Name(s)	Project Number
Keshav B. Kundassery	
	31408

Project Title

The Best Pulley Combination for Reducing Workload

Abstract

Objectives/Goals
The objective was to find the best pulley combination for reducing workload.

Methods/Materials
First, a platform was built to hang and test the pulleys. A total of 11 combinations were tested. After assembly, a spring scale was used to measure the force required to lift a 320 g weight with that combination. Along with force required, the distance the string had to be pulled to lift the weight 10 cm was measured. This was accomplished with a measuring tape attached to the side of the platform. In some cases, the observation was different from my expectation. The weight was changed to confirm a finding. Friction was ignored in my numerical findings, but it was taken into consideration when concluding.

Results
I found that the double tandem pulley combination was most efficient. The force required was equivalent to 0.392 N, and the string was pulled 40 cm to lift the mass 10 centimeters. The block and tackle system with three fixed and two moveable pulleys was also quite effective. The force required was 0.588 N and the string was pulled 40 cm to lift the mass 10 centimeters.

Conclusions/Discussion
There was a slight difference between expected force and actual force. With a fixed pulley the force was 0.392 less than expected, while with a moveable pulley it was 0.245 N more. This is possibly because of the difference in direction of pull with respect to gravity. I thought that more pulleys would decrease the force required, but I found that it is not always the case. My hypothesis was not supported. It is not the amount of pulleys that matters; it is how they are arranged.

Summary Statement
This project is an attempt to find the best pulley combination for reducing workload.

Help Received
Dad helped with choosing the project and understanding physics, Mrs.Morgensen mentored the project