



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> Aaron Geoffrey Celis	<b>Project Number</b> <b>J2008</b>
<b>Project Title</b> <b>Are LED Bulbs the Most Efficient Light Source?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this project was to provide useful information to consumers regarding which type of light bulb would be the most beneficial to purchase. If I needed a new light bulb, an LED would be the most efficient bulb to buy.</p> <p><b>Methods/Materials</b> I gathered 8 different bulbs, 7 of which were 60W equivalents (Clear Incandescent; Frosted Incandescent; First Gen. Unused CFL [13 yrs. old]; First Gen. Used CFL; Mint Condition LED; Halogen; New Gen. CFL; New Gen. CFL [may not be 60W equivalent]), a light meter, a Kill-a-Watt (watt meter), and an infrared thermometer. Each bulb was mounted in the same place one meter away from the measuring tool, and their temperature, EV (exposure value), and wattage were taken. EV measurements were converted to lumen units using an online calculator, and Fahrenheit was converted to Celsius. The data was recorded on site and rewritten in a neater format. It was also compared to the manufacturers' stated ratings.</p> <p><b>Results</b> The bulbs had a variety of measurements ranging from 9 to 56 watts, 5.1 to 8 EV and 83.6 to 314 degrees Fahrenheit. The given results revealed that incandescent light bulbs reach the highest temperature, CFLs (Compact Fluorescent Lights) use the least amount of wattage, and LED light bulbs ,do in fact, emit the most amount of lumens, and the manufacturers# claimed wattage and lumen measurements were fairly accurate compared to the measured results.</p> <p><b>Conclusions/Discussion</b> To conclude, the outcome of the experiment did support my hypothesis, showing that LED light bulbs would be the most energy efficient bulb type to purchase because it requires a minimal wattage, emits a large amount of light and keeps a cool temperature. CFL bulbs were the second most efficient and incandescent bulbs were the least energy efficient. Although, there may have been some inaccuracies in the taken readings because some of the instruments were not kept stationary during measurements and the bulbs were mounted in a non-traditional manner.</p>	
<b>Summary Statement</b> My project tests what type of light bulb is the most energy efficient.	
<b>Help Received</b> Dad took pictures, printed them and bought watt meter and some bulbs. Mom and my sister helped cut out, label and paste elements of the display board.	