



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Nick L. Okita	Project Number J1817
Project Title The Effects of Length on the Strength of a Beam	
Abstract Objectives/Goals To determine whether length has an effect on the weight a beam can support when tested in the form of a simple, free-ended beam bridge. Methods/Materials Bamboo skewers were weighted down by pre-measured rocks until the load broke the skewer. Twenty skewers were tested at each span length of six inches, four inches, and two inches. A bucket hung from the center of the skewer and held the weights. Increments of weights were added based on sample tests and deflection observations. At prescribed increments, the deflection was recorded. A total of seventy tests were conducted. Results The maximum weight of the two inch beam was four times stronger than the six inch beam and two times as strong as the four inch beam. As the length of the span decreases the weight increases at a constant rate. Furthermore, the deflection at each length was proportional to that of all of the other lengths. This means that the same amount of deflection was achieved prior to breaking, but at a much greater weight as the beam became shorter. Conclusions/Discussion The length of the beam had a large effect on the maximum weight supported by a beam. This experimental data illustrates that the length of the span on a bridge is stronger when it is shorter.	
Summary Statement This project determines the effects of length on a beam bridge's strength.	
Help Received Help was received by both my dad and my mom. My dad helped in construction of my apparatus (i.e. working the table saw) and with the designing of graphs on excel. My mom helped minimally with the tests.	