

Reflect

Imagine for a moment that you stay after school one day to clean up the classroom. While cleaning, you move some plants away from the sunny windows. A week later, you remember to move the plants back. You notice something strange has happened. Instead of standing upright, the plants appear to be leaning toward the windows! Why?



Plants need sunlight to survive. If a plant is moved away from sunlight, special cells in the plant help it turn back toward the Sun. The Sun's energy allows plants to produce their own food. Plants then use this food energy to grow and reproduce. But not all organisms can make their own food. How do those other organisms get their food energy? Do they get it from the Sun?

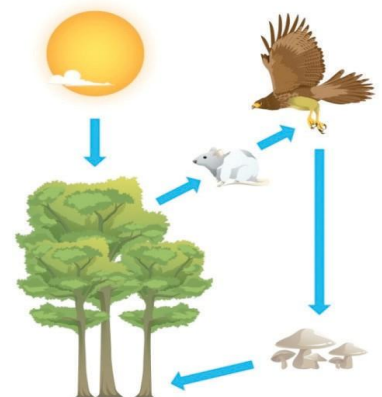
Where do all food webs get their energy?

All of the food energy that passes between organisms comes from the Sun. You might be wondering how this is possible. After all, humans cannot eat sunlight! Plants and other organisms that can use sunlight first absorb it and then use that energy to make their own food. That energy passes to other organisms that eat the plants. For example, grass uses sunlight to make food. A deer gets energy by eating the plants. After that, a wolf gets energy by eating the deer.

The movement of food energy from one organism to another is called a *food chain*. Take a look at the food chain on the right. The arrows show how food energy is passed from one organism to the other. The plants use energy from the Sun to make their own food. The mouse gets energy by eating plants. The hawk gets energy by eating the mouse. Organisms like mushrooms also help move energy through a food chain. In this food chain, they break down material from the hawk or other organisms once they die. Some of the material becomes part of the soil that is later used by plants. You will learn more about this process later in the lesson.

Look Out!

You might think the arrows in a food web show which organism is eating another organism. The arrows actually show how energy is moving through the food web.



What Do You Think?

Suppose a dust storm blocked sunlight in your town for several weeks. What do you think would happen to the plants in the area? What would happen to the organisms that depend on the plants for food? Why?

What are the different parts of a food web?

A group of overlapping or connected food chains is called a **food web**. A food web can be big or small. It can contain many different types of plants and animals or just a few. Whether a food web is big or small, the organisms fall into one of two categories: producers or consumers.

- **Producers:** Producers are organisms that get their energy directly from the Sun. Their cells are able to turn sunlight into food through a process called **photosynthesis**. In photosynthesis, producers combine **carbon dioxide**, water, and sunlight to produce oxygen and sugar (their food). Other organisms get energy by eating producers. Have you ever eaten lettuce or any other vegetable? If so, you have eaten a producer! The lettuce plant converts sunlight into food your body uses as fuel. Producers are very important to life on Earth. Without them, other organisms would not survive.
- **Consumers:** A bald eagle is an example of a **consumer**. It cannot directly use the Sun's energy to make food. As a consumer, it has to eat, or consume, other organisms for energy. A consumer may eat producers (such as a deer eating grasses) or other consumers (such as the bald eagle eating a mouse). Animals, fungi, and some bacteria are types of consumers. Consumers that eat only plants are called herbivores. Consumers that eat only animals are called carnivores. If a consumer eats both plants and animals, it is called an omnivore.

carbon dioxide:
a type of gas found in
Earth's atmosphere

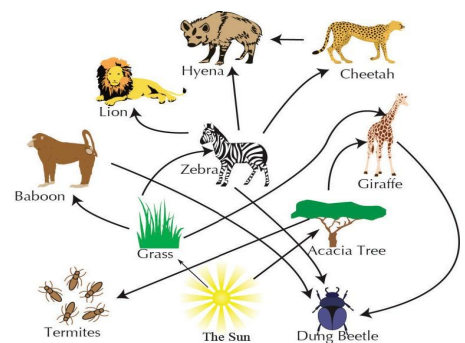


What Do You Think?

Some consumers are called **decomposers**. Mushrooms are decomposers. This group of consumers eats only dead organisms. They break down the nutrients in the dead organisms and return them to the food web. They may eat dead producers or consumers. Suppose a tree dies in a forest. Bacteria and fungi like mushrooms consume the tree and return the nutrients in the tree to the soil. The grass in the forest absorbs those nutrients and uses them to grow.

How does the energy flow from one organism to the next in a food web?

The movement of energy in a food web is similar to a one-way street. The energy flows in one direction from one organism to another. It does not flow backward. For example, in the food web on the right, the zebra gets energy directly from the grass it eats. The grass does not get energy from the zebra. When the zebra dies, a decomposer such as a dung beetle will break its body down into nutrients that the grass can use. Remember, the initial source of all this energy is the Sun.



A food web can include many connections. In the food web here, you can see several animals rely on the zebra as a source of food. The lion, hyena, and cheetah all hunt the zebra. No matter how many connections a food web has, energy flows from the Sun to producers, and from producers to consumers. Decomposers help return energy from producers and consumers back to the food web.

Career Connection: Wildlife Biologist

Do you like spending time outside? Do you like watching animals? Then a career as a wildlife biologist might be right for you! Wildlife biologists research the natural world. For example, a wildlife biologist may study a tropical reef **ecosystem**. She keeps track of the different organisms living on the reef and the number of each type that live there. It is very important for a wildlife biologist to understand the food webs in the ecosystems she is studying. Suppose all producers in a reef died. Many of the fish that depend on the producers for food would be affected too. Wildlife biologists try to find ways to keep food webs and ecosystems healthy and stable.

ecosystem:
all the living
things and
nonliving parts
of an
environment



Try Now





What kind of consumer are you? Complete this activity to find out.

1. First make a list of all the food items you ate for dinner last night.
2. Then record whether the food items came from plants or animals.
 - a. Which food items were vegetables or fruits? These came from plants.
 - b. Which food items were meats, cheese products, or mushrooms? These came from animals.
 - c. Some foods are a mixture of plant and animal sources. For example, a biscuit is made from flour, which comes from a plant. It also has milk and butter, which come from an animal (a cow). Write down all the sources you can think of for each ingredient.
3. Look at your list. Did you eat more food items from plants or from animals and fungi?
4. Now that you have taken a look at what you ate, would you call yourself a carnivore? an herbivore? an omnivore? Explain your answer.

Try Now

What do you know?

Study the images in the chart below. Then decide whether the organism in each image is a producer or a consumer. Write your answer in the first column of the chart. If the organism is a consumer, decide if it is a carnivore, herbivore, or omnivore. Write your answer in the second column of the chart. Finally, think about how each organism gets its food energy. Write your answer in the last column of the chart. The first two answers have been completed for you.

Organism	Producer or Consumer?	Carnivore, Herbivore, or Omnivore?	How Does the Organism Get Food Energy?
Strawberry Bush 	Producer	Not a consumer	
Deer Eating Grass 			
Snake Eating a Frog 			
Raccoon Eating Plants and Animals from a Trash Can 			

Connecting With Your Child

Making a Food Web Poster or Brochure

To help your child learn more about food webs, create a poster or brochure advertising a local food web. Begin with a brainstorming session to think about the organisms that live in your area. Utilize a variety of resources to research the organisms and how they get their food energy. An excellent way to gather information is to search the web for your local or state government's Fish and Wildlife Service.

When you have selected a local food web, classify the organisms using the following categories:

- **Producer:** any organism that uses the Sun's energy to produce its own food. Examples include trees, bushes, cacti, grasses, vines, algae, and phytoplankton (plantlike organisms that live in fresh and salt water). Point out to students that algae and other phytoplankton are common producers from aquatic (water) food webs.
- **Consumer:** any organism that has to consume another organism to get energy. Some examples are deer, beavers, geese, butterflies, mountain lions, falcons, frogs, badgers, coyotes, raccoons, armadillos, and sea turtles.
- **Decomposer:** a consumer that eats dead material. Fungi are very common decomposers, as are bacteria. Some flies, worms, and mites are also decomposers.

Print out or draw pictures of several of your organisms and label each one with its common name and its category (e.g., raccoon—omnivore). Arrange the organisms on the poster or brochure in a food web. Be sure to include the Sun as the source of energy for producers. Producers should be shown passing energy on to consumers; try to include as many connections between organisms as possible.

Here are some questions to discuss with your child:

- Are there some organisms that are linked to more than one organism? Why?
- Why are decomposers such important members of a food web?
- What would happen if one organism completely disappeared from the food web?