

Class 9 Biology - Chapter 1 Notes

Introduction to Biology | Branches, levels of organisation, biological method | Punjab Boards (PCTB)

Biology and Its Branches

- Biology is the scientific study of life. Botany = plants, Zoology = animals, Microbiology = microorganisms.
- Morphology: form and structure. Anatomy: internal structure. Histology: tissues. Cytology: cells.
- Physiology: functions of living parts. Entomology: insects. Ornithology: birds. Ichthyology: fishes.
- Biotechnology, bioinformatics, environmental biology and molecular biology are the modern career-rich branches.

Levels of Biological Organisation

- Atom - Molecule - Organelle - Cell - Tissue - Organ - Organ system - Organism - Population - Community - Ecosystem - Biosphere.
- Cell is the basic unit of life; a tissue is a group of similar cells performing one function.
- Population: members of one species in an area. Community: populations of different species living together.

Biological Method (Long-Question Favourite)

- Steps: Observation - Question - Hypothesis - Deduction - Experimentation - Results - Theory/Law.
- Hypothesis: a proposed, testable explanation. Deduction: the expected result if the hypothesis is true ('if... then...').
- An experiment always has a control group for fair comparison.
- A theory is a hypothesis tested many times; a law/principle describes what always happens in nature.

Solving the Malaria Problem (Case Study)

- Malaria puzzled scientists for centuries; bad air ('mal aria') was blamed initially.
- By 1878 Laveran observed Plasmodium in the blood of malaria patients under the microscope.
- A.F.A. King hypothesised that mosquitoes transmit malaria.
- Ronald Ross (1897) worked on sparrows and mosquitoes and confirmed mosquito transmission through experiments - the classic example of the biological method.

Biodiversity and Careers

- Biodiversity = the variety of organisms (species diversity) in an area; Pakistan has rich biodiversity from coast to mountains.
- IUCN works internationally for conservation of nature and natural resources.
- Careers: medicine, agriculture, forestry, fisheries, biotechnology, environmental protection, teaching and research.

Exam Tips

- The malaria case study is the most repeated long question of this chapter - learn it step by step.
- Draw the levels-of-organisation flow chart in answers; examiners award marks for labelled diagrams.
- Definitions of hypothesis, theory and law must be word-perfect.

Quick Revision Table

Branch	Study of
Entomology	Insects
Ornithology	Birds
Histology	Tissues
Physiology	Functions of body parts
Palaeontology	Fossils
Pharmacology	Drugs and their effects

Practice MCQs (answers at the end)

Q1. The study of fossils is called:

A. Histology **B.** Palaeontology **C.** Ecology **D.** Genetics

Q2. Who confirmed that mosquitoes transmit malaria?

A. Laveran **B.** Ronald Ross **C.** A.F.A. King **D.** Edward Jenner

Q3. A group of related species living in an area is a:

A. Population **B.** Community **C.** Biosphere **D.** Tissue

Q4. The first step of the biological method is:

A. Hypothesis **B.** Experiment **C.** Observation **D.** Deduction

Q5. The study of drugs is:

A. Pharmacology **B.** Biometry **C.** Geography **D.** Embryology