CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
J0730

Project Title
Magnet to Electromagnet

Abstract

Objectives/Goals
The purpose of my science fair project is to answer the question, #Does adding electric current to something that is already magnetized increase or decrease the power of the magnet?# I know that I can make an electromagnet from a piece of soft iron rod by wrapping it with copper wire and giving it an electrical charge-this made me think that I might be able to increase the power of a regular magnet by giving it an electrical charge from a battery. I also knew from my research that magnets can be demagnetized if they are dropped, which disorganizes the ions in the magnet. I wondered if maybe by running an electrical charge through a magnet, I might disorganize the magnet and end up with iron that is not magnetized.

Methods/Materials
I used a cow magnet (ranchers have cows swallow them to catch metal in their stomachs). I put it in a box of paper clips. I pulled it out and counted the number of clips that were stuck to it. I repeated this procedure three times. I then wrapped the cow magnet with ten turns of copper wire. I attached the wire to the poles of a 9 volt battery to create an electromagnet. I then placed the electromagnet in the box of paper clips. I pulled it out and counted the number of clips that were stuck to it. I repeated this three times. To find out if the magnet was disorganized and weaker or demagnetized after I had used it as an electromagnet, I took the wire and battery off of it and placed the magnet in the box of paper clips. I pulled it out and counted the number of clips that were stuck to it. I repeated this three times. Materials:I used a stainless steel cow magnet, one yard of covered copper wire, one 9 volt battery, a box of paper clips, a wire cutter and stripper, and tape.

Results
The magnet with no electric current held 48,47 and 50 paper clips, an average of 48.3 paper clips. The magnet with the electric current held 70,77 and 74 paper clips, an average of 73.6 paper clips. The magnet that had been used as an electromagnet held 62,58 and 57 paper clips, an average of 59 paper clips .

Conclusions/Discussion
I found that I could make a magnet stronger (able to hold more paper clips) by using a battery and copper wire to make it into an electromagnet. I found that adding an electric current to a magnet did not destroy or weaken the magnet.

Summary Statement
Does adding electric current to something that is already magnetized increase or decrease the power of the magnet?

Help Received
My mother helped type my report.