

Food Chains and Food Webs

Food chains and food webs examine how the nutrients and energy contained in food is passed from organism to organism. Each living thing, whether it is a plant or animal, depends on nutrients and energy to survive and reproduce.

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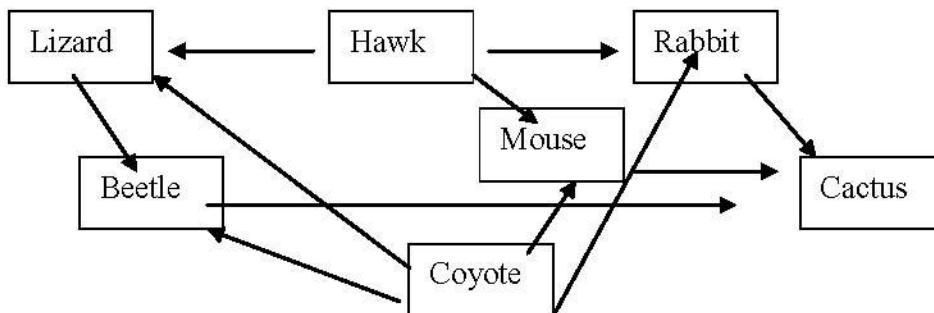
When you think of a food chain, think of a road to get from your classroom to the cafeteria. A food chain is one specific route to get from point A to point B. A food web is like a map of your school with all the possible ways to get from your class to the cafeteria marked. For example you may leave your classroom and turn left, go down the hall, through the library, and come out next to the cafeteria. On another trip, you may leave the class, turn right, cut through the gym, by the office and arrive at the cafeteria. Other days you may turn right out of class but after the gym, head through the library as in the first plan. The total of these routes and all possible combinations is called a food web. On a diagram, it usually looks much like a spider web.

Plants and Animals

Most food chains and webs contain both plants and animals. Some of the things in a food chain are consumers, and other things are producers. Scientists generally use food chains to study how larger species are fed. Let's look at an example: The fox eats small rodents such as rabbits. The rabbit eats plants. The plants get their food by changing sunlight into food that is stored in its leaves. Here is their food chain:



When scientists create food webs, they are usually looking at all of the living things in an area, or community, and studying how the different species interact to meet their food needs. In a desert community, a simple food web might look like this:



In our desert example, you will notice that some species consume more than one food source. The snake has four sources of food and is the food source for only one, the hawk. The hawk does not depend on the snake, because it too has more than one food source.

Population Changes

The number of any one species that live in an area is a population. The number of people who live in your community is the population of that community. The number of ducks that live in an area wetland is the population for that wetland.

Populations vary for many reasons but a major factor that affects the population of a particular animal is the available food sources. If there isn't a supply of food, a species will move on to another area in search of food. If not enough food is found then the species' population will decline.

When You Have Too Many

In any ecosystem or community, if all the individual populations are in balance, each species has enough food to live and reproduce. If the system gets out of balance, by the population of one species being too large or too small, the entire food web can be affected and possibly destroyed.

Let's look at the desert food web. What do you think would happen if the population of beetles were suddenly killed off? Which species depend on the beetle? There are two species that eat beetles in this food web, the lizard and the coyote. Any change in one species will directly affect those who depend on that species. Without beetles to eat, the coyote will have to depend on his other food sources to live. However, the lizard only eats beetles and, with all of the beetles gone, the lizard will have to move to find more beetles, find another insect to eat, or the lizard species will die out.

The opposite can happen when there is sudden increase in the abundance of one species in the web. If the beetle population suddenly doubled, the lizards would have so much food that their species would thrive and do well. They would be able to reproduce and raise more young to adulthood. Their population would therefore increase as well. When the lizard population increases, the food supply for every species that eats lizards also increases and can result in larger populations of those as well.

However, with these increased populations, there is more demand for food. With the increased beetle population, the cactus that they depend on for food will be consumed faster and may die out. With the removal of their food, the beetle population will decline, as will those species that consume beetles. However, with the removal of the cactus by the overpopulation of beetles, the rabbit population, who also depends on the cactus, will also decline or die out because of lack of food.

You can see from these examples that, in order for everyone to eat, live, and reproduce, a balance of populations has to be maintained. Increases and decreases can affect each species in the community.

Application

1. Draw a food chain for either a bear or a wolf in the diagram below.



2. Cut out the pictures on the next page and use them to create a food web for a forest. Glue them on a new page in your science notebook and draw arrows to show who is eating what. (If you were eating an apple, the arrow would go from you to the apple.)

Circle the producers in green.

Circle the consumers in red.

Grade 4's:

We have special words that describe an animal by what it eats.

Meat eaters are called carnivores.

Plant eaters are called herbivores.

Animals that eat both plants and animals are called omnivores.

Label each of the animals in your food web as either a herbivore, carnivore or omnivore.

3. In your forest food web, make a prediction of what would happen if the population of foxes increased. (A prediction is your idea of what will happen in the future.)

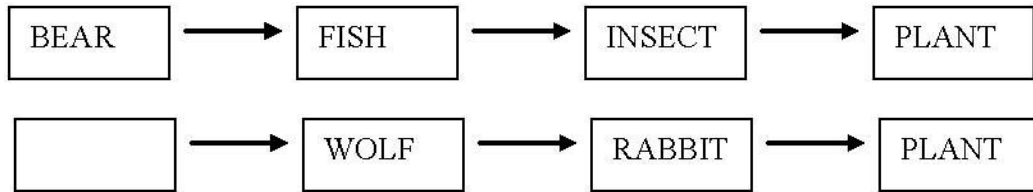
4. In your food web from Question # 2, select one producer or consumer and predict what would happen if it all died or left the area suddenly.

- a. Which one did you pick? _____. Was it a producer or consumer? _____
- b. Which species would be most affected by the loss of the one you picked?
- c. Which species would be able to survive by eating other sources?
- d. Is there any species that would not be affected? Why?

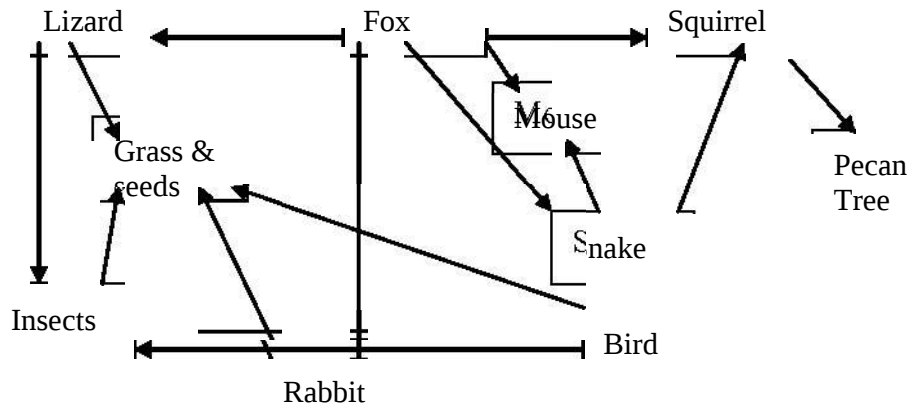


SUGGESTED ANSWERS

1.



2. ANSWERS WILL VARY – Look for obvious connections and logical food sources. Here is a sample.



3. If the population of foxes increased, they would eat more squirrels, lizards, rabbits and snakes so those populations would most likely decrease.

4. ANSWERS WILL VARY DEPENDENT ON WHICH SPECIES THEY SELECT. Key idea: increased population results in decreased food sources

B. Key idea: choose any species that has more than one food source

C. Key idea: all species in the community would eventually be affected as various species increase or decline.