

Reading: Characteristics of Life

Your classroom is full of nonliving things and living things. Desks, books, and lights are nonliving things. Your classmates, teacher, and plants are living things. What makes people and plants different from desks and lights? People and plants, like all living things, have all the characteristics of life. All living things have cells, use energy, responds to stimuli, grows and develops, and reproduces. Nonliving things do not have all these characteristics. A toy may respond to stimuli and lights might use energy, but only those things that have all the characteristics of life are living. Things that have all the characteristics of life are called **organisms**.

1. Has Cells

A **cell** is the smallest unit of life. An organism might be made of just one cell or of many cells.

Unicellular & Multicellular Organisms

Living things that are made of only one cell are called **unicellular organisms**. A unicellular organism has structures with specialized functions. Some structures control cell activities. Some take in nutrients. Other structures enable the organism to move.

Living things that are made of two or more cells are called **multicellular organisms**. Some multicellular organisms only have a few cells, but others have trillions of cells. The cells of a multicellular organism usually do not all do the same things. Instead, groups of cells have specialized functions. These functions might include digestion or movement.

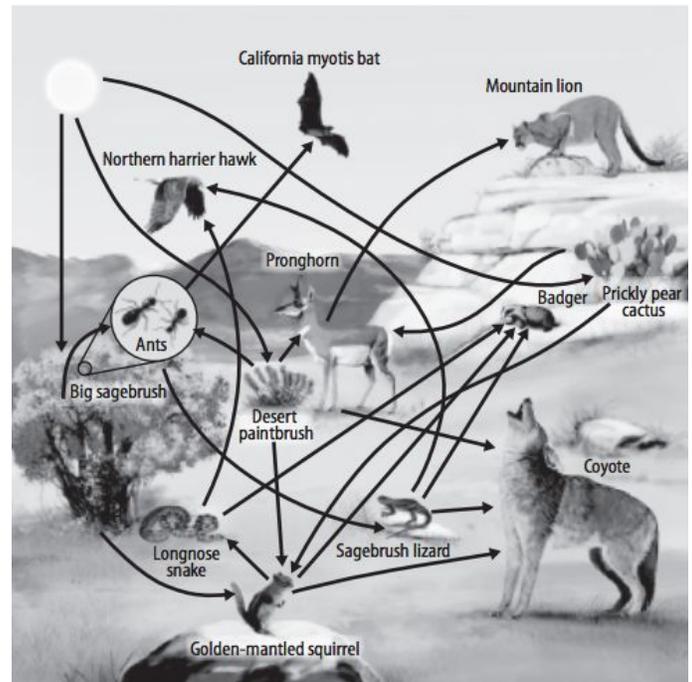
2. Use Energy

All organisms use energy. Digesting food, thinking, reading, and sleeping use energy. Cells use energy to transport substances, make new cells, and perform chemical reactions. All of the characteristics of life use energy.

Energy's Origin

Where does this energy come from? The energy that most organisms use originally came to Earth from the Sun, as shown below. The energy goes from one organism to another. Energy in the cactus comes from the Sun. The squirrel gets energy from the cactus that it eats. The coyote gets energy from eating the squirrel.

Check-in: List the badger's food sources:



3. Responds to Stimuli (Surroundings)

Organisms live in environments that change all the time. These changes are called **stimuli** (STIHM yuh li). One change is called a stimulus. All organisms respond to stimuli.

Internal Stimuli & External Stimuli

Internal stimuli are changes inside an organism. They include hunger, thirst, and pain. If you feel hungry and look for food, you are responding to an internal stimulus—hunger. The feeling of thirst that causes you to look for water is another internal stimulus.

External stimuli are changes outside an organism. They are usually changes in the environment that the organism lives in. Light and temperature are examples of external stimuli.

Light Many organisms respond to changes in light. Many plants will grow toward light. You respond to light, too. If you spend time in sunlight, your skin's response might be to darken, turn red, or freckle.

Temperature How does your body respond to changes in temperature? Like many animals, your body responds by increasing or decreasing the amount of blood flow to your skin. If the temperature gets warmer, your blood vessels respond by widening. Then more blood can flow to your skin. You feel cooler.

Homeostasis

All organisms are able to maintain some internal conditions. **Homeostasis** (hoh mee oh STAY sus) is an organism's ability to maintain steady internal conditions when outside conditions change. Have you ever noticed that if you drink more water than usual,

you have to go to the bathroom more often than you usually do? Your body is keeping your internal conditions steady.

The Importance of Homeostasis

Cells need certain conditions to function the way they should. Homeostasis makes sure cells can function. If cells cannot function the way they should, an organism might get sick or die.

Methods of Regulation

Humans cannot survive if their body temperature changes more than a few degrees from 37°C. When your outside environment becomes too hot or too cold, your body responds. It sweats, shivers, or changes the flow of blood to maintain the body temperature of 37°C.

Both unicellular and multicellular organisms have ways to maintain homeostasis. Some unicellular organisms have a structure called a contractile vacuole (kun TRAK tul · VA kyuh wohl). It collects and pumps extra water out of the cell.

There is a limit to the amount of change that can occur inside an organism. For example, you could live for only a few hours in very cold water. Your body could not maintain steady internal conditions, or homeostasis, in this environment. Your cells could not function.

4. Grows and Develops

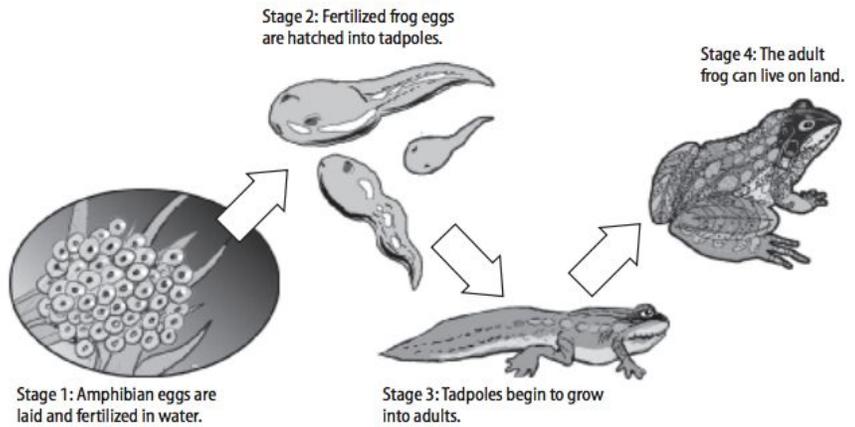
Think about the tadpole in the figure shown. The tadpole does not look like the frog it will become. The tadpole will lose its tail and grow legs. Like all organisms, the tadpole will grow and develop.

How do organisms grow?

When an organism **grows**, it increases in size. A unicellular organism grows as its one cell gets bigger. A multicellular organism grows when more cells are produced.

How do organisms develop?

The changes in an organism during its lifetime are called **development**. A multicellular organism develops as cells become specialized into different cell types, such as skin and muscle cells. Some organisms have amazing developmental changes over their lifetimes. An example is a tadpole developing into a frog.



5. Reproduces

Reproduction is the process by which one organism makes one or more new organisms. Organisms must reproduce, or they will die out. Not all organisms reproduce, such as family pets. But if a type of organism is going to survive, some organisms of that type must reproduce.

Organisms reproduce in many ways. Some unicellular organisms divide and become two new organisms. Each new organism is just like the original cell. Some organisms must have a mate to reproduce. Other organisms can reproduce without a mate. Organisms produce different numbers of offspring. Humans usually produce only one or two offspring at a time. Other organisms, such as frogs, can produce hundreds of offspring at one time.

Reading modified from [here](#) on ckr.org

Name: _____ Period: _____

Cornell Reading Notes: Characteristics of Life (R3)

Questions:

Notes:

<p>L1. List the 5 characteristics of life.</p>	<hr/> <hr/> <hr/>
<p>L1. Define organism.</p>	<hr/> <hr/> <hr/>
<p>L1. Define cell.</p>	<hr/> <hr/>
<p>L2. Contrast unicellular organisms and multicellular organisms.</p>	<hr/> <hr/> <hr/>
<p>L2. All energy comes from the sun, but explain how it is transferred from one organism to another.</p>	<hr/> <hr/> <hr/>
<p>L1. Define stimuli. (Extra: List 2 internal stimuli)</p>	<hr/> <hr/> <hr/>
<p>L2. Contrast internal and external stimuli.</p>	<hr/> <hr/> <hr/>
<p>L1. Define homeostasis</p>	<hr/> <hr/> <hr/>
<p>L3. Predict what word explains why you go to the bathroom more when you drink a lot of water?</p>	<hr/> <hr/> <hr/>
<p>L2. Explain why maintaining</p>	<hr/>

