CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
J0102

Project Title
Folding a Better Plane

Abstract

Objectives/Goals
This project evaluates the effect of changing the length-to-wingspan ratio on a paper airplane's ability to fly long distances. My goal is to control the testing environment so that changes in the distance flown can be attributed solely to changes in the length-to-wingspan ratio of the tested paper plane

Methods/Materials
Five paper airplanes each folded from paper of an area of 900 square centimeters of varying length and width.
All paper airplanes were folded to a delta wing shape with aspect ratios of 0.8, 1.0, 1.5, 2.5, and 3.1.
Each airplane was launched from a homemade launcher seven times and the distance flown recorded. The best and worst flights were discarded and the remaining five values averaged.

Results
Optimal flights were obtained with the launcher by using a five degree inclination and a high speed of launch. Increasing the length-to-wingspan ratio generally increased the distance the plane flew. At a ratio of 3.1, the plane became unstable and flew inconsistently.

Conclusions/Discussion
My launch pad prototype is a successful platform for reproducible airplane flight. For the type of paper airplane tested, a length-to-wingspan ratio of 2.5 is optimal in terms of distance flown. Ratios above this, while providing good distance flight, often become unstable and erratic.

Summary Statement
How does varying a paper plane's length-to-wingspan ratio affect its ability to fly long distances?

Help Received
Advisor helped fine tune my experimental design, My father helped build the launcher