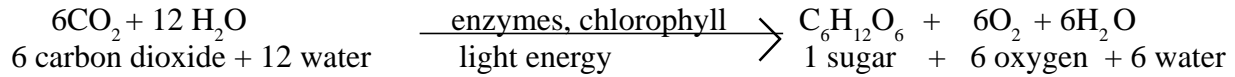


Photosynthesis Game

Classroom Activity

Photosynthesis is the process by which plants and some protists (such as algae) make their own food using sunlight. The formula is:



Water and minerals are absorbed through the roots. The carbon dioxide enters through the stomata (small holes) in leaves. Water and oxygen are released through the stomata in the leaves.

SYNOPSIS

Students will play the Photosynthesis Game to help them understand the process of photosynthesis. We recommend that the teacher first discuss the process through direct instruction so the students are familiar with the concept.

OBJECTIVES

Students will be able to:

- explain that some organisms can create energy through sunlight
- state that plants and some protists, such as algae, take in carbon dioxide and water and through a chemical process make sugar (energy) and oxygen.

VOCABULARY/CONCEPTS

- photosynthesis
- oxygen
- sugar
- carbon dioxide

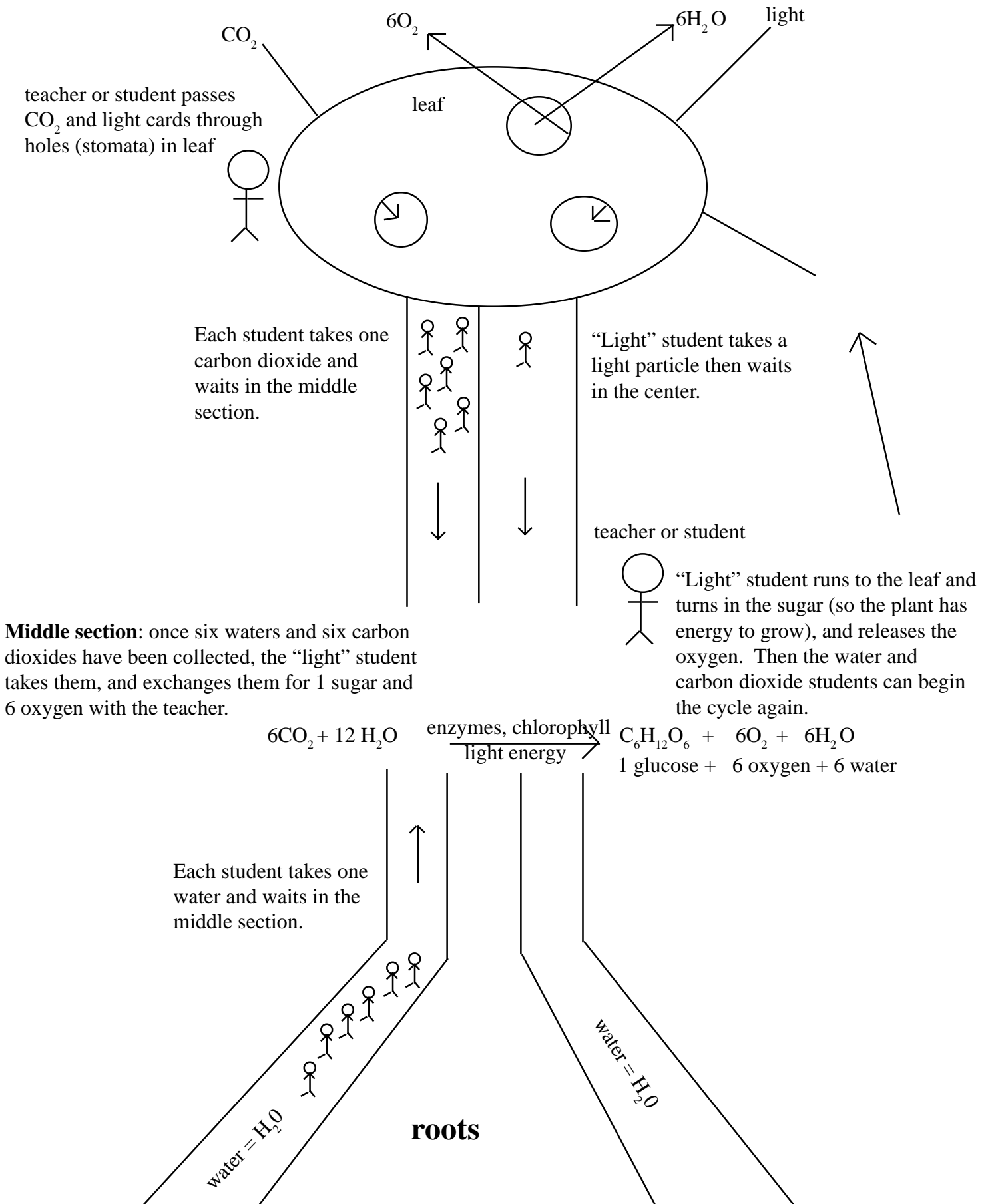
MATERIALS

- a large (3' x 3') leaf with holes made out of construction paper
- chemical cards (see following pages)
- space in which to play

PROCEDURE

1. See the diagram on the following page.

Photosynthesis Game



PROCEDURE (continued)

2. All of these pieces occur simultaneously:

Leaf: A teacher or student hands out CO_2 and light cards through holes (stomata) in the leaf

CO_2 : Students line up near the leaf and each collect one carbon dioxide card.

Once they have collected it from the leaf, they wait in the middle section.

Light: One student takes a light particle from the leaf and then waits in the middle section.

H_2O : Students line up in the root section of the plant. Each collects one water molecule and then waits in the middle section.

Middle Section: Once six carbon dioxide and six water molecules have been collected, the “light” student runs to the leaf and turns them into sugar (exchanges the six carbon dioxide and six water molecules for one sugar and six oxygen with the person working the leaf). The “light” student releases the oxygen and water through the leaf. Once this has occurred, the water and carbon dioxide students can begin the cycle again.

CHECK FOR UNDERSTANDING

- Have the students diagram the process on a piece of paper.
- Review the process of photosynthesis on the board, using a diagram. Have the students correct their own diagrams if they are inaccurate.
- Have each student verbally share his/her diagram with one or two other students.

EXTENSION

Students can conduct an experiment in which they grow bean seeds under two conditions: grown to sunlight and grown in darkness. The seeds should be watered regularly and otherwise exposed to the same conditions. After one week to 10 days, have the students make observations of the plants grown under different conditions. They can draw their observations, measure the length of the plant, count the number of leaves, and collect other relevant data. Once this has been done, expose the plant that was in the darkness to the light. After a few days, have the students record any changes. Remove the seedlings and have the students compare and contrast their root structure. Place a small plastic bag or glass bottle over a remaining seedling and expose it to the sunlight. Condensation should be present after a few hours. This is the water vapor that is given off by the plant as a result of photosynthesis.

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