

# **Unit:01 NATURE OF SCIENCE IN BIOLOGY**

## **Q. What does Biology mean?**

Ans. The word "biology" comes from the Greek words "bios," meaning "life," and "logia," meaning "study of." So, biology literally means "the study of life." It is the Branch of science which studies living things and how they interact with each other and their environment.

## **Major Divisions Of Biology:**

**1. Zoology:** This division studies animals. The word "zoology" comes from two Greek words: "zoon," meaning animal, and "logos," meaning study.

**2. Botany:** This is for studying plants. The word "botany" comes from the Greek word "botanē," which means plant.

**3. Microbiology:** This branch studies organisms that are too small to see without a microscope, like bacteria and viruses. The word "microbiology" comes from two parts: "micro," meaning small, and "biology," meaning the study of life

## **BRANCHES OF BIOLOGY:**

For your exam, you need to know 3 things about each of the branches of biology: Definition, Example and Word Origin.

**1. Morphology:** It is the study of the shape, size, and structure of living things like animals, plants, and microorganisms.

**Example:** Looking at the structure of a flower, like its roots, stem, and leaves.

**Word origin:** "Morpho" (Greek) means form or shape, and "logy" means the study of.

**2. Anatomy:** It studies the internal parts of living things, like the heart, brain, and muscles in humans and animals.

**Example:** Studying how the human body is organized inside.

**Word origin:** "Ana" (Greek) means up, and "tomy" means cutting, referring to cutting or dissecting to study the structure.

**3. Physiology:** It deals with how the different parts of living organisms work and their functions.

**Example:** Studying how the heart pumps blood.

**Word origin:** "Physio" (Greek) means nature, and "logy" means study.

**4. Histology:** This is the study of tissues, which are groups of similar cells that work together to do specific jobs.

**Example:** Studying epithelial tissue, which covers and protects surfaces like the skin.

**Word origin:** "Histo" (Greek) means tissue, and "logy" means study.

**5. Cytology:** It is the study of cells, the smallest living units of organisms.

**Example:** Looking at plant and animal cells under a microscope.

**Word origin:** "Cyto" (Greek) means cell, and "logy" means study.

**6. Genetics:** This field deals with genes and how traits, like eye color or flower color, are passed from parents to their offspring.

**Example:** Learning how genes control whether flowers are red or white.

**Word origin:** "Gen" (Greek) means birth or origin.

**7. Molecular Biology:** This is the study of the molecules that make up living things, like DNA and proteins.

**Example:** Understanding how DNA carries genetic information.

**Word origin:** "Molecule" (Latin) means little mass or substance, and "biology" means the study of life.

**8. Embryology:** It studies how organisms develop from a fertilized egg into a complete being.

**Example:** Observing how a human embryo develops inside the mother's womb.

**Word origin:** "Embryo" (Greek) means developing offspring, and "logy" means study.

**9. Paleontology:** It deals with the study of fossils and ancient life forms that lived millions of years ago.

**Example:** Studying dinosaur fossils.

**Word origin:** "Paleo" (Greek) means ancient, and "ontology" means study of Being. (*Fossils mean "the remains of organisms"*)

**10. Taxonomy:** It is the classification and naming of organisms.

**Example:** Naming and grouping animals like classifying humans as *Homo sapiens*.

**Word origin:** "Taxis" (Greek) means arrangement, and "nomy" means law or method.

**11. Ecology:** It is the study of how living things interact with each other and their environment.

**Example:** Studying how animals in a forest depend on plants for food.

**Word origin:** "Eco" (Greek) means house or environment, and "logy" means study.

**12. Marine Biology:** It studies organisms that live in the ocean.

**Example:** Studying sea creatures like whales, coral reefs, and jellyfish.

**Word origin:** "Marine" (Latin) means sea, and "biology" means study of life.

**13. Pathology:** It is the study of diseases, how they develop, and how they affect the body.

**Example:** Studying how a virus causes illness.

**Word origin:** "Pathos" (Greek) means suffering or disease, and "logy" means study.

**14. Immunology:** It is the study of the body's immune system and how it protects against diseases.

**Example:** Learning how vaccines help the body fight viruses.

**Word origin:** "Immunis" (Latin) means safe or free from, and "logy" means study.

**15. Pharmacology:** It is the study of drugs and how they interact with the body to treat diseases.

**Example:** Researching how aspirin reduces pain.

**Word origin:** "Pharmakon" (Greek) means drug or medicine or poison, and "logy" means study. (*small amounts of poison can be used to treat various diseases.*)

## Home Work

### Section II: Short Answer Questions

1. Define the following branches of biology and give at least one significance of studying these branches

- a) Molecular biology
- b) Physiology
- c) Palaeontology
- d) Pharmacology

2. Can you distinguish between?

- a) Anatomy and Morphology
- b) Cytology and Genetics
- c) Biotechnology and Immunology
- d) Marine Biology and Ecology

3. Healthy life of a person depends on healthy life choices. How study of biology is going to help you to live a healthy life.

*Answer all the questions after thoroughly understanding the concepts from the first lecture. I hope you grasp everything well.*

**GOOD LUCK!!!**