CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J1843

Project Title
Nail That Wood

Abstract

Objectives/Goals
I chose the science project that I did because I have always been interested in building with wood and using it. I figured that if I started doing tests on wood that I might find a lot of interesting facts about how wood works and how it could help me when I build with different types of wood. I also chose this project because I like using hammers and hitting things with a hammer such as nails.

Methods/Materials
Methods: The first procedure that I had to do was build a uniform hammering device, which allowed me to produce standerdized measurement samples. Then I started the testings of my four samples of four different types of wood. The tests included pounding seven nails, one at a time, into each of the four samples of each wood type. I measured the results of each test in millimeters by first marking a nail in a pilot hole and then hammering it three times and putting another mark to measure where the nail was after the pounding. In oder for me to measure the nails I had to pull them out and measure them from the bottom of each mark.

Materials: White Pine from Frost Hardwood Lumber; Red Oak from Frost Hardwood Lumber; Birch Plywood from Frost Hardwood Lumber; Sugar Maple from Frost Hardwood Lumber; 0.9 kilogram drilling hammer from Home Depot; 2 pieces of scrap wood from Home Depot; 1 miter box from Home Depot; A box of 1# nails from Dixieline; Ryobi power drill.

Results
My data shows that softwoods are easier to nail into than hardwoods. White Pine and Birch Plywood, softwoods, had a nail depth average less than Sugar Maple and Red Oak, hardwoods. My data also shows that hardwoods are more likely to break because one of the Red Oak samples split during testing.

Conclusions/Discussion
According to my test results I know that the Birch Plywood was the easiest wood to hammer into because it was the softest wood out of the four different types. The plywood was the wood with the deepest nail depth average because it was the least dense wood that was tested by me. Even though I thought that Birch Plywood would be the hardest to hammer through, I was wrong. Red Oak was the hardest wood to nail into because it was the densest type of wood that I tested. Because the Red Oak was so dense it would need to take more than three hits with a 0.9 kilogram drilling hammer. This is why the average nail depth was only 4.8 millimeters. These are the main reasons why I know my results are true.

Summary Statement
Do different woods work differently with a certain type of nail?

Help Received
Dad helped with getting wood and the device for hammering