



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Maya A. Valeriano	Project Number S0330
Project Title Breaking Point: The Relationship between Strength and Temperature	
Abstract Objectives/Goals The purpose of this experiment was to determine how lower temperatures would affect the strength of plastics, specifically Acrylic and SAN (Styrene-Acrylonitrile Resin). Methods/Materials Both plastics were tested at room temperature (70°F) and, using dry ice as a method of cooling, -109.3 °F. Eight pieces of plastic, each 6 cm x 1 cm x .16 cm, divided into 4 groups of 2 were tested at each temperature using a stress application contraption. Weight was added to the contraption and exerted onto the piece of plastic until it broke. Then the mass of the weight was recorded for each one. Results The masses of the weights showed that the average weight required to break Acrylic at low temperature was 310 g higher the weight required at room temperature, and for SAN, there was only a slight 1 g difference between the average weights required to break the plastic at both temperatures, the room temperature weight being slightly higher. The results, however, did not show any significant decrease (at a 99% significance level) in strength as the temperature decreased. Conclusions/Discussion Because there was no significant decrease in strength with the decrease in temperature of both plastics, this suggests that in the brittle temperature phase there is no significant change in strength as the temperature is lowered.	
Summary Statement I showed how the strength of plastics changes as the temperature is lowered.	
Help Received	