



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

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| Name(s) Brian J. Mills | Project Number S0215 |
| Project Title Practicality of Linear Magnetic Acceleration | |
| Abstract Objectives/Goals How fast, using my own design, can I accelerate a steel ball bearing using only permanent magnets? Methods/Materials For this experiment I used Neodymium-core magnets of equal strength, steel ball bearings, and a length of PVC pipe. To measure the strength of the magnets, a steel ball bearing was glued to the top of a wooden dowel and ballast was attached to the bottom of the dowel. This was placed atop a weight scale and the magnet was slowly lowered to the ball, and the difference in weight due to the magnet's pull was recorded Results The most effective design was the Internet standard of one magnet in the barrel. The runner-up was my original "Quad" design, followed by my "Alternating Quad" design. Conclusions/Discussion Surprisingly, the single magnet in the direct path of the ball bearing was more effective than four magnets closely spaced around the periphery of the barrel. Presumably this is due to interference from the closely spaced magnets' magnetic fields. | |
| Summary Statement I am comparing the efficiency of my Gauss accelerator to a design discovered on the Internet. | |
| Help Received My father helped me to measure the strengths of the different design configurations. | |