

CLASS 11

BIOLOGY

NCERT SOLUTIONS

NCERT Solutions for Class 11 Biology Chapter 1: The Living World – Free PDF Download

Chapter 1, The Living World, opens Class 11 Biology by asking a deceptively simple question — what does it mean to be "alive"? It then moves into the practical side of biology: how scientists give every organism a single, universally accepted scientific name (binomial nomenclature), and how millions of species are...

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Class 11 Biology Chapter 1 – Notes and Extra Questions

Chapter 1, **The Living World**, opens Class 11 Biology by asking a deceptively simple question — what does it mean to be “alive”? It then moves into the practical side of biology: how scientists give every organism a single, universally accepted scientific name (**binomial nomenclature**), and how millions of species are organised into a logical, ascending hierarchy of **taxonomic categories** — species, genus, family, order, class, phylum/division, and kingdom. These Class 11 Biology Chapter 1 solutions are also useful as quick revision notes before exams.

Exercises

Q1. Why are living organisms classified?

The living world contains an enormous variety of organisms — current estimates place the number of described species between 1.7 and 1.8 million, with many more still undiscovered. It is impossible to study each organism individually, so biologists group organisms into convenient categories called **taxa** based on shared, easily observable characteristics. Classification makes identification, naming, and study of organisms systematic and manageable. It also reveals the similarities and evolutionary relationships that organisms share with one another, both among close relatives and across all life forms, which is central to modern **taxonomy** and **systematics**.

Q2. Why are the classification systems changing every now and then?

Classification is not fixed because our understanding of organisms keeps improving and new species keep being discovered. Early classification was based only on the habit and habitat of organisms. Later, external morphology became the basis, followed by internal structure and embryology, and then evolutionary (phylogenetic) relationships and cytological features. Today, biochemical and molecular techniques — including comparison of nucleic acid sequences — are used to classify organisms more accurately. As new characters and tools become available, existing classification schemes are revised to better reflect true relationships between organisms.

Q3. What different criteria would you choose to classify people that you meet often?

People we meet regularly can be grouped using several practical criteria, such as: relationship to us (family, friends, classmates, colleagues); age group; gender; place of residence or hometown; language spoken; occupation or field of study; and even physical features such as height or build. Just as in biological classification, we usually start with a broad, easily observable criterion (say, family versus non-family) and then refine the grouping using more specific criteria (surname, locality, or roll number, for instance) — moving from general categories to increasingly specific ones, similar to how taxonomic hierarchy narrows down from kingdom to species.

Q4. What do we learn from identification of individuals and populations?

Identification allows us to note the characteristics of an individual organism or an entire population and compare these with already known, described taxa. This comparison helps us recognise similarities and differences between the individual/population being studied and other organisms. On this basis, we can determine whether it belongs to an already known species or represents something new, and we can correctly place it within the appropriate taxonomic category. In short, identification is the essential first step that makes accurate classification and nomenclature possible.

Q5. Given below is the scientific name of Mango. Identify the correctly written name.
(a) Mangifera Indica (b) Mangifera indica

The correct name is ***Mangifera indica***. Under the rules of binomial nomenclature, the first word (the genus name, here *Mangifera*) begins with a capital letter, while the second word (the specific epithet, here *indica*) always begins with a small letter, even though the entire name is written in italics (or underlined separately when handwritten). Writing “Indica” with a capital “I” as in option (a) is incorrect.

Q6. Define a taxon. Give some examples of taxa at different hierarchical levels.

A **taxon** is any unit or rank of classification that represents a group of organisms — it is a distinct biological entity, not just a random collection of similar-looking organisms. Every taxonomic category, from species to kingdom, is a taxon. For example: **Insecta** is a taxon at the class level; **Felidae** (the cat family) is a taxon at the family level; **Panthera** is a taxon at the genus level; and **Panthera leo** (the lion) is a taxon at the species level. Similarly, “Mammalia” (class), “Chordata” (phylum), and “Animalia” (kingdom) are all taxa representing successively broader levels of the hierarchy.

Q7. Can you identify the correct sequence of taxonomical categories?

- (a) Species → Order → Phylum → Kingdom**
(b) Genus → Species → Order → Kingdom
(c) Species → Genus → Order → Phylum

Sequences **(a) and (c)** are correct. The taxonomic hierarchy runs, in ascending order, as: Species → Genus → Family → Order → Class → Phylum/Division → Kingdom. Options (a) and (c) list categories that follow this correct ascending order (even though some intermediate ranks are skipped). Option (b) is incorrect because it places Genus before Species — since Species is the lowest, most specific category and Genus is a broader category above it, “Genus, Species” reverses the correct ascending sequence.

Q8. 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.

Species is the most fundamental and basic unit of taxonomic classification. In its most widely accepted form — the biological species concept, proposed by Ernst Mayr — a species is defined as a group of actually or potentially interbreeding natural populations that are reproductively isolated from other such groups, and that can produce fertile offspring. Older, morphological definitions describe a species simply as a group of individuals with fundamental similarities that distinguish them from other, closely related groups.

In **higher plants and animals**, the biological species concept works well because these organisms reproduce sexually, so interbreeding capability and reproductive isolation from other groups are used as the key criteria to define a species. In **bacteria**, however, reproduction is largely asexual, so the interbreeding criterion cannot be applied. Bacterial species are instead defined on the basis of a shared gene pool and strong similarities in cellular, biochemical, and (in modern taxonomy) molecular/genetic characteristics.

Q9. Define and understand the following terms:

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

(i) Phylum: A category that groups together classes of organisms sharing a few broad common

characteristics. For example, classes such as fishes, amphibians, reptiles, birds, and mammals are all placed in phylum Chordata because they share features like the presence of a notochord and a dorsal hollow neural system. (In plants, the equivalent higher category is called a Division.)

(ii) Class: A category comprising related orders. For instance, order Primata (monkeys, gorillas, gibbons) and order Carnivora (tiger, cat, dog) are both placed together in class Mammalia because they share defining mammalian features.

(iii) Family: A group of related genera with fewer shared similarities than a genus, characterised using both vegetative and reproductive features. For example, genera *Panthera* (lion, tiger, leopard) and *Felis* (cats) together form the family Felidae; among plants, *Solanum*, *Petunia*, and *Datura* are placed in family Solanaceae.

(iv) Order: A category that is an assemblage of families sharing a smaller number of similar characters than the genera within a single family. For example, families Felidae and Canidae are both grouped in order Carnivora.

(v) Genus: A group of closely related species that share more characteristics with one another than with species of other genera. For instance, lion (*Panthera leo*), tiger (*Panthera tigris*), and leopard (*Panthera pardus*) all belong to the genus *Panthera*.

Q10. Illustrate the taxonomical hierarchy with suitable examples of a plant and an animal.

The taxonomic hierarchy can be illustrated using Mango as a plant example and Housefly as an animal example:

Mango (plant): Kingdom – Plantae; Division – Angiospermae; Class – Dicotyledonae; Order – Sapindales; Family – Anacardiaceae; Genus – *Mangifera*; Species – *Mangifera indica*.

Housefly (animal): Kingdom – Animalia; Phylum – Arthropoda; Class – Insecta; Order – Diptera; Family – Muscidae; Genus – *Musca*; Species – *Musca domestica*.

Notice that as we move up from species to kingdom, the number of shared characteristics among members decreases, while the number of organisms included in the group increases — this is the basic principle behind the taxonomic hierarchy.

Class 11 Biology Chapter 1 – Notes and Extra Questions

Under the current 2023 rationalised NCERT syllabus (2026–27 session), Chapter 1 “The Living World” has exactly **10 exercise questions**, covering the two retained sections — Diversity in the Living World (which includes nomenclature and binomial nomenclature rules) and Taxonomic Categories. Two portions from the older edition have been dropped entirely from this chapter: the introductory section “What is Living?” and the section “Taxonomical Aids” (which covered herbaria, botanical gardens, museums, zoological parks, and identification keys). As a direct consequence, the exercise question on identification “keys” that appeared in pre-2023 editions has also been removed, and the closing question on taxonomic hierarchy — now Q10 — was previously Q11. While these dropped topics will not be directly tested from this chapter in CBSE board exams, students preparing for competitive exams like NEET should still be familiar with them as background knowledge. For exams, focus on getting the binomial nomenclature rules exactly right

(capitalisation, italics, order of genus and specific epithet), memorising the correct ascending order of the seven major taxonomic categories, and being able to reproduce the taxonomic hierarchy table for at least one plant and one animal example, such as Mango and Housefly, or Wheat and Man.

How many questions are there in the NCERT Class 11 Biology Chapter 1 exercises, and has this changed from earlier editions?

The current rationalised NCERT textbook (2023–24 onward) has exactly **10 exercise questions** in Chapter 1. This is one fewer than the 11 questions found in pre-2023 editions — the question “How is a key helpful in the identification and classification of an organism?” was removed when the “Taxonomical Aids” section was dropped from the chapter during rationalisation.

What is binomial nomenclature, and who introduced it?

Binomial nomenclature is the universally accepted system of giving every organism a scientific name made up of two parts — the genus name followed by the specific epithet, for example *Homo sapiens* for humans. It was introduced by the Swedish botanist **Carolus Linnaeus**. Names are Latinised, written in italics (or underlined separately when handwritten), with the genus name starting with a capital letter and the specific epithet starting with a small letter. Plant names follow the International Code for Botanical Nomenclature (ICBN), while animal names follow the International Code of Zoological Nomenclature (ICZN).

What are the seven major taxonomic categories, from the lowest to the highest rank?

In ascending order, the seven major taxonomic categories are: **Species → Genus → Family → Order → Class → Phylum (or Division, for plants) → Kingdom**. Species is the most basic, most specific unit, while Kingdom is the broadest, most inclusive category. As you move up this hierarchy, the number of shared characteristics among the organisms in a group decreases, while the number of organisms it includes increases.

Why was “Taxonomical Aids” (herbarium, museum, botanical garden, zoological park, key) removed from the current syllabus, and do students still need this information?

The topic was removed as part of CBSE’s 2023 curriculum rationalisation, which aimed to reduce content load without affecting the core conceptual understanding of the chapter. Since it is no longer part of the prescribed syllabus, it will not be directly asked in CBSE board exams from this chapter. However, terms like **herbarium** (a storehouse of dried, pressed, and preserved plant specimens) and **zoological park** (a facility where wild animals are kept and studied in a protected, human-managed environment) remain useful general knowledge for students, especially those preparing for competitive exams such as NEET, where such topics can still appear.