CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
S0912

Project Title
Berry De-light-ful

Abstract

Objectives/Goals
In this project we determined which berry juice would absorb the most light and convert it into potential energy in a dye-sensitized solar cell. We hypothesized that if anthocyanins are able to bind to nanoporous titanium dioxide, then a dye-sensitized solar cell made with blueberry juice will convert the most light into energy because it contains the most anthocyanins.

Methods/Materials
We built three dye-sensitized solar cells and soaked each with different berry juices rich in anthocyanins. Anthocyanins are pigments that are able to absorb energy in the form of light, which can then be turned into electrical charges in a solar cell.

Results
Our results proved our hypothesis to be incorrect because although blackberries did not have the greatest amount of anthocyanins, they allowed the dye-sensitized solar cell to have the greatest output.

Conclusions/Discussion
According to our results, the blackberry juice was the most effective natural dye pigment in converting light energy into electrical output. The solar cell coated with raspberry juice had an average output of 151.45 ohms, the blueberry juice had an average output of 174.9 ohms, and the blackberry juice had the highest output at an average of 188.7 ohms. Compared to the silicon solar cell from a calculator, which had an average output of 189.48 ohms, the blackberry juice coated cell was relatively close in efficiency.

Summary Statement
We tested which berry juice would allow a dye-sensitized solar cell to have the greatest electrical output.

Help Received
Our parents supervised and Kyle Webster provided us with lab equipment.