



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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Project Title Marvelous Maglev	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The Marvelous Maglev project found the optimum load for a maglev train in motion on a 100-centimeter track. To discover the optimum load, the magnetic field was assessed by carrying various loads</p> <p>Methods/Materials This experiment studied the strength and optimum load of the maglev train by transporting four different loads (17.5 oz, 35 oz, 52.5 oz, and 70 oz), while measuring the distance it traveled on the 100-centimeter track. The height between the car and the track magnets, or floating distance, was measured to determine the linear characteristic of the magnetic field. The independent variable was the weight (in ounces), or load, put on the model maglev car. The dependent variable was distance traveled along the 100-centimeter track while carrying the load. The other dependent variable measured floating distance. After much trial and error a suitable propulsion system, the car was propelled by a constant means, using a spring catapult system.</p> <p>Results After the data was collected, it was discovered that the model maglev supported weight in a non-linear fashion. It was very strange to observe, because the closer the magnetic poles came together, the more weight was required to lower the maglev any further distance. A non-linear function regarding the load on the maglev car means the car can support more weight as it gets closer to the track. It was also discovered that it takes a lot of power to get the maglev moving, but once it started, it did not take much energy to maintain the speed. The result details are presented in tables and graphs.</p> <p>Conclusions/Discussion A few conclusions were drawn from the experiment. One of the most important conclusions to be determined was that a maglev required external propulsion before it began to move, even though it was constantly floating and had no friction. In addition, the optimal load for the model maglev was 37 oz, which was the maximum amount of weight it could hold, and still move down the track satisfactorily.</p>	
Summary Statement This project determined the optimum load for a maglev train I designed, developed, constructed, and tested for this experiment.	
Help Received Dad allowed me to use his tools, and mom helped edit paper.	