

**A Photosynthesis Performance Task**  
**Transforming Energy and Matter from the Environment**

**Task Description**

In this assessment, students will explain how plants use energy and matter from their environment to perform the essential function of Photosynthesis. This task focuses on the big ideas of photosynthesis and includes science practices of making a claim and supporting it with evidence. The attached rubric can be used to help students identify areas of mastery for the topic.

**Student Learning:** The following objectives are measured by this task:

*Identify key features of the photosynthetic reaction.*

*Select and explain a model illustrating how energy from sunlight is captured by chloroplasts and used by plants.*

*Apply concepts of photosynthesis to develop a valid argument about variables affecting a plant's mass.*

*Determine whether given information supports a simple hypothesis or conclusion.*

*Evaluate a model to explain how matter is transformed in the process of photosynthesis.*

*Use a chemical equation to represent the process of photosynthesis.*

*Describe how energy is transformed in the process of photosynthesis.*

**Answer Key**

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1. water, carbon dioxide, air, sunlight, energy, food, minerals (or any acceptable synonym)

2a. A. 2b. chloroplasts or chlorophyll 2c. acceptable responses include but are not limited to: grow, make food, make seeds, reproduce. (Do NOT accept: make food for animals and people.)

3. A complete answer must include the following: Choice D, carbon dioxide; discusses that carbon dioxide is taken in by the plant and transformed.

Sample Answer:

Choice D is correct because the tree uses the carbon dioxide in the air to make food which is used to make wood. Carbon dioxide is correct because plants use carbon dioxide during photosynthesis. The carbon becomes part of the cellulose in the tree.

4. Disagree. Acceptable responses include but are not limited to: the soil in the experiment did not lose a significant amount of weight, the tree was dried before it was weighed, plants gain most of their mass from the carbon dioxide in the air.

5. A complete answer must include the following terms:

5a. glucose (or sugar)

5b. carbon dioxide (also accept CO<sub>2</sub> or air)