CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
Callie M. McCaffery

Project Number
34169

Project Title
I See Cantilevers Everywhere

Abstract

Objectives/Goals
What affects how much a cantilever arm will bend?
Specific test: How will changing the length of a cantilever arm affect how much the free end moves with the same weight?
Hypothesis: If I lengthen a cantilever arm it will bend more than when it is at a shorter length.

Methods/Materials
I am going to test my hypothesis by increasing the length of a cantilever arm with the same amount of weight on the end. I will measure the deflection of the cantilever arm from the horizontal at each length.
Materials: Sticks (dowels) for testing as cantilever, clamps, five-pound weight, level surface to support cantilever and measuring device (saw horse), level with ruler, T-square, flashlight, tape, zip ties, pencil and paper.

Results
Table of data showing measurements of deflection for cantilever lengths from 2" to 24". Deflection increased as length increased with the same weight. Also tested different shaped (circle and square) rods/cantilevers. Found square rod bent less than circle rod.

Conclusions/Discussion
My hypothesis was correct. The longer the cantilever arm, the more the rod will bend.
I learned there are a lot of cantilevers around, man made and natural. I even discovered I can be a cantilever by stretching my arms out and holding a weight.
Other variables that I can change in further testing of cantilevers could be shape of rod, coatings on wood, weights used, and since visiting with judges, I have thought about questions on the impact of density, and cross sectional area.

Summary Statement
My project is about changing the length of a cantilever arm to see what effects it has on the deflection distance.

Help Received
Father helped build test set up; mother and father helped with data recording and computer work