Do I Eat That?

Standards of Learning
Science LS.7

Purpose
Students will:
- Trace the energy flow in an ecosystem

Materials
- Note cards
- Chart paper

Background Knowledge
Review a food web with classes. You get energy from the food you eat. Similarly, all living things get energy from their food so that they can move and grow. As food passes through the body, some of it is digested. This process of digestion releases energy. A food chain shows how each living thing gets its food. Some animals eat plants and some animals eat other animals. For example, a simple food chain links the trees & shrubs, the giraffes (that eat trees & shrubs), and the lions (that eat the giraffes). Each link in this chain is food for the next link. A food chain always starts with plant life and ends with an animal. Plants are called producers because they are able to use light energy from the Sun to produce food (sugar) from carbon dioxide and water. Animals cannot make their own food so they must eat plants and/or other animals. They are called consumers. There are three groups of consumers. There are three groups of consumers. Animals that eat only plants are called herbivores (or primary consumers). Animals that eat other animals are called carnivores. Carnivores that eat herbivores are called secondary consumers. Carnivores that eat other carnivores are called tertiary consumers. Animals and people who eat both animals and plants are called omnivores. Then there are decomposers (bacteria and fungi) which feed on decaying matter. In a food chain, energy is passed from one link to another.

When a herbivore eats, only a fraction of the energy (that it gets from the plant food) becomes new body mass; the rest of the energy is lost as waste or used up by the herbivore to carry out its life processes (e.g., movement, digestion, reproduction). Therefore, when the herbivore is eaten by a carnivore, it passes only a small amount of total energy (that it has received) to the carnivore. Of the energy transferred from the herbivore to the carnivore, some energy will be "wasted" or "used up" by the carnivore. The carnivore then has to eat many herbivores to get enough energy to grow. Because of the large amount of energy that is lost at each link, the amount of energy that is transferred gets lesser and lesser. There cannot be too many links in a single food chain because the animals at the end of the chain would not get enough food (and hence energy) to stay alive. Most animals are part of more than one food chain and eat more than one kind of food in order to meet their food and energy requirements. These interconnected food chains form a food web. A change in the size of one population in a food chain will affect other populations. This interdependence of the populations within a food chain helps to maintain the balance of plant and animal populations within a community. For example, when there are too many giraffes; there will be insufficient trees and shrubs for all of them to eat. Many giraffes will starve and die. Fewer giraffes means more time for the trees and shrubs to grow to maturity and multiply. Fewer giraffes also means less food is available for the lions to eat and some lions will starve to death. When there are fewer lions, the giraffe population will

increase. Discuss the sun as a primary energy source featuring how the sun energy translates into usable energy for humans. Trace the flow of energy from plants to animals and where humans fit into the equation.

Procedure

1. On the note card, have the student list a typical dinner.
2. Share the dinners with the class, and group students with similar meals together.
3. Give each group a sheet of chart paper, and have them make columns labeled plant, animal, and other organisms. Then have students place their dinner foods under the appropriate column or columns.
4. Finally, have them count how many were plants, animals, other.
5. Ask discussion questions:
    - Where do these items come from (other than the grocery store)?
    - How many fell in the other category?
    - How many fell into more than one category?

Extension

- In a food chain/food web, what part is missing? Why?
- Use a string line to create a web from one student to the next when acting out a food web.