



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

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Project Title Plants Under the Rainbow	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose was to discover how plants use the different colors of light that are all present in white light. The plants will grow under a single color light to see which color is most utilized. The results would determine if it would be beneficial for greenhouses to use single colored lights during a plant's growing cycle.</p> <p>Methods/Materials Build 6 light chambers by cutting 2 holes on the bottom of 5 large planters. Use small planters to hold a number of colored lights, to produce equal light intensity, through colored filters. Attach a PCV elbow to a piece of air duct and to a small electric fan. The fan will serve as a source of fresh air and a cooling agent for the lights. Measure the plants then place them with seeds in the 6 chambers, (white, red, orange, blue, green, and no light). Water all the plants the same amount every 4th day, and the seeds every day. Record data every week measuring the plant's growth, leaves and flowers. Follow this procedure for 3 weeks.</p> <p>Results The plants under the white light grew the most efficiently. The plants under red light grew fast, at first, but then started to die. The plants under the orange light grew at a very slow, even pace. The plants under the blue light grew slow at first, but then started to grow faster by the 2nd week. The plants under the green light and no lights did not grow, but withered. The seeds under the blue light did the best and the ones under the orange did not grow at all. Plants under the green, and red developed thinner stems. The plants under the blue light developed thicker stems. The plant's stems under white, orange, and no light remained the same.</p> <p>Conclusions/Discussion Plants need white light to grow efficiently because plants need all parts of the light spectrum. This experiment showed that red light is most affective on younger plants. Therefore, a greenhouse could provide young seedlings with more red light if they want to encourage quick growth. Orange light could be used only if slow growth was wanted and if the greenhouses wanted the plants to stay about the same size. Blue light is more affective on older plants. Most of the plants under the blue light grew slow at first but after reaching a certain height, they started to grow faster. Green light and no light are highly not recommended. Young sprouts do not use light until they grow leaves and begin the photosynthesis process.</p>	
Summary Statement This experiment was designed to explore how different colors from a light source affect how a plant grows.	
Help Received	