



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> Samuel C. Wentzel	<b>Project Number</b> <b>J0927</b>
<b>Project Title</b> <b>The Utilization of Thermal Electric Junctions to Generate Electricity</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> This project explores the use of thermal electric thermal junctions using different combinations of metals and temperature differences to determine the combination that produces the highest voltage per junction. The best result was combined in a series electrical circuit to show that a cumulative higher voltage can be generated.</p> <p><b>Methods/Materials</b> Pencil graphite, aluminum, iron and copper oxide wire. Plywood Circle with screws and washers Heat source Multimeter</p> <p>Build and measure junction combinations using the four materials to find the best candidate for thermal electric generation. Then build a series array of 16 thermal junctions and measure the overall resultant voltage.</p> <p><b>Results</b> I found that the combination of pencil graphite and copper oxide wire generated a high voltage, but then found that it was too difficult to construct a thermal pile using the brittle material. I found that Copper Oxide with dissimilar temperatures gave me a combination of good voltage generation per junction and was able to be constructed into a thermal electric pile.</p> <p><b>Conclusions/Discussion</b> I found that a thermal pile which is a series electrical circuit can be used successfully to generate electricity for specialized applications.</p>	
<b>Summary Statement</b> Exploring materials and practices for thermal electric generation.	
<b>Help Received</b> Father supervised construction of array and measurements to assure that I used safe practices.	