

CBSE class IX Science
NCERT Solutions
Chapter 7
Diversity in Living Organisms

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1. Why do we classify organisms?

Ans. A large number of organisms exist on this earth. We cannot study such enormous biodiversity one by one i.e. studying variety of life forms individually is an impossible task. Hence, we make groups or categories of organisms depending upon their similarities and dissimilarities with other organisms. This allows an easier and systematic study of the life forms.

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

Ans. i) Life forms vary in their size – Some organisms are too small and cannot be seen with naked eyes like microorganisms while others are too big like the biggest animal which is the blue whale.

ii) Number and type of cells – Some organisms have a prokaryotic cell like bacteria and that single cell performs all the required functions while others have eukaryotic cells organized into tissue, organ and even organ systems like human beings.

iii) Mode of nutrition – Some organisms are autotrophic i.e. capable of making their own food eg plants while other organisms are heterotrophic i.e. they are dependent on other organisms for their food supply.

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1. Which 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. The classification of organisms based on the place where they live is not quite

convincing because other living in the same habitat they hardly share any other feature for example whales, corals, starfishes, octopus, fishes, sharks etc all are aquatic i.e. they live in water their appearance and all other features are very different.

Therefore classification of organisms based on the kind of cells they are made of is more widely accepted. For such categorisation organisms belonging to prokaryotic group will have a particular cell structure and functional pattern which will be different from the eukaryotic group.

2. What is the primary characteristic on which the first division of organisms is made?

Ans. The primary characteristic on which the first division of organisms is made is that whether the organisms are prokaryotic or eukaryotic.

3. On what bases are plants and animals put into different categories?

Ans. On the basis of their mode of nutrition as well as their body designs plants and animals are put into different categories. Plants are autotrophic and perform photosynthesis whereas animals are heterotrophic and get food from the outside. Plant cells have cell wall whereas animal cells do not have any cell wall.

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

Ans. Such organisms that possess quite simple structure and their body design haven't changed much from their ancient sort of details even after long period of evolution on earth are called as the primitive organisms like bacteria who are still single celled and prokaryotic while advanced organisms have complex body design like trees and humans.

2. Will advanced organisms be the same as complex organisms? Why?

Ans. Yes we can say that the advanced organisms are the same as complex organisms because advancement has occurred due to the process of evolution where a group of simple

organisms have changed themselves into the complex forms of life for better survival.

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

Ans. The criterion used for classification of organisms as belonging to kingdom Monera or Protista is their cell structure.

Both Monerans as well as Protists are unicellular or single celled organisms but among monerans the cell is prokaryotic i.e. do not contain well defined nucleus while in protists the cell is eukaryotic i.e. have a well-defined nucleus.

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

Ans. Kingdom Protista.

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

Ans. Smallest number of organisms with a maximum of characteristics in common will be Species while grouping with largest number of organisms with common characteristics will be Kingdom.

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1. Which division among plants has the simplest organisms?

Ans. Division thallophyta.

2. How are pteridophytes different from the phanerogams?

Ans. Pteridophytes do not produce seeds but develop naked embryos while phanerogams

are seed producing plants like gymnosperms and angiosperms.

3. How do gymnosperms and angiosperms differ from each other?

Ans.

Gymnosperms	Angiosperms
They are plants producing male and female cones. They develop seeds but those seeds are naked i.e. fruits are not formed.	They are flowering plants hence produce flowers as reproductive organs. They develop seeds those are covered inside fruits i.e. fruit formation occurs.

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1. How do poriferan animals differ from coelenterate animals?

Ans.

Poriferans	Coelenterates
They bear pores on their body.	Pores are absent on body.
They have cellular level of body organization.	They have tissue grade of body organization.
Mesoglea absent.	Mesoglea(body cavity) present.

2. How do annelid animals differ from arthropods?

Ans.

Annelids	Arthropods
Body cavity is true coelom.	Body cavity is haemocoel like in cockroach.
Body segmented and segments are called annuli.	Body segmented into head, mesothorax and met thorax.
Legs absent.	Three pairs of legs present.
Closed circulatory system.	Open circulatory system.

3. What are the differences between amphibians and reptiles?

Ans.

Amphibians	Reptiles
Body is soft and slimy without scales.	Body is covered with scales.
Fertilisation external and lay eggs in water.	Fertilization internal and lay eggs on land eg turtles.

4. What are the differences between animals belonging to the Aves group and those in the mammalian group?

Ans.

Aves	Mammalia
They lay eggs from which young ones hatch out.	They give birth to the young ones.
Body is covered with feathers.	Body is covered with hairs.
Bones are hollow or pneumatic.	Bones are filled with bone marrow.

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1. What are the advantages of classifying organisms?

Ans. Because of the huge biodiversity i.e. variety of life forms existing on earth it becomes very difficult to study them individually so scientists have made groups of organisms based on their similarities and dissimilarities. Such categorization of organisms is known as classification which help us to study them easily and systematically.

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

Ans. We would choose the characteristic related to their structure and function that will help developing a hierarchy from one level to the next level. Like arthropods are organisms with jointed appendages but among arthropods insects and spiders make separate groups having peculiar characteristics to define them. Hence we can make the hierarchy in classification by selecting general to specific characteristics.

3. Explain the basis for grouping organisms into five kingdoms.

Ans. The basis for grouping organisms into five kingdoms is as follows:

- a) The organisms are made of prokaryotic or eukaryotic cells.
- b) The organism has a single cell in its body or is a multicellular life form.
- c) The organism prepares its own food or is dependent on other for food.

4. What are the major divisions in the Plantae? What is the basis for these divisions?

Ans.

Thallophyta	Bryophyta	Pteridophyta	Gymnosperms	Angiosperms
Plant body not differentiated into root, stem and leaf.	Develop root like structures called rhizoids but lack vascular tissues.	Develop vascular tissue for conduction but lack seeds.	Develop naked seeds and lack flowers.	Develop seeds covered inside fruits and produce flowers.

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

Ans. Animals are classified into subgroups on the basis of their level of body organization (cellular, tissue, organ grade) and symmetry, body cavity and presence or absence of notochord etc.

6. Explain how animals in Vertebrata are classified into further subgroups.

Ans. Animals in Vertebrata are classified into further subgroups based on their development of nervous system, circulatory system, reproductive methods etc. On the basis of the above mentioned characters the vertebrata is divided into following classes:

1. Exoskeleton of scales, breathing through gills - PISCES
2. Breathing through gills only in larva, skin slimy - AMPHIBIA
3. Exoskeleton of scales, laying eggs outside water - REPTILIA
4. Exoskeleton of feathers, lays eggs, flight possible - AVES (BIRDS)
5. Exoskeleton of hair, external ears, give birth to young ones - MAMMALIA