IB 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

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

4) 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 need to change ONE value (IV) only to see how the gravitational FORCE (DV) is affected. Please do TEN or more different measurements (only 1 trial each).

Possible ideas

- Change mass 1 and keep mass 2 and the distance constant and record gravitational force.
- Change distance and keep mass 1 and 2 constant and record gravitational force.

In both of these examples, think about what you would graph and how it would allow you to determine the constant G. Set up your axes on Loggerpro so that the slope represents G only.

This is an individual assignment with the ONLY the following requirements:

1. Create an organized data table containing your data
2. Include a screenshot of your graph, making sure that all points and WORDS are large enough for your aging teacher to read (at least 20 pt font).
3. Include a formal statement of your estimated value for G along with its estimated uncertainty. Refer to your graph as justification for this estimate.

Be sure to refer to the detailed LAB RUBRIC on Weebly and the same on Turnitin.com. No introduction, research question, procedure or evaluation is needed. This is just about using and presenting data.

DUE DATE: _____