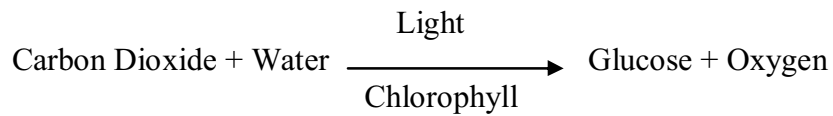<u>Aim:</u> Does light intensity affect photosynthesis?

<u>Background Information:</u>
        Photosynthesis means "making through light" and occurs in the cells of green plants, which are exposed to light.
        The word equation for photosynthesis is:

$$Carbon\ Dioxide + Water \xrightarrow[Chlorophyll]{Light} Glucose + Oxygen$$

        Although most of the glucose produced is converted into insoluble starch for storage in the stem, leaves or roots, some is used immediately by the plant to provide via respiration.
        There are three things which limit the rate of photosynthesis, which are temperature, carbon dioxide concentration and light intensity. This is shown as when the temperature, carbon dioxide concentration and light intensity increases, so does the rate of photosynthesis.

<u>Prediction:</u>
        I think that at high light intensity the rate of photosynthesis will increase because, as shown in my background information, as light intensity increases, so does the rate of photosynthesis. I also think at low light intensity the rate of photosynthesis will decrease. I think this because, as proven in my background information, light is needed for photosynthesis and means "making through light".

Above is a graph to show what I predict my results will show about the rate of photosynthesis as the light intensity increases. I think as the light intensity increases the rate of photosynthesis will increase because, as shown in my background information light is need to photosynthesize.

I think eventually the graph will level out because the light intensity will not be bale to increase anymore.

Preliminary work:

Below is a table showing our results after completing our preliminary test.

Distance the light is from beaker (cm)	Bubble produced per minute
25	6
20	13
15	17
10	19
5	21
0	23

Using these results I can work out what I am going to use. Below is a list:

- 300 ml of water
- 3 pieces of pondweed
- 3 spatulas of sodium hydroxide
- Light will be 25cm, 20cm, 15cm, 10cm, 5cm and 0cm distance from the beaker.
- After one minute the beaker will be stirred twice.
- Use cold water.
- I will count the number of bubbles produced after one minute.

Diagram:

Equipment list:

- Bucket
- Test tube
- 500ml beaker
- Funnel
- 3 pieces of pondweed
- 300ml of water
- Lamp
- Spatula
- Stop watch
- Sodium Hydroxide

Safety points:

- Always wear goggles
- Clean any spilt water up so as not to fall when completing experiment.

Fair test points:

- Use the same amount of water
- Use the same amount of pondweed
- use the same temperature of water

Method:

1. Collect equipment and set up as shown above.
2. Add three spatulas of sodium hydroxide and stir three times.
3. Count the bubbles produced for 1 minute then record result.
4. Repeat this for every 5cm the lamp is moved.
5. Repeat the whole experiment to make the results more reliable
6. Clear and tidy away all equipment.

Results:

1.

Distance the light is from beaker	Bubbles produced per minute
25	11
20	13
15	17
10	20

5	26
0	30

2.

Distance light is from beaker	Bubbles produced per minute
25	13
20	15
15	20
10	26
5	29
0	32

3.

Distance light is from beaker	Bubbles produced per minute
25	9
20	13
15	17
10	22
5	26
0	31

4.

Distance light is from beaker	Bubbles produced per minute
25	13
20	18
15	22
10	27
5	31
0	34

5.

Distance light is from beaker	Bubbles produced per minute
25	5
20	9
15	13
10	20
5	21
0	25

6.

Distance light is from beaker	Bubbles produced per minute

25	12
20	17
15	23
10	26
5	32
0	35

7.

Distance light is from beaker	**Bubbles produced per minute**
25	15
20	21
15	27
10	30
5	32
0	35

8.

Distance light is from beaker	**Bubbles produced per minute**
25	14
20	22
15	25
10	29
5	34
0	37

Repeat Results:

1.

Distance light is from beaker	**Bubbles produced per minute**
25	11
20	14
15	18
10	20
5	26
0	29

2.

Distance light is from beaker	**Bubbles produced per minute**

25	14
20	17
15	20
10	26
5	29
0	32

3.

Distance light is from beaker	Bubbles produced per minute
25	9
20	13
15	17
10	23
5	26
0	30

4.

Distance light is from beaker	Bubbles produced per minute
25	13
20	18
15	22
10	24
5	26
0	31