



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) James L. Newton	Project Number J0118
Project Title Lift and Wing Geometry	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to determine what dimensions in the geometry of a wing, such as angle of attack, airfoil shape, aspect ratio, sweep angle, would achieve higher lift of a plane.</p> <p>Methods/Materials Experiments involved making a wind tunnel using a large cardboard tube and hair dryer, a fuselage with sets of detachable wings with varying design parameters from balsa wood. The test craft with various detachable wings, was placed in the wind tunnel and tests were conducted to determine the lift force generated by the different geometric specifications of the wing.</p> <p>Results The results of my experiments showed that higher sweep angle and aspect ratio, non-symmetric airfoils and a lower angle of attack generated more lift.</p> <p>Conclusions/Discussion Therefore, in real life application, lift is maximized with a lower angle of attack, standard, non-symmetrical airfoil, and a high sweep angle and aspect ratio. When lift is maximized, aircraft can carry more load at higher altitudes, thus reducing fuel consumption. Future applications could include reusable reentry spacecraft vehicles that allow for the craft to reach the edge of the atmosphere, then to fly back like a conventional aircraft.</p>	
Summary Statement This project investigated and demonstrated the lift force generated by various wing geometry.	
Help Received My father who purchased the materials, my mother who helped with the finishing touches, my brother who helped with testing, and my teacher who encouraged and guided me in the preparation.	