CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
J1304

Project Title
How Many Volts Does It Take to Light Up Different Thickness of Pencil Lead?

Abstract

Objectives/Goals
The objectives of this study was to find out how many volts it takes to light up different thickness of lead. This led to a second objective. My second objective was is amperage more important than voltage.

Methods/Materials
.5 mm, .7mm, and .9mm HB pencil lead, D-cell batteries in a series, 9 volt batteries, volt meter, and amperage meter. I started at 1 battery and continued to add batteries until each pencil lead glowed brightly. I used the voltage meter to see how many volt were being used to light the lead. I used two 9-volt batteries in parallel, and one 9-volt battery by itself to show amperage, using the amperage meter.

Results
I took the 3 different size lead, and used the D-cell batteries in a series to light them up. It took more volts to light the thicker lead. I thought I was done until I tried to recreate my results using different batteries. I tried using 9-volts batteries but it wouldn't light the thinnest of lead, and it should have. This led to my second hypothesis, which is amperage is more important than voltage. Using two 9-volts in parallel, I lit up the thinnest lead.

Conclusions/Discussion
My conclusions were what I expected at first. The thicker the lead. The more voltage it took to make it glow, but I learned how fast things can change in an experiment. When I tried to recreate my findings using a different size battery (9-volt). It didn't work. I had to find out why. I did some research, and I came up with my second hypothesis. Amperage was more important than voltage in making the lead glow. This was confirmed.

Summary Statement
I found it took more volts to light up the thicker lead, which led to a second experiment on voltage versus amperage.

Help Received
I designed and performed the experiment myself, after seeing something similar on Hack My Life. I had help building the display by Troy Bray. I used internet searches to get information on my subjects (voltage,light bulbs,batteries, and amperage)