CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
J1506

Project Title
A Comparison of the Adhesion of Liquids on Regular Shapes

Abstract

Objectives/Goals
The original goal of my project was to discover whether or not different shapes would affect adhesion. Adhesion occurs when to substances meet and it does not matter how little it is. As my project progressed though I came to ask myself four other questions. Does the amount of area affect adhesion? Does the type of liquid I'm using affect adhesion? Does the depth of the liquid affect adhesion? Lastly, does temperature affect adhesion?

Methods/Materials
To start answering these questions I began with four shapes at three different sizes. The shapes were circles, squares, triangles, and hexagons. I took these shapes and hung them on the simple balance beam that I constructed. On the other side I used gram weights to counterbalance the adhesion between my plexi-glass shapes and the liquids I used. The liquids I used were water, rubbing alcohol, and motor oil. I tested the shapes at depths of one quart and two quarts. When I did the temperature test I used boiling water and cold water from my sink at home. I tested each shape to see how much force it would take to detach it from the surface of the liquid I was using. I did this three times each for more acurate results.

Results
After each test was completed I was able to come up with some average results. These results show several things. First they showed that the best shape for adhesion was a cirle, and the more sides the shape had the better adhesion except in the case of the hexagon. Second, that the best liquid to use was water. Third, that the largest shape did best. Fourth, that the cooler the liquid was the better adhesion was. Lastly it showed that the two quart depth was better than the one.

Conclusions/Discussion
Using the results I was able to draw a couple of conclusions. First, that the more sides a shape had the better adhesion it had, and that the hexagon was problaby cut wrong or had less area so it did poorly. Second, since the water was the densest liquid, and the others followed in order of density, that the denser a liquid the better the adhesion. Third, the more area you are attaching the better adhesion. Fourth, that adhesion works best when the substances are colder. Lastly, I determined that the difference in results of the depth test were so miniscule that it does not affect adhesion.

Summary Statement
The goal of my project was to discover the properties of adhesion.

Help Received
My mother helped with the board; My father helped assemble the balance beam; and my teacher Mr. Susman proofread the report