AS Physics   Name_____
Enrichment – 1D Forces

Instructions
This assignment has 2 options: an experiment and a VPython program. You may choose to do one or both. Answer the questions on a separate sheet of paper.

Experiment
This experiment will analyze Newton's laws in the context of an object falling with air resistance.
- Draw a **qualitative** force diagram for an object falling **without** air resistance
- On your diagram, calculate and label the net force in both the X- and Y-Dimensions
- Draw a **qualitative** force diagram for an object falling **with** air resistance
- On your diagram, calculate and label the net force in both the X- and Y-Dimensions
- Pre-Experiment
  - Choose an object for your experiment. I suggest you choose something with a sufficient air resistance for it to be measurable.
  - Record the proper data in order to...
  - Draw a **quantitative** force diagram for the object falling **without** air resistance
  - On your diagram, calculate and label the net force in both the X- and Y-Dimensions
- Design an experiment in which you can measure the force of air resistance
  - Write out a description of your experiment and record your results
  - Draw a **quantitative** force diagram for an object falling **with** air resistance
  - On your diagram, calculate and label the net force in both the X- and Y-Dimensions

VPython
In this activity you will use a computer program to demonstrate and analyze the motion of various scenarios. BEFORE beginning this lesson you need to complete the VPython Directions document (also posted on the weebly. I expect a high comment-to-code ratio in all code submissions.

Go to *glowscript.org*, and click on the *Sign In* link in the upper right corner.

- Look at the Forces example.
- Create a program that simulates dropping two objects of different mass without air resistance.
- Write a paragraph explaining the result of your simulated experiment and the reasoning behind it. Include a force diagram along with your paragraph.
- Create a program that simulates dropping two objects of different mass **with** air resistance.
- Write a paragraph explaining the result of your simulated experiment and the reasoning behind it. Include a force diagram along with your paragraph.
- Draw a graph comparing the velocity of the two objects over time.