

Planning fair tests and reading data

Grade 6 science (Year 7 · Class 6) · Lab answers

These model answers use the sample results. Your own times may differ, but the pattern and the steps of the analysis should be the same: variables, mean, graph, conclusion and improvement.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** SEP 3-4

Question 1 Variables

Independent: wing length. Dependent: fall time. Controlled: paper type, drop height, paper clip, wing width, person timing (any three). **Change wing length, measure time.**

Question 2 Check a mean

$(1.9 + 2.0 + 1.9) \div 3 = 5.8 \div 3 = 1.93$. **1.93 s.**

Question 3 Draw the chart

Wing length (cm) goes on the x-axis, mean time (s) on the y-axis with a scale of 0 to 3.0 s in steps of 0.5 s. Label both axes with units and give the graph a title. **Use a bar chart or line graph with labelled axes.**

Question 4 Pattern

The longer the wings, the longer the fall time: 1.53, 1.93, 2.40 and 2.80 s. **Time increases with wing length.**

Question 5 Hypothesis

If the wings are longer, then the helicopter will fall more slowly, because longer wings catch more air. **The data support the hypothesis.**

Question 6 Reliability

Three trials let you spot anomalies and take a mean. The ranges are 0.1 s for 4 cm, 0.1 s for 6 cm, 0.2 s for 8 cm and 0.2 s for 10 cm. **8 cm and 10 cm have the biggest range, 0.2 s.**

Question 7 Prediction

The means rise by 0.40, 0.47 and 0.40 s per 2 cm, so about 0.4 s more: $2.80 + 0.4 = 3.2$ s. **About 3.2 s, but the confidence is low because 12 cm was not tested.**

Question 8 Improve the lab

Use a photo gate or video to time the fall, repeat five times, and release the helicopter with a clamp to avoid pushing it. **More trials and better timing.**