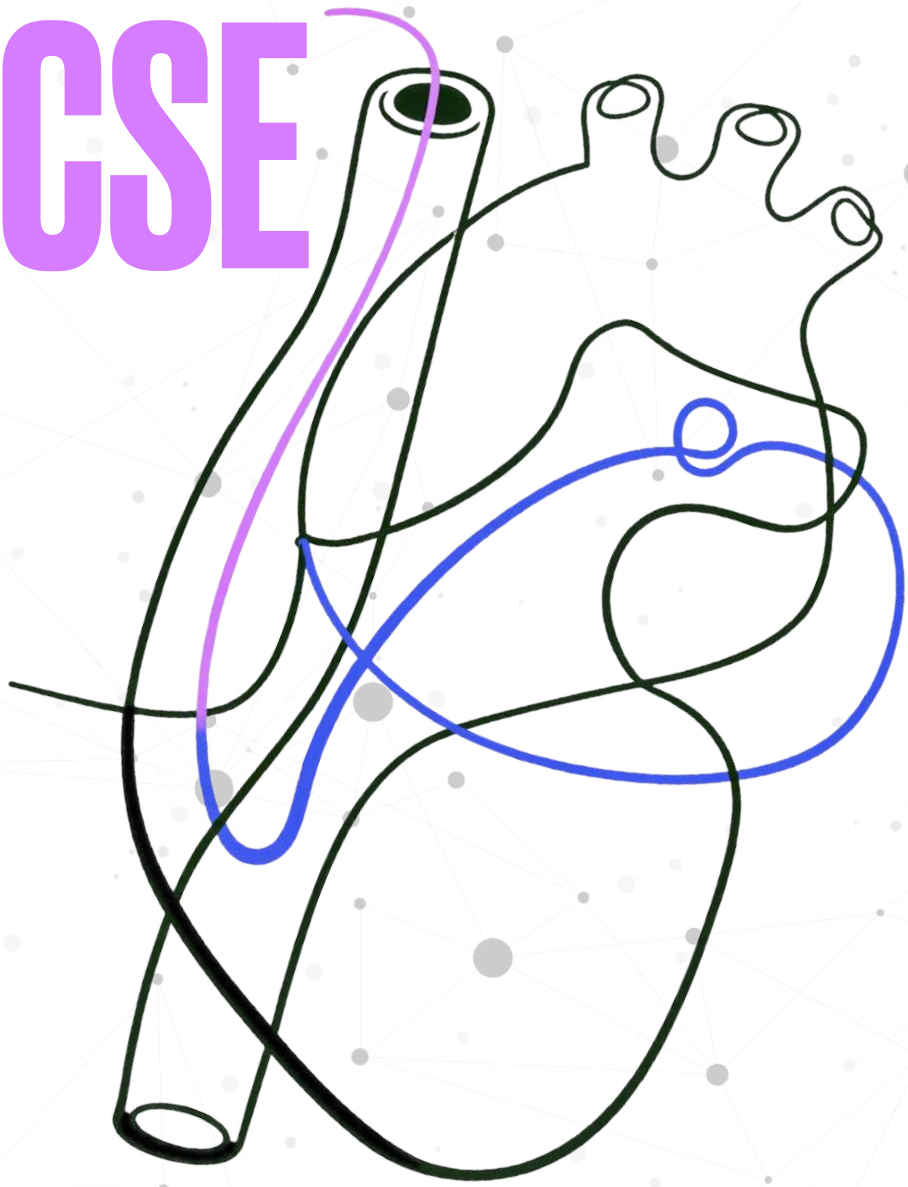
edexcel

BIOLOGY IGCSE



COMPLETE NOTES

LATEST SYLLABUS
MODULE & LINEAR

EDEXCEL IGCSE BIOLOGY

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UNIT 2

How to Use This Book

1

Scan

Read the section headings and every **bold key term** first. This builds a mental map, so each new fact has somewhere to attach.

2

Read

Read each section in full and study every diagram beside the text it illustrates. Diagrams carry information that prose cannot.

3

Flashcards

Stop reading once the topic makes sense, then use the online flashcards. Recalling from memory is **active recall** — far stronger than re-reading.

4

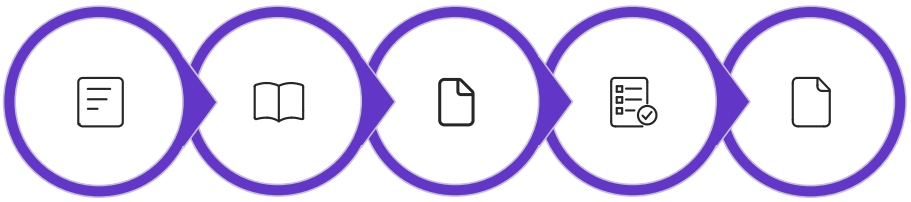
Quiz

Complete the online quiz for the topic. It tests whether you can **apply** the content, not just recognise it. Return to any section a wrong answer points to.

5

Past Papers

Finish by answering past-paper questions under **timed conditions**. Past papers train you to meet the exam command words.



Online Resources

- Flashcards
- Quizzes
- Summary pages
- Progress tracker

Before Any Quiz, Test or Exam

Revise with the online **summary page** for the topic to consolidate everything you have learned.

Finishing a Topic

Open the **progress tracker** on the website and tick it off. This is the top of the ladder — **topic complete**.

DNA, Genes and Chromosomes

The genome is the entire DNA of an organism; genes are sections of DNA located on chromosomes in the nucleus, and each gene codes for a specific protein.

The Genome

The **complete set of genetic information** of an organism — all of its DNA. Every cell in an organism contains the same genome.

Chromosomes

Long molecules of DNA **coiled tightly together**, located in the nucleus of every cell. Genes are carried on chromosomes.

A Gene

A specific section of a DNA molecule that **codes for a particular protein**. The sequence of bases determines the sequence of amino acids in the protein.

Alleles

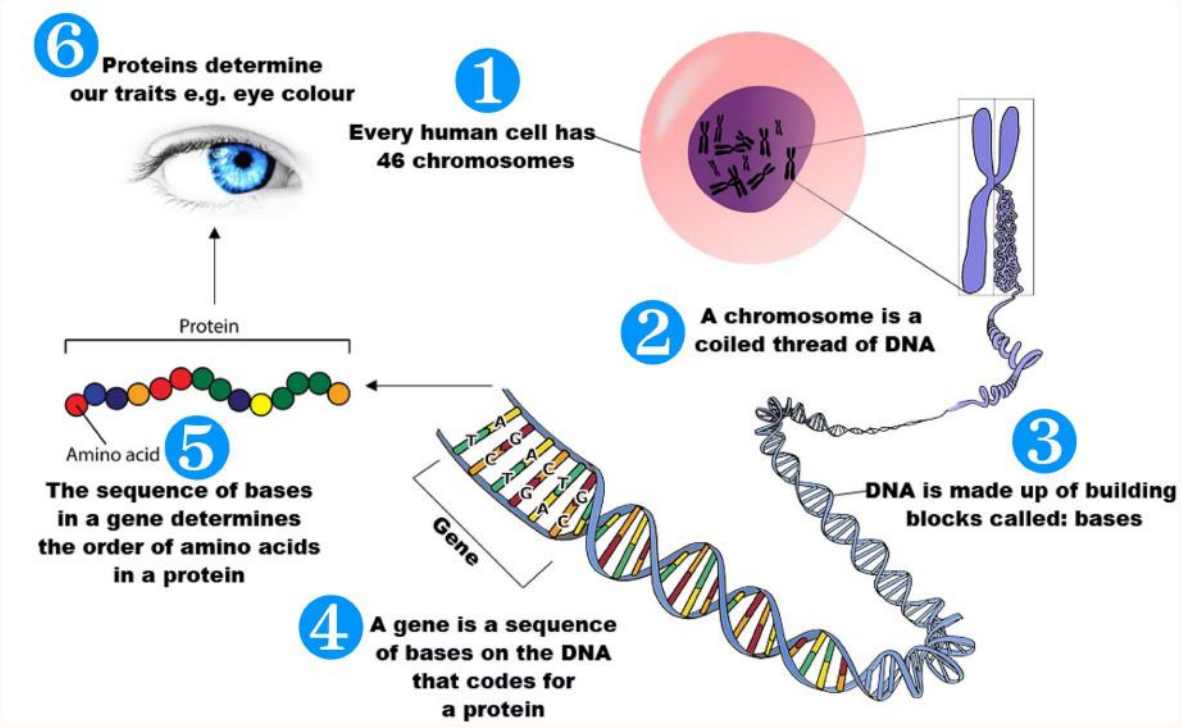
Different versions of the same gene. Different alleles give rise to **different versions of a characteristic** — e.g. blue or brown eye colour.

Diploid Number — Human Body Cells

Human body cells are **diploid** — they contain two copies of each chromosome, arranged in **23 pairs**. The diploid number in humans is **46**.

Haploid Number — Human Gametes

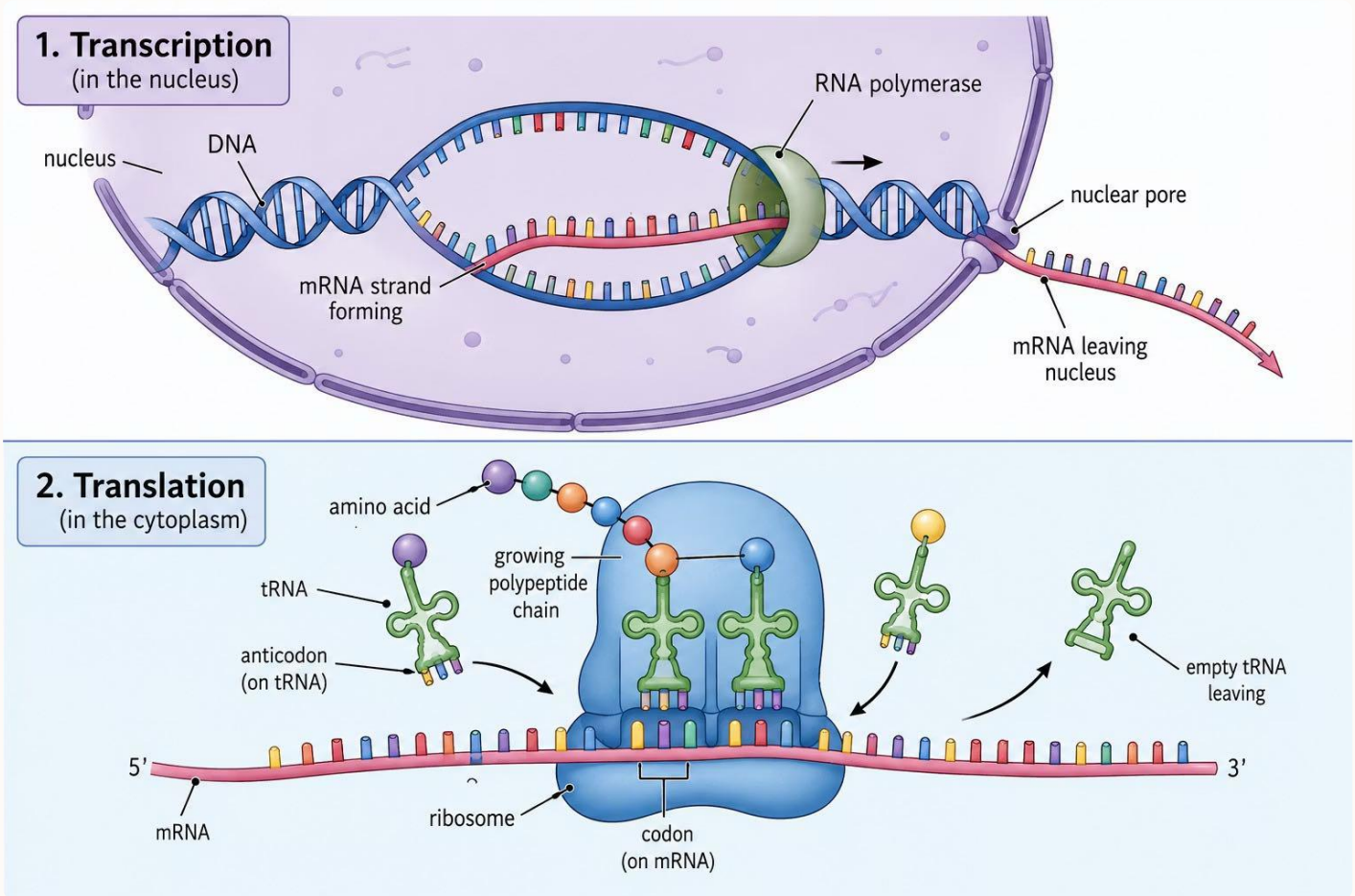
Human gametes (sperm and egg cells) are **haploid** — they contain one copy of each chromosome. The haploid number in humans is **23**.



Key Terms

mRNA	A single-stranded RNA molecule that carries a copy of the gene sequence from the nucleus to the ribosome
Codon	A sequence of three bases on mRNA that codes for one specific amino acid
tRNA	A transfer RNA molecule that carries a specific amino acid to the ribosome during translation
Anticodon	A three-base sequence on tRNA that is complementary to a codon on mRNA
Ribosome	The cellular structure in the cytoplasm where translation occurs and amino acids are joined together

⚠ Exam Tip: Transcription occurs in the nucleus — it produces mRNA. Translation occurs at the ribosome in the cytoplasm — it produces a protein. Remember: Trans·CRIPTION = COPYING the code (nucleus). Trans·LATION = making the protein (ribosome).



Eutrophication — Step by Step

The table below summarises each stage of eutrophication, the event that occurs, and its biological consequence. Learn this sequence precisely for the exam.

Stage	Event	Biological Consequence
❶	Mineral ions (nitrates + phosphates) enter water	Water becomes nutrient-enriched
❷	Algal bloom forms on surface	Surface covered — light penetration blocked
❸	Plants below surface die	Loss of aquatic plant biodiversity
❹	Decomposers multiply on dead plant material	Oxygen consumed rapidly by aerobic respiration
❺	Dissolved oxygen concentration falls	Fish and aerobic organisms die

2

Key Causes

Fertiliser leaching and sewage discharge — both introduce nitrates and phosphates into water bodies.

5

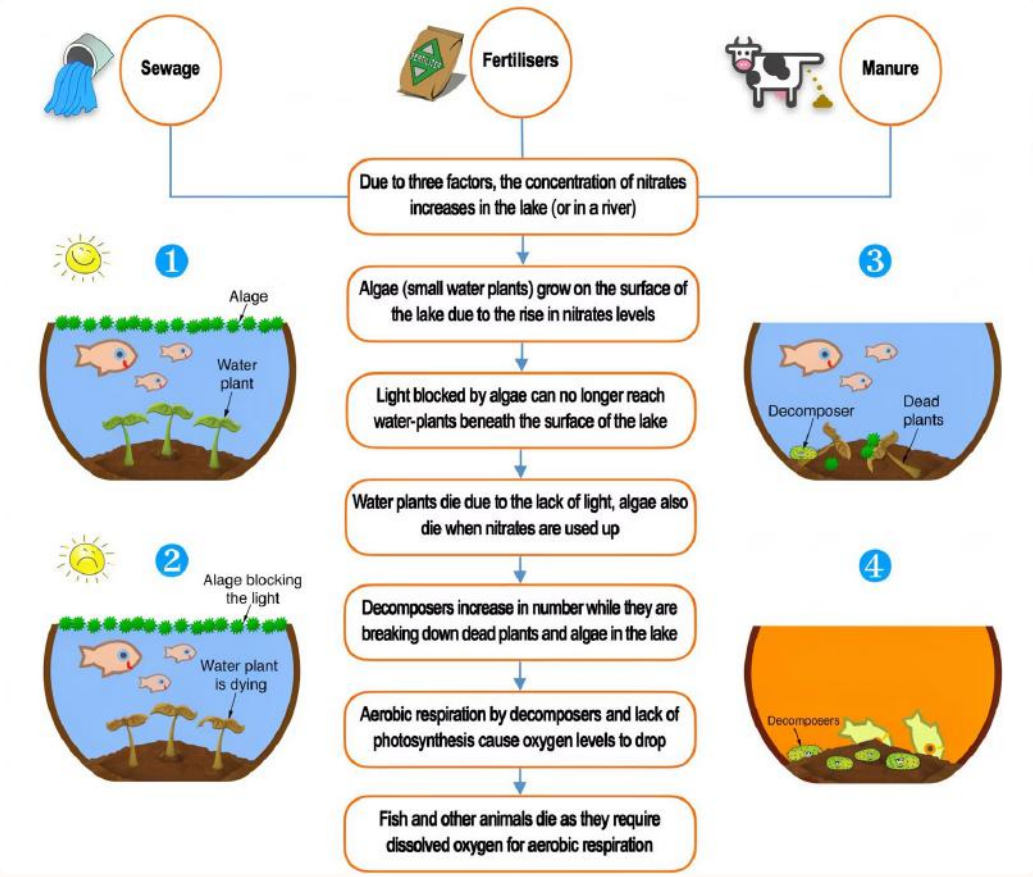
Stages in Chain

Five sequential stages from mineral ion entry to fish death — every stage must be stated in exam answers.

0

O_2 at Final Stage

Dissolved oxygen approaches zero as decomposers consume it through aerobic respiration — causing mass death of aquatic life.



Consequences of Global Warming

Global warming is the observed increase in the average surface temperature of the Earth, caused by the enhanced greenhouse effect. It leads to **climate change** — alterations in the pattern of global and regional climates.

Rising Sea Levels

Caused by **thermal expansion** of ocean water and **melting of polar ice caps**. Low-lying coastal areas and small islands face flooding — causing habitat loss and displacement of human populations.

Changes in Rainfall Patterns

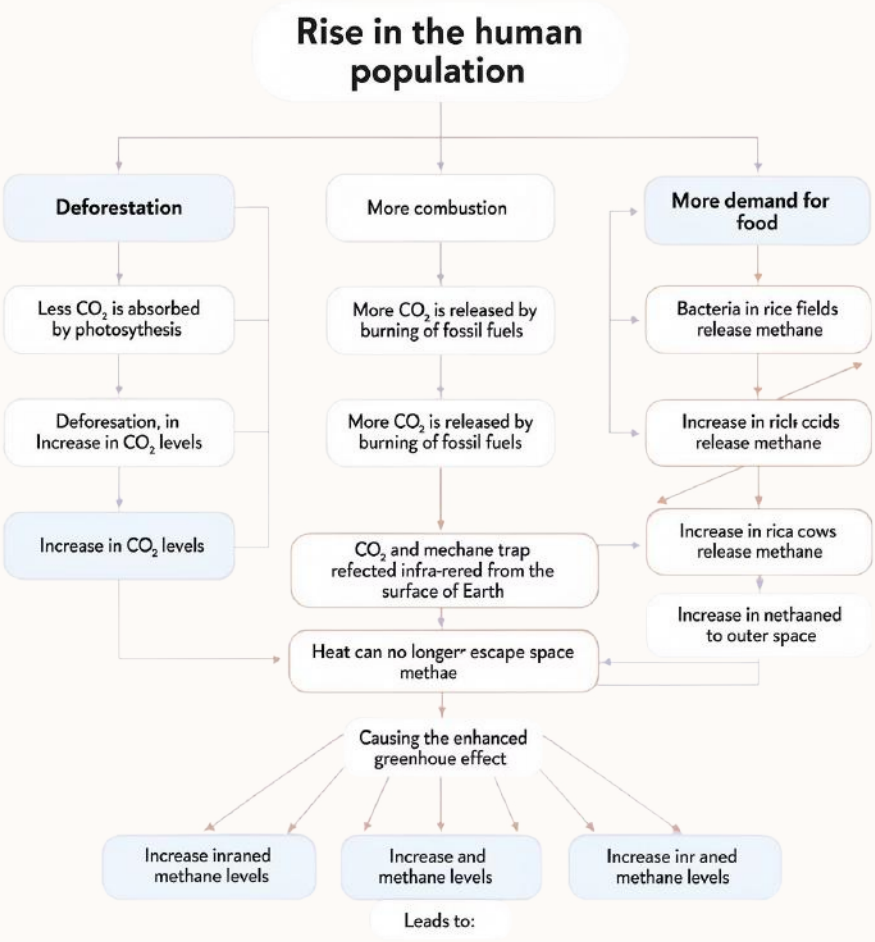
Some regions become **drier**, others **wetter**, affecting the distribution of species and crop productivity. Food security is threatened in vulnerable regions.

Disruption to Food Webs

Shifts in temperature alter the **timing of reproduction and migration** in many species. Predator-prey relationships become misaligned, destabilising ecosystems.

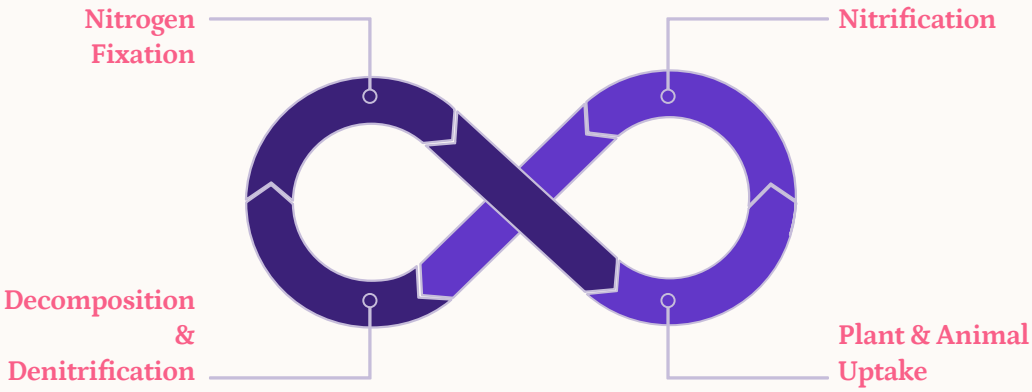
Loss of Biodiversity

Species unable to **adapt or migrate** fast enough face extinction. Entire ecosystems — such as coral reefs — are threatened by rising ocean temperatures and acidification.

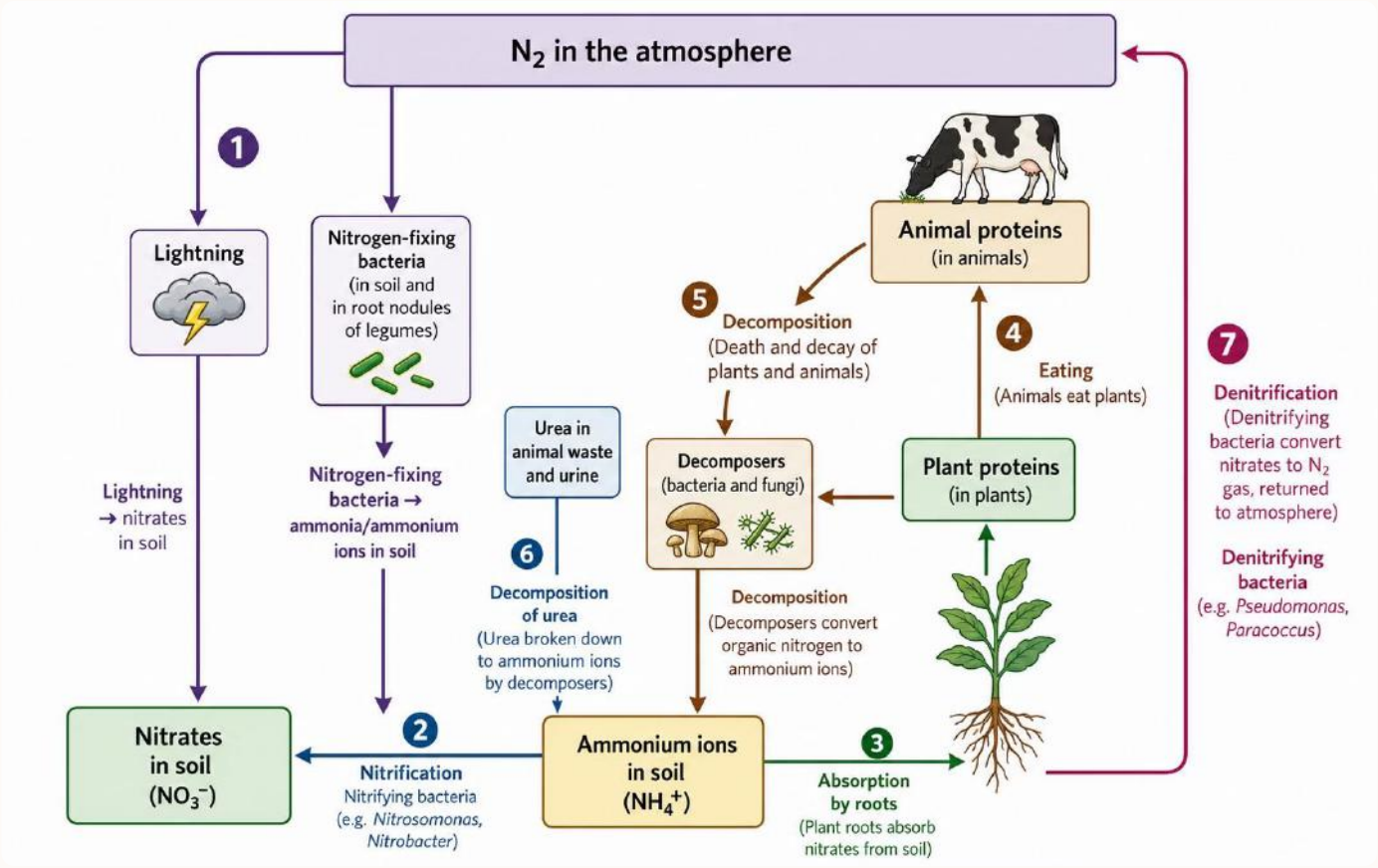


23.3 How Nitrogen Moves Through the Cycle

Follow the numbered steps below to trace the journey of a nitrogen atom — from the atmosphere, through soil bacteria, into plant and animal proteins, and back to the atmosphere.



This six-step sequence shows how nitrogen continuously cycles between the atmosphere and living organisms. Denitrification (Step 6) is the key process that returns nitrogen to the atmosphere, completing the cycle.



Genetic Engineering — Cutting and Joining DNA

Genetic engineering is the process of transferring a gene from one organism's DNA into the cells of another organism of the same or a different species, so that the recipient organism produces the protein encoded by that gene.

Key Enzymes

Restriction Enzymes

Recognise specific base sequences in a DNA molecule and cut the DNA at those precise locations. Each restriction enzyme cuts at a unique recognition sequence, producing fragments with specific **sticky ends**.

Ligase Enzymes

Join two pieces of DNA together by forming bonds between their complementary sticky ends. Ligase seals the sugar-phosphate backbone of the DNA strand.

Key Terms

Recombinant DNA

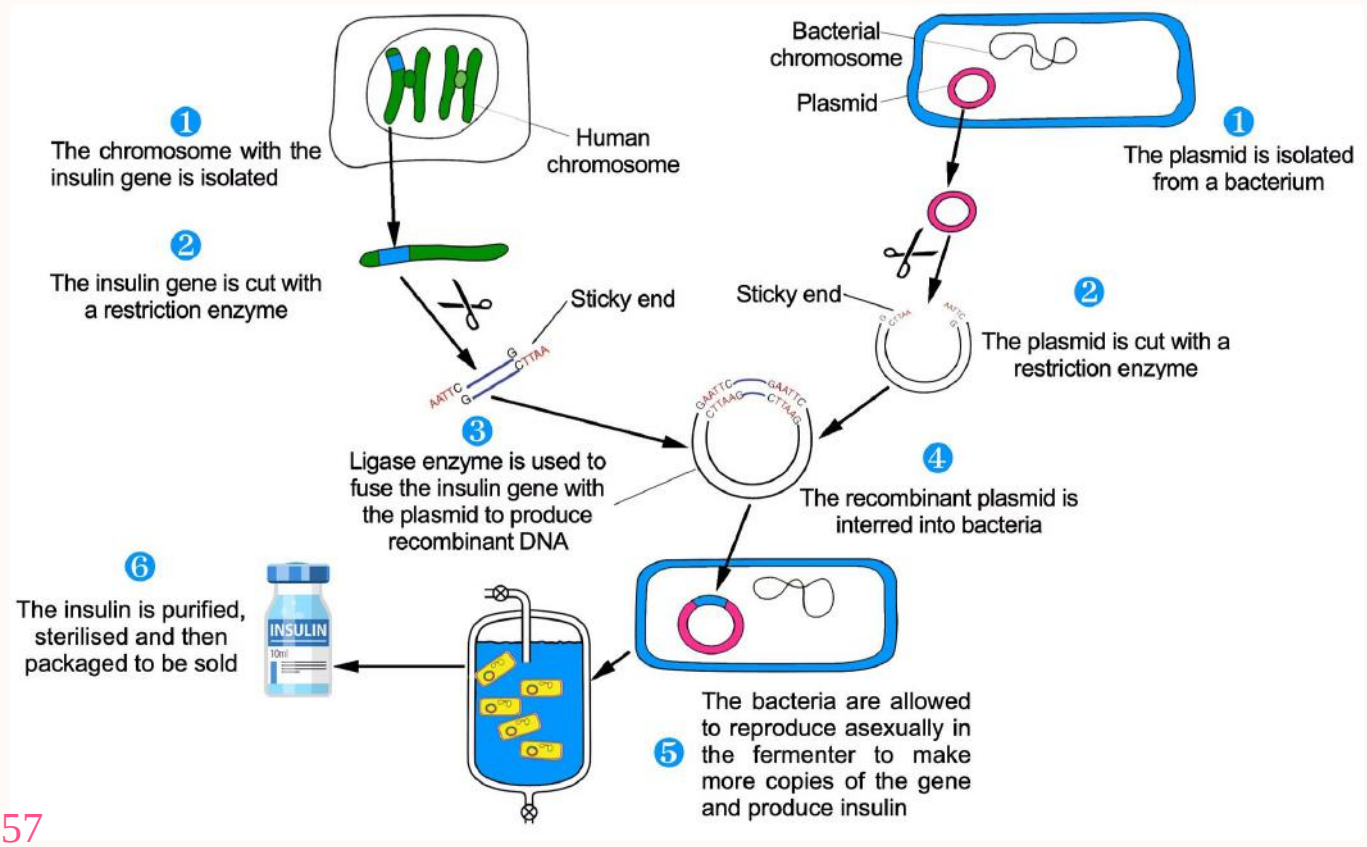
DNA formed by joining together DNA from two different sources — typically a gene from one organism inserted into the DNA of another.

Plasmid Vector

A small, circular molecule of DNA found naturally in bacteria. Cut open with a restriction enzyme, the desired gene is inserted and sealed in using ligase. The recombinant plasmid is then taken up by bacterial cells.

Viral Vector

A virus can insert DNA into the cells it infects. A gene of interest is incorporated into the viral DNA, and the virus delivers it to the target cell during infection.



Edexcel Specification — All Definitions

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Hosni IGCSE Biology Textbook · Core and Extension Topics

📘 **About this glossary:** All definitions are grouped by topic and cover both Core and Extension content. **Extension (B-tier) terms** are included and clearly marked within their respective topic sections. Use this as a complete revision reference for your IGCSE Biology examinations.

Topics Covered

- Topic 1 — Nature & Variety of Living Organisms
- Topic 2a–2j — Levels of Organisation through Co-ordination
- Topic 3 — Reproduction and Inheritance
- Topic 4 — Ecology and the Environment
- Topic 5 — Use of Biological Resources

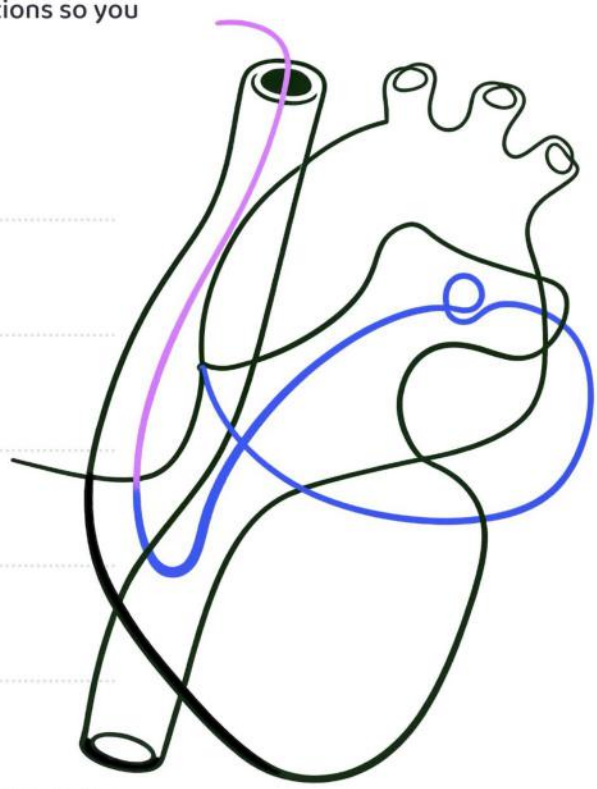
How to Use This Glossary

Each term is presented with its full definition and page reference from the Hosni textbook. Terms are grouped by topic for focused revision. Extension terms are found within Topic 2i and are labelled accordingly.

CORE TERMS ☆ EXTENSION INCLUDED

Everything the exam needs. Nothing it doesn't

A complete, exam-focused resource for **Edexcel IGCSE Biology** students. Study it in any order — two units, linear or modular — written to match the specification and examiners' expectations so you can study smarter and score higher.



100% EDEXCEL SPEC — NO FLUFF
Only what the exam tests, nothing extra.

EXAM TIPS IN EVERY TOPIC
Mark-scheme wording and the traps that lose marks.

EXAM-READY DEFINITIONS
Write answers the way examiners want them.

Exam tips in every topic

mark-scheme wording and the traps that lose marks.

"HOSNI SAYS" MNEMONICS
Memory aids that stick.

A CLEAR STUDY METHOD
Scan, read, recall, quiz, apply.

FREE ONLINE QUIZZES, FLASHCARDS & SUMMARIES
Reinforce and test yourself anytime, anywhere.

ACTIVE PROGRESS TRACKER
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Continue your learning online

Scan to access the full course, resources and exclusive content.

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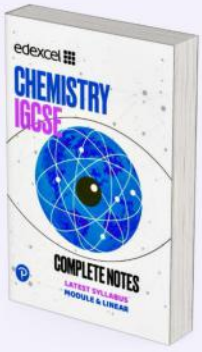
Also available



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