



Attempt questions first; check the separate key afterward. Orientation and scientific-investigation practice; enrichment chapter. Show methods and evidence.

A. Very short answers - 1 mark each

1. What is a testable scientific question?
2. Rewrite "Which plant is best?" as a testable question about growth.
3. Name the variable deliberately changed in an experiment.
4. Name the variable measured as the outcome.
5. Must a fair test control relevant other variables?
6. Identify two controls when testing light's effect on seedling growth.
7. Convert 2.5 km into metres.
8. Convert 250 ms into seconds.

B. Short answers / practice - 2 marks each

9. Three length readings are 12.1, 12.3, 12.2 cm. Find the mean.
10. Explain why repeated measurements are useful.
11. Does correlation alone prove causation?
12. Give an example where a third factor could explain a correlation.
13. What is a hypothesis?
14. Distinguish a hypothesis from an unsupported guess.
15. A ruler's smallest division is 1 mm. Should a length be reported as 12.345678 cm from it?
16. Explain why reported precision must match the instrument.
17. A group measures mass 50 g and volume 20 cm³. Find density.
18. State suitable instruments for these measurements.
19. Should observations that disagree with a prediction be erased?
20. Explain how unexpected results can improve an investigation.

C. Application / reasoning - 3 marks each

21. Draw a results table for temperature measured every 2 min for 10 min.
22. Choose suitable axes for its graph.
23. What is the purpose of a control group?
24. Suggest a control for testing whether fertiliser affects plant growth.
25. Is a larger sample always a cure for a biased method?
26. Explain the difference between random error and systematic bias.
27. A measured mass is 45 g and volume is 15 cm³. Find density.
28. Explain the difference between a variable and a constant in an investigation.
29. Five time readings total 16.5 s. Find their mean.
30. Does a precise measurement automatically guarantee accuracy? Give a reason.
31. Design a results table for testing how pendulum length affects period, including repeated readings.
32. List three precautions for heating a test tube safely.
33. Explain why unknown chemicals must not be tasted.
34. A claim says a device saves 30% electricity. What evidence would you request?
35. Design a fair comparison, specifying measurements, controls, repeats and how to draw a conclusion.

ANSWER KEY - Numerical / closed questions

- 3) Independent variable. 4) Dependent variable.
5) Yes. 7) 2500 m. 8) 0.25 s. 9) 12.2 cm. 11) No. 15) No. 17) 2.5 g/cm³. 18) Balance; measuring cylinder for displacement if appropriate.
19) No. 22) Time horizontal; temperature vertical.
25) No. 27) 3 g/cm³. 29) 3.3 s. 30) No; systematic error may persist.