Which lights do plants like?

Activity
Mission 4

Objectives

Relate the color of plants to their use of visible light
Apply observations to conditions of space travel
Observe phototropism

Initial Questions

Have you ever seen plants bend or grow in certain ways as they respond to something?
What are some of the things plants respond to?

In this experiment, you will observe plant response to light. This is an important consideration in long-duration space travel. White light contains all colors of the spectrum, however plants use some wavelengths of light moreso that others. If scientists know which wavelengths plants need to grow and make food, then we can save energy by just exposing plants to those wavelengths instead of to white light. We will be examining red, green and blue light. Which of these wavelengths of light do you think plants use to make food and grow?

Materials

- 35mm film canister (use the opaque gray canisters, not the translucent ones)
- radish seeds
- 2.5cm squares of red, green and blue cellophane paper
- clear tape
- single hole punch
- red, green and blue markers
- 2.5cm square paper towels
- pipette or dropper
- water

Procedure

1. Punch three holes in the film canister, all approximately the same distance from the open end.
2. Tape a different colored square of plastic over each hole using clear tape. One hole will be red, one green and one blue. Cover the holes completely to maintain humidity in the canister.
3. Place the canister lid on the table. On the inside of the lid, place a square of paper toweling and wet the square.
4. Place 3 radish seeds on the wet paper towel square.
5. Leaving the lid on the table, snap the canister down onto the lid. Leave the canister upside down.
6. Use a red marker to mark the side where red paper covers the hole. Repeat this for the blue and green holes. This will help you when you remove the chamber from the lid in a few days and observe the plants' direction of growth.
7. Place the chamber under bright (but not hot) light. All three holes should receive about the same amount of light.
8. After 3 days, open the chamber and observe the orientation of your plants.

Credits: This experiment is an adaptation of activities from Wisconsin Fast Plants, http://www.fastplants.org, and NSCORT at NC State University, http://www.cals.ncsu.edu/nscort/

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Questions

Which way did each seedling grow? Did they grow in the same direction? How many seedlings bent? Compare your results with the rest of the class.

What can you conclude about the effects of green, red and blue light on the seedlings? Which color(s) did plants bend towards the most?

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