TEACHER RESOURCE BOOK · MATHS · 4TH CLASS

Lesson 45 MEASURES

Renaming length units (m ↔ cm, cm ↔ mm)

CURRICULUM ALIGNMENT

MEA.MSR.3b identify the relationship between equivalent units of measurement, and rename measures using equivalent units.

NUM.OPS.3 understand and apply flexibly the four operations; and the relationships between operations.

INTERACTIVES Unit Converter · challenge, display, explore

LESSON ARC

Hold up a metre of string in Getting Started and ask for its length in centimetres — the string never changes, only the name. Write the two anchors (1 m = 100 cm, 1 cm = 10 mm) on the board and keep returning to them. The unit-converter ladder drives Watch and Notice, where every multiply traces back to the anchors. Pupils rename in their copy, splitting 250 cm into 2 m 50 cm, before the Class Challenge ends on the 325 cm leftover.

TEACHING MOVES

1. **Getting Started.** Hold the metre of string up and pose the question, then give five seconds of quiet think-time before taking three hands-up answers. As a pupil says 'it's the same length', write 1 m = 100 cm and 1 cm = 10 mm on the board — these stay up all lesson. Revoice their words as 'renaming'.
2. **Watch and Notice.** Run the converter one example at a time. For cm→mm say 'smaller unit, so we multiply by ten' and point at the digits; for m→cm say 'even smaller, so multiply by one hundred'. On 150 cm, pause and ask 'how many whole metres fit inside 150 cm?' before revealing the mixed answer — and keep pointing back to the two board anchors so every multiply has a home.
3. **Try It Together.** Send one pupil up per renaming and make them say 'smaller — multiply' or 'bigger — divide' out loud before they slide the converter. Rotate pupils so each handles both cm↔mm and m↔cm. Before each, ask the whole class 'will the number get bigger or smaller?' to head off the multiply/divide reversal.
4. **Build the Rename Column in Your Copy.** Pupils complete the four-row column in their maths copy, writing the ×10, ÷10 or ×100 they used beside each answer. Walk the room glancing for that working — especially the last row, where 250 cm should split into 2 m and 50 cm. This is practice, not marking.
5. **Class Challenge.** Keep it brisk — pupils take turns at the board, prompt 'multiply or divide?' before each one, and the class confirms before moving on. When you reach 325 cm, call out the split: 300 cm = 3 m leaves 25 cm, so 3 m 25 cm. Don't re-teach each item; this is consolidation.
6. **What Did We Notice?.** Ask why the number gets bigger going to a smaller unit, and listen for 'a smaller unit is smaller, so you need more of them'. Revoice a strong answer: 'the length stays the same — we just need more pieces to describe it.' Display-only discussion, no writing.

COMMON MISCONCEPTIONS

⚠ Pupils divide when changing cm to mm (or multiply when going mm to cm) — they pick an operation without checking which unit is smaller.

Before any pupil slides the converter, stop and ask 'will the number get bigger or smaller?' Make them say 'smaller unit means more pieces, so multiply' out loud, then trace it to the 1 cm = 10 mm anchor on the board.

⚠ On 325 cm a pupil writes 3 m 2 cm or just 3 m, mishandling the leftover after pulling out the whole metres.

On the converter, show 300 cm filling exactly 3 m, then point to what's left — 25 cm, not 2. Have the pupil read it as '3 metres AND 25 centimetres' so the leftover isn't dropped or shrunk to a single digit.

⚠ Pupils think 'multiply means the rope got longer' — they believe renaming changes the actual length.

Pick the metre of string back up: it's 1 m and 100 cm at the same time, and it hasn't grown. Revoice that only the count changed, never the length — the multiply just counts smaller pieces.

DIFFERENTIATION

EMERGING

- Stay on cm↔mm only (just ×10 and ÷10) on the converter while the class moves to metres; keep the m = 100 cm jump as teacher-supported.
- Let these pupils write the ×10 or ÷10 arrow beside each copy row before filling the answer, so they commit to the operation first.

DEVELOPING

- After the copy column, hand them a two-step rename: change 4 m to centimetres, then on to millimetres — which board anchor did each step use?
- Pose a missing-number version: ☐ cm = 80 mm, then ☐ m = 350 cm — work backwards from the answer.

PROFICIENT

- Pose: 'a length is 4 m 6 cm — rename the whole thing as centimetres, then as millimetres, and explain which anchor you leaned on each time.' Have them record the reasoning in their copy.
- Ask them to invent a 'tricky leftover' length for the class, like 408 cm, and predict the metres-and-centimetres split before checking on the converter.

↗ **Cross-curricular:** Tie to PE — pupils measure long jumps in centimetres in the yard, then rename each jump as metres and centimetres on the board.

ANSWER KEY

a) 1 m = 100 cm; 1 kg = 1000 g; 1 l = 1000 ml.

b) Multiply to go to a smaller unit; divide to go to a larger one.

c) Convert to the same unit before comparing.

Q1: 3100 cm

Q2: 12.4 cm

Q3: 6000000 cm

Q4: 14.6 cm

EXTENSION SHEET · STRETCH ANSWERS

S1: 24.4 cm

S2: 27000 mm

S3: 28.4 cm

S4: 26000 m

S5: 10.4 cm