

Reflect

You wake up early on a Monday morning. You grab something to eat and drink and then go outside to catch the bus. When you arrive at school, you suddenly remember that you forgot to do part of your homework! You find a classmate, and she helps you finish up a few science questions. Then you both head into class, where your teacher is starting the school day.



organism – a living thing

From the time you woke up until the time you started class, you were interacting with your environment. Any behavior that causes something to affect something else is called an *interaction*. You ate food, drank liquids, breathed air, and relied on other people for help. In the same way, **organisms** interact with their environment every day. These interactions help organisms survive. What are some things organisms might interact with? Are they living or nonliving? Can you think of some ways in which organisms interact with each other?

What is an ecosystem? What are the different parts of an ecosystem?

An *ecosystem* is a community made up of living and nonliving things interacting with each other. Nonliving things do not grow, need food, or reproduce. Some examples of important nonliving things in an ecosystem are sunlight, water, air, wind, and rocks. Living things grow, change, produce waste, reproduce, and die. Some examples of living things are organisms such as plants, animals, fungi, and bacteria. Organisms interact with the living and nonliving things in their ecosystem to survive.



A forest is a type of ecosystem. What kinds of living things would you expect to see in a forest? You might see different kinds of animals, such as bears, deer, mice, and snails. You might also see plants, such as trees and bushes. Other living things in the forest might include mushrooms or even bacteria living in the soil. These living things interact with the nonliving things around them, such as sunlight, temperature, and water.



The living things in an ecosystem are interdependent. This means that living things depend on their interactions with each other and with nonliving things for survival. For example, a tree depends on sunlight for energy to make its own food and a snail depends on the tree for food. A healthy ecosystem is one in which many different species are each able to meet their needs.



Living things are also dependent on the right environment. The environment must meet the particular needs of the organism. Penguins and kingfishers both eat fish, but the penguin would not survive in the kingfisher's tropical or temperate environment. Neither could the kingfisher survive in the penguin's Antarctic environment.



What Do You Think?

This bee is collecting pollen from a plant's flower. It uses the pollen to make food for itself and other bees. The bee depends on the plant's flower for food. What living and nonliving things do you think the plant depends on?



How do the nonliving components in an ecosystem support the other components?

Nonliving components are important parts of any ecosystem. Sunlight is one of the most important nonliving components. Light from the Sun helps plants produce food and oxygen. Sunlight also provides heat that makes life on Earth possible. Without the Sun's heat, Earth would be too cold for most living things to survive.



This plant uses nonliving components, such as sunlight, water, and carbon dioxide, to produce food (sugar) and oxygen.

Take a deep breath. Every time you breathe, you take in air. Air is a mixture of gases, including nitrogen, oxygen, and carbon dioxide. These gases are nonliving components needed by almost all organisms on Earth. Water is another important nonliving component. All organisms depend on water. A healthy ecosystem is one that has enough water to support the variety of organisms that live there. What would happen if there wasn't enough water?



Temperature is a nonliving component that affects living things in an ecosystem. Think about what happens when the temperature drops in the winter. Animals move to warmer areas or hibernate, trees lose their leaves and stop growing, and people begin to wear warmer clothing.

Soil is another component in an ecosystem that has both living and nonliving materials. In a desert, the soil is very sandy and has little moisture or nutrients. It can support only certain plants that have adaptations to live with very little rainfall. In a rain forest, the soil can be poor in nutrients but high in moisture. It supports large trees, long vines, and many other kinds of plants. These plants take up nutrients in the soil right away and often grow quickly.



Animals compete with each other for nonliving components, such as water. But animals aren't the only organisms that compete for the resources around them! Plants also compete with each other and animals for nonliving parts of an ecosystem.

Suppose a fire destroys a forest. A short while later, new trees start to grow. At first, many young plants may grow in the forest. But some plants, such as trees, are able to absorb more water and nutrients, so they begin to grow taller. As they grow, they block the sunlight to smaller plants growing below. The smaller plants cannot produce enough food to survive, and they die off. Forest ecosystems change because conditions in the forest are constantly changing.



How do the living components in an ecosystem support other components?

Think about some of the living components of a desert ecosystem. How do they interact with other things in the ecosystem? A desert has plants, such as grasses, bushes, and cacti. The grasses and bushes provide food to animals, such as deer and mice. Trees provide shade from the sunlight and shelter to other organisms. Birds help spread the seeds of a plant to new areas of the forest. Burrowing creatures mix and move the soil, circulating nutrients back to the ecosystem. When organisms die, their bodies break down, become part of the soil, and provide nutrients to plants and other organisms. The living components of the desert depend on each other for survival. A healthy ecosystem is one in which the population of each **species** is just the right size to support the other organisms that depend on it.

species – a group of organisms that are similar to one another and can combine to produce offspring

Look Out!

A single type of organism may play more than one part in an ecosystem. For example, you might think of a snake only as a predator. While a snake does eat other organisms, it may also be food for another predator. Certain birds, such as eagles or hawks, eat snakes for food. The snake is a predator and also a prey animal for other organisms.



What do you think would happen if a non-native species were introduced into an ecosystem? The new species could actually damage the ecosystem!

The balance of an ecosystem can be greatly harmed by the introduction of a new species. In the 1700s, European rabbits arrived by ship in Australia as a food source. Those that escaped started a population explosion. Since there were no natural predators of rabbits in Australia, there was no control of the population. Rabbits are herbivores, meaning they eat plants for energy. Millions of dollars of crops were destroyed by the abundance of rabbits.



New species of plants can also destroy the balance in ecosystems. An invasive vine from Japan was introduced to the United States at the Centennial Exhibition in Philadelphia in 1876. It was sold as a shade plant and as a plant to prevent soil erosion. The climate and soil of the Southeast proved perfect for the unchecked spread of kudzu.