



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2019 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kayla Cunningham</b>	<b>Project Number</b> <b>S0309</b>
<b>Project Title</b> <b>Using Winglets to Reduce Drag, Therefore Decreasing Fuel Consumption and Carbon Dioxide Emmissions</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Create a winglet that has the ability to reduce drag more effectively than the winglets that are currently being used on airplanes.</p> <p><b>Methods</b> Autodesk Fusion 360 to design the new winglets, a Tronxy 3D printer to make them, and a wind tunnel. Compare the measured movements of the new winglets created and the ones that Boeing currently uses.</p> <p><b>Results</b> All the wings were tested in the wind tunnel several times (to ensure accuracy) on a pivot system of my design. When the trials of the winglets I created were compared to the trials of the previously existing winglets, one of my designs (the triple winglet) was found to reduce the most drag.</p> <p><b>Conclusions</b> I found that the triple winglet that I invented reduced the most drag because it was the slowest to move on the pivot system in the wind tunnel. This means that the triple winglet can make airplanes more efficient.</p>	
<b>Summary Statement</b> I created a winglet that reduces drag on airplanes more efficiently than winglet designs that are currently being used.	
<b>Help Received</b> An internet search helped me understand the concepts behind winglets and guided me in building my wind tunnel. I designed the winglets and wind tunnel pivot system on my own.	