Experimental Design Pre-lab Design Protocol- Assignment #1 (11 Questions, 30 marks)

This assignment must be completed in lab and is due by the end of the lab on **July 7th**

1. What is the problem or question you have sought out to answer? Be sure that your description includes known factors (what is already known about the problem(s)) and unknowns (what your study is trying to understand). Then restate the problem in the form of a question or questions that will guide your research. (3 marks)
2. What do you already know about this problem and/or the organism you will be working with. (2 marks)
3. Using what you know about the problem, state the hypothesis. Remember from BIOL116, a hypothesis must be a testable statement. (2 marks)
4. Look over your hypothesis and define the variable(s) you would use to test your hypothesis? What would be your independent and dependent variable? Next describe the predicted relationship among your variables or describe what relationships have already been found. (3 marks). Need a memory jog on variables? Revisit the content from BIOL 116 - <https://ubco-biology.github.io/BIOL-116-Lab-Manual/designing-the-experiment.html>.
5. What is your “experimental group” and what are your treatment levels? What is your “control group”? What is your sample size? (3 marks)
6. What “data” would you collect? For each variable you would be collecting data on, list the data type and measurement i.e., is it numeric or categorical? If it’s numeric is it discrete or continuous? Is it ratio or interval? If it’s categorical is it nominal or ordinal? For numeric data, what will your units be and to how many decimal places will you record? (2 marks)
7. In detail, describe how you would go about replicating this experiment. How many “runs/trials” would you complete? The experiment will have a control and a treatment group. Make sure you have clearly identified these groups. Outline the methods you would use in order to replicate this experiment. Review the content on “Designing the Experiment” from BIOL116 if needed - <https://ubco-biology.github.io/BIOL-116-Lab-Manual/designing-the-experiment.html>. Make sure you have completed a detailed schedule day by day. (5 marks)
8. How would you record your data? Would you use a simple table in excel? Draw a quick sketch of the table you will use to record your data. Remember to think about the relationship between your recorded data and the principles of Tidy Data to facilitate analysis - <https://ubco-biology.github.io/Procedures-and-Guidelines/tidy-data.html>. (2 marks)
9. How would you manage your data (3 marks)?
   1. Where would you store your data (usb key, external hard drive, laptop, UBC OneDrive etc)?
   2. What file naming conventions will you use for your
      1. Data
      2. Report
      3. Figures & Images
   3. What directory structure would you use for your data? Take a screen shot of or sketch out your directory structure including all appropriate readme files – the readme files don’t need to have content yet, they just need to be created as placeholders.
10. How would you try to limit experimental error, biological variation and also increase your statistical power? (2 marks)
11. List all the equipment and supplies that you would require to conduct your experiment. Ensure you have determined the amount you would need for the duration you would need. (3 marks)