CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36046

Project Title
Are Cool Magnets More Attractive?

Abstract

Objectives/Goals
The objective of my project was to determine how different temperatures would affect the magnetic pull of a magnet. I believe that if the magnet is heated it will have a weaker magnetic force and if a magnet is cooled, then it will have a stronger magnetic force.

Methods/Materials
The materials I have used were, 3 ceramic blocks with identical shapes and sizes, one plate, 62 grams of iron filings, a freezer at 0° F., 10 oz. of boiling water at 186.8° F., One American Weigh Scale, A glass container, and 3 Ziploc bags. My methods were, put a magnet in the boiling 10 oz. of water, then begin your experiment with your room-temperature magnet. First, you must put the magnet a Ziploc bag, then you must drop the bag into the iron filings which have been poured on the plate, then you hold the bag in the iron filings for 5 seconds, and then lift the bag off the iron filings. Then you weigh the iron filings inside the bag and record. Repeat this 5 times. After this, take your heated magnet out of the boiling water, put your last magnet in the freezer for 2 hours, then repeat all the steps listed above. Repeat this 5 times (You do not reboil the magnet). Once you are done with that, do the same with the freezer magnet as you did with the room-temperature magnet. Repeat this 5 times (You do not refreeze the magnet)

Results
In my project, the cooled magnet had an average of 47.8 grams of iron filings after the 5 trials, whilst the room-temperature magnet had an average of 46.2 grams of iron filings after the 5 trials. Finally, the heated magnet had an average of 32.6 grams of iron filings after the 5 trials. The results supported my theory that cooler magnets have a stronger magnetic force than heated and room-temperature magnets.

Conclusions/Discussion
My original hypotheses was #If magnets are heated up, then their magnetic force will be weaker.# And #If magnets are cooled, then their magnetic force will be stronger.# These hypotheses were proven correct based upon the data and observations shown in the previous slide. My data confirms this because the average of my cooled magnet was the highest at 47.8 grams of iron filings while the lowest average was my heated magnet at 32.6 grams of iron filings. In the middle was my room-temperature magnet at 46.2 grams of iron filings. In my experiment, there were no signs of error besides the one variable that I could not control which may be a magnet manufacturing error.

Summary Statement
My project is about how different temperatures affect the magnetic force of a magnet.

Help Received