



CALIFORNIA STATE SCIENCE FAIR 2003 PROJECT SUMMARY

Name(s) Roxanna E. Moradi	Project Number J0127
Project Title Winging It	
Abstract Objectives/Goals My project was to find out what type of airplane wing has the least amount of drag. I believe that the great sweepback wing will have the least amount of drag. Methods/Materials I built a wind tunnel, and drew an x and y axis on it and a 25° line that crosses the (0,0) point. The whole wing lined up with this. I then started testing the wings: complex delta wing, simple delta wing, slight sweepback wing, moderate sweepback wing, great sweepback wing, straight wing, straight-rounded wing, straight-tapered wing. All wings were made out of particle board. Next, I took 3 rubber band pieces and taped them to the nose and sides of the wing. Then I placed the wing in wind tunnel and taped the ends to the outside surface. I placed a fan on the right opening. I placed a brick with a ramp inside to increase airflow, and then put fan adaptor and plastic sheet over fan. I turned the fan on HIGH. I marked the point where the wing moved back the most and measured the distance (displacement) between the mark and the (0,0) point. This measurement is the amount of drag. I took three measurements for each wing. The average of the three measurements was my ultimate result for that wing. I did the same steps for all of the other wings. Results The simple delta wing had the least amount of drag. It's displacement was 0.354 inches. My hypothesis was incorrect- its displacement was 0.625 inches. Results for the other wings: Complex Delta- 0.729in.; Slight Sweepback- 0.771in.; Moderate Sweepback- 0.604in.; Straight- 1.042in.; Straight/rounded- 0.896in.; and Straight/tapered- 0.854in. Conclusions/Discussion Besides learning the answer to my question, I learned that wings that are long and have a narrow width have hardly any drag, while wings that are short and wide have more drag. This can also explain why rockets hardly have wings-they just have fins because more surface area means more drag. This information is quite valuable because it identifies how air travel can be more efficient. Furthermore, it can probably be useful for engineers when building future airplane models.	
Summary Statement My project basically tested different wing types to see how much drag they have.	
Help Received Father helped me build the wind tunnel and cut out wings with a power tool.	