Newton's Second Law with Changing Force

Name_____

Data Collection:

Use the same general procedure that you used for the first Newton's Second Law lab. Except that in this case you will keep the mass on the cart constant (use a 1 kg mass on the cart) and change the force that pulls the cart. You will no longer use sand and a cup for the force but a series of different masses. You will use a 10 g weight, a 20 g weight, 50 g weight and a 100 g weight. Once again you will need to take three trials for each of the four different forces.

Masses

Mass of Cart: _____

Forces

Force caused by 10 gram weight _____
Force caused by 20 gram weight _____
Force caused by 50 gram weight _____
Force caused by 100 gram weight _____

Accelerations

	Acceleration (m/s^2)			Average Acceleration (m/s^2)
10 gram weight	_____	_____	_____	_____
20 gram weight	_____	_____	_____	_____
50 gram weight	_____	_____	_____	_____
100 gram weight	_____	_____	_____	_____

Processing the Data

1.) **Graph the Data. Plot the Average Acceleration verses the Force on a sheet of Graph Paper.**

2.) **What relationship do you observe between the force and the average acceleration.**

3.) **Does this agree with your knowledge of Newton's 2nd law of motion? Support your answer using the law and your data.**

4.) **Extend your graph until it crosses the x-axis. In other words when the Average acceleration equals zero. Does your force equal zero also? If not, what has caused the difference?**

5.) **What is the force due to friction on the cart according to your graph? Which direction is the force due to friction?**