

CONCEPT 2

Living things respond to stimuli, grow, and reproduce.

Activity

Investigating the Characteristics of Life

Choose three organisms that you are familiar with in the places you live and visit. Explain how each organism has all of the characteristics of living things that you have explored so far.

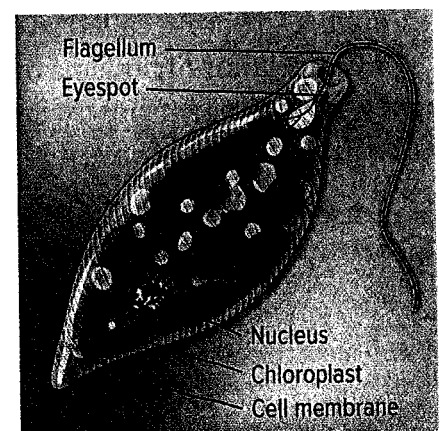
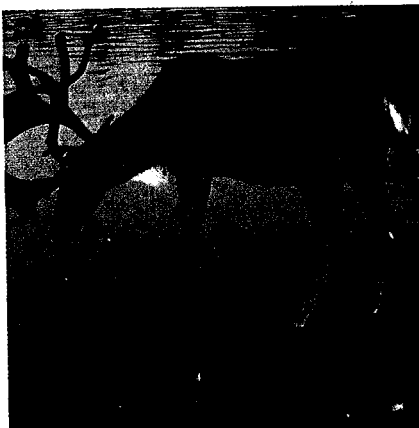


Living Things Respond to Stimuli

A stimulus is anything that causes a living thing to react (respond) in a certain way. The plural of stimulus is stimuli. Living things respond to internal stimuli—things that occur inside their bodies. For example, when your stomach growls, you know you are hungry and you respond to this internal stimulus by eating. Feeling thirsty is another example of an internal stimulus. When animals, such as the caribou in **Figure 1.4**, are thirsty, they find water to drink.

Living things also respond to external stimuli—things that occur outside their bodies, in their surroundings. For example, if you have a dog or a cat, you may have seen its ears flick up in response to a noise at the door. The plant in **Figure 1.4** is responding to the light by growing toward it. Multicellular animals have sense organs and/or a nervous system to respond to stimuli. Unicellular organisms, such as *Euglena*, have structures that allow them to sense and respond to changes in their environment.

Figure 1.4 Organisms respond to internal and external stimuli. The caribou drinks in response to an internal stimulus. A plant growing toward the light is responding to an external stimulus. *Euglena* have a structure called an eyespot that allows them to sense the external stimulus of light.



Living Things Grow

All living things grow by increasing in size, or in the number of their cells, or both. Unicellular organisms grow by increasing in cell size, up to a certain point. Multicellular organisms grow by increasing the number of cells in their body.

Living Things Reproduce

All living things reproduce, which means that they produce more of their own kind (species). Organisms reproduce in different ways. Many unicellular organisms, such as the bacteria in **Figure 1.5**, reproduce by dividing into two cells. Each new cell is the same as the original cell, because it has the same genetic material. Other organisms must have a mate to reproduce.

As shown in **Figure 1.5**, when organisms mate, their offspring are not identical to their parents. The offspring differ because each parent provides different genetic information.

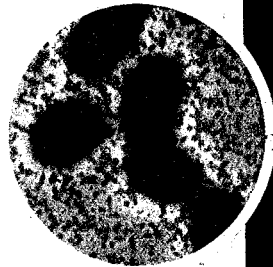


Figure 1.5 Some living things reproduce by dividing into two cells that are identical. Other organisms produce offspring with a mate.

Extending the Connections

Comparing How Different Peoples Define “Life”

Scientists have agreed on a set of characteristics to separate living and non-living things. However, science is just one of many different ways of knowing about and understanding ourselves and the world. Reflect on your own cultural background, and collaborate with your classmates to share the many ways that people think about and understand life.

Before you leave this page . . .

1. Create a scenario that includes six stimuli (three external and three internal). Your scenario must demonstrate your understanding without defining the words stimulus, external, and internal.

Your scenario could take the form of a paragraph, a comic strip, a song, or another format of your choice.

2. Explain how growing is different from reproducing.