CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)
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Project Number
J0312

Project Title
Rubber Bands in Flight

Abstract

Objectives/Goals
The Objective of my experiment was to determine what affects the flight of the rubber band shot from a wooden rubber band toy gun. I believe the longer the barrel length of the gun the further the distance the rubber band will fly.

Methods/Materials
Old Timer 8-12-16 in Rubber band shooter guns
Rubber bands 3 5/8# & 3#
Ruler
Calculator
High Speed Camera
Weights
Tape Measure
Ply Wood
Glue
Three Old Timer brand Rubber band Shooters with 8,12,16 inch barrels were used. Each gun was shot 25 times both inside and outdoors to determine the average distance the rubber band traveled. Elastic potential energy was measured in the un-stretched rubber band and used to convert PE to KE and theoretical range was calculated. A high speed camera was used to calculate that muzzle velocity and flight characteristics.

Results
The longer the barrel length, on average the further the rubber band flew; however, the results were not overwhelmingly conclusive. High speed photography showed that the rubber band flies backwards throughout the flight and the trigger velocity was about the same for both types of rubber bands about 40 meters/sec.

Conclusions/Discussion
A variety of factors affect the distance bands will fly. My Hypothesis regarding barrel length was partly correct, but other factors such as drag, inconsistent air currents, wind resistance, and deterioration of rubber band elasticity also affected the flight. I learned to calculate muzzle velocity using a high speed camera and math. There were differences between theoretical values and actual data. This could be due to human error or environment. Rubber bands are very inconsistent pieces of latex, that can change during flight. The one thing that is for certain is that a rubber band can generate

Summary Statement
My project is about the "physics" of what affects the flight of a rubber band.

Help Received
My Mom helped me type the report, My friend and mentor Mr. Morton a retired physicist helped me determine the elastic potential energy. He also helped me with the high speed photography and he taught me the math to compute velocity, PE, KE and range. We worked in his garage.