



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

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<b>Project Title</b> Ratio vs. Strength	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this project was to test what the best ratio of aggregate to sand would be in redi-mixed concrete. Whether, adding more rock would increase the strength of the concrete. I predicted that the mix design with the greatest amount of rock would be the strongest. <b>Methods/Materials</b> The experiment involved mixing different ratios of aggregate to sand with water and cement. The concrete was placed in cylinders and allowed to cure. The cylinders were taken to a testing lab and tested for strength. <b>Results</b> The mix ratio #1 A, B, and C had an average compression strength of 1,370 psi with an average ultimate load of 17,190 pounds. This was the ratio that had more aggregate than sand. The mix ratio #2 A, B, C had an average compressive strength of 353.3 psi with an average ultimate load of 4,470 pounds. This was the ratio that had more sand and less aggregate than recommended. The mix ratio #3 A, B, C had an average compressive strength of 3,530 psi with an average ultimate load of 44,336.7 pounds. This was the ratio that is recommended by the manufacturer. <b>Conclusions/Discussion</b> The mix ratio that had an even amount of sand and aggregate was the strongest in all three cylinders. My hypothesis was incorrect. The cylinders with more aggregate than sand, were stronger than the cylinders with more sand. The rock added some strength, but left the mix less cohesive. Putting more sand into the mix made it weaker.	
<b>Summary Statement</b> The experiment tests how the ratio of aggregate to sand effects the strength of concrete.	
<b>Help Received</b> my mom and dad helped with supervision and photography, and the labs at Krazan and Associates helped to test the strength of the concrete.	