CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY

Name(s)
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Project Number
J1014

Project Title
The Gauss Rifle

Abstract

Objectives/Goals
My project's goal is to study the following question: Does the number of neodymium magnet stages affect the projectile distance and velocity of the steel plated ball bearings?

Methods/Materials
Procedure to build Gauss Rifle
Glue the two wooden dowels together.
Wait until completely dry.
Put finished Gauss rifle on table with ample space.
Procedure to set up Gauss Rifle and test
Place neodymium magnets first on the dowels.
Place nickel plated steel balls before the neodymium magnets.
Once set up, roll the steel ball down the surface so the magnets connect and launch.
Once projectile stops take tape measure and measure distance.
Track distance in lab book.
Repeat process with a different number of magnetic stages.

Results
The results of my tests show that more magnetic stages do increase the projectile distance of a steel ball.
One magnetic stage
-Least Distance: 0.635 meters
-Greatest Distance: 1.3208 meters
-Average Distance: 1.04926
Three magnetic stages
-Least Distance: 1.2192 meters
-Greatest Distance: 1.7018
Average Distance: 1.50368

Conclusions/Discussion
After completing my project on if more magnetic stages affect the travel distance of a nickel plated steel ball. I tested one to three magnetic stages for ten trials and in the end the more magnetic stages I had, the projectile distance would increase farther every time. In my hypothesis I had already knew that more magnetic stages would go farther than less, but I was wrong in how I thought the projectile would launch. Many times it would bounce back and I would have to retest because I wanted all my trials to be fair.

Summary Statement
In the end I learned that more magnetic stages do affect the travel distance of a little steel ball by making it go farther than with less.

Help Received