MOUSETRAP CAR MINI CAPSTONE PROJECT

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PROJECT OVERVIEW

This project is an introduction to the full implementation of the engineering design process and the physics concepts discussed in class so far. Students are expected to apply physics principles to the design of a system. Each project includes the development and use of design methodology, formulation of design problem statements and specifications, consideration of alternative solutions, feasibility considerations and detailed system descriptions.

PROJECT OBJECTIVES

In this project, students will use the engineering design process to design and build a mousetrap car that will move a certain required distance. As part of their research, students will use their physics knowledge up to this point to inform their proposed improvements.

PROJECT TOPIC

Problem Statement: Build a unique car that best utilizes the potential energy stored in the spring of a mousetrap. Each team will be provided one identical mousetrap to use in their design. Teams cannot alter the mousetrap in anyway (the original tripping mechanism must be used to start the motion) and must supply their own materials for the construction of the car. If you have trouble finding materials, see me for ideas. A competition will be held to determine the car the travels the greatest distance and the car that has the greatest average velocity.

DELIVERABLES

To represent successful completion of this project, students will turn in the following:

- A complete Mousetrap Car prototype (obviously).
- A group notebook outlining the completion of the design through the Engineering Design Process. This notebook should include sketches of designs, calculations, data, and group thinking about how the design work has proceeded. Your instructor may require that you answer certain questions or include certain information in each step of the EDP; this information must be included in your notebook.
- Participation in a competition at the end of the project that pits each car in the class against one another. Cars MUST be able to travel a distance of 1.21 m (4 feet).
- A “check-in” paper briefly describing the research completed, your specific goals (velocity and distance) and a sketch of you design solution and any alternative solutions considered. This paper should be one page with sketches attached.
- A final powerpoint presentation detailing your research, goals, basic calculations, alternative solutions and final design. This presentation should last approximately 10 minutes per group.

ASSESSMENT

Because this project is a learning experience, it will not be assessed in a formal way. Instead, the aim of the project will be to complete the deliverables and engage in formal discourse

around each group's work, as scientists and engineers would. This project will be given an (Exemplary) (A) grade upon full completion of the deliverables above. Additionally, extra credit will be given to the project that goes the greatest distance and the project that has the greatest average velocity in each class.

TIMELINE

The project will be completed over a two week period. At the end of the first week, teams will be required to submit the "check-in" paper described in the deliverables section. Mousetrap cars and presentations are due at the end of the two week period.

DUE DATES:

"Check-in" paper: _____

Final presentation and mousetrap car: _____