

Basic (E grade)

Living things (such as animals and plants) are made from **cells** that have different parts.

Intermediate (C grade)

Nucleus - control, co-ordination
Cell membrane - in/out of cell
Cytoplasm - where stuff happens
Ribosomes - making proteins
Mitochondria - respiration/energy
Plant cells only:
Chloroplasts - photosynthesis/green
Vacuole - storage of water/cell sap
Cell wall - keep shape, cellulose

Advanced (A grade)

Specific **adaptations**, linking **structure** and **function**, especially for common examples of specialised cells.

e.g. Many chloroplasts present in **palisade cells** in leaf, arranged to get **maximum sunlight** for **more photosynthesis**.

Substances can move by **diffusion**, **osmosis** and **active transport**.

Plants take in water through their roots and carbon dioxide through their leaves to make glucose by **photosynthesis**.

Basic (E grade)

Glucose has many uses in the plant.

Plants need minerals like us.

Photosynthesis can be slowed down by limiting factors.

Intermediate (C grade)

Animals eat to get energy.

We use food chains and webs to describe a simple version of an ecosystem.

Pyramids of number and biomass help us to do this.

Energy is lost at each stage of the food chain.

Human effects on the ecosystem have had some unexpected consequences.

Advanced (A grade)

Animals pass on less energy than they have taken in because of movement and maintaining body temperature.

The carbon cycle shows how the processes of **photosynthesis**, **respiration**, **decomposition** and **combustion** are linked.

Intensive farming reduces these energy losses to be more efficient. Ethical issues e.g. battery chickens.

Humans affect C cycle (less **photosynthesis**, more **combustion**) and cause fertiliser pollution in lakes and rivers, leading to **eutrophication**.

Basic (E grade)

Enzymes are natural catalysts used in/by the body, to digest food and build proteins.

Intermediate (C grade)

Advanced (A grade)

We use enzymes in industry too.

Biological washing powder

Proteases to make baby food

Carbohydrases to turn cheap starch into more valuable sugar

Isomerase to turn glucose into very sweet fructose (for slimming foods)

Advantages/Disadvantages

Body conditions need to be kept constant e.g. temperature, water content, glucose.

If body temp (normally 37°C) gets too high or too low we can become ill or die.

Basic (E grade)

Our kidneys regulate water content by filtering the blood and then reabsorbing everything useful. We call the waste product urine.

Intermediate (C grade)

1 Ultrafiltration: Sugar, urea, water and salts are squeezed out of blood under high pressure
2 Reabsorption: All sugar is usually reabsorbed, some salts, none of urea. Amount of water depends on level of ADH.
3 Everything not reabsorbed sent to bladder through ureter; this is urine.

Advanced (A grade)

If there is not enough water in blood, more ADH produced by pituitary. More water is then reabsorbed in the kidney, so urine is concentrated.

If blood dilute: less ADH, less water reabsorbed, large amount of dilute urine.

The pancreas produces a hormone which stops glucose levels in the blood getting too high. If this goes wrong diabetes can result.

Banting and Best did experiments on dogs to identify the exact hormone involved, which led to a treatment for diabetes.

We inherit (some) characteristics from our parents.

In sexual reproduction, one male and one female sex cell (each carrying half of the information) join together to make a new individual.