

Digestion and Nutrition

Lesson 11 - Effect of Temperature on Enzymes

Biology - Key Stage 3

Mrs Walsh



Starch and amylase



Starch and amylase

When amylase is added to the starch and iodine mixture the colour change is reversed.

Explain why the iodine turns back to orange-brown when amylase is added to the starch solution.

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“How does temperature affect enzymes?”



“Temperature affects the rate at which starch is broken down by amylase”

- Independent variable (the one that is changed by the scientist)

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- Dependent variable (this is the outcome that is measured and recorded)

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- Control variables (factors we must keep the same)

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“Temperature affects the rate at which starch is broken down by amylase”

Original method

- Pour some starch solution into a test tube
- Add 2-3 drops of iodine
- Pour about 1cm³ amylase to the test tube and start the stopwatch
- Record the time taken for the colour to disappear.
- Repeat at different temperatures: 0°C, 30°C and 100°C.

Corrected Method

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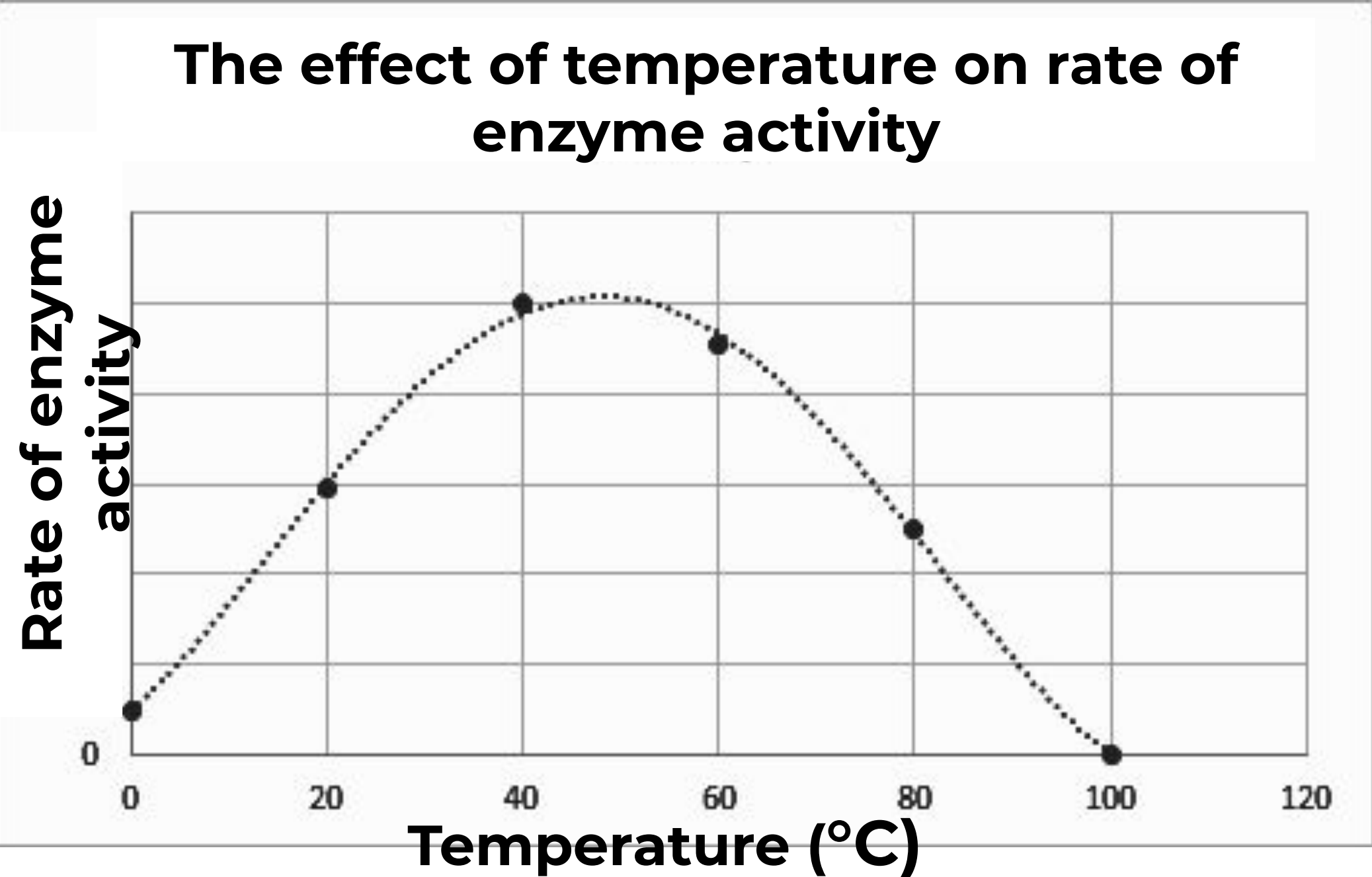
“Temperature affects the rate at which starch is broken down by amylase”

Risk Assessment

Hazard	Harm	Safety precaution
Iodine is an irritant	Can cause mild irritations if in contact	Use a to transfer it. it off immediately.
Hot heating equipment	Can cause	Allow time for the equipment to
Boiled solution	Can cause or	Use or to transfer the hot liquid



“Temperature affects the rate at which starch is broken down by amylase”



What can we interpret from these results about the effect of temperature on the rate of enzyme activity?

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Source: Mrs Walsh



“Temperature affects the rate at which starch is broken down by amylase”

Enzymes are p..... . At high temperatures, their s..... becomes irreversibly changed. This means that the starch no longer f..... inside the amylase (enzyme) and therefore, the enzyme no longer works; it becomes d..... .



Exam Questions Practice

1. Washing powders are used to remove food stains from clothes.

Some washing powders contain enzymes.

i. Suggest what enzymes do to the food stains.

..... [1]

ii. Manufacturers recommend a wash temperature of 30°C rather than 90°C for washing powders containing enzymes.

Suggest why.

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..... [2]

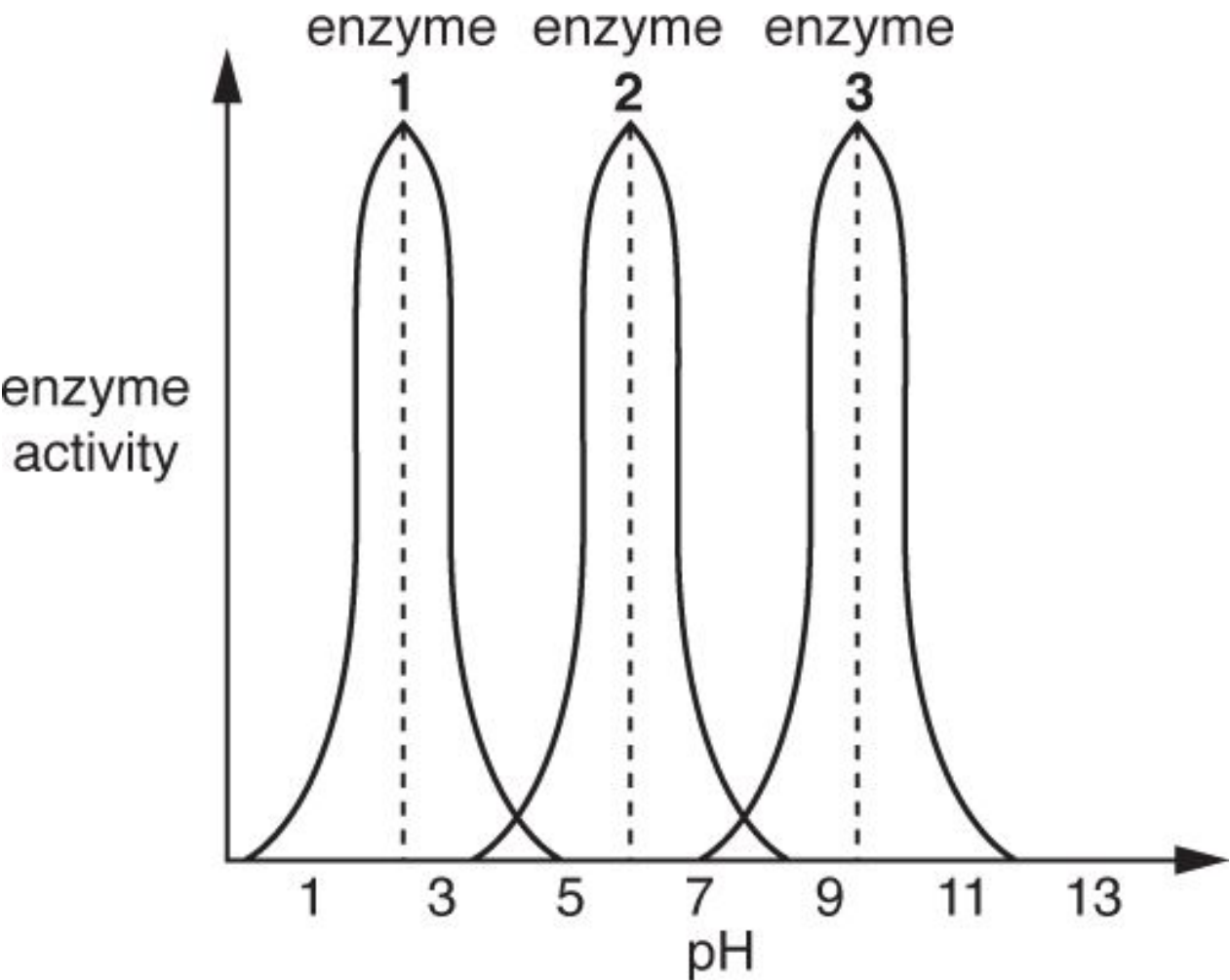


Exam Questions Practice

Gastric juice contains enzymes.

These enzymes work best in acidic conditions.

The activity of three enzymes is shown on the graph.



Identify which of the three enzymes is most likely to be found in the stomach.

Explain your answer.

Enzyme

Explanation

