

## Estimating then measuring: length

### CURRICULUM ALIGNMENT

MEA.MSR.4b

find, interpret and deduce measures experimentally with increasing precision.

MEA.MSR.4a

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

### WHAT THIS LESSON TEACHES

A sensible guess at a length is made before measuring by comparing the object to a length you already know, such as a metre stick or a door. After measuring you find how close your estimate was by working out the difference.

- Knowing a classroom door is about 2 m tall helps you estimate how tall the windows beside it are
- If you estimated 3 m and measured 3.4 m, the difference is 0.4 m

### MODEL THIS ON THE BOARD

#### YARD BENCH ESTIMATE

- 1 Picture a metre stick beside the school-yard bench and make a sensible estimate of **3 m**.
- 2 Measure carefully with the metre stick: the actual length is **2.7 m**.
- 3 Work out the difference:  $3 \text{ m} - 2.7 \text{ m} = \mathbf{0.3 \text{ m}}$ .

### LESSON ARC

Open with a hands-up bet: which is longest — corridor, playground, or this classroom — without walking any of them. Demonstrate estimate-then-measure at the front with a real metre stick on the board rail, a Maths book in centimetres, and the classroom door as a 2 m height anchor. Pupils rule an estimate-actual-difference table, then measure three classroom lengths in groups sharing one stick. Finish on three chalk-marked routes, pool readings on the board, and name the strategies that made the best estimates work.

### TEACHING MOVES

1. **Getting Started.** Take three hands-up answers only — no open call-outs. Leave the disagreement live. Ask: 'How could we settle this without walking each one?' That question opens the lesson; do not reveal which space is longest yet.
2. **Watch and Notice.** Hold the demonstration metre stick at eye level. For each object — board rail, Maths book, door — take one estimate before the stick touches anything. Name aloud that the book is under a metre so centimetres are the sensible unit. After the door, revoice: 'About 2 m — now you know what 2 m looks like to judge other heights against.' Never reverse the estimate-then-measure order.
3. **Set Up Your Estimate Table.** Pupils rule three columns headed estimate, actual, difference with spare rows underneath. Walk the room checking headings and straight rules before anyone measures — the table is the recording frame for the next two steps.
4. **Try It Together.** One metre stick per group of four or five. Insist the estimate is written before the stick comes out for each length. Watchers check the start-at-zero and no-gaps rule while one pupil lays end-over-end; you circulate catching alignment slips. Revoice a strong anchor aloud when you hear one length judged against another.
5. **Class Challenge.** Assign each group one marked route only, then pool all three readings on the board. First have every pupil lay the stick and take one normal step beside it so their pace is their own

calibration. Route A is under 1 m — block pacing; compare to half a stick or a Maths book, then check. Keep the rhythm brisk; the closest estimate of each route is the talking point, not the exact number.

6. **What Did We Notice?** Push for a named strategy, not a lucky number: comparing to a known anchor, or splitting a long route into chunks. Revoice the strongest: 'You didn't guess the whole 12 m at once — you pictured two of the 5 m route plus a bit more.' Head off 'good estimate means lucky guess'.

### COMMON MISCONCEPTIONS

⚠ Pupils lay the metre stick first 'just to check', then write an estimate that is really a measurement in disguise.

Stop the group before the stick moves. Cover the stick or hold it yourself until every estimate column has a number. Name it: 'Once the stick is down, the thinking this lesson builds is gone.'

⚠ When laying end-over-end along a long wall, pupils leave small gaps or lose the count of full sticks, so the actual is inflated or short.

Have the watchers call 'zero' at the start edge and 'mark' at each tip before the next lay. Recount one disputed length together as a class with you calling the sticks aloud.

⚠ Pupils treat a good estimate as a lucky guess and shrug off a large difference instead of asking what anchor they skipped.

Point back at the door: 'Who used the 2 m door to judge the wall height?' Contrast one anchored estimate with one pure guess side by side on the board so the class hears the difference in method, not just in number.

### DIFFERENTIATION

#### EMERGING

- Give only the teacher's desk and the door-frame width first — both under about 2 m — so end-over-end counting stays to one or two lays; save the front-to-back wall for teacher-supported work.
- Pre-rule the three-column table on the board for them to copy, with the first estimate row already labelled with the object name.

#### DEVELOPING

- After the three classroom lengths, ask: 'Which of your anchors helped most, and by how many centimetres were you off when you used it?' Write the reflection as a single sentence under the table.
- On the pooled board readings, have them rank the three routes from smallest to largest difference and say which route punished a weak anchor.

#### PROFICIENT

- Once their route reading is on the board, ask: 'Estimate a length halfway between Route A and Route B — then say which classroom anchor you used and why.' Copybook only; no extra stick work during the pool-up.
- Challenge: 'If your step is about 0.6 m, how many of your steps should fit along the long route — check after, don't pace first.'

✓ **Cross-curricular:** Tie to PE — estimate the length of a hopscotch grid or sprint mark in the yard, then measure with the metre stick and log the difference.

### ANSWER KEY

Q1: 0.2 m

Q2: 0.5 m

Q3: 0 m

Q4: 0.8 m

Q5: 0.4 m

Q6: 0.5 m

a) **Always** : That is exactly how the estimating skill works.

b) **Sometimes** : It is zero only when the estimate matches the measure exactly.

c) **Never** : The skill requires estimating before measuring.

d) **Always** : It is close because it used a known metre comparison.

### EXTENSION SHEET · STRETCH ANSWERS

S1: 5.9 cm

S2: 2.5 cm

S3: 8.7 cm

S4: 11 cm

S5: 19 cm