



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Andre Bourret</b>	<b>Project Number</b> <b>J1503</b>
<b>Project Title</b> <b>How the Temperature of a Magnet Affects Its Strength to Make "7 Inch Nails"</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment is to determine whether the temperature of a magnet affects its strength. My hypothesis is that the dry ice is going to make the magnets decrease in strength and the boiling water will make the magnets stronger.</p> <p><b>Methods/Materials</b> When the temperature of a material is increased or decreased, the temperature of a magnet may decrease or increase in strength. For this experiment I used about 500 one inch nails, all the same type; 8 magnets of the same size and strength; a small amount of dry ice to get the magnets to a temperature of -75 degrees Celsius; about a cup of ice water to cool the magnets to 0 degrees Celsius; about two cups of boiling water to heat the magnets to 100 degrees Celsius; and the fourth temperature was room temperature at 20 degrees Celsius.</p> <p><b>Results</b> My graphs show the number of nails the magnets attracted and held after five trials for each of the four temperatures. When the magnets were in dry ice they were stronger and increased in strength after each trial, attracting the nails quickly and holding a larger number of nails. When the magnets were placed in ice water the number of nails it held showed a slight increase and decrease in the number of nails it could hold. The magnets heated in the boiling water as well as the room temperature magnets, proved to be the weakest and decreased in strength after each trial.</p> <p><b>Conclusions/Discussion</b> My conclusion is that my hypothesis was incorrect. The change in temperature made a significant change in the strength of the magnets. The magnets on dry ice were stronger, and magnets in boiling water were weaker. The boiling water made the magnets weaker because the magnets soaked up all of the heat from the boiling water; the magnets also made the temperature in the boiling water decrease. There was no significant changes in the room temperature magnets. Based on the results of my experiment I would like to see how much weight magnets could hold at various temperatures. Also, can a magnet decrease or increase in strength after using it at extreme temperatures multiple times? It would also be interesting to see if the sizes of the objects matter in what a magnet can attract and hold.</p>	
<b>Summary Statement</b> I conducted this experiment to find out how many small nails a magnet can hold after the magnet is exposed to four varying degrees of temperatures.	
<b>Help Received</b> Parents helped gather and purchase materials needed for the experiment; brothers helped count nails.	