

Jacob Henry

## Investigating the rate of photosynthesis of Canadian Pondweed

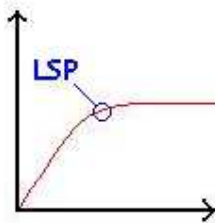
Aim: I will be investigating how light intensity affects the rate of photosynthesis and what the limiting factors do to prevent the rate of photosynthesis from increasing further.

Prediction:

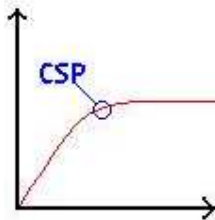
For this investigation I will be investigating how light intensity affects the rate of photosynthesis, the equation of photosynthesis is

*Carbon dioxide+water+glucose+oxygen*

It is important to the reaction that certain factors are present when it is occurring. We know that these are Carbon Dioxide, Water, Light and Chlorophyll. Without these the reaction will not take place at all. But I predict that as I increase the light the rate of photosynthesis will increase until it gets to a certain point where the rate of photosynthesis will no longer increase.



As the light intensity (LI) increases, the rate of p/s increases, until the plant is photosynthesizing as fast as it can - the LSP - **Light Saturation Point**. When the LSP is reached, plants cannot photosynthesize any faster, even when the light gets brighter.



As the amount of  $CO_2$  available increases, the rate of p/s increases, until the plant is photosynthesizing as fast as it can - the CSP -  **$CO_2$  Saturation Point**. If both  $CO_2$  and light supply are increased together, the rate of p/s will level out.

I predict that as I increase the distance away from the lamp I will have less oxygen bubbles to count so as I decrease the distance from the lamp I will have more oxygen bubbles to count.

Method:

I am going to collect my equipment and I am going to place the pondweed in a boiling tube of water and place it in a test tube rack, then I am going to place the lamp at different distances away from the lamp. Then I am going to turn on the lamp and start

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timing the time of 2 minutes and count the bubbles and mark them down on a piece of paper. Once I have done that I and going to complete a table of results.

### Results

#### Experiment 1

Distance from lamp	Time (minutes)	Bubbles
10cm	3	60
15cm	3	46
20cm	3	37
25cm	3	29
30cm	3	15

#### Experiment 2

Distance from lamp	Time (minutes)	Bubbles
10cm	3	55
15cm	3	46
20cm	3	32
25cm	3	19
30cm	3	9

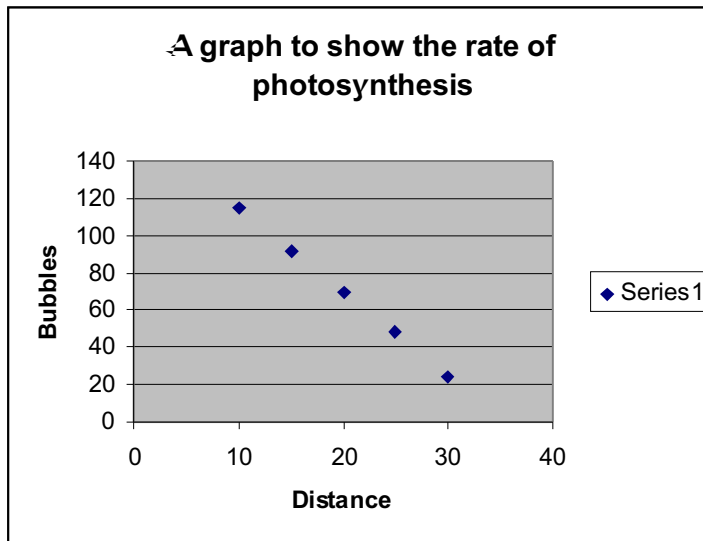
#### Averages

Distance from lamp	Time (minutes)	Bubbles
10cm	3	115
15cm	3	92
20cm	3	69
25cm	3	48
30cm	3	24

I am going to conduct my experiment in the middle of the room as I think that this would give me the best results I am after.

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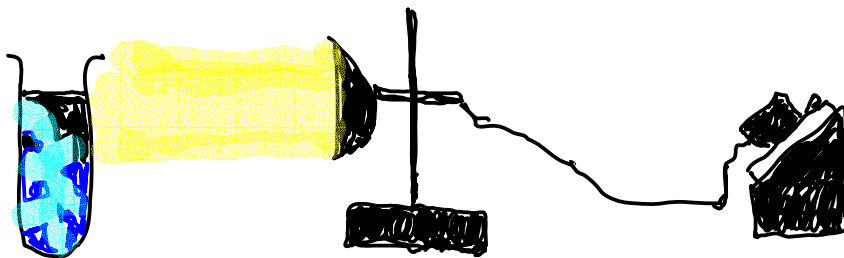
Graph of results



Apparatus:

- Pondweed
- Lamp
- Boiling tube
- Stopwatch
- Test tube rack

Diagram



### Safety

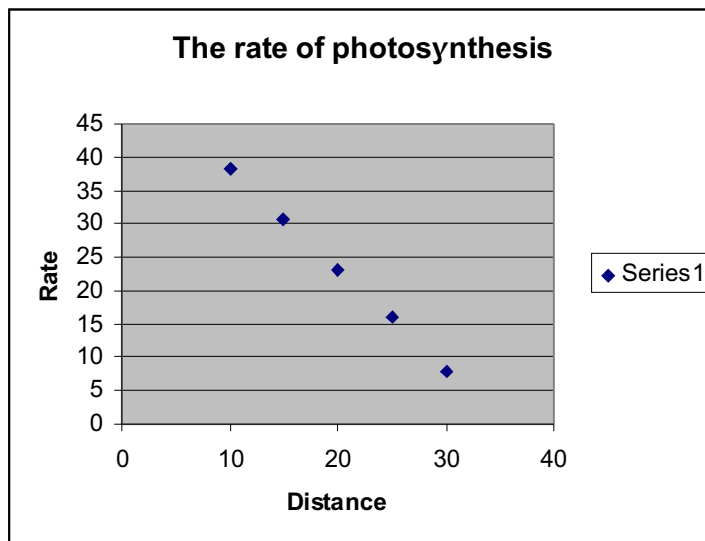
To keep my experiment safe I am going to turn off the lamp when I am measuring the distances as I could burn myself and I am going to clear all objects so I don't knock over the conical flask and spill the water. Also I am going to turn off the lamp when handling the pondweed just in case I drip water over the plug so I don't electrocute myself.

### Variables

I am going to keep the same the pond weed, conical flask and the area where I am doing the experiment.

### Conclusion

As from my results I show that my prediction was correct and that it was not wrong. I found out that the rate of photosynthesis increases as it moves closer to the light source; this proves that as the plant moves closer to the light source the rate of photosynthesis increases hence more oxygen. In my experiment I had some limitations like I only could take the lamp so far away from the pondweed and I could only do it so many times. The rate of photosynthesis can be figured out by;



### Evaluation

I believe that my results were accurate as they were all in order. The method was good except for a few points as they weren't fitting the experiment. I think that the measurements weren't enough for the experiment; I also think that the range wasn't wide enough; I think the evidence was strong enough for the conclusion. I think that

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the plan could have been improved by having a little more than pondweed we could of have another plant to compare the rate of photosynthesis in different plants. There are more experiments that we could do to get more evidence as I just said maybe a different plant.