



Modeling the Chloroplast

Lesson Overview

Unit Title: Photosynthesis

Lesson Summary: This is a hands-on activity designed to investigate the structure of the chloroplast.

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.1 Compare and contrast the structure and function of mitochondria and chloroplasts. This lesson deals only with the structure of the chloroplast.



- Resource: RAFT Example

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:**
- Students will describe and illustrate the structure and function of parts of the chloroplast.
 1. Design and create a model of the internal structure of a chloroplast.
 2. Know the names of the parts of the chloroplast.
 3. Relate the internal structure of a chloroplast to its function.
 4. Write a fact-based account of a journey through a chloroplast from the viewpoint of a molecule or photon.
- Focus Question:**
- How do cells obtain and use energy?

Prerequisites / Background Information:

- See Photosynthesis background document.

Timeline: 1 class period

- Preparation:** • 15 min
- Elicit/Engage:**
- Explore:** • 30 min
- Explain:** • 10 min
- Cleanup:** • 5 min

Teacher Preparation:

- The model should approximate the internal appearance as closely as possible with the materials provided. If studying respiration, the class may be divided, and half of the students assigned models of mitochondria. The models can also be retained and used for comparison to mitochondria in future chapters.

Materials:

- Paper plate or oval cardboard base, glue, scissors, green craft materials,
- Labels for internal structures, green markers,
- Diagrams of chloroplasts and text.

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

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

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

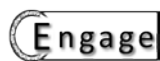
- | | | |
|---|--|---------------------------------|
| <input type="checkbox"/> Database/Spreadsheet | <input type="checkbox"/> Multimedia | <input type="checkbox"/> Other: |
| <input type="checkbox"/> Internet Web Browser | <input type="checkbox"/> Word Processing | |

Internet Resources:

Procedures:	Teacher's Notes:
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- Appropriate classroom behavior required.
- No specific safety equipment.
- Use caution with scissors or hot-glue guns.



Explore

- Students will design and construct a model of a plant chloroplast using textbooks or diagrams as reference. If studying respiration, the class may be divided, and half of the students assigned models of mitochondria.
- The models can also be retained and used for comparison to mitochondria in future chapters.

Explain

Elaborate



- Students can compare their own model to others and practice identifying the correct parts of the chloroplast.

Evaluate



Formative Assessment

- Students' models may be evaluated for accuracy.

Summative Assessment

- RAFT Writing Prompts:
Write a fact-based account of a journey through a chloroplast from the viewpoint of a molecule or photon.

Extend



Cross-Curricular



- Art
- Literacy
- Technology

Notes: