Name(s)	Project Number
Shikha Kini	**J1714**

Project Title

The Effect of Viscosity of Hydraulic Machines

Abstract

Objectives
My objective was to discover if the viscosity of liquid impacts the effectiveness of a simple hydraulic system.

Methods
In this project, I used 4 liquids of different viscosities, water, vinegar, diluted soap, and vegetable oil. I set up a simple hydraulic system using 2 200mL syringe and plastic tubing and filled up one syringe with a liquid. I placed a weight on top of the syringe and timed how long it would take for the other syringe to be completely filled, and repeated this 5 times with each liquid and found the average.

Results
The less viscous a liquid was, the more speedily the hydraulic system operated, which supported my hypothesis. Vinegar had an average of 3.692 seconds, water, 4.046, the soap had an average of 4.294 and vegetable oil was 9.07, which corresponds to their respective viscosity orders.

Conclusions
Using my data, we can conclude how to utilize liquids' viscosities in hydraulic systems without using excess electricity. In order to control a hydraulic machines speed just by using a liquid, we can change use a hydraulic fluid of a corresponding viscosity to the speed, like using a very viscous liquid to make the system move slower. Also, we could even incorporate force multiplier to utilize this concept even more, which shows that if we use a small syringe to apply force to a larger one, the force will become greater in order to keep the pressure constant throughout the system.

Summary Statement

As measured by how quickly all the liquid got transferred from one syringe to another, I discovered that the viscosity of liquids impacts the effectiveness of hydraulic systems.

Help Received

Prashanth Kini (my father), assisted me in this project in the construction of my hydraulic model by the drilling of holes and nails as well as other mechanical tasks.