

5.1

The Roles of Organisms in an Ecosystem

You, like all members of human communities, play several roles. At school you are a student, after school you may be on a sports team, at home you are part of a family. Organisms in a natural community also play different roles within their ecosystem. An organism's role within an ecosystem depends on how it obtains its food. Plants and animals obtain their food in very different ways, so they have very different roles in an ecosystem. The way in which an organism obtains food also affects its interactions with other organisms in the ecosystem.

Producers

Plants have the ability to make their own food through a process called **photosynthesis**. In photosynthesis, plants use energy that they absorb from the Sun, water that they absorb from the soil, and carbon dioxide that they absorb from the air to make food in the form of sugar (Figure 1). Because plants produce their own food through photosynthesis, they are known as producers. **Producers** are organisms that are able to make their own food using abiotic elements in the ecosystem. Plants use only some of the food they make to perform life processes. Any food that they do not use is stored in the form of starch.

photosynthesis: a process by which plants use water, carbon dioxide, and sunlight to produce sugars (food)

producer: an organism that makes its own food from non-living materials

LINKING TO LITERACY

Summarize Your Understanding

In your own words, summarize the process of photosynthesis. Refer to the diagram to support your understanding.

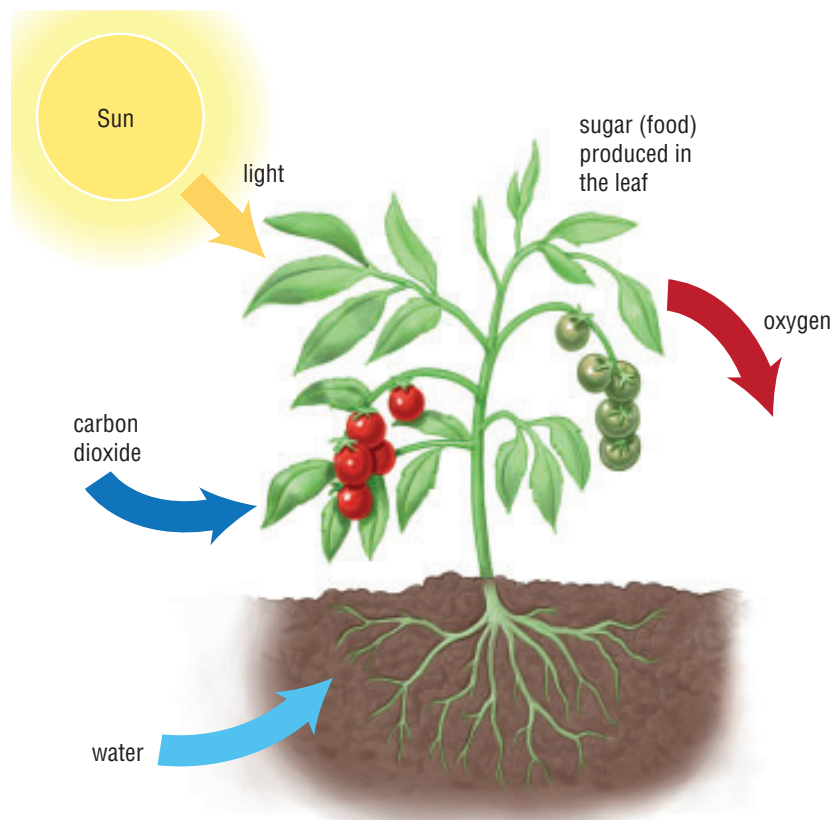


Figure 1 In photosynthesis, energy from the Sun, carbon dioxide, and water combine to produce sugars that the plant can use for food.

The process of photosynthesis can also be written as a word equation:



Oxygen is another product of photosynthesis. Plants need oxygen to help perform life processes, but they produce more oxygen than they need. They release the excess oxygen into the air where it can be used by humans and other organisms. 🌍

To learn more about photosynthesis,

[Go to Nelson Science](#)



Consumers

Animals cannot make their own food. They must obtain their energy by eating, or consuming, other organisms. An organism that eats other organisms for energy is called a **consumer**. There are different types of consumers. Consumers that eat only plants are called **herbivores**. Deer (Figure 2(a)) and beavers are examples of herbivores.

Consumers that eat only animals are called **carnivores**. Ospreys (Figure 2(b)), wolves, and bass are all examples of carnivores. One group of carnivores, called **scavengers**, feed on already dead animals (they do not usually kill their own food). Coyotes and ravens are scavengers, but also occasionally prey on living things.

A consumer that eats both plants and animals is called an **omnivore**. For example, raccoons are omnivores because they eat fish and frogs but also seeds. Bears are omnivores because they eat fish as well as blueberries. Humans are generally omnivores (Figure 2(c)); they can eat chicken, sheep, and many other animals. Humans also eat different types of plant seeds (grains), which are ground up to make flour for use in breads, pastas, and many other foods. In addition, humans eat a wide variety of fruits and vegetables.

consumer: an organism that eats other living things for energy

herbivore: an organism that eats plants only

carnivore: an organism that eats other animals only

scavenger: an organism that eats already dead animals

omnivore: an organism that eats both plants and animals

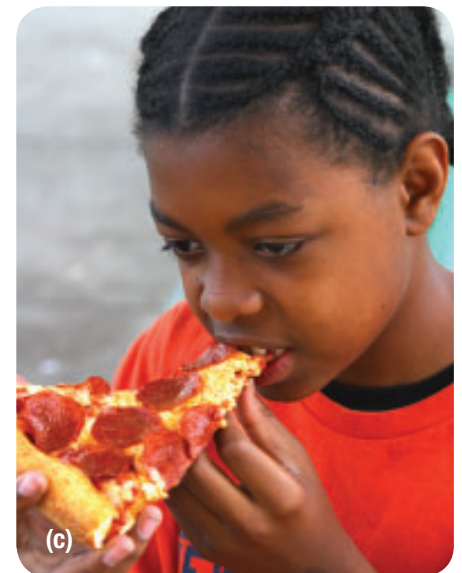


Figure 2 (a) Deer are herbivores. (b) Ospreys and other hawks are carnivores. (c) Although some humans eat only vegetable products, most are omnivores.

Detrivores and Decomposers

detrivore: an organism that feeds on large parts of decaying plant and animal matter and on waste material

Earth would soon be covered in dead organisms if there were not some way of disposing of all the dead plants and animals. **Detrivores** are organisms that obtain nutrients by feeding on large parts of decaying animals and plants, and on waste material. Earthworms, many types of beetles (Figure 3), and some sea birds are detrivores.



Figure 3 In addition to eating living plants, this darkling beetle feeds on decaying vegetation.

decomposer: an organism that consumes and breaks down dead organisms or waste matter into simple substances

Detrivores leave behind their own waste material and small pieces of decaying plant and animal matter. **Decomposers** feed on any remaining decayed matter and waste left behind by consumers and detrivores. Decomposers break these parts down into simpler substances. Bacteria and fungi, such as mould (Figure 4), are common decomposers.

LINKING TO LITERACY

Compare and Contrast

Create a six-column chart and at the top of each column, write one of the following title words: producer, herbivore, carnivore, omnivore, detrivore, decomposer. Below each title, describe how each of these organisms obtains food. Compare ways in which they are the same and different. Discuss your findings with a partner.



Figure 4 The mould on this bread is a decomposer.

✓ CHECK YOUR LEARNING

1. Explain the differences between producers and consumers.
2. (a) What are the raw materials of photosynthesis?
(b) What are the products of photosynthesis?
(c) What happens to the products of photosynthesis?
3. What is the difference between detrivores and decomposers?
4. (a) What are the similarities between omnivores and carnivores?
(b) What are the differences between omnivores and carnivores?
5. What role do scavengers play in ecosystems?