

Mousetrap Car Drag-Race Event

Objective:

To build a car powered by the spring of a single mouse trap (NOT a rat-trap.). The car is to start from rest, be released, and start to move under its own power.

Purpose:

To encourage research and development in an attempt to build a car that will travel the fastest for 6 m powered by the spring of a mousetrap.

Means:

Students will have to determine how to make a car that will go as fast as possible. This event allows students a chance to behave as real world scientists do when faced with a problem that has to be solved.

Students will essentially follow scientific process when seeking the answer to the question of how to build a car that goes as fast as possible for 6 meters. By the time they come to the Expo, they will have learned through trial and error how to best use a mousetrap to propel a car as fast as possible. This advanced preparation will be demonstrated at the competition when the students present their best efforts.

Rules:

1. Students may compete as individuals or as part of a team with a maximum of three students per team.
2. To qualify for competition, each mousetrap car must meet the following structural specifications.
 - a. The vehicle must be built with the wooden base of the trap intact, and not cut up in any way. The only exception to this rule is that holes may be drilled to insert fastening devices. These fastening devices must completely fill the holes. Holes may not be drilled or notches cut for use as wheel wells or pathways for energy transmission.
 - b. All of the parts of the original mousetrap must be incorporated into the car. (Replacement parts from an identical trap could be used if the original parts are lost or broken.)
 - c. Any of the metal parts, including the spring, may be bent or cut. All pieces cut from the metal parts must be used, even if it is only as a decoration and has nothing to do with the actual functioning of the car.
 - d. All of the vehicle's energy must come from the spring of a single mousetrap. (NOTE: Rat traps are NOT allowed. They are DANGEROUS.)
 - e. Parts added to the car (such as wood, wheels, wire, etc.) must not provide any additional energy source beyond the single mousetrap spring.
 - f. The vehicle must function basically like a car. It must start from rest and roll on wheels with energy being transmitted from the spring to the drive wheels or to the drive axle by string, wire, etc.
 - g. The pieces of the trap may be disassembled and reassembled in any way to make the car work better.
3. The car body may be simply the base itself, or it may be a "stock" car that has been modified, or it may be built from scratch from any available materials.
4. There are no size or weight restrictions on the car.
5. The car must be capable of going at least 6 meters along a horizontal surface, which will be a hard floor such as concrete or tile.
6. A notebook is required for each project. If working as a team, each student may use his/her own notebook, or they may use a single notebook. The notebooks are for the team members to enter their ideas, research information and sources, experimentation procedures and data, graphs, analyses, and conclusions. Once an entry is made, it is not destroyed. An incorrect entry will be crossed out with a single line, and followed by a corrected entry. For more specifics on how the entries are to be made, go to Home Page > For Students > Resources > Keeping an Experimental Notebook.

7. At the end of the project, details from the notebook(s) will be extracted and combined to make a single presentation on the display poster. All of the notebooks are required to be at the display. A summary sheet of notebook contents can be placed on top of each notebook to assist judge review.

The display provided for each project must be within the following maximum sizes:

Depth (front to back): 30 inches or 76 centimeters

Width (side to side): 48 inches or 122 centimeters.

Height (floor to top): 108 in or 274 cm. Tables provided will not exceed a height of 36 in (91 cm)

Project display should follow these guidelines:

- a. Title and objective at the top;
- b. Display is neat, organized & appealing;
- c. Should use proper spelling and grammar.
- d. Reasonable prediction of how well they would do
- e. Should mention other approaches that could have been used, and/or other areas that could have been investigated.
- f. Have notebooks available for the interview.

Competition:

Each entry will be inspected for qualification.

Once qualified, the cars will be tested by their builders. Judges will not test the cars.

Cars will be set at the starting line, and then released. The car is simply to be released and not pushed.

Cars must go at least 6.0 meters to qualify. If the car does not go at least 6 m, they will have a second try. If the car fails twice to go 6 m, it may be disqualified.

In each round of competition, cars will compete 2 or 3 at a time. The first car to the finish line wins that round. Times for each car to reach the finish line will be recorded.

Scoring of the Competition:

The maximum score for this portion of the event is 70 points.

For each car, the time will be measured.

Team points will be based on the time it takes to reach the 6 m finish line.

$$\text{Team Score} = \frac{\text{Team Points Earned}}{\text{Winning Team Points Earned}} \times 70 = (\quad) \times 70 = \underline{\hspace{2cm}}$$

Interview scoring: (30 points)

Scoring of the Poster Board, Notebook, and Interview:

Description	Good/Fair/Poor	Points possible	Points earned
<u>Scoring for Poster and Display</u> will consider the following: 1. Display is within size limitations; 2. Poster shows title and the objective at the top 3. Display is neat, organized & appealing; 4. Spelling and sentence structure are correct 5. Reasonable prediction of how well they would do 6. Team described other approaches they could have used, or other areas they could have investigated.	1. Good/Fair/Poor 2. Good/Fair/Poor 3. Good/Fair/Poor 4. Good/Fair/Poor 5. Good/Fair/Poor 6. Good/Fair/Poor	10	
<u>Scoring for Notebook</u> , will consider the following: 1. Notebooks indicate scientific approach 2. Includes bibliography of references 3. Data is recorded well 4. Each day of entries dated and initialed	1. Good/Fair/Poor 2. Good/Fair/Poor 3. Good/Fair/Poor 4. Good/Fair/Poor	10	
<u>Scoring for Interview</u> , will consider the following: 1. Quality of answers to the judges' questions; 2. Understanding of key parts of the challenge, and the underlying science. 3. All participants are knowledgeable and understand the project	1. Good/Fair/Poor 2. Good/Fair/Poor 3. Good/Fair/Poor	10	
Total		30	

Overall Scoring of the Event: (100 points)

(Competition Score) + (Poster, Notebook, and Interview Score)

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