



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) Austin W. Peters	Project Number J0199
Project Title Up, Up, & Away	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My problem for the experiment was, "Do winglets increase the amount of lift created by a wing?" My hypothesis was that winglets do increase lift because they decrease wasted energy around the wingtip.</p> <p>Methods/Materials First I built the wind tunnel to house my plane by taping four large plexiglass panels together. Then I cut and attached the wing in the box and attached guy wires. After that, I glued together a wind stabilizer of three-hundred and seventy-five 2" PVC pipes to make sure there was even airflow. Then I turned on the fan and measured how high the wing got. I used four plexiglass panels, eleven wooden sticks, fishing wire, suction cups, a fan, three-hundred seventy-five 2# PVC pipes, metal L brackets, one straw, heavy duty packaging tape and a wing.</p> <p>Results Out of all of the data collected the two highest amounts of lift were winglet E which is what I designed with an average of 29.4 cm and the winglet D with an average of 27.1 cm of lift. The two lowest were Winglet A with an average of 23.9 cm of lift and winglet B with an average of 20.5. When I had no winglet on the wing, it had 24.2 cm of lift.</p> <p>Conclusions/Discussion My hypothesis was supported to an extent where some winglets did increase lift and some decreased it. This connects to the real world because the use of winglets to increase lift on newer airplanes. That allows planes to carry more weight and can also have shorter runways.</p>	
Summary Statement My project tests if winglets not only reduce drag, but also increase lift on an airplane wing.	
Help Received Dad helped me construct some pieces and helped to keep the box steady; Ms. Fisher kept me on track for getting my science fair done in time; Mrs. Diaz helped me put together the research report; Mom helped me make my papers to be easily read and sensible.	