



## Lab: Oh, What a Tangled Web We Weave

### 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.

### Objectives:

In this exercise, you will:

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

### Procedure:

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

B. Complete the table on the next page. Checkmark or “X” 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 given on pp. 1-2 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.

### Analysis and Conclusions:

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

hawk \_\_\_\_\_                      earthworm \_\_\_\_\_                      fox \_\_\_\_\_  
 owl \_\_\_\_\_                      snake \_\_\_\_\_                      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 the organisms that are only primary consumers.
5. What is another name for an animal that is only a primary consumer?
6. List those organisms 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 different animals might be affected if owls were removed from the food chain.
12. 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 an energy pyramid of the first food chain listed in Part A.**
13. If 2000 kcal of energy are available in grass, how much energy would be available to the cow that eats the grass? To the human that eats the cow? **Explain how you arrived at your answers.**
14. Which organism in this food web has the greatest influence on the ecosystem? Justify your answer.
15. In general, what happens to the organisms that die without being eaten?
16. When people want to buy more meat at the market, farmers respond by growing much more grain than the increase in the mass of meat. Why is a much larger mass of grain needed to produce a certain mass of meat?

