**Mousetrap Car Analysis Report**

1. What are the two types of friction that affected the performance of your vehicle?

* Rolling friction:

When a circular object rolls freely over a surface.

* Static friction:

The frictional force that resists force that’s applied to an object, and the object remains at rest until the force of static friction is overcome.

1. What problems related to friction did you encounter and how did you solve them?

There weren’t many problems related to friction. The only issues we had encountered while constructing the car were the axles for the wheels. We had used wooden skewers at first, and while they had performed the desired function, they didn't fully support the wheels and the car so we had replaced the skewers for thicker pieces of wood, which allowed smoother movement for the wheels.

1. What factors did you consider to decide the number of wheels you chose in your design?

There weren’t many factors to consider as there weren’t many choices of wheels to choose from since all groups were given four CD’s which acted as the car's wheels. Although because our car hadn’t been constructed as well as possible, I think the car would have exceeded the required distance if we were able to use smaller sized wheels.

1. What kind of wheels did you use in each axle? What’s the effect of using small or large wheels?

The effect of using CD’s as wheels for the car’s axles allowed it to cover distance for a certain amount of time. Although, it only covered about two to three metres of ground which, in all honesty, was very disappointing as I had expected the car to gain more distance because of the size of the wheels.

1. Explain how Newton's first, second and third laws apply to the performance of your vehicle:

The first law states that every object remains at rest/continues at the same speed unless acted upon by an unbalanced force. This law applies to the lever, which is the unbalanced force, used to help propel the car into motion by setting off/unwrapping the string used to turn the axles in a forward direction to move the car.

The second law refers to acceleration that’s proportional to the force applied and related to its mass (Force=mass\*acceleration). The car was generally light, the mousetrap being the only mass weighed and the axles had created support to carry the car. Acceleration, referring to the wound up string to create the acceleration needed to move the car.

The third law states that for every action/force, there’s an equal and opposite reaction. This would be the string that was connected to the axles to help move the car. One end was tied around the hammer of the mousetrap while the other end was winded around one of the axles. In motion, the hammer was pulled back to create force which would turn the axles and help move the car forward.

1. Discuss the effect of length of the lever arm in the pulling force of your vehicle:

The car constructed didn’t have a proper lever to hold the string so instead, it was attached to the hammer of the mousetrap. Less effective than if it had an extended lever but nonetheless functional.

1. Discuss the types of energy transformations that occur in your car:

Potential kinetic energy, stemmed from the wound up string on the axle of the car, is converted into kinetic energy because of the release of the string from the axle. Also potential kinetic energy from the string tied to the hammer, when released creates kinetic energy by pulling on the string and in turn, moves the axles.

1. List the energy types that are wasted in your car:

* Sound energy
* Gravitational energy

1. Discuss how you increased the efficiency of your vehicle (reduced the wasted output energy):

Essentially, there wasn’t much wasted energy created from the car. The only adjustments made were to help support the car structurally.