BIOTECHNOLOGY LAB REPORT FORMAT

GENERAL INFORMATION: ALL lab reports follow the same classical organization and format. They should be *neatly* written in your science lab notebook. Every section of the lab report should be written in **no first person "I" or "we" except in the analysis**. *Example: Four test tubes were assembled in a test tube rack. To each tube, 4 ml of H20 was added.* Lab reports will be ***due one week after*** the completion of the experiment, unless instructed otherwise. The reports should be organized according to the sections described.

1. TITLE

Write the lab number and title at the top of the page. Make sure it is in your table of contents of the science lab notebook. The title should indicate what the lab was all about. Be brief, but indicate the nature of the investigation. What was the question being investigated? Specifically what was being observed? Try not to exceed 5 words.

2. INTRODUCTION: (From Your Lab Ticket or Lab Introduction)

While you should assume your audience has some knowledge of the lab topic, the main purpose of this section is to give the reader the necessary understanding of the experiment so that they can interpret your results. A second vital purpose is to include any known facts from past research, so that you can refer to these in your analysis. Use the introduction to the lab to get you on the right track. **Don't just copy the information**. Give me enough information that an uneducated person reading the report would have enough background to understand what is going on.

3. PROBLEM: QUESTION?

State a testable scientific question based on some information or observation, which is written as a question?

4. **HYPOTHESIS:** always include *an explicitly stated **hypothesis*** of what you expect to occur during the experiment. Make an "if ... then" statement. *"If this variable is adjusted, then this should happen to the experimental data."*
5. **EXPERIMENTAL DESIGN: variable chart (if applicable), material list, and procedures**
   - **MATERIALS:** This can be a list
   - **VARIABLE CHART:** Show the control/experimental groups and variable types
   - **METHODS:**
     Lab procedures should always be presented clearly, so that a person who has not done the activity can duplicate the lab *exactly*. ***All steps should be numbered*** and a line skipped between steps for clarity. Include diagrams of your lab set-up if it helps understanding.

6. DATA:

Most of the time **a data table** and accompanying **graph** is the best way to report this. Use a straight edge when making your tables and make sure they are "roomy" enough for the data. *Always use the proper units!* Remember that on graphs, the independent variable goes on the x-axis and the dependent variable goes on the y-axis. Always use graph paper (or computer-generated graphs) with the essentials: title, both axes labeled with units, and a legend. A good data table or graph can be taken completely out of the context of the lab report and still be properly and correctly interpreted. If the lab is "observational" in nature, you would include diagrams and/or descriptions of structures, chemical reactions, behaviors, etc... **DO NOT FUDGE YOUR DATA**! Put only the data that you, or your lab group, or the class collected, not what you think that you should have seen. Please number your observations. *(EX. = colors of a product, solutions that spilled, difficulty you had performing a certain aspect of the lab, texture, smell, unusual behaviors of experimental subjects)*

7. ANALYSIS:

This is the heart and soul of your report. *No report will receive a grade without an analysis.* If there are questions on the lab, use those as guides as to what to include in the analysis section. This is the *ONLY* place in the lab where you should be *interpreting* your results. We will use the **REE,PE,PA**" method in this class. First, "**REE"** means "results", with "evidence" and "evidence" which means to summarize the data from tables and graphs in words to validate your arguments. This does not mean a parrot-like recitation of all the data when you've already given it in a table. It means: look at the data from the experiment for *trends*, refer to your actual data numbers to show a point. Don't just use qualitative terms like: "Group 1 had a larger amount." *Better said: Group 1 had 33% less cavities.* You've taken the raw data, performed a calculation, and used it to underscore a trend.

"**PE"** means identify the sources of experimental design errors that would lead to fallacious data. After you've decide which errors are relevant - which were so large as to invalidate the experiment? How might have your observations affected your results? Analyze WHY you got the results you did ... BE SCIENTIFIC ! *THINK!!!* This is your chance to show you understood the experiment. If there are ways to improve the lab, mention them here.

8. CONCLUSION:

This section is the "**PA"** (practical applications) where you discuss the meaning or value of the experimental results. This can be fairly short. It should answer the question in the purpose. Make sure to include whether you hypothesis was supported or refuted. Avoid "wordy" phrases that are unnecessary and do not add to the report.
Poor example: *" In this lab, it was first concluded that the best or optimum pH for bean seed germination was 5.6".* Better example: *"The optimum pH for bean seed germination is 5.6."*