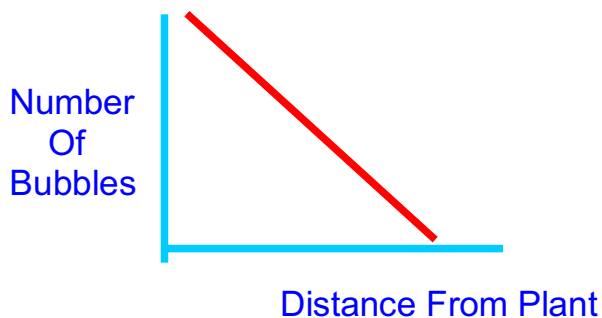


## Experiment to show the rate of photosynthesis with different light intensities

### Aim:

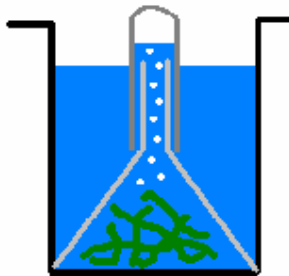
My aim is to find out the different rates of photosynthesis with different light intensities.

### Prediction:



As shown in the graph I think as the distance from the plant increases the number of bubbles will decrease. This is due to the light intensity increasing, as it gets closer.

### Method:



Take the following apparatus:

Measuring Cylinder,  
Glass Beaker,  
Funnel,  
Lamp,  
Canadian Pondweed (Elodea),  
Metre stick.

### Method cont.

Take a glass beaker and fill it with water, place the pondweed (Canadian) in the beaker under the funnel. Fill the measuring cylinder with water, and place over the neck of the funnel (as shown in the diagram). The cylinder needs to be filled with water so that when the oxygen comes out the funnel the gas push the water out. This is how we get pure oxygen in the measuring cylinder.

Now that everything has been set up you will have to turn on the lamp and place it at the desired distance away from the bulb. I would recommend that you would start with the smallest distance what would be 0cm the largest would be 100cm. Start with the light directly next to the beaker. When you are ready switch on the bulb and time five minutes on the stopwatch, start to count the amount of bubbles what come into the test tube. When you have timed this cork the cylinder underwater so that no gas can escape, measure how much oxygen is in the cylinder, then to test to see if it is oxygen get a glowing splint and put it in the cylinder. If there is oxygen the splint should relight.

Repeat the steps above a few more times (six would be fine and every 5 minutes move the light away 20cm).

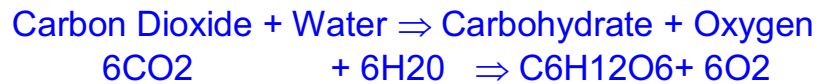
The things that I planning to keep the same in the experiment would be the piece of pondweed used would be the same every time the experiment is done. Also the amount of time the cylinder would be collecting the oxygen for would be the same time all the time.

Independent variables would be the light intensities and the dependant variables would be the photosynthesis itself.

### Science: Photosynthesis.

The experiment is to test the rate of photosynthesis with different light intensities. Photosynthesis is a complex process in which light energy is used to convert water and carbon dioxide into simple carbohydrates, usually taking place in the green leafy part of the leaf. Light-absorbing pigments, notably chlorophyll, found in chloroplasts, are essential to the process, which can be carried out only by green plants and photosynthetic bacteria. Plants are the main source of atmospheric oxygen, released as a by-product of photosynthesis. The sun shines through the leaf while the tiny pores in the surface called the stomata absorb the carbon dioxide and then it uses it to make starchy substances and the it releases

oxygen. Plants help to prevent the green house effect due to the taking in of greenhouse gases and making them into oxygen.



Requirements for photosynthesis :

Light,  
Chlorophyll,  
Carbon dioxide,  
Water.

Preliminary Work :

This work was done to find out what was the better way to do the experiment. First of all i was going to do my experiment on the volume of oxygen given off by the Elodea. That idea was soon changed when it took me thirty minutes to collect myself a reading on the measuring on the measuring cylinder. So i changed my measuring idea to count the number of bubbles in one minute. This is how i came about doing the measuring this way.

Results table :

Distance from plant (cm)	Time (minutes)	No. Bubbles Experiment 1	No. Bubbles Experiment 2	No. Bubbles Experiment 3	No. Bubbles Average
0	5	124	128	140	130
20	5	110	105	99	104
40	5	76	66	72	71
60	5	65	60	57	62
80	5	53	49	45	49
100	5	80	100	72	84

Analysis :

I have found out simply from the graph and from the results table that the further the light is to the plant the quicker the rate of photosynthesis will go.

Conclusion :

I conclude that I accept my hypothesis of as the light gets closer to the plant the rate increase because by sketch graph on the hypothesis matches that of the one on the real results graph. On my graph I have found there to be an anomalous (rogue) result. This means I have either done that experiment wrong or I had added up the average all wrong. On the graph there is a fairly strong negative correlation. Meaning as the distance increases the rate of photosynthesis drops down. The line of best fit shows this. The science behind this is as the energy from the lamps weakens from the increasing in distance away from the plant the rate of photosynthesis decreases also. The plant needs the lamps energy to do the process of photosynthesis, thus no light, no photosynthesis.

#### Evaluation :

The procedure used would have been different to that the one I did if I hadn't carried out my preliminary work. On the whole the experiment I did was very good and I pulled it off fine. The room could have been darker and the light brighter but as it was the experiment was all ok. There were no major problems with the procedure. When I added up the average number of bubbles I came to realise there was an anomalous result on the final experiment. This could have been with the light the temperature or anything. I could have improved the reliability of the results by either having the room darker and the light brighter as I have already said. Overall I think the evidence I have gained is sufficient enough to come to the conclusion like the one above. In the future if I do the experiment again I am to follow the exact same procedure but with a darker room. The experiment has been very successful and next time I wouldn't change it dramatically.

