Introduction to Biology

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Nature of Biology

Biology (*bios* = life and *logos* = knowledge) is the study of life i.e., it is the branch of science devoted to the study of plants, animals, and microbial life.

There are wide varieties of plants and animals on the earth. These plants and animals have different structure, function, shape, colour and other characteristics. The biology involves the study of all these aspects including composition and functioning of plants, animals and other living organisms. Thus, all living organisms are the part of the nature of the biology that covers tallest trees to the smallest microorganisms.

Branches of Biology

Branch	Definition
Botany	Study of plant
Zoology	Study of animals
Microbiology	Study of microorganisms
Morphology	Study of form and structure of plants and animals
Anatomy	Study of internal structure of plants and animals.
Physiology	Study of functions of body of plants and animals.
Cytology (Cell Biology)	Study of cells.
Genetics	Study of inheritance pattern from the parents to the offsprings.
Histology	Study of tissues
Biotechnology	Deals with the application of technology in the field of biology.
Ecology	Study of interaction of living organisms with their environment.
Taxonomy	Study of classification, identification and naming of organisms.
Embryology	The study of development of an embryo
Pathology	Study of diseases

Paleontology	Study of fossils

Let’s check your grasping power.

Important Scientists and their Discoveries

Scientist	Discovery
Aristotle	Father of biology
Theophrastus	Father of botany. Listed over five hundred plants.
Hippocrates	Father of medicine. He initiated the use of plants in medicine.
Herophilus	Father of anatomy. He studied animal body methodically.
Andreas Vesalius	Dissected some animals for the first time
William Harvey	Studies blood circulation
Anton van Leeuwenhoek	Discovered bacteria.
Robert Hooke	Studied cork and observed cells and gave the term “cell”.
Carolus Linnaeus	Father of taxonomy. Proposed binomial system of classification in plants. Defined kingdom as the highest unit of classification.
Lamarck	Proposed the theory of organic evolution
Robert Brown	Discovered nucleus in the cell
Schleiden and Schwann	Proposed cell theory
Charles Darwin	Described the origin of species and proposed the theory of natural selection.
Gregor Johann Mendel	Father of Genetics. Proposed the laws of inheritance
Louis Pasteur	Described the role of micro-organisms in causing diseases. Described fermentation
Alexander Fleming	Discovered antibiotic penicillin

Importance of Biology

Biology is an important branch of science. Biology as a subject is something we can relate to. It is not based on assumptions and estimations but is everything that is happening inside us and around us. The study of biology is useful to understand our life processes and useful (e.g., fermentation) and harmful (e.g., diseases) phenomena occurring around us.

Let us understand why we should study biology

- **For Better Understanding of Life −** How did life came into existence? How did present life forms evolved from primitive life? Why do primitive life forms resemble present ones and what sustains life on the earth are some of the questions answered by the branches of biology.

- **Appreciation of Life −** The diversity and complexity of living things is a thing worth appreciation. The knowledge of biology enlightens us to an amazing variety and beauty of life present on the earth.

- **Maintaining Health** − The study of biology helps us to understand the factors responsible for maintaining health. One is able to identify the causative agents responsible for causing diseases and can thereby take precautions to prevent the occurrence of diseases.

- **Conservation of Natural Resources** − With the knowledge of biology, one is able to understand and appreciate the interdependence of life forms on each other to sustain the ecosystem. At the same time one is able to identify the factors that are responsible for disturbing the balance of the ecosystem and can take care to avoid the processes that cause this disturbance like deforestation, improper waste disposal, etc.

- **Improved Food Production** − Farmers can increase the crop productivity by using techniques like selective hybridization. With the advent of biotechnology, new genetically modified crops are produced which are high yielding and disease resistant. Similarly improved varieties of livestock are also produced. So knowledge of biology is necessary to meet the increased needs of growing population.

- **Career Opportunities** − Knowledge of biology offers many career opportunities like doctor, biotechnologist, horticulturist environmentalist, geneticist, pathologist, research and development scientist, forensic scientist, molecular biologist, etc.