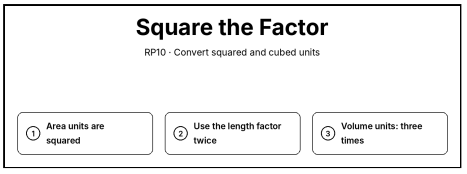
Square the Factor: teacher script

RP10-V1 · RP10 Convert squared and cubed units · teachers only. Without a screen, read each Say line and draw each Draw step on the board. About 87 seconds as a video.

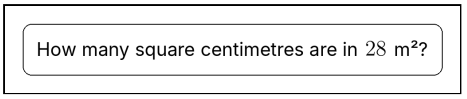
01



Say. Square the factor. Area units are squared, so use the length factor twice. Volume units are cubed: use it three times.

Draw. Write the title “Square the Factor” and the steps: 1. Area units are squared; 2. Use the length factor twice; 3. Volume units: three times.

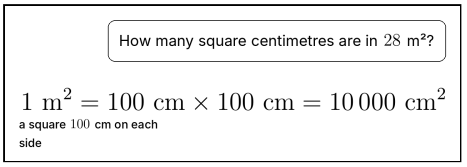
02



Say. How many square centimetres are in 28 square metres?

Draw. Clear the board. Write “How many square centimetres are in 28 m²?” in a box at the top.

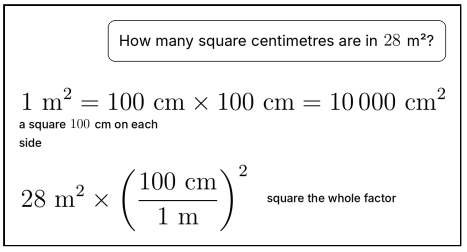
03



Say. One square metre is a square 100 centimetres on each side: 100 times 100, that is 10 thousand square centimetres.

Draw. Write 1 m² = 100 cm × 100 cm = 10 000 cm² on the next line. Beside it, write “a square 100 cm on each side”.

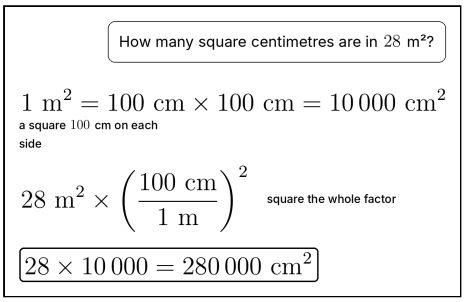
04



Say. Square the whole factor, the number and the unit together.

Draw. Write 28 m² × (100 cm/(1 m))² on the next line. Beside it, write “square the whole factor”.

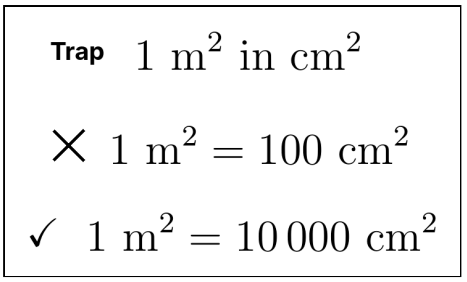
05



Say. 28 times 10 thousand is 280 thousand square centimetres.

Draw. Write 28 × 10 000 = 280 000 cm² and box it on the next line.

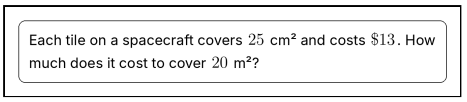
06



Say. Watch for the trap: using the factor only once. One square metre is not 100 square centimetres. Use the factor twice: 10 thousand.

Draw. Clear the board. Write “Trap” and 1 m² in cm². Below, write 1 m² = 100 cm² and cross it out ×. Then write 1 m² = 10 000 cm² with a tick ✓.

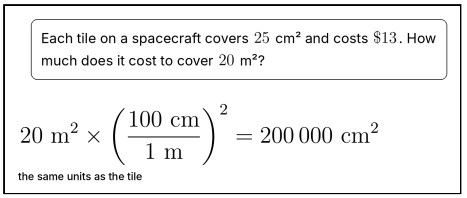
07



Say. Each tile on a spacecraft covers 25 square centimetres and costs 13 dollars. How much does it cost to cover 20 square metres?

Draw. Clear the board. Write “Each tile on a spacecraft covers 25 cm² and costs $13. How much does it cost to cover 20 m²?” in a box at the top.

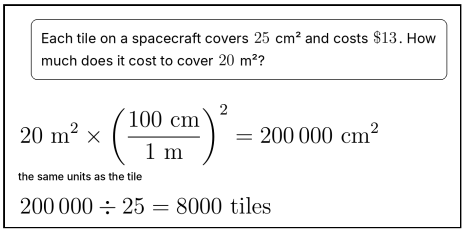
08



Say. First put the area in the same units as the tile: 20 square metres is 200 thousand square centimetres.

Draw. Write 20 m² × (100 cm/(1 m))² = 200 000 cm² on the next line. Beside it, write “the same units as the tile”.

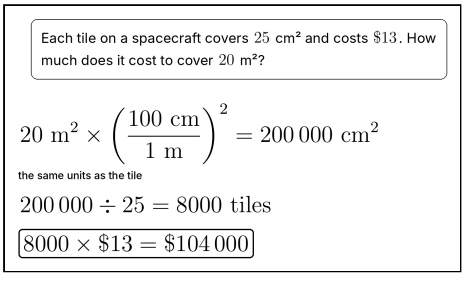
09



Say. Each tile covers 25, so divide: 8000 tiles.

Draw. Write 200 000 ÷ 25 = 8000 tiles on the next line.

10



Say. 8000 tiles at 13 dollars each cost 104 thousand dollars.

Draw. Write 8000 × $13 = $104 000 and box it on the next line.

11

Trap $(100\ \text{cm})^2$

$\times\ 200\ \text{cm}^2$

✓ $10\,000\ \text{cm}^2$

Say. Watch for the trap: doubling instead of squaring. Squaring 100 means 100 times itself, 10 thousand, not 200.

Draw. Clear the board. Write “Trap” and (100 cm)². Below, write 200 cm² and cross it out ×. Then write 10 000 cm² with a tick ✓.

12

Your turn

Square the factor for areas, cube it for volumes.

Say. Now it is your turn. Square the whole factor for areas, and cube it for volumes.

Draw. Point to today’s activity: Square the factor for areas, cube it for volumes.