



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Taran A. Daley	Project Number J0108
Project Title Is Bigger Really Better?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals How does changing the size of a wing affect the amount of lift produced by the wing? Does lift increase proportionally to the size of a wing? It is hypothesized that as the wings got smaller that the amount of lift that the wings produced would also get smaller.</p> <p>Methods/Materials Using two airfoils of the same design, one with a chord length of 10 cm and the other with a chord length of 20 cm. the researcher will test three length sections for the lift that they produce. Each airfoil will be mounted inside the wind tunnel to a fixed frame and attached to a spring scale. A strong fan will be used to generate wind velocity within the wind tunnel. Lift will be measured by the spring scale in grams. The researcher will need the following materials:</p> <ol style="list-style-type: none">1. One wind tunnel2. Strong fan3. Spring scale4. Two different scale airfoils that can be cut <p>Conclusions/Discussion It was hypothesized that as the wings got smaller the amount of lift that was produced would also get smaller. With wing #1, which had a chord of 10 cm, as the wing length got smaller the amount of lift produced was less. A wing length of 15cm gave 29.56 gm of lift on average, a length of 10 cm gave an average of 12.6 gm and the length of 5 cm gave a lift of 2.2 gm. For the wing with the larger chord the same principal held true. The longest length at 15 cm gave 45.4 gm of lift, the wing length of 10 cm gave 15.02 gm of lift on average and the last wing at 5 mc length produced 5.2 gm of lift. This data shows that for this wing design that as the wings got shorter the amount of lift produced also decreased as expected. But the overall wing size provided unexpected data. The hypothesis would make it seem that two wings with the same wing size would produce relatively the same amount of lift. However, this was not true. The 10cm wing with the 10cm chord compared with the 5cm length from the 20 chord wing would give an equal wing size. The lift was very different. W2 wing produced less lift. Wing 1 produced 12.76 gm lift and Wing 2 produced only 5.2 gm lift.</p>	
Summary Statement The project tested the size of airfoils and the lift that was produced.	
Help Received I would like to thank my Dad for helping me build my wind tunnel. I would also like to help Christopher Chew, who voluntarily came over and helped build the wind tunnel.	