

Measuring carefully: zero at the start, read the 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 Measurement Rulers · challenge, display, explore

WHAT THIS LESSON TEACHES

The 0 mark on the ruler must sit exactly at one end of the object before you read the other end. Keep the ruler straight, then read the mark at the far end.

→ With 0 at the start of a zip and the other end on the 14 mark, the zip is 14 cm.

→ If you start from the plastic end before the 0, a 6 cm line can look like 7 cm.

MODEL THIS ON THE BOARD

FIX THE PUPPET'S PENCIL READING

- 1 The puppet put the plastic end (before 0) at the start of a pencil line.
- 2 The far end sat on the 7 mark, so the puppet called out 7 cm.
- 3 But the real line starts at the 0 mark, not the plastic end.
- 4 The gap before 0 is 1 cm, so the true length is 6 cm.
- 5 Check out loud: 0 at the start, ruler straight, read the end.

LESSON ARC

Open with the puppet's wrong pencil length — plastic end before 0. Hold a real ruler on a 6 cm board line: show the slip (~7 cm), then slide 0 to the start (reads 6). Name straight and read-the-end on the ribbon and zip panels. Pupils take turns at the board while the class says the three checks. Copybook: each pupil draws a true 10 cm line with 0 first. Class Challenge keeps the habit aloud before every Check.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers only — no open call-outs. Steer toward the 0 mark without listing the full habit yet. If someone says the puppet 'just can't measure', revoice: 'what part of the ruler should touch the start?'
2. **Watch and Notice.** Lead with zero. Hold a real class ruler on a drawn 6 cm line: plastic-end slip first so the gap is visible, then slide 0 to the start. On the 9 cm ribbon, tilt a real ruler for two seconds and ask what the reading would do. On the 14 cm zip, wait for a pupil who can say zero first, then the two quick checks.
3. **Try It Together.** Model zero-at-the-start and ruler-straight once on a real ruler before the first board turn — the interactive only moves a reading mark. Before each agree, class says the checks in order. Rotate three or four pupils on the same line; if someone rushes the number, revoice the puppet mistake.
4. **Draw 10 cm in your copy.** Give the full five minutes. Walk the room glancing for 0 at the start of each line and a clear 10 cm label — practice, not marking. Quietly rest a finger on any ruler still starting at the plastic end and wait for the pupil to slide it.

5. **Class Challenge.** Keep it brisk. On the first target only, briefly revoice why the puppet was wrong, then move on. Before every Check the class says the three checks; one pupil moves the reading mark; the class agrees the number. Stay at the board — do not re-teach zero and straight mid-round.
6. **What Did We Notice?.** Listen for zero at the start. Revoice: ‘if zero is missed, every reading is out by the same little gap.’ If someone only names read-the-end, ask what must already be true before that number can be trusted.

COMMON MISCONCEPTIONS

⚠ Pupils put the plastic end of the ruler at the start, so a 6 cm line reads about 7 cm — same slip as the puppet.

Hold a real ruler on the board line. Show the gap before 0, then slide 0 to the start. Ask: ‘same line — why did the number change?’

⚠ Pupils tilt the ruler along a ribbon or zip and accept whatever number sits near the far end.

Tilt a real ruler for two seconds on the board edge, then straighten it. ‘The end mark only matches when the ruler runs flat along the object.’

⚠ Pupils jump straight to the end number and treat ‘read the end’ as the whole job, skipping zero and straight.

Pause before Check. Class chants in order: zero first, then straight, then the end number. Revoice: the end number is only safe after zero is right.

DIFFERENTIATION

EMERGING

- During the copybook draw, put a light pencil tick where 0 should meet the page edge so they only align and draw out to 10.
- Stay beside anyone still starting at the plastic end — guide the slide to 0 once, then step back while they finish the line.

DEVELOPING

- After labelling 10 cm, have them draw a second line of 7 cm underneath, still saying the three checks under their breath.
- On a Class Challenge turn, ask why the number would jump if zero slipped by the plastic gap — answer before Check.

PROFICIENT

- After the 10 cm line, pose in copybook: ‘the reading says 10 cm but 0 sat one mark past the start — is the real line longer or shorter than 10, and why?’
- On a later Class Challenge item, ask them to predict the wrong reading if someone started at the plastic end, then confirm the true end mark with the class.

➤ **Cross-curricular:** Tie to Science — measure a leaf or pencil to the nearest centimetre, saying the three checks aloud before writing the length.

ANSWER KEY

a) 6 cm

b) 14 cm

c) 25 cm

Q1: 9 cm

Q2: 14 cm

Q3: 8 cm

Q4: 12 cm

a) **Always** : This is the lead careful-measurer rule for every length.

b) **Never** : Starting before 0 always adds extra and makes the reading too big.

c) **Sometimes** : A tilt can jump the reading, but the size of the error depends on how much it tilts.

d) **Always** : When 0 is correctly placed, the end mark is the true length.

EXTENSION SHEET · STRETCH ANSWERS

S1: 4 cm

S2: 4 cm

S3: 6 cm

S4: 3 cm