

## MOUSETRAP CAR COMPETITION RULES

**Your mission:** Build a vehicle powered solely by the energy of one standard-sized mousetrap that will compete in a speed or distance competition.

Your group was given a mousetrap car kit that contains all the needed materials to construct a successful mousetrap car. However, you are more than welcome to use other materials as long as you comply with the basic regulations stated below

### Competition Rules:

- 1) A single "Victor" brand mousetrap must power the vehicle.
- 2) The mousetrap cannot be physically altered. The mousetrap must be tripped by using the original trip mechanism.
- 3) No additional energy sources may be used. (Examples: CO<sub>2</sub> cartridges, batteries, elastic bands, etc.)
- 4) Vehicles must be self-starting. Vehicles may not receive a push in the forward or side direction.
- 5) The vehicle must steer itself. Measurements of distance will not measure the total distance traveled only the displacement distance.
- 6) Distance will be measured from the tape at the starting line to the point of the vehicle that was closest to the start line at the time of release.
- 7) All cars must achieve a minimum of 5 meters.

## Mousetrap Car Assessment

Each student will complete the written portion of the mousetrap car project. Although there might be some similarities with their partner's work, it is expected that each student will turn in **original** work.

The following assessment criteria for the mousetrap car is:

- 1) Brainstorm/planning worksheet (10 pts)
- 2) Trial Data worksheet (10 pts)
- 3) Mousetrap car construction/design (10pts)
- 4) Mousetrap car performance (10 pts)
- 5) Mousetrap car written analysis/conclusion (20 pts)
- 6) Daily participation grade (5pts/day for 20 pts)
- 7) Oral Presentation (10 pts)
- 8) Self-evaluation (10 pts)

**Total points: 100pts**

**Quantum Leap:** Winners of the distance and speed competitions will earn 10 bonus points for a Quantum bump in their grade. There will also be bonus prizes (5pts) for Best Looking Car, and Most Unique Car.

## Grading Rubric for Mousetrap Car Project

<b>Category</b>	<b>Novice</b>	<b>Emergent</b>	<b>Proficient</b>	<b>Expert</b>
<b>Mousetrap Action worksheet</b>	<b>0-4 points</b> Worksheet not completed, or partially completed. Only a minimal understanding of the physics concepts	<b>5-6 points</b> Worksheet completed, shows good understanding of designing a mousetrap car; some errors	<b>7-8 points</b> Worksheet neatly completed, shows good understanding of designing a mousetrap car	<b>9-10 points</b> Worksheet neatly completed, shows excellent understanding of designing a mousetrap car
<b>Trial Data worksheet</b>	<b>0-4 points</b> Worksheet poorly completed, less than 10 trials recorded	<b>5-6 points</b> Worksheet completed, at least 10 trials recorded	<b>7-8 points</b> Worksheet neatly completed, at least 15 trials recorded	<b>9-10 points</b> Worksheet neatly completed, at least 20 trials recorded
<b>Mousetrap car construction And design</b>	<b>0-4 points</b> Car not complete, does not work or breaks before the competition	<b>5-6 points</b> Car holds together, but looks like a last minute project; may have some design elements for distance or speed	<b>7-8 points</b> Neat assembly and good attention to detail; designed for distance or speed	<b>9-10 points</b> Neat assembly and excellent attention to detail; designed well for distance or speed
<b>Mousetrap car performance</b>	<b>0-4 points</b> Car does not work; or travels less than 1 meter	<b>5-6 points</b> Car travels minimum of 5 meters; does not travel in a straight line	<b>7-8 points</b> Car travels minimum of 5 meters; mostly travels in a straight line	<b>9-10 points</b> Car travels minimum of 5 meters; travels in a straight line
<b>Written Analysis And Conclusion</b>	<b>0-9 points</b> Poorly written, hard to read; responses show a poor understanding of physics principles	<b>10-12 points</b> Neatly written in pen or typed, complete sentences; responses display minimal understanding of physics principles	<b>13-16 points</b> Neatly written in pen or typed, complete sentences; responses display good understanding of physics principles	<b>17-20 points</b> Neatly written in pen or typed, complete sentences; responses display excellent understanding of physics principles
<b>Daily participation (5 pts/day for 20 pts)</b>	<b>0-9 points</b> Student might be absent 3 or more days; needed reminders everyday to stay on-task, did not work safely or did not clean up.	<b>10-12 points</b> Might have been absent 2 days; worked most of the time, worked safely, but might need teacher reminder to stay on task or clean-up	<b>13-16 points</b> Might have been absent 1 day; worked well most of the time, actively participated, worked safely and cleaned up at the end of each class	<b>17-20 points</b> Present each day; worked well with group, actively participated, always worked safely and cleaned up at the end of each class
<b>Oral Presentation</b>	<b>0-4 points</b> Does not complete an oral presentation, or not all members participate. Difficult to understand or only partially explain the project	<b>5-6 points</b> All members participate, presentation not always clear and easy to understand. Does not fully explain design, problems or demonstrate car.	<b>7-8 points</b> All members participate, presentation clear and easy to understand, explains car design and problems. Demonstrates car.	<b>9-10 points</b> All members participate, presentation very clear and easy to understand, explains car design and problems with additional details. Demonstrates car.
<b>Self-evaluation</b>	<b>0-4 points</b> Does not complete self- evaluation	<b>5-6 points</b> Only partially completed, vague or inflates self-evaluation	<b>7-8 points</b> Completes evaluation, but some parts are vague	<b>9-10 points</b> Completes honestly and clearly

# Grade Sheet for Mousetrap Car Project

Student Name: \_\_\_\_\_ per: \_\_\_\_\_

Lab partner: \_\_\_\_\_

Category	Score
<b>Mousetrap Action worksheet</b> (Worksheet neatly completed, shows excellent understanding of designing a mousetrap car)	<b>/10</b>
<b>Trial Data worksheet</b> (Worksheet neatly completed, at least 20 trials recorded)	<b>/10</b>
<b>Mousetrap car construction and design</b> (Neat assembly and excellent attention to detail; designed well for distance or speed)	<b>/10</b>
<b>Mousetrap car performance</b> (Car travels minimum of 5 meters; travels in a straight line Car travels minimum of 5 meters; travels in a straight line)	<b>/10</b>
<b>Written Analysis and Conclusion</b> (Neatly written in pen or typed, complete sentences; responses display excellent understanding of physics principles)	<b>/20</b>
<b>Daily participation (5 pts/day for 20 pts)</b> Present each day; worked well with group, actively participated, always worked safely and cleaned up at the end of each class	<b>/20</b>
<b>Oral Presentation</b> (All members participate, presentation very clear and easy to understand, explains car design and problems with additional details. Demonstrates car.)	<b>/10</b>
<b>Self-evaluation</b> (Completes honestly and clearly)	<b>/10</b>
<b>Bonus points earned:</b> winner of distance(10pts), speed(10 pts), most unique(5pts), best looking(5pts)	
<b>Total points</b>	<b>/100</b>
<b>Grade</b>	
<b>Comments:</b>	