The Living World

Characteristics of living organisms

Growth
Reproduction
Metabolism
Ability to sense the surrounding and response to the stimuli.

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Growth

Growth is defined as an irreversible increase in the number of and increase in number of cells and / or mass of the living structure.

In plants growth occurs continuously throughout life.

In animals, growth is restricted to a certain period only, but cell divisions occur in certain tissues to replace the old and worn out cells.

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Reproduction

Unicellular organisms reproduce by cell division usually mitosis.

In multicellular organisms, reproduction refers to the production of young ones of the same kind.

Reproduction may be asexual or sexual

Asexual reproduction is shown by lower groups of animals like hydra (budding) sponges (gemmules) and Planaria (regeneration).

In many fungi, filamentous algae and mosses , asexual reproduction occurs by fragmentation.

There are certain organisms like mule and worker honey bees, which are sterile and do not reproduce at all.

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Metabolism

Metabolism refers to the sum total of all the chemical reactions occurring in a living body.

All living organisms are made up of small and large chemical compounds, which carry out different functions; they are constantly being synthesised and used.

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Response to stimuli

All organisms, prokaryotes or eukaryotes, simple or complex in organisation, have the ability to sense the conditions in their surroundings and respond to these stimuli.

Such stimuli may be physical, chemical or biological.

Photoperiod affects reproduction in several seasonal breeders, of animals as well as flowering in plants.

Stems of plants bend towards light, while roots bend towards water sources and gravitational pull.

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Taxonomy

Taxonomy is the arrangement of organisms based on certain principles. (taxis :arrangement; nomos : principle)

Taxonomy of organisms is based on the knowledge of the following:

From the structure, (morphology).

Cell structure (cytology)

Developmental processes (embryology)

Remnants of the past organisms (fossils) and

Ecological relationship.

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Diversity

The number and types of living organisms present on earth is known as biodiversity. Total known and described species are between 1.7-1.8 million.

Nomenclature

The process of naming of a living organism is known as **nomenclature**.

The process of assigning a class name to an individual organism is **identification.**

The system of providing a name with two components (Generic name and specific epithet) is known as **Binomial nomenclature**.

(An **epithet** is a word in the scientific name of an organism, following the name of the genus)

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Binomial Nomenclature

Binomial nomenclature was given by Carolus Linnaeus.

The biological names are written in italics (underlined when written by hand).
Example: The biological name of mango is *Mangifera indica*.

The genus name always starts with capital letter while the species name (e.g. *indica*) starts with a small letter.

ICBN – International Code of Botanical Nomenclature

ICZN – International Code of Zoological Nomenclature are responsible for approving a name.

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Classification

It is the scientific ordering of organisms in a hierarchical series on the basis of its similarities and dissimilarities

It is done after finding the correct name and proper position of an organism in a hierarchy.

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Taxon

Taxon is the unit of classification.

The process of classification is known as taxonomy.

Taxonomy is the branch of biology that deals with identification, naming, and classification of organisms.

The hierarchical arrangement of various taxonomical categories in descending order is:

Kingdom → Phylum (Division) Class Order Family → Genus →Species.

All these categories together form a taxonomic hierarchy.

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Kingdom, Phylum

Kingdom - It is the highest level of classification. Example: Kingdom Plantae includes all plants and kingdom Animalia includes all animals.

Phylum - It is the second highest level of classification. It is comprised of group of related classes.

Example: Kingdom Animalia includes phylum Porifera, Coelenterata, Chordata, etc. The term division is used in case of plants.

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Class, Order

Class: A phylum/division is divided into many classes.

Class is a lower taxonomical category than phylum comprising related orders.
Example: Phylum Arthropoda includes class Insecta.

Order : A class is divided into many orders. It is a taxonomical category comprised of related families. For example: **Class-** Insecta includes the **Order-**Diptera.

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Family, Genus, Species

Family: Family includes many genera with less number of similarities. An order divides to form many families. For example, the family *Felidae* includes individuals of genus *Panthera* and *Felis*.

Genus: Genus comprises a group of related species having many similar characters. For example, lion and tiger are placed under the genus *Panthera*.

Species: It is the basic level of classification. It is defined as a group of organisms that is capable of inter-breeding to produce fertile offspring.

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Thank You

God Bless You!