Data

Weight on bathroom scale = _____
Show all calculations below

Your weight (SI units) = _____

Mass of cell phone = _____

Weight of cell phone = _____

The Feel of Gravity Data Table

mass of magnet (g)	**mass of what is on top of magnet (g)**	**Total mass (grams)** [sum of columns 1 & 2]	**Total mass (kg)**	**Force** (use g =10 m/s/s/) **(N)**	**distance (cm)**
12	magnet only	12	0.012 kg	.12	
12	short rod				
12	long rod				
12	mass platform only				
12	mass platform+500g				
12	mass platform+1000g				
12	mass platform+1500g				
12	mass platform+2000g				
12	mass platform+2500g				
12	mass platform+3000g				
12	mass platform+3500g				

The Look of Gravity

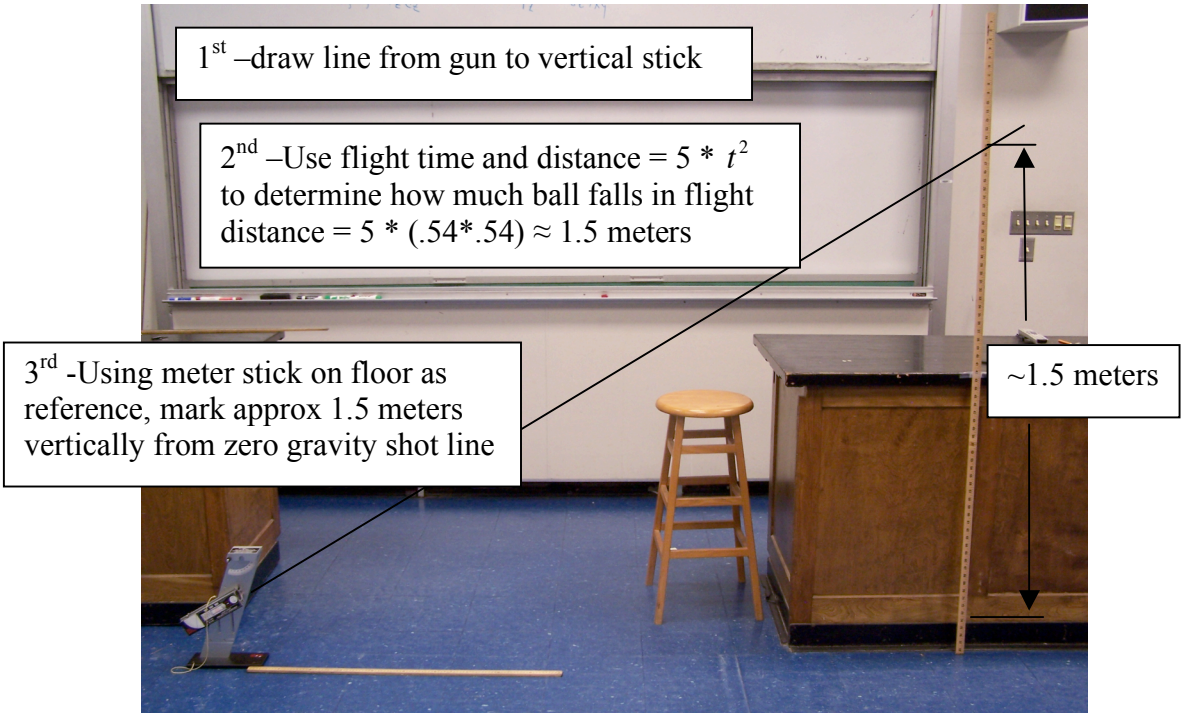

Figure 1- Time of flight to vertical (2 meter) stick = 0.54 seconds

Figure 2- Time of flight to vertical (2 meter) stick = 0.40 seconds

Figure 3- Time of flight to vertical (2 meter) stick = 0.70 seconds

Movie Stills from the Hellboy
(Assume Hellboy is 2 meters tall)

Questions

1. If you took a bathroom scale into an elevator would you weigh more or less when it accelerated up? What about when it accelerated down? Explain your answer.

2. The elevators in the Landmark Tower, in Yokohama, Japan, are among the fastest in the world. They accelerate upward at 3.125 m/ s^2 for 4.00s to reach their final speed. Assuming they accelerate downward at the same rate and using the relationship given below answer the following. Show work.

$$Weight_{moving} = Weight_{stationary} \pm \frac{3.125 m/s^2}{9.80 m/s^2} Weight_{stationary}$$

Your maximum weight in elevator = _____lbs
Your minimum weight in elevator = _____lbs

3. Did your Plots look like an inverse square law plot? Why or why not.

4. Using a caliper, measure the thickness of the skin between you thumb and index finger Using this value and your plot estimate how much force a pair of the magnets in lab would exert on you skin if they were to pinch you. This is done by locating the measured skin thickness on the x-axis and **drawing a vertical line** that intersects your curve and then extending **(drawing) a horizontal line** to the y-axis which gives you the amount of pinch force.

Pinch force = _____N

5. The sun has a diameter of approximately 870,000 miles. How much would its gravity at its surface increase it were to shrink down to approximately the size of the earth say to 8700 miles. (Since it's a gaseous body it really does not have a surface). Show work. Remember gravity is an inverse square force law.