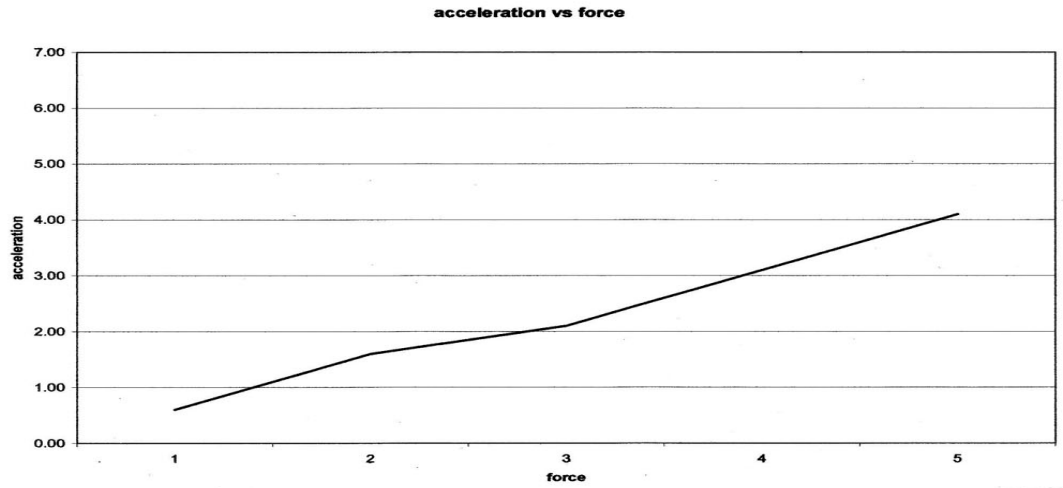
The purpose of this lab is to find the relationship between acceleration of the car and the increased constant force pulling the car. The hypothesis is that if the force is increased, the car will accelerate in an exponential relationship to the force.

Newton's second law of motion states Force = mass * acceleration. The mass of the car in this lab remains constant in all trials. The measuring units of the spring scales used in this lab are Newtons. Force is measured in Newtons. Using the scale, a constant force was used to pull the car 1 meter. This was repeated 3 times to calculate the avg. time speed and acceleration. The series was repeated 5 times with different forces each time.

As the force increased the acceleration increased also. The data of the final outcome shows a linear relationship between acceleration and force, disproving the hypothesis. THIS MAKES SENSE because, mass is constant! Force / acceleration = mass SO... the mass of the car was constant and should be able to be calculated from the force and the acceleration. The following data was collected. The force and times for trials were recorded by observation; all other data was calculated.

force (N)	trial 1 (s)	trial 2 (s)	trial 3 (s)	Avg. time (s)	Avg speed (m/s)	final speed (m/s)	acceleration (m/s^2)	calculated mass of car (oops)
0.60	1.70	1.80	1.70	1.73	0.58	1.15	0.67	0.90
1.60	1.00	1.30	0.90	1.07	0.94	1.88	1.76	0.91
2.10	0.80	0.90	0.80	0.83	1.20	2.40	2.88	0.73
3.10	0.80	0.90	0.50	0.73	1.36	2.73	3.72	0.83
4.10	0.60	0.50	0.60	0.57	1.76	3.53	6.23	0.66



the calculated mass of the car was not constant, therefore the measured time and force may have been incorrect. Using people to measure constant force is not exact. The time of the trials was measured by a stopwatch and the naked eye. It was not exact. Questions to ask: what is the affect of the friction of the wheels? What is the affect of air friction? Does the mass of the spring and string affect the lab?