



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Micah A. Knox	Project Number J0922
Project Title Gauss Magnetic Linear Accelerator	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My project is to determine if the amount of neodymium magnets and the amount of chrome ball bearings affect the speed at which the last ball bearing is going.</p> <p>Methods/Materials four different arrangements of the 16lbs. pull force neodymium magnets. Also four arrangements of the 41lbs. pull force neodymium magnets. The arrangements will consist of one neodymium magnet (16lbs) and two ball bearings, two neodymium magnets (16lbs) with two ball bearings each, three neodymium magnets (16lbs) with two ball bearings each and four neodymium magnets (16lbs) with 2 ball bearings each. I will be measuring the speed by using the formula $V=S/T$ or velocity = speed/time.</p> <p>Results in my project I tested if the amount of neodymium magnets in a gauss linear accelerator affected the final speed. I tested with nine different sets each with one more set than the last. My slowest set was set #1 at a speed of 1.08 mph. my fastest set was set #9 at a speed of 4.00 mph. each set was relatively close to the one before and after it. my closet two sets were set #7 and set #8. Set #7 was at 3.27 mph and set #8 was at 3.30 mph. my farthest two sets were set #8 and set #9. Set #8 was at 3.30 mph and set #9 was at 4.00 mph.</p> <p>Conclusions/Discussion My hypothesis was correct. The amount of sets of neodymium magnets and chrome ball bearings does affect the speed of the last chrome ball bearing. The first set was undeniably the slowest out of all the sets. Set 9 was the fastest of all the sets. If I were to make a gun that uses the gauss linear accelerator I would use a design that closely resembles set 9 and not set 1. Although if I want a gun that was very small and compact I would probably use a design that closely resembles group 1,2 or 3 but instead of using 16 lbs. pull force I would use 41 lbs one.</p>	
Summary Statement My project is about how the amout of neodymium magnets and metal ball bearing affect the speed of my ball bearing track speeds.	
Help Received mother helped me set up my board.	