



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

Name(s) Jacob Armstrong; Amanda Vega	Project Number 38782
Project Title Natural Ways to Dye a Tagua Nut	
Abstract Objectives/Goals The objective of this science fair project was to determine the effectiveness of natural pigments at dyeing a Tagua nut, an Ecuadorian plant also known as "vegetable ivory" which is used in making jewelry and figurines. Methods/Materials Sanded and sliced Tagua nut samples were exposed to pigments obtained from boiled blackberries, beets, and turmeric for up to 48 hours. Pigment saturation was compared using a scale we defined. Results The Tagua nut slices had the strongest saturation in the blackberry pigment solution, earning a 5/5 on our pigment saturation scale after 48 hours of exposure. The nut slices exposed to the beet and turmeric solutions earned a 4/5 rating on our scale. Conclusions/Discussion We found that the Tagua nuts are able to be dyed using natural pigments. The increased movement of molecules due to the heat used to extract the pigment from the cells, increased the saturation of the nut slices. The blackberry may have more pigment in its vacuole than the beet and turmeric plant because it is used to attract animals. The beet and turmeric plant may have less pigment and more water in their vacuoles because they store water for the plant. The results are important because this "vegetable ivory" could be a replacement for elephant tusk ivory.	
Summary Statement We found that pigment heated and extracted from blackberries was more effective at dyeing a Tagua nut than turmeric and beet solutions.	
Help Received Martha Cantos was important to our introduction and understanding of the Tagua nut.	