

Educational Resources from *Phenomenon Science Education*
Student Proficiency Goals for **NGSS HS-LS1-5**



Information about HS-LS1-5

NGSS Performance Expectation HS-LS1-5.

Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

Clarification Statement.

Emphasis is on illustrating inputs and outputs of matter and the transfer and transformation of energy in photosynthesis by plants and other photosynthesizing organisms. Examples of models could include diagrams, chemical equations, and conceptual models.

Assessment Limits.

Assessment does not include specific biochemical steps.

Science and Engineering Practice (Developing and Using Models)

- Use a model based on evidence to illustrate the relationships between systems or between components of a system.

Disciplinary Core Idea (LS1.C: Organization for Matter and Energy Flow in Organisms)

- The process of photosynthesis converts light energy to stored chemical energy by converting carbon dioxide plus water into sugars plus released oxygen.

Crosscutting Concept (Energy and Matter)*

- Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

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Student Proficiency Goals

SEP (Developing and Using Models):

- Students use a model to illustrate the inputs and outputs of matter (e.g., oxygen, carbon dioxide, water, and sugars) during photosynthesis.
- Students use a model to illustrate the transformation of light energy into stored chemical energy during photosynthesis.
- Students use a model based on evidence to illustrate the organization and interactions among the components of a system and/or between systems involved in photosynthesis.

DCI (LS1.C Organization for Matter and Energy Flow in Organisms):

- Students know that the process of photosynthesis converts light energy into stored chemical energy.
- Students know that the process of photosynthesis converts carbon dioxide and water into sugars and oxygen molecules.

CCC (Energy and Matter):

- Students consider the flow of energy, into, within, and out of a system, through the process of photosynthesis.
- Students consider the flow of matter, into, within, and out of a system, through the process of photosynthesis.

*The official [NGSS](#) parsing of HS-LS1-5 displays a different CCC element (for Systems and System Models) than is used for the actual building of the performance expectation. As the Energy and Matter element listed with the performance expectation is an actual high school component of Energy and Matter, and given the wording of the official clarification statement, we expect that the error is in the parsing and have developed these proficiency goals using the Energy and Matter component.