

# NCERT SOLUTIONS

## CLASS IX SCIENCE

### CHAPTER 7- DIVERSITY IN LIVING ORGANISMS

#### 1) Why are organisms classified?

**Solution:** By classifying the organisms, it is easier and more convenient to study their characteristics.

#### 2) Observe and state the different variations around you.

**Solution:**

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

#### 3) What is the most basic characteristic for classifying organisms?

- (a) Their living habitat?
- (b) Or their cell type? why?

**Solution:**

The most basic classification of organisms should be based on the kind of cells they are made up of because a habitat can have species with different characteristics living in harmony whereas the organisms with similar cell arrangement will have similar characteristics.

#### 4) What is the preliminary characteristic on which the first class division of organisms is made?

**Solution:**

The basic characteristic on which the first division of organisms is made is the nature of cells. It is primarily classified as prokaryotic cell and eukaryotic cell which has further classifications within them.

#### 5) On what basis are the plants and animals categorized?

**Solution:**

- (a) The primary consideration of classification is the presence and absence of cell wall.
- (b) Another criterion is the mode of nutrition. The mechanism through which the organism gains their nutrients is used as the base for classification.

#### 6) Which organisms are considered the most primitive and what is the difference between them and the so-called advanced organisms?

**Solution:**

The organisms which have a very simple cell structure and mechanism with no division of labour are called the primitive organisms whereas ones with millions of cells which are formed into different organs for various mechanisms like mammals are called the advanced organisms.

#### 7) Are advanced organisms the same as complex organisms? Why?

**Solution:**

Yes, the advanced organisms will be the same as complex organisms. Advancement leads to multiple cell arrangements that will function in a unique way.

#### 8) How do you classify organisms into kingdom Monera and Protista?

**Solution:**

The development of the nucleus is the key difference in the classification. The ones with no nuclear membrane are defined to be Monera while the ones that have well-defined nuclei walls are Protista.

#### 9) In which kingdom will you place an organism which is single celled eukaryotic and photosynthetic?

**Solution:**

Since the cell is photosynthetic, it must have a well-defined nucleus wall. Therefore it needs to be placed in Protista kingdom.

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

**Solution:**

- (a) The organisms that are classified in the kingdom Monera will have the smallest number of organisms and with maximum characteristics in common.  
 (b) The organisms that are classified under the kingdom Animalia will have the largest number of organisms.

11) Which division among plants have the simplest organisms?

**Solution:**

Algae or Thallophyta has the simplest organisms among the plants.

12) How are pteridophytes different from the phanerogams?

**Solution:**

The pteridophytes have a naked embryo and unclear reproductive organ while the phanerogams have a covered embryo and a well-defined reproductive organ.

13) How do gymnosperms and angiosperms differ from each other?

**Solution:**

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

14) How do poriferan animals differ from coelenterate animals?

**Solution:**

Poriferan	Coelenterate
<ul style="list-style-type: none"> <li>No division of labour seen</li> <li>Shows cellular level organisation</li> <li>Do not have coelom</li> </ul>	<ul style="list-style-type: none"> <li>Some division of labour is seen</li> <li>Tissue level organisation observed</li> <li>Coelom present</li> </ul>

15) How do annelid animals differ from arthropods?

Annelida	Arthropods
<ul style="list-style-type: none"> <li>Body is segmented into rings</li> <li>No skeleton</li> <li>Hermaphrodite</li> </ul>	<ul style="list-style-type: none"> <li>Body is segmented into head, abdomen and thorax</li> <li>Exoskeleton present</li> <li>Different sexes, bisexual present</li> </ul>

16) What are the differences between amphibians and reptiles?

**Solution:**

Amphibia	Reptilia
<ul style="list-style-type: none"> <li>Has soft and moist skin</li> <li>Amphibians in nature, breathe through skin when in water</li> <li>Uses lungs or gills to respire.</li> <li>Can jump</li> <li>Indirect development</li> </ul>	<ul style="list-style-type: none"> <li>Skin is hardened</li> <li>Can live in water, but comes to land to take in oxygen</li> <li>Uses lungs to respire</li> <li>Movement through crawling</li> <li>Direct development</li> </ul>

17) What are the differences between animals belonging to the Aves group and those in the mammalian group?

**Solution:**

Aves	Mammalia
<ul style="list-style-type: none"> <li>• Feathers cover the body</li> <li>• Has no teeth, instead has a beak</li> <li>• Its forelimbs are modified for flying</li> <li>• Contains hollow bones</li> <li>• Streamlined body</li> </ul>	<ul style="list-style-type: none"> <li>• Body is covered with hair</li> <li>• Teeth present, beak absent</li> <li>• Forelimbs are used for various activities</li> <li>• Solid bones</li> <li>• No streamlined body (except in whales)</li> </ul>

**Exercises:**

1) Mention the advantages of classifying organisms?

**Solution:**

When the organisms are classified, their common characters are easily studied.

The study for scientific experiments is simplified.

The human relation with the other organisms are interrelated and the dependency of one another is studied.

The commercial role comes when they are crossbred and genetically modified.

2) What would be the criteria to choose between two characteristics that are to be used in the development of a hierarchy of classification?

**Solution:**

The basis of the start of the hierarchy will be formed by the Gross character while the basis of steps further will be taken care by the fine character.

For example;

The presence of vertebral column in human beings brings them under the classification of vertebrates

For Tetrapods, the presence of four limbs is considered.

In the case of mammals, the mammary gland is the required part.

3) What are the criteria of grouping the organisms under five kingdoms?

**Solution:**

The first criterion is the number of cells present.

Next is the arrangement and the number of layers present.

The presence of cell wall plays the major role in major classification.

The mode of intake of nutrition is the key when it comes to complex organisms

The organization level is also an important aspect of classification.

4) State the major divisions in Plantae. Mention the basis for these divisions.

**Solution:**

Division	Basis of Classification
Thallophyta or Algae	Like body
Bryophyta	Body is divided into leaf and stem
Pteridophyta	The body is divided into root, stem and leaf
Gymnosperm	Seed-bearing, naked seeds
Angiosperm	Seed bearings covered seeds

5) How do the criteria for deciding divisions differ from that of the one that is used to decide the sub groups in animals?

**Solution:**

The major criterion for the classification of Thallophytes and Bryophytes in plants is the basic cell structure.

With the help of seeds' visibility, Gymnosperms and Angiosperms are categorized.

Thus, clearly morphological character plays the major role in the plant classification.

Whereas, in animal classification, cytology is considered primarily as more minute structural variations are considered for animal classification.

The layers of cells, morphology, cytology are the important factors to be considered in the classification of animals.

The higher hierarchies of animals are classified based on the presence and absence of various features.

**6) Brief about the sub classifications of Vertebrata.**

**Solution:**

There are two subclasses under Vertebrata namely, Pisces and Tetrapod of which animals of Pisces have streamlined body with tails and fins which help them swim and the Tetrapoda species have four limbs for their movement.

The tetrapoda animals are further classified as,

- (a) Amphibia: These animals are adaptive in nature. They live both in the land as well as in water. They have organs that help them breathe under water.
- (b) Reptilia: The animals that crawl are classified under this category. Their skin is very thick and withstands extreme temperatures.
- (c) Aves: The forelimbs of these organisms are modified which help them in their flight. They lack teeth and instead have beak and feathers that cover the body.
- (d) Mammalia: These animals shows nurturing skills as they contain mammary glands to support them. Their skin is covered with hair and most of them are viviparous in nature.

