



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jacob R. Castellon</b>	<b>Project Number</b> <b>J0204</b>
<b>Project Title</b> <b>Which Bridge Design Is the Strongest?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project was to construct bridges of three different designs (span, truss, and modified arch) to determine which would be more structurally sound when weight was placed at the base of each bridge. My prediction was that the truss bridge would bear the most weight.</p> <p><b>Methods/Materials</b> After researching numerous bridge designs, three bridges were constructed from Popsicle sticks held together with hot glue. The basic designs of the bridges were a span, truss, and modified arch bridge. The next step was to create weights that would test the load capability of each bridge. This was done by placing sand in three buckets, weighing them on a scale and recording their weight. They held 12.5, 35 and 70 pounds. Each bridge was placed between two tables with a chain wrapped around its base. The least heavy bucket was attached to the chain first, with an "s" hook, and then suspended in midair. If the bridge held the weight, the next heavier bucket was used and the test repeated.</p> <p><b>Results</b> After conducting the tests on each bridge, it was determined that the modified arch bridge was the strongest.</p> <p><b>Conclusions/Discussion</b> After conducting the initial experiment, it was determined that the modified arch bridge was able to bear more weight than the truss and span bridges because it was built with significantly more Popsicle sticks than the others. Further experimentation is necessary to test bridge designs that utilize approximately the same amount of building materials to produce more accurate results.</p>	
<b>Summary Statement</b> This experiment demonstrates the importance of testing bridge designs to make sure they are structurally sound when constructed in order to ensure the safety of people travelling over them.	
<b>Help Received</b> My mom helped by taking pictures and proof reading my writing. My dad helped me weigh the buckets and place them on the hooks.	