Which number can we trust?

Your task: make a measurement another person can check. You need a metric ruler, a book, paper and pencil. Work seated with the book flat on your desk.

1 · Predict, then measure.

Choose one book edge. Predict its length in cm. Keep that estimate visible.

Record the ruler's smallest division: _____ cm. Align zero with the same endpoint each time. Lift and realign the ruler for each new reading. On an analog ruler, record one reasonable estimated digit beyond the marked divisions.

Reading	Book-edge length (cm)	Tool or alignment note
1		
2		
3		

No ruler? Use authored fallback readings 24.1, 24.0, 24.2 cm. Label them “practice data.” They are not your measurements; the original tool divisions are unknown.

Convert: express one reading in mm (1 cm = 10 mm). Show why the length stays the same.

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2 · Keep the unusual reading.

Authored timing data: 4.8, 5.0, 4.9, 8.0, 5.3 s. Predict what the 8.0 s reading will do to the mean. Then calculate. Keep the original record.

Record used	Mean (s)	Median (s)	Range (s)
All five readings			
Comparison without 8.0 s			

Mean = sum ÷ count. Median = middle after sorting (average the middle pair for four values). Range = maximum − minimum.

Explain: what should you investigate before excluding 8.0 s? Why can matching readings still be inaccurate?

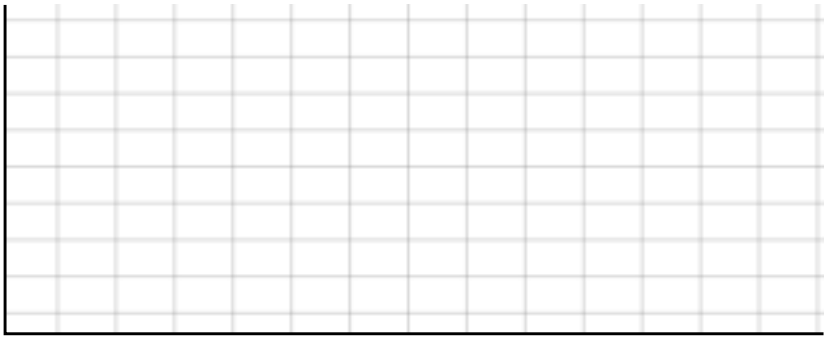
Build a graph. Tell the story.

Authored model data: position along a straight path, measured from the starting point. These values are from the existing Measurement packet; they are not live measurements.

Time (s)	0	1	2	3	4	5
Position (m)	0	1	2	2	4	6

Before plotting: predict the shape. Where might the graph be flat?

Label time on x and position on y with units. Choose equal numerical intervals, plot all six pairs and add a title. Connect successive observations to model the time sequence.



3 · Explain with numbers.

What happened from 2 s to 3 s? Cite both the time and position.

Compare 0–2 s with 3–5 s: how much did position change during each two-second interval? Which interval has the greater average speed?

Limit: does a straight segment prove exactly what happened between two observations? Explain one measurement that could check your model.

Check: title · axes · units · equal intervals · six points · explanation. Optional screen check: measurement-graphing.html#graph-studio.

Can you defend the claim?

A new authored model record: a cart moves along a straight path. A student says, “The cart was fastest at 8 seconds because that point is highest.” Use evidence to evaluate this claim.

Time (s)	0	2	4	6	8
Position (cm)	0	20	60	60	80

Predict: which interval shows the greatest change in position? Keep your first answer, then revise if needed.

Graph: title, axes, units, equal intervals and all five points. Show your chosen time-sequence model.

Calculate: compare the position changes over 2–4 s and 4–6 s. Express the 80 cm final position in meters, showing the conversion.

Defend: agree or disagree with the claim. Cite at least two values and explain how a graph shows a change in position over time.

Revise: identify one limit of this model and propose a useful additional measurement.

Turn in your prediction, graph, calculations, explanation and limitation. Success means someone else can follow your reasoning—not merely that your graph looks neat.