FREE EDITION · NOTES + 3 SAMPLE MCQS

CUET · BIOLOGY · CLASS XI · CODE 304

The Living World

CUET unit: Diversity in Living World → The Living World

By **UniDrill** · NCERT-grounded study material

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📌 Snapshot

- This is the first chapter of Unit 1 (Diversity in the Living World) and leads into Biological Classification, Plant Kingdom, and Animal Kingdom. All present-day living organisms are related to each other and also to all organisms that ever lived on this earth — a statement of common descent (p. 1).
- Biology is the science of life forms and living processes. "What is living?" is a technical (not philosophical) question; biology addresses only the empirical one (p. 3). The identity-defining features of living organisms are growth, reproduction, metabolism, cellular organisation, and consciousness.
- The four basic processes of taxonomy are **characterisation, identification, classification, nomenclature**, and two parallel international codes govern biological names (ICBN for plants, ICZN for animals). Linnaeus's binomial system (genus + specific epithet, written in italics, author abbreviated and unitalicised) follows a numbered four-rule set (pp. 4–5).
- The seven-rank taxonomic hierarchy is **Species** → **Genus** → **Family** → **Order** → **Class** → **Phylum/Division** → **Kingdom**, with worked examples (Man, Housefly, Mango, Wheat) in Table 1.1 on p. 8. As one climbs the hierarchy the number of common characters falls and the difficulty of classification rises.
- Three key Latin-origin terms: **taxon** (any unit of classification at any rank), **taxa** (its plural), and **systematics** (the broader study of diversity and evolutionary relationships, named after Linnaeus's Systema Naturae). NTA examiners regularly test the systematics-vs-taxonomy distinction.
- High-yield CUET territory: terminology (taxon, taxa, species, systematics), Linnaean rules of nomenclature, the species count (1.7–1.8 million), the ascending-hierarchy sequence from Figure 1.1, and the family-level groupings from Table 1.1 (Felidae/Canidae/Solanaceae/Anacardiaceae/Hominidae/Muscidae/Poaceae).

📖 Detailed Notes

2.1 Core concepts

- Biology is the science of life forms and living processes; the living world comprises an amazing diversity of living organisms, and early man could easily perceive the

difference between inanimate matter and living organisms (NCERT Unit 1 Opening, p. 1; §1.1, p. 3).

- Early man "deified some of the inanimate matter (wind, sea, fire etc.) and some among the animals and plants" — awe and fear were the original psychological drivers of biological description; societies with an anthropocentric view of biology "registered limited progress" (NCERT Unit 1 Opening, p. 1).
- A central revelation of taxonomy, stated up front opener, is that "all present day living organisms are related to each other and also to all organisms that ever lived on this earth" — an early signpost for the evolutionary thread that runs through Class XI and XII (NCERT Unit 1 Opening, p. 1).
- The question "what is life?" contains two implicit questions: a technical one about what living means as opposed to non-living, and a philosophical one about the purpose of life; biology as a science addresses only the first (NCERT §1.1 opening, p. 3).
- The number of species presently known and described ranges between **1.7–1.8 million**; this number is referred to as **biodiversity** — "the number and types of organisms present on earth" — and continues to grow as new areas are explored and even old ones re-surveyed (NCERT §1.1, pp. 3–4).
- Each different kind of plant, animal or organism represents a **species**; local names vary from place to place, even within a country, creating confusion in scientific communication, which is why standardised naming is required (NCERT §1.1, p. 4).
- **Nomenclature** is the process of standardising names so that one organism is known by the same name worldwide; it is only possible after correct **identification** of the organism (NCERT §1.1, p. 4).
- Scientific names for plants follow the **International Code for Botanical Nomenclature (ICBN)**; for animals, the **International Code of Zoological Nomenclature (ICZN)** does the same job. These codes ensure each organism has only one name and that the name is not reused for any other known organism (NCERT §1.1, p. 4).
- **Binomial nomenclature**, given by **Carolus Linnaeus**, assigns each organism a two-component name: the **Generic name** (genus) + **specific epithet** (species). Example — Mangifera indica for mango, where Mangifera is the genus and indica is the specific epithet (NCERT §1.1, p. 4).
- Universal rules of nomenclature (NCERT §1.1, pp. 4–5): 1. Biological names are generally in **Latin** and written in italics; they are Latinised regardless of their origin. 2. The first word represents the **genus**; the second the **specific epithet**. 3. When handwritten, the two words are **separately underlined**, or printed in italics in print, to indicate Latin origin. 4. Genus starts with a **capital letter**, specific epithet with a **small letter** — illustrated by Mangifera indica.
- In addition to the four numbered rules, the **author's name** appears after the specific epithet, at the end of the biological name, in an **abbreviated form** — e.g.,

Mangifera indica Linn. — meaning the species was first described by Linnaeus (NCERT §1.1, p. 5). The author abbreviation is **not** italicised, only the binomial is.

- **Classification** is grouping anything into convenient categories based on easily observable characters. Examples — Dogs, Cats, Mammals, Wheat, Rice, Plants, Animals — are called **taxa** (sing. taxon). Taxa can sit at very different levels: 'Plants' is a taxon, 'Wheat' is a taxon, 'Mammals' is a taxon; 'animals', 'mammals' and 'dogs' represent taxa at different levels (NCERT §1.1, p. 5).
- **Taxonomy** is the process by which all living organisms are classified into different taxa, based on (a) external and internal structure, (b) structure of cell, (c) development process, and (d) ecological information (NCERT §1.1, p. 5).
- The four processes basic to taxonomy: **characterisation, identification, classification, nomenclature** (NCERT §1.1, p. 5).
- The earliest classifications were based on the **'uses'** of various organisms — food, clothing and shelter; only later did taxonomic study expand to non-utilitarian dimensions like relationships (NCERT §1.1, p. 5).
- **Systematics** is the study of kinds, diversities and relationships among organisms. The word derives from the Latin systema, meaning "systematic arrangement of organisms"; Linnaeus used Systema Naturae as the title of his publication. The scope of systematics was later enlarged to include identification, nomenclature and classification, and crucially it "takes into account **evolutionary relationships** between organisms" (NCERT §1.1, pp. 5–6).
- **Taxonomic categories** form a hierarchy in which each step represents a rank; the rank itself is called a **taxon** (pl. taxa). Each taxon is a "distinct biological entity and not merely a morphological aggregate" — a phrase NCERT repeats to insist that taxa are real, not arbitrary (NCERT §1.2, p. 6).
- The common categories developed through taxonomic study are **Kingdom, Phylum or Division (for plants), Class, Order, Family, Genus, Species** — with species as the lowest category for all organisms (NCERT §1.2, p. 6). Sub-categories also exist to give finer placement.
- **Species** = a group of individual organisms with fundamental similarities, distinguishable from closely related species by distinct morphological differences. NCERT examples: Mangifera indica, Solanum tuberosum (potato), Panthera leo (lion). Each genus may have one or more specific epithets: Panthera has tigris in addition to leo; Solanum includes nigrum and melongena. Humans belong to species sapiens in genus Homo — hence Homo sapiens (NCERT §1.2.1, pp. 6–7).
- **Genus** = an aggregate of closely related species sharing more characters in common than with species of other genera. Potato and brinjal are different species both in genus Solanum; lion (Panthera leo), leopard (P. pardus) and tiger (P. tigris) are all in genus Panthera, which differs from genus Felis (cats) (NCERT §1.2.2, p. 7).
- **Family** = a group of related genera with still fewer similarities. Plant families are characterised on the basis of both vegetative and reproductive features. Solanum,

Petunia and Datura sit in family **Solanaceae**; Panthera and Felis both belong to **Felidae**; dogs are separated into **Canidae** (NCERT §1.2.3, p. 7).

- **Order** = assemblage of families with a few similar characters. Higher categories like order are identified on the basis of aggregates of characters rather than single traits. Plant families Convolvulaceae and Solanaceae are placed in order **Polymoniales** based on floral characters; the animal order **Carnivora** includes Felidae and Canidae (NCERT §1.2.4, p. 7).
- **Class** = related orders. Order **Primata** (monkey, gorilla, gibbon) and order **Carnivora** (tiger, cat, dog) both belong to class **Mammalia**, which contains other orders too (NCERT §1.2.5, p. 7).
- **Phylum** = related classes. Classes of fishes, amphibians, reptiles, birds and mammals — all sharing **notochord** and **dorsal hollow neural system** — form phylum **Chordata**. In plants, the equivalent rank is called **Division** (NCERT §1.2.6, pp. 7–8).
- **Kingdom** = highest category. Kingdom **Animalia** holds all animal phyla; Kingdom **Plantae** holds all plant divisions (NCERT §1.2.7, p. 8).
- Direction-of-hierarchy rule: as one moves from species → kingdom, the **number of common characteristics decreases**; lower taxa share more characteristics, and at higher categories the difficulty of determining the relationship to other taxa at the same level rises and classification becomes more complex (NCERT §1.2.7, p. 8).
- Worked taxonomic placements (Table 1.1, p. 8): **Man** — Homo sapiens / Homo / Hominidae / Primata / Mammalia / Chordata; **Housefly** — Musca domestica / Musca / Muscidae / Diptera / Insecta / Arthropoda; **Mango** — Mangifera indica / Mangifera / Anacardiaceae / Sapindales / Dicotyledonae / Angiospermae; **Wheat** — Triticum aestivum / Triticum / Poaceae / Poales / Monocotyledonae / Angiospermae.
- Utility of taxonomy: it is useful "in agriculture, forestry, industry and in general for knowing our bio-resources and their diversity" (NCERT Summary, p. 9) — the answer to "why classify?".

2.2 Definitions to memorise

Term	Definition	Page
Biology	The science of life forms and living processes.	3
Biodiversity	The number and types of organisms present on earth; presently 1.7–1.8 million species are known and described.	3–4
Species (NCERT working sense)	Group of individual organisms with fundamental similarities, distinguished from closely related species by distinct morphological differences.	6
Nomenclature		4

Term	Definition	Page
	The process of standardising the naming of living organisms such that an organism is known by the same name all over the world.	
Identification	Correctly describing an organism so that the correct name can be attached to it; the precondition for nomenclature.	4
ICBN	International Code for Botanical Nomenclature — agreed principles and criteria for naming plants.	4
ICZN	International Code of Zoological Nomenclature — agreed principles for naming animals.	4
Binomial nomenclature	Two-word naming system (Generic name + specific epithet) given by Carolus Linnaeus.	4
Generic name	The first word of the binomial; denotes the genus; starts with a capital letter; italicised.	4–5
Specific epithet	The second word of the binomial; denotes the species; starts with a small letter; italicised.	4–5
Author citation	The name of a species, written in an abbreviated, non-italicised form after the specific epithet (e.g., Mangifera indica Linn.).	5
Classification	Process by which anything is grouped into convenient categories based on easily observable characters.	5
Taxon (pl. taxa)	A taxonomic group/category at any rank — a distinct biological entity, not merely a morphological aggregate.	5, 6
Taxonomy	The process of classifying organisms into taxa based on external/internal structure, cell structure, development and ecology.	5
Four basic processes of taxonomy	Characterisation, identification, classification, nomenclature.	5
Systematics	Branch of study dealing with kinds, diversities and evolutionary relationships among organisms; from Latin systema.	5–6
Systema Naturae	Title of Linnaeus's publication; the source of the term systematics.	6
Taxonomic hierarchy	Set of all taxonomic categories arranged in ranked order.	6
Genus	Group of related species with more common characters than with species of other genera.	7
Family	Group of related genera; in plants based on vegetative + reproductive features.	7
Order	Assemblage of related families exhibiting a few similar characters.	7

Term	Definition	Page
Class	Group of related orders.	7
Phylum	Group of related classes (animals); diagnostic shared traits for Chordata are notochord and dorsal hollow neural system.	7–8
Division	The plant-kingdom equivalent of phylum.	8
Kingdom	Highest taxonomic category; Animalia for animals, Plantae for plants.	8

2.3 Diagrams / processes to remember

Figure 1.1 (p. 8) — taxonomic categories in ascending order. This is the most-tested diagram. It shows seven ranks stacked from base to apex: Species → Genus → Family → Order → Class → Phylum or Division → Kingdom. Memorise the direction — species sits at the bottom, kingdom at the top, and the arrow runs upward. CUET frequently flips the order in distractors (kingdom-down, or swapping genus and species). The diagram also encodes the central rule of §1.2.7: the higher you climb the figure, the fewer common characters the members of a taxon share. As we go higher from species to kingdom, the number of common characteristics goes on decreasing — questions that tie Figure 1.1 to "characteristics decrease" ask for direct recall.

Table 1.1 (p. 8) — taxonomic placements for Man, Housefly, Mango and Wheat. Worth memorising line-by-line because almost every CUET cycle pulls a match-the-following from it.

- **Man:** Homo sapiens → Homo → Hominidae → Primata → Mammalia → Chordata. (Animal — uses Phylum.)
- **Housefly:** Musca domestica → Musca → Muscidae → Diptera → Insecta → Arthropoda. (Note: Diptera, not Hemiptera; Insecta, not Insectivora.)
- **Mango:** Mangifera indica → Mangifera → Anacardiaceae → Sapindales → **Dicotyledonae** → **Angiospermae**. (Plant — uses Division/Class names, not Phylum.)
- **Wheat:** Triticum aestivum → Triticum → Poaceae → Poales → **Monocotyledonae** → **Angiospermae**.

Note the asymmetry — the same two columns ("Class" and "Phylum/Division") carry **Mammalia/Chordata** for animals but **Dicotyledonae/Angiospermae** or **Monocotyledonae/Angiospermae** for plants. NTA often slots the wrong organism into the wrong row.

Linnaean nomenclature in action (pp. 4–5). Mangifera indica Linn. is a single worked example of every rule at once: (i) italicised whole binomial, (ii) genus capitalised, (iii) species lowercase even though "indica" is geographic, (iv) author name "Linn." appended unitalicised and abbreviated. When asked to identify which version is correctly written (Exercise Q5, p. 9), the right answer is Mangifera indica — the form Mangifera Indica, with a capital I, breaks Rule 4.

Process flow: taxonomic study. The chain of operations is (p. 5): observe the organism's external and internal structure, cell structure, developmental process and ecology → characterise it → identify it → classify it into a taxon → assign a name via the appropriate code (ICBN or ICZN). CUET sometimes asks for the correct sequence of this four-step pipeline.

Process flow: hierarchical placement. Working downward from kingdom (Figure 1.1), each lower taxon is reached by isolating the additional shared characters that distinguish a sub-group. Working upward, members of a taxon at each successive level share progressively fewer characters, but the inclusiveness of the group grows.

2.4 Common confusions / NTA trap points

- **Phylum vs Division.** Phylum is used for animals (Chordata, Arthropoda); Division is the corresponding rank for plants. NTA likes to swap these in distractors — particularly placing Mango under "Phylum Angiospermae" instead of "Division Angiospermae".
- **Genus vs species capitalisation.** Genus is capitalised, specific epithet is lowercase — **even if** the species is named after a person or place. Mangifera Indica (capital I) is wrong; Mangifera indica is right (see Exercise Q5, p. 9). The author abbreviation (Linn.) is also capitalised, but it is not italicised.
- **Italicisation in print vs underlining in handwriting.** Rule 3 of §1.1 (p. 4) says the binomial is separately underlined when handwritten, or in italics in print. A single continuous underline under the entire two-word name is technically wrong by NCERT's exact wording.
- **Systematics vs taxonomy.** Both deal with classification, but **systematics** additionally incorporates **evolutionary relationships**; taxonomy is the broader operational process of characterisation, identification, classification and nomenclature. NTA framings like "the branch that incorporates evolutionary relationships" should map to systematics, not taxonomy.
- **Author citation placement.** The author's name (e.g., Linn.) is written **after** the specific epithet, in **abbreviated** form, and **not italicised**. Choices that italicise the author name or place it before the binomial are wrong.
- **Hierarchical sequence direction.** Of the three sequences in Exercise Q7 (p. 9), only (a) Species → Order → Phylum → Kingdom respects ascending rank without skipping or inverting; (b) places Genus before Species — a classic NTA trap; (c) ends at Phylum, leaving Kingdom out.
- **Number of species known.** 1.7–1.8 million — not 1.5 million, not 2 million, not "over 5 million". CUET commonly slips a close-looking number into distractor sets.
- **Taxon vs taxonomic category vs rank.** All three refer to essentially the same thing in NCERT's usage (§1.2, p. 6): a unit of classification at a defined level. A taxon at the level of "mammals" is a taxonomic category, and that level is its rank.

- **'Uses' as the earliest basis of classification.** Early classifications were based on the uses of organisms (food, clothing, shelter) — not on evolutionary relationships, which came later (§1.1, p. 5). Distractors sometimes flip this chronology.
- **Plant Family characterisation.** Plant families are characterised on the basis of both vegetative and reproductive features (§1.2.3, p. 7) — not reproductive features alone, which is a common distractor wording.
- **Felidae includes both Panthera and Felis.** Cats (Felis) and big cats (Panthera) sit in the same family (Felidae); they differ at the genus level. A common NTA trap separates them at the family level.
- **Phylum Chordata's diagnostic features.** Notochord and dorsal hollow neural system — both are mentioned together in §1.2.6 (pp. 7–8). Options listing only one of the two are partially correct but typically marked wrong against an option listing both.

🎯 Practice MCQs

Q1. Who proposed the binomial system of nomenclature that is being practised by biologists all over the world?

A. Ernst Mayr

B. R. H. Whittaker

C. Carolus Linnaeus

D. Charles Darwin

Q2. The number of species presently known and described, according to the NCERT, ranges between:

A. 1.0 – 1.2 million

B. 1.5 – 1.7 million

C. 1.7 – 1.8 million

D. 2.0 – 2.5 million

Q3. Which of the following statements about the rules of binomial nomenclature is INCORRECT?

A. Biological names are generally in Latin and written in italics.

B. The first word denoting the genus starts with a capital letter while the specific epithet starts with a small letter.

C. When handwritten, the two words of a biological name are written together with a single underline.

D. The name appears after the specific epithet in an abbreviated form.

📊 PYQ Alignment

The Living World is a low-hanging chapter that recurs every CUET cycle — typically delivering 6–8 MCQs across Biology and General Test papers combined. Past papers (2023–25) have leaned heavily on direct-recall items from binomial nomenclature rules (capitalisation, italicisation, author citation), the species count (1.7–1.8 million), definitions of taxon/taxonomy/systematics, and the ascending hierarchy from Figure 1.1; statement-based and assertion-reason items frequently target the "characters decrease as we move up the hierarchy" principle and the Phylum-vs-Division distinction. Match-the-following items on Table 1.1 (Man / Housefly / Mango / Wheat) and family-level pairings (Felidae, Canidae, Solanaceae, Anacardiaceae) are also reliable. See `/pyq/biology` for the full PYQ archive.

The Living World appeared in CUET (UG) Biology across 2 cycle(s) — 6 question(s) total. The questions below were extracted from official CUET (UG) papers and matched to this chapter by topic. See `/pyq/biology` for the full PYQ archive.

CUET 2024 — Actual PYQs from this chapter

Q.34 (CUET 2024) Match interspecies relationships with features. Commensalism, Mutualism, Amensalism, Parasitism.

- A)
- B)
- C)
- D)

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key

Q.36 (CUET 2024) Two species coexist by violating competitive exclusion principle through:

- A) Eliminating inferior species
- B) Resource partitioning
- C) Symbiosis
- D) Changing grazing area

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key

Q.47 (CUET 2024) Red Data Book contains information about:

- A) Endangered species
- B) Extinct species
- C) Both endangered and extinct species
- D) Medicinal plants

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key

Q.49 (CUET 2024) Which of the following is ex-situ conservation?

- A) National park
- B) Wildlife sanctuary
- C) Botanical garden
- D) Biosphere reserve

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key

CUET 2025 — Actual PYQs from this chapter

Q.41 (CUET 2025) Which of the following is not included in in-situ conservation?

- A) Zoological park
- B) National park
- C) Wildlife sanctuary
- D) Biosphere reserves

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key

Q.44 (CUET 2025) How many episodes of mass extinction of species have occurred since the origin and diversification of life on Earth?

- A) Two
- B) Three

- C) Five
- D) Seven

Tests: aligns with chapter content Answer: Not in extracted key — verify against official NTA key