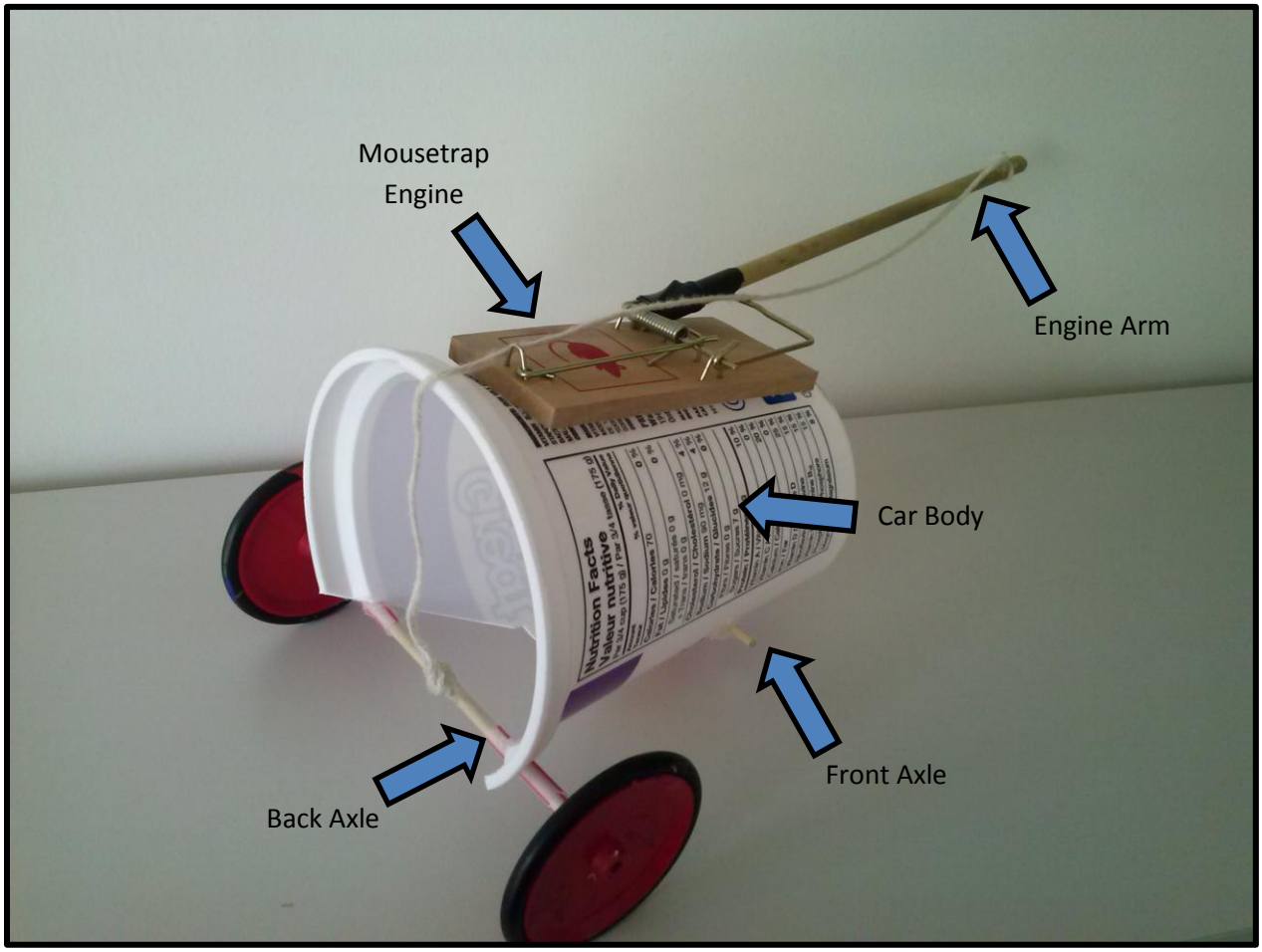
Mousetrap Car

A Mousetrap Car is powered by the energy of the mouse trap's spring. We can take advantage of the potential energy stored when the spring is wound up to propel our cars, converting it into kinetic energy.

The basic design is to tie one end of a string to the mousetrap engine's arm, and the other end to the back axle of the car. By turning the back axle, the string will wind around it, pulling the engine's arm and compressing the spring. Releasing the engine arm will result in the spring returning to its original state, pulling the arm back with it and spinning the axle with wheels.

There are two components to the car: the mousetrap "engine" and the body of the car.



Materials Required

- Mousetrap
- Hot glue and hot glue gun
- Duct tape
- String
- Two short, strong, straight wooden dowels
- A drinking straw large enough to thread the dowels through it
- Three or four wheels
- Recyclable material for the body (i.e. cardboard, plastic containers, milk cartons, etc.)

The Mousetrap Engine

*Note: Use parental supervision when making the mousetrap engine. The spring is powerful, and if you are not careful, you may snap your fingers on the mousetrap.

A larger mousetrap will likely have a larger spring, which can contain more potential energy. The consequence of this though, is that the spring may be more difficult to wind up, or be too powerful for your car and spin out. Start with a small mousetrap and work your way up to see how far you can make your car go.

Attach a sturdy rod securely to the mousetrap wire using hot glue and/or duct tape. By extending the engine arm, we create a larger torque. This allows us to wind the string more easily while extending the length of string we can use (and thus increasing the distance the car will travel).

Tie one end of the string securely to the end of the rod. I like to hot glue it in place, so that it does not slide down when wound up.

Your engine is complete!

The Car Body

The body of the car can be made out of anything. Just be sure that your body is not too heavy for the spring to move it. The lighter your car, the easier it will move. Make sure that your wheels have enough friction on the ground, or they will spin out. Large, light wheels are good for distance (for example, used CDs). This is because they will spin at the same rate as small wheels, but because they have a larger outer circumference, they will travel farther.

Take two short, strong and straight wooden dowels as your front and back axle. I like to thread them through cut pieces of a drinking straw, because they are able to spin freely with little friction. Hot glue the pieces of straw to your car body, with the dowel in them so they glue straight. Attach your wheels to the dowels with hot glue, making sure that they are straight and perpendicular to the dowel. Allow time to dry.

Now loop the other end of the engine string and tie loosely on the back axle. You may glue the string to the dowel to make winding the spring easier, but this will limit the distance your car can travel. Leaving it loose will allow the back axle to continue to spin freely of its own momentum, though winding may be a bit tricky.

Winding the String

When winding the string on the back axle, make sure that you do not put any slack in the string. It should be wound tightly against the dowel, or else your car will have a jerky motion. Wind the string using the force of the mousetrap engine to keep the string taut for you. Do not push the rod upwards as you wind, or you will create slack. Sometimes you will need to lift the rod a bit to get the winding started, but once it is started, let the string go taut once again to finish the wind.

Unwound

Half Wound

Fully Wound