Report Sheet

Newton's Second Law

Data:

Part 1 – constant mass

mass (g)	Force (N)	acceleration (m/s^2)
50	0.49	.8178
60	0.59	.9592
70	0.69	1.125
80	0.79	1.32
90	0.88	1.449
100	0.98	1.790

Include a graph of acceleration on the x-axis vs force on the y-axis.

Slope of the line: .01864 $\frac{\frac{m}{s^2}}{\text{grams}}$ *(include units)* so $\frac{\text{acceleration}}{\text{grams}}$

Part 2 – constant force

mass (g)	acceleration (m/s^2)
300	1.945
550	.8891
800	.7321
1050	.4185

Include graphs of mass on the x-axis vs acceleration on the y-axis and inverse mass on the x-axis vs. acceleration on the y-axis.

Slope of the line for the second graph only: 612.3 $\frac{\left(\frac{m}{s^2}\right)}{g}$ *(include units)*

Questions:

1. According to Newton's Second Law, F = ma, the equation has a y-intercept of zero. How does the graph of force versus acceleration for a system of constant mass support this relationship?

the graph follows this rule for the most part. it get close to the intercept being .12.

2. Compare the slope of the line to the total accelerating mass. Comment on the two values, and the expected relationship between them if the second law is true.

This would mean that Force is increase as we move along the x-axis in a porpendual manner!

3. Newton's Second Law, F = ma can be re-written as: a = F(1/m). How does the graph of acceleration versus inverse mass for a system of constant force support this relationship?

It supports this relationship because as mass is increasing, our acceleration is getting smaller and smaller due to the denominator getting larger! very cool :)

4. Compare the slope of the line to the constant applied force. Comment on the two values, and the expected relationship between them if the second law is true.

Slope in will tell us the force being given to the accelerated object, if we are to beleive Newtons second law. which we do.