

Photosynthesis

Photosynthesis to find effects of distance of a light source from pond weed has on the amount of

oxygen produced Photosynthesis All green plants need to be able to make their own

food. They do this by a process called photosynthesis. For photosynthesis to occur they need

sunlight energy. This energy is absorbed by a green pigment called chlorophyll, which is mainly

found in the leaves. This energy then combines with water molecules (from the soil) and carbon

dioxide (from the air). Then as a result of this, a type of sugar is produced. This is called

glucose. Also oxygen is made. For my experiment I have chosen to use light distance as my

variable. This means that to carry out a fair test everything else must be kept the same during the

experiment. Hypothesis I think that as the light source (desk lamp) is moved closer to the

pondweed, the rate that oxygen is produced will increase therefore more oxygen will be

produced and also more glucose. I believe this will happen because when the light source is

nearer to the plant more of the plant's surface area is coming in to contact with the light from the

desk lamp therefore more photosynthesis will occur which will mean more oxygen and glucose

will be produced. Apparatus • Funnel. • Measuring cylinder. • Stop watch. • Card board and

foil (used to filter the light). • Beaker. • Desk lamp. • one metre ruler stick. • Balance. •

Pondweed. • Carbon dioxide Powder. • Water. • Scapular. Fair Test To ensure that a fair test

is carried out the following things must be done • The same pondweed must be used every time

we change the light distance. • Do the experiment three times for each distance to get an

accurate average. • There must only be one variable and that is the distance of the light source

from the plant. • Chose a value for carbon dioxide mixture and keep at the same value all the

way through the experiment (3 grams). • Keep the experiment at a constant 20 degrees (this is

because more oxygen is produced at this temperature). • Take results after three minutes for

each individual experiment. Safety • Follow lab safety rules (eg no running bags at back etc). •

keep the desk lamp away from contact with water. • Be careful when using scapular. Method •

Collect apparatus. • Set up apparatus as in diagram. • Fill measuring cylinder and beaker with

water. • Add carbon dioxide mixture to water. • Set up desk lamp in correct position (eg 10cm). •

Turn on desk lamp and start stopwatch. • Count the bubbles for the next three minutes and also

make a note of the change in volume. • Record your results. • Repeat experiment twice more for

distance 10cm and then do the same with distance 20,30,40,50,60,70,80,90, and 100cm.

Results These are my results Because my results did not go entirely to plan(because my pondweed was not photosynthesising quick enough) I have been given a past years results

which I will now use as my results instead.They are as follows- Analysis Looking at my

results a can see a significant increase in the rate of photosynthesis as the distance decreases.All

of the results I was given show this pattern.In the experiment when the distance was 50cm there

was not much photosynthesis taken place only about 13 bubbles of oxygen were produced,but

when the desk lamp was 0cm away alot of photosynthesis was occurring on average 184 bubbles in

three minutes a quite substantial difference from 50cm,overall it was a quite significant

increase.I believe This is because when the desk lamp is close to the pondweed more of the

pondweeds surface area has light energy shining upon it which means more photosynthesis will

occur in a shorter time. The average no. of bubbles for different distances are as follows-

Looking at my results it is quite evident that the number of bubbles produced is much greater

when the distance of the pondweed from the desk lamp is less.This proves that my original

hypothesis was correct that "as the distance decreases of the desk lamp from the pondweed

therefore more oxygen bubbles are produced".As i mentioned before this is because there is

more light energy shining on a greater surface area when the desk lamp is closer so therefore

greater surface area equals more photosynthesis. Evaluation I think that on the whole my

experiment was ok.The results i gathered were very odd i believe this is because of the poor

quality of the pondweed we used.But with the set of results we were given we were able to

calculate accurate averages which followed my prediction. I believe our measurements were about

as accurate as we could get using the apparatus that we did. We experienced quite a few

problems throughout our experiment.These were first of all in our first experiment our

pondweed was not of a high standard and was photosynthesizing very slowly the only way we

could have got around this problem without using new pondweed would be to leave the

experiment for longer.Another problem we encountered was the change in temperature when

the desk lamp was close to the pondweed because we could not do anything to amend this we

had to accept any slight change in our results.another problem we faced was counting the

bubbles when the plant was photosynthesising the bubbles were different sizes, but as talked about in my preliminary data we overcame this problem by counting every individual bubble as one.