

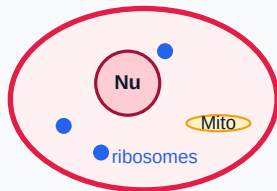
GCSE Biology

Key Concepts, Diagrams & Exam Tips | StudyVolt

■ Cell Biology

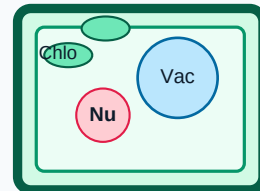
Animal Cell vs Plant Cell

ANIMAL CELL



No wall · No chloroplasts · Small vacuole

PLANT CELL



Cell wall · Chloroplasts · Large vacuole

Topic	Key fact	Remember
Animal cell	Nucleus, cytoplasm, membrane, mitochondria, ribosomes	No wall, no chloroplasts
Plant cell	+ cell wall, chloroplasts, large vacuole	Wall = cellulose
Prokaryotic	No nucleus — DNA free in cytoplasm	Bacteria are prokaryotic
Diffusion	High → low concentration (passive)	No energy needed
Osmosis	Water: high water potential → low	Passive, via membrane
Active transport	Low → high concentration	Needs energy (ATP)

Exam tip: Osmosis: always write "high water potential to low water potential" — NOT just "high to low concentration".

■ Biological Processes

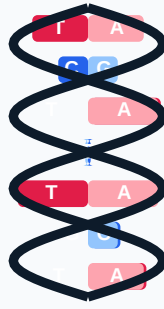
Process	Equation	Location
Photosynthesis	$\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{glucose} + \text{O}_2$ (needs light)	Chloroplasts
Aerobic respiration	$\text{glucose} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$ (+ATP)	Mitochondria
Anaerobic (animals)	$\text{glucose} \rightarrow \text{lactic acid}$ (+ATP)	Cytoplasm
Anaerobic (yeast)	$\text{glucose} \rightarrow \text{ethanol} + \text{CO}_2$ (+ATP)	Cytoplasm

■ Genetics & DNA

DNA Double Helix — Complementary Base Pairs

A pairs with T

C pairs with G



Complementary base pairing: A–T and C–G always

Topic	Key fact	Remember
DNA structure	Double helix: A–T and C–G base pairs	Complementary pairing
Dominant allele	Expressed in Bb AND BB	Capital letter
Recessive allele	Only expressed in bb	Lowercase letter
Mitosis	Growth and repair	2 identical daughter cells
Meiosis	Makes gametes (sex cells)	4 genetically different cells
Natural selection	Best adapted survive and reproduce more	Drives evolution

■ Human Body Systems

System	Key organ(s)	Key function
Circulatory	Heart, blood vessels	Double circulation — pumps oxygenated blood to body
Nervous	Brain, spinal cord, neurones	Receptor → coordinator → effector (fast)
Endocrine	Pancreas, adrenal, pituitary	Hormones in blood — slower, longer lasting
Immune	White blood cells	Phagocytosis + antibody production
Digestive	Small intestine, stomach, liver	Enzymes break food; villi absorb nutrients

Exam tip: 6-mark homeostasis: Detect → What released? → Where? → What result? All four points = full marks.