IGCSE BIOLOGY • EXERCISE SHEET

7.4 Chemical digestion

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

Objective

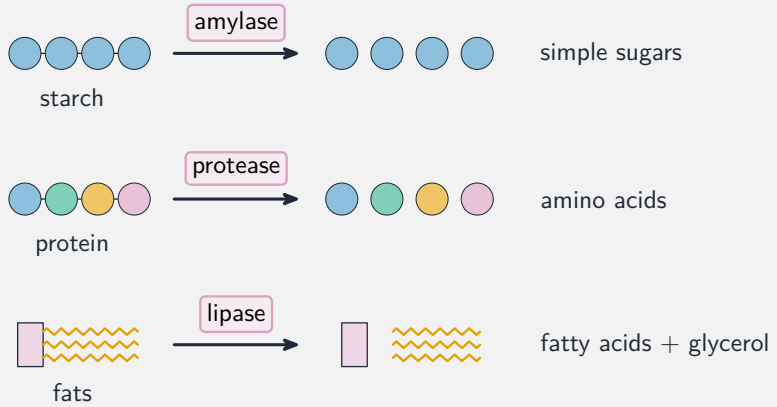
Build the skills to answer exam questions on **chemical digestion** 化学消化—the digestive **enzymes** 酶, the role of stomach acid, and digesting starch and protein.

You must be able to:

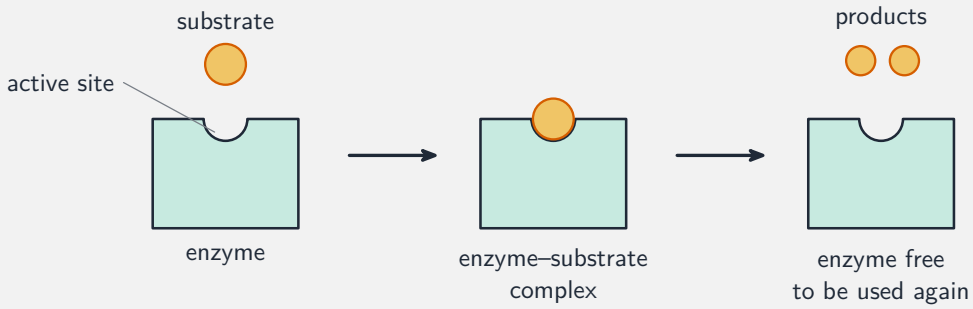
- give the substrate and products of amylase, protease and lipase
- explain the role of hydrochloric acid in the stomach
- describe the two-step digestion of starch and the two proteases

1 Worked examples

Digestive enzymes



Chemical digestion breaks large insoluble molecules into small soluble ones



Digestive enzymes work by a lock-and-key fit

Enzyme	Breaks down → into
amylase	starch → reducing sugars
protease	protein → amino acids
lipase	fats → fatty acids + glycerol

- stomach acid kills microorganisms and gives the best pH for stomach protease (pepsin).

2 Practice

2.1 State the products formed when lipase digests fat. [2]

2.2 Name the enzyme that digests protein. [1]

3 Exam-style questions

3.1 Amylase digests starch into: [1]

- **A** amino acids
- **B** reducing sugars
- **C** fatty acids
- **D** glycerol

3.2 The stomach produces hydrochloric acid.

(a) State two functions of this acid. [2]

(b) Name the protease that works in the acidic stomach. [1]

3.3 Explain why food molecules must be made small and soluble before they can be

used. [2]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **7.4 Chemical digestion** past-paper sheet in the Library, or try these in **Practice mode**:

- 0610/21 N25 —Q10 (digestive enzymes)
- 0610/21 N25 —Q11 (enzymes / sites)

Solutions

2.1 fatty acids; glycerol.

2.2 protease.

3.1 B. Amylase digests starch into reducing sugars.

3.2 (a) it kills harmful microorganisms in the food; it gives an acidic pH suited to the stomach's protease.
(b) pepsin.

3.3 large molecules are insoluble and cannot be absorbed; small soluble molecules can pass into the blood.