

Background:

Plants use light energy of the sun to make food. The food is stored in the cells of the plant. Plants are called producers because they make food. Some of the stored energy in the food plants make is passed on to the animals that eat the plants. Plant-eating animals are called primary consumers. Animals that eat other animals are called secondary consumers.

The pathway that food takes through an ecosystem is called a food chain. A food chain also shows the movement of energy from plants to plant eaters and then to animal eaters. An example of a food chain can be written: **seeds → sparrow → hawk** Some of the food energy in the seeds moves to the sparrow that eats them. Some of the food energy then moves to the hawk that eats the sparrow. Normally, only about 10% of the energy produced by the "food" moves to the consumer. Most of the other energy is used to keep the organism alive and allow it to reproduce.

Because a hawk eats animals other than sparrows, you could make a food chain for each animal the hawk eats. If all the food chains were connected, the result is a food web. A food web is a group of connected food chains. A food web shows many energy relationships.

Goals: In this exercise, you will:

- a. determine what different animals eat in several food chains.
- b. build a food web that could exist in a forest ecosystem.
- c. identify how a food chain can be shown as a food pyramid.

Materials: Colored pencils (red, blue, green and yellow), Set of "organisms"

Procedure:

Part A. Examining Food Chains

A. Study the food chains listed below and at the top of the next page.

B. Complete the table on the next page.

Checkmark using an "X" on all the things that each animal listed on the left side eats.

- plant parts → land snail → mouse → raccoon
- plant parts → sparrow → hawk
- plant parts → rabbit → fox
- plant parts → mouse → fox
- plant parts → earthworm → robin → snake
- plant parts → raccoon → fox
- plant parts → rabbit → snake
- plant parts → cricket → robin → fox
- plant parts → earthworm → snake → hawk → fox
- plant parts → rabbit → hawk
- plant parts → small insects → mouse → owl
- plant parts → rabbit → owl → fox
- plant parts → cricket → mouse → hawk
- plant parts → mouse → snake → owl

Food in an Ecosystem

Animals in a Forest Ecosystem	Living Things the Forest Animals Eat												
	Cricket	Earthworm	Hawk	Insects (small)	Land snail	Mouse	Owl	Plants	Rabbit	Raccoon	Robin	Snake	Sparrow
Cricket													
Earthworm													
Fox													
Hawk													
Insects (small)													
Land snail													
Mouse													
Owl													
Rabbit													
Raccoon													
Robin													
Snake													
Sparrow													

Part B: Making a Food Web

A. Use the information in the food chains to complete the diagram on the next page.

Draw an arrow from each living thing below to each thing that eats it. The first arrow in any food chain (between producer and primary consumer) should be green, the second (between primary consumer and secondary consumer) should be blue, the third (between secondary and tertiary consumer) should be red and the fourth should be yellow. Also, draw your lines so they bend around the animal names. This will make your food web easier to read when you finish.

Questions:

1. In how many food chains do the following animals appear?

hawk _____
owl _____

earthworm _____
snake _____

fox _____
small insects _____

2. In how many food chains do plants (parts) appear? _____

3. List the names of the living things in this forest ecosystem that are producers.

4. List those things that are only primary consumers.

5. What is another name for an animal that is only a primary consumer?

6. List those things that are only secondary consumers

7. What is another name for an animal that is only a secondary consumer?

8. List the consumers that eat both plants and animals.

9. What is another name for an animal that eats both plants and animals?

10. What would happen to the food web if all the plants were removed?

Explain your answer

11. Describe how 3 animals might be affected if owls were removed from the food chain.

12. Draw three food chains showing producers and consumers that you might see in your backyard or on your way to school. (You may use words or drawings.)

13. Since only 10% of the energy produced by a level in a food chain is passed on to its predator, there have to be many more "prey" than "predators". Draw a food pyramid of the first

food chain listed in Part A. Remember that there are more producers than primary consumers, more primary consumers and secondary consumers, etc.

