Enzyme Graphing Activity **Name:** _____

*Construct a **LINE** graph using the data below.*

Temp oC	Enzyme A	Enzyme B
0	80	0
5	90	0
10	95	5
15	80	10
20	65	15
25	45	20
30	25	37
35	8	43
40	0	59
45	0	62
50	0	71
55	0	80
60	0	86
65	0	90
70	0	95
75	0	80
80	0	60
85	0	45
90	0	25
95	0	0
100	0	0

1. What shape did the graph make (direct, inverse, exponential or parabolic)?
2. What is the optimal temperature for Enzyme A?
3. What is the optimal temperature for Enzyme B?
4. What temperature range do the two enzymes overlap?
5. Which enzyme would be found in cells living in a hot spring of 87oC?
6. Which enzyme would be found in cells living in the polar regions of the world?
7. a. What is a human being's body temp in Celsius?
   b. With the above in mind, which of the 2 enzymes would work better in the human body?

8. When an enzyme is denatured, it means that it no longer works because it is damaged. When an enzyme becomes damaged, it no longer has its original shape and it can not fit with the substrate. Why do you think enzyme A is denatured in hotter temperatures but Enzyme B is not?

*Construct a **LINE** graph using the data below. Label the x-axis (pH) and the y-axis (Enzyme Activity) and title the graph "Effect of pH on Enzyme Activity".*

pH	Enzyme A	Enzyme B
0	5	0
1	12	0
2	23	0
3	32	0
4	42	0
5	49	0
6	50	3
7	32	8
8	25	16
9	18	24
10	5	39
11	0	47
12	0	50
13	0	40
14	0	25

1. What shape did the graph make (direct, inverse, exponential or parabolic)?
2. What is the optimal pH for Enzyme A?
3. What is the optimal pH for Enzyme B?
4. What pH ranges do the two enzymes overlap?
5. Which enzyme would be found in the stomach of a human being?
6. Which enzyme could survive in a bucket of bleach?
7. Which of the 2 enzymes would be denatured in lemon juice (ph 3)?
8. What happens to enzyme A at a pH of 12?

Review

9. What happens if an enzyme's active site becomes damaged?
10. Name two ways an enzyme's active site can become damaged.
11. Betty tests positive for lactase but she can still not drink milk or eat cheese without violent stomach cramps and diarrhea. What is one possible reason for this situation?
    What type of molecule does lactase break down?
12. Many drugs, like cocaine, work through competitive inhibition. This means that they block an enzyme's active site and do NOT allow the substrate to bond with the enzyme. How can this be harmful to an individual?