# The living world

We can't define living, only we can differentiate b/w living and non-living on the basis of some certain characteristics.

1. Growth
2. Reproduction
3. Metabolism
4. Cellular organisation
5. Consciousness

1. **Growth**:- Growth is an irreversible change in size, shape, mass & volume.

- Growth is the integral part of development where we can experience or visualise the development.
- Growth occur due to increase in no. of cell and increase in mass.
- No. of cell increases due to cell division.
- Mass increases due to synthesis of new protoplasm.

**Protoplasm**:- The colourless material comprising the living part of a cell, including the cytoplasm, nucleus and other ~~garments~~ organelles.

- In plant, growth is limited till root apex and shoot apex only.
- While animal shows diffused type of growth i.e. all overall way grow.

Ext. growth feature →
Natural →

- In plant growth occur throughout their life, while in animal growth occur upto a certain age.
  i.e, restricted till certain age.

- Some of the non-living also shows growth that not means they are considered to be a living str. or object.
  Ex:- Mountain builder
  Sand dunes

- If growth is occur due to deposition of material that is intransic, that type of growth occur in living.

- Intransic growth is the characteristics feature of living.

2) Reproduction:- Reproduction is the biological process in which organism produces its progeny or offspring of child.

- More or less similiar to their parents.

- Reproduction is the characteristic feature of living organism.

- Reproduction unables continuesty of species generation after generation.
- On the basis of involvement of organism

Reproduction is of two types.

(i) Asexual reproduction
(ii) Sexual reproduction

| Asexual reproduction | Sexual reproduction |
|---|---|
| Only one organism is involved. | Two organism of opposite sex is involved i.e. male or female. |
| Product is called clone (unit of clone = ramate) | Progeny / offspring child |
| No variation occur. | Variation occur. |

Metabolism :- All biochemical reaction occur in living organism is called metabolism.

Metabolism is of two type :-

| Anabolism – (जोड़ना) | Catabolism- (तोड़ना) |
|---|---|
| All smaller molecule unite and form larger sub unit of molecules then it is called constructive reaction. | It many larger molecules break into smaller molecules so it is also called destructive reaction. |
| It accumulate energy so it is endothermic process. | In this process energy releases so it is exothermic process. |
| Ex :- Photosynthesis | Ex :- Respiration |

- Metabolism can only occur in living str. Non-living objects can't perform metabolism so it is defining feature of living organism.
- Outside body or cell we can also perform metabolism in test tube or invitro.
- In test tube its neither be considered living nor non-living.

Cellular organization
↓
Cell
↓
Cell/tissue
↓
Organ
↓
Organ system
↓
Organism

* Consciousness - If a object since there surroundings and response to their surrounding stimulates. Surrounding stimulates may be physical biological chemical so it is defining features of living organism every organism should be aware to their surroundings Women is the himself is having self-conscious Except :- Person who is in comma.

# Diversity in the living world

- No. & type of living organism on this earth is called bio diversity.
- The no. of species that are known and describe are 1.7 million to 1.8 million in which 0.5 million & 1.2 million animals are present.
- To give a specific name for globally recongnisation we have proposed.

1) Nomenclature system: It has process of giving scientific name of any living organism, nomenclature is used to avoid confusion b/w existing organism.
It can classify on the basis of
(i) binomial nomenclature.
(ii) Tautonym
(iii) Trinomial

1) Binomial nomenclature:- It was given by carolus linnaeus. He have written a book in which. He explained plant nomenclature & animal nomenclature.
1st book species plantarum (plant nomenclature)
2nd book species nature (animal nomenclature)

Nomenclature is controlled by independent internati-onal institution.
1) ICBN (International code for botanical nomenclature)
2) ICZN (International code for zoological nomenclature)

- Binomial nomenclature consist of two name.
  1st name represents Genus.
  2nd name represents species.

Name of genus start with capital letter & upper case while name of species start with small letter and lower case.

Binomial nomenclature are in latin (english) but printed in italic.

Both the names are either separated underline or printed in italic to denote their latin origin.
Name of scientist can be written at last.

scientist name

Eng = Magnifera indian linn

Italic = Magnifera indica linn

(ii) Tautonym: If both genus & species is same then it is called tautonym.
It is only applicable for animal not for plant.

Genus ← Equus = Equus ↑ Species = Horse
Naja – Naja = Cobra
Ratus – Ratus = Rat
Catla – Catla = Catla fish

(iii) Trinomial nomenclature: It has three 1st name represent genus.

2nd name represent species.
3rd name represent sub species or variety.

Brassica oleracea botrytis = cauliflower
" " capitata cabbage

2) Identification :- The process of determination of an organism with already existing organism is called identification.
- It occured by comparing of their character.

3) Classification :- The process through which anything (organism) are grouped into their convenient categories based on some easily observable characters.

4) Texonomy :- The principal and processes of classification is called Texonomy.
Term Texonomy is given by A. P. de. candella.
Father of Texonomy Caroles Linnaeus
Characterization, identification, classification and nomenclature are the principle and and texonomy.

## System of classification

i.e systematic

(i) Systematic :- The study of biodiversity & their comparative and evolutionary relationship is called systematic.
- It is branch of texonomy insystematic organism

are classified on the basis of morphological sth.

Ex:- Plants are classified on the basis of morphological like root, stem, leaf & flower.

(ii) Neosystematic or new systematic or bio systematic.

Neosystematic term was given by Huxley it is based on external or internal sth. Both Neosystematic is based on genetic or evolutionary relationship.

Ex:- Thallophyta (Algae) → Bryophyte → Pteridophyte → Gymnosperm → Angiosperm.

## Types of classification

1) Artifical system of classification.
2) Natural system of classification.
3) Phylogenetic system of classification.

1) Artifical system of classification :- Organism classified on the basis of one or two morphological character.
Ex :- Linnaus classified the plant on the basis of str. of stamen and carpel. It was not accepted.

2) Natural system of classification :- Organism are classified on the basis of over all morphological str. that is complete.
- It is also called Phenetic system of classification. Since morphological character can be changed by environmental change so this system of classification is not accepted.

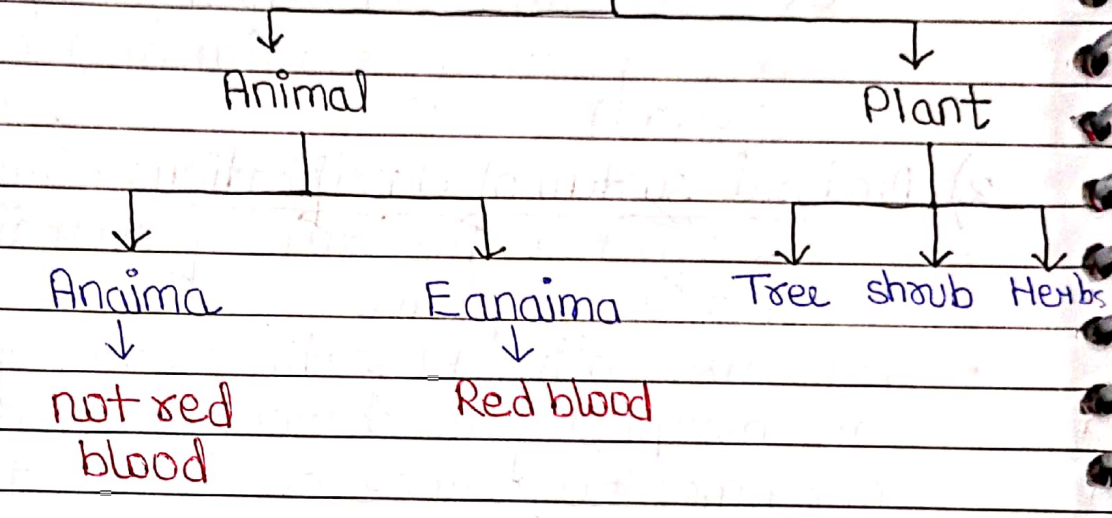
3) Phylogenetic system of classificatio :- phylogenetic means evolutionary relationship. phylogenetic system of classification was given by bentham and Hookers.
- It is based of phylogenetic relationship.
- It is also called Dadestic system of classification.
- It is the more accepted System of classification.

→ System of classification on the basis of phylogenetic System is of five types :-

1) One system classification :- Given by aristotal.

Phenetic – Aristotal

Cladestic – Living organism




2) Two kingdom system classification :- Given by Carolus Linnaeus.

i) kingdom plant
ii) kingdom animal

3) Three kingdom system classification :- Given by earnest Haeckel.

i) Protista
ii) Plant
iii) Animal

4) Four kingdom system classification :- Given by copeland.

Monera
Protista
Plant
animal

5) Five kingdom system classification:- Given by "R.H Whittaker"

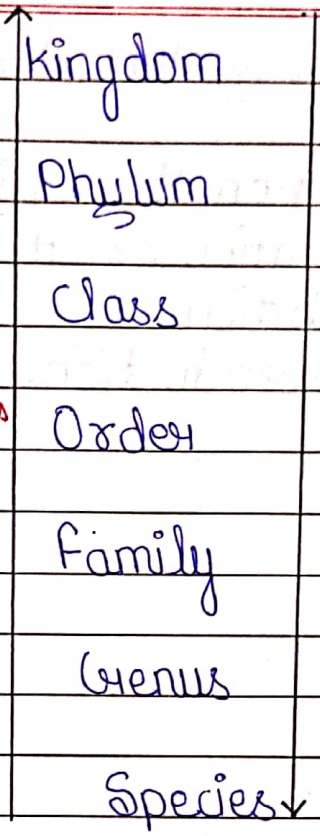
1. It is classified on the basis of cell str.
2. Body organization or thalus.
3. Mode of nutrition.
4. Mode of reproduction.

i. Monera
ii. Protista
iii. Fungi
iv. Plant
v. Animal

* There is three domain of life:-
- Domain concept of was given by carl wobes in 1900.
- He was also awarded by national medal of science.

He classified living organism into three domain
Domain archaea — It includes archaea bacteria.
Domain prokarya — It includes kingdom monera.
Domain Eukarya - It includes plant, fungi, animal or protista.

Texonomical Hierarchy:- ~~Species is the smallest~~ *




:- Species is the basic & smallest unit of classification

:- Term species was given by "John ray"

:- He also given the concept of species.

:- About species different scientist was given different concept of species:-

1) Biological concept of species
2) Static concept of species
3) Dynamic concept of species

1) Biological concept of species:- It was given by earnest m
A/q to him which can interbred among themselves

and produce a fertile of spring are member of same species.

Static concept of species :- It was given by "Linnaeus"

Character of species are constant or unchanged so no. of species is constant since the origin of life and also remain constant generation after generation.

Dynamic concept of species :- It was given by "Lamarck"

No. of character changes due to evolution. So, no. of species also changes it increases due to evolution and decreases due to extinction.

## Genus

Group of related species is called genus.

Genus contain less no. of common character then species.

Example :- Panthera leo (lion)
Panthera tigris (tiger)
Panthera pardus (leopard)

All three belongs to same genes that is panthera.

Solenum Tuberosum (Potato)
Solenum Melongena (Brinjal)
Solenum Nigram (Makoy) or (Night shade)

## Family

→ Group of related genus is called family.

→ Family has less no. of common character than genus

Example :- Genus panthera
Genus Felis (Group of cat)

→ This all belongs to same family i.e Felidae

Example :- Genus solenum, Genus daturo, Genus petunia belongs to same family solenaceae

## Order

→ Group of related family is called order.

→ Order has less no. of common character than family (whed)

→ Family solenaceae, family convolvulace both belongs to same order i.e polymorial.

→ Family Felidae family Canidae both belongs to same order i.e Carnivora

## Class

→ Group of related order is called class.

→ Class has less no. of common character than order.

Example :- Order carnivora and order herbivora and primates like monkey, gorilla and human all belongs to same class i.e mammalians.

## Phylum

→ Group of related class is called phylum.

→ Phylum has less no. of common character than class.

Example :- class pieces, amphibians, reptiles, birds and mammalians all belong to same phylum i.e chordata

## kingdom

→ Group of phylum is called kingdom.

→ largest group of texonomical categories i.e top of the Hierarchy.

Example :- All the animal of different phylum are included under kingdom animal.

# Texonomical aids

Texonomical aids are various types :-

1) Herbarium
2) Botanical gardens
3) Museum
4) Zoological parks
5) Key

1) **Herbarium :-** Store house of collection of plant specimen which has been dried, pressed, preserved on herbarium sheet.

→ In Herbarium sheet are placed according to universaly accepted system of classification.

→ Herbarium sheet contain level of place of collection date of collection, time of collection, collector name, botanical come, common name, english name, family name etc.

2) **Botanical garden :-** Botanical garden is a place of living plant for pure and applied study.

→ In botanical garden each plant is leveled by botanical name or family name as well as common name.

→ Botanical garden is for identification purpose

→ Botanical garden also help in onside teaching, integrated research, project, Botanical research conservation of rare plant species as well for aesthatic appeal for seed bank for herbarium.

3) Museum :- Place where plant & animal species are preserved for study and refrences.

→ In museum specimen are kept in a container or jar in a preservative solution.

→ Plant and animal are kept in a dry speciment.
Insect are kept in a insect box after catching, killing and pinning.

→ Larger animals like birds and mammalians are generally stuff and then kept.

→ Museum ~~also~~ have also skeleted system of animals.

4) Zoological parks : It is place where wild animal are kept in a protected environment under Human care for the study of habitat and their feeding behaviour.

→ Zoological park provide safe place for breeding of species.

:- key is a texonomical aid identification of plant and animal.

→ In key generally two organism are taken together after comparing one species

→ Both the species are together called couplet.

→ key is generally analitical in nature.

→ Each statement of key is called lead.

## Flora

→ Flora contain a actual account of habitat and distribution of plant of a given area.

→ This provide the index to the plant species found in a particular area.

## Manuals

It is used to provide information of identification of name of species found in an area.

* Monographs :- Monograph contain information on anyone texon.

Date
Page

information of

* Catalogues :- Catalogues contain all taxon briefly at a single place.