



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Andrew D. Durkee	Project Number S0105
Project Title Flying Boats	
Abstract Objectives/Goals The purpose of this project was to investigate the possible application of airfoil wing shapes to hydrofoil craft to reduce drag when in the water. It was hypothesized that a whale shape would have the least amount of drag closely followed by forward swept and Delta wing shapes. Methods/Materials Five "boats" were built out of balsa wood, each with a different shape. The shapes were a straight wing, a forward swept wing, a rearward swept wing, a delta wing, and a humpback whale shaped wing. A tub was built with a large conduit pipe and a pulley system was used to pull each shape through the six meters of water in the tub. The time the craft took to traverse the tub was measured. The process was repeated ten times for each shape and the averages were compared. Results The results showed that the Delta shape took the least amount of time to traverse the tub, which indicates that it had the least amount of drag. The shape took an average time of 5.34 seconds. The whale shape took an average time of 9.08 seconds and the straight, forward, and rearward swept took average times of 11.23, 15.75, and 18.02 seconds respectively. Conclusions/Discussion These results could be explained by the Delta shape having a very small front profile while the whale shape had a relatively large front profile. This project could be followed up by an experiment testing the different lift values for each foil shape and comparing them with the average times of each shape.	
Summary Statement This project investigated the use of airfoil wing shapes and applying them to hydrofoil craft to reduce drag in the water.	
Help Received Mother helped type report. Father helped in construction of the experiment.	