



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Kyle J. Bardet	Project Number J1803
---	---------------------------------------

Project Title I Beam

<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine whether or not size effected the weight carrying and span capacity of an I-beam. If it did, what variations of the flange / web ratio made it stronger, and what variations made it weaker. Hypothesis: I believe that the size of an I-beam (flange /web ratio) would effect the load carrying and span capacity of an I-beam. After researching, I thought that the higher and thicker the web, and the wider and thicker the flanges, the more weight an I-beam could carry with out deflecting as much.</p> <p>Methods/Materials Using the strips of Pine wood, I first designed and constructed 5 different sized I-Beams labeling them 1-5. I then calculated how many fluid ounces it would take to weigh a pound. I found that it would take 15.4 fl. Oz. to equal a pound. Then, I placed the I-Beam #1 on wood supports, and strapped on the five-gallon bucket using the thin fabric. I placed 15.4 fl. Oz. (1 pound) in the bucket. I placed a 24-inch straight edge across the top of the beam and measured the distance between the bottom of the straight edge and the I-beam with a 200mm ruler to find the amount of deflection. I repeated the process 4 more times and then did the rest of the I-beams in the same manner</p> <p>Results I-beam # 1 deflected 1.5 mm with one pound, 4mm with two pounds, 6mm with 3 pounds, and 9mm with 4 pounds. I-beam # 2 deflected 1.5mm with 4 pounds, 2mm with 5 pounds, 2.5mm with 6 pounds, and 3mm with 7 pounds. I-beam # 3 deflected 1.5mm with 9 pounds, 1.75 mm with 11 pounds, 2mm with 15 pounds, and 2.5 mm with 19 pounds. I-beam #4 deflected 1.5 mm with 7 pounds, 1.75mm with 9 pounds, 2mm with 11 pounds, and 3mm with 15 pounds. I-beam #5 deflected .5mm with 4 pounds, 1mm with 7 pounds, 1.5mm with 10 pounds, and 2mm with 13 pounds.</p> <p>Conclusions/Discussion Conclusion: In conclusion, my hypothesis was somewhat right and somewhat wrong. I found that size did affect a beams strength, and that the wider the flanges and taller the web, the stronger the I-beam would be. I also found out that the web height was more important than the flange width and thickness.</p>

Summary Statement THE DIMENSIONS OF AN I- BEAM AFFECTS ITS LOAD CARRYING AND SPANNING CAPACITIES.

Help Received
