

WJEC England Biology GCSE

SP5: Photosynthesis

Practical notes



Photosynthesis

Aim

Investigation into the effect of light intensity the rate of photosynthesis

Equipment

- a boiling tube
- freshly cut 10 cm piece of pondweed
- a light source
- a ruler
- a test tube rack
- a stopwatch
- a range of concentrations of solution sodium hydrogen carbonate (including 0.2%)
- a glass rod

Method

1. Place a test tube rack containing a boiling tube 10 cm away from the light source, measured using the ruler.
2. Fill the boiling tube with a fixed volume of 0.2% sodium hydrogen carbonate solution
3. Place the cut pondweed into the boiling tube with the cut end at the top. Gently push the pondweed down with the glass rod.
4. Leave the boiling tube to rest for 5 minutes.
5. Start the stopwatch and count the number of bubbles produced in one minute.
6. For each light intensity/distance, repeat the count twice more and take a mean.
7. Record in a table as seen below.
8. Repeat steps 1-7 for 3 more distances (20, 30, 40 cm) of the boiling tube from the light source.
9. Plot a graph of the rate of photosynthesis (given by the no. of bubbles) against light intensity (using the inverse square law, light intensity = $1/\text{distance}^2$ between pondweed and light source).

| Distance between pondweed and light source / cm | Number of bubbles per minute | | | |
|---|------------------------------|---|---|------|
| | 1 | 2 | 3 | Mean |
| | | | | |

Sources of error

Temperature may also be a factor affecting the rate of photosynthesis and this is not taken account of.

Bubbles may form too quickly to be counted.



Potential Hazards

There is a potential allergy risk from the pondweed.

Lamp may get hot.

Be careful to keep water away from electrical power outlets and wiring.

