



Investigating Photosynthesis through Kinesthetics

Lesson Overview

Unit Title: Photosynthesis

Lesson Summary: Recognize the photosynthesis equation. Engage Activity for Photosynthesis-should be taught before MC.3.B.4

Subject Area(s) and Grade Levels: Click box(s) of the subject(s) and grade(s) that your Unit targets.

Life Science Physical Science Earth Science 5th 7th Biology

Arkansas Framework: http://arkansased.org/education/word/biology_9-12_06.doc

SLE – Student Learning Expectation Details



- MC.3.B.4 Describe and model the conversion of light energy to chemical energy by photosynthetic organisms:
 1. light dependent reactions
 2. light independent reactions



- Balancing Equations



- Read non-fiction articles and construct benchmark style questions.
- Solar Powered Sea Slug video:
<http://www.newscientist.com/article/dn16124-solarpowered-sea-slug-harnesses-stolen-plant-genes-.html>

National Standards: <http://www.education-world.com/standards/national/index.shtml>

National Standards Details:

- Standard C: develop an understanding of the cell

Student Objectives and Procedures: (All 7-E's may not be present in a single lesson)

- Objective:**
- Recognize the photosynthesis equation.
 - Write the equations for photosynthesis with coefficients and subscripts (study time may be required).
 - Realize that the same carbon atoms that make up carbon dioxide make up the backbone for the glucose (carbohydrates) molecule.
- Focus Question:**
- How do cells obtain and utilize energy?

Prerequisites / Background Information:

- Document Included: Photosynthesis Background Information

Timeline: This activity can be completed in 15-30 minutes depending on the size of your class and their familiarity with the concepts presented.

- Preparation:** • Prep will take 1 hour the first time, then materials are reusable.
- Elicit/Engage:** • 15 min – 30 min
- Explore:**
- Explain:**
- Cleanup:** • 5 Min

Teacher Preparation:

- Copy templates and prepare cards.

Materials:

- 43 pieces of card stock or laminated cards. 1 poster board is optional.

Technology – Hardware: (Click boxes of all equipment needed)

- | | | |
|---|---|---|
| <input type="checkbox"/> Camera | <input type="checkbox"/> Computer(s) | <input type="checkbox"/> Digital Camera |
| <input checked="" type="checkbox"/> Projection System | <input type="checkbox"/> Television | <input type="checkbox"/> VCR |
| <input type="checkbox"/> Video Camera | <input checked="" type="checkbox"/> Internet Connection | <input type="checkbox"/> Other: |

Technology – Software: (Click boxes of all software needed.)

- | | | |
|--|--|---------------------------------|
| <input type="checkbox"/> Database/Spreadsheet | <input type="checkbox"/> Multimedia | <input type="checkbox"/> Other: |
| <input checked="" type="checkbox"/> Internet Web Browser | <input type="checkbox"/> Word Processing | |

Internet Resources:

Procedures:

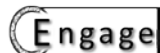
Teacher’s Notes:



- No horseplay in the lab. No special safety equipment is necessary.



- Give students the following warm-up activity:
 1. Write the equation for photosynthesis.
 2. Define atom, element, molecule and compound.



- This is the engage activity for the lessons on photosynthesis.
- This activity can be done as whole group with students actively moving about to create the photosynthesis equation or it can be done as table groups.

- The science specialists prefer the table groups doing the activity.

Explore

Explain

Elaborate



Evaluate



Formative Assessment

- Non-paper assessments such as verbal acknowledgment of equation, proper placement of elements in equation.

Summative Assessment

Extend



- This activity provides a good transition into the study of acids and bases, chemical bonding, study of nutrients, and the way that cells and the bodies of animals use energy.

Cross-Curricular



- Document included:
 1. Photosynthesis Cross-curricular Connections
- Other:
 1. Glucose & humans: Research or discussions could also be conducted to explore the physiology of diabetes.
 2. Students love to sing. Challenge students to include basic concepts about photosynthesis in a song, poem or rap.

Notes:

- Modified from an activity by: Eva Carswell, Westside High School, Macon, GA and Ananda Weerasuriya, PhD, Mercer University School of Medicine
- Photosynthesis Equation for the poster included.