Report Sheet

Newton's Second Law

Data:

Part 1 – constant mass

mass (g)	Force (N)	acceleration (m/s^2)
50	0.49	
60	0.59	
70	0.69	
80	0.79	
90	0.88	
100	0.98	

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

Slope of the line: _____ *(include units)*

Part 2 – constant force

mass (g)	acceleration (m/s^2)
300	
550	
800	
1050	

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: _____ *(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?

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.

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?

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.