CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J0104

Project Title
The Study of Varying a Parachute's Surface Area on a Rocket's Rate of Descent

Abstract

Objectives/Goals
My project was designed to determine how the surface area of a parachute affects a rocket's rate of descent.

Methods/Materials
One rocket was launched 30 times with three different parachutes (10 launches each parachute) of 100% surface area, 70% surface area (30% surface area was removed from apex), and 40% surface area (60% surface area was removed from apex). The rocket's descent was recorded from the apogee to the landing for each launch by two timers. The data was then analzyed and compared.

Results
The control parachute (100% surface area) descended at an averaged rate of 29.25 seconds. The parachute with 70% surface area descended at an average rate of 21.89 seconds, while the 40% surface area parachute descended at an average rate of 12.37 seconds. Compared to the control parachute, the 60% parachute descended 25% faster and compared to the control parachute, the 40% parachute 58% faster.

Conclusions/Discussion
The study showed that the rocket was able to descend at a faster rate with the altered parachutes. It also showed that even with the parachute's surface area reduced by 60%, the rocket landed in good condition. The results from the study could be used to further investigate the optimum surface area a parachute must have for a rocket's rapid descent and safe recovery. Even though the hypothesis was supported by the experiment, there is still much more research that can be conducted. Future experiments should include an altimeter to accurately measure the rocket's apogee, and parachutes with a surface area less than 40% should be tested. Also, the experiment could include measuring the distance from the launch pad to the landing site in relation to the parachute's surface area.

Summary Statement
The project was designed to determine how the surface area of a parachute affected a rocket's rate of descent.

Help Received
Andy Woerner, President of DART (Diego Area Rocket Team) aided in the construction and procedures for launching the rocket. His son, Alex, and my mother were timers. My mother also chauffeured me to and from the launch site over a period of three months.