CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
Gregory D. Livengood

Project Number
J0716

Project Title
Lightning in a Jar

Abstract

Objectives/Goals
My objective was to find what Leyden jar can capture the most voltage. I believed the liquid Leyden jar would outperform the Foil and Hybrid in storage of voltage due to early testing.

Methods/Materials
I conducted my experiment using a ruler, insulated test wire, a Van de Graff generator, and a Leyden jar. The Leyden jar acted as a capacitor, storing the static discharge of the Van de Graff generator. I then measured the energy stored by jar with a test wire and a scientific equation that stated the voltage needed to send a spark of electricity one centimeter: 35,000xLength(cm)=Total voltage

Results
After testing each jar several times, I graphed the results and noticed a trend that caught me by surprise. The results came out with the Hybrid jar being the most successful, with a storage capacity of up to 70,000 volts. The Foil jar was close behind, averaging around 30,000 volts of storage capacity. The Water jar proved to be more consistent but less effective than the other two, with a consistent discharge of 17,500 volts.

Conclusions/Discussion
My hypothesis was proven incorrect, with a paradox occurring that I could hardly believe. The hybrid jar proved to be the most effective, and the water jar proved to be the least effective. From the results of my experiment I could recommend power companies utilize capacitors with foil and water interiors to capture and harness high energy static discharges, such as lightning.

Summary Statement
My project is about the capture of static discharge

Help Received
Dad helped build jars; Used lab equipment from Atascadero Junior High School with permission from Mr. Librizzi; Sister helped design board and edit project content.