

Exercise walk-through

# 2.1

## **Principles of organisation and digestion (4.2.1–4.2.2.1, RP4)**

---

AQA · GCSE · Biology

## Exercises 2.1·2.3

---

**2.1** Define a tissue and give one example from the digestive system. [2]

---

**2.2** Name the enzyme that digests starch, its two production sites and its product. [4]

---

**2.3** State the two functions of bile and the reason each works. [4]

## Exercises 2.1·2.3

---

**2.1** Define a tissue and give one example from the digestive system. [2]

**2.1** A group of cells with a similar structure and function; e.g. glandular/muscular/epithelial tissue.

---

**2.2** Name the enzyme that digests starch, its two production sites and its product. [4]

**2.2** Amylase; salivary glands and pancreas / small intestine; glucose / simple sugars.

---

**2.3** State the two functions of bile and the reason each works. [4]

**2.3** Alkaline – neutralises hydrochloric acid from the stomach so lipase works; emulsifies fat into small droplets – a larger surface area for lipase to work on, so a faster rate.

## Exercises 3.1·3.2

---

**3.1** Explain why amylase stops working at 80 °C but works again if cooled when at 5 °C it is only slow. [4]

---

**3.2** A student tests a mystery food: Benedict's stays blue; iodine goes blue-black; Biuret stays blue.

(a) What does the food contain? [2]

(b) Why must the Benedict's tube be heated? [1]

## Exercises 3.1·3.2

---

**3.1** Explain why amylase stops working at 80 °C but works again if cooled when at 5 °C it is only slow. [4]

**3.1** At 80 °C the enzyme has denatured – the active site's shape changed permanently, so starch no longer fits; this is irreversible, so it stays inactive on cooling. At 5 °C the enzyme is undamaged, just low kinetic energy – fewer successful collisions, so the reaction is slow but restarts when warmed.

---

**3.2** A student tests a mystery food: Benedict's stays blue; iodine goes blue-black; Biuret stays blue.

(a) What does the food contain? [2]

(b) Why must the Benedict's tube be heated? [1]

**3.2** (a) Starch (iodine blue-black, B1) but no sugar and no protein. (b) Benedict's only turns brick-red when heated.

## Exercise 3.3

---

**3.3** Describe a method for investigating the effect of pH on the rate of amylase (RP5).  
Include how the rate is judged and two control variables. [6]

## Exercise 3.3

---

**3.3** Describe a method for investigating the effect of pH on the rate of amylase (RP5). Include how the rate is judged and two control variables. [6]

**3.3** Indicative content: set up water bath at constant temperature; mix amylase, starch and buffer at each pH value; start timing; sample at regular intervals onto iodine in a spotting tile (continuous sampling); record when iodine stays orange-brown (all starch digested); shortest time = fastest rate; repeat at each pH and use means; controls – temperature, volumes of enzyme and starch, same concentration. Level 3 (5–6): all key steps, sampling method, controls and repeats. Level 2 (3–4): most steps with a gap. Level 1 (1–3): isolated steps.