# Photosynthesis Coursework

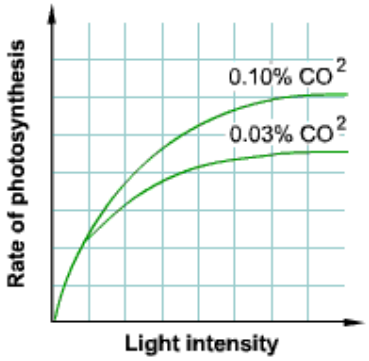
## Introduction

## Background Information


Glucose can be converted to sucrose and carried to other parts of the plant in **phloem vessels**. Glucose can also be converted into **starch** and stored

### Light

Sometimes light is a limiting factor. A plant may have lots of water and carbon dioxide, but it will not photosynthesize very fast if there is not enough light; increasing the light intensity will make photosynthesis faster.




### Carbon dioxide

Sometimes the level of carbon dioxide is limiting. There may be plenty of light but the plant cannot photosynthesize because it has run out of carbon dioxide.

### Temperature

Temperature can be a limiting factor too. The rate of photosynthesis will be limited if it is too cold for the enzymes to work properly.

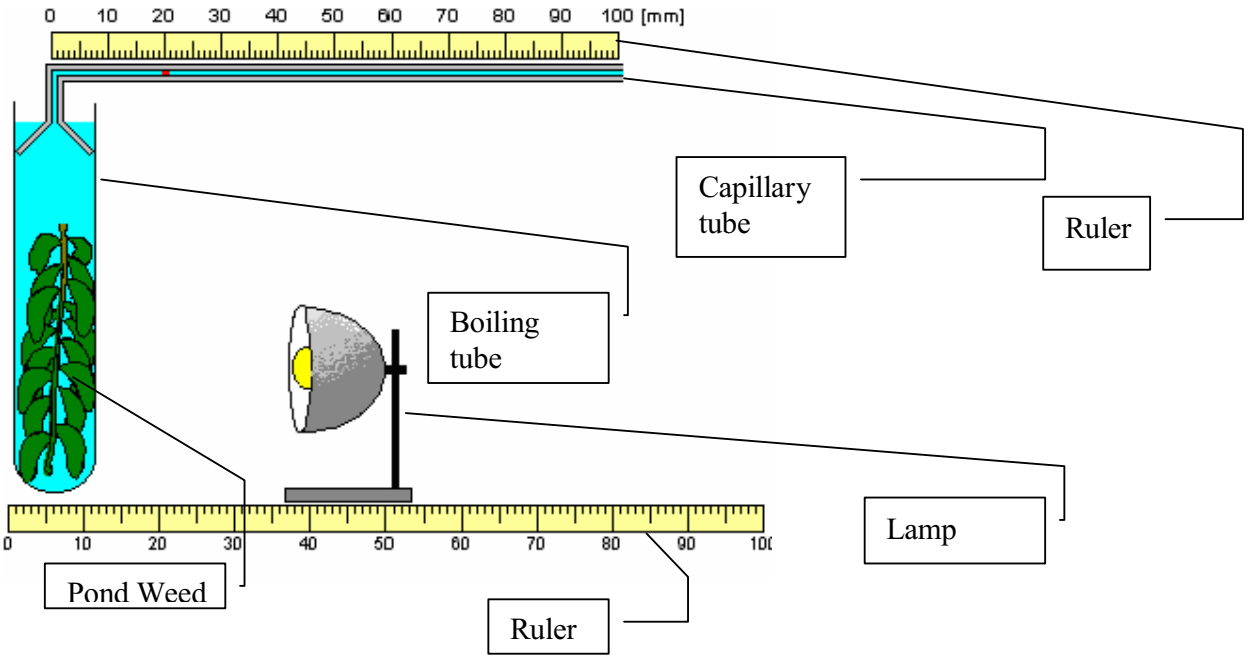
## Aim

Investigate if light intensity affects the rate of oxygen production by photosynthesis in pond week. I have chosen to study light intensity because in a classroom it would be hard to monitor the other limiting factors, carbon dioxide levels and temperature. Also I don't have facilities to carry out the other experiments.

Prediction

I predict that as the light intensity increases (the lamp is closer) more oxygen will be produced due to photosynthesis. Carbon dioxide levels will be kept high by using 5% sodium hydrogen carbonate solution. This will give the plant a healthy supply of carbon dioxide. The environment temperature of the room will be kept the same. I was aware that bulbs create heat so when the bulb is a close distance (10 cm) the result may be affected but to a negligible extent.

Diagram




Preliminary method

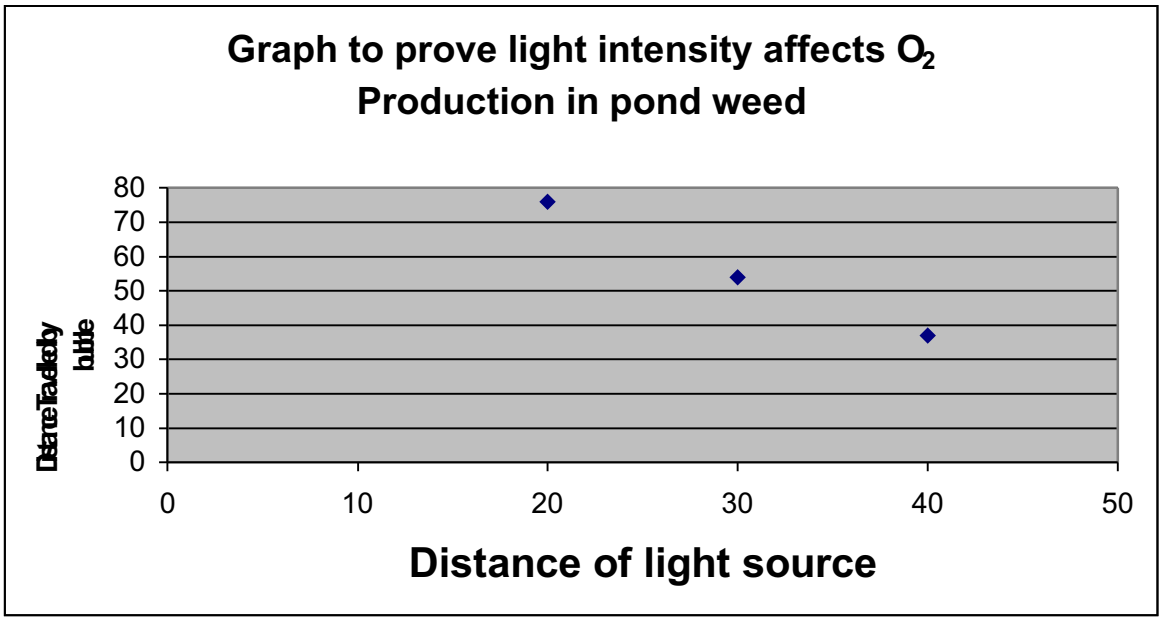
I was going to do a method which involved counting the bubbles at different light intensities. I chose not to do this method as it is and inaccurate method to show volume of $O_2$ produced. This is because each bubble could be of different size therefore containing different amounts of $0_2$ gas. We chose to use a method that gave an accurate result of the $O_2$. Produced. We did preliminary work to find out if the method worked, to prove that $O_2$ was produced and that the variables that we used were correct (amount of solution, length of pond weed and distance of light). So we used the bellow

- Firstly Set up the equipment as above
- Choose the starting length of the lamp
- Find out where the dye stats in the capillarity tube
- Turn the lamp on and start the stop watch
- Measure the distanced moved the dye has moved in 10 minutes

Preliminary Table

| Distance | 20 | 30 | 40 |
|---|---|---|---|
| Distance Moved | 76 | 55 | 36 |

Preliminary Graph



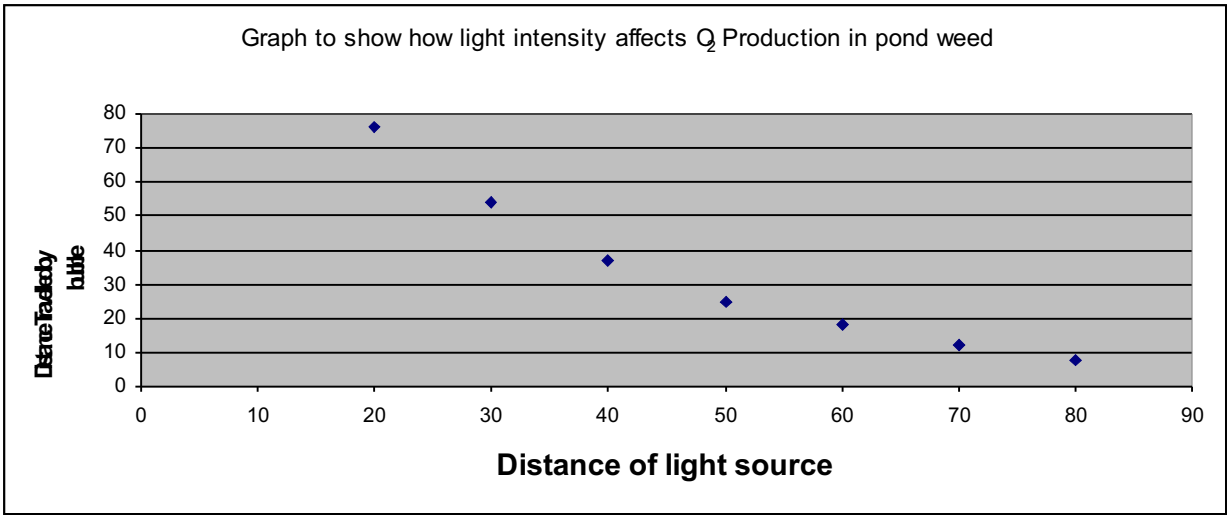

Method

- Firstly Set up the equipment as above
- Choose the starting length of the lamp
- Find out where the dye stats in the capillarity tube
- Turn the lamp on and start the stop watch
- Measure the distanced moved the dye has moved in 10 minutes
- Now repeat this as many times as you like for different distances and record your results

Results Table

| Distance | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
|---|---|---|---|---|---|---|---|
| Distance Moved | 76 | 54 | 37 | 25 | 18 | 12 | 8 |

Graph




Conclusion

In conclusion, my results showed negative coloration meaning the then point move negatively down the graph. So therefore showing that the further away the light source is the less the pondweed photosynthesises. This means that my prediction was correct as I predicted "the light intensity increases more oxygen will be produced due to photosynthesis". This also proved my background information, which explained the other limiting factors as well as light. As our method used a scale we could take accurate results we also made the experiment fairer by being in our lab so people couldn't incriminate these results by coming in the door and letting extra light in.

Evaluation

Our experiment went very well, but if I did it again I would take more measurements so I would get a better spread of data. Also I would keep moving the light source b ack until the bubble didn't move at all this would mean that photosynthesis couldn't happen because there was to little light, so then I can prove that light is a Major limiting factor.