



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Jared A. Ruekberg	Project Number J1819
Project Title What Is the Effect of Cement Ratio on Concrete Strength?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Concrete can be made from different mixtures of cement, sand, gravel, and water, which can determine its attributes, including strength. The hypothesis states that the most common mixture of materials does not produce the strongest concrete. My goal was to test the flexural strength of the most common mixture and compare it to the results of the two other mixtures.</p> <p>Methods/Materials To test this, three batches of concrete were mixed using different ratios of cement to set amounts of sand, gravel, and water. The concrete was poured into homemade molds to make three sets of 17 individual bricks, 25.4cm x 5.08cm x 5.08cm in size. These were then allowed to cure and harden for 28 days. Then the bricks were tested using a Flexural test consisting of a homemade tester and weights.</p> <p>Results During the first testing, Batch #1, the most common mixture, averaged 64.7 Kg to break the brick. Batch #2, the batch the experimenter thought would be the strongest, averaged 108.3 Kg. Batch #3 was the strongest requiring an average 108.5 Kg to break. During the second trial, Batch #1 averaged 65.3 Kg., Batch #2 averaged 108.4 Kg., and Batch #3 averaged 108.7 Kg.</p> <p>Conclusions/Discussion The Hypothesis was correct because both Batch #2 and Batch #3 were stronger than Batch #1. Further testing using mixtures of even greater ratios of cement to other materials would provide further information on the mixture needed to create the strongest concrete.</p>	
Summary Statement I am testing to see if the flexural strength of the most common mixture of concrete will be stronger than other mixtures.	
Help Received Mother hepled with the board; Dad took pictures and helped with testing; Neighbor helped build monds and tester and supplied tools.	