



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

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|---|---------------------------------------|
| <b>Name(s)</b><br><b>Jeremy A. Horwich</b>  | <b>Project Number</b><br><b>J0911</b> |
| <b>Project Title</b><br><b>The Chain Gang</b>   |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>My science fair experiment investigated tabletop linear accelerators. The experiment tested chain reactions using the forces of magnetic and kinetic energy. The question is is it possible to cause a significant chain reaction by using the forces of magnetism and kinetic energy?</p> <p><b>Methods/Materials</b><br/># Double-Sided Foam Tape<br/># 9 Steel Balls (marbles)<br/># 4 Neodymium magnets<br/># 1 Rulers<br/># Recycling Bin</p> <p><b>Results</b><br/>The first time I launched the marble it took 2.4 seconds to hit the recycling bin. The second time I launched the marble it took 4.0 seconds to hit the recycling bin. The third time I launched the marble it took 2.2 seconds to hit the recycling bin. The fourth time I launched the marble it took 3.7 seconds to hit the recycling.</p> <p><b>Conclusions/Discussion</b><br/>A linear accelerator is a system that uses energy to create motion in particles. A linear accelerator demonstrates kinetic energy. Linear accelerators are used to study subatomic particles. Understanding how particles interact is an important way to further our knowledge of physics. Next time I do my experiment, I would test if it would go faster if you enlarged the setup of the accelerator. The marble in the accelerator was holding potential energy until it was launched, and at that point it was turned into kinetic energy.</p> |                                       |
| <b>Summary Statement</b><br>My project uses   |                                       |
| <b>Help Received</b><br>Teacher helped film project   |                                       |