***Laboratory Report : Science in My Backyard***

Following the "Mystery of the Backyard Holes" presentation and discussion, consider a "scientific" investigation in your own backyard, home, office, school, etc. Your assignment is to come up with a research question that you wish to address, plan a scientifically-based method for researching your question, and carry it out. You will report your investigation in the form of a formal lab report. Remember from your course syllabus that each lab report (there will be 3 of them during the semester) is worth 5% of your course grade.

You should have come prepared to class todaywith written answers in your lab notebooks to the following questions/statements:

1. What problem could you investigate in your own backyard, home, or workplace? Describe the problem in your own words.
2. Describe the observations that led to the research question being asked.
3. Write out a hypothesis statement(s) that you wish to test during your investigation. It is possible to have more than one hypothesis during your investigation, just make sure that each is stated separately and clearly. It may be helpful to number your hypothesis (if more than one) and refer to the hypothesis by number later on in your lab report.
4. Come up with one way that you could test your hypothesis. Give as much detail as possible.

We will discuss your research plans in class today. You should then conduct your research investigation and compose your formal lab report at home. **Your formal lab reports will be due at the beginning of class on XXX.**

Your lab report should be 3-5 typed pages, double spaced with 1" margins and 12 font type, and will consist of the following sections:

1. Title
2. Abstract

The abstract should be a brief description of the research being conducted. It should include a **concise** summary of the research question, the methods, and the results.

1. Introduction

The introduction should include a detailed description of the problem being investigated. You should include your initial observations that caused you to ask the research question that you are addressing in the project and any background details that you know before conducting your investigation. You should clearly state your hypothesis statement(s) and describe the rationale for putting this hypothesis together. You should also include a very brief statement of the methods you will be using to investigate your hypothesis. You should not go into details of your methods -- save the details for the methods section.

1. Methods

The methods section should be a **detailed** description of the methods you used for investigating your hypothesis. It should include a description of any equipment used, the timing of your experiments, the protocol for your experiments, etc. You want to include enough detail that another scientist could replicate your experiments following the information you provide.

1. Results

The results section will include any observations made, data collected, etc. You should **both** describe the observations, data, etc. in words, **and** include graphs, photographs, and/or figures to enhance your results section. Start with an overview statement of the general trend in your data and then go into more detail about individual data points, averages, etc. that will present a full picture of your results. You should use the text to describe the patterns, trends, etc. that you observe in your visuals (graphs, figures, etc.) and draw the reader's attention to these trends. It is helpful to clue the reader into the fact that you're discussing one of your figures by using notations such as "As illustrated in Figure 2…." You should not discuss whether or not your results support your hypothesis or not in the results section; save this assessment for the discussion section of your report.

1. Discussion

The discussion section should begin with a discussion of how/if your results support or reject your hypothesis. Following this sentence, you should discuss the major results of the experiment/investigation and go into more detail about **how** these results support, reject, or modify your original hypothesis.

1. Conclusion

The conclusion section should be your "wrap up" to your report with some final thoughts. You should consider what your results mean in the larger scheme of things -- are there any implications to your results? Were the results what you expected? What questions are remaining in your investigation that you didn't answer or didn't fully answer? How might you go about investigating these questions further? Did your results raise any new questions? What might you have done differently now that you have some more experience?

You should consult the Grading Rubric on the Lab Report Evaluation sheet provided to guide your preparation of your lab reports. One note: It is perfectly okay for your results to discredit your hypothesis! That is part of the learning experience and the process of doing science. The important thing is that you developed a well thought-out hypothesis and that you discuss how your results support or reject your hypothesis.