



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Collen M. Kennedy	Project Number J0109
Project Title What Is the Best Aerodynamic Design for a UAV Wing?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My science project was to identify the best aerodynamic design for a Unmanned Aerial Vehicle wing. I understand why different UAVs had such a larger difference in the shapes and sizes of their wings.</p> <p>Methods/Materials I built 8 different shapes that could be tested within the wind tunnel. 5 of the shapes were non-flying shapes but were used to demonstrate smoke patterns off of different surfaces. 3 of the shapes were traditional wing shapes of varying aspect ratios. I placed each shape into the wind tunnel and used video to record the test events. Each shape was moved through a series of directions. The point of turbulence noted on each shape was identified. Using a contrasting grid pattern I was able to utilize a ratio to compare each shape as to its aerodynamic attributes.</p> <p>Results The smaller wing shape had the least noted turbulence.</p> <p>Conclusions/Discussion My conclusion is that a traditional wing shape is preferred shape but the most important characteristic for the long loiter time requirement of a UAV is aspect ratio. The higher the aspect ratio, the better the lift characteristics.</p>	
Summary Statement My science project was to determine what is the effect of changing the shape of a wing and how that affects its flight characteristics.	
Help Received My entire project was built in my garage. I used household items that could be repurposed for this project. My father helped with the cutting of the cardboard while building the wind tunnel and provided a second set of hands for the larger items.	