

The Affects of Light Intensity on the Rate of Photosynthesis

Variables:

- 1. Independent:** *light intensity*
- 2. Dependent:** *the rate of photosynthesis, and the number of oxygen bubbles produced.*
- 3. Controlled:**
 - *The same type of plant must be used.*
 - *The time in which the oxygen bubbles are counted must be the same (five minutes, measured using a stopwatch).*
 - *The time taken for the plant to adapt in its new environment must be kept the same (two minutes measured with a stopwatch).*

Apparatus:

- *A Green plant*
- *A Test tube*
- *Some Water*
- *Stop-watch*
- *A pair Scissors*
- *Table of results*
- *Two lamps*

Method:

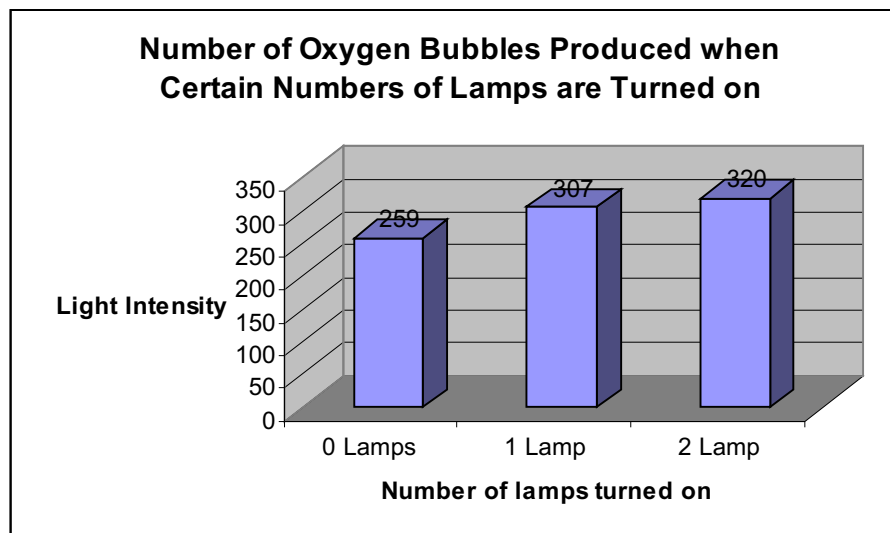
1. *Gather the apparatus listed above.*
2. *Cut the plant from both ends using the pair of scissors.*
3. *Fill the test tube with water, and put the plant in the tube.*
4. *Make sure that the plant, which was put in the test tube fully, sinks in the water.*
5. *You need to wait two minutes before you can start counting the oxygen bubbles.*
6. *Make sure that you use the same plant for every experiment.*
7. *Make sure that the temperature is the same, for accurate readings.*
8. *As soon as the two minutes is over, you start the oxygen bubbles.*
9. *After the second five minutes are over, turn on of the lamps on, and wait for wait another two minutes. And when the two minutes are over start the count again.*
10. *Redo the whole experiment again with tow lamps. And make sure you keep the temperature and plant the same.*

Data Collection:

Table showing the number of oxygen bubbles produced when certain numbers of lamps are turned on

	Bubbles counted when no lamps were on	Bubbles counted when one lamp was on	Bubbles counted when two lamps were on
In the First five minutes	80	103	102
In the second five minutes	27	35	35
In the third five minutes	49	53	37
In the fourth five minutes	52	50	52
In the fifth five minutes	51	66	94
Total	259	307	320
Mean	52	61	64

Data Processing and Presentation:



Conclusion:

With a greater light intensity the rate of photosynthesis increases, because with more light there are more photons which are taken in by the plant leaves. This will increase the rate at which light dependent phase takes place. *In the light dependent phase, the photosynthetic organism converts the light energy (photon) into energy carried by electrons. In photosynthesis the electrons are picked up by electron carrier which uses the energy in the electrons to make energy carrying compounds called ATP (Adenosine Tri Phosphate). It also makes another compound called NADPH. And the main product of this phase is to create oxygen. Because this phase depends on light, the more light we have the more oxygen is produced.* My graph proves this theory. By looking at my graph, one can see that when no lamps were turned on the total oxygen production was 259. And when one lamp was turned on the production of oxygen bubbles increased to equal 307. Finally when two lamps were turned on the production of oxygen increased even more to equal 320.

Evaluation:

Measuring the rate of photosynthesis is very tricky, because the controlled factors are hard to control. In this experiment the light intensity was changed and the oxygen bubbles were counted. A more efficient count would be to capture the oxygen produced in the experiment and measure its volume. We could also use more than one plant to see if we can find a pattern. So that we can make sure that our results are accurate. We can also try the experiment with more than two light bulbs so we can have a bigger range of results. We can do the experiment more than once to get more results, and by doing that we get even more accurate results. The temperature had to be measured for accurate results, however the temperature was not measured. So if the experiment is to be carried out again, then I would need to measure the temperature and keep it constant. For better results we would need to control the limiting factors.