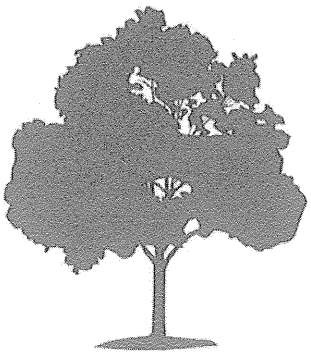
Elementary/Intermediate Activity: Photosynthesis Simulation

Background



Photosynthesis is the process by which plants convert radiant energy from the sun into chemical energy in the form of glucose (a sugar), which they store in their leaves, stems, roots, and fruits. The plants absorb water from the ground and carbon dioxide from the air and convert it into glucose and oxygen gas.

Overview

Students representing hydrogen, oxygen, and carbon atoms form water and carbon dioxide molecules, then absorb radiant energy and are transformed into a glucose molecule with stored energy and oxygen gas. Thirty-six (36) students are needed to represent the following roles: 12 hydrogen atoms (H), 18 oxygen atoms (O), 6 carbon atoms (C).

Materials (template of hangtags is on the next page)

- 1 flashing bulb (NEED strobe) representing energy
- 1 atom hangtag for each student
- 6 water signs
- 6 carbon dioxide signs
- 1 glucose sign
- 6 oxygen gas signs
- 1 ball of yarn

Preparation

1. Make 36 atom hangtags as listed above using 30-inch lengths of yarn.
2. Make 6 water signs, 6 carbon dioxide signs, 6 oxygen gas signs, and 1 glucose sign using poster board.
3. Write the photosynthesis conversion formula on the board:

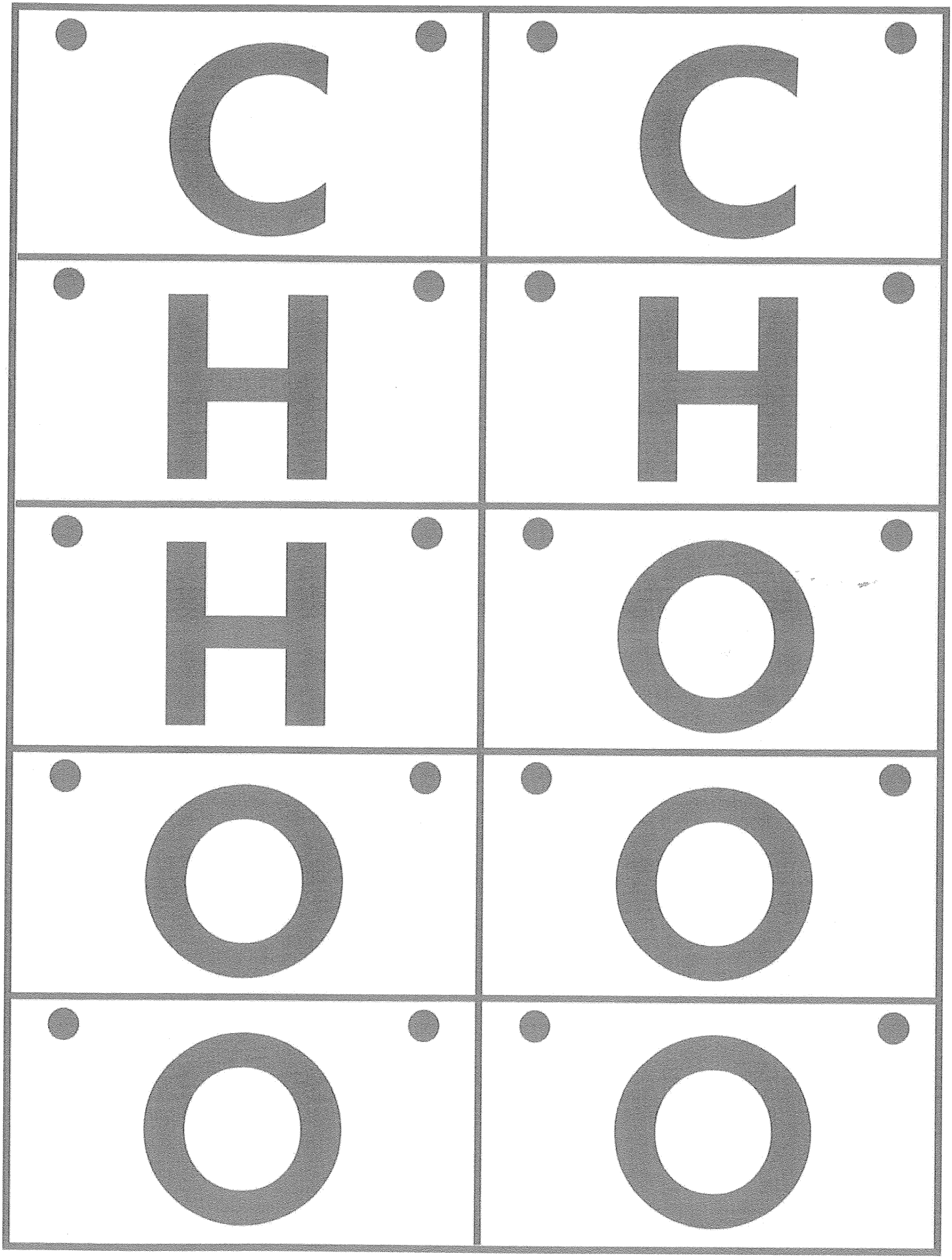
Procedure

1. Give each student a hangtag to wear around his/her neck.
2. Point out the conversion formula on the board and instruct the students to form water and carbon dioxide molecules by linking arms, then hold the appropriate molecule signs.
3. Turn on the flashing bulb and explain that it represents radiant energy.
4. Instruct the students to drop arms and transform into glucose and oxygen gas molecules by linking arms and holding the appropriate signs. Give the flashing bulb to the glucose molecule to represent the stored energy.
5. Have students trade hangtags and repeat the simulation.
6. Discuss photosynthesis.

Extension

Discuss the following questions:

1. Plants absorb carbon dioxide and produce oxygen; what about animals?
2. Why do fossil fuels contain chemical energy that was once stored in plants and animals?
3. When fossil fuels are burned, what is the impact on oxygen and carbon dioxide levels in the air?
4. What role do trees play in reducing global warming?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