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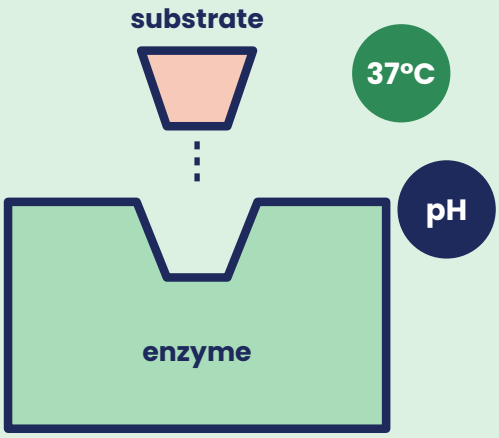
Year 10–11 • GCSE & IGCSE Biology



Enzymes

Exam-Style Worksheet

Exam-style questions on the lock and key model, digestive enzymes, temperature and pH, data analysis and uses of enzymes.

Active site | Digestion | Temperature | pH | Data | Uses

KEY IDEAS IN THIS WORKSHEET

YEAR 10–11

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Section A	Enzyme basics	**21 marks**
Section B	Factors affecting enzymes	**10 marks**
Section C	Interpreting data	**9 marks**
Section D	Applications and calculation	**9 marks**

Instructions

- Answer all questions in the spaces provided.
- Show your working in calculations.
- Marks for each question are shown in [ ].
- Use the word and equation boxes to help you.

Total score

/ 49

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Enzymes Worksheet

Year 10–11 • GCSE (AQA 4.2.2) and Cambridge IGCSE 0610 topic 5 • Exam-style questions.

Section A — Enzyme basics [21 marks]

Word box catalyst | active site | substrate | product | protein | denatured | specific

1 Use words from the box to complete each sentence. Each word can be used once.

(a) Enzymes are biological ..... that speed up reactions without being used up. [1]

(b) Enzymes are made of ..... [1]

(c) The substrate fits into the ..... of the enzyme. [1]

(d) The molecule the enzyme acts on is called the ..... [1]

(e) Each enzyme only works on one substrate, so enzymes are ..... [1]

(f) If an enzyme changes shape and stops working it has been ..... [1]

2 Use the lock and key model to explain why an enzyme only works on one substrate. [3]

.....

.....

.....

3 Complete the table about digestive enzymes. [12]

Enzyme	Substrate	Product(s)	Where it is made
Amylase			
Protease			
Lipase			

Section B Factors affecting enzymes [10 marks]

4 Explain how an increase in temperature from 0 °C to 37 °C affects the rate of an enzyme-controlled reaction. **[3]**

5 Explain why the rate of reaction falls sharply above the optimum temperature. **[3]**

6 Stomach protease works best at pH 2 but pancreatic protease works best at pH 8. Explain why they work at different pH. **[2]**

7 Explain what happens to an enzyme if the pH is too far from its optimum. **[2]**

Section C Interpreting data [9 marks]

8 A student investigates the effect of temperature on amylase. The time taken for the starch to disappear (iodine test) is recorded.

Results:

Temperature (°C)	10	20	30	40	50	60
Time for starch to disappear (s)	420	210	100	60	240	no change after 600

(a) State the optimum temperature from the results. **[1]**

.....

(b) Calculate the rate at 30 °C using rate = 1000 ÷ time. **[2]**

.....

.....

rate = ...

(c) Explain the result at 60 °C. **[2]**

.....

.....

(d) Suggest how the student could find a more accurate optimum temperature. **[1]**

.....

(e) Name **two** variables the student must control. **[2]**

.....

.....

(f) Describe how the student would know when all the starch had been digested. **[1]**

.....

Section D Applications and calculation [9 marks]

9 Biological washing powders contain protease and lipase. Explain **one** advantage and **one** disadvantage of using them. **[2]**

.....

.....

10 Lactase is used to make lactose-free milk. Explain why lactose-intolerant people benefit. **[3]**

.....

.....

.....

11 The graph for a reaction shows the rate rising to a plateau as substrate concentration is increased. Explain the plateau. **[2]**

.....

.....

12 Calculate the percentage change in rate if the rate increases from 8 to 14 units. (Higher tier maths) **[2]**

.....

.....

percentage change = ... %

END OF WORKSHEET **Total: _____ / 49**