



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Angelo Giangiorgi; Pierce Nelson	Project Number J0110
Project Title Which Design of Winglet Best Prevents Wingtip Vortices?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to see which design of winglet best prevents wingtip vortices and also the efficiency of planes by increasing lift and decreasing drag.</p> <p>Methods/Materials Wind tunnel at the Naval Postgraduate School in Monterey, 3 different aluminum winglets, an aluminum sting, and a Force-Balance, tested the three different wings at 3 different angles of attack and 3 different wind speeds.</p> <p>Results Different wings were placed in a wind tunnel and the lift and drag numbers were recorded. The tests were repeated after notches were made to help with angle of attack to reduce uncontrolled variables.</p> <p>Conclusions/Discussion The repeated tests showed that the winglet with only the top was the best compared to the wing with no winglets. It was concluded that the Top-Only winglet has the best lift-to-drag ratio.</p>	
Summary Statement As measured in the wind tunnel with lift and drag, we showed that the Top Only winglet has the best lift:drag ratio.	
Help Received We had the help of Dr. James Paul of Airflow Sciences, and Dr. Kevin Jones, who works at the Naval Postgraduate School.	