Biology 3A Laboratory **Name:** _____
Cellular Respiration Worksheet **Lab Section:** _____

DID YOU REMEMBER TO BRING YOUR USB THUMBDRIVE TO LAB TODAY?

A. Aerobic respiration in germinating peas

1. Upload the data from the Pasco Xplorer LX to Excel and graph the CO_2 production data as a function of time for the normal and the freeze/thawed peas. Add a trendline with the slope of the line equation and the R^2 value for both types of peas. Calculate the slope of each line and enter them on Table 1. The slope of the line is the **respiration rate** (ml/min or ml•min^{-1}). Calculate the mass-specific CO_2 production.

Table 1. Mass specific carbon dioxide production (ml/min/g) for normal and freeze/thawed peas

Tube	Contents	Slope (ml/min)	Peas mass (g)	Mass-specific CO_2 production (ml/min/g *or* ml min^{-1}g^{-1})
1	Normal peas			
2	Freeze/Thaw			

2. State a reasonable hypothesis for this experiment.

3. Using Excel, graph the mass specific CO_2 production for the peas that would support your hypothesis.

4. Did freezing and then thawing the peas inhibit respiration? What was the percentage of inhibition? **Show your work below**.

5. Why was it necessary make the mass-specific determination?

6. If you repeated the experiment with half as many seeds, how would the respiration rate (slope of the line) be different?

7. Would the mass-specific respiration rate be different for the sample from question #6? Explain.

B. CO_2 production during aerobic respiration

8. State a reasonable hypothesis being tested in this experiment.

Table 2. Data for CO_2 production during aerobic respiration

Tube	Total mass of Organism (g)	ml of NaOH	Relative respiration rate (ml NaOH)	Resp. Rate/ g of organism (ml NaOH/ g of organism)
Goldfish				
Elodea				
Control	-----		-----	-----

9. Briefly explain why *Elodea* was placed in the dark.

10. What most likely contributed to the observed differences in respiration rate between organisms?

11. Explain why you think goldfish were chosen for comparison.

C. Anaerobic respiration –

Please record the 30 minute values on the computer for each fermentation tube.

Table 3. Amount of carbon dioxide produced (measured in mm) as a result of anaerobic respiration in yeast

		Time (minutes)						
Tube	**Contents**	**0**	**5**	**10**	**15**	**20**	**25**	**30**
1	DI H_2O							
2	Sucrose							
3	Corn syrup							

12. Which is (are) the control tube(s)? Which are the experimental tube(s)?

13. Smell the contents of the tube containing the most CO_2. Describe this smell?

14. Consider the results of this experiment. Use the 30-minute data from all the group results to answer this question: Can yeast utilize all of the sugars equally well?
    a. State a reasonable hypothesis for the question above
    b. Run the appropriate statistical analysis for your hypothesis
    c. Construct an appropriately labeled graph for the results (do not forget to report the calculated p-value and if it is a one- or two-tailed analysis)