



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Patrick A. Lowe	Project Number J0115
Project Title Spoilers, Inverted Wings, Ground Effects: Which Will Make Down Force Efficiently?	
Abstract Objectives/Goals To find the most efficient way of producing downforce in a car by altering aerodynamics. Methods/Materials Using a wind tunnel I tested car bodies I designed & carved out of foam. One body was made that could be modified to accommodate spoilers, inverted wings, and ground effects. Each version was tested multiple times for drag and down force. The results were graphed and put into a ratio of down force to drag. The car with the highest ratio (the steepest positively line) is the most efficient. Results My hypothesis that ground effects would be the most efficient was disproved. Instead spoilers were found to be the most efficient at generating down force in a car body. Conclusions/Discussion I made my hypothesis based on the fact that ground effects adds little if any extra drag. I thought that the small amount of drag would make it efficient. I did not think spoilers would be efficient because they generate quite a bit of drag. They were the best though because they produced enough down force to counteract the drag. My tests went well and the only thing that I would do differently if I did it again would be to equip my wind tunnel with an anemometer so I could use Reynold's number. If I continued this project I would test spoiler angle, placement of spoilers and wings, height of car, and combinations of spoilers, inverted wings, and ground effects.	
Summary Statement Finding the most efficient way of generating down force out of spoilers, inverted wings, and ground effects by altering car body aerodynamics.	
Help Received My dad helped me drill holes and cut wood in the construction of my wind tunnel.	