

Enzyme Cut-Out Activity

Enzymes are proteins that help chemical reactions occur at a faster rate by lowering the energy needed for the reactions. First, the enzymes react with a substrate to form an enzyme-substrate complex (like a lock and key). Once this complex is formed, the substrate becomes a product or products and leaves the enzyme. The enzyme can then repeat the reaction with more substrate. The enzyme is shaped so it will react with only one specific substrate.

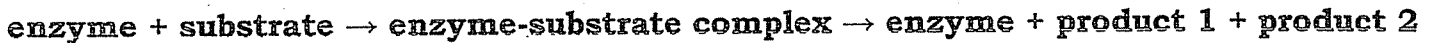
Part A: Vocabulary:

Define the following terms

<u>Enzyme</u>	<u>Substrate</u>
<u>Catalyst</u>	<u>Active Site</u>
<u>Chemical reaction</u>	<u>Denatured</u>
<u>Activation Energy</u>	

Part B

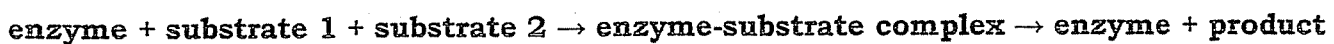
1. Cut out all of the figures in Part B.
2. Organize the cut outs on the construction paper so the pieces demonstrate this equation:



3. Glue the cut outs in the appropriate places on the paper.
4. Label the cutouts as the following compounds:
 - Enzyme = lactase**
 - Substrate = lactose**
 - Products = glucose and galactose**
5. Explain what happened - use the vocabulary words from Part A.

Part C

1. Cut out all of the figures in Part C.
2. Follow the directions as above, this time demonstrating this equation:

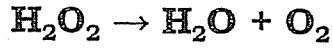


3. Glue and label the cutouts as the following compounds:
 - Enzyme = sucrase**
 - Substrates = glucose and fructose**
 - Product = sucrose**
4. Explain what happened - use the vocabulary words from Part A.

Part D

Each enzyme works best at a certain temperature and pH. Below or above an enzyme's optimal temperature or optimal pH, the reaction is slower.

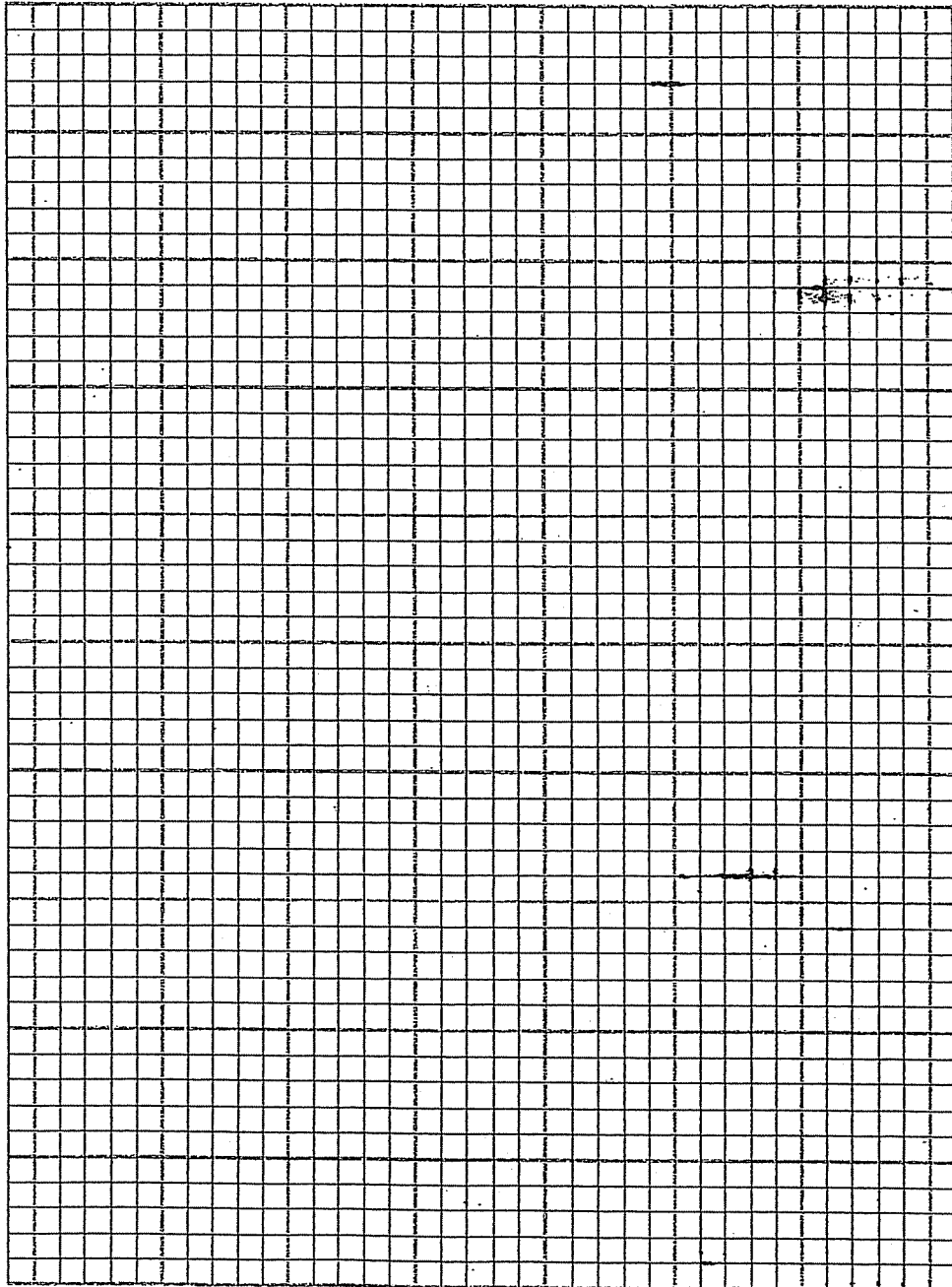
1. Using the table and grid below, graph the data to determine the optimum temperature for the enzyme catalase which speeds up the following reaction:



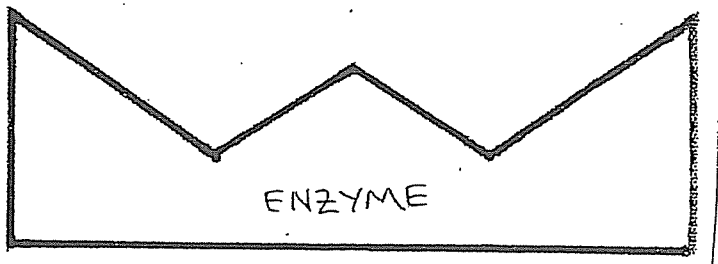
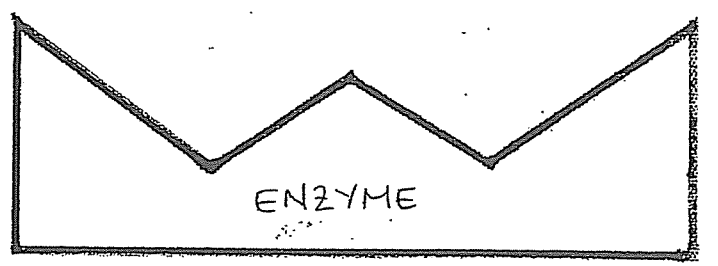
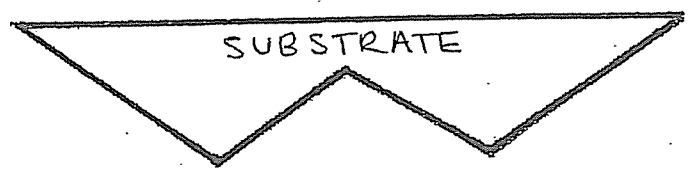
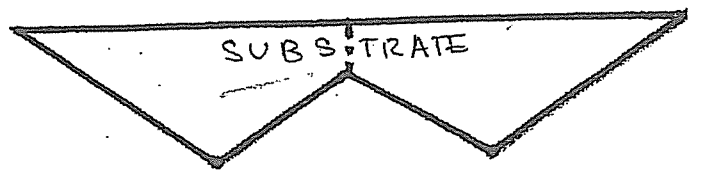
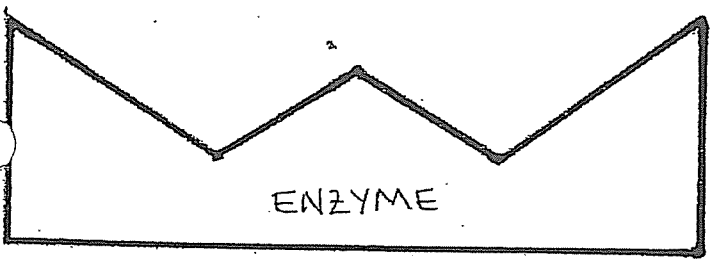
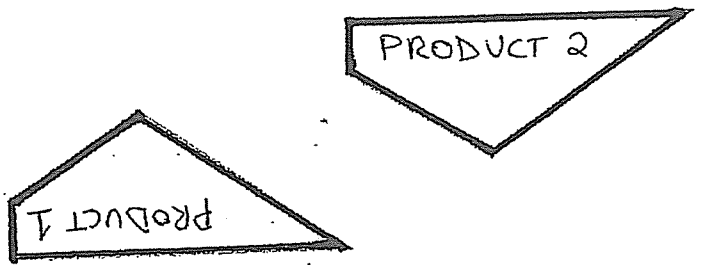
2. Describe the line that you just drew; what happens as temperature increases?

3. What is the optimum temperature for which the enzyme activity is the greatest for this reaction? _____

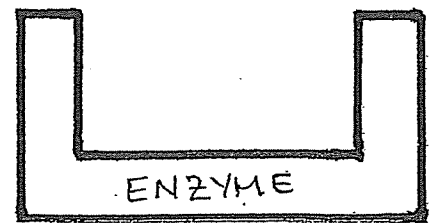
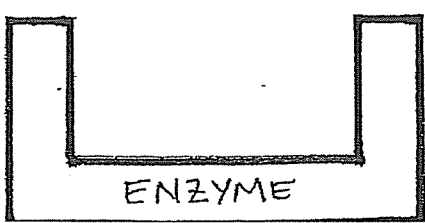
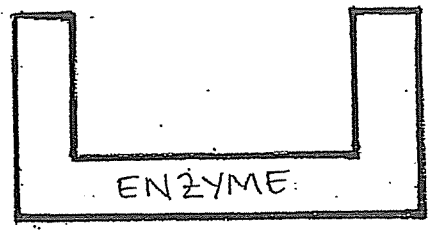
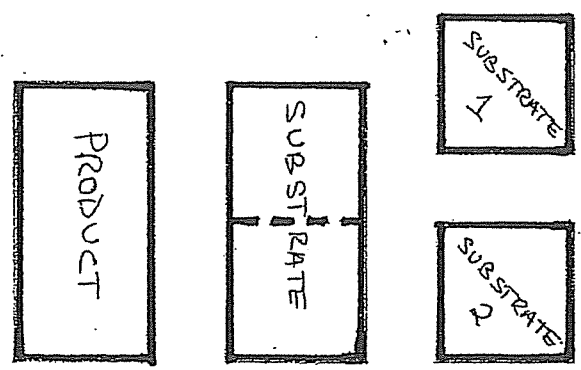
Temp (°C)	Reaction Rate (mol/min)
5	0
10	5
20	15
25	20
30	22.5
35	25
40	22.5
42.5	15
45	0
50	0
55	0
60	0



Part B



Part C



Part B

What just happened?

Part C

What just happened?