Lab Report Guidelines (M21)

Due date: July 21st, 2014

Minimum Length: 4 pages FULL of content (not including a title page)

Your lab report should contain the following **Labeled** sections:

1. **Abstract**- This is a one paragraph summary of your entire report. It belongs at the beginning of the document, below the title, although it is often best to write the abstract after finishing the other sections (since it's a summary of the report)

2. **Introduction**-This outlines the physical principles which your are testing as well as your expectations. It should contain any equations which your are testing and any derivations (i.e. conservation of momentum, determining the final velocity of the pendulum using the principle of conservation of energy, etc.) Make sure to cite the sources from which you get these equations.

3. **Procedure**-Briefly outline how the experiment was conducted in 2-3 paragraphs. This should explain how *you* conducted the experiment honestly and should *not* be instructions for someone else to conduct the experiment. You can put pictures or diagrams of the experimental apparatus in this section.

4. **Results**-One or two paragraphs explaining your data (which should also be listed in a table and/or displayed in a graph) as well as comments on the precision with which the data was measured and any known or suspected sources of error in the measurements.

5. **Conclusion**-One or two paragraphs explaining whether or not the results agreed with your expectations or not. If the results were in agreement with your expectations, discuss the limits of the experiment's accuracy in verifying your hypothesis and quantitatively to what degree it matched with your expectations. If the results do not match with your expectations, explain how the sources of error you mentioned in the "Results" section influenced the discrepancy and what improvements you could make if you were going to try the experiment again.

6. **Works Cited**-List any works referenced in your lab. You should at least reference your textbook, and maybe the lab handout. Format can be similar to any peer-reviewed scientific or engineering journal.

Other important things:

- This is an individual effort. Everyone needs to write his or her own report.

- Be quantitative whenever possible. (i.e. We measured the distance between photogate eyes using the digital calipers to an accuracy of 0.1mm

NOT The measurements of the distance between photogate eyes were taken very carefully.)

- Make sure to put captions under any diagrams, pictures, tables, or graphs. The captions should briefly explain to the reader what they are looking at. (i.e. Figure 1. Diagram of the experimental apparatus with (a) the pendulum (b) the launcher, etc.)

- Science cannot prove anything absolutely true! The process of deduction only allows us to test hypotheses and verify that nature/physics agrees with our hypotheses within some range of validity. Through many tests of different kinds we gain confidence that our hypothesis does in fact represent reality and maybe, just maybe, we will call it a theory.