Team Design Final Paper

Title: Name your paper.

Authors: List of group members.

Abstract: A brief statement summarizing the important points of the text (~1 paragraph).

Introduction: In this section of your paper, you will introduce what your group did in the Team Design Project. This should include the *goals of your project* and what you have done to achieve those goals, including a brief description of what you have *modeled theoretically*, what you have *experimentally measured* and how you have *analyzed* your results. (~ 1 page)

Theory: In this section, your group will describe the details of the theoretical analysis of your project. Starting with basic physical principles (i.e. Newton's 2nd Law or Work-Energy Theorems). Show detailed derivations of the mathematical models used to interpret or predict the motion of your toy car. Include theoretical analysis used to *measure parameters* (such as the frictional and drag coefficients) which effects the motion of your car, and theoretical analysis used to *predict* how your car would perform on an arbitrary track. Also include a schematic diagram of your car, the track setup you are analyzing for each case, the reference frame you have used, forces you have considered, etc. (~ 1 page)

Experiment: In this section of your group will describe the details of the experiments you have completed for this project. Include figures (showing experimental setup(s)), a list of equipment (describing what physical quantities where measured and how the equipment is used to make the measurements), and details of your experimental protocol (i.e. number of trials, any specific notes that would be useful to other who may be interested in repeating your experiment, etc.). (~ 1 page)

Results: In this section your group will illustrate the outcomes of your experimental investigation. This part should include plots of what you have measured (remember units, labels, titles) for both experiments (measuring the operational parameters of friction/drag and the comparison of theory vs. experiment for an arbitrary track). (~ 1 page)

Conclusions: In this section your group should discuss the predictive capabilities of your theoretical model and its limitations. (~ 1 paragraph).

Appendix: In the appendix include plots and solutions for the Challenge Sessions (~ 1-2 pages).

Final Paper Grade Rubric		**Challenge Session Solutions**	
Abstract **:**	**/5**		
Introduction:	**/5**	**Challenge 1:**	**/5**
Experimental Explanation:	**/20**	**Challenge 2:**	**/5**
Experimental Data:	**/20**	**Challenge 3:**	**/5**
Theoretical Explanation:	**/15**	**Challenge 4:**	**/5**
Numerical Calculations:	**/15**	**Challenge 5:**	**/5**
Comparison of Theory and Experiment:	**/15**		
Conclusion:	**/5**		
Total:	**/100**	**Total:**	**/25**