GCSE and IGCSE Biology: Enzymes Worksheet

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

Name: ..... **Class:** ..... **Date:** ..... **Score:** / 49

Section A: Enzyme basics [21 marks]

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

1 Use words from the box to complete the passage. 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]**

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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]**

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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 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]**

(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]**