



QUESTION WORKBOOK

Variables and controls: what an experiment can show

Scientific method and quantitative biology · Unit B00

AQA Practical skills PS 1.1–1.2, 2.1–2.4, 3.1–3.3 · OCR A Module 1.1.1–1.1.3

Edexcel A Working as a biologist; core practical requirements

CAIE Paper 3 and Paper 5 (planning, analysis and evaluation)

5 questions · 18 marks

PRINT EDITION

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SECTION A · Short, 1 to 2 marks

- A1** State what a negative control is designed to rule out, and state what a positive control is designed to rule out. [2]

SECTION B · Standard, 3 to 5 marks

- B1** A student measures oxygen production by pondweed at five distances from a filament lamp, and the rate rises as the lamp is brought closer. Explain why repeating the whole investigation ten times would not make the conclusion valid. [4]

- B2** Compare accuracy with precision, and compare repeatability with reproducibility, as descriptions of a set of measurements. [4]

- B3** A student tests six extracts of seaweed for antibacterial activity by soaking paper discs in each and placing them on a lawn of bacteria. No clear zone appears around any of the six discs. Suggest two control experiments the student should have set up, and suggest what each would have shown. [4]

- B4** A survey of 5000 adults finds that those with a higher intake of oily fish have fewer heart attacks over the following ten years. A newspaper reports that eating oily fish prevents heart attacks. Evaluate that conclusion. [4]
