

SECTION 4-1

SECTION SUMMARY

What Is Life?

Guide for Reading

- ◆ What characteristics do all living things share?
- ◆ What are structure and function?
- ◆ What do living things need to survive?

Organisms are living things. All living things share six important characteristics. **All living things are made of cells, contain similar chemicals, use energy, grow and develop, respond to their surroundings, and reproduce.**

A **cell** is the basic unit of **structure** and **function** in an organism. **An organism's structure is the way it is made. The function of a part of an organism is the job it performs.** Unicellular, or single-celled, organisms include bacteria, the most numerous organisms on Earth. Multicellular organisms are composed of many cells.

Cells are composed of chemicals. The most abundant chemical in cells is water. Other chemicals called carbohydrates are 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.

All living cells use energy. Organisms use energy for things such as growth and repair of damaged parts.

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.

A change in an organism's surroundings that causes the organism to react is called a **stimulus**. An **external stimulus** comes from outside the organism, while an **internal stimulus** comes from inside the organism. An organism reacts to a stimulus with a **response**—an action or change in behavior.

Another characteristic of organisms is the ability to **reproduce**, or produce offspring that are similar to the parents. People once believed the mistaken idea that living things arise from nonliving sources—an idea called **spontaneous generation**. Controlled experiments helped disprove spontaneous generation.

All organisms need four things to stay alive. **Living things must satisfy their basic needs for energy, water, 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 other autotrophs or heterotrophs. All organisms need food, water, and living space. 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**.

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REVIEW AND REINFORCE

What Is Life?

◆ Understanding Main Ideas

Answer the following questions on the back of this page or on a separate sheet of paper.

1. What are six characteristics all living things share?
2. How did Redi's experiment help disprove the idea of spontaneous generation?
3. What are the four basic needs all living things must satisfy?
4. Describe the difference between growth and development.

◆ Building Vocabulary

From the list below, choose the term that best completes each sentence.

- | | | |
|------------|------------------------|-------------|
| autotrophs | heterotrophs | internal |
| organisms | spontaneous generation | homeostasis |
| stimulus | response | cell |
| reproduce | external | |

5. Any change in an organism's environment that causes the organism to react is called a(n) _____.
6. Organisms that make their own food are _____.
7. A change in temperature in the environment is an example of a(n) _____ stimulus.
8. _____ is the mistaken idea that living organisms arise from nonliving sources.
9. All living things are called _____.
10. The _____ is the basic unit of structure and function in an organism.
11. Organisms that get energy by consuming other organisms are _____.
12. An organism reacts to a stimulus with a(n) _____.
13. Thirst is an example of a(n) _____ stimulus.
14. An organism's ability to maintain stable internal conditions is called _____.
15. To _____ is to produce offspring that are similar to the parents.