

Energy Transformation through Photosynthesis

7th grade CP Science Project Requirement

Background: Photosynthesis is the process by which plants produce their own food as well as a very helpful gas for us to live-oxygen! During photosynthesis, chlorophyll, which is a green pigment found in the chloroplasts of the plant cells, absorbs radiant energy from the sun. It is then converted into chemical energy to produce glucose.

Objective: You are to conduct an experiment to make observations and record data demonstrating the need for radiant energy to produce the energy transformation that takes place within plants in order for them to grow during photosynthesis.

Materials: shoe box with lid, bean seeds, potting soil, cup or small flower pot, scissors, cardstock or cardboard, tape

Pre-lab questions:

1. Can plants grow without a light source? Explain _____

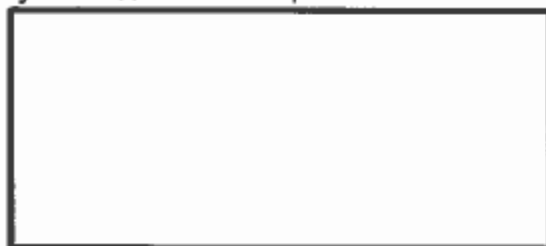
2. What is the purpose of the chlorophyll within a plant cell as stated in the background information above? _____

3. Write the chemical equation for photosynthesis: _____

Procedure:

1. Plant several bean seeds in a cup of soil and allow the beans to sprout and start growing.
2. Use the cardstock (or cardboard) and tape to create a maze of your choosing in a shoe box.
3. Cut a hole in one end of the shoe box lid and place the bean plant at one end of the shoe box maze.
4. Cover the shoe box with the lid so that the hole in the lid is placed opposite the beans. (You don't want your bean plant where the opening is!)
5. Check the growth of the bean plant each day and record observations. Water as needed.
6. Over several days, your bean plants should grow, weaving throughout the maze to finally reach the opening for light.

Diagram of apparatus (draw your shoe box maze here):



Daily Observation Log: Record your observations in this section of your lab!

Day	observations
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Post-Lab Analysis:

1. Define the term phototropism: _____

2. What is given off as a by-product (waste product) during photosynthesis? _____
3. Explain why your bean plant grew towards the hole in the lid of your maze.

4. Describe the energy transformation taking place during photosynthesis.

5. How are gases exchanged through a plant? (They don't have lungs or gills like animals...so how are the gases absorbed and released?) _____

Label the plant diagram below to represent photosynthesis. You must correctly use arrows to demonstrate this process. All of the following must be included: water, CO₂, glucose, sunlight, O₂

