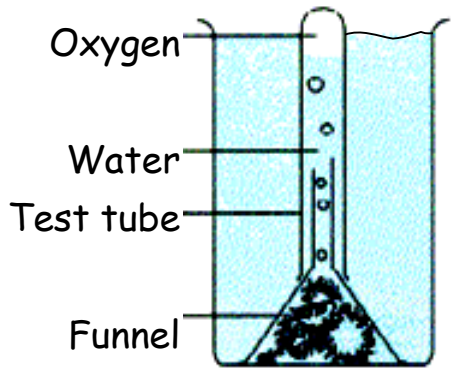
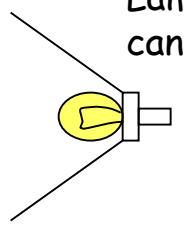
Limiting Factors on Photosynthesis

The apparatus was set up as shown below. The following data shows how many bubbles of oxygen were produced by the pondweed in different light intensities.

The experiment was repeated three times giving the weed different concentrations of carbon dioxide each time.



Collecting bubbles of gas from some pondweed



Lamp – light intensity can be changed

Light intensity (units)

Plant in	1	2	3	4	5	7	8	9	10	12	14
0.1% CO_2	0	0	4	6	6	10	10	10	10	10	10
0.2% CO_2	0	0	4	6	8	12	14	14	14	14	14
0.3% CO_2	0	0	4	6	8	12	14	16	16	16	16

Number of bubbles of oxygen produced.

1. Plot these figures as a graph on one pair of axes (light intensity horizontal and number of oxygen bubbles (rate of photosynthesis) vertical). You will have 3 separate lines – label them.
2. To make sure it was a fair test – what should have remained constant when carrying out the experiment?
3. Why are no bubbles seen until the light intensity reaches 3 units?
4. Why do all three curves follow the same path up to light intensity 5 units?
5. Why do the curves separate beyond this?
6. Using this graph and the text book to write a short account of 'limiting factors in photosynthesis'.