**AP Physics – Hooke’s Law Hands-on and Masses and Springs PhET Lab**

**Goal –**

*Your goal is to determine the relationship between force and stretch of a spring. You will use both a rubber band and a spring for the hands-on lab. For the computer simulation, you will select one spring to study.*

**PreLab Q’s**

1) What does a spring do when you pull on it? Be specific and use scientific terms.

2) What happens when you push a spring? How is this different than pulling it?

3) What type(s) of energy does a spring before and after you stretch it? Draw a diagram below and explain your reasoning.

4) Are all springs/rubber bands the same? What makes them different?

**Part 1 – Hands-on Lab**

Using the materials provided (rubber band, spring, ruler, set of masses and scale), determine the spring constant for your rubber band and spring. \*Hint – you may need to make a graph using Excel\* Develop your procedure below then ask the teacher to verify your procedure before receiving your materials.

Data –

Sketch of graph –

Use of Hooke’s Law –

Brief Conclusion –

**Part 2 – Masses and Springs PhET Simulation**

Now, you will use the PhET simulation to replicate your Hooke’s Law experiment. For this lab, you will write a formal lab write up. In your conclusion, answer the following questions

1. How is using the PhET simulation different from the hands-on experiment?
2. What are the advantages/disadvantages of using the simulation?
3. Was it easier/harder to use the sim over doing the hands-on investigation?
4. Which spring constant (your hands-on or your sim) result do you think is more accurate? Why?
5. How could you minimize error in your hands-on experiment? Sim experiment?

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