



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) William Chung	Project Number S0307
Project Title Manipulating Concentrations of Plant-Based Starches to Optimize Durability for Use in Biodegradable Plastics	
<p style="text-align: center;">Abstract</p> <p>Objectives Obtaining the most durable biodegradable plastic in terms of tensile strength and water resistance by utilizing combinations of several plant-based starches.</p> <p>Methods Tested the tensile strength of the biodegradable plastic by devising a system where one side of the plastic is attached to a stationary object and the other is attached to a bucket holding weights. By placing more and more weights in the bucket, I could tell at which point the plastic would break and record the amount of weight. Tested the water resistance by placing the plastic on top of a cup and placing water in the center. The amount of time passed before the water fell through was recorded. Used a homemade compressor to get plastic to uniform thickness and size.</p> <p>Results When comparing seven different types of starches, using potato starch had the greatest relative tensile strength and using tapioca starch had the greatest relative water resistance.</p> <p>Conclusions These results suggest that when producing biodegradable plastics, it is best to use potato starch for its high tensile strength and tapioca starch for its high water resistance time. This could be later on used for biodegradable plastic products such as bags, aiding in the resolution of environmental problems.</p>	
Summary Statement I used different types of starches to create a biodegradable plastic and tested which would produce the most durable product.	
Help Received I used the internet to research about the different properties of starch and how biodegradable plastic is made. I used this information as a basis for my experiment. I did not receive any help from mentors/teachers.	