**PreAP Physics – Gravity Force Lab**

Today, you will use the Gravity Force Lab PhET Simulation to investigate what the gravitational force between two objects depends on and experimentally determine the Universal Gravitational constant, G.

**PreLab and Beginning Observations**

1) Write the formula for the force of gravity (Law of Universal Gravitation). Label each variable and constant and include its units.

2) Open the Gravity Force PhET Simulation. What can you change about the simulation?

**Part 1 – Qualitative Observations**

1) Look at the formula above. What three things can you change in the formula that you can also change in the simulation?

2) Change each variable and record what happens to the gravitational force as you change it. Be specific with your language (i.e. use terms like increase, decrease, remains constant).

**Part 2 – Quantitative Measurements**

In this section of the lab, you will develop your own method for determining the gravitational constant G in the formula for gravity using the simulation and Excel. You will develop your own procedure, collect data, graph your data, find a best fit line and interpret its slope to find G.

Here is a **sample** idea –

1. Click “Reset All” to get everything back to the original values.

2. Record m2 and the distance between m1 and m2 on your paper.

3. For at least 12 different data points, change the mass of m1, and then record the mass and gravitational force in your data table.

4. Using Excel, graph mass 1 on the horizontal axis and gravitational force on the vertical axis.

5. Determine your line of best fit and interpret your slope to find the constant G.