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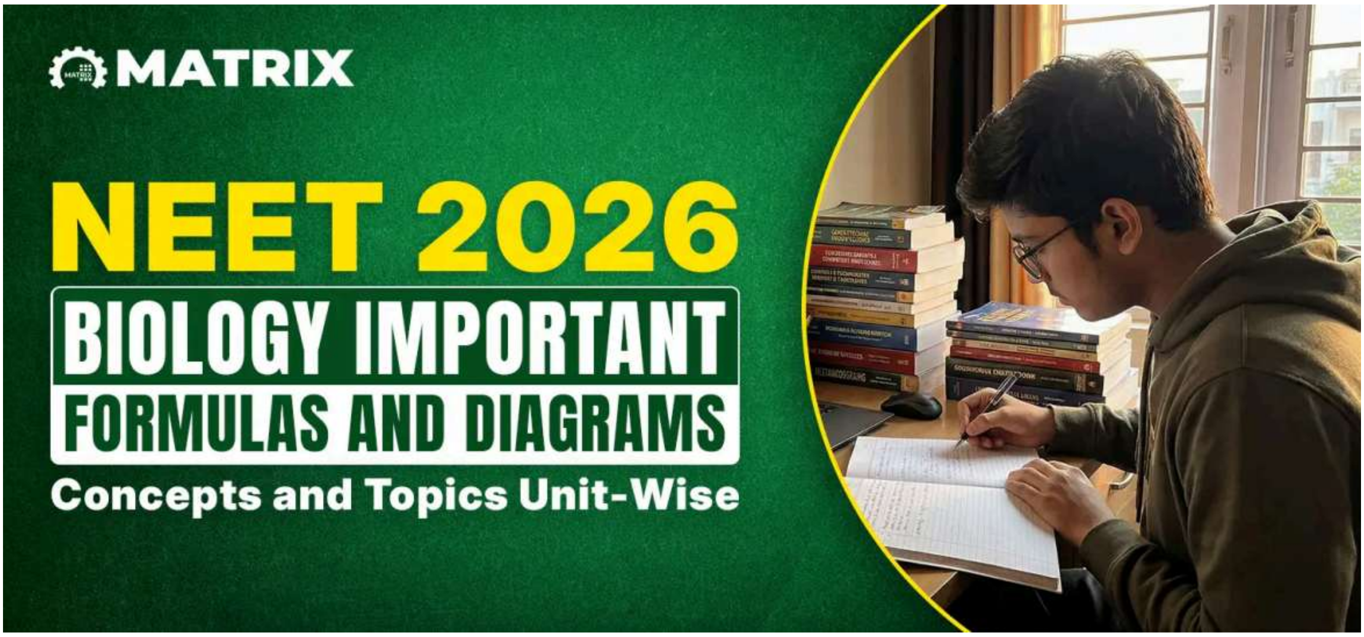

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Matrix NEET Division | NEET & Medical | NEET UG

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NEET 2026 Biology Important Formulas and Diagrams: Concepts and Topics Unit-Wise

Biology is the backbone of the NEET exam, but its preparation is different from subjects like Physics and Ch... istry and Physics are formula-oriented subjects, Biology is a memory-intensive su... s, processes, concepts, terminology, and formulas to help identify the interactions of various living systems.

NEET biology cannot be studied solely through the simple memorisation of core textbooks; it requires an understanding of core concepts, visual representation of diagrams, and regular practice of important formulas. For this, we prepared a blog by taking informative inputs from Matrix Academy NEET experts, clearly highlighting important concepts, formulas, topics, and diagrams of Biology by suggesting preparation tips to score well in the upcoming 2026 exam.

Important Biology Formulas, Diagrams, Concepts, and Topics for NEET 2026 Exam (Unit-Wise)

NEET Biology is a theory and practical knowledge subject, which can be effectively studied by considering diagrams, conceptual understanding, and high-weightage areas to score well in this exam. NEET Biology is divided into the Botany and Zoology sections as follows-

- **Botany:** The Botany in NEET Biology offers a complete and detailed study of plant life (physiology, ecology, structure, and genetics). In the final NEET exam, 45 questions are from the Botany section, which is equal to 180 marks.
- **Zoology:** The Zoology section of Biology is related to the detailed study of animal life, with important topics like anatomy, diversity, human physiology, and evolution. The Zoology section also has 45 questions equal to the Botany section, which is of 180 total marks.

The NEET Biology section consists of a total of 10 units, where each unit has its own strategic topics to focus on. Matrix analysed key focus area for each unit as follows-

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Unit 1: Diversity in Living World

Diversity in Living World is a core Biology chapter, which clearly explains the concepts associated with life, such as reproduction, growth, and metabolism. The unit briefly introduces the nomenclature, classification, and diversity of living organisms with a special focus on the identification of organisms based on characteristic features. Matrix Academy NEET experts find that this unit is diagram and flowchart-oriented, so one of the most effective tricks to practice this unit is through visual learning and comparison tables by regularly practising it. Matrix suggested key consideration factors for this unit are as follows-

Unit 1: Diversity in Living World Important Diagrams:

1. Five-kingdom classification flowchart
2. Characteristics of Monera, Protista, Fungi, Plantae, and Animalia, and taxonomic hierarchy charts
3. Diagram related to plant families like Fabaceae, Solanaceae, and Liliaceae
4. Floral diagrams

5. Learning Labelled Diagrams.
6. Flowcharts showing Monera, Protista, Fungi, Plantae, and Animalia distinctions

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Unit 1: The Living World Important Topics:

1. **The Living World:** Life characterisation, Metabolism, Reproduction, Cellular organisation
2. **Taxonomy & Systematics:** Naming, Classification, Herbarium, and Science of Identification.
3. **Classification of 5 Kingdoms:** Monera, Protista, Fungi, Plantae, Animalia, their examples and features.

Matrix Academy believes that practising these diagrams is necessary to score well in the final exam, because they create a system for students to cover one clean and organised labelled diagram from a separate section in their notes. The Matrix-designed effective Biology note preparation approach aligns with practising important diagrams and flowcharts by using the digital platform MATLAB to create video notes based on recreating key diagrams for conceptual clarity, thereby solving 60-70% of NEET questions.

Unit 2: Structural Organisation in Animals and Plants (Concept-Oriented)

The second unit of the NEET Biology syllabus focuses on the mechanisms of organs and tissues that perform various functions, where understanding this unit with conceptual clarity is crucial for a deeper understanding of its topics. The Matrix NEET faculty, Abhishek Sir identify all the important concepts and diagrams from this unit as follows-

Unit 2- Structural Organisation in Animals and Plants Key Topics:	**Unit 2- Structural Organisation in Animals and Plants Key Diagrams:**
Plant tissues (meristematic and permanent) animal tissues (epithelial, connective, muscular, nervous) anatomical structures like dicot and monocot stems, roots, and leaves. From these units, approximately 3-4 questions appear in the final exam every year.	Transverse sections of stems, roots, Vertebrates (digestive, nervous, nephron, and neuron), plant tissues & anatomy, animal tissues (connective tissues, muscle, and neural), and the human heart.

Matrix recommends its students to practice the core diagrams and concepts of this unit by practising diagram-oriented questions and evaluating structure-function relationships frequently asked in the NEET exam every year. Students are encouraged to actively participate in time-based micro tests to improve overall accuracy and speed for the difficult topics.

UNIT 3: Cell Structure and Function (Formula and Concept-Oriented)

The unit offers important information regarding the concept of a living organism in relation to modern Biology. This is one of the important units that consists of formulas apart from the conceptual understanding. The key formulas and ratios of this unit to consider for the 2026 exam are as follows-

1. Mitotic Index: (Number of cells in mitosis / Total number of cells) × 100%

2. Enzyme Kinetics: $v = (V_{max} \times [S]) / (K_m + [S])$

3. Genotypic Ratio: 1:2:1

4. Phenotypic Ratio: 3:1

5. Dihybrid Cross F_2 phenotypic Ratio: 9:3:3:1

6. Hardy-Weinberg equilibrium:

$$p^2 + 2pq + q^2 = 1$$

7. Surface Area to Volume Ratio:

$$\frac{\text{Surface Area}}{\text{Volume}}$$

The unit also has various important concepts for the NEET 2026 exams, fluid mosaic model, cell organelle functions, Prokaryotic vs. Eukaryotic Cells, Cell Membrane, Chloroplasts, Golgi Apparatus, and the cell cycle. The unit also includes important ratios and facts of Prokaryotic and Eukaryotic Cells to solve, which are as follows-

Important Concept to Consider	Prokaryotic Cells	Eukaryotic Cells
Cell Size	3 to 5 µm long (bacteria)	Ranges between 0.1–30 µm
Smallest Cell	Mycoplasmas (0.3 µm in length)	10-100 µm
Ribosomes	70S	80S
DNA Structure	Circular based Single loop	Double Helix
Flagella Structure	9+2 structure with rotating movement	9+2 structure with fixed movement

Some of the most important diagrams of this unit are mitochondria, chloroplasts, the nucleus, plasma membrane, ribosomes, and the phases of mitosis and meiosis. Matrix suggests that to cover this unit in an organised manner, you should align diagrams with functions and revise formulas regularly to eliminate scope for calculation-based errors.

UNIT 4: Plant Physiology (Diagrams, Flowcharts, and Formulas)

Unit 4 is a core unit of the plant section that evaluates the life process of a plant. This unit can be effectively learned by strengthening numeric and conceptual skills, where you can improve this unit with the help of regularly practising equations and flowcharts.

The key topics of this unit for the 2026 exam are water potential, imbibition, root pressure, photosynthesis, transpiration, respiration, mineral nutrition, plant growth curves & phases, and plant hormones. This unit also has some important diagrams to practice, highly important for the 2026 exam, like the Calvin cycle,

transpiration pull, nitrogen cycle, Xylem and Phloem structure, mineral nutrition, chloroplast structure, pathways diagrams (C3/C4/CAM), and many more.

The important diagrams of this unit can be practised by understanding the step-by-step process by using flowcharts rather than memorising general or regular facts. Some of the questions in this unit are chemical reaction and equation-based, so it is important to practice their formulas regularly. Some of the important formulas to practice regularly are as follows-

1. Photosynthesis (total equation):

$$6\mathrm{CO_2} + 12\mathrm{H_2O} \xrightarrow{\text{Light}} \mathrm{C_6H_{12}O_6} + 6\mathrm{O_2} + 6\mathrm{H_2O}$$

2. Aerobic Respiration (Overall Equation):

$$\mathrm{C_6H_{12}O_6} = +6\mathrm{O_2} \rightarrow 6\mathrm{CO_2} + 6\mathrm{H_2O} + \text{Energy (ATP)}$$

3. Anaerobic Respiration (Fermentation in plants):

$$textC_6\mathrm{H_{12}O_6} \rightarrow 2\mathrm{C_2H_5OH} + 2\mathrm{CO_2} + \text{Energy (2 ATP)}$$

The practice formulas related to growth and rate measurement are as follows-

4. Arithmetic Growth:

$$L_t = L_0 + rt$$

5. Respiratory Quotient:

$$RQ = \frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$$

6. Relative Growth Rate:

$$RQ = \frac{\text{Volume of CO}_2 \text{ evolved}}{\text{Volume of O}_2 \text{ consumed}}$$

7. Water Potential:

$$\Psi = \Psi_s + \Psi_p$$

To ensure a complete study of these diagrams and topics, Matrix Academy uses a concept-to-practice study methodology by teaching with the help of visual diagrams to learn the reasoning exist behind the biological processes of each formula.

UNIT 5: Human Physiology (Formula-Oriented)

In NEET Biology, human physiology is a high-weightage unit with approximately 13-15 questions every year in the exam. The unit provides complete information regarding the human body system. From this unit, formulas and diagrams are frequently asked, where some of the high-weightage important formulas are as follows-

1. Cardiac Output (CO2):

$$\text{Heart Rate (HR)} \times \text{Stroke Volume (SV)}$$

2. Blood Pressure:

$$\text{Heart Rate (HR)} \times \text{Stroke Volume (SV)}$$

3. Oxygen dissociation curve interpretation:

$$Y = \frac{pO_2^n}{pO_2^n + P_{50}^n}$$

4. Glomerular Filtration Rate:

$$RQ = \frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$$

5. Stroke Volume:

$$\text{End Diastolic Volume (EDV)} - \text{End Systolic Volume (ESV)}$$

6. Pulse Pressure:

$$\text{Systolic Pressure (SP)} - \text{Diastolic Pressure (DP)}$$

7. Mean Arterial Pressure:

$$\text{MAP} = \text{DP} + \frac{\text{PP}}{3}$$

Important volumes of various elements to consider-

- **Inspiratory Reserve Volume:** 2500-3000 ml
- **Expiratory Reserve Volume:** 1000-1100 ml
- **Residual Volume:** 1100-1200 ml
- **Tidal Volume:** 500 ml
- **Vital Capacity:** 4000-5000 ml
- **Total Lung Capacity:** 5200-5800 ml

Human Physiology is a unit with various direct or indirect concepts related to the functional mechanism of the human body, mainly based on the 11th and 12th class NCERT syllabus. The high-weightage important concepts in this unit are respiration, circulation, excretion, locomotion and movement, neural control, breathing mechanism, and the endocrine system. There are also some questions in this unit related to the human body to consider very important, so the matrix below lists all the key formulas to consider for the upcoming 2026 exam as follows-

NEET Biology Unit 5: Plant Physiology Important Diagrams
1. Heart diagram
2. Nephron and Brain diagram
3. Circulatory system diagrams (blood flow and structure of the heart)
4. Diagram of Endocrine Glands
5. Respiratory system (lungs and alveoli)
6. Excretory system (nephron and kidney)
7. Human eye
8. Digestive system (digestive glands and alimentary canal)

Matrix Academy arranges separate practice classes to improve these areas of the Human Physiology unit by suggesting that solving assertion-reason questions from strengthens conceptual application. One of the most effective sources to practice PYQs and MCQs is from Matrix NEET Biology Books, which is a collection of 1700+ PYQs & 3500+ MCQs. These practice books are directly aligned with the NCERT question pattern by offering important topics with visual learning and dedicated diagram practice.

UNIT 6: Reproduction (Diagrams and Physiological Processes)

The unit covers various diagrams and concept-based physiological processes related to the reproductive system of humans and plants. It is important to study this unit with extensive clarity regarding sequences and diagrams of the important topics. Matrix NEET division faculty Abhishek Sir identified that the unit has approximately 40-50 diagrams and figures, where some of the most important diagrams and concepts are as follows-

Unit 6: Reproduction Important Diagrams for NEET 2026 Exam:	Unit 6: Reproduction Important Concepts (Physiological Processes) for NEET 2026 Exam:
1. Human Gametogenesis	1. Hormonal regulation
2. Menstrual cycle	2. Fertilisation
3. Male & female reproductive system	3. Reproductive health
4. Embryo development	4. Asexual vs. Sexual Reproduction
5. Microsporogenesis & Megasporogenesis	5. Various stages of human reproduction (Implantation, fertilisation, parturition, gametogenesis, and embryogenesis)
6. Flower structure	
7. Oogenesis	
8. Contraceptive devices	6. Parturition & Lactation

Unit 6: Reproduction Important Diagrams for NEET 2026 Exam:	Unit 6: Reproduction Important Concepts (Physiological Processes) for NEET 2026 Exam:
9. [illegible] 10. Endosperm & Embryo Development	

Matrix focuses on the regular practice of important concepts and diagrams by breaking the complex structure of diagrams into primary and secondary sections. You should practice these diagrams to actively recall them for the final exam, based on their weightage and complexity. NEET aspirants can also practice diagram-based MCQs and revise NCERT examples to score well in the final exam.

UNIT 7: Genetics and Evolution (Formula-Oriented)

This unit is practical-oriented, where scoring is slightly challenging in this unit because of questions related to numerical formulas. Practising this chapter can be improved with the implementation of a problem-solving approach. The unit contains some concept-based formulas and ratios to practice for the upcoming exam as follows-

Mendelian ratios (phenotypic): 3:1 (3 dominant phenotype: 1 recessive phenotype)

Mendelian ratios (genotypic): 1:2:1 (1 homozygous: 2 heterozygous: 1 homozygous recessive)

Hardy-Weinberg (allele):

$$p + q = 1$$

Hardy-Weinberg (genotype):

$$RQ = \frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$$

Probability rules:

$$P(A) = \frac{\text{Number of favorable outcomes}}{\text{Total number of possible outcomes}}, \qquad 0 \leq P(A) \leq 1$$

Recombination Frequency:

$$\text{Recombination Frequency (RF)} = \frac{\text{Number of recombinant offspring}}{\text{Total number of offspring}} \times 100\%$$

Apart from the formulas, the unit also includes a wide range of concepts like gene interaction, chromosomal aberrations, eukaryotic mechanisms, genetic mapping, molecular genetics, and evolutionary theories. According to Matrix Academy, the practice of these formulas should be based on making separate formula notes, extensive practice, and daily revision by using the NCERT core books and Matrix-designed supplementary books.

In this unit, approximately 60-70% questions are diagram-based, so you can practice by drawing clean and labelled diagrams from the NCERT books. Matrix-identified important diagrams for the 2026 exam are DNA replication, chromosome structure, Mendelian genetics, transcription, translation, molecular genetics (replication, structure of DNA, transcription, translation), and pedigree charts.

Unit 8: Biology and Human Welfare (Diagrams and Concepts)

Unit 8 is a fundamental Biology chapter, which effectively analyses the application of different types of biological principles to improve human life. The unit is divided into two major sections: human health & diseases, and microbes in human welfare. Some of the important concepts of this unit are disease-causing agents, immunity, human welfare microbes, vaccines and types, antibiotics, and HIV/cancer basics.

Matrix suggests practising these concepts effectively by discussing complex topics with friends/teachers to improve your overall understanding of the difficult topics. After the discussion, it is important to discuss and work regularly on the areas in which you are facing challenges.

The diagram-based questions from this unit continuously appear from the NCERT, where some of the important diagrams are the immune system components, biogas plant, vaccines, sewage treatment plant, pathogen life cycle, lymphoid tissues, and fermentation processes. These diagrams are important due to their high-level scoring potential, so you should learn them with real-life correlations and NCERT tables to retain information effectively and answer application-based questions accurately.

Unit 9: Biotechnology and Its Applications (Concept-Oriented)

This is a major unit in the NEET Biology syllabus, divided into 2 core areas-

- **Biotechnology- Principles and Processes:** The section covers concepts and techniques related to modern biotechnology.
- **Biotechnology and Its Applications:** The section focuses on the practical use of biotechnology principles in various areas.

Students should focus on understanding the procedure of the sequence of steps rather than memorising definitions. Revising NCERT diagrams by taking practical examples from Matrix-designed books is crucial for understanding topics in an organised manner. The important concepts and diagrams of this unit to practice are as follows-

Unit 9: Biotechnology and Its Applications Important Concepts:	**Unit 9: Biotechnology and Its Applications Important Diagrams:**
1. DNA technology 2. PCR 3. Cloning vectors 4. Gene therapy 5. GM crops 6. Fermentation	Diagrams of plasmids Restriction enzymes Cloning steps Golden rice Flavr Savr Tomato

7. Bioproducts production	Polymerase chain reaction
8. Sterile conditions	Nematode Resistance

Matrix-designed NEET mock tests also work as an effective tool to improve speed and identify weak areas of this unit.

Unit 10: Ecology and Environment (Formula, Application, and Concept-Oriented)

Ecology and environment are the final unit of the NEET Biology syllabus, which offers a deep analysis of how organisms interact with each other and their surroundings. This is a concept and application-oriented unit, so it is crucial to study all the important formulas and concepts line by line with prioritisation. The core and important formulas of this unit are as follows-

Population Density:

$$D = \frac{\text{Total number of individuals}}{\text{Number of units of space}}$$

Exponential Growth Model for J-shaped curve:

$$\frac{dN}{dt} = rN$$

Population size at time:

$$N_t = N_0 e^{rt}$$

Ecological efficiency:

$$(n-1) \times 100\%$$

Biomass pyramids: Number of organisms in the area * Average mass of a single organism

Some of the important concepts and diagrams to consider for the 2026 exam from this unit are as follows-

Unit 10: Ecology and Environment Important Concepts	**Unit 10: Ecology and Environment Important Diagrams**
1. Ecosystems (flow of energy, ecological succession, and structure & function)	Food chains
2. Biodiversity	Food webs
3. Conservation	Ecological pyramids
4. Environmental issues (ozone depletion, pollution, resource depletion, climate change & global warming)	Age and Ecological Pyramids
5. Organisms & Populations	Organismic response graphs
	Nutrient cycles