**Which Colors Of Light Are Most Important For Plant Growth?**

**I. Introduction**

 Photosynthesis is the process in which plants use 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 reflects 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.

**II. Procedure**

 1. Start the activity by going to the following website :

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

 2. Click the Video button. Watch the animation to learn about how 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 in Analysis & Conclusions.

 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. Use the calculator to average

 the heights of the three plants under each color light filter. Record your calculations in the

 Table.

 10. Click the Reset button. Repeat the experiment using a different color light filter and the

 same type of seed. Click Graph to see the results of your experiment.

 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.

**III. Data**

 Record your observations in the Table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Filter Color** | **Spinach Avg. Height** **(cm)** | **Radish Avg. Height** **(cm)** | **Lettuce Avg. Height** **(cm)** |
| Red |  |  |  |
| Orange |  |  |  |
| Green |  |  |  |
| Blue |  |  |  |
| Violet |  |  |  |

**IV. Analysis & Conclusions**

 1. Make a hypothesis about which color in the visible spectrum causes the most plant growth

 and which color in the visible spectrum causes the least plant growth.

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 2. How did you test your hypothesis?

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 3. Which variables did you control in your experiment and which variable did you change in

 order to compare your growth results?

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 4. Did your data support your hypothesis? Explain.

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 5. If you conducted tests with more than one type of seed, explain any difference or similarities

 you found among types of the seeds.

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 6. What conclusions can you draw about which color in the visible spectrum causes the most

 plant growth?

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 7. Given that white light contains all colors of the spectrum, what growth results would you

 expect under white light?

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