**Nedwidek DOUBLY Revised LABORATORY REPORT EXERCISE #5 (revision 2, Nov 21, '12)**
**LABORATORY QUESTIONS: Acids, Bases, Buffers, and pH in Biology DUE NOV 27, 2012!!!**

Name _____Section_____ Teacher_DR. NEDWIDEK_ Date_____

## I. PRE-LAB EXERCISE: Define the following terms below:
1) Acid:

2) Base:

3) Neutralization:

4) Buffer:

## II. DATA PROCESSING: Group the class and individual data generated previously as follows:
With the high acid to low acid to low base to high base amount arranged ordinally as the independent variable, plot the pH generated by all classes (this is in both the whole and partial spreadsheet I sent you) as keyed and symboled data sets for each of the following 6 groups of class averages: water chamber, pH 4 buffer chamber, pH 10 buffer chamber, apple juice buffer chamber, cranberry juice buffer chamber, potato extract buffer chamber. Connect each data set of points with a solid line. Plot your data (whatever it was) as keyed and symboled data sets on the same graph and connect each set of dots with a dotted line. **Attach** your **ORIGINAL data record** (returned to you in class) to the plot.

## III. SUMMARY QUESTIONS: Please type your answers to the following questions and attach them:

1. What is the dependent variable in this experiment? Do you expect the values of the dependent variable to be the same or different in unbuffered versus buffered conditions? Why or why not?

3. Describe the effect of adding ACID to water, to buffer range 4 (yellow), and to buffer range 10 (blue). Was there a difference for each? Why do you think so?

4. Describe the effect of adding BASE to water, to buffer range 4 (yellow), and to buffer range 10 (blue)? Was there a difference for each? Why do you think so?

6. What is the value of plotting the pH ranges for the water chamber versus the pH ranges for the buffer chamber?  Compare the buffering capacity of the pH 4 range and the pH 10 range.  What is the difference between them?

7. What are the effective buffering ranges of apple juice versus cranberry juice versus potato extract?  On what basis do you make these determinations?

8. What are the major shortcomings of this experiment?  Address the significance of the fact that the class averages generated do not deal with the same number of measurements for each condition.  Does this concern you?  Do your data sets agree with the class averages for the same classes of data?  Why do they or do they not, and what is the significance of this?

8. Read about the carbonate buffer system in humans. Very briefly explain how this system helps maintain pH stability in our bloodstream.

**Closing Declaration:** At the close of this lab report, I can attest to having done it by my own sore hand, regardless of how frustrating and time-consuming it was.  If I received help from peers or from tutors in doing it, this was purely to sanely understand the material and still get some sleep, and I did not knowingly transfer information from or to other sources (my peers or otherwise) in the process of doing this work.

**Student Signature: _____ Date: _____**

**Lab Completed Satisfactorily_____**
                        **Teacher   Signature**