

Food Web Game

BROWARD COUNTY ELEMENTARY SCIENCE BENCHMARK PLAN

Grade 3—Quarter 4

Activity 40

SC.B.1.2.1

The student knows how to trace the flow of energy in a system (e.g., as in an ecosystem).

SC.B.2.2.1

The student knows that some source of energy is needed for organisms to stay alive and grow.

SC.F.1.2.2

The student knows how all animals depend on plants.

SC.G.1.2.1

The student knows ways that plants, animals, and protists interact.

SC.G.1.2.2

The student knows that living things compete in a climatic region with other living things and that structural adaptations make them fit for an environment.

SC.H.1.2.3

The student knows that to work collaboratively, all team members should be free to reach, explain, and justify their own individual conclusions.

SC.H.1.2.5

The student knows that a model of something is different from the real thing but can be used to learn something about the real thing.

ACTIVITY ASSESSMENT OPPORTUNITIES

The following suggestions are intended to help identify major concepts covered in the activity that may need extra reinforcement. The goal is to provide opportunities to assess student progress without creating the need for a separate, formal assessment session (or activity) for each of the 40 hands-on activities at this grade level.

1. Ask, *If we added decomposers to the food web you made with the yarn, would the food chains end with the decomposers? Why or why not?* (No. Decomposers break down dead material into nutrients that plants use. Those nutrients would go to the producers in the food web to start new food chains in a continuous cycle.)

2. Use the Activity Sheet(s) to assess student understanding of the major concepts in the activity.

In addition to the above assessment suggestions, the questions in bold and tasks that students perform throughout the activity provide opportunities to identify areas that may require additional review before proceeding further with the activity.

Food Web Game

OBJECTIVES

Students model a food web by passing a skein of yarn from each organism represented to an organism that eats it. They begin the food web with the Sun to show that it is the source of energy for all organisms in the food web.

The students

- ▶ play a game to model a food web
- ▶ understand that the food web is made up of many food chains
- ▶ identify how energy flows through the food web

SCHEDULE

About 40 minutes

VOCABULARY

primary consumer
secondary consumer

MATERIALS

For each student

- 1 Activity Sheet 40

For each team of twelve

- 1 set Food Web cards, cut up and hung on yarn (from Activity 39)
- 1 pr scissors*
- 4 skeins yarn, various colors

For the class

Delta Science Reader *Food Chains and Webs*

*provided by the teacher

PREPARATION

- 1 Make a copy of Activity Sheet 40 for each student.
- 2 Find an indoor or outdoor location with sufficient space for two teams to do this activity.
- 3 Remove the earthworms from the Food Web card sets.

BACKGROUND INFORMATION

Energy from the Sun enters a food web at the level of the **producers**, plants that use energy from the Sun to make their own food through the process of photosynthesis. The energy moves through the food chains and food webs as one organism is eaten by another. Eventually it is dissipated into forms that are no longer useful for sustaining life. As a result, food energy must be continually replenished by the photosynthesizing work of producers.

Crickets are common insects often found in tall grasses and around buildings. They move by crawling and hopping, and often feel their way with their antennae. Green anoles, often called American chameleons, are native to the southeastern United States. They are branch-dwelling organisms that eat only live insects because they cannot recognize an insect as prey unless it is moving.

Animals such as crickets that eat plants are called **primary consumers**. Animals such as green anoles that eat primary consumers are called **secondary consumers**, to denote that these animals are one step farther removed from the plants that are the original producers of the food.

Earthworms and other organisms physically break down dead organic matter. Then **decomposers**, such as bacteria and fungi, chemically break down the organic matter into nutrients such as nitrogen, phosphorus, and potassium. The nutrients are then more available to the plants growing in the soil. In this way, earthworms and decomposers facilitate the constant recycling of nutrients in nature.

▼ Activity Sheet 40

Food Web Game

1. Identify four features of your food web.

Answers will vary. Possible answers include 1) all the food chains end with a consumer; 2) every food chain includes producers but does not necessarily include both primary and secondary consumers; 3) some consumers act as both primary and secondary consumers; 4) an organism can be part of more than one food chain.

2. What is the source of energy for the organisms in your food web?

the Sun

3. How does the energy flow through the food web?

It flows from the Sun to the producers, then to the primary consumers, and then to the secondary consumers.

Guiding the Activity

1 To review, write the words *producer*, *consumer*, and *decomposer* on the board.

Ask, **What is a producer?**

Ask, **What are some examples of producers?**

Ask, **What is a consumer?**

Ask, **What are some example of consumers?**

Ask, **What is a decomposer?**

Ask, **What are some examples of decomposers?**

Additional Information

a plant that uses sunlight to produce food from carbon dioxide and water

Students may mention grass and trees.

an organism that obtains food by eating other organisms

Students may mention mice, owls, grasshoppers, and other consumers.

an organism that breaks down dead plant and animal matter into nutrients

Students may mention bacteria and fungi.

Guiding the Activity

Additional Information

Write the words *primary consumer* and *secondary consumer* on the board. Explain that a **primary consumer** is an animal that eats plants. A **secondary consumer** is an animal that eats other animals.

Ask, **What is an example of a primary consumer? What is an example of a secondary consumer?**

Students may mention that grasshoppers are primary consumers and owls are secondary consumers.

2

To review, ask, **What is a food web?**

all the interacting food chains in an ecological community

Take students to the location you have identified, and tell them that they are going to play a game to model a food web. Divide the class into two teams of 12 each. Give one student in each team a skein of yarn, and explain that this student will represent the Sun. Give each of the other team members one Food Web card, and tell students to hang the card around their neck.

The complete food web plus the Sun requires 12 students. If you do not have exactly 24 students, you can either have two students share a card, or you can have one student wear two cards.

Identify the teams as Team 1 and Team 2. Have each team of students sit in a circle with the “Sun” standing in the middle.

3

Tell the “Sun” to hold the end of the yarn tightly and pass the skein to any single “producer” in the circle. Then have the “producer” hold onto the yarn and pass the skein to any single “primary consumer” that eats this “producer.” If there is another consumer that eats this consumer, have the “primary consumer” hold the yarn and pass the skein to the “secondary consumer.” Continue until all possible consumers are identified for the food chain.

Ask, **What have you created?**

a food chain



▲ *Figure 40-1. Students create one food chain.*

Guiding the Activity

Additional Information

- 4** Give the “Sun” a second skein of yarn of a different color. Have the students repeat the process in Step 3 to create a second food chain. Point out that the yarn can go to a student a second time, but the second food chain cannot duplicate the first chain. Challenge students to create as many different food chains as they can.

Each team continues making food chains until they cannot make any more.

- 5** Ask, **What do you notice about your food web?**

Ask, **What is the source of energy for this food web?**

As students continue to create more food chains and the chains overlap, their food web will become increasingly complex.

Answers may vary, but students should notice that all the food chains end with a consumer; every food chain includes producers but does not necessarily include both primary and secondary consumers; some consumers in the web function as both primary and secondary consumers; and an organism can be part of more than one food chain.

the Sun

Guiding the Activity

Ask, **What part of the food web represents the flow of energy? How does the energy of the Sun flow through the food web?**

Ask, **What is missing from this food web?**

Ask, **How would decomposers fit into this food web?**

Give each student a copy of Activity Sheet 40 and have the students answer the questions.

6

As appropriate, read or review pages 4–9 of the Delta Science Reader *Food Chains and Webs*.

Additional Information

The yarn represents the flow of energy. The energy flows to the producers, then to the primary consumers, and then to secondary consumers.

decomposers

The yarn would go from every organism to the decomposers, so the decomposers would be part of every food chain in the web.

REINFORCEMENT

As each food chain is created, have students name the animals in the food chain from the producer to the primary consumer to the secondary consumer.

SCIENCE JOURNALS

Have students place their completed activity sheets in their science journals.

CLEANUP

It is best to wind up one piece of yarn at a time in order to try to avoid a large snarl. Return the yarn and the Food Web Cards to the kit.

Connections

Science Challenge

Once the food web is complete, have students illustrate how humans might affect the organisms in this habitat. Describe a scenario—for example, someone sprays all the plants with herbicide. Instruct the “plants” to “die” and move backward out of the circle. This will cause a tug on the strings connecting them to a primary consumer. Then anyone who feels the tug also “dies” and moves back, as they have lost their food supplies. The repercussions are felt throughout the web and eventually only the “Sun” is left unaffected.

Science Extension

- ▶ Have students do library and Internet research to find out about organisms in another habitat, such as a pond. Have them create new Food Web cards for these organisms and play the game again. Then have them compare the food webs they created for the two habitats.
- ▶ Have students imagine that one of the organisms in their food web went extinct. Have them repeat the food web game and then compare the two food webs. Have them discuss what they think the impact of one organism going extinct would be on the whole community.

Science and Language Arts

Have students identify other meanings of the words *producer* and *consumer*. Have them explain each meaning and then write sentences with these words, using a different meaning for each sentence.

Science and Math

Discuss probability with the students in regard to their food web. Have them identify which organisms are least likely, most likely, and equally likely to be affected by a change in the environment. For example, which organisms are most likely to be affected if the crickets are removed from the environment? Which are least likely to be affected? Which are equally likely to be affected? Have students explain their reasoning in each case.