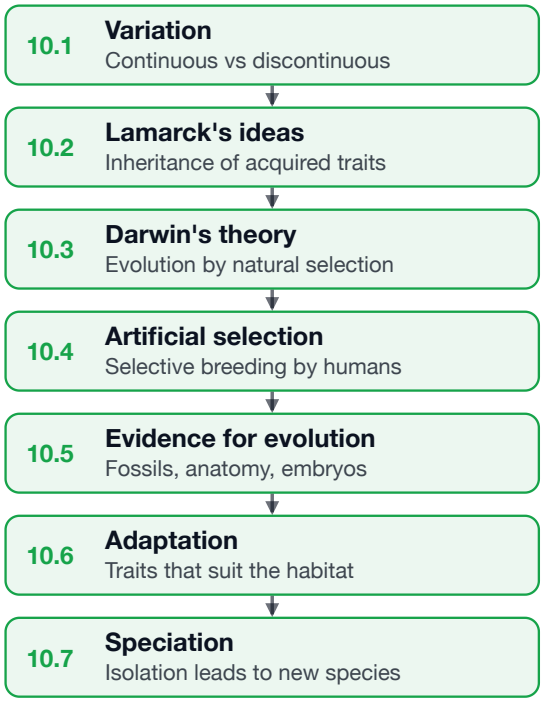
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Chapter 10: Evolution

Class 10 Biology · Quick revision notes · New syllabus 2026-27 · Punjab Boards

Notes by 10th.pk
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Chapter 10 explains how living things change over many generations. It starts with **variation**: no two students in your class are exactly alike, and some differences are inherited while others come from the environment. You will compare Lamarck's ideas with Darwin's theory of **natural selection**, and see how farmers use the same idea in selective breeding, from high-yield wheat varieties to Sahiwal cows bred for milk. The chapter then covers the evidence for evolution, including fossils such as *Pakicetus*, an early whale ancestor found in Pakistan, homologous organs and embryos, followed by **adaptation** and how new species form.



Topics at a glance

- **10.1 Variation** Continuous vs discontinuous
  Types of variation and its genetic and environmental causes.
- **10.2 Lamarck's ideas** Inheritance of acquired traits
  Use and disuse and why the idea was rejected.
- **10.3 Darwin's theory** Evolution by natural selection
  Darwin's observations and the steps of natural selection.
- **10.4 Artificial selection** Selective breeding by humans
  Selective breeding of crops and farm animals.

- **10.5 Evidence for evolution** Fossils, anatomy, embryos
  Fossils, homologous and vestigial organs, embryology and DNA.
- **10.6 Adaptation** Traits that suit the habitat
  Structural, behavioural and physiological adaptations.
- **10.7 Speciation** Isolation leads to new species
  How geographical isolation can lead to new species.

Key definitions

- **Evolution** is the gradual change in the inherited characteristics of a population over many generations.
- **Variation** is the differences between individuals of the same species, such as height, blood group or eye colour.
- **Natural selection** is the process in which individuals with useful inherited traits survive and reproduce more, so those traits become more common in the next generations.
- **Adaptation** is an inherited feature that helps an organism survive and reproduce in its habitat, like the thick fur of a snow leopard.
- **Fossil** is the preserved remains or trace of an organism that lived long ago, usually found in sedimentary rock.
- **Homologous organs** are organs with the same basic structure and origin but different functions, such as a human arm, a bat wing and a whale flipper.
- **Speciation** is the formation of a new species when populations become so different that they can no longer interbreed.

Questions students ask

Q. What is the difference between Lamarck's and Darwin's ideas?

Lamarck said organisms change by using or not using body parts and pass these acquired changes to their young. Darwin said individuals already vary, and those with useful inherited traits survive and reproduce more. Acquired changes are not inherited, so Darwin's idea is the accepted one.

Q. What is the difference between homologous and analogous organs?

Homologous organs have the same basic structure but different jobs, like the forelimbs of humans, bats and whales, which points to a common ancestor. Analogous organs do the same job but have different structures, like the wings of a bird and an insect.

Q. Can we see evolution happening today?

Yes, in organisms that reproduce quickly. Bacteria becoming resistant to antibiotics and mosquitoes becoming resistant to insecticides are examples of natural selection happening within a few years.

Q. What are vestigial organs?

Vestigial organs are reduced body parts that have little or no use now but were useful in ancestors, such as the human appendix, wisdom teeth and the tail bone (coccyx). They are one piece of evidence for evolution.

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