



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Ian K. Flagstad	Project Number J0108
Project Title Downforce on a Stock Car	
Abstract Objectives/Goals The goal of this aerodynamic science fair project, "Downforce on a Stock Car," is to test the amount of added weight to a stock car during movement. The variables used in this test were: angle of air flow, temperature of the air flow, and speed of the air flow. It is hypothesized that the amount of force on the car will be stronger with low temperature and high speed air. The angle of air is not expected to cause a significant force on the car. Methods/Materials For this testing I used a model stock car, postal scale (weight in grams), blow dryer with a concentrator nozzle attachment, a plexiglass box. The car was attached inside the plexiglass box and a hole was made for the blow dryer to point at the nose of the car. I performed 10 trials each of different combinations of speed (high & low), temperature (high, medium, & low), and angle of air flow (none, 45 degrees, 90 degrees, and 180 degrees. I recorded each of these results in my log book and later converted these results to equivalent force on a life-sized stock car. Results My findings proved that the faster air speed and lower temperature had the most downforce on the stock car. Surprisingly, the 45-degree angle showed the most change in downforce. The high temperature and low speed air flow with 90-degree or 180-degree angles resulted in the least amount of change to the car's weight. Conclusions/Discussion I conclude that studying the air flow over a stock car is important because it can affect the results of a race. To my surprise the 45-degree angle showed the most amount of downforce on the car, in a real race, this would only happen when the car was banked in a steep turn. This could be one of the reasons why oval race tracks are slanted on the turns. My recommendation for the future would be to use a stronger source of air to test the effects. My converted results did not meet the actual force on a car in a race.	
Summary Statement The amount of downforce on a stock car with speed, temperature, and angle of air flow as variables.	
Help Received My father helped with conversion of data, Mother helped with graphs and typing, Uncle Chuck helped build my box, and my teachers guided me through the testing and report.	