



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Alex Kirley	Project Number 35126
Project Title 3...2...1... Blast Off! An Experiment in Building and Testing Rocket Cars to Achieve High Speeds	
Objectives/Goals The purpose of the project was to build three rocket cars and test their aerodynamic attributes to determine which design was the fastest. Methods/Materials Three rocket cars were constructed for testing. Each rocket car constructed had different configurations of stabilizers, wings, tube diameters, nosecone shapes, and chassis lengths. Their designs were each based around a different influence ranging from Formula 1 cars, to missiles and rockets. The F1 had many wings and stabilizers to create large amounts of both downforce and stability. The Missile had a combination of stability and aerodynamic efficiency with a small top mounted wing and stabilizers both in front and back. The Rocket was the most minimal design with only three tail mounted stabilizers. The rocket cars were propelled by C-6-5 Estes rocket engines and shared identical wheels, tires, and chassis to insure consistency in my testing. For additional safety and preventing catastrophic crashes, a guide tube was placed on the bottom of each rocket car. The guide tube would loosely direct each car on a 15 pound fishing line the length of the 150# course. Only minimal tension was necessary to achieve consistent results and a safe test environment. Results In my experiment, the car that had the best balance of stability and aerodynamic efficiency was the fastest. The F1 influenced car created the most downforce helping with stability, but also creating drag. The F1 only achieved an average top speed of 48.33 mph and an average time of 4.7 seconds on the 150 foot course. The second fastest, The Rocket, was unstable and wasn't able to stay on the ground at launch. The Rocket had an average top speed of 49.33 mph and an average time of 4.44 seconds. The Missile car concept was the fastest and most balanced design achieving an average top speed of 53.33 mph and an average time of 3.33 seconds. Conclusions/Discussion My experiment proved a balance of stability and aerodynamic efficiency will consistently allow a rocket car to achieve the highest speeds.	
Summary Statement The purpose of the project was to build three rocket cars and test their aerodynamic attributes to determine which design was the fastest.	
Help Received My dad showed me how to use the tools needed to construct my rocket cars and the display board. He also was my assistant during testing. My mom helped me edit my final report.	