

Lesson 1

The Science of Life

Focus Question

What are the characteristics of living things?

New Vocabulary

biology

organism

organization

growth

development

reproduction

species

stimulus

response

homeostasis

adaptation

Review Vocabulary

environment: the living and nonliving things that surround an organism and with which the organism interacts

Introduction to Biology

- **Biology** comes from the Greek *bio*, meaning *life*, and from *logos*, meaning *study*.
- In biology you will study:
 - The origins and history of life and once-living things
 - The structures of living things
 - How living things interact with one another
 - How living things function

What do biologists do?

- Study the diversity of life
- Research diseases
- Develop technologies
- Improve agriculture
- Preserve the environment

The Characteristics of Life

An **organism** is anything that has or that once had all of the following characteristics:

Made of one or more cells	Responds to stimuli
Displays organization	Requires energy
Grows and develops	Maintains homeostasis
Reproduces	Has adaptations that evolve over time

The Characteristics of Life

Made of one or more cells

- Cells are the basic unit of structure and function in all living things.
- Living things can be *unicellular* (one cell) or *multicellular* (many cells).

The Characteristics of Life

Displays organization

- Living things display **organization**, which means they are arranged in an orderly way.
- Single cells contain organized functional structures.
- Multicellular organisms have a hierarchical structural organization:
 - Specialized cells are organized into tissues.
 - Tissues are organized into organs.
 - Organ systems work together to support an organism.

The Characteristics of Life

Grows and develops

- Most organisms begin as a single cell.
- The addition of mass to an organism, often in the form of new cells and structures, is called **growth**.
- The process of natural changes over the lifetime of an organism is called **development**.

The Characteristics of Life

Reproduces

- **Reproduction** is the production of offspring.
- Organisms that can breed with one another and produce fertile offspring are known as a **species**.
- Reproduction is not essential for the survival of an individual, but it is essential for the continuation of the species.

The Characteristics of Life

Responds to stimuli

- Anything that is part of an organism's internal or external environments and that causes a reaction by the organism is called a **stimulus**.
- The reaction to a stimulus is a **response**.
- Being able to respond to the environment is critical for an organism's safety and survival.

The Characteristics of Life

Requires energy

- Living things get their energy from food.
- Most plants and some unicellular organisms use light energy from the Sun to make their own food.
- Organisms that cannot make their own food get energy by consuming other organisms.

The Characteristics of Life

Maintains homeostasis

- Regulation of an organism's internal conditions to maintain life is called **homeostasis**.
- If anything happens within or to an organism that affects its normal state, processes to restore the normal state begin.

The Characteristics of Life


Has adaptations that evolve over time

- An **adaptation** is any inherited characteristic that results from changes to a species over time.
- Adaptations enable species to survive and pass on their genes to the next generation.
- Adaptations are usually developed in response to an environmental factor.


Quiz

1. Which is the best and most complete definition of the term *biology*?

 the study of life
CORRECT

 the study of agriculture

 the application of scientific knowledge

 the study of plants and animals

Quiz


2. Which is a characteristic of all living organisms?

 has organs

 has tissues

 has one or more cells

CORRECT

 has one or more organ systems

Quiz

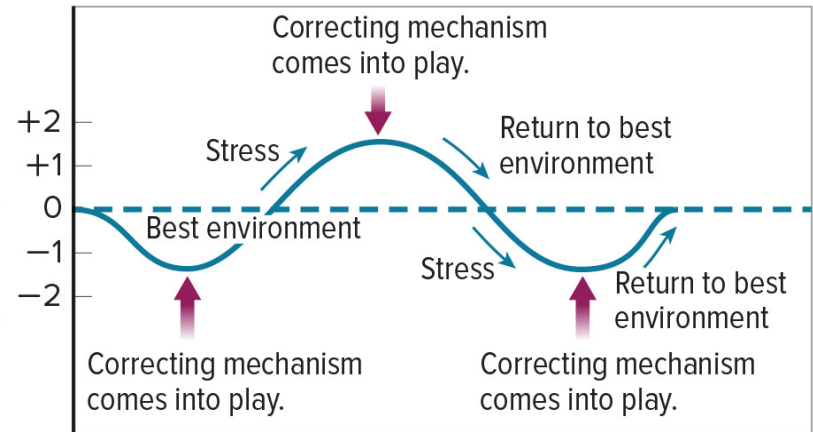
3. Which characteristic of life should be the title of this graph?

 Cellular Basis

 Growth

 Homeostasis **CORRECT**

 Reproduction



Quiz

4. Which best describes adaptation?

 reproducing as a species

 a short-term change in behavior in response to a stimuli

 inherited changes in response to environmental factors **CORRECT**

 change in size as an organism ages

Quiz

5. How do most plants and some unicellular organisms get the food they need to survive?

 by transforming the energy in chemical compounds

 by taking in energy through their roots

 by eating other organisms

 by using light energy from the Sun to make food

CORRECT