

Biology

Name \_\_\_\_\_

## The Science of Biology and Characteristics of Living Things

What is science? Science is an organized way of gathering and analyzing evidence about the natural world.

Biology - the study of life

### Characteristics of Living Things

What do you think are the characteristics that make something living? List your ideas below:

**Characteristic** - organization and cells

**Organization** - the high degree of order within an organism's internal and external parts and in its interactions with the living world

Levels of organization (from highest to lowest):

1. **organism**
2. **organ system**
3. **organ**
4. **tissue**
5. **cell**
6. **organelle**
7. **biological molecule**
8. **atom**

**atom - molecule - organelle - cell - tissue - organ - organ system - organism**

**Characteristic** - response to stimuli

Stimulus - a physical or chemical change in the internal or external environment

Example: dilation of pupils in response to light, pulling hand off of a hot stove

**Characteristic** - homeostasis

This is the maintenance of a stable level of internal conditions even though environmental conditions are constantly changing

Example: maintaining a constant body temperature

**Characteristic** - metabolism

Living organisms use energy to power all the life processes, such as

1. repair
2. movement
3. growth

**metabolism** - the sum of all the chemical reactions that take in and transform energy and materials from the environment

Example: human metabolism allows us to get chemicals from the food we eat and use it as an energy source to grow

**Characteristic** - growth and development

The growth of living things results from the division and enlargement of cells

**Cell division** - the formation of two new cells from an existing cell (mitosis and meiosis)

**Development** - the process by which an organism becomes a mature adult

**Characteristic** - reproduction

This is the process in which organisms produce new organisms like themselves

Is reproduction essential to the survival of an individual organism? **no**

Is reproduction essential for the continuation of a species? **yes**

Does an organism have to reproduce to be considered living? **no**

**Characteristic** - change through time (evolution)

Individual organisms experience many changes during their lifetime, but their basic genetic characteristics don't change

Populations of living organisms evolve or change through time, which is important for survival