

Measuring with our own units: cubes end to end

CURRICULUM ALIGNMENT

MEA.MSR.2

compare, approximate and measure length, weight, capacity and area using appropriate instruments and record using appropriate units of measurement.

INTERACTIVES Estimation Game · challenge, display, explore

WHAT THIS LESSON TEACHES

To measure length with our own units, lay cubes end to end so each cube touches the next with no gaps and no cube on top of another. First estimate how many cubes, then lay them and count.

- Along a lunchbox: cube, cube, cube each touching the next, then count how many.
- Guess about 8 cubes for a book, then count 9: one off, and a good estimate.

MODEL THIS ON THE BOARD

CUBES ALONG A COPYBOOK

- 1 Estimate the copybook is about 8 cubes long.
- 2 Lay cubes end to end along the edge so each cube touches the next: no gaps and no stacking.
- 3 Count the cubes one by one: **1 2 3 4 5 6 7 8 9**.
- 4 The copybook is **9** cubes long. The estimate of 8 was close.

LESSON ARC

Open with cubes along a desk edge that leave a clear gap; pupils name what went wrong before any rule is stated. On the estimation-game length bar, take a class estimate for a book then a lunchbox, reveal the counts, and point at each join as touching with no gap. Three Try It Together rounds and a brisk Class Challenge (copybook, bench, table) build the estimate-then-measure habit. Student Activity Book page 74 is the seatwork hand-off.

TEACHING MOVES

1. **Getting Started.** Before pupils settle, leave a clear gap between the second and third cube on the desk edge or visualiser. Take three hands-up answers that name the gap (or an overlap). Do not state the rule yet — let the mistake do the teaching.
2. **Watch and Notice.** Hide each length bar count until the class has estimated out loud. For the book, invite the guess then reveal 9 and name the gap of one; for the lunchbox, reveal 12 spot on. Point at a join and say 'touching, no gap'. Flash one wrong line with a cube half on top and ask: is that count fair?
3. **Try It Together.** Three rounds. Give five seconds of quiet think-time before any hands. One pupil shares the class estimate at the board, then Reveal. If a guess is far off, ask what the pupil was looking at before the next round — keep talk on the line of cubes.
4. **Class Challenge.** Keep the board work brisk: estimate, Reveal, class confirms, move on. Hold the order copybook 8 → bench 15 → teacher's table 18 so lengths grow. Before each Reveal, ask who feels nearer or further than last time.
5. **Measure on Paper.** Model the first warm-up item once on the IWB length bar, then send pupils to Student Activity Book page 74. Glance for gaps drawn between cubes or cubes stacked on the page diagrams.

6. What Did We Notice?. Ask what goes wrong with gaps, and with a cube on top. Re-voice: a gap is not a cube, and a cube on top is not end to end — the count only works when every cube touches the next in one straight line. If someone only says ‘it’s wrong’, push once for why.

COMMON MISCONCEPTIONS

⚠ Pupils count across a gap as if the empty space were still ‘along the length’, so a 5-cube stretch with a gap becomes ‘6’ or the gap is simply ignored.

Rebuild the same line on the desk with the gap still open, then close it cube-to-cube. Ask: did the desk get longer, or did we only stop skipping empty air?

⚠ Pupils stack or half-overlap cubes to ‘fit more in’ and still read the piled count as the length.

Show the wrong line from Watch and Notice again. Slide the top cube down beside the other so both sit in one straight touching line, then re-count together: only the end-to-end line is fair.

⚠ Pupils shout a wild number with no look at the object — estimate is treated as a guess-anything game, not a careful look.

Before the next Reveal, freeze five seconds of silent looking: ‘eyes on the object — what are you matching the cubes to?’ Then take the estimate.

DIFFERENTIATION

EMERGING

- Stay with the shortest length bar items and the warm-up row on page 74; teacher places the first two cubes touching so the pupil only continues the line and counts.
- On a real desk edge, lay cubes together with the pupil while saying ‘touch... touch...’ out loud before any number is written.

DEVELOPING

- After a Class Challenge reveal, ask: were you nearer or further than last time, and what did you look at differently?
- On page 74, once the warm-up is done, estimate a second classroom object and jot the guess beside the count in the maths copy.

PROFICIENT

- Early finishers measure one real classroom object with interlocking cubes, write estimate then count in the maths copy, and note whether any gap crept in.
- Challenge: same object measured twice — once carefully end to end, once with a deliberate gap — and explain which count the class should trust.

✚ **Cross-curricular:** Tie to PE — estimate how many cube-lengths a bench or mat is, then check end to end before the next station.

ANSWER KEY

Q1: 10 cubes

Q2: 3 cubes

Q3: 7 cubes

Q4: 11 cubes

Q5: 24 cubes

Q6: 45 cubes

a) Always : The rule is to lay cubes end to end so each one touches the next.

b) Never : Cubes must stay in a single line end to end with none stacked.

c) Sometimes : Estimates are often close but can be one or two cubes different from the count.

d) Always : Gaps mean fewer cubes fit along the object so the measure is too short.

EXTENSION SHEET · STRETCH ANSWERS

S1: 26 paperclips

S2: 27 paperclips

S3: 29 cubes

S4: 14 paperclips