CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Alexander C. Barrett

Project Number
J0904

Project Title
How Does the Number of Magnets on a Gauss Rifle Affect the Distance Flown by Its Projectiles?

Abstract

Objectives/Goals
My objective was to discover if the number of magnets on a Gauss Rifle affected how far its launched projectile traveled. My Hypothesis was that the more magnets connected to each other along the barrel the farther the marble would fly.

Methods/Materials
I assembled a miniature version of a Gauss Rifle that had two neodymium super magnets. Then I lined up three meter sticks and put the Gauss rifle exactly 2 centimeters off the ground. From there I fired five iron balls and recorded where they landed along the meter sticks. I then added two more magnets at a time to the mechanism and repeated the process. Finally, after ten magnets had been successfully tested, I determined whether the number of magnets on a Gauss Mechanism affects how far it shoots.

Results
My data that I have collected and graphed shows that the average distances the marbles traveled for each set of magnets were 10.68cm for two magnets, 12.06cm for four magnets, 15.89cm for six magnets, 17.66cm for eight magnets, and 22.06cm for ten magnets. From my experiment I have concluded that the more magnets you have on a Gauss rifle the farther the projectile will travel, so my hypothesis about this particular experiment was correct.

Conclusions/Discussion
My experiment shows that the more magnetic force you have pulling on an object, the harder it will hit the magnet when attracted, thus producing a stronger output of kinetic energy on the opposing side of the magnet. This is why I believe I got the results I got. My experiment is important as it shows how this generally classified #Sci-Fi# weapon can be used effectively in the real world. My experiment in particular could be beneficial to the military, especially in the role of a sniping weapon. The U.S. armed forces have many advanced reconnaissance sniper teams around the world that could gain the advantage from this idea. Most snipers have to compensate for wind resistance, bullet drop, and the coriolis effect (the earths rotation against the bullets flight path); but with my design they theoretically shoot five-times farther with significantly less bullet drop, no wind resistance, and an almost non-existent Coriolis effect.

Summary Statement
My project was about proving the Gauss Rifle theory

Help Received
My father helped me research my experiment background.