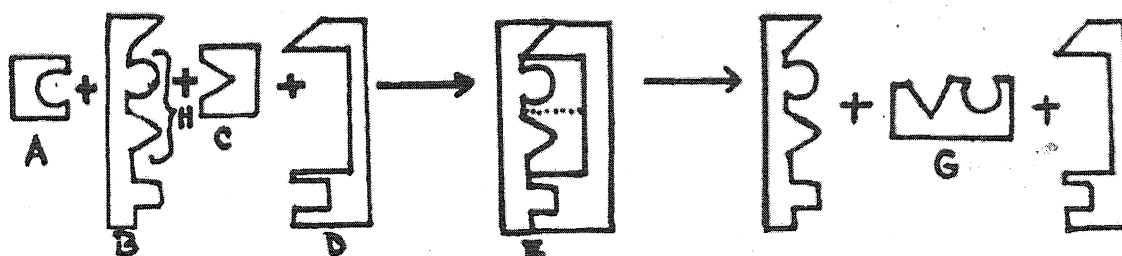


Use the reading handout to answer the following questions:

- Consider the diagram below. Which part is the enzyme? _____
Which parts of it are the substrate? _____
Which part is the active site? _____
Which part is the coenzyme? _____
Which part is the enzyme-substrate complex? _____
Which part is the reaction product? _____
Which part must be a protein? _____



- What is the role of an enzyme? _____
What is the role of a coenzyme? _____
Where do enzyme reactions take place? _____
- Complete the analogy:
Key:Lock :: _____ : _____

Explain why the analogy is accurate.

- Explain the phrase "Enzymes are specific".
- List factors that influence enzyme reactions.

IB Biology
Enzyme Data Analysis

Name _____
Period _____ Date _____

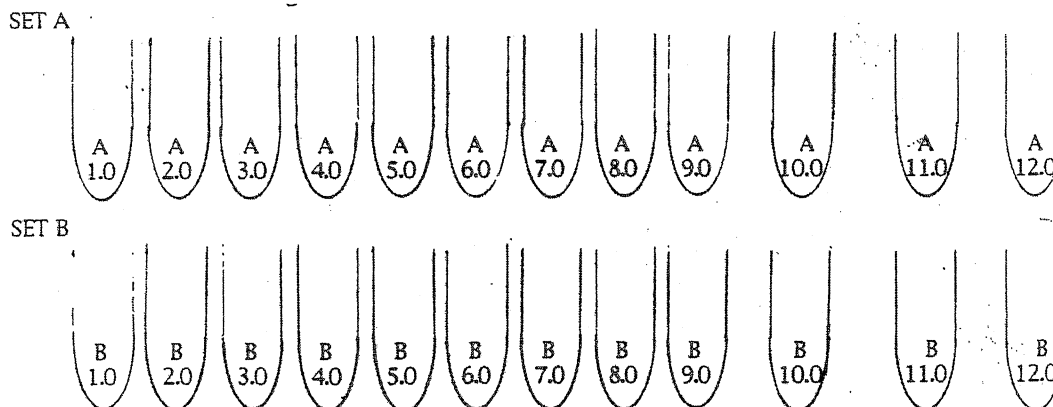
Background: pH influences the chemical reactions that occur. Enzyme reactions are particularly sensitive to variations in pH. The optimal conditions can be found by trying the reaction to be studied in a variety of conditions. Proteins are digested in the stomach and the small intestine by proteases. Two different proteases are pepsin and trypsin. These enzymes both chemically digest the protein gelatin.

Experimental Question: Do pepsin and trypsin have the same optimal pH environment?

Hypothesis: The optimal pH will be the pH at which the most protein is digested. If the pH of protein-pepsin solution is varied from test tube to test tube, then there should be a greater amount of protein digested at the best pH. If the pH of protein-trypsin is varied from test tube to test tube, then there should be a greater amount of protein digested at the best pH.

Procedure:

1. Set up 2 sets of 12 test tubes. Label one set of tubes Set A and the other Set B.
2. Put 5 mL of water and a substance to alter pH to each test tube in each set so that the following conditions exist in each test tube.



3. Label each test tube as to its set and pH as shown above.
4. Add 10 mL of gelatin to each test tube.
5. Add 5 mL of pepsin solution to each test tube in Set A.
6. Add 5 mL of trypsin solution to each test tube in Set B.

Results:

Enzyme Activity in Different pH Conditions

Enzyme	pH												
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
Pepsin	0%	80%	88%	35%	5%	0%	0%	0%	0%	0%	0%	0%	0%
Trypsin	0%	0%	0%	0%	8%	40%	75%	96%	90%	72%	48%	15%	0%

Make a graph of these results.

On the back of the graph, write a conclusion for this experiment. Be sure to include an answer to the experimental question and data to support your conclusion.

Write an evaluation in which you consider what variables were and were not controlled in this experiment. Think about what variables could affect enzyme activity.