

## **Teacher's Instructions**

### **Materials (per car)**

- 4 flanged bearings 1/4" inner diameter
- 12x12" square of 1/8" thick plywood
- 1 mousetrap
- 1ft 1/4"aluminum tubing
- 4 wood screws, 1/2" long
- 1 foot 1/8" diameter aluminum tubing
- 4 CD's with cardboard hubs or laser cut acrylic
- (optional) laser cut acrylic 'gears'

### **Description**

#### **Assembly**

Students 10 and older should be able to easily assemble the mousetrap cars with hot glue and screw drivers. The assembly process takes approximately 30 minutes per car for groups of 2-4 students. The construction should be expedited by mounting the bearings in the plywood beforehand.

#### **Build the course**

Demonstrating mechanical advantage will require the use of a stop watch and some device to measure distance. The cars will only travel approximately 30 feet depending on surface. The instructor should mark the course with tape at 2 foot intervals or perform the activity on a floor with equally sized tiles. The instructor should also be in charge of timing the runs with a basic stop watch.

#### **Releasing the cars**

The students should be in groups of no more than 4. They should each have multiple attempts at running their cars for maximum distance or least time to travel a certain distance. This can be manipulated through gear selection. The runs are recorded and the winners of each heat can move on to challenge one another. The students should be engaged in conversation about what gear selection is most effective for the task at hand. The lesson primarily teaches mechanical advantage, but also energy transfer and a simple building/prototype process.