

# Sc1 Investigation

## By Jason Shelton

### AIM

I am to plan an investigation to examine the factors which increase or decrease bubble production in a canadian pondweed.

### FACTORS

Factors that i think will affect the investigation will be:

- Light
- Concentration of the potassium hydrogencarbonate
- Temperature
- Stomata

1) The reason that the amount of light will affect the investigation is because in the dark a plant cannot Photosynthesise at all. In dim light it can photosynthesise slowly. As light intensity increases, the rate of photosynthesis will increase, until the plant is photosynthesising as fast as it can. At this point it would not matter whether you increased light.

that it

A - B Light limiting factor, the plant is limited in how fast photosynthesise.

Between B - C the light is not a limiting factor because the plant is working at its full photosynthesising rate. You show this because even when the light intensity is increased it has no effect what so ever on the rate of photosynthesis

2) Concentration of the potassium hydrocarbonate will affect it because it is the main place that the plant or pondweed is getting carbon dioxide from. The reason for the affect will be that the higher the concentration the more carbon dioxide the solution will have in it and there fore the more the plant can take up. There is a point that when the carbon dioxide level gets to high the plant will only take in the amount that it can use for photosynthesis and there fore I am expecting to see a very similar graph to the one of the light but it should have a quicker time to be seen and concluded.

To the side is a graph of what I am expecting to see:

You can see here that the more carbon dioxide the plant is given the quicker it can photosynthesise up to a certain point, then the maximum is reached.

3) Temperature is another factor that I think will affect the result because the chemical reactions of photosynthesis will only take place at a very slowly at low temperatures, so a plant can photosynthesise faster on a warm day than a cold day.

4) The carbon dioxide that the plant uses passes into the leaf through the stomata and if they were closed then photosynthesis can not take place. So therefore on warmer days the stomata often close to prevent too much water being lost and then the less carbon dioxide the plant can take in.

THE INFORMATION THAT I HAVE FOUND HAS BEEN FROM A GCSE BOOK ON BIOLOGY

I have chosen to change the concentration of the potassium hydrogencarbonate because i think that the amount of carbon dioxide will be an interesting investigation because i will be able to find out whether or not teh amount of carbon dioxide can decrease the amont of bubbles or whether it can increase ut. I have reasarched it and so far i am expecting to see an increase as the concentration rises. It should go steady and then no more increasing or decreasing of the rate.

I am hoping to do

0.5%

1%

1.5%

2%

Each experiment will consist of 3 experiments so then i will be able to get a mean and that will mean that i will be able to get it as accurate as i can.

### **FAIRTEST**

I think that there are many things that can change the results that will make it not a fair test. 1) the test will be done at different hours each time that it goes a head this means that the plants biological clock will be changeing everytime so for example we will do it oneday in the morning and the plant has come out of a sleep, if you like. The next time that we do it it will be after lunch and the plant has been photosynthesising hours now.

Also there is the amount of light that will change depending on what room we are in, whether or not we are near a window or whether we have artaficial lights on or off. The affects that chlorophyll that picks up the light for photosynthesis and the amount of light that tose get will vary.

To get around these problems we could put the plant in a bag and then it would be able to have the same amount of light each experiment. The time of day is a hard one to change and i dont think that we will be able to do that so we will just have to try and get the lessons in order and then do it at similar times, give or take an hour or two.

Another thing is the amount of bubbles will be counted manually so there might be some trouble there so it would be a good idea if we had the same person counting because some bubbles might be seen by one person and not the other and also one person might call one a bubble and the other might not.

### **APPARATUS**

### **RISK**

This is a science lab that we are working in and normal rules apply. The hair must be tied back and also we will be using glass in the equipment so danger there too.

### **METHOD**

The apparatus will be used in the same manner all the time so then we will try and get an accurate reading of bubbles.

#### **STEP BY STEP**

1. apparatus together.( set out like below.)

2. Get the temperature right level so then it will make it fair.

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