

Savannah

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Part A: Graph and Optimum Temperature (3 points maximum)

Graph Setup (1 point)

Must contain:

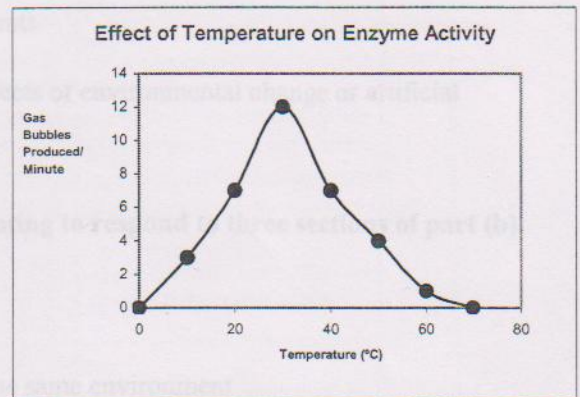
- Title/Legend and Y-axis [Bubbles of gas/Min]
- X-axis [Temperature (°C)]
- Correct measurement units and scaling for axes

Data Plotted (1 point)

- Correctly plotted points in proper orientation
- Points may or may not be connected with a line
- Bar graph acceptable

Optimum Temperature (1 point)

- 30° C, or between 20° C and 40° C either clearly indicated on the graph or in a sentence



Part B: Analyze and Explain the Results

(4 points maximum)

Analysis (1 point)

- Provide range of the change in respiration activity (increase and decrease) to temperature change (increase and decrease)

Explanations (1 point each)

- Below optimum—Increase in molecular movement leads to increase in reaction rate
- Above optimum—Denaturing of enzymes leads to decrease in reaction rate

Elaboration (2 points maximum, 1 point each)

- Relating enzyme function (effect on reaction rates) to allosteric site, active site, H⁺ bond, R groups
- Gas production due to respiration (can use either aerobic respiration or fermentation)
- Induced fit
- Lowering energy of activation
- Enzyme specificity

Part C: Experimental Design (4 points maximum)

NOTE: Experiment must be feasible. Must include sugar solutions of varying pH and an organism. If experiment is not reasonable, no points are awarded in the design structure section below.

Design Structures (3 points maximum, 1 point each)

- Two experimental constants—constant amounts of yeast or sugar, or temperature held constant
- Independent variable tested—reasonable pH range must be stated, including acid through base