



Subject Code	SCI 21101
Subject	SCIENCE1
Credit	1.5 units
Learning Standards	SCIENCE
Teacher	Ms.Genç Chonthicha
Grade Level	Grade 7 (Matthayom 1)
Learning Time	3 hrs/ week
Total Learning Time	60 hrs

Lesson Plan 2

Lesson Objectives:

Students will be able to model the molecules involved in the process of photosynthesis.

Differentiation Strategies to meet the needs of diverse learners:

English Learners: Students will use word triangles to review the molecules

involved in the process of photosynthesis. (To complete a word triangle, students draw one triangle for each word and divide the triangle into three bands horizontally. The new vocabulary is placed in the middle band, the definition of the word is written on the bottom band and a diagram of the word is written in the top band).

Special Education: Students will draw a leaf diagram and use this to illustrate what goes in (reactants), and what comes out (products) of photosynthesis.

GATE: Students will sequence the process of photosynthesis and identify specific reactions involved, using a “flow map” (or other suitable maps for sequencing events).

Materials:

- a. aluminum tray
- b. waxed paper
- c. 6 green marshmallows
- d. 12 pink marshmallows
- e. 18 white marshmallows
- f. sandwich bag for marshmallows
- g. 36 toothpicks
- h. gallon plastic bag
- i. colored pencils

Instructional Resources Used:

Brainstorm, Think-Pair-Share

Teacher asks students what materials are involved in the process of photosynthesis. Students think about the question for one minute, then turn to a shoulder partner and discuss their thoughts to the question. When all students have discussed the question, the teacher leads students in a brief, whole class share out of ideas, scripting possible solutions on the board.

Procedure

ENGAGE

Describe how the teacher will capture the students' interest.

What kind of questions should the students ask themselves after the engagement?

Teacher will lead students in a discussion about the substances necessary for plants to survive, and how plants obtain those substances.

Questions students should ask themselves:

1. What reactants are required for the process of photosynthesis?
2. What are the roles of chloroplast and chlorophyll in photosynthesis?
3. How is the energy from sunlight used to build sugars?

EXPLORE

Describe the hands-on laboratory activity that the students will be doing. List the "big idea" conceptual questions that the teacher will ask to focus the student exploration.

Students will model the reactants and products of photosynthesis by using different colors of marshmallows to build chemical compounds involved in the

process of photosynthesis. "Big Idea" Conceptual Questions:

1. Describe how energy from light is absorbed during photosynthesis and what happens to the energy after it is absorbed.
2. Describe why the first part, or the light-dependent part of photosynthesis, is

considered the “synthesis” part of photosynthesis.

EXPLAIN

What is the “big idea” concept that students should have internalized from doing the exploration?

List the higher order questions that the teacher will ask to solicit student explanations for their laboratory outcomes, and justify their explanations.

“Big Idea Concept:

1. The overall process of photosynthesis uses water and carbon dioxide to produce sugars that store chemical energy.
2. Sunlight is absorbed using plant pigments called chlorophyll, and the process of photosynthesis takes place within organelles called chloroplasts.
3. Energy from sunlight is captured during the light-dependent reactions and is used to build sugars during the light-independent reactions.

Higher order Questions:

1. Using the models you created, write the equation for the process of photosynthesis and explain in your own words your interpretation of the equation.
2. Describe what happens during the light-dependent and light-independent phases of photosynthesis.
3. Using what you know about photosynthesis, justify why a houseplant that does

not receive adequate amount of sunlight will end up dying.

EXTEND

Explain how students will develop a more sophisticated understanding of the concept. How is this knowledge applied in our daily lives?

a. b.

Students should create an analogy for the process of photosynthesis and compare each part of the process with some other process in everyday life. (Ex. The process of photosynthesis is like baking bread).

Students should practice growing some plants around the home or engage in some other type of agricultural activity to investigate the process of photosynthesis.

EVALUATE

How will the student demonstrate their new understanding and/or skill?

Teacher will ask students to imagine that they are leaves applying for a job in photosynthesis company. Students should create their “resume”, explaining their job qualifications and describing how they will efficiently get the job done. Descriptions must include key vocabulary such as stomata, water, carbon dioxide, light, energy, chlorophyll and chloroplast.

What is the learning product for the lesson? Student created “resume” with job descriptions.

Background Knowledge for the Teacher:

Photosynthesis is a process whereby green plants and algae convert radiant energy into stored chemical energy. During photosynthesis, light energy is absorbed by pigments in plant cells particularly, chlorophyll. The absorbed energy is used to combine water and carbon dioxide in a series of chemical reactions to produce simple sugars, particularly glucose, and to release oxygen back into the environment.

Source: Bilash, Borislav. A demo a day: a year of biological demonstrations. Batavia, IL: Flinn Scientific, 2001.