## LEAVE IT TO THE SUN

**Photosynthesis and Respiration Unit** 

# OBJECTIVE

• Describe evidence that plants use water and carbon dioxide with energy of sunlight to make sugar in the process of photosynthesis

# **RESEARCH QUESTION**

• How does covering a leaf with foil affect the color and size of the leaf?

## HYPOTHESIS

• Answer the following question:

What do you think will happen to the leaves when they are covered with aluminum foil?

# PROCEDURE

- Cut 8 pieces of paper 10-12 cm strips. Use a pen or marker to label the strips 1U, 2U, 3U, 4U, 1C, 2C, 3C, 4C. (U = uncovered and C = covered)
- 2. Select 4 leaves on the same side of the plant. Loosely attach a paper strips with 1-4 C to each leaf. Select 4 more leaves on the same side of the plant and attach the paper strips with 1-4U to each leaf.
- 3. In your data table, sketch and label a diagram of both sides of all 8 leaves. Record the color. Measure the width of each leaf at the widest point. Record the measurement.
- 4. Cut 4 pieces of aluminum foil big enough to cover the leaves labeled "C" on both sides. Wrap the foil gently around the leaf to block out ALL of the sunlight.

### WHAT OUR EXPERIMENT WILL LOOK LIKE

• Draw what your lab set up looks like. Make sure to label where your leaves are and if they are covered or uncovered.



## DATA: DAY 1

	1	2	3	4	1 Cover	2 Cover	3 Cover	4 Cover
	Uncover	Uncover	Uncover	Uncover				
Leaf								
Obs. &								
Starting								
Color								
Leaf								
Starting								
Size								

•Carefully remove the aluminum foil from the geranium leaf

•When measuring and observing the leaf, carefully handle it while collecting data
•Measure the leaf in centimeters, <u>NOT</u>
<u>INCHES!!!!!</u>

## DATA: DAY 3

	1	2	3	4	1 Cover	2 Cover	3 Cover	4 Cover
	Uncover	Uncover	Uncover	Uncover				
Leaf								
Obs. &								
Color								
Leaf								
Size								
after 3								
days								

•Carefully remove the aluminum foil from the geranium leaf

•When measuring and observing the leaf, carefully handle it while collecting data
•Measure the leaf in centimeters, <u>NOT</u>
<u>INCHES!!!!!</u>

### DATA: DAY 7

	1	2	3	4	1 Cover	2 Cover	3 Cover	4 Cover
	Uncover	Uncover	Uncover	Uncover				
Leaf								
Obs. &								
Color								
Leaf								
Size								
after 7								
days								

•Carefully remove the aluminum foil from the geranium leaf

When measuring and observing the leaf, carefully handle it while collecting data
Measure the leaf in centimeters

## CONCLUSION

- 1. What observed changes in leaves' color and size occurred to the uncovered leaves of the geranium?
- 2. What observed changes in the leaves' color and size occurred to the covered leaves of the geranium?
- 3. What caused the differences in size between the covered and uncovered leaves?
- 4. Which leaves, uncovered or covered, were able to go through the process of photosynthesis? Which leaves were not able to go through the process of photosynthesis?
- 5. How does photosynthesis affect the color and size of the leaves in this experiment?

- <u>Photosynthesis</u> the process by which green plants and some other organisms use <u>sunlight</u> to make foods from carbon dioxide and water.
- The ingredients or <u>reactants</u> for photosynthesis are <u>water, carbon dioxide</u>, and sunlight.
- <u>Photosynthesis</u> happens within a plant cell's <u>chloroplast</u> and <u>cytoplasm</u>.
- In the <u>chloroplast</u> there is a <u>pigment</u> known as <u>chlorophyll</u>. <u>Chlorophyll</u> is the chemical used to trap <u>sunlight energy</u> used for the process of photosynthesis.

- <u>Water</u> enter the plants primarily through the <u>roots</u> of plants and <u>carbon dioxide</u> enter the plants through small openings on leaves known as <u>stomata</u>.
- Both water and carbon dioxide enter the cell through the <u>cell membrane</u>, and eventually enter the <u>chloroplast</u>.
- The <u>sunlight</u> energy is used to <u>split</u> water and carbon dioxide molecules into individual atoms of <u>hydrogen, oxygen, and carbon</u>.

- Hydrogen, oxygen, and carbon atoms go through several chemical reactions and get <u>rearranged</u> to form new molecules as <u>products</u>.
- The <u>products</u> of photosynthesis are <u>oxygen</u> gas and a <u>sugar</u> known as <u>glucose</u>.
- Oxygen gas leaves the plants through the stomata of the leaves while the glucose gets stored in the plants and used as a food source for energy.



## Photosynthesis Video

• <u>https://www.youtube.com/watch?v=JJxZH\_Y5D4s</u>



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