THE HILL REACTION: POST-LAB ASSIGNMENT

Name:

Lab day and time:

(Attach Fig. 1,2 and 3 to the back of this report)

I. The effects of light intensity on Photosynthetic rate

To determine the effect of light intensity on the rate of DCPIP reduction (which is equivalent to the rate of photosynthesis) you must do the following:

Figure 1 (1pt)

Plot absorbance (vertical axis) vs. time from zero for each tube using the results from tubes 1-6. Determine the rate of DCPIP reduction (rate of photosynthesis) from these graphs. Use the portion of the graph before the absorbance reaches zero to determine the slope. Include a caption and label the axis correctly.

Fill in the following table with the rates which you determine using the graphs as described above.

Tube #	**Rate**
1	
2	
3	
4	
5	
6	

Figure 2 (1pt)

Construct a second graph showing light intensity (x-axis) vs. rates (y-axis). Plot the absolute value of each of the rates vs. light intensity (1/distance 2) for tubes 2-6. Remember that tube #6 was foil wrapped! Connect the data points with a smooth line.

Look carefully at your graphs and use them to answer the following questions. We expect carefully constructed, concise, full answers. Use the back of this sheet if you need more room for your answer.

1.(1pt) How is the rate of photosynthesis related to light intensity?

2.(2pt) Did the experiment demonstrate a maximum rate of photosynthesis at any of the distances? Would you expect a maximum rate? Why or why not?

3 (2pt) Is there a level of light intensity that you tested at which photosynthesis no longer occurs? What is the intensity of light necessary to support a minimum rate of photosynthesis?

4.(1pt) What was the purpose of tube #1? Were there any changes in absorption over time for tube #1? If so, explain why.

II. The effects of temperature and Atrazine on photosynthetic rate

Figure 3 (1pt)

Plot absorbance vs time for tubes #7 and #8 (same way as in Fig.1). Determine the rates of photosynthesis for these tubes and record in the table below.

Tube #	**Rate**
7	
8	

Answer the questions below using the rates for tubes #7 and # 8 and the rate for tube #3.

1. (1pt) What was the effect of heating the chloroplasts on photosynthetic rate?

2. (2pt) Why did this happen? Think about the effect of temperature on protein structure and function.

3. (1pt) What was the effect of Atrazine on photosynthetic rate?

4. (2pt) How does the herbicide Atrazine kill weeds? Explain the actual mechanism.