



Living Links

Lesson Description

Students learn about food chains and how humans fit into such chains.

Subjects

Art, Language Arts,
Science

Teacher Background

This lesson introduces *food chains* and explains soil's critical role in supporting life on Earth. One way to think about the organisms in an environment is by using a food chain. Some animals eat plants for *food*, while other animals eat animals that eat the plants. Plants are therefore an integral part of any food chain, and plants in turn depend on the soil to provide *resources* for survival. The soil food chain is the community of organisms living all or part of their lives in the soil.

Living things continue to be part of the food chain even after they die. Some animals are *scavengers* or *decomposers* and depend on dead plant and animal matter for food. (In Lesson 9, your students will learn more about one of the most familiar decomposers in soil, earthworms.) *Organic material* enriches soil and provides *nutrients* for soil-dwelling animals and plants.

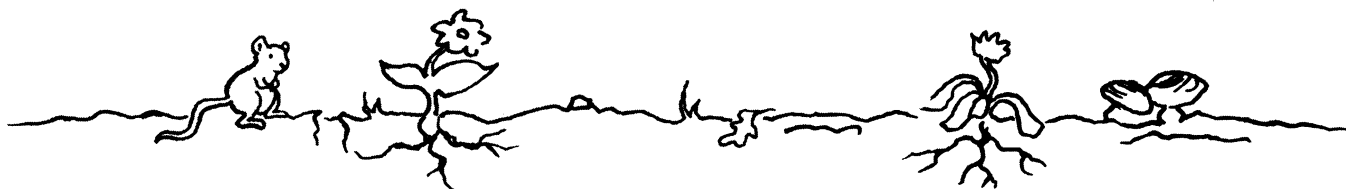
Time

Prep: 15 minutes

Activities: 2–2 ½ hours
(not including Extensions)



Topic: food chains
Go to: www.scilinks.org
Code: DIG08



Student Objectives

Students will be able to:

- describe a simple food chain;
- construct a food-chain mobile based on their understanding of food chains; and
- understand that all living things need soil to produce their food, either directly or indirectly.

This lesson dispels young learners' misconception that our food originates in grocery stores. For instance, consider the chain of events needed to make breakfast cereal: the cereal, milk, and fruit were purchased in the grocery store, but before that, those items came from plants, cows, and trees. The grains used in cereal, the fruit trees, and the cow's food were grown in soil.

Materials

For Each Student Group

- Index cards
- Cardboard
- Glue
- Single-hole puncher
- Crayons, colored pencils, or markers
- String
- Scissors
- Dowels or sticks
- Student Handouts 8A and 8B

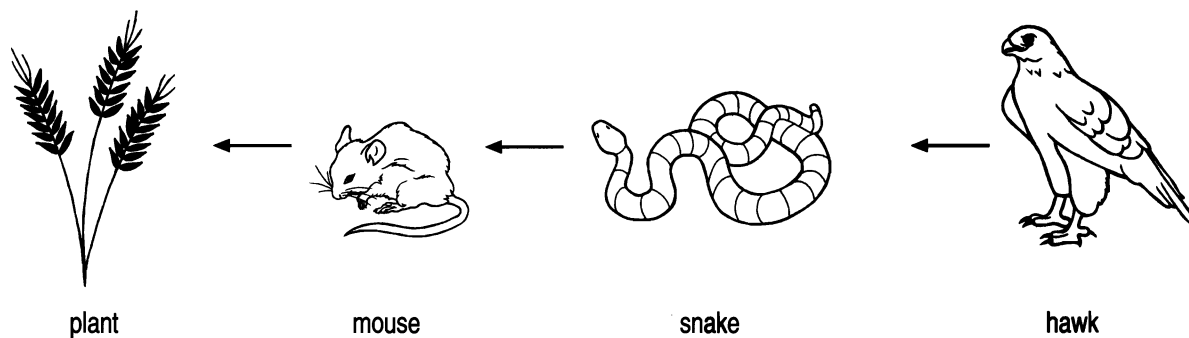
Learning Cycle

Perception: 30 minutes

Prep On the board or on poster paper, sketch a simple food chain like the one in Figure 8.1. Draw arrows from predator to prey to show who eats whom in the chain. Use animals and plants native to your region.

- 1 Ask students to explain what the sketch represents. Guide students to understand that animals eat plants or other animals, and that a

Figure 8.1. A food chain.





food chain connects animals and plants based on who eats whom.

- 2 Ask students how dead animals and plants can be part of the food chain. Discuss scavengers or decomposers that depend on dead plant and animal material for food.
- 3 Help students understand that plants are the basis for most food chains: almost all kinds of animal food can be traced back to plants. In the food chain in Figure 8.1, the snake doesn't eat plants but it eats the mice that eat plants. Discuss how the Sun, rain, and soil fit into the food chain by providing nutrients that plants need to grow. To emphasize this point, you might add a Sun at the top of the food chain sketch and a strip of soil at the bottom.

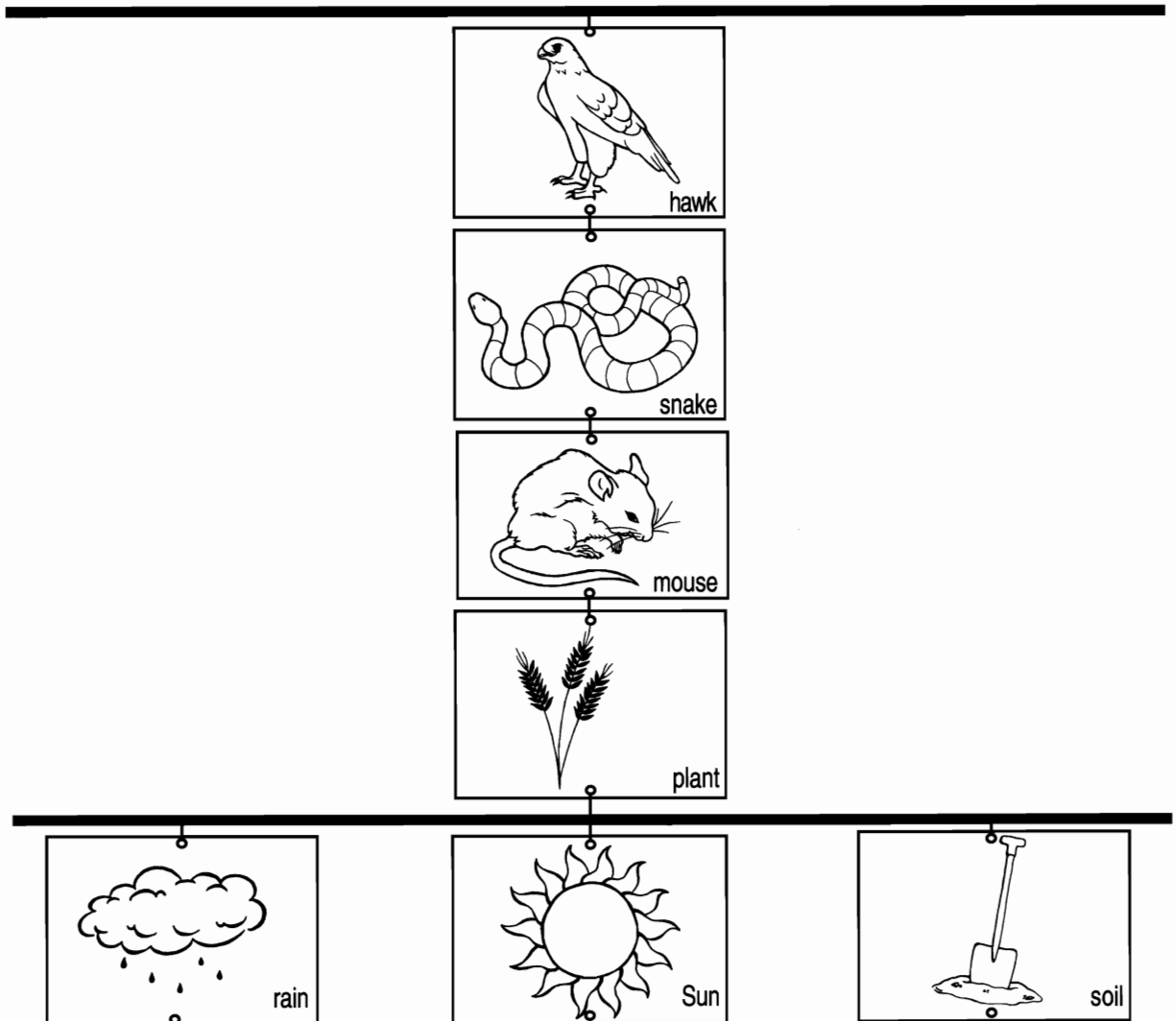
Exploration: 30 minutes

- 1 Design a new food chain based upon the animals discovered in Lesson 7, or have students suggest animals and plants to use. Keep the original food chain sketch on display while you write students' suggestions on the board. Encourage class participation, and keep answers general. The purpose of this lesson is to stress that living things depend on the soil, rather than to emphasize exactly what each animal eats.
- 2 Repeat this exercise using other examples of living things. Discuss the foods that students ate recently. For example: (1) Sun, water, and soil make grass grow; (2) a cow eats grass; (3) the cow produces milk; and (4) humans consume milk. Cows also provide nutrients for plants through their exhaled air (carbon dioxide) and other waste products that enrich soil.



- 3 Encourage students to brainstorm how the parts of a recent meal were grown. Lead them through several examples of how each item arrived on their plate.

Figure 8.2. A food-chain mobile.





Application: 45 minutes–1 hour

- 1** Explain how to construct food-chain mobiles by putting one feature on each index card (see Figure 8.2). Older students can design their own mobiles, but give younger students a list of animals and plants to choose from to construct their mobiles. If mobiles are too complex for your class, have students draw animals and plants on one piece of paper and connect drawings with arrows. Older students might make more sophisticated mobiles with several levels, including decomposers and multiple food sources.
- 2** If your class is making mobiles, have students draw and label each feature of their food chains on a separate index card. In addition to animals and plants, students could include environmental features such as the Sun, soil, water, and grass as shown in Figure 8.2. When the drawings are complete, students glue the cards to cardboard.
- 3** Students put the cards in the proper order and then punch a hole in the top and bottom of each card.
- 4** Using the cards, string, and dowels or sticks, students can construct their mobiles.

Evaluation: 15–30 minutes

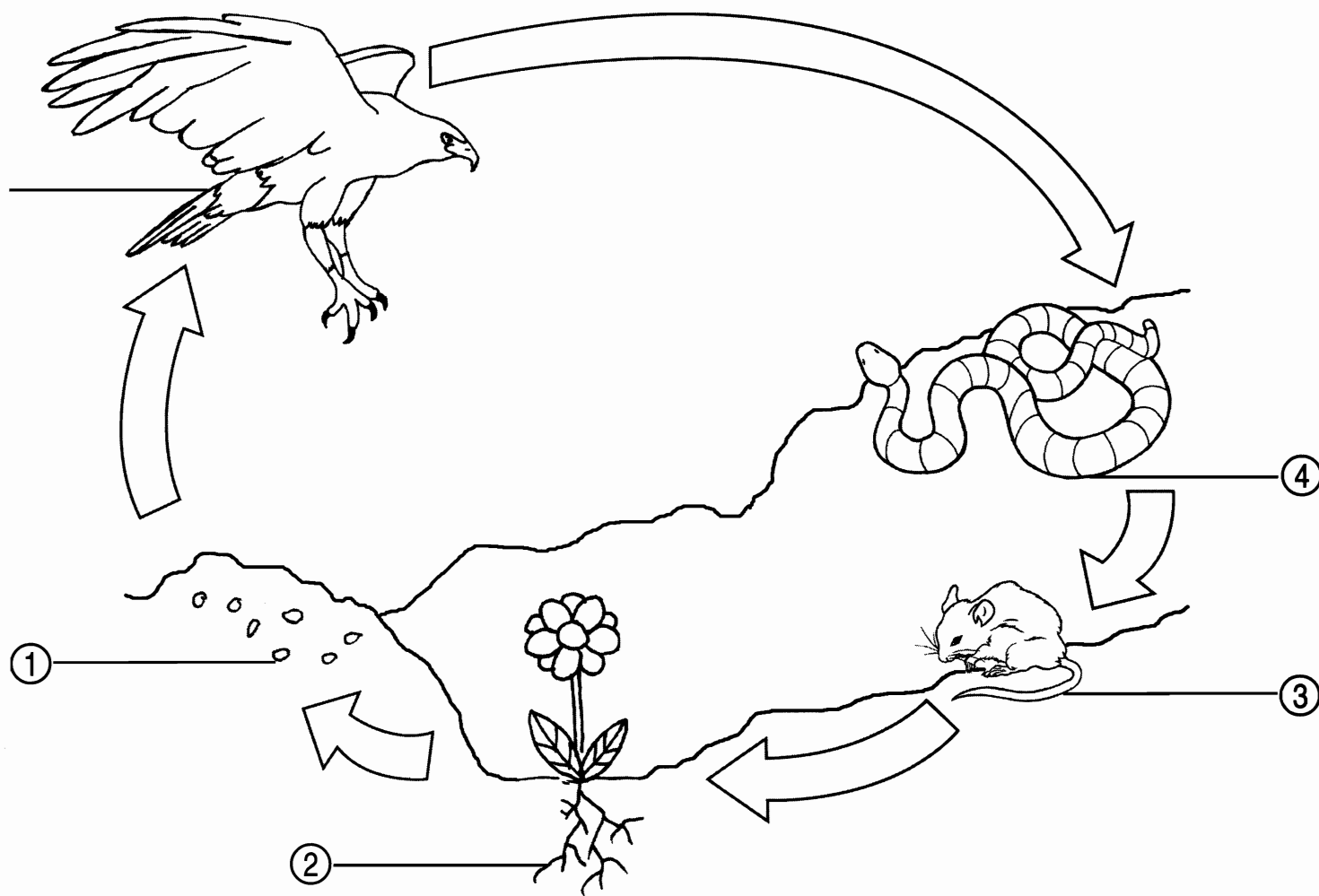
Students can label the illustrations on Student Handout 8A. You may wish to provide younger students with a vocabulary list or choice of words to use when labeling the drawing. Older students can write sentences describing each food chain event.



Extensions: 30 minutes each

- Read the story "Sara, Queen of Corn" that follows this lesson and color in Student Handout 8B.
- Play a game called "Are You Related?" in which students determine how an organism or feature is related to others through a food chain. For example, you might write "Sun," "grass," "cow," and "human" on different cards. Each student receives a card and role plays the plant, animal, or environmental feature named on the card. Split students into groups of four. One group at a time, students must explain to the class how they are linked to each other. This can be played over and over because many different chains can be formed from a large group of cards.
- Give each student one of the cards with an organism or environmental feature on it. Position the student with the "Sun" card in the center of the floor. Students position themselves in a circle around the Sun, then stretch a string between features that are related (for example, Sun—water—soil—grass—worm—robin, etc.). The result is a web of life, illustrating interrelationships between animals, plants, and environmental features. You can also use humans as one of the features to show that humans are part of nature's relationships.

Name: _____







Sara, Queen of Corn

Teacher Tips

Corn, or maize, is a North American plant with many uses. “Sara, Queen of Corn” is the story of an imaginative child who lives on a farm and learns about corn. Reading this story will help your class learn about corn and other crops: where crops are grown, how crops are harvested, who harvests crops, and where crops go after the harvest.

After reading the story, ask students to describe daily life on a farm. If your school is urban or suburban and students don’t have much knowledge of farms, consider bringing a farmer or gardener to your school to talk about his or her activities. Your class could

develop a play around corn or another crop from your area. If so, be sure to include the natural resources such as soil, water, and sunlight and show the seasons, harvesting, and other aspects of agriculture.

You can develop several art activities around “Sara, Queen of Corn.” Make a mural depicting the seasons, crops, harvesting, and other aspects of agriculture. Or, students can color the illustration on Student Handout 8B.

Bring in unhusked ears of corn and a picture of a corn plant to show students what corn looks like. You might even surprise your students with a treat of popcorn, just like at the end of the story!



Sara, Queen of Corn

Sara loved living on her family's corn farm. There was always something exciting going on. Sara was seven years old and had lived on the farm all her life.

"Raising corn is a very important thing to do," her parents told her. "There are a lot of hungry people out there who need our crop and the products made from it."

Sara pretended she was the Queen of Corn. Everyday she would walk among the stalks and tell them what to do.

"Make sure you eat your food to get vitamins," she would tell them. "Drink all your water," she would scold. "Grow straight and don't slouch."

Sara helped plant the corn, and she watched as it grew from little seedlings to plants that touched her knees. The plants grew quickly. After just a few months, they were as high as her waist, then her shoulders. The stalks grew so tall that even her father looked small when he stood beside them.

The ears of corn also started out very small, smaller than the tip of Sara's little finger. As the summer passed, the ears grew bigger and bigger. Slowly, the kernels turned from a ghostly white to a rich yellow, the color of the Sun that helped them live.

Although the corn was grown by Sara's family, there were many other animals that liked to eat the crop. Sara often saw mice running through the fields, nibbling on bits of corn that had fallen to the ground.

One summer night brought a terrible storm. The wind ran through the fields, and streaks of lightning lit up the sky. Sara held her hands over her ears to keep the sound of thunder from echoing in her head.



The family gathered nervously around the kitchen table, but it wasn't the thunder and lightning that frightened them.

"It's going to rain," said Sara's mother, "and there is nothing we can do about it."

"What's wrong with rain?" asked Sara. "I thought water was good for plants."

Sara's father put his arm around her and held her close. "There's nothing wrong with rain," he said. "But too much rain can be bad for the corn crop."

He looked down at Sara and laughed. "You know, Sara, you and the corn are very much alike. You both like to drink water, but you both hate to take a bath."

It rained that night, but it was only a light rain. The corn had a good drink and continued to grow.

Sara and the corn really were alike. Both were natives of North America. Both loved sunshine and warm summer evenings. Both needed careful, loving attention. And both the queen and her corn grew tall and strong during the summer months.

Growing corn, or any crop, is hard work. Yet there were always several days of farming that were pure fun for Sara. At harvest time, men and women came from all over the county with their large huffing and growling machines to pick corn and cut the stalks. It was like a big party.

Sara's family worked for days preparing for the great event of harvest. The workers had to be fed, so dozens of hams and chickens were baked. Sacks of potatoes and carrots were peeled, and the house was alive with the smells of cookies, candies, cakes, and pies. Sara helped with the cookies.



Sara awoke one morning to the sounds of dishes rattling and people laughing in the kitchen. She jumped out of bed and ran to the window. Today was the first day of the harvest, and she didn't want to miss a minute of it.

From her window she could see the tall stalks of corn swaying, their tassels moving back and forth. They looked like thousands of subjects waving yellow handkerchiefs at their queen. Sara quickly jumped into her shirt and jeans and ran down the stairs, out the door, and down to the field of corn. In the distance she could hear the sound of the great harvest machines crawling down the road toward their farm. It was difficult saying goodbye to such good friends as her stalks of corn, but the corn was needed somewhere else.

In a few days, most of the corn would be sent far away. Some would go directly to market to be eaten as fresh corn-on-the-cob, usually with lots of butter. Some would be made into corn oil at processing plants. Some corn would be made into corn bread or into hominy and grits. Others would end up in the canning factories where the kernels would be stripped from the cob and creamed for special lunches. The stalks and a few of the kernels would become food for animals. Some of it would even be shipped overseas to help feed people in other countries, and Sara felt good knowing her corn was going to help other people.

But there was one use for corn that Sara liked the most. The American Indians first invented this use, long before the people of other nations came to North America. For Sara, it came in handy on a warm summer's eve while sitting on the porch with friends, or when her parents took her to a movie.

Can you guess Sara's favorite use of corn?

It was to pop it.

Name: _____



