

WJEC Wales Biology GCSE

SP1.5A: Photosynthesis

Practical notes



Photosynthesis

Aim

Investigation into factors (light) affecting the rate of photosynthesis by measuring the rate of oxygen bubble production.

Equipment

- a 250 cm³ beaker
- a boiling tube
- freshly cut 10 cm piece of pondweed (*Elodea*)
- a light source
- a metre ruler
- a test tube rack
- a stopwatch
- sodium hydrogen carbonate powder
- a glass rod
- stand and clamp
- a filter funnel
- plasticine

Method

1. Place the cut pondweed with the cut end at the top into a beaker with 200 cm³ of water. Gently push the pondweed down with the glass rod.
2. Add a spatula of sodium hydrogen carbonate powder into the beaker.
3. Invert a filter funnel and place it over the pondweed, fixing it in place with plasticine.
4. Fill a boiling tube with water completely and place it on top of the end of the funnel, underwater. Fix in place with a stand and clamp.
5. Place a lamp 5 cm away from the pondweed, measured with the ruler.
6. Start the stopwatch and count the number of bubbles produced in one minute.
7. Record in a table as seen below.
8. For each distance, repeat the count twice more.
9. Repeat steps 1-7 for 5 more distances (10, 15, 20, 25, 30 cm) of the boiling tube from the light source.
10. Plot a graph of the rate of photosynthesis (given by the no. of bubbles) against distance.

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



Controlled variables

- Species of pondweed
- Sodium hydrogen carbonate solution concentration
- Temperature
- Time allowed for counting gas bubbles

Sources of error

When changing the light intensity, the temperature may also change.
Bubbles may form too quickly to be counted accurately.

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.

