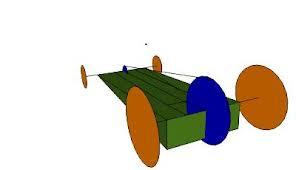
**MOUSETRAP CAR**

**DESIGN PROJECT**



**TEAM NAME:**

**TEAM MEMBERS:**

Purpose of project :

Materials List :



(Add spaces if needed)

Steps to Construction of car:



Incorporate your picture on this page. You can scan it into the file or even use google draw to make a representation of your car with dimensions attached. Remember to include a front, top and side view drawing of your car.

**Abbreviation and key and terms**

Mass - The amount of matter in an object

Radius - The distance from the outside to the center of a circle.

* mfw - mass of forward wheel
* mrw - mass of rear wheel
* mmt - mass of the mouse trap
* mch - mass of the chassis
* mar - mass of the lever arm
* d in front of the letters means distance
* M in front means moments calculated from step 2
* Radius is the distance from the center of the wheel to the outer edge.

You will need to refer to this list above as you complete the lab report.

**CALCULATING THE FORCE OF GRAVITY ON THE CAR.**

**Mass of the:**

**Forward wheel(s) - \_\_\_\_\_**

**Back wheel(s) - \_\_\_\_\_**

**Body - \_\_\_\_\_**

**Axils- \_\_\_\_\_**

**Mouse trap- \_\_\_\_\_**

**Lever arm and string \_\_\_\_\_**

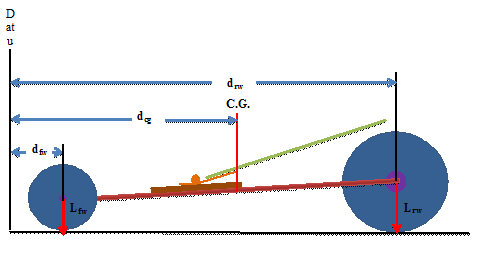
**Sum all of the above ∑Masses = \_\_\_\_\_\_**

**Using a balance scale, measure the mass of your completed car. \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Subtract the two numbers above and the difference has to be all of the tape and glue that you have used to attach all of the parts. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CALCULATING THE FORCE OF GRAVITY ON THE CAR.**

**The force of gravity on an object is called weight. It is calculated by multiplying the mass times the acceleration of gravity. (9.8m/s2)**



**Step 1. Solve for total load (Force due to gravity)**

**Total weight due to gravity = (total mass \* g (g = gravity 9.8 m/s2) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**

**Step 2. Solve for load at each axle**

**Load for rw = Weight / distance to rw \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

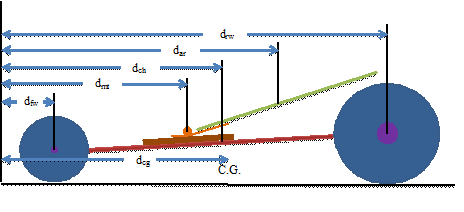
**Load for fw = Weight / distance to fw \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 3. Solve for load at each wheel**

**Load rear wheel = Load for rw / 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Load front wheel = Load for fw / 2 \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**CALCULATING THE MOMENT ON THE CAR.**



**Step 2. Solve for moments of each component**

**Mfw = dfw \* mfw =\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mmt = dmt \* mmt =\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mch = dch \* mch =\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mar = dar \* mar =\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Mrw = drw \* mrw =\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

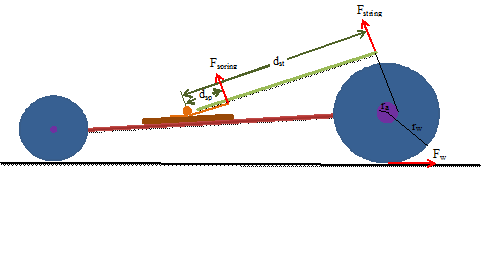
**Step 3. Find summation of moments**

**∑M = Mfw + Mmt + Mch + Mar + Mrw (Addition of the moments = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**

**Step 4. Find location of center of Gravity**

**∑M / ∑m (answer 3/ answer 1 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)**

**MEASURING THE FORCE OF THE PULL ARM.**



**Step 1. Measure the force produced by the spring using a spring scale**

**Attach a spring scale to end of the mouse trap lever. Pull the lever back while your partner reads the force measure on the scale. Stop at 5 different locations read and record the data. Make sure that the scale is at a right angle to the lever. You may have to adjust the spring scale as you pull. Add the force measures together and find for the average force**

**\_\_\_\_\_+\_\_\_\_\_\_+\_\_\_\_\_\_+\_\_\_\_\_\_\_+\_\_\_\_\_\_\_= \_\_\_\_\_\_\_\_\_\_/ 5 = \_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 2. Solve torque of spring**

**Ƭourque of arm = Average force of the spring(answer from 1) \* lever arm length = \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 3. Solve for the tension force in the string**

**Force of the string = Ƭourque of the arm / length of the string =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 4. Solve for the torque at the rear axle**

**Ƭourque of the axle = Force of the string \* radius of the axle = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Step 5. Solve for the force applied by the wheel to the road surface**

**Force of the wheel = Ƭourque of the axle / radius of the wheel =\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**