

Data and chance investigation: survey and show

CURRICULUM ALIGNMENT

DAT.DAT.3

pose questions of interest and collect, display and critically analyse data in a range of ways for a range of purposes and communicate the findings.

DAT.CHN.3

describe and test predictability and (un)certainty in events.

INTERACTIVES

Tally Chart · display, explore

Bar Chart Builder · challenge, display

WHAT THIS LESSON TEACHES

To answer a question with data follow these steps: ask a good question, collect and tally the answers, show them in a chart, then read what the chart tells us.

- Ask the class their favourite season, tally the answers, build a bar chart, then read off which season won.
- If summer has the tallest bar, then summer is the mode.
- If most of the class chose summer, the next person is likely to choose summer too.

MODEL THIS ON THE BOARD

RUNNING THE FULL DATA CYCLE FOR FAVOURITE COLOURS

- 1 Ask the class their favourite colour and write the question at the top.
- 2 Tally the answers for each colour one row at a time.
- 3 Draw a bar chart with heights matching the tallies.
- 4 Read the chart to find the mode and what it shows.

DISCUSSION STARTER

REFLECT

Which part did you enjoy most — asking the question, making the chart, or finding the mode?

LESSON ARC

Settle on one class question with three or four tidy answer options in Getting Started and write it in a board corner. Watch and Notice runs the full cycle once for favourite season, pointing from the summer tally row of 11 across to the bar of 11, then landing the 'likely' sentence. Try It Together surveys the real class by show-of-hands; pupils copy that tally into their printed template, then build the bar chart, read the mode and write a chance sentence on paper on their own.

TEACHING MOVES

1. **Getting Started.** Take three hands-up ideas only, and steer hard away from open questions like 'favourite animal' toward a small tidy answer set — favourite season, how you got to school, favourite lunch. Lock in ONE question and write it with its three or four options in a board corner; this is the exact question you type into the interactive next.
2. **Watch and Notice.** Run your finger from the summer tally row across to the summer bar so the class watches the count of 11 become the bar height of 11. Ask 'which bar is tallest?' then revoice 'so summer is the mode.' Read the last paragraph's chance sentence aloud together, stressing likely — don't move on until a pupil can name the mode AND say the likely sentence unaided.

3. **Try It Together.** Type the agreed question and its answer options into the interactive so they're captured on screen, then count one answer at a time by show of hands rather than pupil by pupil. A pupil at the board tallies in fives — watch the fifth gate stroke goes across the group of four. Build the bar chart by hand, setting each bar to its tally count, pointing row-to-bar as you go.
4. **Copy the Class Tally into Your Copy.** Every pupil copies the completed board tally onto their printed template with the question at the top — same data for everyone, so nobody re-surveys later. Glance for correct counts, no marking. The circled 'most people picked' answer is only a hunch; say plainly they'll read the real winner off the tally.
5. **Class Challenge.** Brisk practice management: pupils work on paper on their own from their copied tally — no fresh survey. Circulate and keep them to the four steps in order: read counts, build the chart with a scale that fits the biggest count, read the mode, write the chance sentence. Head off any pupil writing 'certain' — a mode makes the next answer likely, never certain.
6. **Lunch choices: two classrooms.** Drive the two-room interactive from the front; pupils call out each move. Run your finger along the Room 1 bars to find the tallest and name the mode, then repeat for Room 2. Ask 'do the two rooms have the same winner?' and close with a likely sentence for each room.

COMMON MISCONCEPTIONS

⚠ A pupil reads the mode correctly but says 'so the next person will DEFINITELY choose summer' — collapsing likely into certain.

Point back to the shorter bars still standing on the chart. 'Some people didn't choose summer — so it can't be certain.' Press for the word likely and revoice a corrected sentence together before moving on.

⚠ When tallying at the board a pupil makes the fifth stroke as a fifth upright line instead of a gate stroke across the group of four, so counts drift.

Stop at the fifth mark and demonstrate the gate stroke going diagonally across the four. Count the completed gates in fives aloud with the class so the total on the board matches the show of hands.

⚠ Building the bar chart, a pupil draws every bar the same width apart but picks a scale that can't fit the biggest count, then runs off the top of the canvas.

Before any bar is drawn, ask 'what's your biggest count?' and check the top gridline can reach it. Have them mark the tallest bar first so the scale is tested against the largest value straight away.

DIFFERENTIATION

EMERGING

- Pre-number the scale on the printed bar-chart canvas so these pupils only place bar heights, not invent the scale.
- Keep them working from just two answer rows of the class tally to build two bars first, then add the rest once the method holds.

DEVELOPING

- After the chart is done, ask which two answers were closest and by how many — reading a difference off the bars, not just the tallest.
- Have them write a second chance sentence about the LEAST likely next choice, using the shortest bar.

PROFICIENT

- Pose: could the mode change if five more people were surveyed? Ask them to sketch a tally where the current runner-up overtakes — and explain what would have to happen.
- Pull them ahead to the two-classroom lunch chart and ask them to write, in their own words, why two rooms with the same pupils could still have different modes.

✂ **Cross-curricular:** Tie to Geography — survey how pupils travelled to school (walk, cycle, car, bus), chart it, and discuss what's most likely for a classmate living nearby.

ANSWER KEY

c) summer

Q1:

Maths //// //// //// //// //; Art //// //// //// //; mode = maths

Q2: Yes //// //// //// (15); No //// //// //// //// //// (25); bars 15 & 25, mode=no

Q3: Summer //// //// //// //// //// ////; Winter //// //// //// ////; mode = summer

Q4: Mode = soup (35)

a) Always : The data cycle always requires tally first then chart.

EXTENSION SHEET · STRETCH ANSWERS

S1: walk 14, car 6, bus 3, cycle 2; 25 pupils

S2: The mode is walk. For example: it is likely, but not certain, that the next pupil walks.

S3: In twos, because 16 then needs only 8 squares. The bar for 11 stops halfway between the 10 and 12 marks.

b) Always : The mode is always the one with most votes shown by the tallest bar.

c) Never : The mode is only the most popular so far and never guarantees the next choice.

d) Sometimes : Most good survey questions have few choices but sometimes open questions work too.

S4:

Ms Ryan's class: zoo. Mr Doyle's class: farm. Together: farm, with 23 votes (zoo has 19, beach has 11).

S5: Ask the question, keep a tally, draw the bar chart, read off the mode.

Investigation: Survey the class — open-ended; scan pupils' working for valid solution paths rather than a single answer.