

* Living

Objects having characteristics of cellular organisation, growth reproduction, ability to sense the environment and give response, metabolism etc.

→ Characteristics of Living Organisms

A. Reproduction - Process of living beings to produce progenies possessing features of their own types. Reproduction is of sexual and asexual type

B. Growth & Development - Growth is a permanent and irreversible change in the size of a cell, an organ or whole organism wholly usually accompanied by an increase in dry weight, increase in mass & increase in no. of individuals.

Development is the sum of changes that occur in an organ or an organism during its life time

C. Metabolism - 2 types :-

i. Catabolism - It is a destructive metabolism in which the nutrients, acting as a source of energy are broken down to release energy. It converts potential energy into kinetic energy.

ii. Anabolism - It is a constructive metabolism in which the energy released by degradative reactions is used for synthetic reactions. It converts kinetic energy into potential energy

- D. Homeostasis - All living organisms keep themselves stable by maintaining their internal conditions within certain boundaries under adverse temperature, moisture level, acidity and other physiological factors in order to continue their metabolic processes, it is called homeostasis.
- E. Excretion - Useless and harmful waste products produced as a result of metabolism are thrown out of body of all living organisms, process is called excretion.

* Diversity in living World

- Described no. of species range 1.7-1.8 million.
- Local names of organisms may not be applied at global level.
- Scientific names are given to organisms after identification, acceptable at global level.
- Nomenclature is done as per criteria given in ICBN (International Code for Botanical Nomenclature) & ICZN (International Code for Zoological Nomenclature).
- Binomial nomenclature was given by CAROLUS LINNAEUS.
- First word is Generic Name & second word is specific epithet in scientific name of organism.
- Names are in latin language
- First word starts with capital letter & second word with small letters. eg. - *Mangifera Indica* (Mango).
- Name of author in last as abbreviation
- For ease of study organisms are classified into groups or categories known as taxa.

* Three Domains of Life

Characteristics of Three Domains

A. Domain Archaea (Archaea means ancient)

- It includes archaebacteria
- Domain archaea is characterized by possessing cell walls with peptidoglycans
- It includes three kingdoms:
 - i. Methanogens - The "methane makers". They use CO_2 , H & N to produce energy to live and as a result give off methane gas.
 - ii. Extreme Halophiles - The 'salt lovers', these bacteria live in Dead Sea, Great Salt Lake. They prefer salty environment.
 - iii. Extreme Thermoacidophiles - The 'Heat/cold lovers',

B. Domain Bacteria

It is mostly associated with human or animal disease. But some bacterial species play beneficial roles for humans by producing antibiotics and food. Bacteria perform many essential functions in the biosphere, eg. - N_2 fixation, decomposition of organic material.

Two divisions of bacteria :-

- i. Cyanobacteria - Photosynthetic 'blue-green' bacteria produce O_2 gas. It plays a vital role in supplying oxygen in the earth's environment
- ii. Eubacteria - 'The true bacteria', eg. - E. coli. Salmonella Typhus. These bacteria are closely related to eukaryotic mitochondria and often move by whip like flagella.