CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0202

Project Title
The Effects of Rolling Resistance on Different Surfaces

Abstract

Objectives/Goals
The objective of our project is to find out why some cars travel faster on a surface with less friction than a surface with more friction and potentially waste more fossil fuel. We would like to know if the roughness of the surface on our track will effect the amount of time it would take for a car to finish the lane. We hypothesize that the surface of the track will effect the amount of time it takes a Hot Wheel toy car to finish the lane.

Methods/Materials
We constructed a model track out of a 1.22 meter by 0.3048 meters wide. The track was raised on the starting end to allow the cars to roll down the incline. We used three different grades of sandpaper for each lane. Lane #1 had the smoothest surface with 1500-grade sandpaper, 220-grade sandpaper in lane #2, and 60-grade sandpaper in lane #3. We used three of the same type of Hot Wheel toy cars to run the test data/trials. Each car was allowed to roll down each lane fifteen times. The finished times were noted and results were recorded for the data.

Results
Our results overall showed that lane #1 had less resistance than lanes #2 and #3. This allowed the cars to finish the track faster in lane #1 as compared to lanes #2 and lane #3 in each of the trials.

Conclusions/Discussion
Our hypothesis was proven to be valid because the cars traveled faster on a surface with less friction. Our data shows that a car will travel slower on a surface with greater resistance as compared to a surface with less resistance. The rougher the road, the longer it will take for the car to travel using more force and energy. The effects of rolling resistance are factors in how fast a car can travel. Better maintained roads, like lane #1 of our track will reduce in amount of travel time and could potentially save on the amount of fuel used by a vehicle. Smoother roads provide less friction and could possibly increase car mileage.

Summary Statement
A car on a road with less resistance will travel faster than on a road with more resistance.

Help Received
Our dads helped us purchase supplies needed for the track. They helped us build and construct the track. Our moms helped us set up the project display board and transporting it to the school and county science fairs. Our science fair teacher provided guidance, support, and learning.