

Mousetrap Car Project

Mr. Cote' and Mr. Tolan

Objective: to research, design, construct, test, and modify two mousetrap cars, and to report on this engineering design process. Each group of two or three students will build two cars: one built for speed, and one built for distance. At the end of the project, each student will submit an *individual report for each car*.

Grading: (100 Point Project for Each Car)

A) Written Report (55 pts)

- 1) Pre-construction and Construction Phase (30 pts) - This part of the report will clearly summarize the original research and design phase of the project. Be sure to properly cite references used, and document the overall original design process. The decision making process should be guided by concepts learned in Physics class or otherwise researched. Have logical reasons for making decisions.
- 2) Post-construction (25 pts) - This part of the report will document at least three modifications made to the car after the initial construction. Clearly indicate the changes made, the reasoning behind the changes, and the resultant effect on performance. Three separate components must be tested and tuned for maximum performance. Examples of such changes are: adding or removing mass, switching pulley locations, and increasing or decreasing the length of the lever arm.

B) Participation (30 pts)

- 1) Student self assessment (15 pts) - each student will be given a self-assessment rubric to report their participation in the design, construction, testing, and modification of the car.
- 2) Teacher assessment (15 pts) - Your teacher will also assess the contribution of individual group members using the same scoring rubric. The teacher may also inquire about the participation of individuals from other group members.

C) Performance (15 pts)

Each of the two mousetrap cars will have minimum performance specifications to score 5, 10, or 15 points. Bonus points will also be given for the top performing cars. First place will be worth 5 bonus points, second place will be worth 3 bonus points, and third place will be worth 1 bonus point.

General Rules: Each car must be built with the materials provided. No additional materials are allowed. No other power source may be used. For example, motors, rockets, nuclear power, or dilithium crystals are not allowed. During construction, safety glasses must be worn at all times. Each group will be given three runs during competition, and the best of the three runs will be used for scoring.

Sprint Car Objectives and Scoring: Design a car to travel 3 meters in as little time as possible. Points will be awarded according to the following time schedule:

0 pts - more than 4 seconds

5 pts - 4 seconds or less

10 pts - 3 seconds or less

15 pts - 2 seconds or less

Distance Car Objectives and Scoring: Design a car to travel as far as possible (in the school hallway, without hitting the sides). Designing a car that **goes straight** will be very important. Points will be awarded according to the following distance schedule:

0 pts - less than 4.0 meters

5 pts - between 4.0 and 6.0 meters

10 pts - between 6.0 and 8.0 meters

15 pts - 8.0 meters or more