Cover Page

Design to Specification Report (name of the report)
Group Number: (Rube Goldberg Machine #xxxx)
Student Names: (names of all your group members)
ENGR 100A
Date:

Table of Contents

Beginning with the Abstract, each page should have a page number in the bottom center of the page. These are the page numbers you will include in the TOC.

Informative Abstract

The abstract is a type of summary. You pull core ideas from each section of your paper and place them in the abstract, so that another student could read the abstract and get the big picture. Because the abstract summarizes your paper, write it last (after you've written what you are summarizing). Briefly state the background, purpose, and scope. State what you found (your conclusions). If you have recommendations, state them as well. But be BRIEF: the abstract is usually fewer than 150 words.

Introduction (Background, Purpose, and Scope)

This section briefly lays out the project and the requirements (i.e., the specifications and constraints). It should end with a goals/objectives statement. After reading this section, the reader should know in broad terms what you were trying to do, and your goals.

The introduction orients and prepares the reader to understand the rest of the paper. It should cover the following topics, not necessarily in this order:
- **Purpose**: the objective of the project. Tell in one or two sentences what the project should do or what it should tell people.
- **Problem**: closely tied to purpose. What is the problem that created the need to do the project? Reader must understand the problem before she/he can understand the solution.
- **Scope**: limitations. Settles all doubts about what the report will cover and what it will leave unresearched. Also may touch briefly upon your qualifications to study this problem.
- **Background information**: Review of previous, related projects. Gives readers the grounding they need to understand the project.

Analysis

This should describe your analytical approach to arriving at an optimum Rube Goldberg machine design. Justify key features of your design using theory, equations, or good engineering reasoning, and describe the tools and energy types and energy conversions involved in the design process. Describe your procedure for optimization. Also identify any non-ideal conditions not included

in your analysis if you can. On what basis did you exclude their consideration? This section should end with a clear statement, including specific numbers, of your conceptual design.

Prototype Construction

This section presents details on the prototype design. Here you need drawings that describe the exact shape of the cuts, angles, bevels, etc. How will the pieces be joined together? In what order will they be assembled? This section is a road map that describes how to build the prototype. It should include graphs and drawings to help visualize your design. You should discuss any problems that occurred in both the hardware design and the software design. You should also discuss the reasons that caused the build team to build something different than you envisions. (Scans from your journals are acceptable.)

Performance Results and Discussion

This section briefly presents the results of the performance test and the results in the competition. You should compare the overall performance against that projected in analysis. Was the outcome of the competition more or less as you expected? What caused the machine to fail to compete successfully in the competition? Was the failure due to the hardware or software design? With the new information you have acquired from the competition, how would you change your design if you have to do it over?

Conclusions

In the conclusions section, tell the reader what you decided about the overall project, about the problem that inspired the project, and about the way you handled the experiment. In other words, what did you conclude after all your work?

Label this section "Conclusions," not "Conclusion."

Bring out the major points you feel are worth emphasis. This should be a brief, bottom-line summary. You generally do not bring anything new into a conclusion section. Instead, this simply restates the key points from the body of the report.

Recommendations

Make any recommendations you feel are appropriate.
The Recommendations section is where you give advice to the reader. In other words, what would you do differently next time? What is the next step in project? What actions in the real world does your project support?

Reference

Reference the ideas, theories, figures or quotes that you take from other sources. Listing of references should follow the format described in "Referencing your work."

Appendix
- Include a copy of your spreadsheet, and anything else you think is appropriate (but you do not want to clutter your report with).
- Include the design drawings of the machine.
- Include the program you wrote.
- The last pages of the appendix should be a brief, individual, **signed** paragraph from each team member that states that member's specific contribution(s) to the overall effort, including analysis, building, testing, and writing.