Physics Honors, 440
Project #3:

Title: Potential Energy Cars

Purpose: The purpose of this project is to design a vehicle which uses the spring energy from a mouse trap as its source of power. The goal is to drive your vehicle **exactly 10 m** (plus or minus 0.1 m). Points are awarded based on how far your vehicle is from the desired goal. Each individual student will construct their own vehicle and attempt reaching their goal a total of 3 times. The best test only is recorded for points. All vehicles must be 100% Ready Before the day of Test. No time will be given on the test day to work on your car.

Materials:
You must use only a mouse trap as your source of power. An additional power sources (springs, motors, etc) will result in a grade of **ZERO** for vehicle construction and testing.

You may any additional materials of your choice. Below are some suggested materials.
Wood / Balsa Wood / Cardboard
Erector Set parts, KNex parts, Lego parts
Tape / Glue / String
Milk Cartons / Cereal Boxes
CD's / Jar Lids / Plates

Goals:
You **MAY NOT** use pre-designed kits
Your vehicle can be no wider than 0.3 cm (30 cm) and no longer than 0.5 m (50 cm)
Your vehicle must drive along the floor. No flying or jumping.
Your vehicle only uses one mouse trap
Your vehicle must be able to reset for additional runs in less than one minute.
Your vehicle does not fall apart during testing
Your vehicle uses some simple machine (Pulley/Gear, Lever, etc.) to translate the force into motion.

Points:

(5 Points) The vehicle is only constructed with one mouse trap.
(5 Points) The vehicle is no longer than 0.5 m or wider than 0.3 m
(10 Points) The vehicle consists of at least one simple machine
(5 Points) The vehicle can be reset quickly (less than 1 minute)
(5 Points) The vehicle drives along the floor

Testing:
(10 Points) The vehicle is able to drive at least 5.0 m successfully
(20 Points) The vehicle is able to drive exactly 10 m plus or minus 0.1 m
For every 1 m too short of the goal or too far past the goal lose 2 points (-2 points)

Individual Writing:
(10 Points) Write a one page summary of your construction goals and reasons for your design. Support with example.
Due **before** testing.

Due on: _____

(10 Points) Write two pages minimum with MLA citations on the topics of simple machines **or** Hooke's Law and Conservation of Energy

Due **on testing day** of vehicles. Two book sources required.
(No Dictionaries, Internet Sources, or Textbooks)

Due on: _____ <--- Testing Date

(20 Points) Design and perform an experimental procedure with your vehicle to determine the average velocity, initial potential energy, and the energy lost by your device. A discussion of your results of this experiment along with a copy of the procedures will be submitted. **Data must be collected from all cars.**

Due **after** testing

Due on: _____