

MOUSETRAP RACE CAR PROJECT

Due Date: February 14th, 2019

Objective: Students will demonstrate their understanding of the laws of motion, the force of friction, simple machines, speed and momentum by designing and constructing a mousetrap race car at home. The primary goal is to change the potential energy stored in the spring of a mousetrap into kinetic energy, allowing the race car to move. When the mousetrap is released, the spring and bar pull the string that is wrapped around the axle of the car, moving it forward. This project will test not only the distance that the race car will achieve, but also its overall speed and ability to beat all competitors. Students will also need to complete a short write-up related to construction of their race car, and the Physics behind their construction.

Rules: To receive credit, the models must be on time, and originally made. Parents, please be sure to only help your student with the necessary situation(s). Other requirements are:

1. *You must use 1 mousetrap for power (small trap, approximately 5cm x 10cm).*
2. *You must have your name on your mousetrap race car (somewhere on the chassis or bottom)*
3. *You may have a partner in class, but your instructor must be informed **no later than 1 week prior to the due date.***
4. **No store-bought kits are allowed.** *No model car parts or construction bricks are allowed for building the chassis (body) of the race car. However, the wheels and axles from LEGO or KINEX toys are allowed.*
5. *The race car must be a **MINIMUM of at least 30cm long**, which is approximately 1foot long.*
6. *The power of the mousetrap spring must be delivered to the axle of the vehicle. No rubber bands, slingshots, motors or other power sources are allowed.*

Grading: Participants will have 2 chances for maximum distance and speed:

RACE 1: DISTANCE

A+ 50 points, full credit:	4 meters
A. 47 points, partial credit:	3 meters
B. 42 points, partial credit:	2 meters
C. 37 points, partial credit:	1 meters
D. 33 points, partial credit:	< 1 meter
D. 30 points, partial credit:	Does Not Move
F. No points,	No Race Car

RACE 2: SPEED (remember, $s = d/t$)

Time from start to finish will be recorded for each turn

Fastest car:	10 bonus points
Second Fastest Car:	7 bonus points
Third Fastest Car:	4 bonus points

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RACE 3: INTER-CLASS RACING CONTEST (Race Each Other In Single Elimination)

First Place:	10 bonus points
Second Place:	7 bonus points
Third Place:	4 bonus points

RACE 4: CLASS-TO-CLASS RACING CONTEST: PERIOD WINNER

First Place:	10 bonus points
Second Place:	7 bonus points
Third Place:	4 bonus points

RACE 5: FIRST PLACE RACING CONTEST: 8th GRADE OVERALL WINNER

First Place:	10 bonus points
Second Place:	7 bonus points
Third Place:	4 bonus points

Race Car Quick Write:

Another part of this project is a quick write regarding your mousetrap race car. The quick write must be a minimum of $\frac{3}{4}$ to one (1) page in length, and will address the following questions (not in this order):

1. How easy/difficult was this project for you; explain your answer(s)
2. Did you have help from a parent/guardian? If so, how much, and what did they help you with?
3. If you worked with a partner, describe the process of working with them to create your final product. If you worked alone, how manageable was the project for you; explain.
4. Which simple machines did you use in your mousetrap race car? Explain how each simple machine was used, and where it is located on the racecar. (this part is very important)

Where to Buy Mousetraps?

The school is purchasing mousetraps for each student. We will give each of you one free mousetrap. If you need to replace the one that we gave you, Mr. Bridges and Mr. Yepiz will be selling mousetraps individually for cost (approx.. \$.50 - \$1.00). If you prefer, you can buy a mousetrap from any hardware, grocery or department store. Mousetraps come in packs of 2, and sell for about 1-2 dollars.

We will have various mousetrap race cars on display in each classroom. Take a look at them for ideas. You can turn this in whenever you want, as long as it is before the official due date. Consider bringing it to school, so that you can test your race car on OUR surfaces. Please, do not delay on this project; start building your cars right away!

Total Points that This Project is worth: 65 points