CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J0101

Project Title
Airworthy Airfoils

Abstract

Objectives/Goals
In my experiment, I tested how modified shapes of airfoils produced lift. I wanted to find the most efficient, lift-producing shape.

Methods/Materials
I used a wind tunnel to test my five airfoils. The five, differently shaped, airfoils were made from styrofoam. I used a sensitive weight measuring device to see how much each airfoil lifted when the wind tunnel was at maximum speed. I recorded each data point three times, to ensure consistency. I repeated the procedure at three different angles of attack (10, 20, 40 degrees). I graphed the resulting lift curves for each airfoil.

Results
As the angle of attack increased in each airfoil, they mostly produced more lift. However above a certain angle, the lift production decreased. Separately, each differently shaped airfoil gave a different amount of lift and a different lift curve.

Conclusions/Discussion
I found that there is no single most efficient airfoil. Depending on what a designer wants (speed, load-carrying, aerobatics...etc.) a different airfoil can be suitable.

Summary Statement
How do different shapes of airfoils affect the lift produced?

Help Received
School's science teacher supervised the experiment and gave suggestions for improvement.