**Elements of a Laboratory Report**

There is no fixed format for a laboratory report but here are some guidelines:

**Abstract:** A brief concise summary paragraph describing the experiment's purpose, what was done, the results and any conclusions.

**Introduction:** A brief overview of the physical principles involved in the experiment. It should not be exhaustive but should also not assume the reader is fully knowledgeable in the details of the topic.

**Purpose:** The reason why the experiment is being performed. Often simply put in the abstract.

**Hypothesis:** The experimenter's prediction of the outcome. Often written as an if-then statement.

**Materials and/or Apparatus:** A list of the equipment used in the experiment. It is not included in the presented portion of a published report.

**Method and/or Procedure:** A step-by-step description of what was done in the experiment. It is written in the past tense and should not contain personal pronouns (as should not any part of the report). “Refer to the procedure outlined in <insert title here>” is sufficient when the procedure is provided. Changes to the procedure, however, must be noted. This section is not included in the presented portion of a published report.

**Data and Analysis:** The analysis consists mainly of any calculations made with the data (e.g. the velocity calculated from a distance-time graph), however the actual calculations should not always be presented but rather placed in the appendix unless important. The measured data is also presented in this section and should be done so efficiently, often as a graph. If the data tables are not presented (e.g. in a case where the data is presented as a graph), they can be included in the appendix. No conclusions should be made in this section. All tables and graphs must be done properly and calculations done with proper units, symbols and significant figures. This section should not simply be an array of graphs and tables with calculations but should all be tied together with a flowing dialogue.

**Error Analysis:** Error is often discussed in the discussion section but the calculation of uncertainties warrants occasionally its own section.

**Discussion:** This section is a discussion of the results of the analysis and a critique of the success of the experiment with a focus on errors. It should be written up in full paragraph form. The efficacy of the experiment (i.e. its success) and any errors affecting the results (there are always errors) are discussed. Note that human error is assumed, is to be minimized, and should not be mentioned. If human error is a major source of error, the experiment was performed poorly. Suggestions on how to improve the experiment to minimize errors should also be included with this discussion. This is the section in which to answer any questions given in the experimental procedure. As the outcomes are discussed here it is natural that the conclusion is often included in the discussion.

**Conclusion:** Here any conclusions derived from the analysis of the data are stated and discussed. An overall conclusion of the report is also appropriate at the end of this section but that is not the focus. This section is occasionally incorporated into the discussion.

**Appendix:** A section to place all extra data and calculations deemed superfluous in the main body of the report. Note the same calculation should not be repeated in the report, rather one sample calculation is sufficient.