

# Project Write-Up Guidance

The following is a general outline for a project report. Some items mentioned below may be relevant to your report while others may not be relevant. It is important to compose a concise, chronological and/or procedural development, analysis and results of your project that can be easily read and understood by others not necessarily familiar with the topic. Generally, your report should address the following:

**Title Page.** Your report should have a title page, in accordance with the DOWW.

**Abstract.** *Font: Times New Roman, size 12, single-spaced.* As you progress through the curriculum, you may be asked to include an abstract. An abstract is a one-page document providing information on what the project concerns, the bottom line results and conclusions. An abstract whets the appetite of the reader and draws the reader into reading the entire document. Think of this as the Superintendent's version of your work. The Superintendent is a very busy person and does not have time to read and digest every project report that he may be responsible for. It is your job to distil your analysis into a concise document where he can get the idea of what you found. The most important component of this document is your findings. This page is not numbered and does not count toward any "page budget".

**Table of Contents.** As you progress through the curriculum, you may be asked to include a table of contents. Outline each major section of your report and identify its location in your document.

**Main Body** *Font: Times New Roman, size 12, double-spaced.*

- **Background.** Provide a general description of the context of the problem you are trying to solve. Assume that the reader was not privy to the reading contained in the project handout, or preliminary research. Start by stating the problem that you are going to solve as well as why it is important, interesting or worthwhile to solve.
- **Facts.** State known facts that influence the question. You can and should include any given data or circumstances. Examples are the actual data (tables, figures, etc.) from your project hand-out or initial research.
- **Assumptions.** Assumptions need to be both necessary and valid to solve the problem. These are items of information not known as facts, but which you must assume in order to address the real-world problem. Each assumption must have an explanation why it is both valid (reasonable) and necessary for your mathematical model. Many times, assumptions are based off some insight about the current situation.
- **Analysis.** Provide a detailed description of the logical investigation of the question you are answering. This section is very specific to your project. Make sure you clearly define all your variables and state the domain of these variables such that people will understand what you are talking about. Within your detailed description of the logical investigation of the question; incorporate mathematical symbols, expressions, pertinent graphs, tables, and calculations with coherent sentences to convey meaning. Include enough discussion of the mathematics such that a reader could replicate your procedures. **Do not** simply write line

after line of unexplained equations or provide a laundry list of tasks that you have performed. When the calculations get too involved, or where the result of a computer program is too large, you should include some of the data and printouts in an appendix. The computer program that we use has an equation editor to make mathematical formulas. It is not hard to use and it adds a professional touch to your work. For example:  $f(x) = x^2 + e^x - \pi$

- **Discussion of Results.** Provide an interpretation of the results obtained from your model. This is the thinking and reasoning part of the report that logically weighs the evidence developed in the analysis. Discuss the meaning of the mathematical analysis in the context of the original problem's setting. (Transforming the *Math world* to the *Real world*). Address the pro and cons of courses of action or be prepared to conduct sensitivity analysis (what if the value of  $x$  changes to ..., etc.) Address the effects of the assumptions not being valid. The key is that you describe what is happening mathematically in English. Try to explain it so that your mother or father or anyone else who is reading your work can understand your work no matter how strong their mathematical background.
- **Conclusion and Recommendations.** Present your conclusions attained from your results and the recommended course of action dictated by your analysis and results. Several courses of action can be prioritized, but a clear recommendation should be made. Also include any recommendations on how to improve the quality of the current study (e.g., by considering factors that the current study assumed negligible, by varying the assumptions, by adopting a different analytical approach, etc.) Provide suggestions for further study if more time and resources were available.

**Appendices.** *Font: Times New Roman, size 12, single-spaced.* Appendices are appropriate if the project involves large amounts of tabulated data (such as spreadsheet calculations or Mathematica notebooks), annotated sample calculations, detailed mathematical derivations, supporting plots and graphs, computer output, data lists, or supporting material which may be essential to the completeness of the submission, but which would be distracting or unwieldy if placed in the report. For example, in the main body, it is appropriate to place a function or equation and describe its importance. However, the derivation of the function, or possible iteration of the function over a specified domain may distract from the main body, and so it would be more appropriate to add each within an appendix instead. Each appendix must be referenced in the body of the report as an enclosure. As decision makers may not look at these additional enclosures, do not bury important information solely in an appendix -- ensure you reference it in the main body. Additionally, appendices should stand-alone – a brief introductory sentence at the beginning of an appendix will help your reader understand what is contained in your appendix. Figures and tables should be adequately labeled and discussed.

**Documentation.** Use appropriate endnotes or footnotes for your specific attributions. You must also include a list of sources (also called Works Cited or References). You may list a source without having a corresponding endnote, but any endnote should also have a corresponding source listed. The format for entries is available in the Documentation for Written Work.

**Note:** Remember that this is college-level work. Handwritten formulas or charts are not appropriate.