

Mousetrap Car

Name:

Block:

Objective

To design and build a vehicle, powered solely by the energy of one standard-sized mousetrap that will travel the greatest linear distance.

Construction Rules

- The device must be powered by a single Victor brand mousetrap (1-3/4 inches × 3-7/8 inches).
- The mousetrap trigger mechanism must be used to start the vehicle, and the mousetrap must not be disassembled or modified except as required for mounting to the car.
- The spring from the mousetrap cannot be altered. Do not double wind the spring.
- The spring cannot be wound more than its normal travel distance of 180 degrees.
- The vehicle must have at least 3 wheels. A wheel is defined as any object that can rotate about an axis and makes contact with the floor at all times.
- The device cannot have any additional potential or kinetic energy at the start other than what can be stored in the mousetrap's spring itself.
- The propulsion of the vehicle must be a direct result of Newton's Third Law of Motion between the floor and the wheels of the car. In other words, no part of the vehicle may push (or pull) off any surface other than the floor beneath the car.
- All parts of the vehicle must remain with the vehicle as it travels down the track and stops.
- The vehicle must be self-starting and may not receive a push in the forward direction or side direction.
- The vehicle must be fully autonomous after it leaves the start line.



Figure 1: Victor-brand mousetraps

Car Testing

1. The car must be registered on the competition date. All cars will be inspected to ensure that all contestants have met the construction rules.
2. The course will be the length of the hallway and approx. 2.5 meters wide.
3. The car will be started with the front axel centered over the starting line.
4. The distance traveled will be measured along the center-line of the track, from the starting line to the point of contact between the wheel farthest from the starting point and the floor.
5. Any vehicle that exits the track before coming to a complete stop will have its exit point marked and the distance traveled measured from the starting line along the center-line to the adjacent exit point.
6. Each vehicle will complete two runs. The better of the two runs will be recorded.

Scoring

Cars will receive a grade based on either the distance travelled or placing among all contestants, whichever is higher.

Distance (rounded down)	Grade
20 m	100
19 m	99
18 m	98
17 m	97
16 m	96
15 m	95
14 m	94
13 m	93
12 m	92
11 m	91
10 m	90
9 m	89
8 m	88
7 m	87
6 m	86
5 m	85
4.5 m	84
4 m	83
3.5 m	82
3 m	81
2.5 m	80
<2.5 m	70
Rolling Chassis*	50
Disallowed Cars**	<50

Place	Grade
1st	100
2nd	98
3rd	96
4th	94
5th	92

*A rolling chassis that meets all design requirements (excluding mousetrap) and rolls 2.5 meters with a reasonable push earns a 50.

**Cars that do not meet design requirements are scaled between 0 and 50. A car that travels 20 meters earns a 50; a car that travels minimum earns a 40; a car that travels less than minimum earns a 35; a rolling chassis or car the needs assistance starting earns a 25.

One bonus point will be awarded for every 2 meters traveled in excess of 20 meters beyond minimum. Bonus points are awarded only to vehicles that meet all specifications.