



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Evan S. Stanford	Project Number S0110
Project Title How Does the Camber of an Airfoil Affect the Lift-to-Drag-Ratio?	
Abstract Objectives/Goals The object of my science project was to determine how the camber of an airfoil affects its lift-to-drag ratio. Methods/Materials I tested the performance of several airfoils in a homemade wind tunnel. I carved four wings out of foam and coated them with paper, each with different cambers. I put each wing in the test section of my wind tunnel and then measured the lift and drag at various angles of attack. Results With this information, I was able to analyze the data in several ways. I found that all four of my cambered wings stalled at about +20 degrees and -20 degrees angle of attack. I found out how angle of attack affects lift, drag, and the lift-to-drag ratio. I also determined how camber affects lift-to-drag ratio and optimum angle of attack. I found that the airfoil with fifteen percent camber had the greatest efficiency. Conclusions/Discussion My hypothesis (0% would have the greatest efficiency) was not supported by my results. Instead, the airfoil with 15% camber had the greatest lift-to-drag ratio. In addition, I found that my data was consistent and logical. My results are useful for many applications; they can be used to build efficient wings for airplanes, ideal propellers, optimum spoilers for racecars, or effective fins for watercraft.	
Summary Statement My project used a homemade wind tunnel to test how the camber of an airfoil affects lift-to-drag ratio.	
Help Received My father helped purchase supplies for the wind tunnel. My mother helped proofread paperwork.	