



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Luke A. Agajanian	Project Number J0901
Project Title Gauss Rifle: Magnetic Linear Accelerator	
Abstract Objectives/Goals My project tested the velocity of a projectile based on the number of magnet stages used in a Gauss Rifle -- magnetic linear accelerator. I wanted to prove that the velocity of the projectile would increase as magnet stages increased. Methods/Materials A magnetic linear accelerator was built using Neodymium magnets and one half inch diameter, 8.4 gram nickel plated steel balls. Magnets and steel balls were placed onto a 4 foot wooden board with a groove in it. The magnets were secured to the wooden board. Two steel balls were magnetically attached on one side of each magnet. The experiment was performed with 2 magnets and the projectile velocity was measured using measured distance divided by time. The experiment was repeated for 3 through 8 magnet stages. Results By first performing the experiment with 2 magnet stages, I was able to determine the magnet spacing distance of 4 inches to produce the maximum velocity. A 4 inch magnet stage spacing was used when measuring velocities on magnet stages from 2 to 8. As the magnet stages increased, so did the velocity of the Gauss Rifle. Conclusions/Discussion My hypothesis was correct. With more magnet stages in the Gauss Rifle experiment, the steel ball projectile had more kinetic energy and it traveled farther. This meant that the velocity was faster.	
Summary Statement This experiment tested the velocity of the Gauss Rifle as more magnet stages were added.	
Help Received My father and brother helped in measuring the distance the steel ball projectile traveled from the Gauss Rifle.	