CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36720

Project Title
Does the Surface Tension of Water Change When You Mix Different Substances in It?

Abstract

Objectives/Goals
My project is to find out if different solutions have different surface tensions. The purpose of this project is to see if affecting the surface tension of an ecosystem can affect the wildlife that lives there. For example, creatures such as water striders rely on surface tension to keep them afloat on the water. If someone or something alters the surface tension, the water striders may potentially not be able to survive. Another purpose was to find a cost effective and environmentally friendly substance that can be used to alter the surface tension of water so that it prevents mosquitos from laying eggs on still water.

Methods/Materials
To conduct my experiment, I built a simple scale out of Knex. On one side, I attached a string with a slide taped to it. On the other side, I built a small paper basket to keep counterweights in. I used this scale to measure the surface tension of my solution. I measured the surface tension of my solution by placing the slide on the surface of the solution and putting counterweights in the basket to balance out the scale. I took the number of weights and divided it by the two lengths of the slide which totaled up to be fifteen. This measurement is the mg wt/cm.
-mg is a measure of mass
-mg wt refers to force

Results
My results showed that after I had tested all my prototypes (distilled water; salt water; oil, and bubble liquid water), distilled water had the highest surface tension. Bubble liquid water had the lowest surface tension.
Bubble liquid can initially be used as a low cost solution to control the population of mosquitos, but it is not environmentally friendly and may harm other species.

Conclusions/Discussion
I did my analysis on all of the prototypes and found out that distilled water had the highest surface tension because of the imbalance of intermolecular attraction. The distilled water did not have any other substance interfering with the attraction between its molecules whereas the other solutions had foreign substances altering the attraction between molecules therefore reducing the surface tension. The bubble liquid solution affected the surface tension the most. Since most household waste is derived from soap (detergents), we can potentially harm the environment when we dispose of materials in streams and waterways.

Summary Statement
I built a simple device to measure how much the surface tension of water change when you mix different substances in it.

Help Received
The people who guided me during my project were my father, Saravjeet Singh, and my science teacher, Mr. Jenkinson. My father helped me understand what polarity was and my science teacher taught me about significant figures.