



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Jennifer L. Bitterly	Project Number J1502
Project Title Red Hot Magnets	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals When deciding on this experiment, I wanted to know if magnets were affected by heat, and if so, to what extent. In my hypothesis, I stated that if the temperature increases, then the magnet's level of magnetism will weaken.</p> <p>Methods/Materials I used the force of repulsion to test the strength of the magnet at room temperature, in two heated temperatures (121 and 260 degrees Celsius), and in another final room temperature run. My device held two alnico magnets, with opposite poles facing each other. Looking through the slit in the stainless-steel tube, I continually added weights to the top magnet and progressively watched the distance shrink until the two magnets touched. Because weight is a force, the weight added upon the first magnet must be equal to the force of repulsion that is stopping the two magnets from touching.</p> <p>Results The room temperature had 1.437 N added on the magnet before the magnets finally touched. The 1st oven temperature, 121 degrees Celsius, has a touching point when 0.790 N were added, and in the hottest oven temperature (260 degrees Celsius) only 0.554 N were needed to make the magnets touch together. Also, when I did the final room temperature after the apparatus cooled down, the touching point for this run was when 1.215 N were added, which was 0.222 N less than what was needed for the 1st room temperature run.</p> <p>Conclusions/Discussion My results proved my hypothesis: higher temperatures really did affect the magnetic force. The level to which the magnets lost their magnetism was surprising. Although alnico's curie temperature is about 860 degrees Celsius, I could already see the magnets beginning to lose their magnetism just from 260 degrees Celsius! Part of this loss was permanent, as I saw when I did my second room temperature run.</p>	
Summary Statement I used the repulsive force of magnets to determine whether magnets lost some of their magnetism when placed in high temperatures.	
Help Received My Father supervised me throughout the experiment, helped teach me the error analysis and curve-fitting techniques, and let me use his equipment.	