30-1 What Are Some Parts of a Food Chain and a Food Web?

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 that plants make is passed on to the animals that eat the plants. Plant-eating animals are called primary consumers. Some of the energy is passed on to the animals that eat primary consumers. Animals that eat other animals are called secondary consumers.

The pathway that food energy takes through an ecosystem is called a food chain. A food chain shows the movement of energy from plants to plant eaters and then to animal eaters. An example of a food chain can be written as follows:

(producer)  (primary consumer)  (secondary consumer)
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.

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.

OBJECTIVES
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.

KEYWORDS
Define the following keywords:

consumer: organism that relies on other organisms for its energy and food
food chain: series of steps in an ecosystem in which transfer energy by eating
food energy: in seeds move to the sparrow that eats them
food web: shows many energy relationships
producer: make their own food

MATERIALS
colored pencils  metric ruler
PROCEDURE
Part A. Examining Food Chains
1. Read the introduction and examine the food chains given below.

(producer) (primary consumer) (secondary consumers)
plant roots → rabbit → fox
plant seeds → mouse → fox
plant leaves → earthworm → robin → snake
plant leaves → rabbit → snake
plant leaves → cricket → robin → fox
plant stems → earthworm → snake → hawk → fox
plant stems → rabbit → hawk
plant stems → small insects → mouse → owl
plant leaves → rabbit → owl → fox
plant leaves → cricket → mouse → hawk
plant fruits → mouse → snake → owl
plant fruits → small insects → robin → snake

2. Answer the questions that follow:
   a. List the organisms that you think are producers. plant roots, seeds, leaves, stems, fruits
   b. Why are they called producers? because they produce their own food
   c. List the organisms that you think are primary consumers. rabbit, mouse, earthworm, small insects, crickets, mice
   d. Why are they called primary consumers? get eaten by other animals
   e. List the organisms that you think are secondary consumers. fox, robin, snakes, hawks, owl
   f. Why are they called secondary consumers? They eat other animals
   g. Herbivores are organisms that eat plants. List the herbivores in the food chains. rabbits, mouse, earthworm, cricket, small insects
   h. How does your list of herbivores compare with your list in question c? They are the same because list c contains primary consumers and primary consumers are herbivores
   i. Carnivores are organisms that eat other animals. List the carnivores in the food chains. fox, robin, snakes, hawks, owl
   j. How does your list of carnivores compare with your list in question c? Same as list c because the secondary consumers consume other animals
   k. Make two food chains using animals not listed in the above food chains.
   1. algae, shrimp, fish, shark
      2. grass, cows, humans
Part B. Making a Food Web
1. Use the information in Part A on the previous page to complete Figure 1.
2. Draw lines from each organism to other organisms that eat it.
3. Show which organism gets the energy by making an arrow pointing in the direction of energy flow from producers to primary consumers, to secondary consumers. One food chain has already been done for you.
4. Draw your lines with different colored pencils for different food chains. To make it easier to read when finished, do not draw through the circles.

FIGURE 1. A food web in a forest ecosystem
QUESTIONS
1. How many of the food chains you made in Figure 1 include the following animals? hawk 3 earthworm 2 fox 5
   small insects 2 owl 3 snake 6
2. How many of the food chains include plant parts? 12
3. Give the names of the producers that are in the food web. plant parts
4. Give the names of the consumers that eat both plants and animals. mouse
5. What would happen to the food web if all the plants were removed? There would be no food chain
   Explain your answer. Because the animals that only eat plants will die and so would the ones that would eat the
   snakes in a certain year? The population would decrease
6. What might happen to the owl population if there were less rabbits, mice, and herbivores?
7. What organisms will be affected if crickets, small insects, and earthworms are killed by pesticides? robin and the mouse
8. Draw three food chains below that can be connected in a food web. Show producers and consumers that you might see in your backyard or on your way to school.

   secondary consumers
   Bird
   primary consumers
   Butterfly
   producers
   Flowers