CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
Ramon Gomez Jr.; Sergio Ramirez

Project Number
J0212

Project Title
Trebuchet 3... 2... 1... Fire!

Abstract

Objectives/Goals
The purpose of this project is to build and construct a trebuchet to experiment and test certain variables to hit certain targets. Along with those things we have to put together a technical paper and make a display board to show data, graphs, photographs, and drawings. One of the two tasks is to see which trebuchet can throw the projectile the furthest distance. The other is to see which trebuchet has the most accuracy to throw the projectile the closest to two ground level targets.

Methods/Materials
The materials we used to test the trebuchet#s performance were wood, dental floss, sand, PVC tubing, a plastic container, 2 hula hoops, safety goggles, a meter stick, and material (hackie sack). The procedures that we followed: Vary the length of the string from 60 # 90 centimeters. Change the angle of the hook from 30-90 degrees. To hit the target we adjusted the sling length and hook angle. According to our results, when the sling length was shorter, the projectile went a further distance. We also predicted that if the hook angle was acute, then the projectile would travel a further distance. When we adjusted the hook angle to 45 and 60 degrees, we got the best results.

Results
While we were analyzing the data we saw interesting things. One thing we observed was that the best fulcrum height was exactly what the best sling length was. We also thought of an idea that could help our trebuchet be more efficient. All the things we hypothesized were correct, except for when we believed that the higher the fulcrum, the farther the projectile will travel. After looking at the results, we recognized that our machine was not very efficient. Its efficiency was 22.5%. Instead of fixing the old machine, we decided to make a new one.

The new and improved trebuchet was a success. It hit both of the designated targets and threw the projectile about 12 to 13 feet. We saw that the machine was very efficient and worked amazingly well.

Conclusions/Discussion
In conclusion, our hypothesis was correct for our second machine. According to our results, when the sling length was shorter, the projectile went a further distance. We also predicted that if the hook angle was acute, then the projectile would travel a further distance. When we adjusted the hook angle to 30, 45, and 60 degrees, we got the best results.

Summary Statement
To construct and test a trebuchet by using the specified measurements and materials that will allow the projectile to travel the furthest distance and hit the 6.25m and the 10m level targets.

Help Received
Mom provided materials, Teacher helped in construction of the device.