
GCSE Biology required practical activity 6: Photosynthesis

Student sheet

Required practical activity	Apparatus and techniques
Investigate the effect of a factor on the rate of photosynthesis.	AT 1, AT 3, AT 4, AT 5

Investigating the effect of light intensity on photosynthesis in pondweed

Plants use carbon dioxide and water to produce glucose and oxygen during the process of photosynthesis. Many factors, such as light intensity and light wavelength, affect the rate at which photosynthesis occurs.

Aquatic plants, such as pondweed, produce visible bubbles of oxygen gas into the surrounding water when they photosynthesise. These bubbles can be counted as a measure of the rate of photosynthesis.

The effect of light intensity can be investigated by varying the distance between pondweed and a light source. The closer the light source the greater the light intensity.

Learning outcomes
1
2
Teachers to add these with particular reference to working scientifically

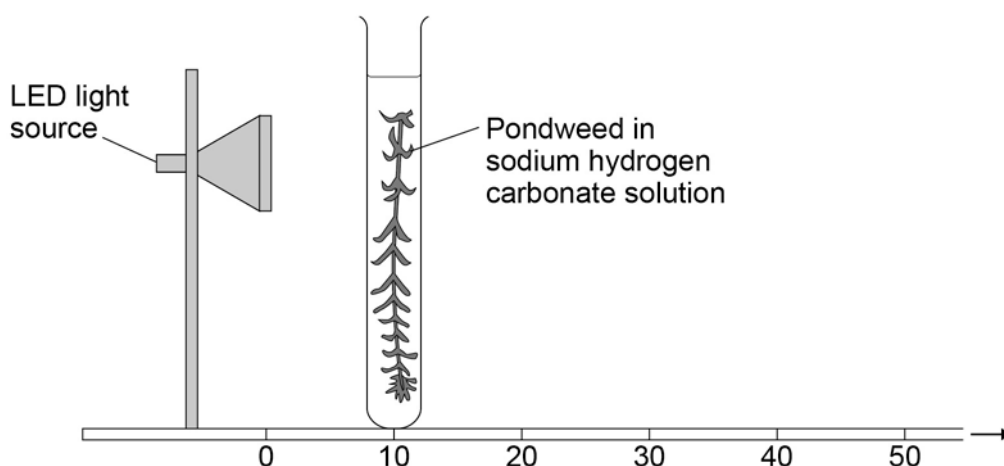
Method

You are provided with the following:

- a boiling tube
- freshly cut 10 cm piece of pondweed (*Cabomba* or *Elodea*)
- a light source
- a ruler
- a test tube rack
- a stop watch
- 0.2% solution of sodium hydrogen carbonate
- a glass rod.

You should read these instructions carefully before you start work:

1. Set up a test tube rack containing a boiling tube at a distance of 10 cm away from the light source
2. Fill the boiling tube with the sodium hydrogen carbonate solution.
3. Place the piece of pondweed into the boiling tube with the cut end uppermost. Gently push the pondweed down with the glass rod.
4. Leave the boiling tube for 5 minutes.
5. Start the stop watch and count the number of bubbles produced in one minute.



6. Record the results in a table such as the one here.

Distance between pondweed and light source in cm	Number of bubbles per minute			
	1	2	3	Mean
10				
20				
30				
40				

7. Repeat the count twice more so that the mean number of bubbles per minute can be calculated.
8. Move the test tube rack to a distance of 20 cm from the light source and repeat steps 4–6.
9. Repeat using distances of 30 cm and 40 cm between the test tube rack and the light source.