Lesson 92 MIXED

Posing statistical questions and collecting data

CURRICULUM ALIGNMENT

DAT.DAT.4a pose questions, collect, compare, summarise and represent data selectively to answer those questions.

WHAT THIS LESSON TEACHES

A good **statistical question** has answers that vary, and a clear plan for **collecting** the data fairly.

→ 'How do classmates travel to school?' varies — a good question.

→ Decide your categories before you start counting.

LESSON ARC

Open by putting 'How tall am I?' beside 'How tall is everyone in our class?' on the IWB and let pupils spot which is worth surveying. Sort four sample questions together, dwelling on homework-minutes as the strongest spread. Groups draft and refine one question at the board until the class agrees one. Pupils write three of their own in copybook, then run the agreed survey live — a recorder builds the raw-data list on the board, exactly as answers are called.

TEACHING MOVES

1. **Getting Started.** Put both height questions up, give five seconds of quiet think-time, then take three hands-up answers only. Listen for 'one answer versus a whole spread' but hold back the term 'statistical question' — that's the next step's job.
2. **Watch and Notice.** Read the four questions one at a time and have pupils predict 'vary or same?' before you reveal. Dwell on homework-minutes as the clearest spread. Land the key line aloud: 'if the answers vary, it's worth surveying; if they don't, it isn't.'
3. **Try It Together.** As groups draft, circulate and push them off yes/no questions ('Do you like football?') toward open ones. At share-back, ask the class of each draft 'would the answers vary, or would most say the same?' and re-voice the fix: 'changing "do you like" to "how many" widens the range.' End by agreeing one class question and writing it at the top of the board — it stays there for the survey.
4. **Write Three Questions in Your Copy.** Walk the room glancing for yes/no questions sneaking in — quietly prompt those pupils to reword. This is copybook practice, not marking; keep moving.
5. **Class Challenge.** Hand out response cards, pupils write their answer to the agreed question, and a rotating recorder lists each one on the board in the order read. Stress 'exactly as given, no sorting yet.' Gather row by row until time runs out — partial is fine; if a response doesn't fit the question, ask that pupil why before moving on.
6. **What Did We Notice?.** Steer talk toward the link between a clear question and a tidy list. Re-voice a strong answer: 'so a fuzzy question lets people answer in different ways, and then our list is hard to make sense of.'

COMMON MISCONCEPTIONS

⚠ Pupils draft a yes/no question — 'Do you like football?' — and call it statistical because lots of people answer it.

At the board, tally the only two possible answers. Show that two columns isn't a real spread, then reword live to 'How many matches do you watch in a week?' and ask how many different answers that could give.

⚠ During the survey a pupil wants to tidy answers as they come in — grouping or counting them rather than listing them as given.

Pause and point at the board list: 'raw data is every answer exactly as said, in order.' Show that the moment we start sorting we've changed it — that organising step is the next lesson, not this one.

⚠ Pupils think a question is statistical because it's hard, not because the answers vary — they put '7 times 8' forward as survey-worthy.

Ask three pupils for the answer to 7 × 8. All say 56. Contrast with three pupils' shoe sizes. The test isn't difficulty — it's whether the answers differ across people.

DIFFERENTIATION

EMERGING

- Give these pupils a sentence frame on the board — 'How many ____ do you ____ in a ____?' — so they fill blanks rather than build a question from scratch.
- For the copybook three, let them reuse two questions from the Watch and Notice sort and invent only one of their own.

DEVELOPING

- Ask them to write, beside each copybook question, one answer they think nobody else will give — forces them to picture the spread before surveying.
- Challenge them to take a not-statistical question ('What colour is the sky?') and reword it into a statistical one ('What's your favourite colour?').

PROFICIENT

- Pose: 'Write a question that sounds statistical but secretly isn't' and have them explain the trap to the class — surfaces the vary-or-fixed test in their own words.
- While others finish, ask them to predict whether the agreed class survey will give a wide or narrow spread, and justify it before the cards come in.

⚬ **Cross-curricular:** Tie to Geography — pupils pose a statistical question about how each classmate travels to school and collect the raw list of journeys.

ANSWER KEY

W1: Banana (29)

W2: 18

Q1: 17

Q2: 2 gate(s) and 2 singles

Q3: 116

Q4: 48

EXTENSION SHEET · STRETCH ANSWERS

S1: 41

S2: 106

S3: 138

S4: 2 gate(s) and 2 singles

S5: 15

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