

DATA TABLE AND OBSERVATIONS

1. Record your results in the data tables.
2. For each data table total each column and find the average for each column.

Data Table 1: Liver

Trial	Start Temp	30	1	1:30	2	2:30	3	3:30	4	4:30	5
1											
2											
3											
Total											
Average											

Data Table 2: Potato

Trial	Start Temp	30	1	1:30	2	2:30	3	3:30	4	4:30	5
1											
2											
3											
Total											
Average											

Data Table 3: Carrot

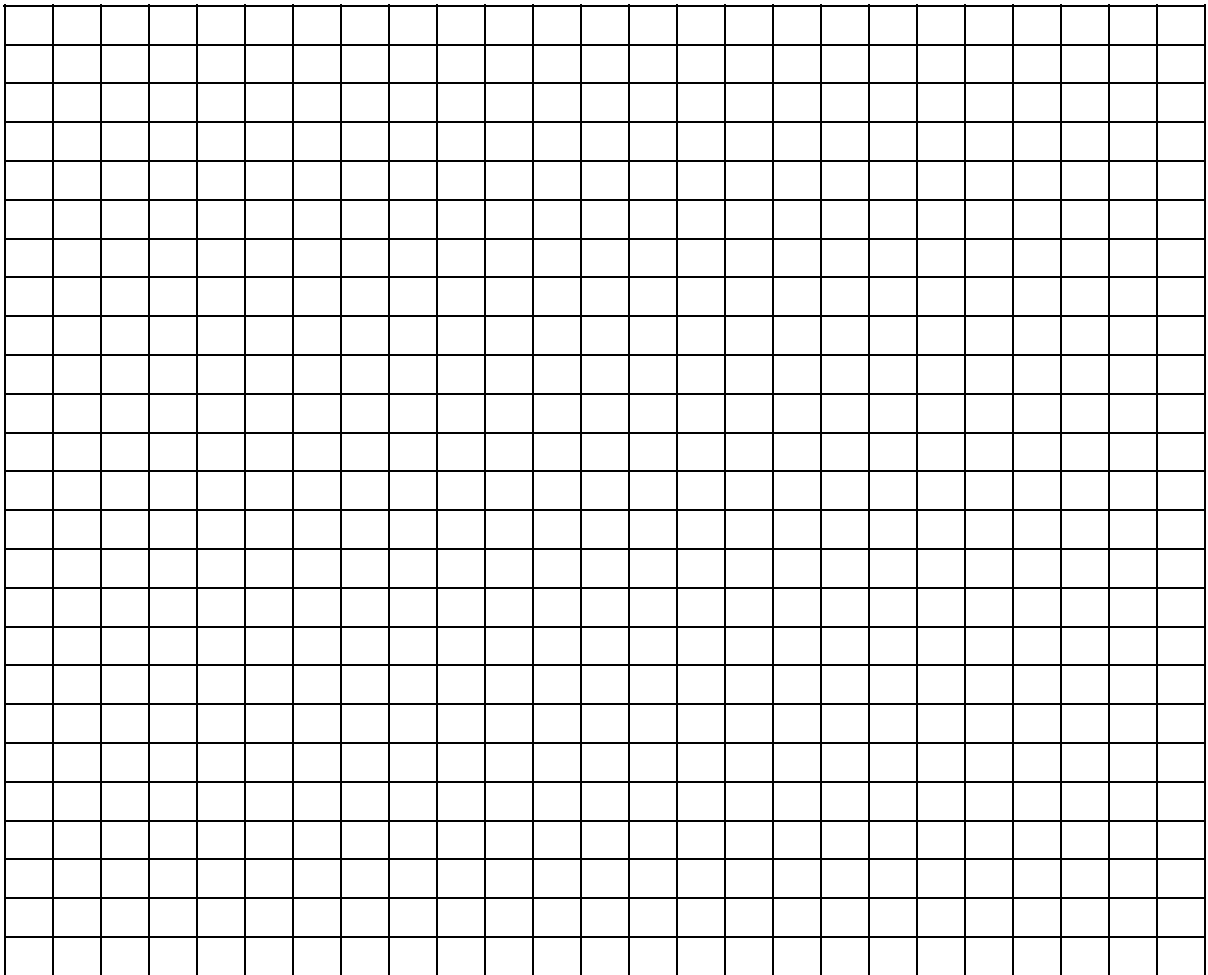
Trial	Start Temp	30	1	1:30	2	2:30	3	3:30	4	4:30	5
1											
2											
3											
Total											
Average											

Data Table 4: OBSERVATIONS

Item Tested	Activity Assessment 5 = most active 1 = least active	Observations Explain what you saw.

Data Sheet 5 : The Graph

Graph your average result from each data table (liver, potato and carrot). Place a dot on the graph for the average starting temperature and for each temperature $\frac{1}{2}$ minute through 5 minutes. Connect the dot with lines. Use different colors to represent liver, potato and carrot. Be sure to place a legend below your graph to explain your data.



SUMMARY:

1. Explain your results.
2. What conclusions can be made from this data?
3. Does that data agree or disagree with your hypothesis.

6. Laboratory Rubric

Criteria	4 pts.	3 pts.	2 pts.	1 pt.
HYPOTHESIS	Hypothesis is clear, states the problem. Hypothesis is in statement or question form.	Hypothesis is clear, states the problem. Hypothesis is not in a statement or question form.	Hypothesis is not clear, and /or does not state the problem.	No hypothesis.
PROCEDURE	Has a team leader, materials manager, and secretary. <ul style="list-style-type: none"> • Follows directions of the lab. • Uses appropriate equipment Accurately measures solids and/or liquids	Has team leader, materials manager and secretary. Follows direction of lab.	Follows direction of lab.	Does not follow procedure.
ACTIVITY	All members in group are: <ul style="list-style-type: none"> • participating in lab • following directions • contributing to data sheet 	Most members of group follow directions.	Group did not follow all directions. Lab completed but group did not work together or follow directions.	No directions or cooperation. One student worked the lab but continuously asked for help from teacher or other lab groups (peers).
SUMMARY	Clear concise summary that addresses their hypothesis Data sheet is complete. Graph is complete and correct . Lab report is turned in to teacher in a timely manner.	Summary is not clear, but it addresses hypothesis Data sheet is complete. Graph is incomplete. Lab report is turned into teacher.	Has a summary, but is does not address hypothesis. Data sheet is complete. No graph. Lab report is late.	No summary. Data sheet is incomplete. No graph Lab report is late or not turned in.

7. Written Assessment

Students will write an essay describing enzymatic action in a biological system. The essay should encompass the following information:

- A. A definition of enzyme.
- B. Describe the importance of enzymes in biological systems. Why are they necessary?
- C. What evidence demonstrated that energy was produced when hydrogen peroxide was introduced to liver, potato and carrot?
- D. What laboratory evidence supports the statement; Energy is fundamental to biological processes.
- E. Explain the Law of Conservation and its application to enzymatic reactions.