Virtual Photosynthesis Lab

Which colors of the light spectrum are most important for plant growth?

Photosynthesis is the process in which plants use light energy, water, and carbon dioxide to produce food. Plants use the food they make for growth and for carrying out other life processes.

Sunlight is the natural energy source for photosynthesis. White light from the sun is a mixture of all colors of the light spectrum: red, orange, yellow, green, blue and violet. Light can be either absorbed or reflected by substances called pigments. Most plants are green because the pigment chlorophyll reflect green and yellow light and absorbs the other colors of the spectrum.

In this virtual lab you will perform an experiment to investigate what colors of the light spectrum cause the most plant growth. You will calculate the plant growth by measuring the height of each plant under different colors of light. You will compare these measurements and interpret a graph to determine which colors of the spectrum cause the most plant growth.

Objectives:
- Carry out an experiment to determine which colors of the light spectrum are used in photosynthesis as shown by plant growth.
- Measure plant growth under lights of different colors of the spectrum.

Procedure:
1. Go to google and type in "photosynthesis virtual lab", you should end up on this website: http://www.glencoe.com/sites/common_assets/science/virtual_labs/LS12/LS12.html
2. Using headphones, click the video button. Watch the animation to learn about how the light affects photosynthesis.
3. *Make a hypothesis about which part of the light spectrum causes the most plant growth and which part of the light spectrum causes the least plant growth. Assume that all conditions other than the color of the light are the same for each seed as it grows: the soil, moisture, viability of the seed, etc. State your hypothesis on your lab worksheet.* Example: *If a plant is grown under _____ color of light then the plant will grow well. However, if the plant is grown under _____ color light then the plant will not grow well.*
4. Test your hypothesis by choosing different plant seeds and observing how the plants grow under different colors of light.
5. Choose the type of seed that you want to test and click its seed packet.
6. Click the arrows on the color display to select a color light filter for each set of three plants.
7. Start the experiment by clicking the light switch to the on position.
8. Observe the plant growth.
9. Click the ruler and drag it to each plant to measure the height of each plant. Record the measurement in the table provided on your worksheet. Use the calculator to average the heights of the three plants under each color filter. Record your average in the table provided on your worksheet.
10. Click the reset button. Repeat the experiment using a different color light filter and the same type of seed.
11. After all color filters have been tested on one type of seed, conduct the experiment again with another type of seed to verify your conclusions. Complete the analysis questions.

Names:_____ Period:_____

Problem:
Which color of light will a plant need to grow the tallest?

Background Information: (please restate the information from the video in 1-2 sentences)

Hypothesis:

Data:

Color	Spinach		Radish		Lettuce	
	Individual	average	Individual	Average	Individual	Average
Red						
Orange						
Green						
Blue						
Violet						

Graph:

Print the graph and attach it to your lab report.

Analysis:

1. How did you test your hypothesis? Which variables did you control in your experiment and which variable did you change in order to compare your growth results?

2. Analyze the results of your experiment. Did your data support your hypothesis? Explain. If you conducted tests with more than one type of seed, explain any differences or similarities you found among types of seeds.

3. What conclusions can you draw about which color in the visible spectrum causes the most plant growth?

4. Given white light contains all colors of the spectrum, what growth results would you expect under white light?