Teacher Background:

Food Chains and Food Webs

Living things need energy for everything they do. For example, a butterfly needs energy to change position when it flies, and a flower needs energy to change size as it grows and blooms.

All living things get energy from food. Plants use energy from the sun to make their food. Plants use the food they make for energy to grow. Animals get energy by eating plants or other animals.

The energy in living things originates from the sun. Plants are the only living organisms that can use the energy from the sun to make food.

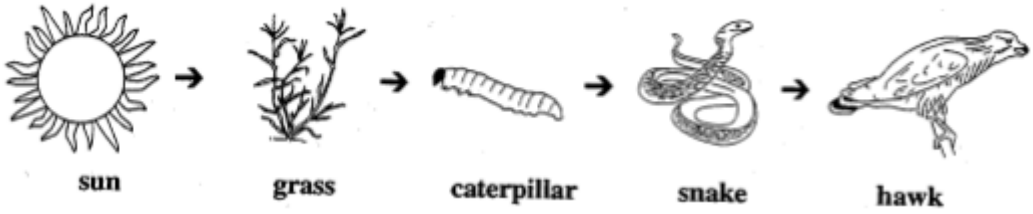
Although many children know that the sun keeps plants healthy, they may not know that plants rely on the sun's energy to make food, or that this food can be used by the plant itself or by animals that eat the plant. For example, a sugar maple tree uses the sun's energy to make sugar, a food, in its leaves. The tree uses the sugar for energy to grow and stay alive. If people eat maple syrup, they get energy from the sugar in the tree. But people cannot hold out their hands to the sun and make food in the same way that a maple tree can make food in its leaves.

Children may think that the sun is important because it keeps animals warm. The sun does provide warmth to the animals, but, more importantly, the sun provides the energy that plants use to produce food. Animals get this energy when they eat the plants. To help students understand that animals depend on the sun for food energy, have them think about how long a rabbit could live if it only basked in the sun and did not eat plants. The relationship between the sun's energy and the energy required by living things will become clearer as the children learn about food chains and webs.

Children may cling to the idea that plants draw in usable food from the soil through their roots. It is true that plants absorb water and essential minerals from the soil and that they need water to make food. Food contains energy, however, and the water and minerals in the soil do not contain energy. So, plants use the energy from the sunlight plus water and minerals along with carbon dioxide from the air to produce food that contains energy.

A food chain's energy is transferred in sequence. For example, energy comes from the sun, to plants, to animals that eat plants, and to animals that eat other animals. Plants use the sun's energy directly to make food. When animals eat plants and other animals

eat those animals, the energy moves from one living thing to another along the food chain. Ultimately, all members of a food chain depend on the energy from the sun that plants transform into food energy.



For example, the above diagram illustrates a food chain that might be found in the prairie. Arrows indicate the transfer of energy from one organism to another. The sun provides energy for the grass, the grass for the caterpillars that eat the grass, and so on.

Students may want to use arrows to show animals moving toward their food. It may be necessary to help students recognize their thinking, as in the following example: “Does your arrow show that the Desert Tortoise moves toward the Prickly Pear to get food? Now, can you draw the arrow to show which way the food energy is going? Does eating the Prickly Pear give energy to the Desert Tortoise?” As they draw food chains in this unit, the students will better understand how the sun’s energy passes through food chains.

Food webs are more complex than food chains. They consist of many food chains that are interconnected. Each living organism can provide energy to many other living organisms. There is not just one path of energy for a living thing.