California Science Center

CALIFORNIA STATE SCIENCE FAIR

2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.)

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Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)

Airfoils

Science Fair Use Only

S0905

Division

S Junior (6-8) S Senior (9-12)

Preferred Category (See page 5 for descriptions.)

9 - Fluid Mechanics/ Aerodynamics/ Thermophysics

Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.)

Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.

Objective: To test 3 types of air foils (the shape of the wings). The 3 types of air foils that we are testing are: flat bottom, symmetrical, and semi-symmetrical. Our objective is to determine which airfoil design will be produce the most lift by use of a reverse mounting system.

Hypothesis: We predict that the flat bottom air foil will produce the most lift because it will create the most friction and resistance thereby resulting in achieving greater lift.

Methods and Materials: NACA computer program (for wing design), fan, plexiglass, Weld On glue, balsa wood, digital scale. Cut plexiglass to specifications for the wind tunnel design; use the NACA computer program to cut wings' skeletal structure; using heat-shrink mylar cover the wings. Mount wings on two pieces of balsa wood inside the wind tunnel. Zero out the digital with the wing on it. Turn on the fan and record scale readings. Take measurements in grams and convert into Newtons.

Results: The flat bottom wing design performed the best; the semi-symetrical performed second best and the symetrical wing design had the worst performance. Graphing and analysis of results indicated that the flat bottom wing design was the best performer.

Conclusion: We were able to prove our original hypothesis that the flat bottom wing design would produce the most lift.

Summary Statement (In one sentence, state what your project is about.)

What airfoil will produce the most lift?

Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.

Mark Horton provided the plexiglass.