

# Science Lesson Plan Template: 5E Learning Cycle

Date of Lesson: 11/4/14

<b>Lesson Title: Photosynthesis</b>		
<b>Lesson: 1 of 3</b>	<b>Time Allotted for this Lesson:</b> 50 minutes	
<p><b>Standard:</b> HS-LS1-5. Using a model to illustrate how photosynthesis transforms light energy into stored chemical energy</p> <p><b>Goal 1:</b> Students will Demonstrate comprehension of Photosynthesis.</p> <p><b>Goal 6:</b> Students will predict the affect water, light intensity, and temperature has on the rate of photosynthesis.</p>	<p><b>Objective 1.1</b> Describe photosynthesis as the process that uses the energy from the sun to convert water and carbon dioxide into sugar and oxygen.</p> <p><b>Objective 6.1</b> Indicate how these factors affect plant growth and stored energy. The rate of photosynthesis and stored chemical energy.</p> <p>Students will be able to perform these objectives with 80% + accuracy.</p>	
<p><b>Pre-Requisite Knowledge and/or Skills:</b></p> <p>A. <b>Prior Knowledge.</b> Planting gardens and growing fruits or vegetables</p> <p>B. <b>Pre-Requisite Skills:</b> writing, art, and designing</p> <p>C. <b>Misconceptions:</b> how factors affect rate of photosynthesis</p> <p>D. <b>Scientific Vocabulary:</b> rate, factors, raw material, enzymes, intensity</p>		
<b>Scientific Vocabulary Introduced:</b>		
<b>Prep &amp; Setup (beforehand)</b>	<b>Materials/Equipment/Supplies</b> <b>How many? Per group or?</b>	<b>Technology:</b>
Rubric directions Seed packages posterboard	1 for each student 15 seed packages	Phones, tablets, and computers for research on the internet.
<p><b>Safety Considerations</b> Room is crowded, so students will need to be aware of each other when moving around.</p>		
<b>Procedure: Teacher</b>		<b>Procedure: Students</b>
<b>Time</b>	<p><b>Engage: Motivation/Hook:</b> Distribute packages of seeds to students.</p> <p>Ask them, what are the main factors that plants need in order to photosynthesis and grow?</p> <p>Have students locate these factors on the back of the package.</p>	<p><b>Engage: Motivation/Hook:</b> Student will turn to a partner and locate these seed plant requirements labeled on the back of the package.</p>

	<p>Temperature, sunlight environment and watering preference on the back of the package for each plant.</p>	
	<p><b>Explore-</b>          Explain to students how scientists really work. In teams, gathering information, designing, testing, designing more, working with members in the community.</p> <p>Give students the opportunity to choose which region on the planet they want to build their community garden. They will have to explore the area to determine which plants will thrive in that region.</p> <p><b>Explain-</b> Describe photosynthesis using Prezi, include the elements needed from the environment and the products released.</p> <p>Explain to students how scientific teams work (STEM) and the rationale for doing this assignment.</p> <p>In a 2-3 page paper students will have to justify their plants and their community garden design.</p> <p><b>Elaborate-</b> Three factors that affect photosynthesis. Draw a diagram of their garden</p> <p><b>Evaluate – Rubric</b></p> <p>Partner with city council board members in Alaska for students to submit community garden plan designs and write-up for proposal and feedback.</p>	<p><b>Explore-</b> Students will explore different regions around the globe and design a community garden that will benefit the people in that specific area.</p> <p><b>Explain-</b> Students will describe photosynthesis including the raw materials needed from the environment and the products released.</p> <p>Students will explain in a 2-3 page written paper with their team of 4 members why they selected the plants for their garden and discuss how these plants will provide nourishment and self-reliance to the people living in the area.</p> <p><b>Elaborate-</b> Students will give detailed description of the region and how the three factors will affect the rate of photosynthesis in the plants they have chosen in their garden and how they swayed their decision in selecting those specific plants.</p> <p>Students will design in a model, on the computer or in a drawing their community garden. They must include 7+ different variety of fruits and/or vegetables. Provide location and measurements for the area and planter boxes if they choose to include those. They will need to include structures around the perimeter to keep out animals. All this must be done with the regions natural resources and on a budget.</p> <p><b>Evaluate –</b> Students will evaluate the reason for helping the people in the regions community and the responsibility scientists have in designing beneficial contributions to society.</p>

	<p><b>Closure:</b> Ask students – “What do scientist do?”</p>	<p>Students will stand in two lines each facing the other and share their thoughts to this question.</p>
<p><b>Meeting Varying Needs of Students:</b>  Differentiation is met by having visuals, realia, and variety of activities that will meet the needs of different learning styles such as, logical, linguistic, spatial, and naturalist.</p>		
<p><b>Assessment</b></p> <ul style="list-style-type: none"> <li>• Evidence of learning collected during this lesson: formative assessment will be gathered while groups are creating community gardens.</li> <li>• Students able to meet the objectives; describe photosynthesis and indicate the factors that affect the rate of photosynthesis.</li> <li>• During the discussion and directions, students were able to respond with correct answers when prompted or did they continue to ask for concepts to be clarified.</li> <li>• These formative assessments will signal whether I can move on, if misconceptions have been replaced with definite understanding, or if I need to re-teach.</li> <li>• The final project will be used as a summative assessment to give me further evidence as to whether or not students “got” the concepts.</li> </ul>		
<p><b>Reflection:</b>  The students were eager to choose from the eight regions I offered for this assignment. They were thrilled to use their phones, tablets and the computers as a resource. This allowed them to be actively engaged and collaborate through the entire 30 minutes allotted for this activity. Students showed enthusiasm for the opportunity to be creative, and were busy telling each other about “fun facts” they had not known about plants from other regions in the world.  Changes I would make would include</p> <ul style="list-style-type: none"> <li>• Clearly defined directions for paper and garden design, a rubric was not sufficient enough for student comprehension.</li> <li>• Model example of a designed garden and provide visuals of Horticulturalists participating in humanitarian community gardens.</li> </ul>		