

1st Quarter Grade 9

Revised Standards on Living Things and Their Environment

Learning Competency: Conduct an experiment or investigation as proof that plants make their own food

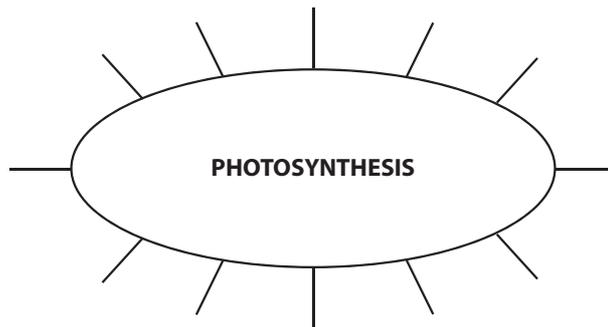
Lesson Focus: Evidence of Photosynthetic Occurrence

I. INTRODUCTION

Activating Prior Knowledge

1. Word Association

List down different words associated with the word photosynthesis.



2. Recall

Fill in the missing word to complete the passage.

"Photosynthesis is a process by which plant cells combine _____ and _____ in the presence of _____ to produce _____."

3. Pretest

Write TRUE if the statement is correct. Change the underlined word/s if the statement is incorrect. Write your answer on the space provided.

- _____ 1. Photosynthesis may occur on the stem of a plant.
- _____ 2. The food-making process of plants is affected by the intensity of light.
- _____ 3. If there is sufficient amount of water, the rate of photosynthesis is slow.
- _____ 4. The presence of water on the leaves of plants proves that plants undergo photosynthetic process.
- _____ 5. To test for the presence of starch on leaves, we usually use the iodine test.

II. BODY

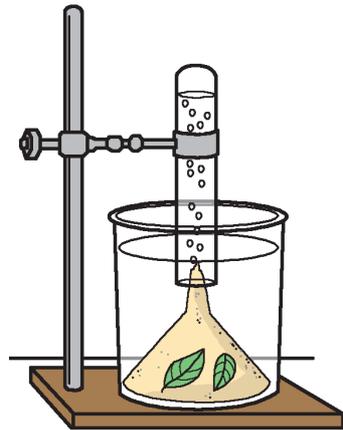
Experiment Time!

Materials:

2 beakers	2 test tubes	2 iron stands
2 funnels	2 Santan leaves or twigs of Hydrilla	2 iron clamps
lighter or matches		

Procedure:

1. Make two setups similar to the one on the right.
2. Take a few pieces of fresh Santan or Hydrilla leaves and place them inside the inverted funnel.
3. Fill a test tube with water and carefully invert it over the stem of the funnel, making sure that there is very little amount of air inside the test tube.
4. Leave one setup under the sun. The other setup should have its beaker covered with black garbage bag or manila paper to prevent sunlight from reaching the leaves.
5. Count the number of bubbles produced within 5 minutes after being exposed to sunlight for the first setup or after covering with garbage bag for the second setup.
6. After 10 to 15 minutes, or once the space the gas occupies inside the test tube has significantly increased, remove the test tube carefully and insert a lighter or a lighted matchstick into it. Observe what will happen to the flame.



III. CONCLUSION

1. Predict

Identify the requirements met and not met for photosynthesis to occur in the following situations:

- a. A rose plant submerged in floodwater
 - b. A lawn during a severe drought
 - c. A home plant in a well-lighted room at midnight
 - d. A cornfield on an evening with no moonlight
 - e. Sprouting seedlings in an open field on a sunny day
2. Post-test
Please refer to the pretest.

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Revised Standards on Living Things and Their Environment

Learning Competencies:

- Define respiration and give its importance to organisms
- Describe the role of mitochondria in the respiration process

Lesson Focus: Mitochondria and Cellular Respiration

I. INTRODUCTION

Activating Prior Knowledge

1. Vocabulary

Match the word in column A with its meaning in column B.

A	B
1. fermentation	a. complex process by which food is being converted into energy (ATP)
2. glycolysis	b. breaking down of glucose into pyruvic acid
3. respiration	c. site where cellular respiration occurs
4. oxidative respiration	d. the release of large amount of energy using oxygen
5. mitochondria	e. incomplete breakdown of organic compound in the absence of oxygen

2. Recall

Give the raw materials and products of the light and dark reaction of photosynthesis.

3. Pretest

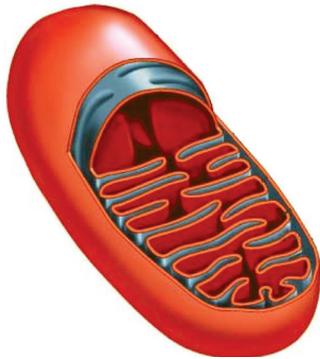
Analogy: For each set of terms, complete the analogy.

1. Photosynthesis: stores energy; cellular respiration: _____
2. Chloroplast: photosynthesis; _____: respiration
3. Oxidative respiration: _____; fermentation: absence of oxygen
4. _____: mitochondria's inner compartment; cristae: mitochondria's inner membrane folding
5. Cellular respiration: _____; photosynthesis: glucose

II. BODY

1. Labeling

Provide a large picture of mitochondria with its matrix and cristae. Let the students label its parts and give their functions in respiration. Point out also where the three stages of cellular respiration occurs.



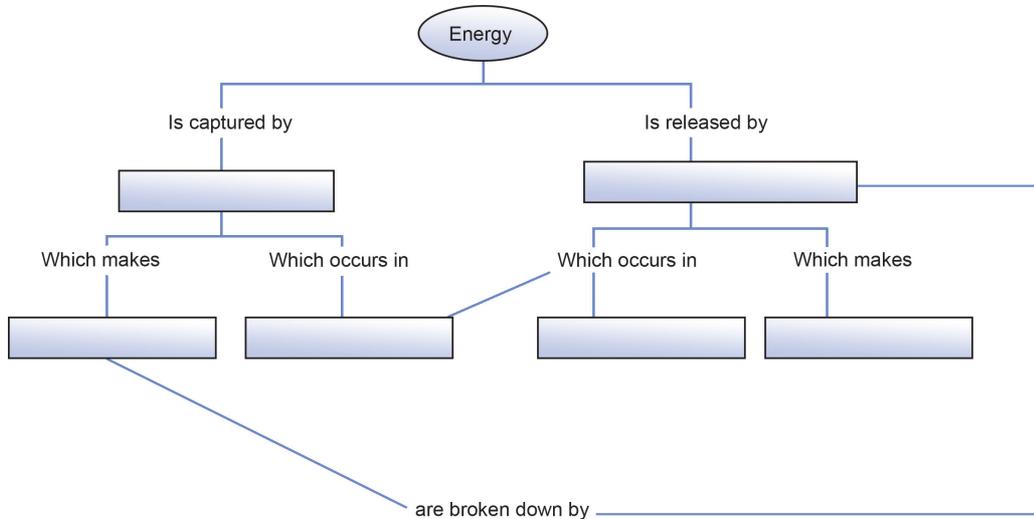
Drawing of Mitochondria

2. Create a flowchart of the different events in the three stages of cellular respiration.

III. CONCLUSION

1. Concept Map

Complete the missing words.



2. Post-test

Please refer to the pretest.

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Revised Standards on Living Things and Their Environment

Learning Competency: Explain the different patterns of non-Mendelian Inheritance

Lesson Focus: Non-Mendelian Inheritance

I. INTRODUCTION

Activating Prior Knowledge

1. Vocabulary

Using a dictionary, look for the meaning of the following:

- co-dominance
- incomplete dominance
- multiple alleles
- linkage

2. Recall

Let the students enumerate the three principles made by Gregor Mendel and have them explain or describe these principles.

- a. Law of Dominance and Recessiveness
- b. Law of Segregation
- c. Law of Independent Assortment

3. Pretest

- (1) Which is determined by multiple alleles?
 - a. Down Syndrome
 - b. Huntington's Disease
 - c. ABO Blood Group
- (2) If a black corn crossed with a white one forms one with grey color, there is...
 - a. Mutation
 - b. Recessive Trait
 - c. Incomplete Dominance
- (3) Which is not a sex-linked trait?
 - a. Diabetes
 - b. Hemophilia
 - c. Color Blindness
- (4) Red-green color blindness is caused by an x-linked recessive allele. A color-blind man marries a woman with normal vision whose father is color blind. There is a _____ chance that the couple's daughter will be color blind.
 - a. 0 percent
 - b. 25 percent
 - c. 50 percent
- (5) The ratio of children with normal vision to those who will be color blind will be...
 - a. 4:0
 - b. 1:1
 - c. 3:1

II. BODY

Rotational Learning

Let the students go over to every station made by the teacher. Every station has situations or activities that students should perform and guide questions that they should answer.

Station 1

Mix red paint with white paint. Observe what happens.

Guide Questions:

1. What is the resulting color after mixing two paints?
2. Relate your observation to genetics. Does it follow Mendel's Laws? What do you call this phenomenon?
3. Are there any examples that you can give similar to this phenomenon?

Station 2

Mix white sand with black sand. Observe the result of their combination.

Guide Questions:

1. What is the resulting color after mixing the two sands?
2. Is there a blending of colors? Why?
3. What do you call this phenomenon?
4. This combination is common among animals. Can you give some examples?

Station 3

Blood Types and Genes	
Blood Type	Genes
O	OO
AB	AB
A	AA or AO
B	BB or BO

Guide Questions:

1. What have you observed with the genes of the different blood types?
2. What do you call these kinds of alleles?
3. If you have type A blood, what are your blood genes? Which one is dominant over the other?

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Station 4

Thomas Hunt Morgan studied genetic variations in *Drosophila melanogaster* (fruit fly). See the result of his study below:

W : dominant gene for red eye

w : recessive gene for red eye

o : no gene partner for eye color

white-eyed male – X^wY^o x X^WX^W – red-eyed female

	X^W	X^W
X^w	X^WX^W	$X^W X^w$
Y^o	$X^W Y^o$	$X^W Y^o$

Result:

All males are normal (red-eyed).

Phenotype – All females are red-eyed.

	X^W	X^w
X^w	X^WX^w	$X^w X^w$
Y^o	$X^W Y^o$	$X^w Y^o$

Genotype – All females are carriers of white-eyed.

red-eyed male – X^wY^o

x X^WX^w – red-eyed female (carrier)

Result:

½ of the female – normal

½ of the female – carrier

½ of the male – normal

½ of the male – one white-eyed

Guide Questions:

1. Based on Morgan's study, who are mostly affected by this genetic condition? Why?
2. What do you call this phenomenon?
3. When can a female be affected? Show result using Punnett Square.

III. CONCLUSION

1. Generalization
 - A. Show a cross between red and white showing incomplete dominance and co-dominance.
 - B. Enumerate examples of sex-linkage or sex-linked traits.
2. Post-test
Please refer to the pretest.

1st Quarter Grade 9

Revised Standards on Living Things and Their Environment

Learning Competencies:

- Describe the structures and discuss the functions of plant parts and organelles involved in photosynthesis
- Identify the materials needed and the products produced in the photosynthetic process

Lesson Focus: Structures and Functions of Plant Parts in Photosynthesis

I. INTRODUCTION

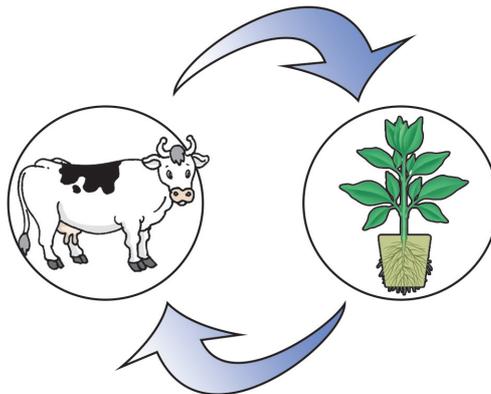
Activating Prior Knowledge

1. Vocabulary

Solicit from the students their own definition of photosynthesis based on what they have learned from their previous Science classes.

2. Recall

Let them explain the following diagram by citing some important information in the relationship between animals and plants.



3. Pretest

Complete the needed information in the table.

	Light Reaction	Dark Reaction
Raw Materials		
Products		
Place of Occurrence		
Light Requirement		

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II. BODY

1. Where do I belong?

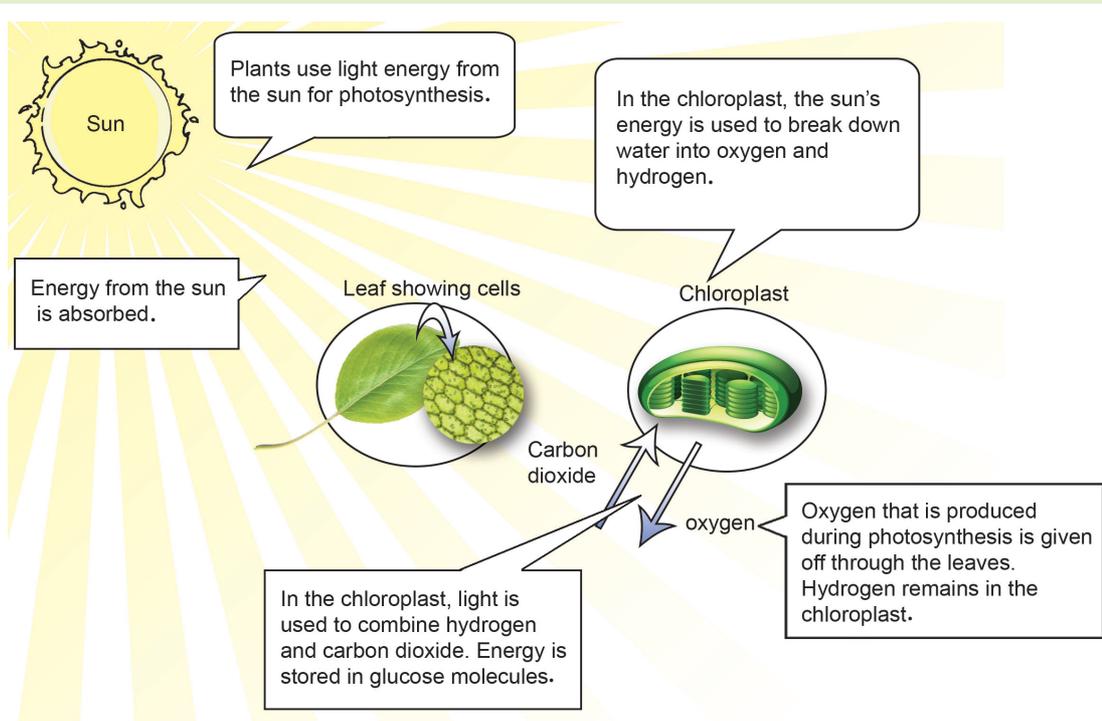
Below are functions of plant parts. Put them on their appropriate column as to whether they are the function of roots, stems, and leaves. Then highlight the functions in every plant part that makes it possible for photosynthesis to take place.

ROOTS	STEMS	LEAVES

Anchors the plant in the soil	Manufactures food	Conducts water and minerals upward into the stem
For reproduction	Absorbs water and minerals from the soil	Stores food and water
Releases water vapor through transpiration	For nitrogen fixation	Supports leaves and flowers
Conducts materials from roots to leaves and from leaves to roots	Produces new living tissues	

2. The Photosynthetic Process – A Group Activity

The class will be divided into five groups. Provide each group a puzzle to connect. The first to finish will also be the first to discuss their understanding of the process. However, a certain piece of the puzzle is missing. The group will then look for it on the teacher's table to complete their puzzle. Picture and illustrations are to be provided by the teacher.



III. CONCLUSION

1. Formula Making

Let the students create a formula showing the raw materials and products of photosynthesis.

2. Post-test

Please refer to the pretest.