



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Jordan W. Wang	Project Number S0325
Project Title The Effect of Airfoil Design and Angle of Attack on Lift	
Abstract Objectives/Goals The objective is to find the optimum airfoil design and angle of attack to generate the most amount of lift. In doing so, I hope to find whether the bernoulli principle or newton's third law have more to do with the generation of lift. Methods/Materials Seven airfoils and nine angles of attack were each tested in a wind tunnel. The airfoils were created with balsa wood, wooden dowels, paper, and super glue. The wind tunnel was made out of gatorboard, hot glue, a fan, plastic sheets, and a protractor. Each airfoil was paired with each angle of attack, and those combinations were tested five times each. The wind tunnel was able to measure the lift by balancing a rig made of foam on top of a scale. The rig held the airfoils in place at whatever angle of attack they were meant to be in. Results The third airfoil with a curved top and bottom and long curved tail produced the most amount of lift (in grams) paired with the 15 degree angle of attack. A trend in the information revealed that the 15 degree angle of attack was the high point in terms of lift for all the airfoils. Conclusions/Discussion I found through much experimentation that the third airfoil and an angle of attack of 15 produced the most amount of lift. Because of the large curve in the design of the third airfoil, the bernoulli effect created higher pressure zones. At the same time, a trend showing one angle of attack was best also shows that newton's third law has as much reason to affect it as well.	
Summary Statement My project is about testing wing section designs and the angles at which the wind hits them to determine the amount of lift.	
Help Received My dad helped me construct the wind tunnel and airfoils and also oversaw testing.	