CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
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Project Number
35868

Project Title
Hovercrafts

Abstract

Objectives/Goals
The overall purpose of this investigation was to understand how hovercrafts operate on different surfaces, and how aerodynamics and friction affect their flight.

Methods/Materials
To begin, I created the hovercraft, which consisted mainly of a DVD, balloon, and a pop-top lid from a plastic drinking bottle. I tested the hovercraft on cement, carpet, glass, table, and water. I tested the hovercraft three times on each surface and recorded the duration of flight in my lab notebook.

Results
The balloon hovercraft hovered the longest on table, while it hovered the shortest on water. For all the trials on carpet, the hovercraft had no leverage. While testing the balloon hovercraft on water, I observed that the hovercraft was weighed down on one side by the balloon. As a result, the hovercraft was thrashing around in the water.

Conclusions/Discussion
My hypothesis was that the hovercraft would hover longest on the smoothest surfaces and not as well on the rough surfaces. The results for all three trials remained consistent on all surfaces except for glass. This probably happened because the stopwatch was timed inaccurately. My hypothesis was supported in my experiment because the duration of flight on smooth surfaces surpassed that of the rougher surfaces. The cause of these results is due to the way friction affects flight. It was harder for the hovercraft to gain lift on rough surfaces with more friction because the friction hampered the hovercraft's ability to accelerate off the ground. One possible source of error in my procedure was that I may have ended the timer on the stopwatch slightly early or late. If I were going to continue this research, I would like to investigate how well a real, controllable hovercraft would maneuver on different surfaces. I would also like to observe the changes that would take place if I created the base of the hovercraft with a different material, other than a DVD.

Summary Statement
I performed this experiment to understand how aerodynamics and friction affect maneuverability in hovercrafts.

Help Received
I would like to acknowledge my parents for helping me execute this experiment by timing the hovercraft with a stopwatch.