Website: <http://www.glencoe.com/sites/common_assets/science/virtual_labs/LS12/LS12.html>

Purpose: To determine how various colors of light impact plant growth.

Procedures:

1. You will see how the different colors (red, violet, orange, blue and green) impact the growth of lettuce.
2. Select lettuce as your plant. Then select the 2 different colors you wish to examine. Turn the light on and when the growth is done measure the three plants height and record in the data table. Then determine the average growth for that color.
3. Reset the growth and select 2 new colors and repeat step B. When finished reset once more and select the remaining color to test. Record all result in the data table below.

Data Table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Color** | **Plant 1 growth (cm)** | **Plant 2 growth (cm)** | **Plant 3 growth (cm)** | **Average Growth (cm)** |
| Red | 8 | 13 | 12 | 11 |
| Violet | 8 | 12 | 7 | 9 |
| Blue | 10 | 15 | 11 | 12 |
| Green  | 2 | 4 | 3 | 3 |
| Orange | 5 | 9 | 4 | 6 |

Questions:

1. Which color resulted in the most growth?

The blue light resulted in the most growth of the lettuce.

1. Which color resulted in the least growth? Why?

The green light resulted in the least growth, because the lettuce already being green cannot be effected as much by the green light.

Website 2: <http://www.reading.ac.uk/virtualexperiments/ves/preloader-photosynthesis-full.html>

Purpose: To determine how light intensity impacts photosynthesis rates.

Procedure:

1. Move the light source to 100mm distance from the elodea plant. Hit the start button.
2. When the experiment begins you will hit the tap button for each new bubble created by the elodea. When you feel that you have sufficiently timed the tapping to the bubble production rate, stop and record the bubbles per minute in to the data table.
3. Hit the back button and move the light to 150mm distance and repeat step B. Once you have recorded the data for this distance change the distance to 200mm and repeat step B. Record data in your table.

Data Table:

|  |  |
| --- | --- |
| **Distance (mm)** | **Bubbles Per Minute (BPM)** |
| 100 | 142 |
| 150 | 62 |
| 200 | 19 |

Questions:

1. How did the bubbles produced per minute relate to the light’s distance from the plant?

The BPM increased greatly as the light was 100 mm from the plant. As you gradually decrease the light exposure to the plant, the rate of BPM greatly decreased.

1. How do clouds impact photosynthesis rates based on what you learned from this experiment versus the rate of photosynthesis on a cloudless day?

On a sunny day, the amount of oxygen produced by a plant would greatly differ from that of a cloudy day. When there is a great amount of light exposure, more oxygen will be produced.

1. How does this relate to photosynthesis rates in the summer versus the winter?

The rates of photosynthesis increases during the summer, because the light exposure is high. In the winter time, there is very little growth, and the rate of photosynthesis drops dramatically.

Conclusion: (Minimum of 10 sentences on what you learned about photosynthesis and how colors and intensity impact its rate.)

 Photosynthesis, a production that cannot occur without a source of light is a rather long process. On average, the amount of needed light exposure is optimized by the sun, but in some instances this poses a problem. During the winter, when there is little sun exposure, and on cloudy days photosynthesis is set back. Commonly, plant growth is not abundant during the winter time, but the few plants that do continue to grow during this season need exposure to light as well. The color of these lights can affect the growth of the plant and can create problem when the wrong light source is in use. Scientifically speaking, blue is one of the hottest colors when it comes to heat. It stands to reason that within 30 days of a plant being exposed to a blue light that it would have tremendous growth efforts. Though plants are green, being exposed to green light does not increase their growth much, if any at all. The plant being green cannot absorb the light, because the chlorophyll in the plant will not allow it. It is common for other sources of light to be used when carrying out photosynthesis, but sunlight is the most common. When there is a lack of sunlight, photosynthesis cannot take place and it will not help the production of the plant. The intensity of the light can create problem when producing plants. The more light exposure, the more oxygen produced by the plant. The further away the plant is from its source will create a deficient atmosphere for the plant.