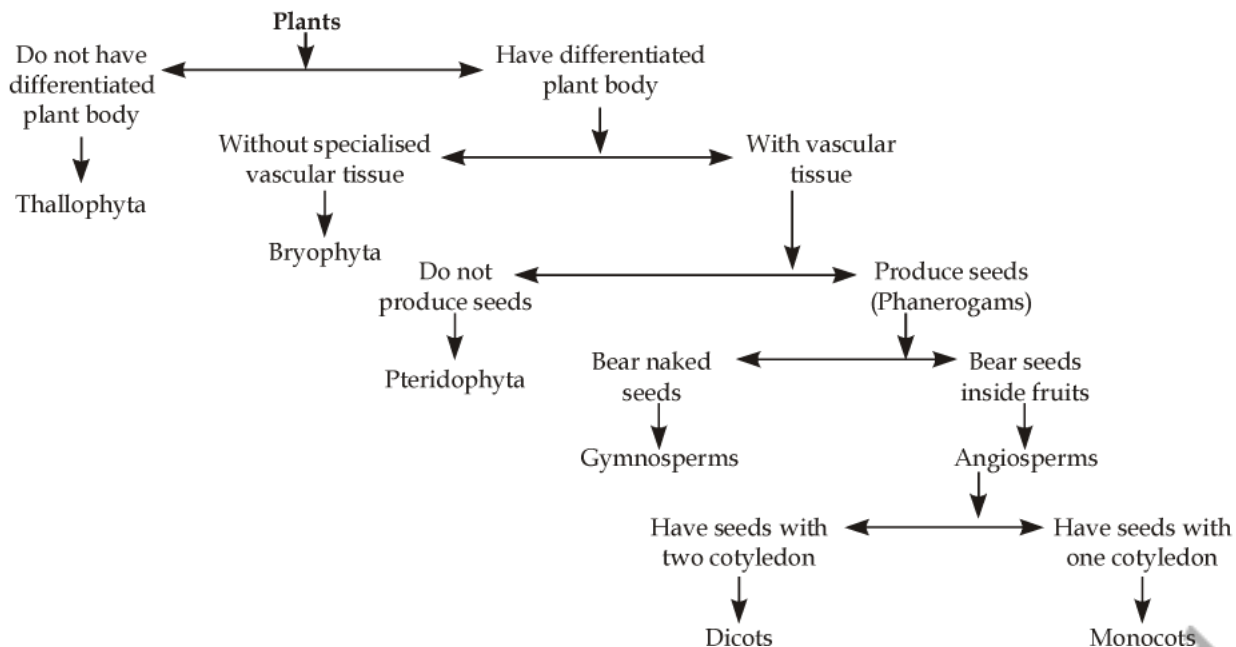


- Q1.** What is the primary characteristic on which the first division of organisms is made?
- Q2.** In which kingdom will you place an organism which is single-celled, eukaryotic and photosynthetic?
- Q3.** Which division among plants has the simplest organisms?
- Q4.** Why do we classify organism?
- Q5.** Which do you think is a more basic characteristic of classifying organisms? Explain.
(a) The place where they live. (b) The kind of cells they are made of.
- Q6.** On what bases are plants and animals put into different categories?
- Q7.** Which organisms are called primitive and how are they different from the so-called advanced organisms?
- Q8.** Will advanced organisms be the same as complex organisms? Why?
- Q9.** What is the criterion for classification of organisms as belonging to kingdom Monera or Protista?
- Q10.** 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?
- Q11.** Explain the basis for grouping organisms into five kingdoms.
- Q12.** How are pteridophytes different from the phanerogams?
- Q13.** How do gymnosperms and angiosperms differ from each other?
- Q14.** Give three examples of the range of variations that you see in life-forms around you.
- Q15.** What are the advantages of classifying organisms?
- Q16.** How would you choose between two characteristics to be used for developing a hierarchy in classification?
- Q17.** What are the major divisions in the Plantae? What is the basis for these divisions?
- Q18.** How do poriferan animals differ from coelenterate animals?
- Q19.** How do annelid animals differ from arthropods?
- Q20.** What are the differences between amphibians and reptiles?
- Q21.** What are the differences between animals belonging to the Aves group and those in the Mammalia groups?
- Q22.** Explain how animals in Vertebrata are classified into further sub-groups.
- Q23.** How are the criteria for deciding divisions in plants different from the criteria for deciding the subgroups among animals?

- S1.** Nature of cell is the primary characteristic on which the first division of organisms is decided. Based on this criterion life forms can be classified into prokaryotes and eukaryotes.
- S2.** Single-celled, eukaryotic and photosynthetic organism will be placed under kingdom Protista.
- S3.** In kingdom plantae, division thallophyta constitutes the simplest organisms.
- S4.** The purpose of classifying organisms is to organize the vast number of known plants and animals into categories that could be identified, named, remembered and studied. Identification is not possible without any system of classification. It is not possible to study every organism. Study of few organisms gives a fair idea about other members of the group. Classification helps in bringing out similarities and dissimilarities amongst organisms. They indicate the evolutionary pathways. Moreover organisms of other regions as well as fossils can be studied only with the help of a system of classification.
- S5.** (a) Kind of cells constituted by the living organism is the basic characteristic for classifying organisms. Habitat is a place where diverse types of organisms live together. If we consider habitat as the characteristic for classifying organisms it will not be appropriate. This can be explained by citing following example. Corals, whales, octopuses, fishes, star fish, sea anemone are a few examples of aquatic organisms which live in sea. But all these organisms have different characteristics.
- (b) When we consider nature of cell as the basic characteristic for classifying organisms, we categorize the life forms into two types – Prokaryotes and Eukaryotic in nature. Members of protista are unicellular while fungi, plants and animals are multicellular in nature. Cell wall is absent in animals whereas plants have cellulosic cell walls and fungi contains chitin.
- S6.** Plants and animals are placed in different categories because they differ in several characteristics. Nature of cell, body organisation, complexity of organ systems, mode of nutrition, nature of reserve food material, locomotion, growth and their ecological role are a few criteria for classifying plants and animals.
- S7.** Organisms which have ancient body designs and that have not changed very much over a long period of time are referred as primitive organisms.
- Organisms that have acquired their particular body plan recently and possess several specializations are referred as advanced organisms. They exhibit more complex structure as compared to primitive organisms.
- S8.** Yes, it will be correct to say advanced organisms as complex organisms because advancement is based on development of specializations. Specialization occurs when there is more elaboration and hence more complexity which will increase over evolutionary time. Thus, we can say that older organisms (primitive) are simple and younger organisms (advanced) are more complex.
- S9.** Cell structure is used as a criterion for placing an organism in monera or protista. Monera is a kingdom of prokaryotes in which the genetic material is not organized into a nucleus. It lies directly inside the cytoplasm and is referred as nucleoid. Monera kingdom organisms are basically unicellular and do not have membrane bound cell organelles. While all unicellular, eukaryotic organisms have been kept under kingdom Protista. They have true nucleus and membrane bound cell organelles.
- S10.** Species will have the smallest number of organisms with a maximum of characteristic in common. Kingdom will have the largest number of organisms.
- S11.** The basis for grouping organisms into five kingdoms are complexity of cell structure, complexity of body structure, mode of nutrition, reproduction, ecological role and phylogenetic relationship.

- S12.** Pteridophytes are seedless plants. Gametophytes in pteridophytes are small but independent. Reproductive organs are inconspicuous and external water is required for fertilization. On the other hand phanerogams are seed bearing plants whose gametophytes are nutritionally dependent upon the sporophyte. Reproductive organs are quite conspicuous and the process of fertilization does not require an external water.
- S13.** Both gymnosperms and angiosperms are the subdivision of seed plants which differs primarily in following ways:
- The seeds of gymnosperms are naked whereas angiosperms bear seeds inside the fruits.
 - The sporophylls in gymnosperms are aggregated to form cones. On the other hand sporophylls in angiosperms are aggregated to form flowers.
- S14.** Size, life span and colour are three examples of the range of variations that we see in life forms around us.
- Size:** It varies from microscopic organisms like bacteria to very large sized animals.
 - Life span:** Mayfly lives for one day, mosquitoes for a few days while pine trees live for hundreds of years.
 - Colour:** Jelly fish and many worms are colourless while birds, butterflies and flowers are brightly coloured.
- S15.** Classification is the arrangement of organisms into groups and subgroups on the basis of their similarities and dissimilarities and placing them in hierarchy that brings out their relationships. Following are the advantages of classifying organisms:
- Classification gives us a system for identification of known and unknown organisms. It gives an idea of whole range of diversity found in organisms. By classifying organisms we place them in groups that reflect their most significant features and relationships.
 - Organisms can be named, remembered and easily studied. Fossils as well as organisms give a fair idea about the general identifying features of the group.
 - It is not possible to study every organism. Study of a few organisms of a group can give a fair idea about the general identifying features of the group.
 - Other biological sciences like biogeography, ecology, pathology, forestry depend on the system of classifying for study of organisms.
- S16.** Characteristics which create fundamental differences amongst life forms are used for raising kingdoms, divisions and other large groups. They are generally present in large number of organisms. On the other hand the character of lesser importance which is present in smaller number of individuals is used for raising lower category. For example, complexity of the cell structure will be considered first wherein organisms would be classified into eukaryotes and prokaryotes. The complexity of body structure will now be taken into account and organisms can be classified as unicellular or multicellular. All unicellular organisms with eukaryotic cell structure have now been placed in kingdom protista.

S17.



S18. Poriferans and coelenterates differ from each other in following ways:

Porifera

1. Cellular level of organization is present in the members of phylum porifera.
2. A number of pores are present all over the body.
3. Intracellular digestion takes place.
4. Appendages are absent.
5. Body design have minimal differentiation and division into tissues.
6. Special cells called choanocytes or collar cells are present.

Examples: Sycon, Spongilla.

Coelenterata or Cnidaria

1. Tissue level of organization is present in the members of phylum coelenterata.
2. There is a single opening.
3. Intercellular as well as intracellular digestion takes place.
4. Appendages are represented by tentacles.
5. Differentiation of body is more pronounced as compared to porifers.
6. Cnidoblasts or stinging cells are specialised defensive cells from which phylum cnidaria derives its name.

Examples: Hydra, sea Anemone.

S19. Difference between annelids and arthropods:

Annelids

1. Annelids do not have chitinous exoskeleton
2. Well developed true coelom is present.
3. Parapodia are used for locomotion.
4. Appendages are unjointed.
5. Annelids have closed circulatory system *i.e.*, blood flows inside the blood vessels.
6. Excretory organs are nephridia.

Examples: Leech, Earthworm.

Arthropods

1. Arthropods have chitinous exoskeleton.
2. Blood filled body cavity called haemocoel is present.
3. Legs and wings are used for locomotion.
4. Appendages are jointed.
5. Arthropods have open circulatory system.
6. Malpighian tubules and green glands are the excretory organs.

Examples: Butterfly, Crab, Scorpion.

S20. Difference between amphibians and reptiles:

Amphibians

1. Skin is glandular and moist.
2. Scales are absent.
3. Heart is threechambered.
4. Appendages are unjoined.
5. Amphibians lay soft shelled eggs.
6. Fertilization is external.
Examples: Frog, Toad.

Reptiles

1. Skin is non-glandular, dry and keratinized.
2. Scales are present over the body.
3. Heart is three chambered in few cases and four chambered in crocodiles and turtles.
4. Appendages are joined.
5. Hard shelled eggs are laid by reptiles.
6. Fertilization is internal.
Examples: Lizards, Snakes, Tortoise.

S21. Difference between Aves and Mammalia:

Aves

1. Streamlined body is covered with feathers.
2. Skin is dry.
3. Forelimbs are modified into wings.
4. A toothless beak is present.
5. Bones are hollow or pneumatic.
6. Birds are oviparous.
7. Mammary glands are absent.

Mammalia

1. Feathers and scales are absent.
2. Skin bears number of sweat and oil glands.
3. Wings are absent except in bats.
4. Jaws do not form a beak. Teeth are present.
5. Air cavities are absent in bones.
6. Mammals are viviparous with the exception of few species.
7. Female possesses mammary glands for feeding the young ones.

S22. Animals of Vertebrata are further classified into sub-groups on the basis of following features:

- (a) Nature of heart (two, three or four chambered).
- (b) Presence of exoskeleton either in the form of scales, feathers or hair.
- (c) Ability to regulate their body temperature or not (cold-blooded or warm-blooded).
- (d) Reproduction (Egg laying or give birth to young ones).
- (e) Presence of mammary glands.
- (f) Nature of egg (Hard shelled, soft shelled or without shell).
- (g) Mode of respiration (By skin, slugs or gills).

S23. Criteria for deciding divisions in plants:

- (a) Differentiation of plant body.
- (b) Presence or absence of special tissues for transport of water and other substances within it.
- (c) Ability to bear seeds.
- (d) Whether seeds are naked or enclosed within the fruit.

Criteria for deciding the subgroups among animals:

- (a) Body plan.
- (b) Number of germinal layers in the body.
- (c) Presence of coelom.
- (d) Symmetry.
- (e) Cold-blooded or warm-blooded.
- (f) Egg laying or give birth to young ones.
- (g) Presence or absence of vertebral column or notochord.