

The Web of Life



Overview

Students construct a food web to learn how all living things in an ecosystem are interconnected and energy for life comes from the sun.

Suggested Grade Level

PreK - 1

Estimated Time

30 - 40 minutes

Objectives

Students will be able to:

1. show how plants and animals get energy, by telling other students which plants and animals are eaten by other animals.
2. explain that energy for life comes from the sun.
3. explain how all living things depend directly or indirectly on green plants for food.
4. use pictures and arrows to create a food web that includes the sun, green plants, and animals from the prairie.

Materials

1. Ball of yarn
2. Pictures of prairie plants, animals, and humans
3. Tape to attach pictures to clothing
4. Space for the class to form a large circle

Background

Living Things Need Energy From Food

Energy can be defined as the capacity for change. Living things need energy for everything they do. For example, a butterfly needs energy to change position when it flies, and a daffodil needs energy to change size as it grows and blooms.

All living things get energy from food. Green 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 Sun is the Source

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

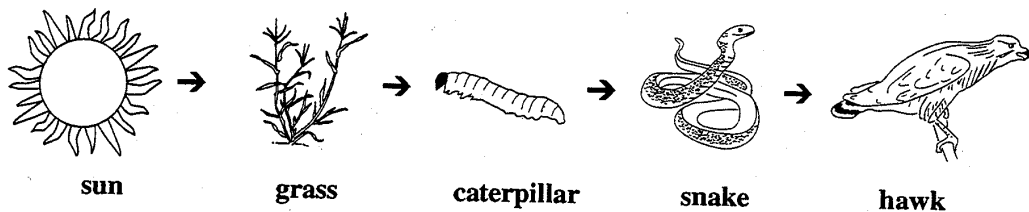
Although many children know that the sun keeps plants healthy, they may not know that plants rely on the sun's energy to make food, or that this food can be used by the plant itself or by animals that eat the plant. For example, a maple tree uses the sun's energy to make sugar, a food, in its leaves. The tree uses sugar for energy to grow and stay alive. If people eat maple syrup, they get energy from the sugar that was 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 green plants use to produce food. Animals get this energy when they eat plants. To help students understand that animals depend on the sun for food energy, have them think about how long a deer could live if it only basked in the sun and did not eat green 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 the water and minerals from the soil along with carbon dioxide from the air to produce food that contains energy.

Food Chains

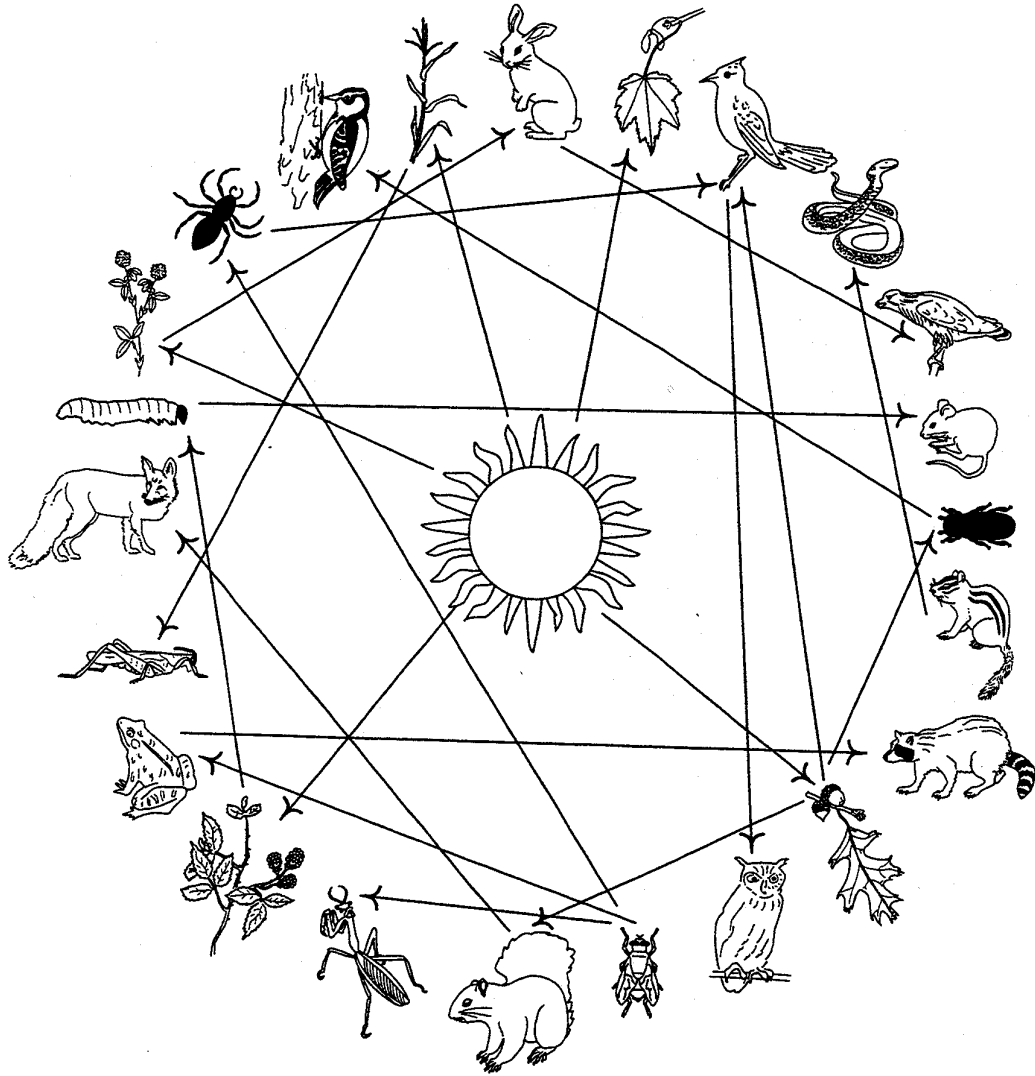
A food chain's energy is transferred in sequence; for example, energy from sunlight, to green plants, to animals that eat plants, and to animals that eat other animals. Green plants use the sun's energy directly to make food. When animals eat green plants and other animals eat those animals, the energy moves from one living thing to another along the food chain. Animals that eat plants are called herbivores, animals that eat both plants and animals are called omnivores, and animals that eat *only* other animals are called carnivores: Ultimately, all members of a food chain depend on the energy from the sun that green plants transform into food energy.



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.

Food Webs

Food webs are more complex than food chains. They consist of several food chains that are interconnected. The following example is a series of food chains, which together make a food web.



Activity

1. Copy, cut and pass one picture of prairie plants and animals to each student. Help students tape their pictures to their chests. The teacher should represent the sun. Be sure that there are enough plant species represented.
2. Tell the students that they will see how plants and animals are all interconnected in the prairie and other ecosystems. Have them sit in a circle and introduce themselves as the plant or animal they represent. They should look around and then tell the group:

Who in the circle could I give my energy to? (Who might eat me?)

Who in the circle could give me energy? (Whom could I eat?)

This is an opportunity to talk about relationships between plants and animals and how they get their energy. Explain that humans, bears, raccoons, etc., are omnivores that eat both plants and animals.

3. Explain that the ball of yarn represents sunbeams, or energy from the sun. Hold the end of the yarn tightly and toss the ball to someone who can use that energy (a green plant). When a student representing the green plant catches the ball of yarn, he or she should hold the yarn and throw the ball to someone else who could use the energy (an animal that might eat them). For example, the sun might throw the yarn to the grass, the grass to the grasshopper, and the grasshopper to the quail. Each time have the students hold tightly to the loop of yarn. Next have students throw the ball of yarn to someone that either they give energy to **or** they get energy from. The quail could throw the yarn to the fox (someone who takes energy from them; eats them) or to the caterpillar (someone they get energy from; something they eat). **NOTE:** Most of the action will take place between the plants, the sun and the herbivores (animals that eat plants) It takes many energy transfers to get to the carnivores (animals that eat other animals).

After the ball of yarn has been passed to everyone at least once, and the plants and the sun many times, explain that you have created a food web (it looks like a spider's web). This is a graphic way to show how plants and animals are interrelated in a community.

Ask:

Who is holding the most yarn? (The sun.)

Why? (Because the sun gives energy to all the plants to make food)

Who else is holding many loops of yarn? (Green plants.)

What would happen if all the green plants died? (There would be no food. Nothing else in the food web could survive.)

What would happen if one kind of plant, such as all the clover, died? (The student representing clover could drop the yarn and the food web would sag and be less complex.)

If all the clover was gone, who else may have trouble getting enough food? Who gets their energy from the clover? (Look at the sagging parts of the web to see who was holding pieces that are connected to the clover)

Why should we be concerned about each kind of plant or animal? (Because other plants and animals in the food web may depend on them. We are all connected.)

Emphasize that each group is important and applaud each in turn.

Will the carnivores (animals that eat other animals) please show their teeth?

Will the omnivores (animals that eat both plants and animals) please wave their arms?

Will the herbivores (animals that only eat plants) please stamp your feet?

Will the only living things that can make food using the sun's energy – green plants – please take a bow?

Collect the “Who Eats Who” sheets for another activity.

Extensions

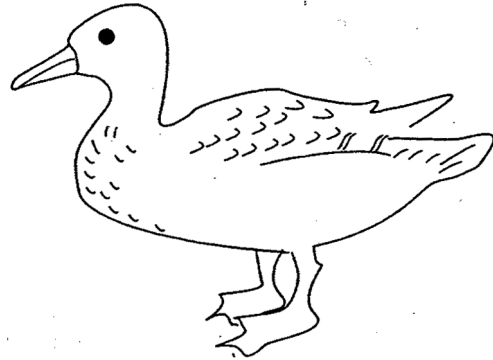
1. Students can learn more about the plant or animal they represent and tell a story about the plant or animal to the class.
2. Have students color the plant or animal they represent prior to creating the food web.
3. Have students draw their own picture of a plant or animal from the prairie.

Adapted from Project LEAP: Learning about Ecology, Animals, and Plants, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY 14853.

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Human



Duck



Prairie Grass

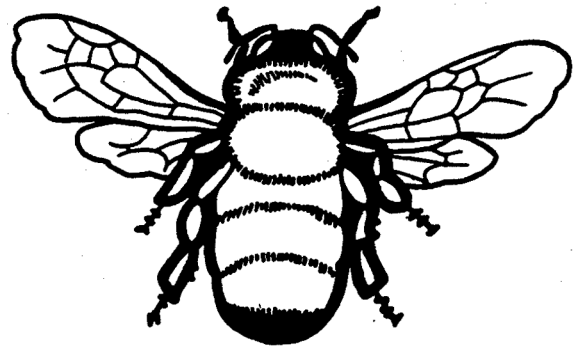


Deer

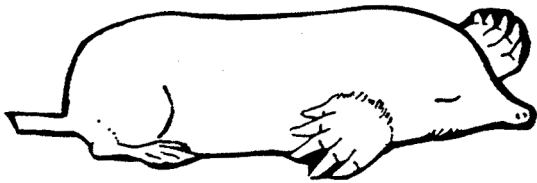
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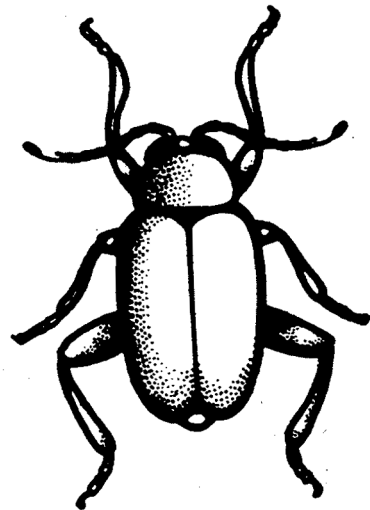
Owl



Bee

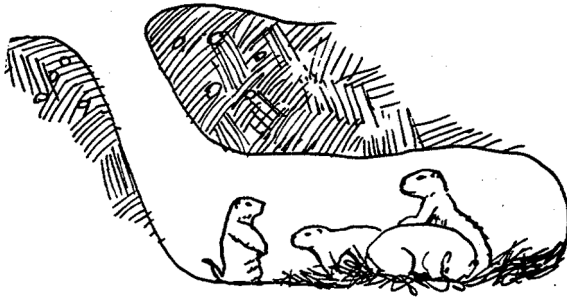


Mole



Beetle

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Prairie Dogs



Sunflower

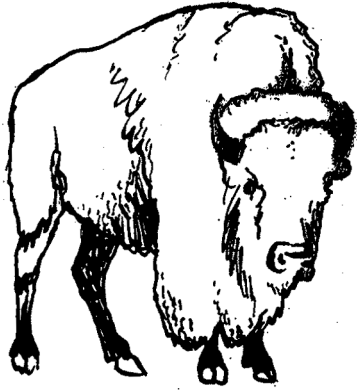


Meadow lark

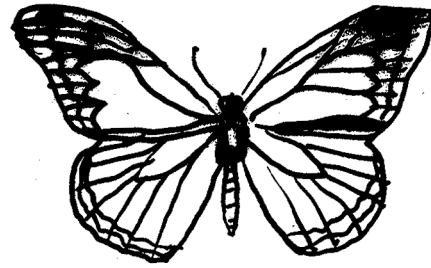


Quail

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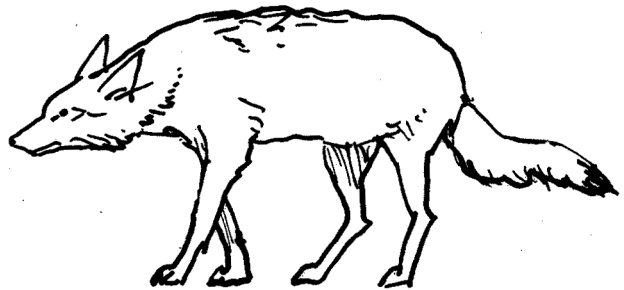
Bison



Butterfly

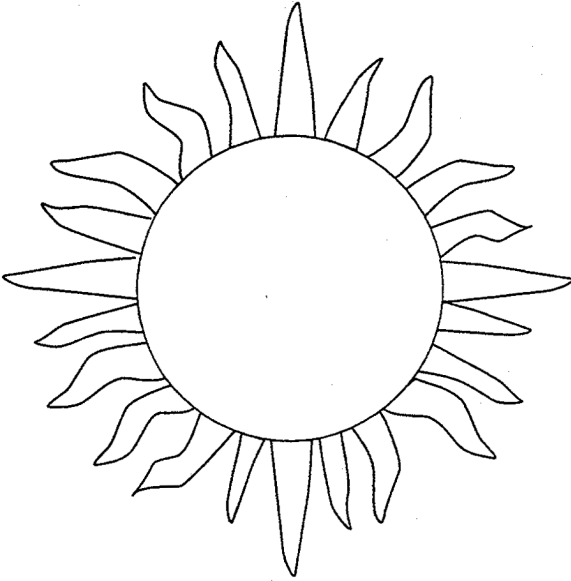


Aster



Coyote

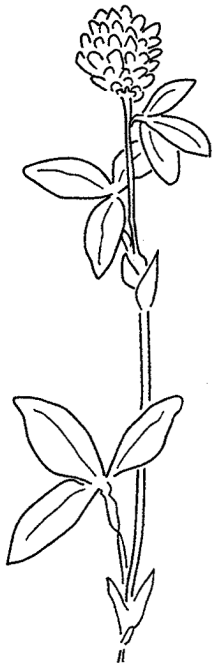
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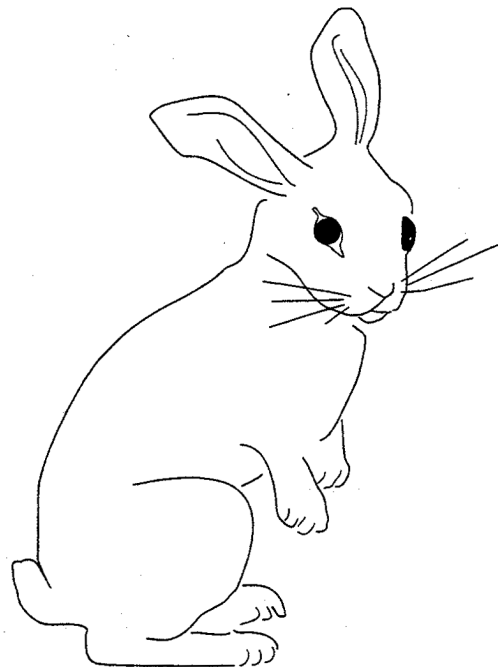
Sun



Orchard grass

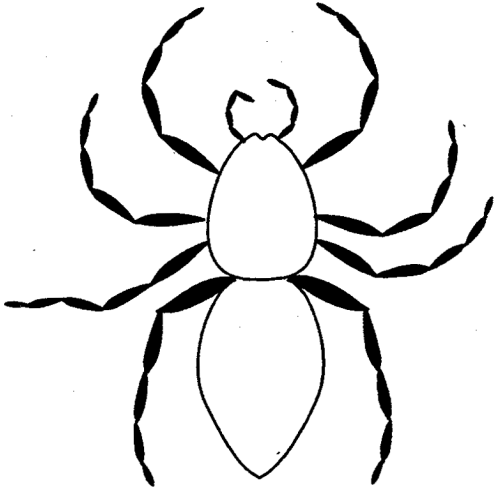


Clover

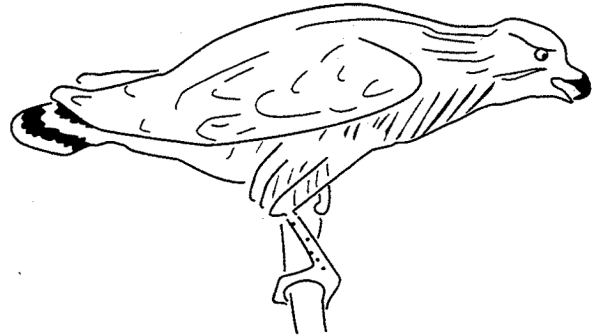


Rabbit

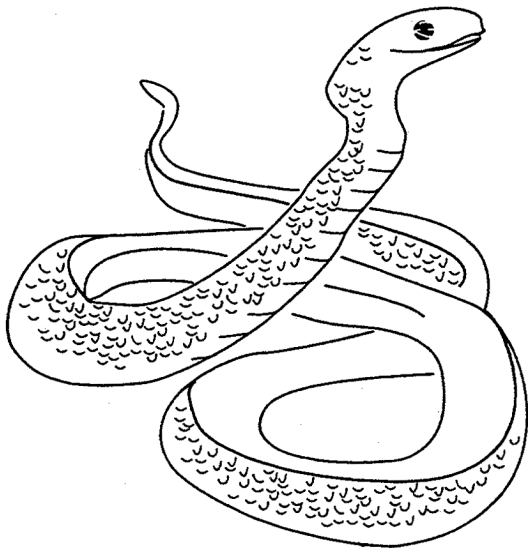
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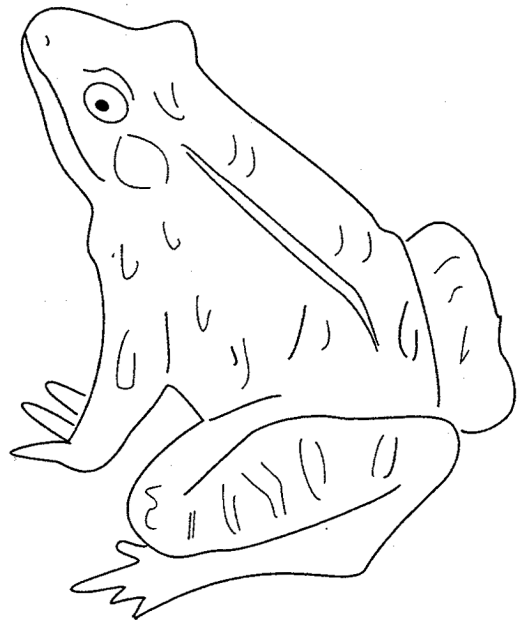
Spider



Hawk

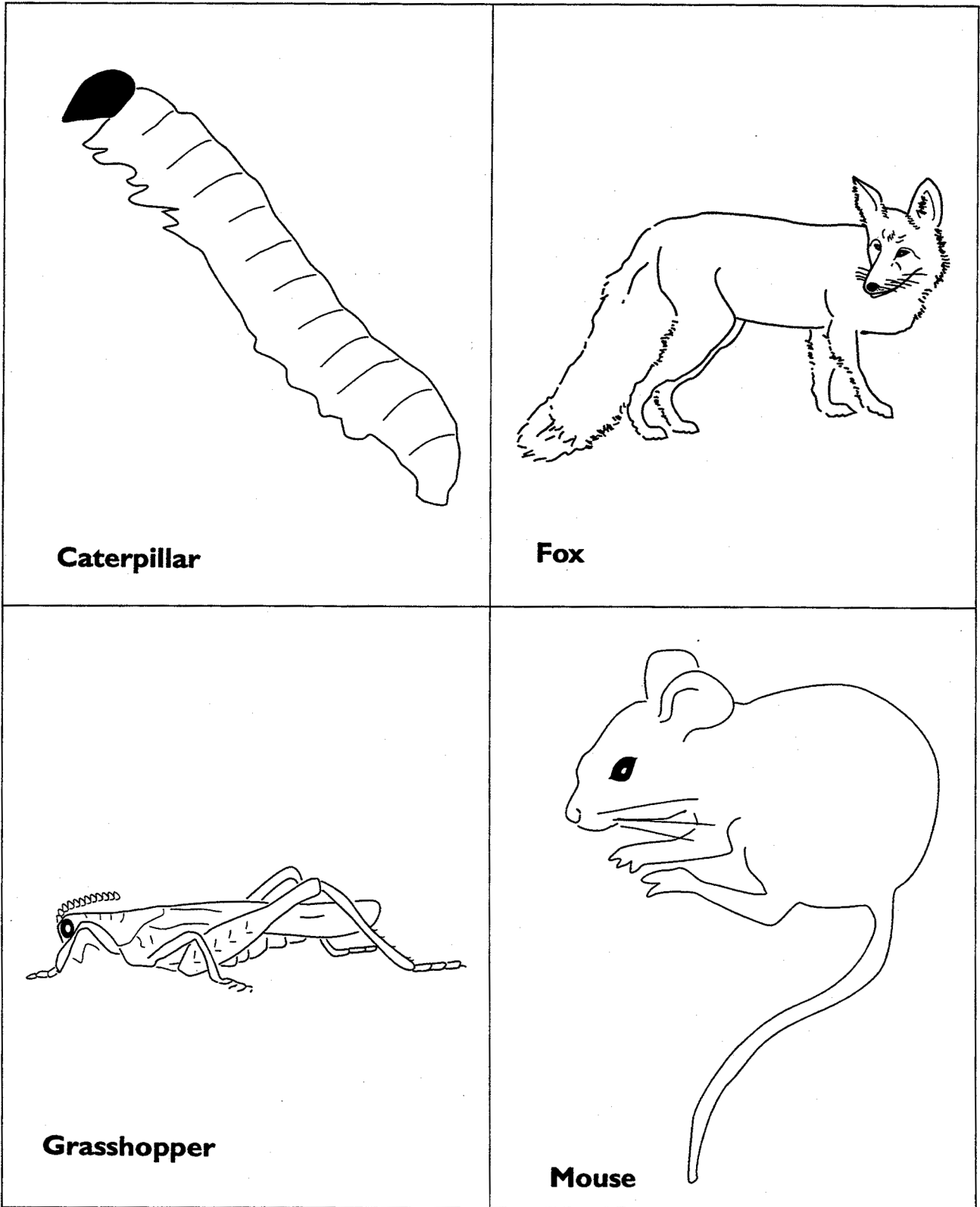


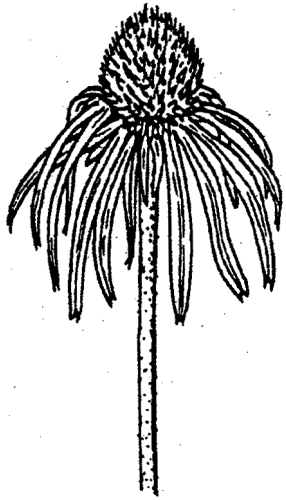
Snake



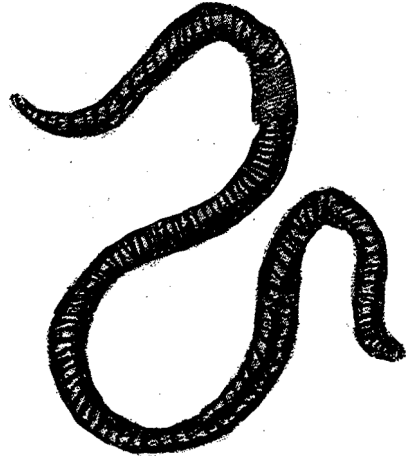
Frog

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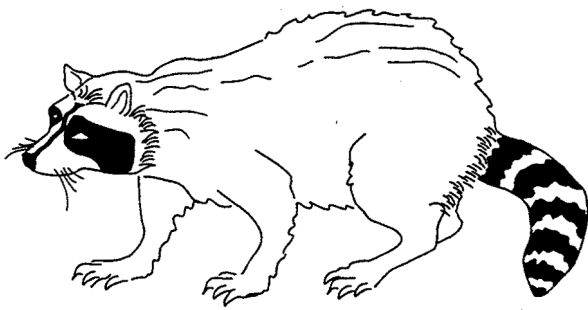




Coneflower



Worm



Raccoon



Black-eyed Susan