California Science Center

CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

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

Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9)
Aerodynamics and Its Effect on a Rocket's Apogee

Science Fair Use Only

J0903

Division
X **Junior (6-8)** _ **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: The objective was to find out if aerodynamics has an effect on a rocket's apogee. My hypothesis was that the more aerodynamic the rocket was, the more the rocket's apogee would be increased.
Materials and Methods: My experiment used three model rockets exactly the same except for the nose cone. I researched several aspects of aerodynamics: drag, friction, etc. I used facts on these subjects to build three nose cones of balsa wood. One nose cone was aerodynamic, another semi-aerodynamic and the last was non-aerodynamic. The aerodynamic nose cone resembled a parabola. The semi-aerodynamic rocket resembled a hemisphere and the non-aerodynamic rocket resembled a flat wall. I also used nine A8-3 Estes rocket engines. I launched the rockets three times each. While the rockets were in the process of flying to their apogee, (highest point from earth), I followed them through the site of my altiscope. The "altiscope" is a clever device used to figure out the height of the object sited through it. In my case it would be the rocket. The altiscope is a tool used with trigonometry to figure out the apogee of the rocket by means of triangulation. The steps for this process were to first mark a spot two hundred feet away from the launch rod of the launch pad. Second, to set the launch rod to ninety degrees. Third, to follow the rockets path to it's apogee and record the angle the altiscope reads. Once I found the angle the altiscope read I found the tangent for that angle. After finding that tangent I multiplied it by two hundred (how far away I was from the launch pad). By doing this I found the height of the rocket's apogee through means of triangulation.
Results: The results of my experiment demonstrated that the more aerodynamic the rocket was, the higher the rocket would go. My results pertained to my objective by showing me that aerodynamics does effect a rocket's apogee.
Conclusion: In conclusion aerodynamics does have an effect on a rocket's apogee. My hypothesis was proven correct and my objective was obtained. Information from my experiment expands the knowledge of any model rocket fan such as myself. When you want to make rockets go higher in the air, make them more aerodynamic. These results have expanded my knowledge and have proven very useful to me and others too.

Summary Statement (In one sentence, state what your project is about.)
My project was about finding out if aerodynamics effected the apogee of a rocket when using different shaped nose cones.

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.
My dad helped edit essay and abstract and teach math involved in doing triangulation. My mom helped launch the rockets because I was 200 feet away from the launch pad and drove me everywhere. My brother also helped with math involved in doing triangulation.