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# Absorption & Transmission

Monochromatic light is light composed of a single color. A plant grown in monochromatic red light can survive while one grown in monochromatic green light soon becomes sick and dies. Why? While chlorophyll pigments in plants absorb and use red light in the vital process of photosynthesis, they cannot absorb or use green light. Thus, plants grown in monochromatic green light cannot produce sugars because no photosynthesis occurs. Since green light is not absorbed, it is either reflected and/or transmitted, producing the green color of trees and shrubs.

**Concepts to Investigate:** Absorption, transmission, monochromatic light

**Materials:** Light source, prism, colored cellophane, cardboard or dark construction paper to create slit for sunlight, white paper for background

**Procedures:**

1. This activity requires bright light (flashlight or sunlight work well). Arrange your cardboard or dark construction paper so the light passes through the slit (slit should be approximately 5 mm x 15 mm). Pass the light through the prism and project the spectrum on the piece of white paper. Place a piece of red cellophane between the prism and white paper. What colors does the red filter allow through? Repeat the procedure using green and blue filters. Record your results in the table below:

Color of Filter	Colors Trasmitted	Colors Absorbed
Red		
Green		
Blue		

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2. Use red- and green-colored markers to write the word “physics!” Draw the “h”, “i”, and “l” in green and the other letters in red. Examine your writing from behind different colored filters. What do you see? Develop your own secret coding system using different combinations of colored inks and filters.
  - a. In what color(s) does a multicolored picture appear when viewed through a red filter? Explain.
  - b. How will a multicolored picture appear when viewed through both a red and a blue filter at the same time? Explain. (*hint: try it yourself*)
  - c. Before polarized lenses were popular, opticians sold sunglasses made of green-tinted glass. Describe potential problems with such glasses.