

Predict next year's school enrolment

CURRICULUM ALIGNMENT

DAT.DAT.4b

critically analyse and evaluate findings; and communicate inferences, conclusions and implications from the findings.

DAT.CHN.4a

use probability to make informed decisions and predictions.

INTERACTIVES (Bar Chart Builder · display, explore)

WHAT THIS LESSON TEACHES

The overall direction a set of enrolment numbers is moving over time is the trend (rising, falling or steady). Use the mean, the yearly step or the trend itself to predict next year's school enrolment.

→ Five years 210, 216, 220, 226, 230 rise by about 5 each year so a step prediction is 235.

→ Mean of 180, 188, 196, 204, 212 is 980 divided by 5 = 196 so one prediction is 196.

MODEL THIS ON THE BOARD

BALLYBANE N.S. PREDICTION

- 1 Write the five years: **180, 188, 196, 204, 212**.
- 2 Add them: **$180 + 188 + 196 + 204 + 212 = 980$** .
- 3 Mean prediction: **980** divided by 5 = **196**.
- 4 Yearly step is **+8**, so step prediction is **$212 + 8 = 220$** .
- 5 The steady rise means next year should be higher than **212**.

LESSON ARC

Open with five enrolment figures on the board — 210, 216, 220, 226, 230 — and collect three or four quiet guesses for next year without ranking them. On the bar-chart interactive, work the mean live (≈ 220), then the year-to-year step (≈ 234), then a what-if estate tweak, saying the contrast aloud. In Try It Together, three volunteers each place a sixth bar after naming their method. Class Challenge moves to a ruled three-column copybook table for Ballybane and Douglas. A paper journal entry locks one trusted prediction with a reason before the maths-talk close.

TEACHING MOVES

1. **Getting Started.** Give five seconds of silent think-time, then take three or four hands-up guesses and write them raw on the board — 234, 240, 230, whatever comes. Do not rank or correct; the spread is the hook the lesson will explain.
2. **Watch and Notice.** Work each method live rather than reading off the screen. Mean first: $210+216+220+226+230 = 1102$, $\div 5 \approx 220$. Point at the dashed mean line sitting below Year 5 and draw out why older smaller years pull it down. Then read the jumps aloud — +6, +4, +6, +4 — so about +4 or +5, giving $230+4 = 234$. Say the contrast: same five years, mean says ~ 220 , step says ~ 234 . Frame the what-if as a tweak to the step: 'a new estate adds 30' $\rightarrow 234+30 \approx 264$.
3. **Try It Together.** Tell the room nothing is stored and no one is being assessed, so volunteers will risk a wrong bar. Before each sixth bar moves, the pupil names the method aloud; then ask the class 'where will this land?' and take two quick answers before the drag. Rotate three pupils so the class sees mean (~ 220), step (~ 234) and a what-if (higher). Close by revoicing: same five years, three different next years.

4. **Class Challenge.** This is a seat task in the copy, not on screen. Model a three-column table on the board — method | working | prediction — and have pupils rule it once. Circulate for named methods and visible steps, not bare guesses. On Ballybane watch for the forgotten -20 in the what-if; on Douglas flag that the flipping jumps make the step unreliable, so the mean (~ 300) is the confident call.
5. **Write Your Best Prediction in Your Journal.** Model the full Ballybane write-up on the board first: mean 196, step 220, what-if 200; trusted step 220 because the climb is steady $+8$. Pupils then write one school only — three numbers, a choice, a reason. Glance for a named method tied to the shape of the data; a Douglas pupil who picks the mean ‘because the numbers wobble’ has the whole lesson.
6. **Think About It.** Leave the two questions up as spoken discussion only — nothing to write. Let pupils argue steady-trend vs wobble before you step in, then revoice: a steady climb rewards the step; a wobbly set rewards the mean.
7. **What Did We Notice?.** Listen for answers that name the shape of the data, not ‘the mean is easiest’. Revoice a strong one: the numbers themselves tell us which method to trust. Head off any claim that one method is always best.

COMMON MISCONCEPTIONS

⚠ Pupils treat the mean as next year’s enrolment on a rising set — ‘the average is 220, so next year is 220’ — without noticing it sits below the latest bar.

Point back at the dashed mean line under Year 5 on the bar-chart interactive. Ask why 220 is lower than 230, and draw out that older smaller years pull the average down, so the mean under-predicts a steady climb.

⚠ On a wobbly set like Douglas, pupils still force the year-to-year step and chase the last jump’s sign. Read the Douglas jumps aloud so the class hears them flip. Ask ‘if last year went down, does that mean next year must go down?’ Then place the mean beside it as the calmer call when the path won’t sit still.

⚠ In a what-if, pupils apply the adjustment to the raw last year, or forget the adjustment entirely — writing 212 or 220 instead of 200 on Ballybane’s -20 .

Rewrite the chain on the board as two clear strokes: first the step ($212+8=220$), then the tweak ($220-20=200$). Have the pupil point to which number the 20 comes off.

DIFFERENTIATION

EMERGING

- Pre-rule the three-column table and let them complete Ballybane only — mean and step — with the $+8$ jump already marked beside the figures.
- On Douglas, accept mean alone plus a one-line judgement (‘numbers wobble’) without forcing a step calculation.

DEVELOPING

- After Ballybane, ask them to change the what-if from -20 to $+15$ and recalculate which prediction they would now trust.
- On Douglas, write one sentence comparing why step worked on Ballybane but not here, using the jump signs as evidence.

PROFICIENT

- Add a fourth copybook line: invent a what-if for their own school (new estate, classroom closes) and defend which base — mean or step — the tweak should sit on.
- In the journal, rank all three predictions from most to least trustworthy for their chosen school and justify the order from the shape of the data.

↗ **Cross-curricular:** Tie to Geography — a new housing estate near the school is exactly the what-if pupils just modelled; link it to local development on a simple map.

ANSWER KEY

a) 210, 216, 220, 226, 230, 234

Q2: 280

b) 180, 188, 196, 204, 212, 196

Q3: 200

c) 250, 245, 240, 235, 230, 225

Q4: 310

Q1: 193

- a) **Always** : By definition a rising trend continues upward so the next value exceeds the last.
- b) **Sometimes** : True when numbers go up and down around the same level; false when they rise by a fixed step each year, where the step method is better.

- c) **Always** : A constant yearly difference makes the next step easy to forecast reliably.
- d) **Never** : When the step itself changes size or direction the step method misleads.