

Living Things • Section Summary

What Is Life?

Key Concepts

- What characteristics do all living things share?
- Where do living things come from?
- What do living things need to survive?

Organisms are living things. All living things share six important characteristics. **All living things have a cellular organization, contain similar chemicals, use energy, respond to their surroundings, grow and develop, and reproduce.**

A **cell** is the basic unit of structure and function in an organism. **Unicellular**, or single-celled, organisms include bacteria, the most numerous organisms on Earth. **Multicellular** organisms are composed of many cells that are specialized.

Cells are composed of chemicals. The most abundant chemical in cells is water. Another chemical called carbohydrate is a cell's energy source. Proteins and lipids are the building materials of cells. Nucleic acids are the genetic materials that direct the cell's activities. Also, the cells of organisms use energy to grow and repair injured parts.

A change in an organism's surroundings that causes the organism to react is called a **stimulus**. An organism reacts to a stimulus with a **response**—an action or change in behavior.

Living things grow and develop. Growth is the process of becoming larger. **Development** is the process of change that occurs during an organism's life to produce a more complex organism.

Another characteristic of organisms is the ability to reproduce, or produce offspring that are similar to the parents. **Living things arise from living things through reproduction.**

People once believed the mistaken idea that living things arise from nonliving sources—an idea called **spontaneous generation**. Controlled experiments helped disprove spontaneous generation. In a controlled experiment, a scientist carries out two tests that are identical in every respect except for one factor, called the variable.

All organisms need four things to stay alive. **All living things must satisfy their basic needs for water, food, living space, and stable internal conditions.**

Organisms that make their own food are called **autotrophs**. Organisms that cannot make their own food are called **heterotrophs**. Heterotrophs consume autotrophs or other heterotrophs. All organisms need food, water, and living space. Because space on Earth is limited, some organisms compete for food and space.

Because conditions in their surroundings can change, organisms must be able to keep the conditions inside their bodies constant. The maintenance of stable internal conditions despite changes in surroundings is called **homeostasis**.