

Science 9
100 pts.

MOUSE TRAP CAR COMPETITION

Objective: To build a mouse trap powered vehicle using inexpensive household materials that will allow the vehicle to travel the greatest possible distance at the greatest possible speed.

The contests:

Speed → The winner of the speed award is the vehicle that goes 5 m in the fastest time.

Distance → The winner of the distance award is the vehicle that covers the greatest distance along the track (continuous motion) without leaving the track.

Style → The winner of the style award is the vehicle that is judged by the criterion to look the best. [Criterion: a theme is obvious, time and effort is apparent, creativity, neatness, artistic.]

Bonus points:

+10 first place speed overall

+10 first place distance overall

Within each class:

+3 first place speed/distance/style

+2 second place speed/distance/style

+1 third place speed/distance/style

Teams: Race teams may have a maximum of three members and a minimum of two.

Rules:

1. All materials can be brought from home but **ALL CONSTRUCTION MUST OCCUR IN CLASS.**
2. Materials you must supply: 1 mouse trap, the body to the vehicle (wood constructed, 2-L bottle, Styrofoam, cardboard, etc.), other decorations, wire hangers (to extend the spring on the mouse trap).

3. Consider different materials: 2 metal dowels (13-14 cm long), rubber grommets, cd's, string, Legos, straws, cans, pipe cleaners, toothpicks, rubber bands, thread, yarn, Popsicle sticks, staples, nails, pencils, aluminum foil, index cards, tape, paint, twisty ties, paper clips, lids from margarine dishes, glue, empty spools, old 45's, etc.
4. **ONLY THE MOUSE TRAP CAN PROVIDE THE ENERGY CAUSING THE MOTION OF THE VEHICLE.**
5. The vehicle must retain all of its components for the duration of the run.
6. The teacher must approve of all construction choices that fall outside of the explanation of the teacher's rules.
7. The track will be a 50 cm wide section of hallway beginning near the fire doors outside of our classroom.

Work Time: Time during **three** class periods

Competition: Fourth day of class

Group Requirements:

- 1) Compete.
- 2) Draw a labeled sketch (**diagram**) of your car [**minimum** 8 $\frac{1}{2}$ x 11 paper].
- 3) Explain three **energy conversions** that occur in your mouse trap vehicle. Be specific and consider **all** parts of the vehicle.
- 4) For each of the following Physics topics, 1- define the term, 2- discuss how this applies to your vehicle, and 3- describe/explain changes you would make if you were given more time and resources.

Friction (good and bad)

Inertia

Momentum

Torque

Power

Competition Points [100]:

Vehicle -----	25
Diagram -----	25
Energy conversion explanation --	25
Physics content-----	25