

Follow-up Activities

- Using index cards and paper clips, have students create food chains to hang on a line stretched across the classroom. Punch holes at the top and bottom of each card and connect cards together with the paper clips. Have students draw a picture or paste a photo of the organism on the front of each card and write the name and habitat on the back of each card. Challenge students to see who can make the longest food chain. (Variation: use green cards for herbivores, pink for carnivores, and blue for omnivores).
- Demonstrate food webs by seating students in a circle, giving each a sign to identify him/her (grass, wildflower, butterfly, rabbit, mouse, frog, snake, fox, soil bacteria, deer, and eagle). Have each student with a plant designation hold on to one end of a length of yarn and pass the yarn to every other organism with which there is an eating relationship (note: at this point, there should be a "web" of yarn connections around the circle, with some, like decomposers, connected to everyone). Next, eliminate an organism, such as the eagle, and have students explain how that will affect the whole web. Continue with different scenarios to show how each organism is dependent on all the others for balance.
- Divide students into small groups and assign each group a particular habitat (lake, desert, forest, tundra, city, ocean) to study. In their research children should focus on the feeding relationships specific to animals in their assigned habitat. Challenge each group to create a mural that illustrates the interdependence of creatures within their habitat. Encourage the class to find links among the different food chains represented in the murals.

Internet Resources

Periodically, Internet Resources are updated on our web site at www.libraryvideo.com.

- www.bellmuseum.org/distancelearning/prairie
This site contains an interactive prairie restoration game as well as a field guide and other curriculum tools.
- www.thewildones.org/Curric/habitatex.html
This site contains a lesson plan geared to grades two through five that is designed to build skills that allow children to identify relationships between organisms within different habitats by encouraging the observation of local animals and plants.

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- ofcn.org/cyber.serv/academy/ace/sci/cecsaci/cecsaci139.html

In this simulated wolf population study, fourth grade students become wolves and components of a habitat in a highly involved physical activity that is designed to get students to consider all the factors in a food chain.

Suggested Print Resources

- Crenson, Victoria. *Horseshoe Crabs and Shorebirds: The Story of a Food Web*. Marshall Cavendish, Tarrytown, NY; 2003.
- Fisher, Aileen. *The Story Goes On*. Roaring Brook Press, New York, NY; 2005.
- Hunter, Rebecca. *Facts about Habitats*. Smart Apple Media, Mankato, MN; 2004.
- Kalman, Bobbie. *Food Chains and You*. Crabtree Publishing Company, New York, NY; 2004.

TEACHER'S GUIDE CONSULTANT

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All About Food Chains

Grades K-4

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, after reviewing the pre-viewing discussion questions provided for your class, create an "Everything We Know About..." list. Preview key vocabulary words and have students raise additional questions they hope will be answered by this program. Most importantly, students should be told that as "science detectives" they must listen closely, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your "science detectives" to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and use the followup questions and activities to inspire further discussion. Encourage students to research the topic further with the Internet and reading resources provided.

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Program Summary

Every living thing needs food to survive. Without energy from sunlight, there would be no food on Earth. This life-sustaining energy is passed along from plants to animals in a food chain. Plants are the first link in the food chain and are called producers. Green plants use light energy from the sun, as well as water and carbon dioxide from the air and other nutrients from the soil to make their own food. The next link in the food chain involves plant-eating animals called herbivores. We call these animals consumers because they eat the first link, plants, to get the energy they need to survive. Animals like lions and hawks that eat other animals to get energy are consumers called carnivores. Some animals, like humans and bears, consume plants and animals, making them omnivores. To complete a food chain, organisms called decomposers eat the bodies of dead animals and other leftover waste. The decomposers get energy from breaking down the remains of animals and plants, and return that energy to the soil where it can be used by living plants to start the process all over again.

The following is an example of a simple food chain: a mouse eats grass; a snake eats the mouse; an eagle eats the snake. When a habitat includes a number of animals that eat the same foods, the connections among different food chains create what is called a food web. In most cases, a habitat is in balance, with the right number of producers, herbivores and carnivores to keep it going. However, if changes are introduced like habitat destruction, new predators or removal of predators, an environment can be thrown out of balance. For example, the removal of large predators like lions or bears from their natural habitat may cause the herbivores' numbers to grow too large for the food supply thereby causing some to starve. Humans are responsible for creating some imbalances in nature by enlarging cities and killing predators; however, many people are working hard to help keep the environment in its natural balance.

Vocabulary

The following words are included for teacher reference or for use with students. They are listed in the order in which they appear in the video.

nutrients — Substances that an organism must obtain from its environment in order to grow.

food chain — The path that energy takes as it passes from the sun to producers to consumers (from plants to herbivores to carnivores to decomposers).

producers — Organisms that use the sun's energy to make food. Green plants are producers.

consumers — Organisms that use the sun's energy indirectly by eating plants or animals.

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herbivores — Animals that eat only plants.

carnivores — Animals that eat other animals.

omnivores — Animals that eat both plants and animals.

decomposers — Organisms such as worms, bacteria and some insects that break down dead plants and animals, returning nutrients to the soil.

plankton — Tiny free-floating plants and animals that live in the ocean and form the bottom links of marine food chains.

phytoplankton — Tiny plants that live in oceans and produce food through photosynthesis.

zooplankton — Tiny animals that live in oceans and consume phytoplankton.

food web — The complex feeding relationships among all the creatures in all the food chains of a particular habitat.

owl pellets — The undigested parts of food (i.e. hair, bones or feathers) that owls spit up in pellet form.

habitat — The specific environment where plants and animals live.

environmental balance — The state of a habitat when it is stable and healthy with the right number of producers, herbivores and carnivores.

Pre-viewing Discussion

Before students generate their list of "Everything We Know About..." this topic, stimulate and focus their thinking by raising these questions so that their list will better reflect the key ideas in this show:

1. How do living things get the energy they need to survive?
2. How do different animals get their food?
3. What is a "food chain"?
4. What would life be like if the sun stopped shining?

After the class has completed their "Everything We Know About..." list, and before watching the show, ask them what other questions they have that they hope will be answered during this program. Have students listen closely to learn if everything on their class list is accurate and to hear if any of their own questions are answered.

Focus Questions

You may wish to ask your class the following questions to assess their comprehension of key points presented in the program:

1. What supplies the energy that your body needs to work and play?
2. What is the original source of all the food energy on Earth?
3. What types of organisms are called producers? Why?
4. What types of nutrients do plants need to make food?
5. What types of organisms are called consumers? Why? (Continued)

6. What is a "food chain"? Give an example.
7. What happens in a food chain?
8. What are herbivores? Give an example.
9. What are carnivores? Give an example.
10. What are omnivores? Give an example.
11. What are decomposers? Give an example.
12. Where are plankton found in a marine food chain?
13. What is the difference between a food chain and a food web?
14. What is an example of a food chain that contains a mouse?
15. What did you learn about food chains from the "owl pellet" investigation?
16. What does it mean when a habitat is in balance?
17. What would happen in a forest habitat if we removed all of the top carnivores?
18. Why would the clearing of trees to build new houses possibly create an imbalance in that habitat?
19. The show talked about a situation in which a shepherd brings in a herd of sheep where they had not been before. How might that action affect other members of the local food web?
20. What is one possible reason that rats and pigeons survive so well in cities?

Follow-up Discussion

The most important part of this segment is to examine both the facts and beliefs generated by the class in their "Everything We Know About..." list. Research indicates that students will retain their previous misconceptions — in preference to the new information — until they actively recognize and correct their own errors. Because of this, it is important to lead students to the correct ideas while identifying and correcting any misconceptions from the class list. After reviewing the list, encourage students to share the answers they got to the questions raised before viewing the program.

Raising a thought-provoking question is a good way to assess the overall depth of understanding. A couple of suggestions are listed below:

1. Who do you think gets more energy from the sun in the foods they eat: an herbivore or a carnivore? Why?
2. Discuss why decomposers are said to be the final step in the food chain.
3. Discuss what might happen to a marine food web if plankton caused all the phytoplankton in the ocean to die. How would this influence humans?