The purpose of a laboratory report or research report is to communicate to others the data you have collected in an experiment that you have performed, and what you think this data means. A typical report contains the following sections (numbered here only for convenience):

1. **TITLE**
   The title of a report should indicate exactly what you have studied.
   
   The Effects of Light and Temperature on the Growth of the Bacterium *Escherichia coli*.
   
   If a large number of variables or organisms were used, the title could say 'Several Factors...' or 'Various Chemicals...' However, you should aim to be as specific as possible. It is unnecessary to include words such as 'Observations on the Effects of...' or 'A Study on the Effects of ...'

2. **ABSTRACT**
   The abstract is a condensed version of the entire paper. It allows a reader to determine the purpose, methods, results and significance of your report quickly without having to read the entire paper. To reflect the content of the paper accurately, the abstract should be written after the final draft of your paper is complete, even though it is placed at the beginning of the paper.

3. **INTRODUCTION**
   Why did you study this problem? The introduction should:
   
   • name the problem or issue and give background information (historical and/or theoretical) about that problem.
   • contain a brief literature review which should describe previous research done on the topic and how the current experiment will help to clarify or expand the knowledge. All references to previous study should be properly cited using the appropriate style, e.g. APA style.
   • end with a purpose statement. This is sometimes expressed in the form of an hypothesis, i.e. one sentence which specifically states the question your research is designed to answer. If a statistical hypothesis test is being conducted for the experiment, a null hypothesis should be stated. In short, the null hypothesis asserts that the results arose due to chance alone. Check with teaching staff for clarification.

4. **MATERIALS AND METHODS**
   What did you do? How did you do it? The materials and methods section describes how you did your work, including:
   
   • experimental design
   • experimental apparatus
   • methods of gathering and analysing data
   • types of control.
   
   This section must be detailed and clear enough so that readers could duplicate the experiment if they so wished. It is written in the past tense because you have already done the experiment. Methods adapted from other sources should be referenced. Photographs, maps and diagrams may be useful to help describe the experimental set-up.

5. **RESULTS**
   What did you find?
   In this section, you should present your observations and data, but with no interpretations or conclusions about what they mean. Tables and graphs should be used to supplement the text and to present the data in a more condensed form. Trends are best illustrated or summarised in graphical form. Use the past tense to describe your results, e.g. 'At the highest temperatures tested, bacterial growth was reduced....'
6. **DISCUSSION**

   **What does it mean? How does it relate to previous work in the field?**
   - Describe patterns and relationships that emerged from your data.
   - Explain what you think your data mean. Compare your results to trends described in the literature and to theoretical behaviour.
   - Offer alternative explanations as to why your results may have differed or been similar to related experiments. Explain any changes to, or problems with, the experimental procedure that may have affected the results.
   - Support interpretations, whenever possible, by references to the lab manual, the text, data presented or other studies from the literature.
   - Remind the reader of your own results, when relevant, **without** repeating large sections from the Results section. If your lab manual includes questions to be answered in the Discussion, integrate your responses into a logical discussion rather than answering them one by one (unless you have been instructed to do so). Do not include only the answers to the questions. Use them as guidelines for supplementing your own discussion, not limiting it.

7. **LITERATURE CITED**

   Also called References or References Cited, this is a list of only those papers mentioned (cited) within the report.

8. **TABLES AND FIGURES**

   Tables and figures are often used in a report to present complicated data. Use the following guidelines to incorporate them effectively:
   - Each table or figure must be introduced within the text, and the comment should highlight the main points.
   - Tables and figures are numbered independently of each other (i.e. Table 1 and 2, and then Figure 1 and 2 as well). Numbers are assigned according to the order of first mention in the text.
   - Each table and figure must have a self-explanatory title so that the reader can understand its content without referring to the text.
   - Tables are referred to as tables, and all other items (graphs, photographs, drawings, diagrams, maps, etc.) are referred to as figures.
   - Tables and figures may be placed at the end of a paper, or within the text. Check with teaching staff for their preference. If placing them within the text, do so as soon as possible after they are mentioned, without interrupting the text, i.e. at the end of a paragraph or section.

9. **REFERENCES**

