**Task 8: Science Inquiry**

Constructing an Energy Efficient Vehicle from a Mouse Trap

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**The Mousetrap Car Analysis Report**

Answer the following questions completely (include formulas and/or calculations where appropriate). Your answers may be written below or typed and submitted on SEQTA. It must be a minimum of 300 words.

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

* When a force or torque is supplied to a stationary wheel, a little static rolling friction force stops the rolling motion from beginning. But static sliding friction resistance is what gets the wheel turning. When the car's wheel is turning, this form of friction occurs, causing (rolling friction).

Frictional force that resists force that’s applied to an 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 friction-related issues. The wood for the wheel was the only problem we ran into when building the vehicle, and we had to utilise a tunnel-like wheel to aid the wood, attached to the (wheels), help the car move. The car will be able to travel more smoothly as a result.**

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

* **There weren't many things to consider. We were all handed CDs to serve as wheels, so we had no choice but to make do with what we had. I think we could have given the car more range and movement if we had adjusted the design, such as the size of the wheels (CDs).**

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

* **The effects of using CD’s and tape around the edges helped with the distance and movement for the car.**

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

* **Every object that is at rest continues to move at the same pace unless it is affected by an imbalanced force, according to the first law. This law is applicable to the lever, which is the unbalanced force that helps the car go ahead by setting off the string that is wrapped around the axels to turn them in that direction. The second law describes acceleration as being connected to mass and proportional to the applied force. The mousetrap was the sole mass that weighed anything, and the axels had made a support to carry the automobile because it was so light.**
* **The third law states that for every action or force. There’s and equal and opposite reaction, this would be the string that was connected to the axels 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 axes.**

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

**- Because the car wasn't built with a proper lever to hold the string, it was instead attached to the mousetrap's hammer, which was less efficient but still useful.**

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

**- When the string is released from the car's axle, the potential kinetic energy that was originally generated by the wound-up string on the axle is changed into kinetic energy. Additionally, the string that is attached to the hammer contains potential kinetic energy that, when released, turns into kinetic energy by tugging on the string and moving the axis.**

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

* **Gravitational energy**
* **Sound energy**

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

**- The car didn't produce a lot of wasted energy. The only modifications made served to strengthen the car's framework.**