

# The Effect of Light Color on Plant Growth



**Grade:** 8th Grade | **Topic:** How plants grow | **Measurement:** US Customary (cups, ounces, inches, etc.)

## Purpose

This experiment investigates how different colors of light affect the growth of a common plant. It helps students understand how plants use light for growth and which colors are most effective.

## Hypothesis

If plants are exposed to different colors of light, then the plants under blue or red light will grow better than plants under green or no light because plants absorb blue and red light more efficiently.

## Materials

- 4 small clear plastic cups or pots (about 4 inches tall)
- Potting soil (about 4 cups)
- Fast-growing seeds (such as radish or bean seeds), 12 seeds total
- Plastic wrap or light-proof paper
- Colored cellophane sheets: red, blue, green, and one clear
- Rubber bands or tape
- Water (about 1 cup)
- Measuring cup
- Ruler (with inches)
- Notebook and pencil for recording results

## Procedure

1. Fill each cup with about 1 cup of potting soil, leaving about 1 inch from the top.
2. Plant 3 seeds in each cup, about  $\frac{1}{2}$  inch deep, and cover with soil.
3. Water each cup with  $\frac{1}{4}$  cup of water evenly.
4. Cover the first cup with red cellophane, the second with blue, the third with green, and leave the fourth uncovered as the control.
5. Secure the cellophane on each cup with rubber bands or tape so light passes only through the colored sheet.
6. Place all cups in the same warm location with natural indirect sunlight.
7. Water the cups with  $\frac{1}{4}$  cup of water every 2 days to keep the soil moist but not soggy.
8. Measure and record the height of the seedlings every other day for 2 weeks.
9. Observe and note differences in plant color, leaf size, and stem strength.

## Results

You should observe that plants under red and blue light generally grow taller and look healthier compared to those under green light or the uncovered control. Plants under green light may grow more slowly or look weaker because green light is mostly reflected by leaves rather than absorbed.

## Conclusion

Different colors of light affect plant growth because plants use specific wavelengths for photosynthesis. Red and blue lights promote better growth than green light, which plants reflect rather than absorb.

## Learning Objectives

- Understand the role of light in plant growth.
- Learn how different wavelengths (colors) of light impact photosynthesis.
- Practice designing and conducting a controlled experiment.
- Record and analyze plant growth data over time.

### Teacher Notes:

**Key Concept:** Plants require light for photosynthesis, but they do not use all colors of light equally. Chlorophyll absorbs mainly red and blue wavelengths, which are most effective for plant growth.

**Answer/Explanation:** The experiment shows how light quality affects photosynthesis rate and plant health. Green light is less effective because it is reflected, explaining why plants appear green but grow less under green light.

### Teaching Tips:

- Emphasize the importance of keeping other conditions the same (water, soil, temperature). 2. Encourage students to make detailed daily observations and sketches. 3. Discuss how this relates to why plants grow best in sunlight, which contains a full spectrum of light. 4. Have students think about real-world applications, such as how farmers use grow lights indoors.

**Relevant Standards:** NGSS MS-LS1-6, CCSS.ELA-LITERACY.RST.6-8.3



Name: \_\_\_\_\_

Date: \_\_\_\_\_

Experiment Title:

Purpose: *(I wonder...)*

Hypothesis: *(I think...)*

Materials:

Procedure:

Results: *(What happened?)*

Conclusion: *(I learned...)*