



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

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Project Title Solar Power for a Bright Future	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to determine which natural dye is the most effective in allowing the dye-sensitized solar cell to capture light energy. This determination will allow scientists who construct dye-sensitized solar cells to be aware of the ideal natural dye, and maximize the potential of their cell. In the last decade, dye-sensitized cells have been exposed to lots of attention due to their unorthodox yet effective way of obtaining light energy. Due to the fact that these types of cells are increasingly popular today, the natural dye chosen is extremely important in maximizing the cell's performance.</p> <p>Methods/Materials In this experiment, I constructed five different solar cells using the identical procedure, but changing the natural dye. The five dyes examined were the berry mix, which consisted of raspberries, black, and strawberries, the onion skin solution, the hibiscus tea solvent, the turmeric powder solution, and the black tea solvent. After constructing the cells, I tested the voltage produced by each cell. By connecting the cell to the multimeter via an alligator clip, and exposing it to a strong light source, in my case a flood light, I was able to record the voltages produced by each cell.</p> <p>Results The voltages varied for each naturally-dyed cell. The onion-skin dye was clearly the most effective however, producing 24-26 minivolts. The hibiscus was also generally successful, with a voltage of 14-16 minivolts. Both the turmeric powder-based cell and black tea cell ranged from 12-15 minivolts. The berry mix was especially disappointing, only producing 10-11 minivolts. This was surprising due to the fact that berry mix is usually the most recommended of the natural dyes.</p> <p>Conclusions/Discussion In conclusion, the onion-skin natural dye proved to be the most successful out of the five dyes tested in this experiment in allowing the cell to obtain the energy. I would like to acknowledge my grandfather, Mr. Everett Mckeen, for his guidance and help throughout the experiment and for providing myself with the flood light. I would also like to thank my parents for being so flexible throughout the entire experiment despite constant changes.</p>	
Summary Statement My experiment focuses on finding the ideal natural photo sensitizer in order to maximize the performance of one's dye sensitized solar cell.	
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