CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
Hannah R. Ornas

Project Number
J0119

Project Title
Four Fins in Flight

Abstract

Objectives/Goals
The objective of my experiment is to measure the effect of different fin shapes on a rockets stability and altitude.

Methods/Materials
Do three launches with the original trapezoid fins. Measure the altitude of each launch. Then cut off the original fins with a knife. Measured the surface area of the original fins {area=(B1+B2)H/2}.

I made a set of triangular fins with same surface area as original fins. Sanded them smooth and tapered edges to reduce drag. Glued them on and dried them with a hair dryer. Did three launches and measured the altitude of each. Then I cut off triangle fins.

Created rectangular fins with the same surface area. Sanded them and glued them onto the rocket. Did three more launches and measured altitude of each one. Removed fins and launched the rocket a couple of times without fins and measured the altitude. For each set of fins I added the three altitudes together and took average.

Results
Rectangular fins reached the highest altitude averaging 872.3 feet. Triangular fins were second averaging 838.6 feet. Original fins placed last averaging 577.1 feet. Did two launches without any fins. One launch went only 41.6 feet. The other went a two hundred feet. Both spiraled out of control and crashed.

Conclusions/Discussion
The rectangular fins went higher than the other fins in each one of its launches, but only averaged 34 feet higher than second place triangle fins. My experiment didn#t prove that rectangle fins would always be the best fin shape.

Each shape had its own trajectory. For example the rectangular fins flew straight up. The triangle fins curved toward the wind. The original fins curved away from the wind.

Many variables make a difference in the flights so when I went to launch I tried to minimize the variables. We launched at the same place at the same time each day in the same weather conditions. But there might have been more wind one day than another and it might be blowing different directions too. The placement of the homemade fins wasn't perfect. I couldn#t glue them on perfectly.

Summary Statement
My project is about how different fin shapes affect the altitude and stability of a rocket.

Help Received
Dad helped typed the report; Dad showed me how to cut the fins; Brother showed me how to set up the engine starters