Components of an Ecosystem

Guide for Reading

- What components of an ecosystem do organisms respond to?
- What are the levels of organization within an ecosystem?

All the living and nonliving things that interact in a particular area make up an ecosystem. Organisms live in a specific place within an ecosystem. An organism obtains food, water, shelter, and other things it needs to live, grow, and reproduce from its surroundings. The place where an organism lives and that provides the things the organism needs is called its habitat.

An organism interacts with both the living and nonliving things in its environment. The living parts of an ecosystem are called biotic factors. The nonliving parts of an ecosystem are called abiotic factors. Abiotic factors include water, sunlight, oxygen, temperature, and soil.

All the members of one species in a particular area are referred to as a population. Some animal populations form highly structured groups called societies. A society is a closely related population of animals that work together for the benefit of the whole group.

All the different populations that live together in an area make up a community. The smallest unit of organization is a single organism, which belongs to a population of other members of its species. The population belongs to a community of different species. The community and abiotic factors together form an ecosystem.

The study of how living things interact with each other and with their environment is called ecology. Ecologists, scientists who study ecology, look at how all the biotic and abiotic factors in an ecosystem are related. They study how organisms react to changes in their environment. Living things constantly interact with their surroundings, responding to changes in the conditions around them.

Energy in an Ecosystem

Guide for Reading

- How does energy flow in living systems?
- What happens when biomass decays?

Autotrophs, such as plants, use the sun’s energy to turn water and carbon dioxide into sugar molecules. An organism that can make its own food is a producer. Producers are the source of all the food in an ecosystem.

Heterotrophs cannot make their own food. They depend on autotrophs for food and energy. An organism that obtains energy by feeding on other organisms is a consumer. Consumers are classified by what they eat. Consumers that eat only plants are called herbivores. Consumers that eat only animals are called carnivores. A consumer that eats both plants and animals is called an omnivore. An organism may play more than one role in an ecosystem.

Heterotrophs that break down wastes and dead organisms and return the raw materials to the environment are called decomposers. As decomposers obtain energy for their own needs, they return simple molecules to the environment to be used again by other organisms.

Ecologists use a diagram called a food chain to show to flow of energy from organism to organism in an ecosystem. In general, energy flows from producers to consumers to decomposers in an ecosystem. A diagram called a food web shows
how many food chains are connected.

The total amount of living matter, and the remains of dead organisms, in an area is the area’s biomass. When living things die, decomposers break down the material in the biomass, and the biomass decays. The decay of biomass produces matter in the form of small molecules. This chemical breakdown also releases the energy stored in the chemical compounds in the biomass.