



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Jaden A. Luna	Project Number J1416
Project Title Subsidizing Cement with the Utilization of Bio-Waste Materials to Create a Superior Concrete	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my project is to find how the addition of waste materials effects the superiority of concrete.</p> <p>Methods/Materials Part 1: Collect waste materials, coffee grounds, almond hulls, peach pits, eggshells, oyster shells and fly ash. Part 2: Burn waste materials to an ash using burn pit, blow torch and lighter fluid. Add ash into concrete mix. Part 3: Place one of each brick in view of heat lamp. Allow to sit for time. Remove from heat lamp and record temperature using surface reading thermometer. Allow to sit for time. Record temperature. Part 4: Place three of each brick on scale. Weigh all three and record the average (mean). Part 5: Tested in CSUF materials testing lab, with assistance from Dr. Kimberly Stillmaker. Place one of each brick in compression machine (Test Mark CM 3000) at a time. Allow to be compressed until deemed broken remove and record highest PSI load. Part 6: Place one of each brick in glass of deionized water. Record ph of water before bricks were added. Allow bricks to set for time. Record ph of water.</p> <p>Results I found that the bricks with charred eggshells performed the best in the compression and heat retention tests. The heaviest concrete was the almond hull ash and the lightest weight concrete was the fly ash. The brick with the most effect on the ph of the water was the almond hull ash.</p> <p>Conclusions/Discussion In my research I found that the most desirable concrete was the charred eggshells. Performing best in the compression and heat tests. It also was fairly lightweight and moderately changed the ph of the water</p>	
Summary Statement My project is about creating a not only stronger, but creating a superior concrete using waste materials.	
Help Received I collected and burned my waste materials with adult supervision, I mixed my concrete and tested the weight, PH and heat retention portions of my project alone, I had help testing my compression strength of my concrete from Dr. Kimberly Stillmaker in the materials testing lab at California University of Fresno	