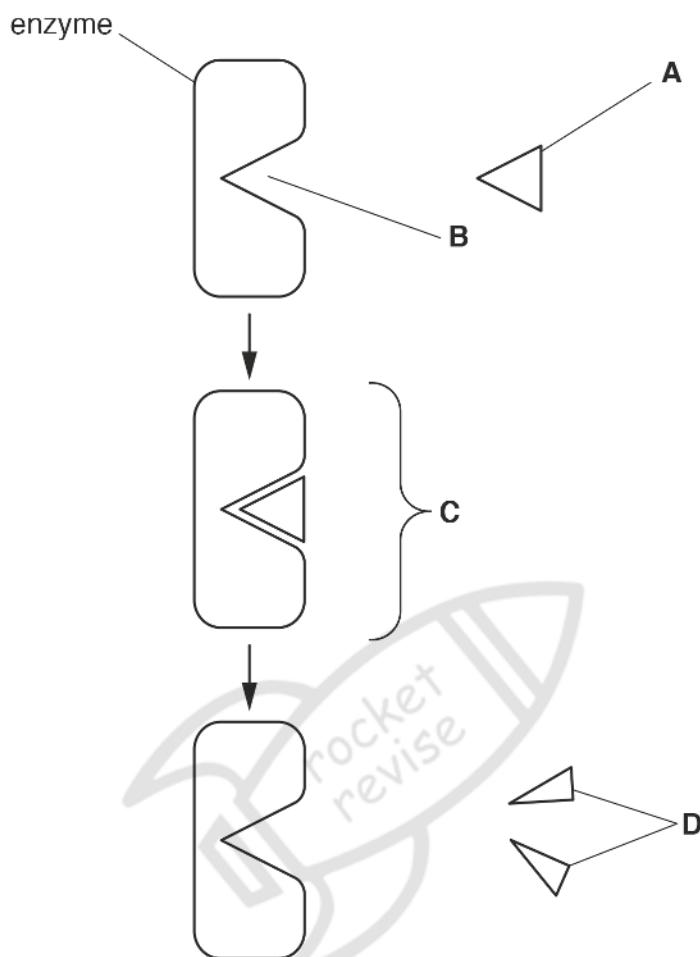




1 The reactions of chemical digestion are catalysed by enzymes.

The diagram shows the stages of an enzyme-catalysed reaction.



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State the names of **A** to **D** in the diagram.

A

B

C

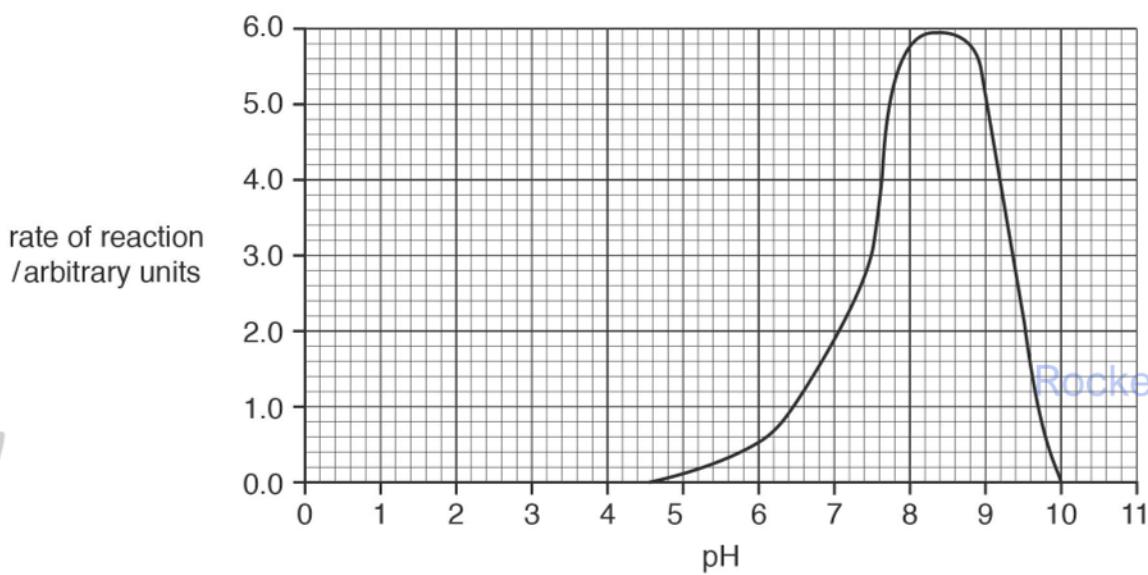
D

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[Total: 4]



2 The graph shows how the rate of reaction of a digestive enzyme changes with pH.



Describe the effect of the increase in pH on the rate of reaction shown in the graph.

.....

.....

.....

.....

[2]

[Total: 2]



3 A factory uses biotechnology to process apples.

Some of the apple juice is mixed with yeast and used to make ethanol.

The yeast uses enzymes to produce ethanol.

Define the term *enzyme*.

.....

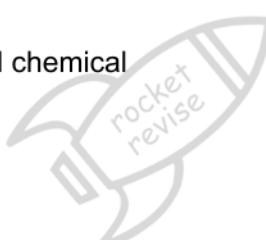
.....

[2]

[Total: 2]

4 The digestive systems of young mammals are not fully developed.

Enzymes such as amylase, maltase and protease are often added to baby food to aid chemical digestion.





(a) (i) Suggest why the temperature of baby food must be controlled when the enzymes are added.

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.....
.....

[2]

(ii) State **one** other condition that must also be controlled to optimise enzyme activity.

.....

[Total: 3]





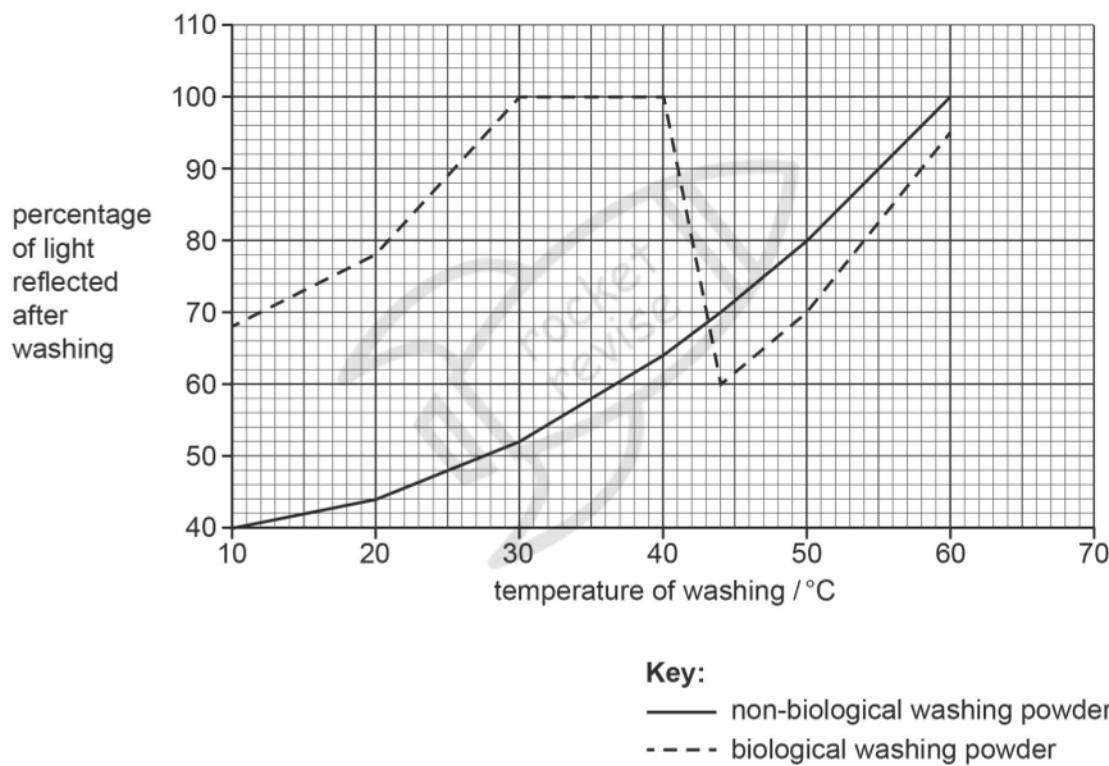
5 Biological washing powders contain enzymes that break down food stains.

Some students compared how effective biological and non-biological washing powders are at removing stains at temperatures between 10 °C and 60 °C.

- Pieces of stained cloth were washed using two different washing powders.
- The degree of stain removal was measured by using a light meter to record the percentage of light reflected from the cloth.
- A light meter gave a value of 100% when the cloth was completely clean.
- Any stain left on the cloth reduced the percentage of light reflected.

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The results of the students' investigation are shown in the graph.



The students suggested that the enzymes in the biological washing powder were denatured at high temperatures.

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Explain why enzyme molecules do not function when they are denatured.

.....

.....

.....

.....

[2]



[Total: 2]

6 Amino acids are transported in plants.

State the name of the group of molecules that are made of proteins and act as catalysts.

..... [1]

[Total: 1]

7 Pectinase is an enzyme.

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The box on the left shows the beginning of a sentence.

The boxes on the right show some endings of sentences.

Draw **three** lines from the word 'Enzymes' to make three correct sentences.

Enzymes

are living organisms.

are proteins.

can only be used once.

have a complementary shape to their substrate.

increase the rate of chemical reactions.

in the stomach are most active at pH 8.

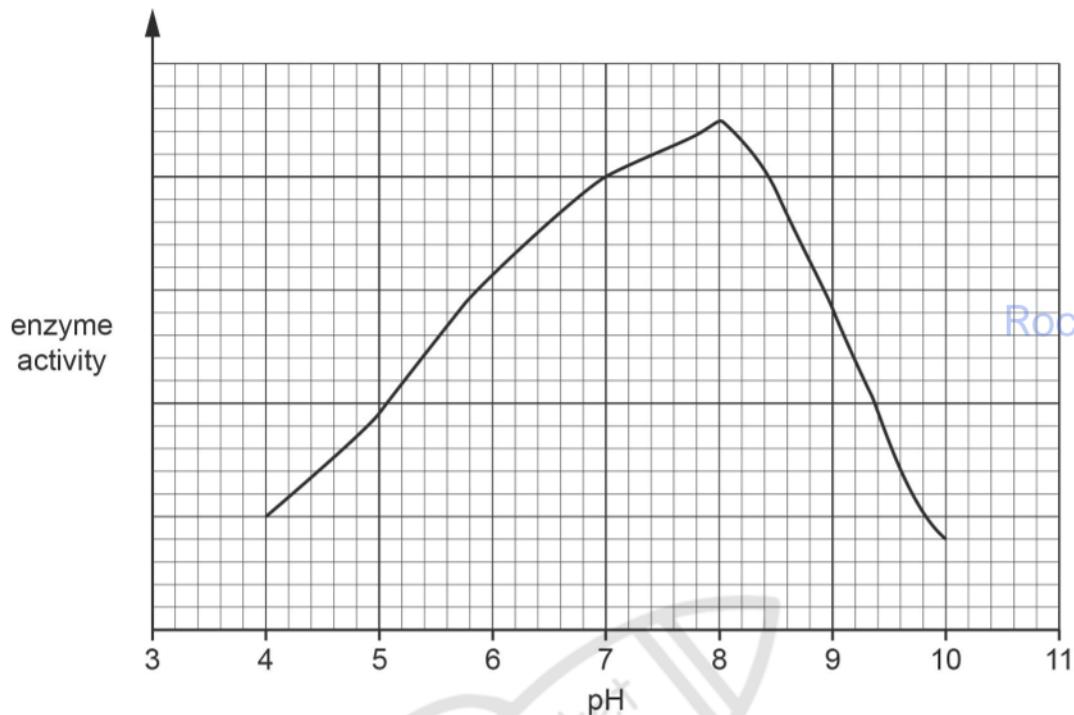
[3]

[Total: 3]



8 Alcohol dehydrogenase is an enzyme that breaks down alcohol in the body.

The graph shows the activity of alcohol dehydrogenase at different pH values.



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State the pH value with the lowest enzyme activity in the graph.

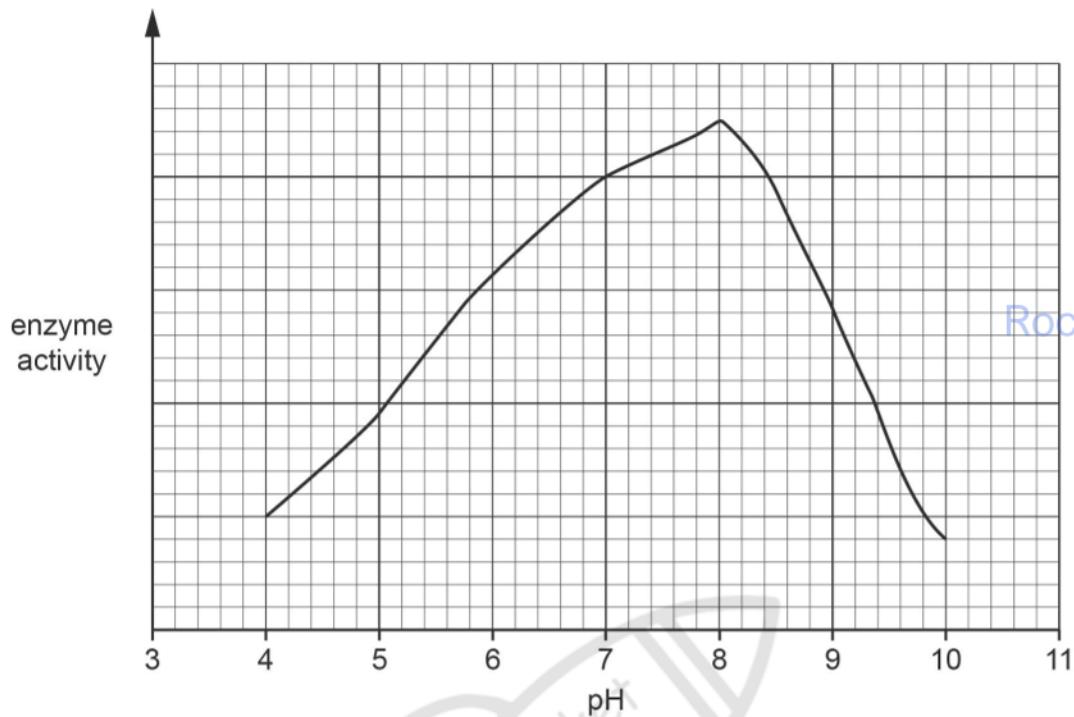
..... [1]

[Total: 1]



9 Alcohol dehydrogenase is an enzyme that breaks down alcohol in the body.

The graph shows the activity of alcohol dehydrogenase at different pH values.



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State the pH value with the highest enzyme activity in the graph.

..... [1]

[Total: 1]

10 Enzymes are biological catalysts.

Define the term catalyst.

.....

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[Total: 2]





11 The shape of a protein is very important for its function.

Explain the importance of shape for the function of an enzyme.

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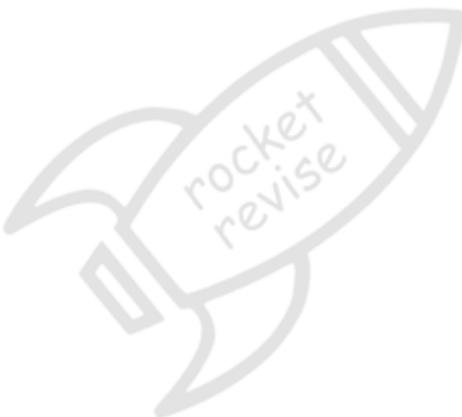
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[3]

[Total: 3]



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12 Yeast cells make the enzyme sucrase. Sucrase catalyses the breakdown of sucrose to glucose and fructose.

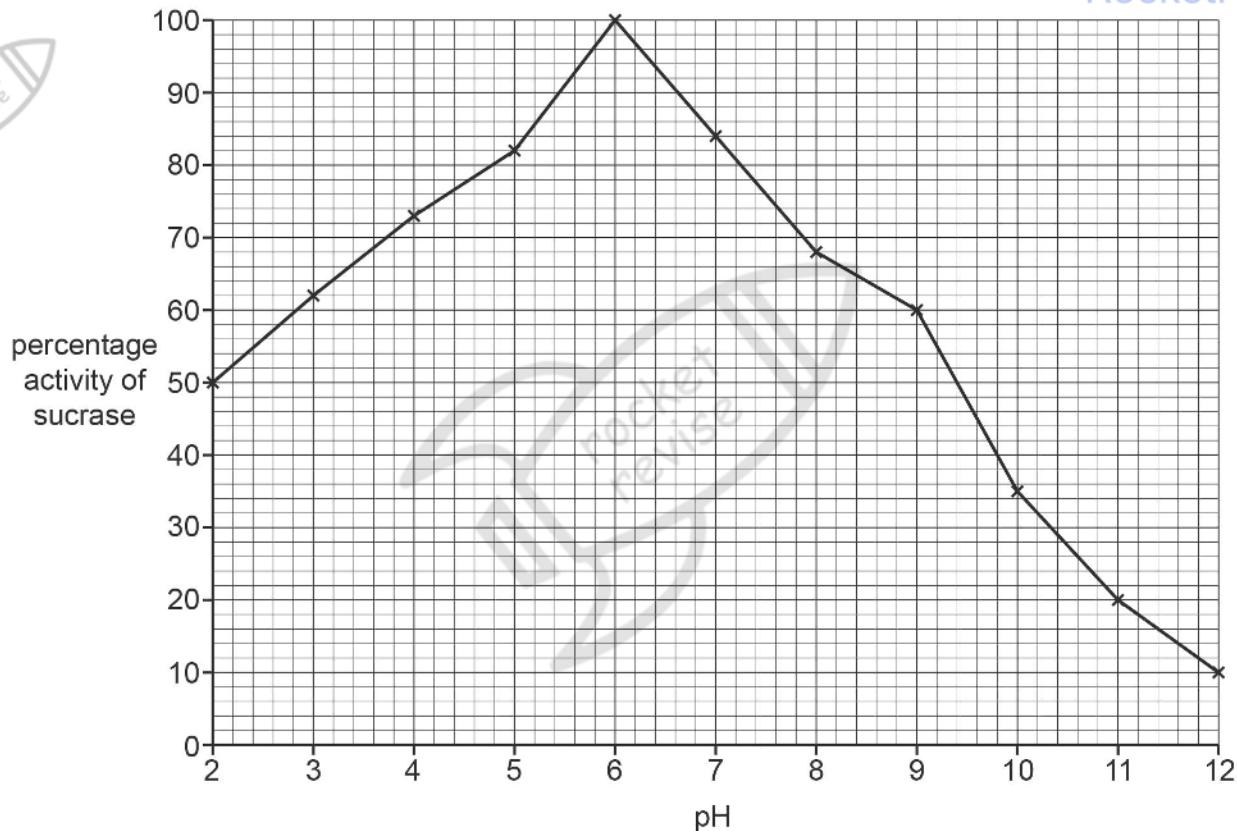
Some students made an extract of sucrase from yeast cells.

They investigated the activity of the sucrase extract at different pH values. They determined the rate of reaction at each pH.

They then calculated the rate of each reaction as a percentage of the fastest reaction, to give the percentage activity of sucrase.

The results of this investigation are shown in the graph.

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Describe **and** explain the effect of pH on the activity of sucrase shown in the graph.

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[6]

[Total: 6]

13 Yeast cells make the enzyme sucrase. Sucrase catalyses the breakdown of sucrose to glucose and fructose.

Enzymes are made of protein.

Explain how the shape of a sucrase molecule is related to its function.

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[2]

[Total: 2]

