Edexcel Biology IGCSE

2.45B - Photosynthesis

Flashcards

What is photosynthesis?

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The process by which plants synthesise glucose using light energy from the Sun.

Describe how you would investigate the effect of light intensity on the rate of photosynthesis in an aquatic plant

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- Place algal beads in a boiling tube at a fixed distance from a light source.
- Fill the boiling tube with bicarbonate indicator and record the initial colour.
- After 30 minutes, record the final colour and find the pH using a colour standard.
- Repeat several times at different distances/light intensities, and calculate a mean for each distance.
- Plot a graph of light intensity (x) against rate of photosynthesis (bubbles per minute, y).

Why is it best to use an LED light source rather than a lamp?

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A lamp will emit more heat energy than an LED - therefore it may change the temperature of the experiment and affect the rate of photosynthesis.

What is the relationship between the distance from a light source and light intensity?

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Inverse square law:

light intensity $\propto$ 1 / distance^2

How can the measurement of oxygen production be made more accurate?

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If the the pondweed is placed under a filter funnel with an inverted measuring cylinder over the spout, the volume of oxygen produced can be determined.

Why is sodium hydrogen carbonate solution used during this experiment?

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It releases CO_2, which is used by the pondweed during photosynthesis.

Why can pH be used as an indication of the rate of photosynthesis?

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Dissolved carbon dioxide, which makes the solution acidic, is taken up during photosynthesis. The higher the rate of photosynthesis, the greater the **increase** in pH in the given time.

What is a source of error in this practical?

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The colour change may be subjective and determining the pH using a colour standard may be difficult.