Enzymes, active sites and temperature

Teacher / technician

YEAR 10 / LESSON 9 / BIOLOGY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Theory and model lesson. Numerical values are invented for reasoning practice and are not experimental findings.

Coverage and delivery

Shared Biology / Double Award: 2.10–2.11. Enzyme action and temperature.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklets / graph sheets	2 of each per pair	30 of each
Paper model sets / rulers	1 per pair	15 of each

Immediate safety

Paper modelling and data analysis only; no peroxide, biological samples or flame is used.

Preparation and delivery

Read alongside the student method

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1. Prepare paper models and graph paper for 15 pairs. Use the supplied dataset with its illustrative label.

2. Replace the former pH/catalase procedure in this temperature-theory lesson; the controlled amylase practical follows in Lesson 10.

3. Check students distinguish catalyst, active site, substrate and denaturation; retain their predictions for comparison with actual results.

Close of lesson

- Return equipment and wash hands after practical work.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- A biological substance that increases reaction rate without being used up overall.
- The region where suitable substrate binds and catalysis occurs.
- Greater kinetic energy produces more frequent successful interactions, while the enzyme remains functional.
- Denaturation changes structure and active-site properties, reducing suitable substrate binding and catalysis.
- 40 °C has the greatest activity among sampled points; closer temperatures are needed to locate the optimum.
- Enzyme source/concentration, starch source/concentration, volumes, pH, equilibration, sampling interval and endpoint judgement.

References and provenance

Pearson Biology specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.