Lesson 48 NUMBER

Converting length units

CURRICULUM ALIGNMENT

MEA.MSR.4a determine and calculate units of measurement in fractional and/or decimal form to solve practical problems.

INTERACTIVES Unit Converter · challenge, display, guided

LESSON ARC

Open from the hook with the builder's 4.7 m wall and take a few estimates before confirming. Bring up the place-value columns first to show the digits sliding two columns left for ×100 while the decimal point stays put. Then move to the unit-converter ladder, naming the factor for each rung-jump. Pupils chain 1.5 km down to mm together, then label factor-arrows in their copy. Student Activity Book follows for solo practice.

TEACHING MOVES

1. **Getting Started.** Take two or three hands-up estimates for 4.7 m in cm — not open call-outs — and resist confirming. If a pupil says 'multiply by 100', bounce it back: 'why 100 and not 10?' and leave it hanging until the ladder.
2. **Watch the Digits Move.** Point at the place-value columns as each digit steps left: 'the 4 was in the ones, now it sits in the hundreds; the 7 steps from the tenths into the tens.' Land one idea only — the digits move, the decimal point stays put.
3. **Watch and Notice.** Walk each ladder example one rung at a time and name the factor before each step lands. On 0.085 km → 85 m → 8,500 cm, stress that km is the biggest unit so its number is the smallest — that small decimal is where pupils stumble.
4. **Try It Together.** Run the first pass through 1.5 km → mm in guided mode so the factor chip pulses with each step. Then switch to explore mode and invite pupils up to tap a rung and name the factor before the digits land. Catch any pupil 'moving the decimal point' and redirect.
5. **Chain the Conversions in Your Copy.** Glance at the arrow-labels as you walk the room — a chain with no factors written on the arrows is the slip to catch. Note aloud that the two chains use different factors at each rung, so pupils can't reuse one rule.
6. **Class Challenge.** Keep the board work brisk — pupils take turns, the class confirms each answer before moving on. On the 3 km → mm chain, let the class predict each rung before Check marks it and watch for pupils stopping one step short.
7. **What Did We Notice?.** Listen for pupils naming the chain as three separate steps with different factors. Revoice a strong answer: 'the smaller the unit, the more of them you need to make the same length.' Head off 'bigger number means longer thing' — the length never changed, only the unit.

COMMON MISCONCEPTIONS

⚠ Pupils say the decimal point moves: '4.7 m → 47 cm, you move the point one place'.

Back on the place-value columns, hold the decimal point fixed with your finger and slide each digit two columns left for ×100. Say it as the class watches: the digits move, the point stays. 4.7 m is 470 cm, not 47.

⚠ Pupils reuse one factor all the way down a chain — 3 km → 3,000 m → 30,000 cm → 300,000 mm, applying ×1000 or ×10 at every rung.

Stop on the ladder and make them name each rung-jump separately: km→m is ×1000, m→cm is ×100, cm→mm is ×10. Point out the factor chip changes at each rung — three different jumps, not one repeated rule.

⚠ Pupils think the bigger millimetre number means the wall got longer.

In the maths-talk, lay 3 km and 3,000,000 mm side by side and ask which is longer. Steer them to: same length, smaller unit, so more of them. The number changed, the wall didn't.

DIFFERENTIATION

EMERGING

- Keep these pupils on single-step jumps (cm↔mm, m↔cm) while the class chains — one rung at a time on the ladder, factor named aloud before each tap.
- Pre-draw the arrow-and-factor frame for the copybook chains so they fill the numbers, not invent the structure.

DEVELOPING

- After the copybook chains, ask them to work one chain backwards — start at the mm answer and divide their way up to km, checking it matches.
- Give 7,500 mm and ask for it in three different units, with the factor labelled for each.

PROFICIENT

- Pose: 'a length is 2,400,000 mm — without a calculator, what's the shortest way to write it, and in which unit?' Ask them to justify the unit choice in their copy.
- Pull fast finishers ahead into the Student Activity Book page while the class finishes the Class Challenge chain.

↗ **Cross-curricular:** Tie to Geography — pupils take a distance between two Irish towns in km and convert it to metres for a scale-map task.

ANSWER KEY

a) 2 m 35 cm = **235 cm** = **2,350 mm**.

b) 1 km 250 m = **1,250 m**.

c) 8 cm 5 mm = **85 mm**.

d) 3.4 m = **340 cm** = **3,400 mm**.

Q1: 0.981 kg

Q2: 7.17 m

Q3: 0.05969 km

Q4: 3.29 km

EXTENSION SHEET · STRETCH ANSWERS

S1: 0.07628 km

S2: 4.95 m

S3: 0.892 l