Year 9 · Statistics: Reading Between the Lines of Data

Name: _____ Date: _____

This sheet helps you become a data detective! You'll practise spotting when graphs and claims are trustworthy, and when they might be tricking you. Take your time and back up your thinking with evidence.

Warm-up

1. A survey asked 20 students at Avondale College how many hours they slept last night. The results (in hours) were: 6, 7, 8, 5, 9, 7, 6, 8, 7, 10, 6, 7, 8, 5, 7, 9, 6, 8, 7, 6. What is the most common (mode) number of hours slept?

2. A bar graph starts its vertical axis at 40 instead of 0. What effect can this have on how the bars look?

3. True or false: If a coin lands on heads 6 times out of 10 flips, the coin must be unfair.

4. A pie chart shows 'Favourite takeaway in Avondale' with slices for Fish & Chips 45%, Pizza 30%, Burgers 20%, and Sushi 5%. Do these add up correctly?

Practice

5. A local newspaper headline reads: 'Ice cream sales rise as drownings increase, is ice cream dangerous?' Explain why this claim is misleading.

6. A pictograph about pets uses a picture of a dog to represent 10 pets. To show 30 cats, the designer draws one cat picture that is three times as tall AND three times as wide as a single symbol. Why does this misrepresent the data?

7. Aroha conjectures that 'most Year 9 students at her school walk to school'. She surveys the 25 students in her own maths class and finds 14 walk. Is her sample good enough to support a claim about the whole Year 9? Explain.

8. A company claims '9 out of 10 dentists recommend BrightSmile toothpaste'. What questions should you ask before believing this claim?

9. Two classes sat the same test. Class A had a median score of 72 and Class B had a median of 68, but Class A's scores ranged from 40 to 95, while Class B's ranged from 62 to 74. Which class performed more consistently, and how do you know?

10. A survey of 200 Auckland residents found 130 support a new cycleway. A report states 'The people of Auckland strongly support the cycleway.' Evaluate whether the data supports this statement.

Challenge

11. A shop advertises 'Prices slashed by up to 70%!' After visiting, you find only 2 items out of 500 have a 70% discount; most items are discounted 5–10%. Explain how the advertisement uses true data in a misleading way, and suggest a more honest statement.

12. A researcher runs an experiment giving 8 plants a new fertiliser and 8 plants water only. The fertilised plants grew an average of 12 cm; the water-only plants grew 11 cm. She claims 'the fertiliser clearly works.' Discuss two reasons to be cautious about this claim, and describe one way to improve the experiment.