

## WORKSHOP on **Simple Machines**

### Project: **Mousetrap Cart**



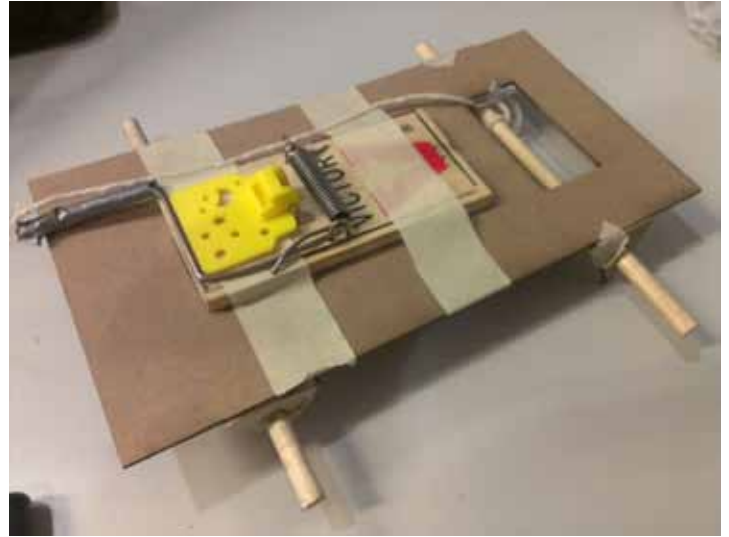
## 1 Project Overview

Today we're going to build mousetrap carts, like the one pictured here. The cart combines several simple machines. Which simple machines do you see?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

We'll hand out the parts a few at a time. Eventually, each cart will use:

1. 4 CDs or plastic plates
2. 4 cardboard disks with a hole in the center
3. 4 cardboard disks with flaps in the center
4. 2 6 inch pieces of wooden dowel (round)
5. 1 piece of string
6. 1 large cardboard body
7. 2 small cardboard rectangles,  $4 \times \frac{1}{2}$  inch
8. 1 mousetrap



## 2 Attaching the Mousetrap

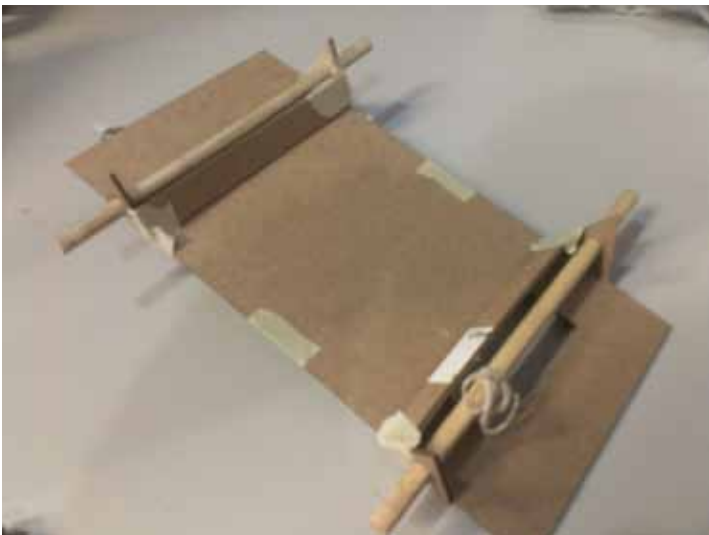
The mousetrap will move the cart forward by turning the rear axle, which turns the rear wheels.

1. Take the cart body, both 4 inch rectangles, one 6 inch wooden dowel, the string, and the mousetrap.
2. Write your name on one end of the cart.
3. Tape the mousetrap to the marked rectangle on the body. The metal arm of the mousetrap should point away from the cut-out rectangle.
4. Fold down two flaps on the sides of the body, along the scored lines. These flaps will support the axle, which holds the wheels.
5. Tape or glue one 4 inch rectangle between the flaps.
6. Do the same for the other pair of flaps.
7. Slide the wooden dowel through the pair of flaps near the cut-out rectangle.
8. Tie or tape one end of the string to the axle.
9. Bring the other end of the string up through the center of the cart body. Tie or tape it to the metal arm of the mousetrap.



### 3 Preparing the Wheels

1. Take one wheel, and one of each kind of cardboard disk
2. Lay the disk with a hole on top of the wheel. The center of the cardboard should be on top of the center of the wheel.
3. Tape the disk down in this position
4. With a pencil, poke the disk with flaps in the center so the flaps open
5. Lay the disk with flaps on top of the wheel, with the flaps pointing up. The center of the cardboard should be on top of the center of the wheel.
6. Tape the disk down in this position.
7. Do the same for the other 3 wheels.



## 4 Attaching the Wheels

1. Slide the remaining wooden dowel through the remaining pair of holes on the cart body.
2. Take one wheel, and slide it onto the end of one axle so the cardboard flaps point towards the end of the axle.
3. Tape or glue the cardboard flaps to the axle to prevent turning
4. Do the same for the other 3 wheels.

## 5 Winding the Cart

Your cart is finished now, and almost ready to go.

1. You may want a partner to help with this step.
2. Turn the rear wheels so the top of the wheels move away from the mousetrap. This will wrap the string around the rear axle.
3. At the same time, slowly lift the metal arm of the mousetrap. Continue until the metal arm is flat against the cart body.
4. Put the cart on the floor and release the metal arm.

