



CONSTRUCTING A FOOD WEB

SUMMARY

Ecosystems are biological communities of interacting organisms with their physical environments. Organisms can only survive when their needs are met (food, water, space, and shelter). Food chains show how energy is transferred from one organism to another while a food web shows the interconnectedness of feeding patterns and how energy flows through the entire ecosystem.

Next Generation Science Standards

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations or organisms in an ecosystem.

MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

BACKGROUND INFORMATION

Healthy, well-balanced ecosystems are made up of many interacting food chains, called food webs. In most ecosystems, organisms can obtain food and energy from more than one source and commonly have more than one predator.

A food web is one way of representing predator-prey relationships and the energy flow in a system. Looking at a food web is a great way to see the interactions between organisms and how these connections determine the health of an ecosystem. If there is an imbalance, every organism in the food web may be affected.

OBJECTIVES

Students will:

- Understand the concept of a food web and its importance in ecosystems.
- Identify & classify organisms into different trophic levels.
- Analyze and interpret the flow of energy and matter in a food web.

LESSON PLAN: CONSTRUCTING A FOOD WEB

TIME

75 - 90 minutes

MATERIALS

- Food web slides
- Food web cards
- Yarn/string
- Scissors
- Tape

ENGAGE

Begin by asking students to define a "food chain." Explain to students that a food web is a combination of food chains. Ask students what type of components play a role in food chains.

Remind students that producers receive their energy from the sun, consumers receive their energy from producers or other consumers, and decomposers feed on dead or decaying matter.

EXPLORE

Have students stand in a circle and hand out an organism card to each, telling them to take note of what type of organism they are, their predators, what they eat, and if they are threatened or endangered. Explain to students what threatened or endangered means. Have students tape their card to their shirt or hold it in front of them.

Let students know that one organism card represents humans which can be a threat to any type of organism on the food web.

Have one individual play the role of the sun. This person will start with the yarn/string and hand it to any of the producers. Continue passing the yarn/string to a consumer who eats the producer. Continue until all students have interacted. *Don't forget about the decomposers!*

Next, have students with "threatened" or "endangered" cards sit down and cut their pieces of string. Ask students to observe what other organisms are impacted.

EXPLAIN

Ask the students some things they noticed or observed during the activity. What happens to the food web when threatened or endangered species are no longer a part of it? Mention if some omnivores were removed, specific producers would start to flourish, and top predators may dwindle without enough food. Ask students what organisms may have the greatest impact if removed. Explain to students that producers are vital to the food chain and without them, the ecosystem can collapse. Explain to students that every organism plays an important role in the food web - their niche.

EXTEND

Ask students to develop a model of a food chain that depicts how they received the energy they have today. Remind students to include photosynthesis, a producer, consumer, and themselves. *Optional: Include a bacteria as a decomposer.*

Have students create a model of their niche. What role do they feel they play in their families or community?

EVALUATE

Conclude the lesson with a discussion about ecosystems and the importance of biodiversity. The more biologically diverse an ecosystem, the more resilient - in other words, it can respond better to change.

Assess student understanding with an exit ticket on how an ecosystem may be impacted if a species were removed from the food web.