



# CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

<b>Name(s)</b> <b>Graham M. Francis</b>	<b>Project Number</b> <b>J0210</b>
<b>Project Title</b> <b>Tensile Strength of Wood</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The main reason I did this project was to test which wood is the strongest. This is valuable for construction and/or recreational purposes.</p> <p><b>Methods/Materials</b> In my experiment I had a control group that consisted of: temperature, humidity, elevation, air pressure, length of wood, length of wood being supported by the work bench, height from the floor of the work area to the platform tare. I gathered the equipment: steel weights in varying increments; 3 ft pieces of poplar, redwood, oak, maple, and douglas fir; an inches tape measure; a tare made of wood, chain, and a s-hook; graph paper; pencil; and an I-bolt. I set up a rig with a consistent length of unsupported wood and a consistent length of supported wood on a three foot piece of wood. I changed the independent variable, weight, by either adding a weight or taking one off and adding a heavier one consistently rising by 5 pounds. To measure the dependent variable, distance from the ground, I simply measured the distance from the ground to the lowest point of the wood with the inches tape measure. I recorded my results for every five pounds. I then followed the same procedures for the four other types of wood until they splintered or broke. .Because of the destructive nature of the experiment and the high cost of materials the test was only run once per wood type.</p> <p>Footnote: Originally the experiment was preformed with six foot lengths of wood. However the wood flexed and reached the floor before they reached a breaking point.</p> <p><b>Results</b> The maple broke at 130 lbs making it the strongest. The oak fractured at 100 lbs making it the second strongest. The poplar snapped at 90 lbs. Douglas fir broke at 65 lbs and lastly, redwood, the weakest, splintered at 35 lbs.</p> <p><b>Conclusions/Discussion</b> My experiment showed what I had hoped it would show. Harder woods can hold more weight, but that does not mean a hardwood is always the wood to use. The wood used depends on the strength needed. Although redwood broke first it is still a very popular wood for fences because it is durable enough and inexpensive. If furniture is the final product, oak and maple are popular choices.</p>	
<b>Summary Statement</b> I evaluated the tensile strength of five common wood types.	
<b>Help Received</b> Mother help jot down data. Father helped apply weight to wood.	