

## CBSE NCERT Solutions for Class 11 Biology Chapter 01

### *Back of Chapter Questions*

#### 1. Why are living organisms classified?

**Solution:**

- There is a **large variety of living organisms** on earth like animals, plants, and microbes, and they all are of different shape, size, colour, habitat, and various other characteristics.
- Therefore, scientists have developed mechanisms to classify all the living organisms on specific rules and principles that would allow **identification, nomenclature, and classification of any organism**. For example, based on the presence of one pair of legs and two pairs of wings, an organism is identified as a bird, it will be given a scientific name and then grouped with other similar organisms.
- Therefore, classifying organisms, based on their similarities would make it **easier for keeping data, makes the study of organisms easy and organised**.
- Also, biological classification helps us in **revealing the relationship between various organisms**.

#### 2. Why are the classification systems changing every now and then?

**Solution:**

There are two main reasons for the change in the classification system now and then: i. **evolution**, and ii. **discovery of new species**.

- i. There are millions of animals, plants, and microorganisms living on this earth which have been identified by the scientists while several new species are still being discovered around the world. These newly discovered plant and animal

specimens are identified, classified and named according to the already existing classification systems.

- ii. Since evolution is a continuous process, many different species of plants and animals keep on changing, so necessary changes in the already existing classification systems are essential.

### 3. What different criteria would you choose to classify people that you meet often?

(This is an opinion or activity-based question, and the answer would differ with each person, hence no marking scheme)

#### **Solution:**

There are various criteria we can choose to classify people (humans):

- Sex of the person: Male, Female or Other
- Skin colour
- Height
- Mother tongue
- Age group
- Colour of eyes
- Profession, etc.

### 4. What do we learn from identification of individuals and populations?

**Solution:**

The identification of individuals and the population has taught us that there is **huge biodiversity** existing on earth.

Based on the **identification of similarities and dissimilarities among individuals or its entire population**, scientists have been able to **classify** them into primarily five different kingdoms like plant, animal, fungi, protista, monera.

Further, the most similar individuals can be categorised into the same **species**.

5. Given below is the scientific name of Mango. Identify the correctly written name.

*Mangifera Indica*

*Mangifera indica*

**Solution:**

The right scientific name of Mango is *Mangifera indica* according to the binomial nomenclature system, which states that the generic name of a species starts with a capital letter and the specific name starts with a small letter.

6. Define a taxon. Give some examples of taxa at different hierarchical levels.

**Solution:**

Each category or a unit of classification is called “taxon”. It signifies a rank. ICBN introduced the term 'taxon' in 1956. For example, the hierarchical order of classification is species, followed by genus, family, order, class, phylum (or division), and kingdom in ascending order. So, each level is called a taxon.

Example: Human Taxonomy

Kingdom:	<i>Animalia</i>
Phylum:	<i>Chordata</i>
Class:	<i>Mammalia</i>
Order:	<i>Primates</i>
Family:	<i>Hominidae</i>
Genus:	<i>Homo</i>
Species:	<i>Homo sapiens</i> <i>Linnaeus, 1758</i>

**7. Can you identify the correct sequence of taxonomical categories?**

**(a) Species → Order → Phylum → Kingdom**

**(b) Genus → Species → Order → Kingdom**

**(c) Species → Genus → Order → Phylum**

**Solution:**

The hierarchical order of classification is species, followed by genus, family, order, class, phylum (or division), and kingdom in ascending order.

Hence, both (a) and (c) options are correct.

- 8. Try to collect all the currently accepted meanings for the word ‘species’. Discuss with your teacher the meaning of species in case of higher plants and animals on one hand, and bacteria on the other hand.**

**Solution:**

Definition of ‘Species’: A group of similar organisms which share the same genetic pool and are capable of interbreeding under natural conditions to produce fertile offsprings.

In case of higher plants and animals, one genus may have one or more than one species, e.g., *Panthera leo* (lion) and *Panthera tigris* (tiger). Here, *Panthera* is genus, and *tigris* is a species.

Similarly, in bacteria also one genus may have one or more than one species., e.g., *Streptomyces anulatus* ad *Streptomyces coelicolor*. Here, *Streptomyces* is a genus and *anulatus* is a species. But, bacteria divide asexually (no interbreeding), plus constant genetic changes due to natural selection (example: antibiotic resistance bacteria); the

concept of species that works best for animals, becomes a matter of judgement in case of bacteria.

**9. Define and understand the following terms:**

**(i) Phylum (ii) Class (iii) Family (iv) Order (v) Genus**

**Solution:**

- i. Phylum: A principal taxonomic category that ranks above class and below kingdom, equivalent to the 'division' in botany. Based on the common features like presence of notochord and dorsal hollow neural system, are included in phylum Chordata.
- ii. Class: A principal taxonomic category that ranks above order and below phylum. Example, Class mammals: All animals with hairs or fur and milk-producing glands are of class Mammalia.
- iii. Family: A principal taxonomic category that ranks above genus and below order. For example, genus *Panthera* (lion, tiger, leopard) is put along with genus *Felis* (cats) in the family Felidae. But, if you observe the features of a cat and a dog, you will find some similarities and some differences as well. They are separated into two different families: Felidae and Canidae, respectively.
- iv. Order: A principal taxonomic category that ranks above family and below class. For example, families like Canidae and Felidae are under Carnivora order.
- v. Genus: A principal taxonomic category that ranks above species and below family. Closely related species are put under the same genus. Example, *Panthera leo* (lion) and *Panthera tigris* (tiger). Here, *Panthera* is genus, and *tigris* is a species.

**10. How is a key helpful in the identification and classification of an organism?****Solution:**

- Key is a **taxonomical aid** used for identification of animals and plants based on their dissimilarities and similarities.
- The keys are always in a pair and based on the contrasting characters called **couplet**.
- So, a choice has to be made between **two opposite options**. This results in the acceptance of only one and the rejection of the other.
- Each statement in the key is called a **lead**.
- **Distinct taxonomic keys for each taxonomic category** such as genus, family and species are required for the identification purposes.
- Keys are usually **analytical** in nature.

**11. Illustrate the taxonomical hierarchy with suitable examples of a plant and an animal.****Solution:**

The classification system of Linnaean consists of a hierarchy of groupings, called **taxa**, which range from species at the bottom to kingdom at the top.

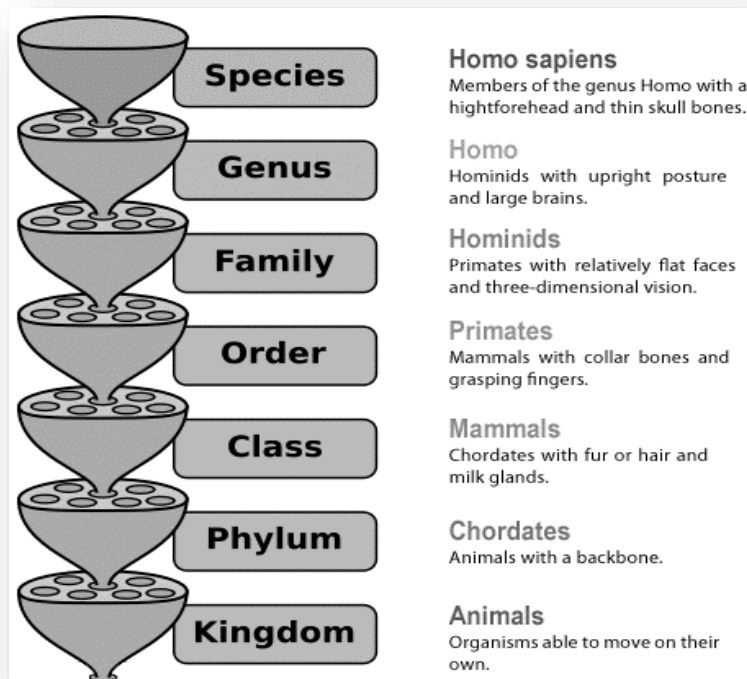


Figure: Taxonomic hierarchy in *Homo sapiens* (animal-humans)

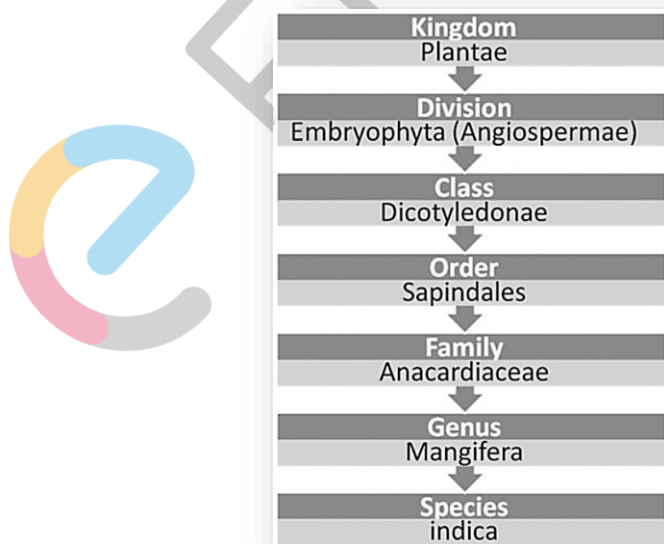


Figure: Taxonomic hierarchy in *Mangifera indica* (plant-mango tree)