



Lab-8- The characteristics of living organisms ?

What are the characteristics of the living organisms ? give five ? or explain two ? or do eight ? ”

Biologists have established that living things (organism) share eight characteristics of life :

1-Organization : is the high degree of order within an organism's internal and external parts and its interactions with living world.

2-Response to stimuli: an organism can respond to a stimulus (physical or chemical change in the internal or external environment). Organisms must be able to respond and react to changes in their environment to study alive.

3-Metabolism: living organism use energy to power all the life processes such as repair movement and growth. This energy use depends on metabolism.

Metabolism is the sum of all chemical reactions that take in and transform energy and materials from the environment.

4-Growth and development: all organisms grow and increase in size. The growth results from the division and enlargement of cells. Cell division is the formation of two new cells from an



existing cell. Multicellular organisms mature through cell division, cell enlargement, and development.

Development is the process by which an organism becomes a mature adult.

Development involves cell division and cell differentiation, or Specialization. In fact the human body is composed of trillions of specialized cells, all of which originated from a single cell, the fertilized egg.

5-Reproduction: All organisms produce new organisms like themselves in a process called reproduction.

Reproduction unlike other characteristics is not essential to the survival of an individual organism. However, because no organism lives forever. Reproduction is essential for the continuation of a species. During reproduction organisms transmit hereditary information to their offspring.

6-Evolution (change through time) :

Although individual organisms experience many changes during their lifetime, their basic genetic characteristics do not change. However, populations of living organisms evolve or change through time. The ability of populations of organisms to evolve



overtime is important for survival in a changing world. This factor is also important in explaining the diversity of live - forms we see earth today.

7-Homeostasis : All living things from single cells to entire organisms have mechanisms that allow them to maintain stable internal conditions. Without these mechanisms organisms can die. For example, a cell s water content is closely controlled by the taking in or releasing of water.

A cell that takes in too much water will rupture and die. A cell doesn't get enough water will also shrive! and die.

Homeostasis is the maintenance of a stable level of internal condition even though environmental conditions are constantly changing organisms have regulatory systems that are maintain internal conditions, such as temperature, water content, and uptake nutrients by the cell.

8-Respiration : The respiratory system involves both external respiration and internal respiration.

□ **External respiration** is the exchange of gases between the atmosphere and the blood.



• **Internal respiration** is the exchange of gases between the blood and the cells of the organism (the body).

Once of the oxygen is the cells, the cell use it to break down glucose and make ATP by process of aerobic respiration (cellular respiration). Excess carbon dioxide produced as a waste product of aerobic respiration is toxic to cells and is removed from the cells by internal respiration.

What are the characteristics of living Organisms?

The characteristics of living Organisms are:

Living things are highly organized, from the smallest part to the largest.

All living things have an ability to acquire materials and energy.

All living things have an ability to respond to their environment.

All living things have an ability to reproduce.

All living things have an ability to adapt.

All Living things:

1- Are comprised of one or more units called cells.

2- Reproduce (sexually or asexually).

3- Grow and develop.



4- Obtain and use energy.

5- Respond to their environment.

All living things are comprised of cells :

Cell a collection of living matter enclosed by a barrier that protects it from its surroundings.

Unicellular Organism-a one -celled organism (e.g. bacteria)

Multi cellular Organism:

An organism made of more than one cell (e.g. starfish, and turtle).

All Living things reproduce :

That is, they produce **new individuals** similar **to themselves**.

Why the reproduction is necessary ?

To replace the dead ones.

kinds of Reproduction :-

A) Asexual Reproduction :-

A single Organism reproduces without the aid of another (without sex).

Common among bacteria and other microscopic organisms.

Splitting (bacterial cells) or budding (plants).



B) Sexual Reproduction :-

* Two cells from different individuals unite to produce the first cell of a new organism.

* Union of a sperm cell from male united with egg cell from female.

Some of organisms are capable of sexual and asexual reproduction.

* **All living things grow and develop :-**

Life does not necessarily mean continuous growth.

During growth organisms undergo a cycle of changes called development.

Bodily maintenance occurs throughout

Life (requires energy). Again occurs when an organism loses its ability to maintain itself.

* **All living thing obtain and use energy. Energy required for growth and maintenance.**

Energy (usually sugars) obtained from the environment.

***Anabolism** - a process (such as tissue growth)that involves synthesizing, or putting together complex substances from simpler, substances (sugars) (REQUIRES ENERGY)



***Catabolism** - final break down (digestion) of complex substances in to simpler ones (RELEASES ENERGY).

Metabolism - total sum of all chemical reactions in the body, or the balance between anabolism and catabolism.

***All living things respond to their environment *Stimulus* (plural stimuli).**

Anything that causes an organism to react.

Can plants respond to stimuli?

Yes, but normally not as quickly as animals.

Homeostasis - (homeo- similar, stasis standing)

An organism's ability to maintain the constant or stable conditions necessary for life.

Just as the thermostat automatically **cools** or **warms** a room if it deviates from a desired temperature, your body maintains a constant temperature.

Summary

- 1- Living things are highly ordered.
- 2- Living things are organized in to units called cells.
- 3- Living things use energy from their environment.
- 4- Living organisms respond to stimuli.



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- 5- Living things develop and adapt .
 - 6- Living things reproduce themselves.
 - 7- Living things contain genetic information.

The End