

Task 8: Integrated science Yr 12

Mouse trap analysis report

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This report is going to include all the questions about my group's mousetrap car.

# 1. What are the two types of friction that affect 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 is applied to an object, and the object remains at rest until the force of static friction is overcome.

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

There weren't many friction-related issues. The axles for the wheels were the only problems we ran across while building the automobile. Initially, we had used wooden skewers, which served the intended purpose but were not strong enough to hold the wheels and the car. As a result, we switched to thicker pieces of wood, which enabled the wood to move more smoothly.

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

Since each group received four CDs, which served as the car's wheels, there were not many elements to take into account and few options for wheels. Although I believe the automobile would have exceeded the necessary distance if we had been able to utilise smaller sized wheels, our car had not been made as effectively as it might have.

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

For a brief period of time, the automobile was able to go a distance because to the impact of employing CDs as wheels for its axles. However, it barely covered two to three metres of ground, which was really disappointing because I had anticipated the car to travel farther due to the size of the wheels.

# 5. Explain how Newton’s first, second and third laws apply to the performance of your vehicle.

Unless acted upon by an imbalanced force, the first law asserts that every object remains at rest or continues to move at the same pace. This law is applicable to the lever, the unbalanced force that helps drive the automobile ahead by detaching/releasing the string that turns the axels in a forwards direction.

According to the second law, force equals mass multiplied by acceleration, which is proportional to the applied force. The mousetrap weighed the same as the automobile, which was light due to the axles' ability to withstand the weight of the vehicle. Acceleration is the term used to describe the wound-up string that propelled the automobile forwards.

According to the third rule, there is an equal and opposite response to every force or action. This would be the rope used to move the automobile by being fastened to the axles. The mousetrap's hammer was secured with one end, and one of the axles was wrapped with the other. The hammer was pushed back while the automobile was moving to generate force that would spin the axles and assist with forwards propulsion.

# 6. Discuss the effects of the length of the lever arm in the pulling force of your vehicle.

The string was tied to the mousetrap's hammer since the automobile design lacked an appropriate lever to retain it. Although less efficient than if it had an extended lever, it is nonetheless usable.

# 7. Discuss the types of energy transformations that occur in your car.

The wound-up string on the car's axle generates potential kinetic energy, which is transformed into kinetic energy when the string is released. Additionally, when the string that is attached to the hammer is pulled, the potential kinetic energy in the string is released, creating kinetic energy that pulls on the string and moves the axles.

# 8. List the energy types that are wasted in your car.

* Sound energy
* Gravitational energy

# 9. Discuss how you increased the efficiency of your vehicle (reduced the waste output energy).

Adjustments were made to the car accordingly to help the car' structure become more stable. Energy wise, not much energy was used.