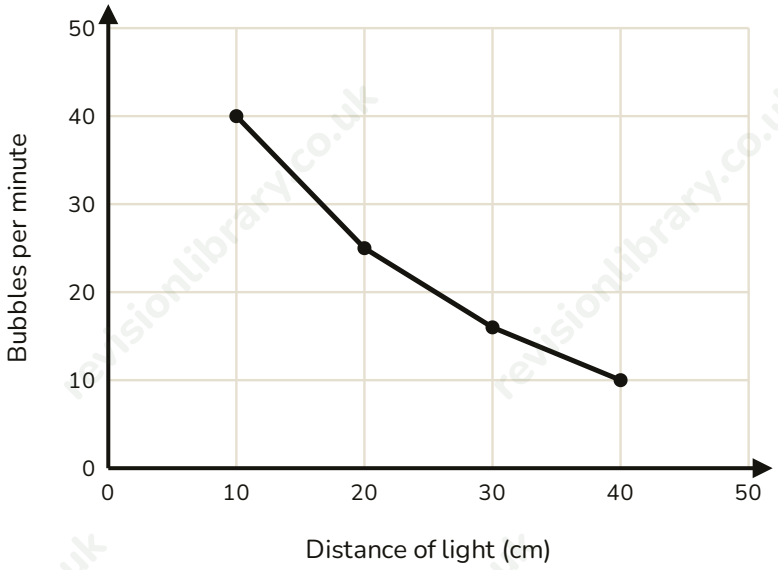
1.1 Cells and Organisation: 10-minute Pack

Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Extended response: A class investigates how light intensity affects the rate of photosynthesis in pondweed. They measure number of bubbles produced per minute at different light distances: 10 cm gives 40 bubbles/min, 20 cm gives 25 bubbles/min, 30 cm gives 16 bubbles/min, 40 cm gives 10 bubbles/min. The students think the graph should be a straight line but the results curve. Evaluate the students' expectation of a straight line, discuss variables they should control, suggest improvements and explain why each improvement would help. Refer to the data in your answer.



(6)

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2 In an animal, different tissues can work together in one structure to perform a function. For example, muscle tissue that contracts can work together with blood vessels that supply oxygen and nutrients and nervous tissue that carries signals.

(a) Name the level of organisation where groups of different tissues work together to perform a job. State how it differs from a tissue, and give one example. **(3)**

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Mark scheme · 1.1 Cells and Organisation: 10-minute Pack

Question 1

Level 3 Detailed evaluation: links evidence from the data to a clear judgement about the students' expectation of a straight line; identifies several key variables to control and gives specific, practical improvements with scientific reasons; communicates clearly. **5-6**

Level 2 Partial evaluation: uses the data to suggest why the relationship is not linear and names at least two variables to control; gives some reasonable improvements with basic reasons. **3-4**

Level 1 Limited evaluation: makes a simple statement about the students' expectation with little or no reference to the data; mentions one variable or a vague improvement. **0-2**

Indicative content:

- Data shows bubble rate decreases as distance increases but curve levels off at larger distance, so relationship is not a straight line; light intensity is inversely proportional to the square of the distance from the lamp, so a curved (not straight-line) decrease is expected.
- Variables to control: temperature, concentration of dissolved carbon dioxide, length and mass of pondweed, same species, same light source, time allowed to settle before measuring.
- Improvements: use a light meter or keep light intensity measured rather than distance; repeat measurements and take mean to reduce random error; keep water temperature constant using a water bath; use a ruler to keep the same position; measure bubbles for longer and count total to reduce timing error.
- Reasons: controlling temperature and CO_2 prevents them confounding bubble rate; using means reduces effect of anomalous results; measuring light intensity allows plotting rate against actual intensity, which should show the rate rising as intensity increases and then levelling off when another factor (such as carbon dioxide concentration or temperature) becomes limiting.

Question 2

(a) organ cao **B1**

(a) states the difference: an organ is made of several different tissues working together, whereas a tissue is a group of similar cells, oe **B1**

(a) any correct example of an organ, e.g. heart or stomach **B1**

(a) Answer: **Organ. An organ is made of several different tissues working together, whereas a tissue is a group of similar cells. Example: the heart (or stomach).**

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