

Lesson 10: Food Webs and Food Chains

□ Getting Started

Food chains and food webs are graphical descriptions of feeding relationships among species in an ecological community, basically telling who eats whom. A **food chain** shows a single chain of feeding relationships, whereas a **food web** shows all of the food chains in a particular ecosystem and how they are related. Food webs also show how energy and materials (both good and bad) flow through an ecosystem.

In today's lesson, you are going to learn and/or refresh your memory about different types of organisms as well as begin to see relationships that are present throughout the ecosystem, both among the organisms and the environment in which they live. In ecosystems, every organism has a niche, or a place in the group where it belongs. You will look at the following groups:

- **Producers**, which are organisms that make their own food using either photosynthesis or chemosynthesis;
- **Primary consumers**, also known as herbivores, which are organisms that feed directly on plants;
- **Secondary consumers**, which feed on primary consumers and include organisms such as an octopus or medium/large fish; and
- **Tertiary consumers**, which are the top organisms that feed on more or less whatever they want. They include sharks, killer whales, and even humans.

The goal of this lesson is to look at these different relationships, how organisms interact, and how some activities can impact an ecosystem.

Stuff You Need

- ✓ scissors

Ideas to Think About

- What types of relationships are there between organisms?
- How do these relationships influence other organisms in an ecosystem?
- What factors may influence relationships in an ecosystem?

Things to Know

- A **food chain** is a representation of the feeding relationships among specific organisms in an ecological community.
- A **food web** is a representation of all of the food chains in an ecosystem.
- **Terrestrial** means related to land.
- **Producers** are the organisms that use sunlight to make food necessary for survival.
- Primary, secondary, and tertiary consumers are organisms that rely on other organisms for energy and are not capable of making their own food.
- **Primary consumers** (such as cows, deer, and clams) consume producers like grass and algae.
- **Secondary consumers** (such as bears, coyotes, some fish) consume primary consumers.
- **Tertiary consumers** (such as sharks, killer whales, humans) consume whatever they need.

Reading and Questions

Read the two "Kelp Forest Food Web" pages. As you read, consider the organisms represented in this aquatic food chain and the relationships among them. Take time to study the graphics of the kelp forest food web and the barren kelp forest food web, noticing what happens to the entire food web when sea otters are removed. Answer the following questions.

1. What is the difference between a food chain and a food web?

2. If you were to count the number of organisms at different points in a food web, which organisms do you think would be the most plentiful: producers, primary consumers, secondary consumers, or tertiary consumers? Why do you think this might be?

3. What happens to a kelp forest ecosystem when otters are removed from the ecosystem?

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? Big Ideas

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- How do these relationships influence other organisms in an ecosystem?
- What factors may influence relationships in an ecosystem?



Facts and Definitions

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Skills

- Analyze evidence to explain observations, make inferences and predictions, and develop the relationship between evidence and explanation. (S)
- Analyze and evaluate information from a scientifically literate viewpoint by reading, hearing, and/or viewing scientific texts, articles, and events in the popular press. (S)
- Describe how terrestrial and aquatic food webs are interconnected. (S)

Introducing the Lesson

Your child will be asked to think about different types of organisms and the relationships these organisms have with one another and with their environment. Your child will become familiar with producers and consumers of all types, and is expected to make connections in terms of how food webs and food chains are ordered based on certain types of relationships, such as feeding. While these relationships hold significance in a variety of scientific studies, such as ecology, the goal of this lesson is to look at these different relationships, how the organisms interact, and how some occurrences can impact an ecosystem.

Reading and Questions (Answers)

1. What is the difference between a food chain and a food web?

- A food chain shows the feeding relationships of a few different organisms, whereas a food web shows many different food chains in a particular environment.

2. If you were to count the number of organisms at different points in a food web, which organisms do you think would be the most plentiful: producers, primary consumers, secondary consumers, or tertiary consumers? Why do you think this might be?

- Producers are the largest group by number. This is because it takes a great deal of plant matter to supply herbivores with sufficient calories (energy) and nutrients to survive. (Consider how much time deer, cows, and other large herbivores spend eating, and the amount of food they must consume each day!)

3. What happens to a kelp forest ecosystem when otters are removed from the ecosystem?

- There aren't enough predators of sea urchins to keep their populations down, and sea urchins reproduce and grow so quickly that they take over most of the simple food sources in the area, endangering other animals throughout the food chain.