \times \frac{1\ \text{L}}{1000\ \text{mL}} = 0.25\ \text{L}$$ mL underneath

**Say.** First change the millilitres into litres: 250 over 1000 is 0.25 litres.

**Draw.** Write 250 mL × 1 L/(1000 mL) = 0.25 L on the next line. Beside it, write “mL underneath”.

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**09**

A soda has $450$ calories per litre. How many calories are in $250$ mL?

$$250\ \text{mL} \times \frac{1\ \text{L}}{1000\ \text{mL}} = 0.25\ \text{L}$$ mL underneath

$$0.25\ \text{L} \times \frac{450\ \text{calories}}{1\ \text{L}}$$ a rate is a factor too

**Say.** The rate, 450 calories per litre, is a conversion factor too. The litres cancel.

**Draw.** Write 0.25 L × 450 calories/(1 L) on the next line. Beside it, write “a rate is a factor too”.

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**10**

A soda has $450$ calories per litre. How many calories are in $250$ mL?

$$250\ \text{mL} \times \frac{1\ \text{L}}{1000\ \text{mL}} = 0.25\ \text{L}$$ mL underneath

$$0.25\ \text{L} \times \frac{450\ \text{calories}}{1\ \text{L}}$$ a rate is a factor too

$$= \boxed{112.5\ \text{calories}}$$

**Say.** 0.25 times 450 is 112.5 calories.

**Draw.** Write = 112.5 calories and box it on the next line.

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**11**

Trap $250\ \text{mL},\ \ 450\ \text{calories per L}$

$\times\ 250 \times 450 = 112\,500$

$\checkmark\ \ 0.25 \times 450 = 112.5$

**Say.** Watch for the trap: dropping the units. 250 times 450 mixes millilitres and litres. Write the units, and change one of them first.

**Draw.** Clear the board. Write “Trap” and 250 mL, 450 calories per L. Below, write 250 × 450 = 112 500 and cross it out ×. Then write 0.25 × 450 = 112.5 with a tick ✓.

## Your turn

The starting unit goes underneath, and the units cancel.

**Say.** Now it is your turn. Write the units, put the starting unit underneath, and let the units cancel.

**Draw.** Point to today's activity: The starting unit goes underneath, and the units cancel.