

# PHOTOSYNTHESIS LAB REPORT



## Introduction

Photosynthesis is a process of converting light energy from the sun into chemical energy and stores it in form of sugars. Plants require only light energy, carbon dioxide, and water to make sugar. The purpose of our photosynthesis lab exercise is to test the action of light from various wavelengths on a plant.

## Action of light from various wavelengths on a plant

Sunlight is a radiation that travels as rhythmic waves. A wavelength is the distance between waves whose SI units are nanometers (nm). Sunlight energy is the visible light we are able to see with our naked eyes. The sunlight's component parts are visible as a spectrum known as a rainbow when the light is refracted. The spectrum's colors range from 380nm for violet light to 750nm for red light. Green light ranges at around 550nm. Colors are visible because their component pigments absorb light of different wavelengths. Plants convert more energy when exposed to red and violet light than other light weights. Plant leaves appear green because the color is poorly absorbed by chloroplasts and so is reflected to the observers eyes. Green light is not used in the photosynthesis process.

## Prediction

The action of light on the growing plants is supposed to be different if exposed to plants through different colors. The plants exposed to full sunlight are supposed to grow quicker than all the other plants. The plants exposed to green light only are supposed to grow slower than those exposed to red and blue colors.

## Procedure

1. Prepare 12 different Styrofoam cups with soil for planting bean seeds.  
(Note: The cups should be half-filled with soil)
2. Cut 12 cup-covering circles from clear plastics of three different colors; red, blue green.
3. Poke a hole at the centre of every cup using a pencil/ pen.
4. Plant a seed in every cup and cover the seed with soil.
5. Add sufficient water for seed germination.
6. Cover every 3 cups with a transparent plastic of one color, so the cups will be arranged in four groups of three cups each, covered with transparent plastics of red, blue clear and green on top.
7. Arrange the cups in a box away from intruders.
8. Regularly add water to the cups after every two days.
9. Record the date, and follow up observations from germination of the seeds to day 17. (The recorded data will be used to write the lab report)

## Data

The following data is a calculation of the mean height of plants grown under red, green, clear and blue plastic and the mean number of leaves of plants grown under red, green, clear and blue plastic.

Clear Plastics	Clear Plastic 1	Clear Plastic 2	Clear Plastic 3	Mean
Sprouted (Day No)	6	6	6	6
No of Leaves (Day 10)	5	3	4	4
Height of Plant (Day 10)	110mm	115mm	97mm	107mm
No of Leaves (Day 13)	7	6	8	21
Height of Plant (Day 13)	170mm	165mm	135mm	157mm
No of Leaves (Day 17)	8	7	8	8
Height of Plant (Day 17)	205mm	190mm	180mm	192mm

NB: The mean figures are rounded off to the nearest whole number

Blue Plastics	Blue plastic 1	Blue plastic 2	Blue plastic 3	Mean
Sprouted (Day No.)	7	8	6	7
No of Leaves (Day 10)	2	2	2	2
Height of Plant (Day 10)	90mm	85mm	80mm	85mm
No of Leaves (Day 13)	2	2	2	2
Height of Plant (Day 13)	120mm	110mm	100mm	110mm
No of Leaves (Day 17)	5	6	4	5
Height of Plant (Day 17)	150mm	140mm	130mm	140mm

NB: The mean figures are rounded off to the nearest whole number

Red Plastics	Red plastic 1	Red plastic 2	Red plastic 3	Mean
Sprouted (Day No.)	7	7	7	7
No of Leaves (Day 10)	2	2	2	2
Height of Plant (Day 10)	88mm	75mm	95mm	86mm
No of Leaves (Day 13)	2	2	2	2
Height of Plant (Day 13)	145mm	140mm	165mm	150mm
No of Leaves (Day 17)	6	4	5	5
Height of Plant (Day 17)	160mm	140mm	185mm	162mm

NB: The mean figures are rounded off to the nearest whole number

Green Plastics	Green plastic 1	Green plastic 2	Green plastic 3	Mean
Sprouted (Day No.)	9	9	9	9
No of Leaves (Day 10)	1	2	1	1
Height of Plant (Day 10)	35mm	20mm	40mm	95mm
No of Leaves (Day 13)	2	2	2	2
Height of Plant (Day 13)	45mm	35mm	50mm	43mm
No of Leaves (Day 17)	3	2	4	3
Height of Plant (Day 17)	80mm	70mm	80mm	77mm

NB: The mean figures are rounded off to the nearest whole number

# Experimental Results

The data collected indicates that the whole process was as follows;

	Green	Blue	Red	Clear
Sprouting (Day)	9	7	7	6
No of leaves (Day 10)	1	2	2	4
Height Day 10 (mm)	95	86	85	107
No of leaves (Day 13)	2	2	2	21
Height Day 13(mm)	43	110	150	157
No of leaves (Day 17)	3	5	5	8
Height Day 17 (mm)	77	140	162	192

The plants under full exposure to sunlight performed best. The plants under blue and red exposure performed a bit lower but almost comparable. The plants under green exposure performed poorest.

## Conclusion

The experiments performed show that plants exposed to full sunlight grew fastest. The plants exposed to red and blue light waves grow a bit slower than the plants exposed to full sunlight but plants exposed to green light grow extremely slowly. The action of light on plants varies depending on the waves that reach the plant leaves. Plants are able to convert light to energy from blue waves, red waves and the full spectrum producing oxygen but are unable to absorb green waves.