



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Nolan C. Lautrette	Project Number 36272
Project Title The Effects of Varying Tube Materials on Electromagnetic Induction	
Abstract Objectives/Goals The purpose of this study was to measure the efficiency of various tube materials (plastic, cardboard, steel, and aluminum) on electromagnetic induction, a process that produces electricity with a coil, magnet, and method of containment (tube). The technology was applied through a home-made circuit to power a flashlight. Methods/Materials Stopwatch, magnet (neodymium), various tubes of different materials, copper coil, LED, flashlight housing, and circuitry. Stopwatch was used to measure how long each system, comprised of the coil, magnet, and tube powered an LED after going through a circuit. Results After conducting the experiment for many trials to ensure accuracy, the results revealed that the plastic tube was most effective in harnessing changes in magnetic fields, thus powering the LED much longer than the others. Conclusions/Discussion Conducting the experiment revealed that using plastic encasing when applying electromagnetic induction was significantly better and much more efficient. The performance of the other tubes were decreased due to multiple factors including friction, magnetism, and properties describes in Lenz's laws. These methods can be used to further improve technology involving electromagnetic induction.	
Summary Statement I constructed a flashlight which contained no standard batteries, and tested the efficiency of various tubes of different materials on electromagnetic induction; the power-source of the flashlight.	
Help Received I devised and constructed the experiment by myself. My science professor, Christine Rizzo helped me make final revisions to the written portion of my project.	