Class 9 Science Chapter 12: Patterns in Life: Diversity and Classification - Notes, Important Questions and MCQs (2026-27)

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These Class 9 Science Chapter 12 notes cover “Patterns in Life: Diversity and Classification” from the new NCERT textbook Exploration (2026-27): biodiversity and India’s endemic species and hotspots, why and how we classify organisms, the history of classification from artificial systems to Whittaker’s five kingdoms, the taxonomic hierarchy, binomial nomenclature, adaptations, fossils and threats to biodiversity – with tables, Q&A, 10 MCQs and a free PDF.

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Chapter Overview

The living world is enormously varied. India alone is home to many endemic species – found nowhere else – such as the Nilgiri tahr, the lion-tailed macaque, the pitcher plant Nepenthes khasiana and the Neelakurinji shrub. Four global biodiversity hotspots lie partly in India: the Western Ghats, the Himalayas, Indo-Burma and Sundaland (Nicobar Islands).

To study this diversity, scientists group organisms by shared features. Classification systems have evolved from simple artificial groupings to the two-, three-, four- and five-kingdom systems. Organisms are arranged in a hierarchy from kingdom to species and named with a two-part scientific name. The chapter also links diversity to adaptation, fossils and the need to protect species under threat.

Important Topics and Concepts

Biodiversity and India

- Biodiversity is the variety of living organisms in an area – plants, animals and microorganisms.
- Endemic species are found only in a particular region (Nilgiri tahr, lion-tailed macaque, Nepenthes khasiana, Neelakurinji, purple frog Nasikabatrachus sahyadrensis).
- Biodiversity hotspots are regions very rich in endemic species but under threat; India includes the Western Ghats, Himalayas, Indo-Burma and Sundaland (Nicobar).
- Diversity arose as small differences among organisms helped some survive and reproduce better in their surroundings, accumulating over long periods.

Why and How We Classify

- Classification makes the huge variety of life easier to study, compare and remember.
- It shows relationships between groups and helps in identifying new organisms.
- Criteria used: external features, mode of nutrition, internal structures, cell structure (prokaryotic or eukaryotic, unicellular or multicellular, cell wall), ecological role, mode of reproduction and genetic similarity.
- Ancient Indian texts such as the Rigveda and Brihat Samhita grouped animals by habitat (land, water, air).

History of Classification Systems

- Artificial systems used one or a few easily visible features (habitat, use).
- Two-kingdom system (Linnaeus, 1758): Plantae and Animalia.
- Three-kingdom system (Haeckel, 1866): added Protista for single-celled organisms.
- Four-kingdom system (Copeland, 1938): separated Monera (prokaryotes).
- Five-kingdom system (Whittaker, 1969): Monera, Protista, Fungi, Plantae and Animalia – based on cell type, body organisation and mode of nutrition.

Hierarchy and Binomial Nomenclature

- Taxonomic hierarchy: Kingdom → Phylum (Division in plants) → Class → Order → Family → Genus → Species.
- Moving down the hierarchy, the number of organisms decreases and their similarity increases.
- Species: a group of organisms that can interbreed and produce fertile offspring.
- Binomial nomenclature, introduced by Carl Linnaeus in the 18th century, gives each species a two-part name: Genus (capitalised) + species (lowercase), italicised or underlined – e.g. Homo sapiens, Panthera tigris, Mangifera indica.

Adaptations, Fossils and Threats

- Adaptations are features that help organisms survive in their habitat (thick fur in polar animals, spines in cactus, streamlined bodies in fish).
- Fossils are preserved remains or traces of past organisms; they show how life has changed over time.
- Threats to biodiversity: habitat loss, deforestation, pollution, overexploitation, invasive species and climate change.

- Conservation through protected areas, sustainable use and awareness helps protect endemic and endangered species.

The Five Kingdoms at a Glance

Most-asked table.

Kingdom	Cell type	Body	Nutrition	Examples
Monera	Prokaryotic	Unicellular	Auto/heterotrophic	Bacteria, cyanobacteria
Protista	Eukaryotic	Unicellular	Auto/heterotrophic	Amoeba, Paramecium, diatoms
Fungi	Eukaryotic	Mostly multicellular, cell wall of chitin	Heterotrophic (saprophytic)	Yeast, mushroom, Penicillium
Plantae	Eukaryotic	Multicellular, cellulose wall	Autotrophic	Mango, fern, moss
Animalia	Eukaryotic	Multicellular, no cell wall	Heterotrophic	Fish, frog, human

Memory Aid for the Hierarchy

- Kingdom – Phylum – Class – Order – Family – Genus – Species: “King Philip Came Over For Good Soup”.
- Example – Human: Animalia → Chordata → Mammalia → Primates → Hominidae → Homo → sapiens.

Timeline of Classification Systems

System	Proposed by / year	Groups
Artificial	Ancient times	Habitat, use, visible features
Two kingdom	Linnaeus, 1758	Plantae, Animalia
Three kingdom	Haeckel, 1866	+ Protista
Four kingdom	Copeland, 1938	+ Monera
Five kingdom	Whittaker, 1969	Monera, Protista, Fungi, Plantae, Animalia

Important Definitions and Terms

Term	Meaning
Biodiversity	Variety of living organisms in an area
Endemic species	Species found only in a particular region
Biodiversity hotspot	Region rich in endemic species and under threat
Classification	Grouping organisms by similarities and differences
Taxonomy	Science of identifying, naming and classifying organisms
Species	Organisms that can interbreed and produce fertile offspring
Genus	Group of closely related species
Binomial nomenclature	Two-part scientific naming system (Genus + species)

Term	Meaning
Adaptation	Feature that helps an organism survive in its habitat
Fossil	Preserved remains or traces of past organisms

Short Answer Questions

Q1. What are endemic species? Give two examples from India.

Species found only in a particular region; e.g. Nilgiri tahr and lion-tailed macaque (Western Ghats).

Q2. Name the four biodiversity hotspots that include parts of India.

Western Ghats, Himalayas, Indo-Burma and Sundaland (Nicobar Islands).

Q3. Why do we need to classify organisms?

To study the huge diversity easily, understand relationships among groups and identify organisms.

Q4. Name the five kingdoms proposed by Whittaker.

Monera, Protista, Fungi, Plantae and Animalia.

Q5. How is Monera different from Protista?

Monera are prokaryotic (no well-defined nucleus); Protista are eukaryotic unicellular organisms.

Q6. Write the rules for writing a scientific name.

Genus name starts with a capital letter, species name with a small letter; printed in italics or underlined when handwritten.

Q7. What happens to similarity as we move from kingdom to species?

The number of organisms decreases and the similarity among them increases.

Q8. How do fossils help in understanding diversity?

They show the forms of past organisms and how life has changed over time.

Long Answer Questions

Q1. Trace the development of classification systems up to the five-kingdom system.

Early artificial systems grouped organisms by habitat or use.

Linnaeus (1758) proposed two kingdoms – Plantae and Animalia.

Haeckel (1866) added Protista for unicellular organisms (three kingdoms).

Copeland (1938) separated prokaryotes as Monera (four kingdoms).

Whittaker (1969) separated Fungi, giving Monera, Protista, Fungi, Plantae and Animalia, based on cell type, body organisation and nutrition.

Q2. Explain the taxonomic hierarchy with an example.

Organisms are placed in ranks: Kingdom, Phylum, Class, Order, Family, Genus, Species.

Species is the basic unit – members interbreed and produce fertile offspring.

Example (human): Animalia → Chordata → Mammalia → Primates → Hominidae → Homo → sapiens.

The last two ranks form the scientific name Homo sapiens.

Q3. What threatens biodiversity and how can it be conserved?

Habitat loss through deforestation, urbanisation and agriculture.

Pollution, overexploitation (hunting, overfishing) and invasive species.

Climate change alters habitats faster than species can adapt.

Endemic species with small ranges are most at risk.

Conservation: protected areas, sustainable use, restoring habitats and public awareness.

MCQs with Answers

1. Five-kingdom classification was proposed by(a) Linnaeus (b) Haeckel (c) Whittaker (d) CopelandAnswer: (c) Whittaker

2. Prokaryotic organisms belong to(a) Protista (b) Monera (c) Fungi (d) PlantaeAnswer: (b) Monera

3. Binomial nomenclature was introduced by(a) Darwin (b) Linnaeus (c) Whittaker (d) MendelAnswer: (b) Linnaeus

4. The basic unit of classification is(a) genus (b) family (c) species (d) kingdomAnswer: (c) species

5. Correct way to write the scientific name of mango(a) Mangifera Indica (b) mangifera indica (c) Mangifera indica (d) MANGIFERA INDICAAnswer: (c) Mangifera indica

6. Yeast and mushrooms belong to(a) Plantae (b) Fungi (c) Monera (d) ProtistaAnswer: (b) Fungi

7. Nilgiri tahr is an example of(a) an invasive species (b) an endemic species (c) a fossil (d) a microorganismAnswer: (b) an endemic species

8. Which is NOT a biodiversity hotspot in India?(a) Western Ghats (b) Himalayas (c) Thar Desert (d) Indo-BurmaAnswer: (c) Thar Desert

9. Three-kingdom system added(a) Monera (b) Fungi (c) Protista (d) AnimaliaAnswer: (c) Protista

10. Rank just above genus is(a) species (b) order (c) family (d) classAnswer: (c) family

Quick Revision Points

- Biodiversity, endemic species, four hotspots in India.
- Classification criteria: features, nutrition, cells, reproduction, genetics.
- 2 → 3 → 4 → 5 kingdoms (1758, 1866, 1938, 1969).
- Five kingdoms: Monera, Protista, Fungi, Plantae, Animalia.
- K-P-C-O-F-G-S hierarchy.

- Binomial name: Genus species.
- Adaptations, fossils, threats and conservation.

Chapter Summary

Life on Earth is remarkably diverse, and India hosts many endemic species and parts of four biodiversity hotspots. Diversity arose as small advantageous differences accumulated over time.

Classification groups organisms by shared features. Systems progressed from artificial groupings to Whittaker's five kingdoms. Organisms are arranged in a hierarchy from kingdom to species and given binomial names. Adaptations and fossils help explain diversity, while habitat loss, pollution and climate change threaten it, making conservation essential.

Exam Tips and PYQ Pattern

- The five-kingdom table and classification timeline are high-scoring.
- Practise writing scientific names correctly.
- Remember the order of the hierarchy with the mnemonic.
- Learn two endemic species and the four hotspots.
- Case-based questions may give features and ask for the kingdom.

Frequently Asked Questions

Is this chapter in the 2026-27 CBSE syllabus?

Yes. It is part of the new NCERT Class 9 Science textbook "Exploration" (first edition 2026), prescribed for the 2026-27 session.

Can I download these notes as a PDF?

Yes. Use the free PDF link at the top of this page – no signup needed.

Who proposed the five-kingdom classification?

R. H. Whittaker in 1969.

What is binomial nomenclature?

A two-part scientific naming system (Genus + species) introduced by Carl Linnaeus, e.g. Homo sapiens.

Conclusion

Patterns in Life brings order to the variety of living things. Learn the timeline, five-kingdom table and hierarchy, practise the Q&A here and save the free PDF for revision.

More Notes: Class 9 Science Chapter 11: Reproduction: How Life Continues notes | Class 9 Science Chapter 13: Earth as a System: Energy, Matter and Life notes | All Class 9 Science notes

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