

**NCERT Solutions for Class 9 Science Chapter 7:** NCERT Solutions for Class 9 Science Chapter 7, "Diversity in Living Organisms," provide a detailed understanding of the vast variety of life forms found on Earth. This chapter explains the classification of organisms into different kingdoms based on their characteristics and evolutionary relationships.

Students learn about the diversity of plants, animals, fungi, protists, and bacteria, studying their unique features, habitats, and adaptation strategies.

By studying these solutions, students can gain a deeper appreciation of the complexity and interconnectedness of life forms and ecosystems, preparing them for further studies in biology and environmental sciences.

## **NCERT Solutions for Class 9 Science Chapter 7 Overview**

The NCERT Solutions for Class 9 Science Chapter 7, "Diversity in Living Organisms," created by experts of Physics Wallah, give a detailed look at the different types of living things on our planet.

By using these solutions, students can learn more about the variety of life forms around us and how they fit into the natural world.

## **Diversity in Living Organisms**

"Diversity in Living Organisms" refers to the wide range of species and variations found in the biological world. It encompasses the different types of living organisms, including plants, animals, fungi, protists, and bacteria, among others.

This diversity is characterized by various factors such as differences in morphology, physiology, behavior, habitat preferences, and evolutionary histories. Understanding diversity in living organisms involves studying their classification, adaptations, ecological roles, and interactions within ecosystems.

## **NCERT Solutions for Class 9 Science Chapter 7 PDF**

You can find the PDF link for NCERT Solutions for Class 9 Science Chapter 7, "Diversity in Living Organisms," below.

This resource provided by subject experts from Physics Wallah provide detailed explanations to help you understand the diverse classifications of living organisms.

**NCERT Solutions for Class 9 Science Chapter 7 PDF**

# **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms**

Below we have provided NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms for the ease of the students –

## **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms Exercise – 7.1**

**Q1. Why do we classify organisms?**

**Ans:**

Classifying organisms allows scientists to systematically organize and study their characteristics more effectively. By identifying similarities among different organisms, scientists can group them into categories or classes. This classification helps in understanding broader patterns and relationships within the natural world.

It enables scientists to study groups of organisms collectively, making it easier to compare their anatomical features, behaviors, evolutionary histories, and ecological roles. This systematic approach to classification not only simplifies scientific study but also provides insights into the diversity and interconnectedness of living organisms on Earth.

**Q2. Give three examples of the range of variations that you see in life forms around you.**

**Ans:**

Listed below are a few ranges of variations observed in life forms:

- (a) Small frog to big whale
- (b) Creeper to the eucalyptus tree
- (c) Black cuckoo to colourful peacock

## **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms Exercise-7.1**

**Q3. Which of the following do you think is a more basic characteristic for classifying organisms?**

- (a) The place where they live.
- (b) The kind of cells they are made of. Why?

**Ans:**

Establishing the most basic classification of organisms based on the type of cells they are made up of is fundamental because it reflects fundamental differences in biological structure and function. Cells are the building blocks of life, and their organization and specialization determine an organism's characteristics and behaviors.

By classifying organisms according to cell type—such as prokaryotic cells (like bacteria) versus eukaryotic cells (like plants and animals)—scientists can discern key differences in how organisms function and interact with their environments.

This classification approach is important because it helps to distinguish between organisms that may appear similar superficially but differ significantly at the cellular level. For example, organisms with similar cell structures are likely to exhibit comparable physiological processes and adaptations, even if they inhabit different habitats. Understanding these cellular foundations allows scientists to make broader generalizations about biological diversity and to study the evolutionary relationships between different groups of organisms.

**Q4. What is the primary characteristic on which the broad division of organisms is made?**

**Ans:**

The primary characteristic used to classify organisms is the nature of their cells. This classification broadly divides organisms into two major categories: prokaryotic cells and eukaryotic cells.

**Q5. On what basis are plants and animals put into different categories?**

**Ans:**

**(a) Presence of Cell Wall:**

- This is a fundamental criterion for classification. Plants typically have cells surrounded by a rigid cell wall composed of cellulose, which provides structural support and protection. In contrast, animals generally lack a cell wall, allowing for greater flexibility and mobility.

**(b) Mode of Nutrition:**

- This criterion focuses on how organisms obtain and process nutrients. Plants are autotrophic, meaning they produce their own food through photosynthesis using sunlight, water, and carbon dioxide.
- Animals, on the other hand, are generally heterotrophic, meaning they rely on consuming other organisms or organic matter for nutrients.

## **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms Exercise-7.2**

**Q6. Which organisms are called primitive, and how are they different from the so-called advanced organisms?**

**Ans:**

Primitive organisms are characterized by simple and basic cell arrangements, mechanisms, and structures. They lack specialization and do not exhibit division of labor among their cells. These organisms often have a single cell type performing all necessary functions for survival. Examples include unicellular organisms like bacteria and protists.

In contrast, advanced organisms are characterized by millions of specialized cells that are organized into tissues, organs, and systems. These organisms exhibit a high degree of complexity and division of labor among different cell types and organs. For instance, mammals have specialized organs such as the heart, lungs, and brain, each performing distinct functions essential for survival and adaptation to their environment.

This division highlights the evolutionary progression from simpler, primitive organisms to more complex, advanced organisms, reflecting increased specialization and efficiency in biological functions over time.

**Q7. Will advanced organisms be the same as complex organisms? Why?**

**Ans:**

Yes, complex organisms and advanced organisms generally refer to the same concept. As organisms evolve and become more advanced, they develop complex arrangements of cells that operate in specialized ways. This complexity allows for the division of labor among different cell types and the formation of tissues, organs, and systems that perform specific functions essential for survival and adaptation.

## **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms Exercise-7.3**

**Q8. What is the criterion for the classification of organisms as belonging to the kingdom Monera or Protista?**

**Ans:**

The presence or absence of a well-defined nucleus is indeed a significant criterion in biological classification. Here's a clarification:

**Monera (Prokaryotes):**

- Organisms in the Monera kingdom are characterized by the absence of a true nucleus and other membrane-bound organelles. Their genetic material floats freely in the cytoplasm.
- Examples include bacteria and archaea.

**Protista (Protists):**

- Organisms in the Protista kingdom are primarily single-celled eukaryotes that possess a well-defined nucleus enclosed within a nuclear membrane.
- Protists exhibit a wide range of characteristics and can be autotrophic or heterotrophic. They include organisms like amoebas, algae, and protozoans.

**Q9. In which kingdom will you place an organism which is single-celled, eukaryotic and photosynthetic?**

**Ans:**

Photosynthetic organisms with a well-defined nucleus, such as algae, belong to the Protista kingdom. This kingdom includes diverse eukaryotic organisms that can be both unicellular and multicellular. Algae possess chloroplasts for photosynthesis and exhibit a wide range of forms and lifestyles in aquatic and terrestrial environments. Their classification is based on their cellular structure, including the presence of a nucleus enclosed within a nuclear membrane, distinguishing them from prokaryotic organisms in the Monera kingdom.

**Q10. In the hierarchy of classification, which grouping will have the smallest number of organisms with maximum common characteristics and which will have the largest number of organisms?**

**Ans:**

(a) Organisms in the Kingdom Monera, such as bacteria and archaea, exhibit a high degree of similarity in their basic characteristics, including prokaryotic cell structure and often simple modes of nutrition. This kingdom represents a diverse yet relatively small group compared to others.

(b) The Kingdom Animalia comprises the largest number of organisms, ranging from microscopic single-celled organisms to complex multicellular organisms. Animals within this kingdom display vast diversity in form, habitat, and behavior, reflecting a wide range of adaptations for survival and reproduction.

# **NCERT Solutions for Class 9 Science**

## **Chapter 7 Diversity in Living Organisms**

### **Exercise-7.4**

**Q11. Which division among plants has the simplest organisms?**

**Ans:**

Algae or Thallophyta has the simplest organism among plants.

**Q12. How are pteridophytes different from phanerogams?**

**Ans:**

The following are the differences between pteridophytes and phanerogams:

**Pteridophytes:**

- **Embryo:** They possess a naked embryo.
- **Reproductive Organ:** They exhibit unclear or less well-defined reproductive organs compared to Phanerogams.

**Phanerogams:**

- **Embryo:** They possess a covered embryo.
- **Reproductive Organ:** They exhibit well-defined reproductive organs, which may include flowers in angiosperms (flowering plants) and cones in gymnosperms.

**Q13. How do gymnosperms and angiosperms differ from each other?**

**Ans:**

In gymnosperms, the seeds are naked, while in angiosperms, the seeds are covered.

## **NCERT Solutions for Class 9 Science Chapter 7 Diversity in Living Organisms Exercise-7.5**

**Q14. How do poriferan animals differ from coelenterate animals?**

**Ans:**

Listed below are the differences between poriferan and coelenterate animals:

<b>Characteristic</b>	<b>Porifera (Sponges)</b>	<b>Coelenterata (Cnidarians)</b>
<b>Division of Labour</b>	Not observed; cells perform independent functions	Observed; different cells and tissues specialize in specific functions
<b>Organisation Level</b>	Cellular level; specialized cells, no true tissues	Tissue level; distinct tissues like epidermis, gastrodermis, and mesoglea

<b>Coelom</b>	Absent	Generally absent; some have a simple gastrovascular cavity
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**Q15. How do annelid animals differ from arthropods?**

**Ans:**

Listed below are the differences between annelid and arthropods:

<b>Characteristic</b>	<b>Annelida (Segmented Worms)</b>	<b>Arthropoda (Arthropods)</b>
<b>Body Segmentation</b>	The entire body is segmented into rings	Segmentation into head, abdomen, and thorax
<b>Skeleton</b>	Skeleton is absent	Presence of an exoskeleton (external skeleton)
<b>Reproductive Strategy</b>	Hermaphrodites	Separate sexes; bisexuals may be present

**Q16. What are the differences between amphibians and reptiles?**

**Ans:**

Listed below are the differences between amphibians and reptiles:

**Class 9 Science Chapter 7 Exercise**

**Q1. What are the advantages of classifying organisms?**

**Ans:**

Listed below are the advantages of the classification of organisms:

- **Study of Common Features:** Classification allows for the systematic study of organisms with shared characteristics, aiding in understanding their biology and evolution.
- **Simplified Scientific Studies:** It facilitates easier comparison and analysis of scientific experiments and observations across different species.
- **Interpretation of Human Interactions:** Classification helps in understanding the relationships and dependencies between humans and other organisms, including ecological roles and impact on ecosystems.
- **Commercial Applications:** It provides a framework for crossbreeding and genetic modification, leading to advancements in agriculture, medicine, and other commercial sectors.

**Q2. How would you choose between two characteristics to be used for developing a hierarchy in classification?**

**Ans:**

**Start of Hierarchy (Gross Character):** Organisms are initially classified based on prominent, easily observable features. For example, human beings are categorized as vertebrates due to the presence of a vertebral column.

**Further Steps (Fine Character):** Subsequent classification involves finer details and specific traits that distinguish groups within broader categories. For instance:

- **Tetrapods:** This group includes organisms with four limbs, such as amphibians, reptiles, birds, and mammals.
- **Mammals:** Further classification within tetrapods focuses on distinctive characteristics like the presence of mammary glands for lactation.

**Q3. Explain the basis for grouping organisms into five kingdoms.**

**Ans:**

Here are the factors governing the basis of grouping organisms into five kingdoms:

1. **Number of Cells:** The first criterion considers whether the organism is unicellular (made of one cell) or multicellular (made of many cells).
2. **Arrangement and Layers:** This factor examines how cells are organized and the number of cellular layers present in the organism's body structure.
3. **Presence of Cell Wall:** Classification also considers whether organisms have a cell wall surrounding their cells, which can vary in composition and function.
4. **Mode of Nutrition:** Complex organisms are classified based on how they obtain and process nutrients. This includes whether they are autotrophic (produce their own food) or heterotrophic (obtain food from other sources).
5. **Organization Level:** The level of organization within an organism, such as cellular level, tissue level, or organ level, is also crucial in classification. This reflects how cells and tissues are specialized to perform specific functions within the organism.

**Q4. What are the major divisions in the Plantae? What is the basis of these divisions?**

**Ans:**

The following table depicts plant division and the basis of classification for each division.

Division	Basis of Classification
Thallophyta or Algae	Like body



Bryophyta	The body is divided into leaf and stem
Pteridophyta	The body is separated into root, stem and leaf
Gymnosperm	Seed-bearing, naked seeds
Angiosperm	Seed bearings covered seeds

**Q5. How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?**

**Ans:**

**Plant Classification:**

- **Thallophytes vs. Bryophytes:** These groups are classified based on the basic cell structure. Thallophytes have simpler, undifferentiated cells, while Bryophytes have more specialized cells that form primitive tissues.
- **Gymnosperms vs. Angiosperms:** Classification is based on the presence and visibility of seeds. Gymnosperms have naked seeds (not enclosed in a fruit), while Angiosperms have seeds enclosed within a fruit.

**Animal Classification:**

- **Cytology:** In animal classification, cytology (the study of cells) plays a crucial role. Minute structural variations at the cellular level are considered to distinguish different groups.
- **Morphological Features:** Characteristics such as cell layers, cytology, and overall morphology are significant in the classification of animals. These features help categorize organisms into higher hierarchical groups based on the presence or absence of specific traits.

**Q6. Explain how animals in Vertebrata are classified into further subgroups.**

**Ans:**

**Vertebrata (Subclasses):**

- **Pisces:** Fishes with streamlined bodies, tails, and fins for swimming.
- **Tetrapoda:** Tetrapod animals with four limbs for movement.

**Tetrapoda (Classes):**

1. **Amphibia:** Adaptive animals that can live both on land and in water, with specialized organs for underwater breathing.

2. **Reptilia:** Crawling animals with thick skin that can withstand extreme temperatures.
3. **Aves:** Birds with modified forelimbs for flight, lacking teeth and having a beak and feathers.
4. **Mammalia:** Animals with nurturing skills, possessing mammary glands for milk production, covered with hair, and most are viviparous (give birth to live young).

## Benefits of NCERT Solutions for Class 9 Science Chapter 7

- **Comprehensive Coverage:** They provide thorough explanations and solutions to all questions and exercises in the NCERT textbook, ensuring students understand core concepts effectively.
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