

B2 Organisation

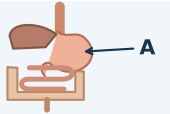
Biology Paper 1 | AQA Combined Science Trilogy | Key ideas to remember

Cells → tissues → organs

1 Organisation and digestion

Cells → tissues → organs → organ systems.

Digestion breaks large insoluble food molecules into small soluble molecules.



A = stomach. Food: mouth → oesophagus → stomach → small intestine → large intestine → anus.

Small intestine: absorbs digested food.

Large intestine: absorbs water.

Bile: made in liver, stored in gall bladder; neutralises stomach acid and emulsifies fats.

Enzymes speed reactions

2 Enzymes and digestion

Enzymes are biological catalysts.

A substrate fits the enzyme's active site.

Enzyme	Breaks down	Products
Amylase	Starch	Sugars
Protease	Protein	Amino acids
Lipase	Lipids	Fatty acids + glycerol

Temperature: rate rises to an optimum. Too hot → active site changes (**denatured**).

pH: each enzyme has an optimum.

Bile is **not an enzyme**. It increases the fat surface area for lipase.

Blood and plants transport

3 Required practicals: food and enzymes

Test	Positive result
Starch: iodine	Blue-black
Reducing sugar: Benedict's + heat	Green, yellow, orange or brick-red precipitate
Protein: Biuret	Lilac/purple
Lipid: Sudan III	Red-stained oil layer

Amylase and pH: use buffers; mix amylase with starch. Test samples with iodine at regular intervals. Time until iodine stays brown (no starch left). Keep temperature and concentrations the same; repeat. **Rate** $\propto$ **1/time**.

4 Heart, blood and vessels



Right ventricle → lungs. Left ventricle → body; thicker muscle. Valves stop backflow.

Arteries: away from heart; thick walls.

Veins: towards heart; valves.

Capillaries: very thin walls for exchange.

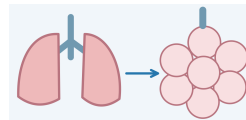
Red cells: haemoglobin carries oxygen.

White cells: defend against pathogens.

Platelets: help blood clot.

Plasma: liquid carrying cells and dissolved substances, e.g. glucose, CO₂ and urea.

5 Lungs, health and disease



Alveoli: large area, thin moist walls, good blood supply. Oxygen diffuses into blood; carbon dioxide diffuses out.

Coronary heart disease: fatty deposits narrow coronary arteries, reducing oxygen to heart muscle. Stents hold arteries open; statins lower cholesterol.

Cancer: uncontrolled cell division. Malignant tumours invade/spread.

Risk factors: smoking, diet, alcohol.

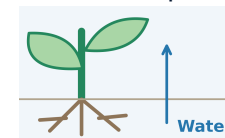
Correlation alone does not prove causation.

6 Leaves and plant transport

Palisade cells: many chloroplasts.

Spongy mesophyll: air spaces for diffusion.

Stomata: pores; guard cells control opening.



Xylem: water + mineral ions upwards from roots.

Phloem: dissolved sugars to where needed (translocation).

Transpiration: water vapour lost from leaves. Faster with more light, higher temperature, more air movement or lower humidity.

Potometer: measures water uptake, an estimate of transpiration rate.