Photosynthesis Lesson Plan: MAT/Certification Elementary

Candidate Name: Alison Annis	**Host Teacher Name: Heather King**	
School: Ravenwood Elementary	**Grade Level(s): 5**	**# of Students: 24**
Date & Time of Lesson: 10/9/2015, 9:00 am	**Length of Lesson: 1 hour**	
Topic of Lesson: Photosynthesis	**Content Area(s): Science**	
Materials including technology: Ceramic boot with little green silk sprout in it (prop), Microscope with algae slide, green paper with leaf printed on it, five paper arrow labels in varying colors, document camera, white screen, photosynthesis "cootie catcher" foldable. **Students will need glue sticks, green color pencil or marker, pencil and science notebook.**		

Alaska Standards:

C1—Concepts of Life Science

GRADE 5

The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by

[5] SC2.1 identifying and sorting animals into groups using basic external and internal features

[5] SC2.2 explaining how external features and internal systems (i.e., respiratory, excretory, skeletal, circulatory, and digestive) of plants and animals may help them grow, survive, and reproduce

[5] SC2.3 recognizing that organisms are composed of cells

The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by

[5] SC3.1 diagramming how matter and energy are transferred within and between living and nonliving things

[5] SC3.2 organizing a simple food chain of familiar plants and animals that traces the source of the energy back to sunlight

Profile of Your Students (cultural, language, developmental and behavioral characteristics):

This is a classroom comprised of all Caucasian students in a neighborhood school that services middle and upper middle class neighborhoods. There is only one student in this class who gets math and reading support from the resource department. Based on my observations so far, there are only two boys who engage in attention seeking behavior occasionally. The class is generally well behaved and engaged.

STAGE ONE	**STAGE TWO:**
Objective(s): 1. I can diagram how energy is transferred. 2. I can explain internal systems.	**Student Assessment:** 1. I can diagram how energy is transferred by creating a paper model of a leaf. 2. I can explain internal systems of a leaf by labeling the parts of plant respiration (photosynthesis) accurately.

STAGE THREE: Opportunities to Learn

Introduction/Hook: Place ceramic boot/sprout on desk. (prop that looks like the plant in the boot on WALL-E) Remember last week when we talked about WALL-E, and why the people had to leave Earth and live in space? Today we are going to talk about photosynthesis, how it happens inside plants, and why it's so important.	
Procedure and products	Differentiation/Accommodations/Modifications

• Instruct students to get out their science notebooks. • Pass out green leaf • Give instructions to fold paper in half and cut leaf shape out of paper careful to leave it attached at one edge. • Students use glue stick to glue leaf on blank page in science notebook. Leaf should be in two attached parts so that it opens up like a card. Only one side is glued to the page. • Label top of page "Photosynthesis" (demonstrate all using document camera) • Explain that inside leaves are plant cells and inside the plant cells are Chloroplasts that contain Chlorophyl which convert 3 of the following components into 2 of the following components. • Draw a rudimentary cell with Chloroplasts and Chlorophyl inside. • Instruct students to draw and label a plant cell on the inside of their leaf. Explain the following components • pass out the BRIGHT YELLOW arrow • Instruct students to cut it out and label "Sunlight" on the arrow. Demonstrate. • Glue arrow on the outside of the leaf to represent external element of photosynthesis. • Pass out the GOLDENROD colored arrow, cut out, label CO2, glue to the outside of the leaf pointing in. • Pass out BLUE colored arrow, cut out, label, water (H2O) (from roots) glue to inside of leaf pointing in. • Pass out PINK arrow, cut out, label Glucose C6H12O2, glue to inside of leaf <u>pointing out</u> • Pass out PASTEL YELLOW paper, cut out, label, Oxygen O2, glue to inside of leaf <u>pointing out.</u> Next explain that the energy from the sun becomes energy contained in the plant in the form of glucose. Animals eat the plants, other animals eat them, sometimes people eat animals, and the energy is transferred up the food chain. Remind them of our lesson on producers, consumers, and decomposers and the food chains in the Alaska Ecosystem. Bring in a yellow leaf and a green leaf. Talk about the differences and why. — in fall, leaves stop photosynthesizing and the chlorophyll disappears from the cells. Students who finish their paper model can peer into the microscope to see the plant cells of algae. It's only 40x magnified but you can see the cell structure, next they can get a "Cootie Catcher" to fold. They will have time to quiz each other on the definitions.	Visual demonstration and repetition of instructions and labels will help visual learners and students who benefit from repetition. I will be mindful to pace myself slowly with pauses to be sure all students are following along. Passing out the arrows one at a time will help students avoid confusion. Creating the paper model is a hands on activity that will help tactile learners and encourage engagement in all students.

Closure: Students who complete the leaf diagram/model in their science notebooks get a “cootie catcher” fold as an exit ticket. They can fold it and begin using it to study the terms related to photosynthesis.

Reflection

This was a fun lesson and it went really well. We started the conversation by going deeper into the idea of WALL-E and what had happened to the earth to make it so uninhabitable. We talked about how life was no longer “sustainable” and what that meant.

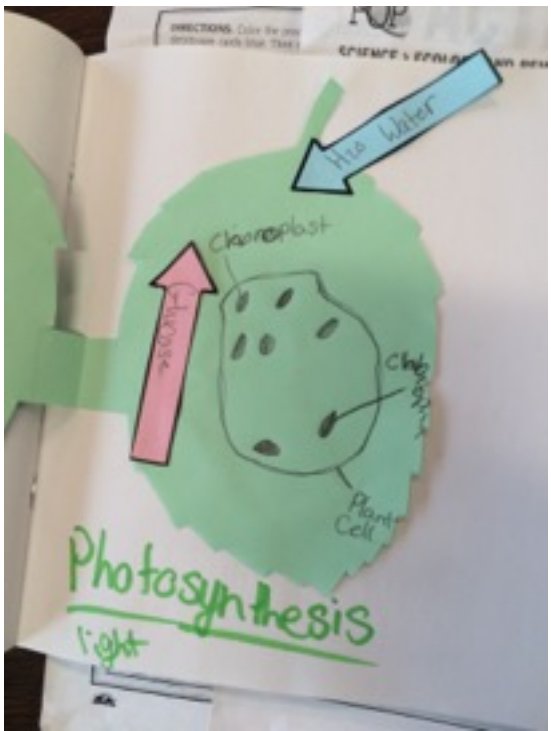
The kids liked creating the paper model and adding the arrows in a particular order helped make the concept easier for the students to understand. I told them this was like making a “recipe card” to help them think of it in a relatable way. They answered my questions as we went through the steps and I made sure to call on different students to gage understanding throughout. I used repetition and by the end I felt the students had a good grasp of how photosynthesis works and the three parts in/two parts out.

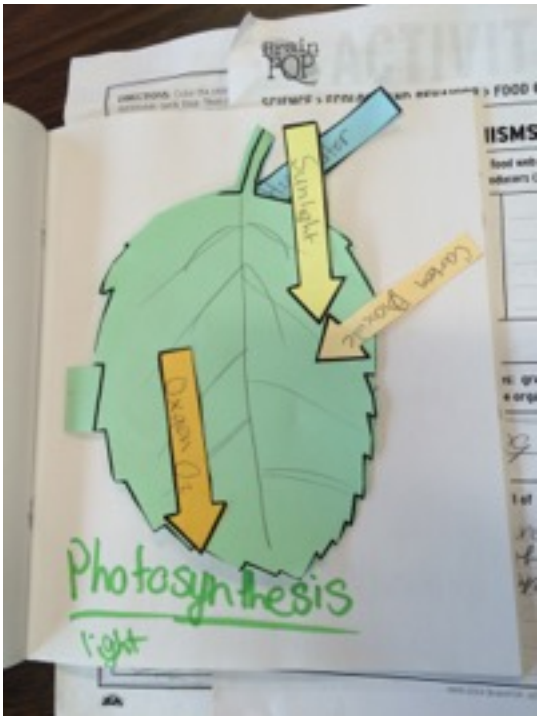
Since chloroplasts are the glucose/oxygen factories in the plant cell I wanted to have that in the diagram. I debated about including other parts of a cell but felt that that was an entire other lesson on it’s own and may even be too advanced for 5th grade. I thought they may not care about Golgi bodies, vacuoles, and mitochondria and their functions until they have to memorize them in 10th grade biology. I did tell the students that there are many more parts in a cell than just the chloroplasts but since we were studying photosynthesis, we really only needed the chloroplasts.

I brought in a huge yellow leaf from my morning walk with my pugs. It had turned mostly yellow and had a few patches of green here and there. We had a discussion about why that was the case and the students understood that it was because the chloroplasts had stopped working and the chlorophyl went away. Many of them said that they (correctly) thought photosynthesis had stopped.

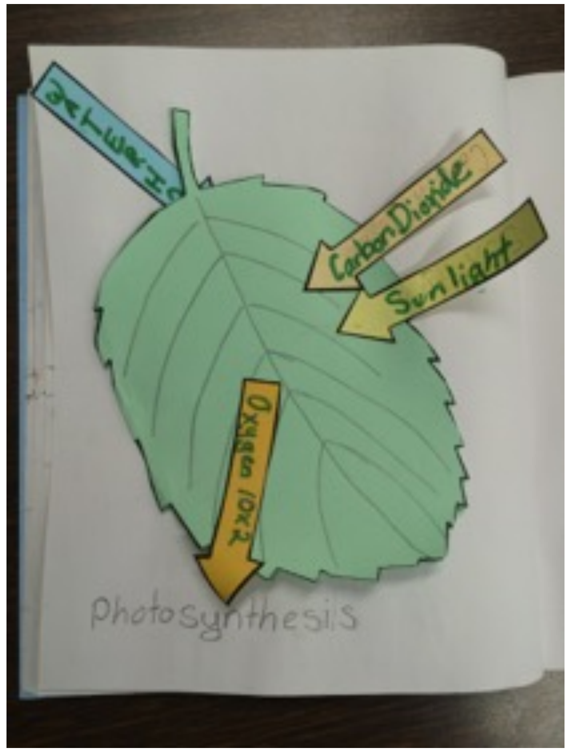
They thought the leaf was cool and getting to look through the microscope was fun. It is a toy microscope my son go for Christmas but it does have 40x magnification which (luckily) is enough to see the plant cell shapes on a slide with algae in it. They had fun with the fortune tellers (cootie catchers) at the end. They were a good tool for reviewing the photosynthesis terms.

Attachments: 3 artifacts of student work





plant cell
osynthesis



Carbon Dioxide
Sunlight
photosynthesis

Multiple Choice Question:

Alison used several props in this lesson including:
a) a large yellow leaf
b) a microscope
c) a ceramic boot with sprout
d) all of the above

Sources:

Alaska Science Standards:
https://education.alaska.gov/AKStandards/standards/standards.pdf

Photosynthesis "Cootie Catcher" purchased from:
teacherspayteachers.com