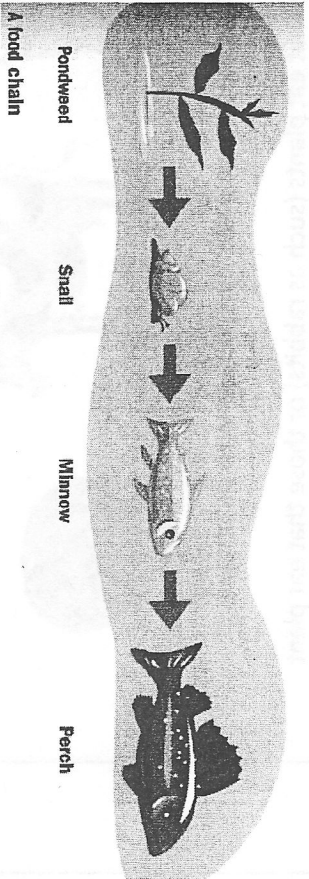


(7.5C) Flow of Energy (Food Chain, Food Webs and Energy)

Food Chains

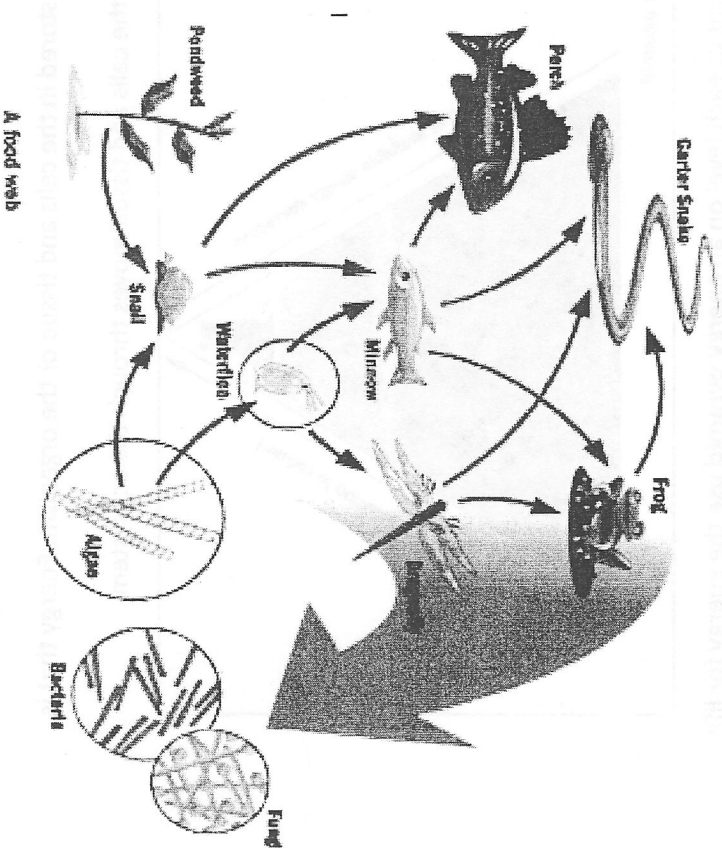
Organisms get the energy they need from food. A **food chain** traces the path of energy as it moves from one organism to the next in an ecosystem. In most ecosystems, energy begins with the sun, so **producers** (organisms that use the sun's energy to make food) always form the base, or starting point, of a food chain. Arrows show the direction of energy movement in a food chain.



In the food chain above, the pondweed is the producer. As shown by the arrow, energy moves from the pondweed to the snail that eats it. The snail is the **primary consumer** in this food chain because it is the first to feed. Energy next moves from the snail to the minnow. As the second consumer in the food chain, the minnow is a **secondary consumer**. When the perch eats the minnow, it takes in energy. The perch is the **tertiary consumer** in this food chain – the third feeder. The final link in the food chain is filled by the bacteria and fungi that act as **decomposers**. These organisms feed on and break down the remains of the perch when it dies.

Food Webs

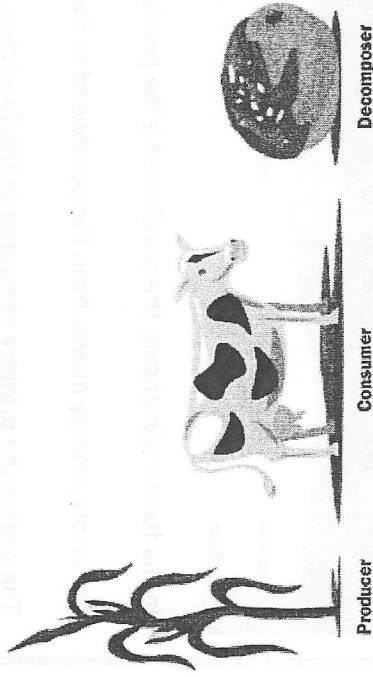
A food chain shows only one energy path in an ecosystem. But most organisms are part of more than one food chain. Scientists often use a food web to show a more complete picture of the flow of energy in an ecosystem. A **food web** is a system of several overlapping food chains.



As with most ecosystems, the energy in a pond ecosystem starts with the sun. This energy is taken in by producers and converted to food energy. The energy in food then moves through different levels of consumers. The movement of energy ends with the many bacteria and fungi that live in the mud at the bottom of the pond. As they feed, they break down the organisms into materials that are then returned to the ecosystem.

Feeding Relationships

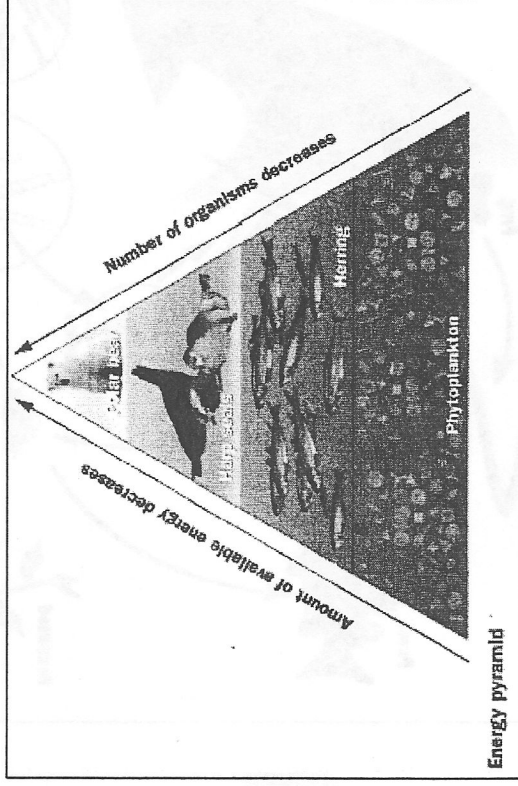
All organisms need energy to live. Organisms can be divided into three main groups – producers, consumers, and decomposers. Plants, algae, and bacteria that make their own food are **producers**. Most producers make their food using the energy of the sun and materials from the environment. Any organism that gets its food by eating other organisms is a **consumer**. There are different types of consumers.



- **Herbivores** are plant-eaters. They feed directly on producers. Animals that eat plants (such as rabbits) or those that eat plant products (such as squirrels eating acorns) are herbivores.
- **Carnivores** are meat-eaters. They get food by eating herbivores or other carnivores. Examples of carnivores include sharks and eagles.
- **Omnivores** are organisms that feed on both producers and other consumers. Raccoons, bears, and most people are omnivores.
- **Decomposers** are organisms that feed on the remains or wastes of other organisms. Fungi and bacteria are decomposers.

Energy Pyramids

The energy in most ecosystems begins with the sun. Plants and other organisms perform photosynthesis to capture the Sun's energy and use it to make food. The Sun's energy is converted into chemical energy that moves through the ecosystem. Some of the energy is used by the organism for life activities (energy to move, reproduce, etc...) and some energy is stored in the cells and tissue of the organism. Energy that is stored in the cells and tissue moves through the ecosystem.



Organisms at each level on an **energy pyramid** use the energy for life activities. Only 10% of the energy from one feeding level will move UP to the next feeding level. This means that 90% of the energy is LOST to the environment as heat. There is a decrease of available energy as you move UP the energy pyramid. The producers at the bottom of the energy pyramid have the most available energy.