CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
35889

Project Title
Using Lasers to Measure the Sugar Content of Liquids through Refraction

Abstract

Objectives/Goals
My objective was to learn if a laser's path becomes changed more with the amount of sugar, and if it can be used to measure sugar content.

Methods/Materials
To make a glass prism apparatus: Microscope slides Waterproof caulking or epoxy Small glass for base Duct tape Laser pointer To test sugar content in liquids: Piece of paper and pen to mark laser#s path Kitchen Scale and Containers For Calibration Phase: Sugar/water in 5%, 10%, and 20% concentration For Application Phase: Sprite, 7Up, Fanta, Crush, Coke and Pepsi

Results
My results indicated that laser testing is not the most exact way to measure. I had a 6% error, meaning that the actual result according to the label was 6% away from mine. I found this by taking the arctangent of the measured distance from the beams unaltered path over the distance to the wall from the center of the prism.

Conclusions/Discussion
Yes, my hypothesis was correct in that I could measure the sugar content with a laser. However, my results were not extremely accurate. This could have been caused by the color of the liquids, or the apparatus used to measure the laser. It also could have been caused by the difference between Corn Syrup and Cane Sugar. I will attempt to repeat my results if time allows for it.

Summary Statement
My project is about using lasers to measure the sugar content of liquids through the measurement of refraction.

Help Received
My dad helped me by providing the laser and by helping me glue the prism.