



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Zachary N. Johnson	Project Number J0114
Project Title Length for Lift	
Objectives/Goals My question was "How does the length of a wing help keep the wing in the air?" My goal was to find out which wing generated more lift, large or small. I guessed that the long wings would be able to generate more lift because the longer the wing gets, the more surface area it has.	
Abstract	
Methods/Materials One sheet of Lucite, Electric fan, Two 2 1/2 inch Styrofoam wings, Two 4 1/4 inch Styrofoam wings, Four 13 inch metal rods, 2 bungee cords, 4 chain clamps, 2 small screws, 10 three and four tenths gram washers, 1 eyebolt, 1 nut, 2 square metal bars, Stopwatch, Dremel drill, Epoxy glue, Silicone sealer, Razor blade, Pliers, Hammer	
Results I hypothesized that the large wing would carry more weight. My results agreed with my hypothesis. The two large wings lifted much more than the two smaller wings. The large wings lifted all ten washers on all but two for wing four, where it lifted nine. The two smaller wings averaged two and three washers.	
Conclusions/Discussion The long wings lifted more than the short wings. I think this happened because the large wings had more surface area than the small wings. It expands my knowledge of the subject by letting me know that length does effect how much lift is generated by the wing.	
Summary Statement My project is about how much lift a longer and shorter wing generates.	
Help Received H. T. Johnson, the Assistant Secretary of the Navy, helped me build my wind tunnel.	