CBSE NCERT · Class 12 · Biology

Biology

ORIGINAL STUDY COMPANION
PADIKAM
CLASS 12 | SCIENCE
Biology
CBSE / NCERT core lessons | Academic year 2026-27
14 chapter lessons
Quick explanations, core points, exam practice and chapter-specific notation in one consistent format.
Padikam explanations are independently written. Official textbooks are used as the coverage map, chapter sequence and terminology reference.

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Study rhythm
Read the quick explanation, recall the core points aloud, then answer the prompts without looking back. Use the official textbook links for full prescribed readings, activities and diagrams.
Textbook and verification links
1. https://cbseacademic.nic.in/web_material/CurriculumMain27/SecPart2/Biology_SecP2_2026-27.pdf
2. https://ncert.nic.in/textbook.php
3. https://ncert.nic.in/textbook.php?lebo1=0-13
4. https://cbseacademic.nic.in/curriculum_2027.html

CHAPTER 01
Sexual Reproduction in Flowering Plants
Quick understanding
Flowering plants form gametophytes, transfer pollen, complete double fertilisation and develop seeds and fruits.
Core points
Anther and ovule development produce male and female gametophytes.
Pollen-pistil interaction controls compatible fertilisation.
Double fertilisation forms both zygote and primary endosperm nucleus.
Check your learning
Explain the central idea of Sexual Reproduction in Flowering Plants in your own words.
Apply one idea from Sexual Reproduction in Flowering Plants to a textbook-style example or source.
One-line recall
Anther and ovule development produce male and female gametophytes.

CHAPTER 02
Human Reproduction
Quick understanding
Human reproduction coordinates anatomy, gamete formation, hormonal cycles, fertilisation, implantation and birth.
Core points Check your learning
Spermatogenesis and oogenesis differ in timing and products. Explain the central idea of Human Reproduction in your own words.
The menstrual cycle reflects ovarian and uterine hormone changes. Apply one idea from Human Reproduction to a textbook-style example or source.
Placenta supports exchange and also acts as an endocrine tissue.
One-line recall Spermatogenesis and oogenesis differ in timing and products.
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CHAPTER 03
Reproductive Health
Quick understanding
Reproductive health combines informed choice, disease prevention, safe care and responsible reproductive technologies.
Core points Check your learning
Contraceptive methods act at different stages. Explain the central idea of Reproductive Health in your own words.
STI prevention depends on awareness, testing and barrier protection. Apply one idea from Reproductive Health to a textbook-style example or source.
Assisted reproductive technologies address selected causes of infertility.
One-line recall Contraceptive methods act at different stages.
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CHAPTER 04
Principles of Inheritance and Variation
Quick understanding
Inheritance patterns arise from allele behaviour, chromosome movement, linkage, recombination and mutation.
Core points Check your learning
Mendelian ratios require stated assumptions. Explain the central idea of Principles of Inheritance and Variation in your own words.
Incomplete dominance and codominance do not destroy segregation.
Apply one idea from Principles of Inheritance and Variation to a textbook-style example or source.
Pedigrees and karyotypes reveal different kinds of inherited conditions.
Equation and notation
Monohybrid F_2 phenotypic ratio = 3:1
Hardy-Weinberg: $p^2 + 2pq + q^2 = 1$
SYMBOLS AND UNITS
p, q: allele frequencies, dimensionless p^2, 2pq, q^2: genotype frequencies, dimensionless
One-line recall Mendelian ratios require stated assumptions.

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CHAPTER 05
Molecular Basis of Inheritance
Quick understanding
DNA stores sequence information that is replicated and expressed through RNA and protein synthesis.
Core points Check your learning
Semiconservative replication copies each parental Explain the central idea of Molecular
strand. Basis of Inheritance in your own words.
The genetic code is read in triplet codons. Apply one idea from Molecular Basis of
Inheritance to a textbook-style example
Regulation changes gene expression without
or source.
changing the basic code.
One-line recall Semiconservative replication copies each parental strand.
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CHAPTER 06
Evolution
Quick understanding
Evolution explains population change across generations through variation, selection, drift, gene flow
and shared ancestry.
Core points Check your learning
Evidence comes from fossils, anatomy, embryos and Explain the central idea of Evolution in
molecules. your own words.
Natural selection changes allele frequencies through Apply one idea from Evolution to a
differential reproduction. textbook-style example or source.
Hardy-Weinberg equilibrium provides a reference for
detecting change.
Equation and notation
$p + q = 1$
$p^2 + 2pq + q^2 = 1$
SYMBOLS AND UNITS
p, q: frequencies of two alleles All frequencies are dimensionless and range from 0
to 1
One-line recall Evidence comes from fossils, anatomy, embryos and molecules.
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CHAPTER 07
Human Health and Disease
Quick understanding
Health depends on host, pathogen, immunity, behaviour and environment, so prevention and
treatment work at several levels.
Core points Check your learning
Innate and adaptive immunity have different speed Explain the central idea of Human Health
and specificity. and Disease in your own words.
Vaccination builds immunological memory. Apply one idea from Human Health and
Disease to a textbook-style example or
Cancer, HIV infection and substance misuse require
source.
accurate, non-stigmatising understanding.
One-line recall Innate and adaptive immunity have different speed and specificity.
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CHAPTER 08

Microbes in Human Welfare
Quick understanding
Microorganisms support food production, industry, sewage treatment, energy, biological control and nutrient cycling.
Core points Check your learning
Fermentation products depend on organism and conditions. Explain the central idea of Microbes in Human Welfare in your own words.
Activated sludge reduces organic load in sewage. Apply one idea from Microbes in Human Welfare to a textbook-style example or source.
Biofertilisers and biocontrol can lower dependence on synthetic inputs.
One-line recall Fermentation products depend on organism and conditions.
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CHAPTER 09
Biotechnology: Principles and Processes
Quick understanding
Modern biotechnology isolates, cuts, joins, transfers and selects genetic material using controlled biological tools.
Core points Check your learning
Restriction enzymes cut selected DNA sequences. Explain the central idea of Biotechnology: Principles and Processes in your own words.
Vectors carry inserts into host cells.
PCR amplifies a target sequence through repeated temperature cycles.
Apply one idea from Biotechnology: Principles and Processes to a textbook-style example or source.
One-line recall Restriction enzymes cut selected DNA sequences.
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CHAPTER 10
Biotechnology and Its Applications
Quick understanding
Biotechnology applies engineered organisms or molecules to medicine, agriculture and diagnosis while raising biosafety and ownership questions.
Core points Check your learning
Recombinant insulin separates production from animal extraction.
Bt crops express a microbial insecticidal protein. Explain the central idea of Biotechnology and Its Applications in your own words.
Patents, biopiracy and biosafety require ethical and legal scrutiny.
Apply one idea from Biotechnology and Its Applications to a textbook-style example or source.
One-line recall Recombinant insulin separates production from animal extraction.
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CHAPTER 11
Organisms and Populations
Quick understanding
Population ecology links organismal adaptations with birth, death, age structure, growth and species interactions.
Core points Check your learning

Population size changes through births, deaths, immigration and emigration.
Exponential and logistic models make different resource assumptions.
Mutualism, competition, predation and parasitism shape communities.

Explain the central idea of Organisms and Populations in your own words.
Apply one idea from Organisms and Populations to a textbook-style example or source.

Equation and notation
Exponential growth: $dN/dt = rN$
Logistic growth: $dN/dt = rN(1 - N/K)$
SYMBOLS AND UNITS
N: population size t: time
r: intrinsic rate of natural increase (time^{-1}) K: carrying capacity in number of individuals

One-line recall Population size changes through births, deaths, immigration and emigration.

CHAPTER 12
Ecosystem
Quick understanding
An ecosystem moves energy through trophic levels while cycling matter between organisms and the physical environment.
Core points
Productivity measures biomass or energy production per area per time.
Decomposition includes fragmentation, leaching, catabolism, humification and mineralisation.
Energy flow is one-way; nutrients cycle.

Check your learning
Explain the central idea of Ecosystem in your own words.
Apply one idea from Ecosystem to a textbook-style example or source.

Equation and notation
NPP = GPP - R
SYMBOLS AND UNITS
NPP: net primary productivity (energy or mass area^{-1} time^{-1}) GPP: gross primary productivity
R: respiratory loss in matching units

One-line recall Productivity measures biomass or energy production per area per time.

CHAPTER 13
Biodiversity and Conservation
Quick understanding
Biodiversity at genetic, species and ecosystem levels supports resilience and human well-being but is threatened by rapid loss.
Core points
Species richness follows broad latitudinal and area patterns.
Habitat loss, overuse, invasion and co-extinction are major drivers.
In-situ conservation protects habitats; ex-situ conservation protects selected organisms.

Check your learning
Explain the central idea of Biodiversity and Conservation in your own words.
Apply one idea from Biodiversity and Conservation to a textbook-style example or source.

One-line recall Species richness follows broad latitudinal and area patterns.

CHAPTER 14
Formative Reading: Environmental Issues
Quick understanding

Examine pollution, waste, climate change, ozone loss and land degradation through causes, effects and prevention.

Core points Check your learning

Prevention and reduction are preferred to end-of- Explain the central idea of Formative
pipe treatment. Reading: Environmental Issues in your
own words.

Biomagnification increases selected persistent
pollutants along food chains. Apply one idea from Formative Reading:
Environmental Issues to a textbook-style

Environmental decisions must connect evidence, law,
example or source.
technology and public participation.

One-line recall Prevention and reduction are preferred to end-of-pipe treatment.