



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Nicole D. Gaudenti	Project Number J1614
Project Title How Does the Temperature of a Magnet Affect Its Magnetic Force?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This experiment will demonstrate how the temperature of a magnet influences its magnetic force.</p> <p>Methods/Materials Method: 1. Record the temperature of the room temperature magnet. 2. Attach the magnet to the bottom of the metal plate. 3. Slowly pull downward on the magnet while observing the weight displayed on the scale. 4. When the magnet lets go of the metal plate, record the highest weight displayed on the scale. 5. Repeat steps 2-4 nine more times. 6. Repeat steps 2-4 at the cold temperature ten times. 7. Repeat steps 2-4 at the hot temperature ten times.</p> <p>Materials: Two 2½ by 2 centimeter permanent magnets, Two wooden boards, String, Scale, Stove, Pot of water, Thermometer, Freezer, Metal plate, Oven mitts</p> <p>Results The results from the ambient temperature section was an average force of 28.4 ounces. The results from the cold temperature section was an average force of 33.7 ounces. Lastly, the results from the hot temperature section was an average force of 17.4 ounces. The colder magnet section had a higher magnetic force than the ambient temperature section, and the hotter magnet section had a lower magnetic force.</p> <p>Conclusions/Discussion This project proved that the temperature of a permanent magnet affects its magnetic force. If the experiment was repeated, it would be helpful use some sort of hand crank to pull the magnet down, so it is insured that each and every pull will be exactly the same. It was noticed that if the string was pulled down very quickly, the scale would read a lower value. Also, a digital scale with a feature that holds the highest weight would increase the accuracy. The fact that magnets are used in many motors is just one way this experiment could be relevant to a practical application. Judging by the experiment's results, one would think it is best to keep the motor's magnets cool, which is good because a motor that overheats is bad for other reasons. A stronger magnetic force will make a more efficient motor.</p>	
Summary Statement This project determines how the temperature of a magnet influences its magnetic force.	
Help Received Father helped with some of the assembly.	