CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
Dylan Freedman; Alexander Newton

Project Number
S0206

Project Title
Spoilers: Not Just for Looks

Abstract

Objectives/Goals
In our project, we tested the aerodynamics of spoilers to see whether there is a mathematical relationship between spoiler angle and traction produced.

Methods/Materials
To test our experiment, we constructed a wind tunnel and a spoiler. We then placed the spoiler on a scale in the wind tunnel and turned a fan on. We measured the effect of spoiler angle on traction by seeing how much the weight of the spoiler increased when in the wind tunnel. 600 observations were collected at 30 preset angles.

Results
These results were analyzed, and we constructed different regression lines for the data. We constructed linear, power, exponential, and quadratic regressions, along with residual plots for each angle. We found that a quadratic line best fit the data because it explained 96.46% of the total variation in spoiler traction.

Conclusions/Discussion
Through proper statistical analysis we concluded that there is a mathematical relationship between spoiler angle and traction produced. The quadratic line best fit the data. Knowing there is a mathematical relationship could be very useful in lowering gas mileage by changing a car's weight as needed. Our project produced excellent results and was a valuable learning experience.

Summary Statement
We tested the aerordynamics of spoilers to see whether there is a mathematical relationship between spoiler angle and traction produced.

Help Received
Both our fathers helped provide advice on building the wind tunnel and provided materials for construction.