



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Carson A. Pope	Project Number J0928
Project Title Voltage Revival: Recharging 1.5 Volt AA Alkaline (Non-Rechargeable) Batteries	
Objectives/Goals was to determine if it was possible to recharge 1.5V AA pile alkaline (non-rechargeable) batteries using a cordless drill as a generator.	
Abstract Methods/Materials I recharged 18 batteries using a cordless drill as a generator, by turning a metal hand crank (attached to the drill) 50 times. First I tested the voltage of used batteries using a volt meter, and divided them into 4 categories depending on their voltage. The categories were 1v* or under, 1v-1.240v, 1.240v-1.35v, and 1.35v-1.5v. Then I tested 3 batteries from each category, and recorded the voltage before, directly after, and 2 minutes after recharging. A set of 6 batteries (3 batteries from category 1 and 3 batteries from category 3) went into a 1.2volt incandescent light bulb circuit to determine how long the batteries would continue to light the incandescent bulb. Another group of 6 batteries (3 from category 1 and 3 from category 3) went into a LED bulb lighting circuit to determine if the batteries would light the bulb before and after recharging.*v=volts	
Results The batteries in all categories recharged to near full or over capacity and dropped in voltage after 2 minutes, but were still significantly higher than the starting voltage. The average total voltage increase for category 1 was 0.32v, category 2 was 0.092v, category 3 was 0.126v, and category 4 was 0.069v. Batteries from category 3 that were not completely drained before recharging lasted a lot longer in the 1.2v lighting circuit than batteries from category 1 that were dead before recharging. For the LED test, batteries from category 1 didn't light the bulb before being recharged, but did light the bulb after being recharged. For the batteries from category 3 they lit the LED bulb both before and after recharging.	
Conclusions/Discussion It is possible to increase the voltage of 1.5volt batteries using the cordless drill recharging unit. Even though AA alkaline batteries don't retain a complete charge, it is still worth recharging them if you use a power efficient bulb like a LED. By being able to recharge (non-rechargeable) AA pile alkaline batteries, you can get the maximum use out of them before sending them to the landfill.	
Summary Statement My project is to determine if it is possible to recharge 1.5V AA pile alkaline (non-rechargeable) batteries using a cordless drill as a generator, and testing the recharged batteries in an incandescent and LED light bulb circuit.	
Help Received My father helped with the assembly of the drill recharging unit (using power tools), light bulb testing circuits (soldering wires), and paper cutting for the display board.	