



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

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Project Title The Effect of Acid Rain on Construction Materials	
Abstract Objectives/Goals The objective of this study, is to determine which construction material best withstands the effect of acid rain. Methods/Materials 15 2x2 inch samples of construction materials per test set, 3 test sets including a control group, were exposed to two pH solutions made from vinegar and water, and were sprayed 3 times a week and measured weekly. Results Sample data had to be normalized since sample weights were different. Using the average weekly percent mass changes, standard deviation, and observations, I determined that the best materials were granite and marble. Wood samples and metal samples had significant visible damage as a result of natural rain, which was an uncontrolled variable. The original hypothesis was disproved. Conclusions/Discussion Damage by rain was unexpected and proved to be the most significant. For some samples, damage caused by natural rain was heightened by the presence of acid, while for others, like granite and marble, the least affected materials, there was no measureable effect. A longer duration of testing or stronger acid solutions are necessary to differentiate the effect of acid solutions and moisture (rain) on these materials. Additionally, material cost and possible barrier finishes need to be considered.	
Summary Statement As measured by standard deviation and averaged percent mass changes, a six week exposure to mild acid solutions is not long enough to accurately differentiate material properties.	
Help Received I got help from my dad in cutting samples, and my mom taught me how to use excel.	