

Topic 2: Cells and Control

Edexcel · GCSE Biology · Revision Notes

Specification reference: 2.1–2.9

Note: Sections marked ★ HIGHER TIER ONLY are for Higher tier students only. Foundation tier students should focus on the unmarked sections.

2.1–2.4 Mitosis and Growth

Mitosis produces two genetically identical cells for growth, repair and asexual reproduction. Before mitosis, DNA replicates.

- In the cell cycle: interphase (DNA replication and cell growth), mitosis (chromosomes separate), cytokinesis (cell divides).
- Cell differentiation: cells become specialised early in development. In adults, stem cells can still differentiate.

Key Terms

Mitosis: Cell division producing 2 identical daughter cells — same chromosome number as parent

Stem cell: Undifferentiated cell that can divide and differentiate into specialised cells

2.5–2.9 The Nervous System

The nervous system detects changes and coordinates responses rapidly.

- Sensory neurone → relay neurone → motor neurone → effector.
- Synapse: neurotransmitters carry signals across the gap between neurones.
- Reflex arc: bypasses the brain for fast responses.
- **The brain:** cerebral cortex (conscious thought), cerebellum (movement and balance), medulla oblongata (automatic functions — breathing, heart rate).

★ HIGHER TIER ONLY — Investigating Brain Function

- MRI (magnetic resonance imaging) scans map active areas of the brain.
- Damage to specific areas of the brain can reveal their functions.
- Electric stimulation of brain areas during surgery shows what each region controls.

Exam Tip: Learn the three main brain regions and their functions — cerebral cortex, cerebellum, medulla oblongata.