



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

<p>Your Name (List all student names if multiple authors.) Laura J Gardner</p>	<p>Science Fair Use Only</p>
<p>Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Does Mass or Temperature Affect Magnetic Repulsion?</p>	<p style="font-size: 2em;">J1410</p>
<p>Preferred Category (See page 5 for descriptions.) 14 - Physics & Astronomy</p>	<p>Division <input checked="" type="checkbox"/> Junior (6-8) <input type="checkbox"/> Senior (9-12)</p>
<p>Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p>OBJECTIVE: My objective was to learn how a magnet's size effects magnetic repulsion, and if temperature alters the force.</p> <p>MATERIALS AND METHODS: To do my experiment I found 6 magnets, each with a different mass. I measured the repulsion force between each magnet and my control magnet by sliding them both down a wooden dowel, like sides together (e.g. north to north). With Charles Coulomb's formula, [the mass of magnet 1, times the mass of magnet 2, divided by the distance squared between them]I found the exact amount of repelling force.</p> <p>I tested my experiment 3 times in each of the following temperatures: 5 degrees C (walk-in-refrigerator), 20 degrees C (room temperature), and 43 degrees C (underneath a heat lamp). I hypothesized that my smallest magnet(35.2g) would have the greatest amount of repulsion between it and my control magnet(35.2g). I thought that temperature would not effect repulsion.</p> <p>RESULTS: It turned out that my largest magnet(111.5g) consistently had the greatest amount of repulsion between it and my control magnet. The smallest magnet had the least amount. Temperature also had an effect on the force. Inside the 5 degree C atmosphere there was, consistently, a greater amount of repulsion in each test. In the 20 degree C atmosphere the amount of repulsion was the lowest. The measurement of repulsion in the 42 degree C temperature was in-between the other two atmospheres.</p> <p>CONSLUSION/DISCUSSION: My results were the opposite to what I hypothesized. The largest magnet had the greatest amount of force, and temperature did effect my results. My results taught me that temperature effects repulsion because the force was greater in the cold atmosphere. In my mind, this explains why so many magnetization and mineral mines are in the freezing North, and why levitating trains are in only the cold regions of Japan. I also learned that size effects force. The larger the magnet, the greater the force. This is probably why large magnets are used for things like MRI screenings and in televisions. The research and results of my experiment expanded the knowledge of magnetic repulsion and the things that effect it.</p>	
<p>Summary Statement (In one sentence, state what your project is about.) My project is about the effects of different size magnets and temperature on magnetic repulsion.</p>	
<p>Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. My father proofread all of my writings; my mom helped me glue the magnetic plumer's tape to my display board; Bahooka restaurant provided certain facilities for my experiment.</p>	