

Lesson Topic: Photosynthesis

Objective:

Students will be able to:

1. Explain the process of photosynthesis
2. Describe the components of photosynthesis

Time Required: 110 minutes

Materials Needed:

- (2) Leaf (recently picked from living plant)
- (2) Glass bowl filled with water
- (2) Small rock or weight
- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Double-sided copies of Photosynthesis handout and Photosynthesis Comic Strip (attached)

Teacher Preparation:

- Assign a Legends of Learning Instructional [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Instructional - Middle School - Photosynthesis
- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
 - Content Review - Middle School - Photosynthesis
- Make copies of the Photosynthesis handout (1 per student)
- Set up “leaf breathing” demonstration
 - Take glass bowl and fill with water several hours before class begins
 - Take leaf and submerge under the water
 - You can use a small rock or weight to make sure water is covering the entire leaf
 - Place bowl in sunny spot

Engage (10 minutes):

1. To engage students, show them a glass bowl filled with water and a leaf just recently picked.
2. Take the leaf and submerge it under water, using a rock or weight if necessary.
3. Ask for students predictions on what they think will happen after the bowl with the leaf is left in the sun.
 - a. Answer: The leaf will take sunlight and turn it into sugar. Also, accept reasonable answers and prompt students to justify their predictions with previous knowledge about how plants use sunlight to survive.
4. Take out glass bowl with leaf previously set up before class. Show students the bowl and have them take note of any differences.

- a. Answer: There will be tiny bubbles on the leaf and the edges of the bowl. These bubbles are the oxygen the leaf expels during photosynthesis.
5. Explain to students: “The bowl with the leaf is demonstrating a process called photosynthesis, which is how plants make sugar, or food, using the sun’s energy. The byproduct of this chemical reaction is oxygen, which plants release into the air. You can see this in the demonstration through the bubbles that are in the water and on the leaf. Those are oxygen bubbles that the leaf is releasing! Think about this demonstration during today’s lesson and we will refer back to it at the end of class.”

Explore (30 minutes):

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Instructional playlist.
2. As students complete the assigned game, students should fill out the boxes on the Photosynthesis Handout.
3. Assist students as needed during game play, pause playlist if you need to address content or questions to the entire class.

Explain (10 minutes):

1. Review answers to Photosynthesis Handout by drawing diagrams on board or using Smartboard.
2. Relate student knowledge to demonstration at the beginning of class.
 - a. What are the three components that go into photosynthesis? (sunlight, water, carbon dioxide)
 - b. What does photosynthesis produce? (oxygen and glucose/sugar)
3. Show video [The Photosynthesis Song](#) on Youtube.com

Elaborate (45 minutes):

1. Explain to students that they are going to use their knowledge of photosynthesis to create a comic strip that contains the process of photosynthesis. Depending on time, this can be done independently or in partners.
2. Instruct students to flip handout over and go over the required elements for the comic. Give more individualized instructions such as neatness, complete sentences, etc as needed.
3. Give students time to map out and create a comic strip.

Evaluate (15 minutes):

1. After students have finished, have partners or individual student volunteers present their comic strip to the class.
2. Collect comic strips for a grade.
3. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Content Review playlist.
4. [Analyze student results](#) to determine what concepts need to be a focus for reteaching.

Additional Lesson Strategies:

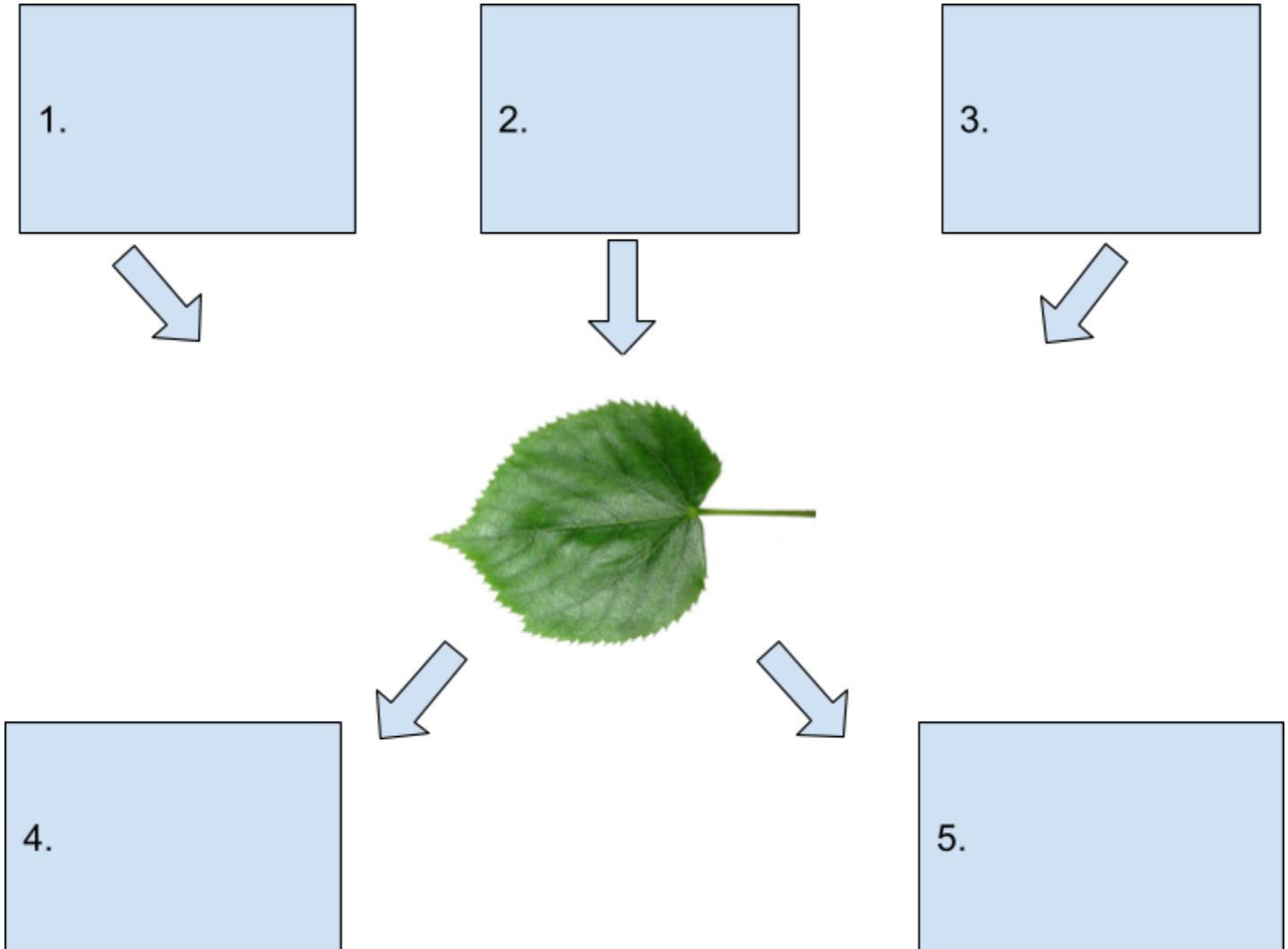
- To use Legends for additional instruction, create a [custom playlist](#) with an [instructional game](#) and pre and post [assessment](#).



- To use Legends for a quick formative assessment, create a 5-question [assessment](#) in a [playlist](#).
- To use Legends for a student-directed experience, create a [targeted freeplay](#) playlist.
- Encourage students to play on their own at home in [Legends of Learning: Awakening](#) for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in class.

Photosynthesis

Directions: Fill in the boxes below with the reactants/products of photosynthesis.



Photosynthesis Comic Strip

Required:

- Show all steps in photosynthesis
- Draw and label carbon dioxide, sunlight, water, oxygen, and glucose/sugar
- Each box should have a drawing and matching description. You do not need to use all available boxes.

1.	2.	3.
4.	5.	6.
7.	8.	9.

Photosynthesis Key

Directions: Fill in the boxes below with the reactants/products of photosynthesis.

