



CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

Name(s) Dylan J. Lee	Project Number 36210
Project Title How Does the Addition of Diagonal Braces Affect the Rigidity of a Wall?	
Abstract Objectives/Goals The objective of this project was to determine what kind of diagonal bracing renders a wall most rigid. My hypothesis was that, out of four different configurations of diagonal bracings (X configuration, chevron configuration, parallel configuration, and no bracing), the X configuration would render a wall most rigid. Methods/Materials The materials used for this project were one Vernier Dual-Range Force Sensor, one LabQuest Mini, one Dremel drill press, balsa wood, cyanoacrylate wood glue, and one Xacto knife. There were twelve walls of each configuration, therefore yielding a total sample size of 48 walls. Each of these walls was tested under the drill press, and the force required to compromise the wall was recorded. After all twelve trials of each configuration, the two extreme points of data were eliminated to keep the data more consistent. Results The results of the experiment actually showed that the configuration of diagonal bracing that withstood the most amount of vertical load was the chevron bracing, contrary to my hypothesis. However, the results may have varied if a horizontal or shear load had been applied, since the chevron bracing would probably not perform as well under those conditions. Conclusions/Discussion The conclusion that can be drawn from this experiment is that the chevron bracing performed the best in the circumstances given, but the other walls could have performed better in other given circumstances. Some factors that might have skewed the results were the inconsistencies of the quality of wood, cutting, and gluing. However, an assembly jig was used to help assemble the walls. Also, the rate at which the drill press was pulled could have affected the results, though it was tested with spare walls that the rate did not affect the amount of force required to compromise a wall.	
Summary Statement My project tested what kind of diagonal bracing added to walls would render it the most rigid.	
Help Received Father helped modify drill press to hold force sensor.	