

Teacher's Guide

Grade 5: Carbon Dioxide-Oxygen Cycle



TEKS 5.9 Organisms and Environments: The student knows that there are relationships, systems, and cycles within environments. The student is expected to:

D) identify the significance of the carbon dioxide-oxygen cycle to the survival of plants and animals.



Background Information: In this unit students learn how the processes of photosynthesis, respiration, and decomposition help cycle carbon dioxide and oxygen between living things. Plants release oxygen into the atmosphere during photosynthesis while respiration by plants and animals and the decomposition and decay of dead organisms releases carbon dioxide into the atmosphere. These three produce maintain a cycle in which plants and animals depend on and benefit from each other. Plants need the carbon dioxide produced by respiration and decomposition and animals need the oxygen produced by plants. This cycle helps maintain the balance of carbon dioxide and oxygen in our atmosphere.



Prerequisite Knowledge: Students know that living things interact within their environment and depend on one another for survival. They know that plants and animals have basic needs and depend on both living and nonliving parts of the environment. Students have learned that photosynthesis is the process plants use to convert sunlight, water and carbon dioxide into sugar the plant uses for food.



Common Misconceptions: Students may think that plants do not need air to survive, but almost all living things need air. Students may see plants as having a reverse breathing, inhaling carbon dioxide and exhaling oxygen. Plants actually take in both, using carbon dioxide to produce food and oxygen to release energy from stored sugars.

Some students will think that respiration and breathing are the same. While breathing takes place in organisms with lungs or gills, respiration takes place in all living things.



Essential Questions:

- 1) What are the three processes necessary for the carbon dioxide–oxygen cycle and how do they work together?

Photosynthesis, respiration, and decomposition are processes that are responsible for maintaining the carbon dioxide–oxygen cycle. The process of photosynthesis in plants releases oxygen into the atmosphere. Respiration by plants and animals, as they use the energy stored in food, and the process of decomposition of dead organisms, releases carbon dioxide into the atmosphere. All three work together to maintain the carbon dioxide-oxygen cycle.

- 2) How would you describe the differences between photosynthesis and respiration?

Photosynthesis only occurs in plants, but respiration occurs in both plants and animals. Photosynthesis uses carbon dioxide and releases oxygen. Respiration uses oxygen and releases carbon dioxide. Photosynthesis allows plants to make food while respiration allows plants and animals to get energy from their food. Finally, photosynthesis requires sunlight, but respiration does not.

- 3) Why is the carbon dioxide–oxygen cycle important for all living things?

The carbon dioxide–oxygen cycle maintains the balance of these gases within the atmosphere so all plants and animals have what they need to survive.

- 4) What might be the result if most of the plants in the world suddenly died?

If most of the plants suddenly died, then the amount of oxygen in the atmosphere would decrease and the level of carbon dioxide would increase.



Notes: