

Unit 4: Mechanical Systems *End of Unit Project*

You must choose **1** of these

You will do the project **alone**, or with a **partner**, depending on the chosen project

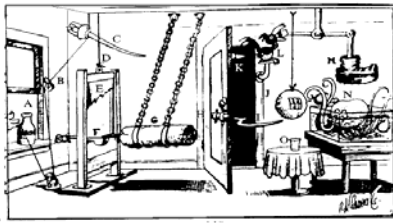
Description of Project Goals

1. To design and construct a working model (prototype) of a **Rube Goldberg Mousetrap** that will catch an (imaginary) mouse.
2. To design a working model of a **Mousetrap Racer**.
3. To design a working model of a **Mousetrap Catapult**.

Background:

Rube Goldberg Mousetrap (Alone, or w/partner)

Rube Goldberg was an artist who designed devices that were useless. His devices were complicated impractical contraptions that performed a common everyday task.



Mousetrap Racer (Alone)

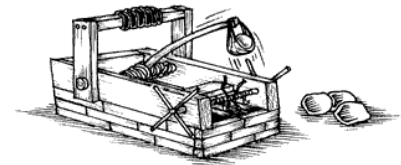
This Internet link will help you:
<http://www.mousetrap-cars.com/>
 The links on this site provide useful information as you decide on the components and the construction details. There are even competitions and records you might try to break. The purpose of this project is to reinforce the concepts of **mechanical advantage**, **speed ratio** and **efficiency** in a mechanical device.



Mousetrap Catapult (Alone)



With the power of a single, spring-loaded mousetrap, how far can you hurl a **hacky sack**?



Mouse Trap Powered Vehicles How To Build One

The Best Ones

Specifications:

How They Work

Rube Goldberg Mousetrap

Prototype must be your own design.

Testing. You must have at least 5 different actions performed by different simple machines that will end up by catching a mouse in your mousetrap. (This mousetrap does not have to be spring loaded and the mouse you catch can be a plush mouse toy.)

Project **Report** should include:

- Design (Cartoon sketch)
- Step-by-step action sequence
- **Construction Details**
- Troubleshooting

Mousetrap Racer

Design and build a working model of a **Mousetrap Powered Vehicle** that compliments the following Units:

- **Structures and Forces** (Grade 7)
- **Mechanical Systems** (Grade 8)

Materials: Race Vehicle powered by a single mousetrap. The materials you use are up to you, but the only power source your vehicle can have is a single standard spring-loaded mousetrap.

Mousetrap Vehicle Guidelines:

- Complete a poster (11x17), which outlines the details of your design and highlights the use of the simple machines and scientific principles your vehicle makes use of.
- Earn points for speed and distance.

Become the record holder for the school.

Mousetrap Catapult

Design and build a working model of a **Mousetrap Catapult** that compliments the following Units:

- **Structures and Forces** (Grade 7)
- **Mechanical Systems** (Grade 8)

Materials: Catapult powered by a single mousetrap. The materials you use are up to you, but the only power source your catapult can have is a single standard spring-loaded mousetrap.

Mousetrap Catapult Guidelines:

- Complete a poster (11x17), which outlines the details of your design and highlights the use of the simple machines and scientific principles your device makes use of.
- Earn points for distance.

Become the record holder for the school.

Evaluation:

Model 60%

Presentation: 40%

Testing Your **Working** model
 – If it doesn't work – don't expect a passing grade

Self-Evaluation
10%

Peer Evaluation
10%

Teacher Analysis
20%