Energy of Mass on Spring

Lab Preparation

Energy/SHM Lab Tips

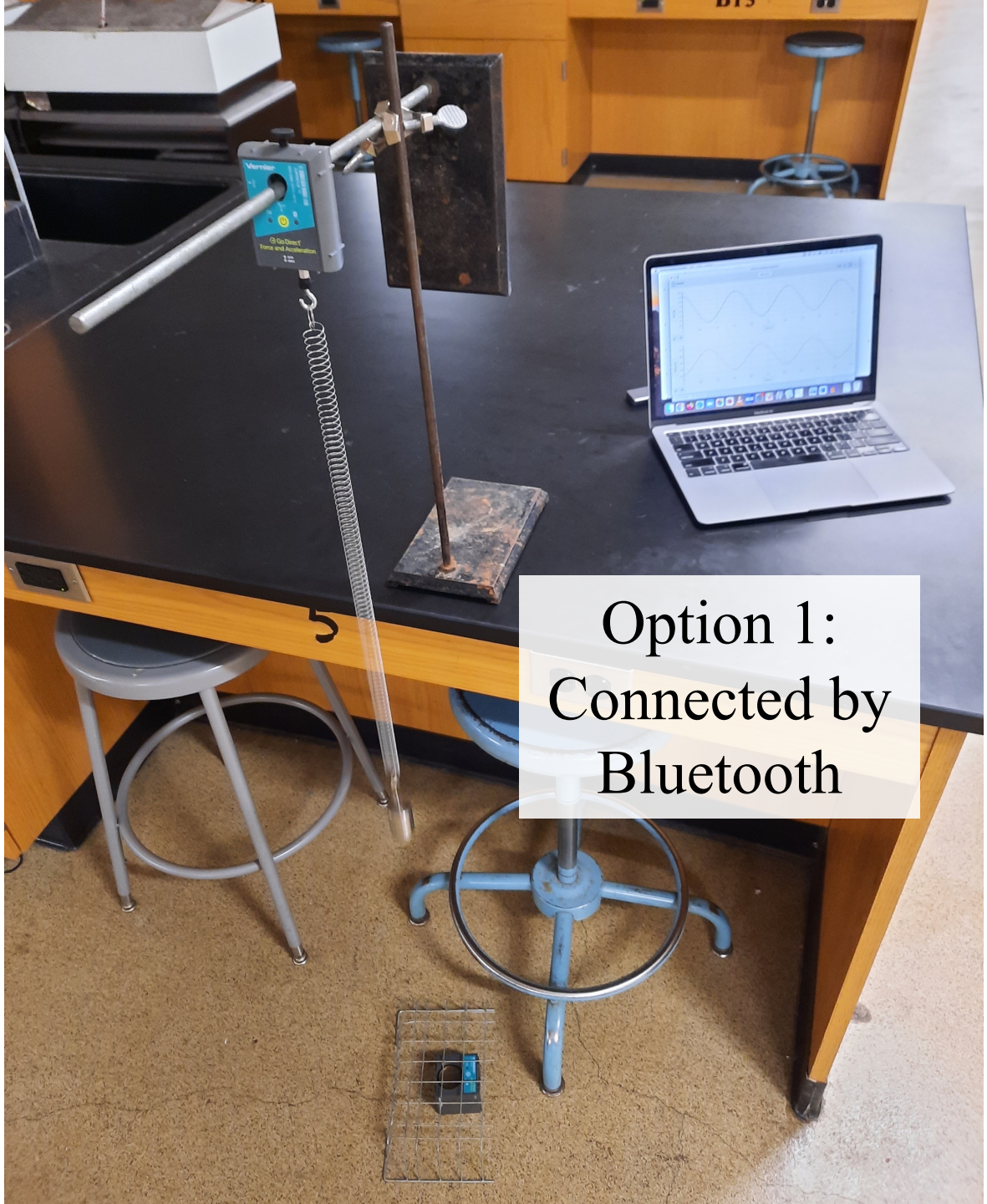
- Read the directions!
- The sequence of steps is important – ***read*** and follow the procedure in order.
- Goal: collect and save data, analyze data, and produce graphs and data table for printing
- You have at least a week to work on your report – production of graphs and responses to questions are **not** a group project!

Go Direct
Force Sensor

Spring

100-g mass

Go Direct
Motion Detector
(protected by cage!)



Go Direct
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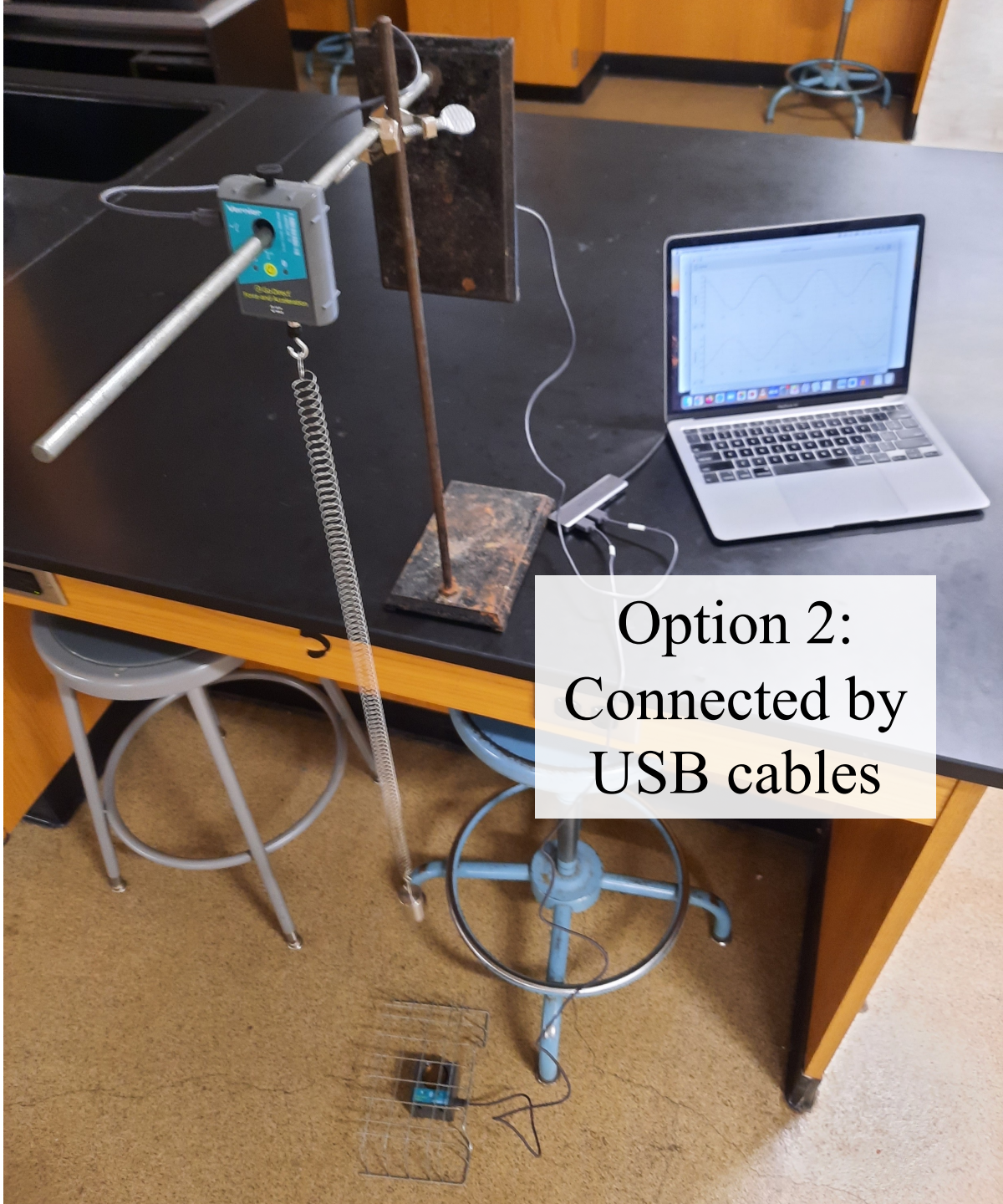
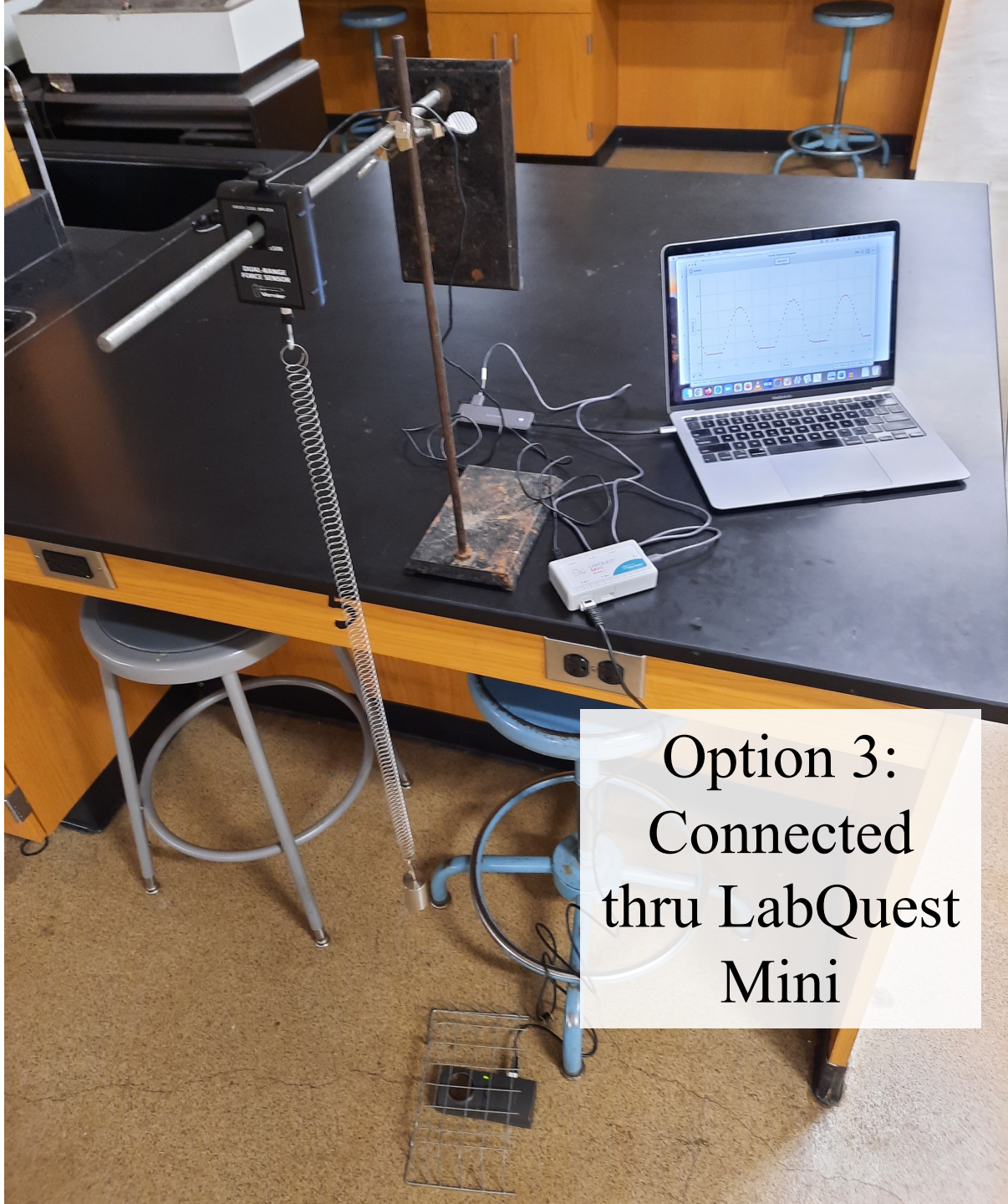


Dual Range Force Sensor connect to CH1

Spring

100-g mass

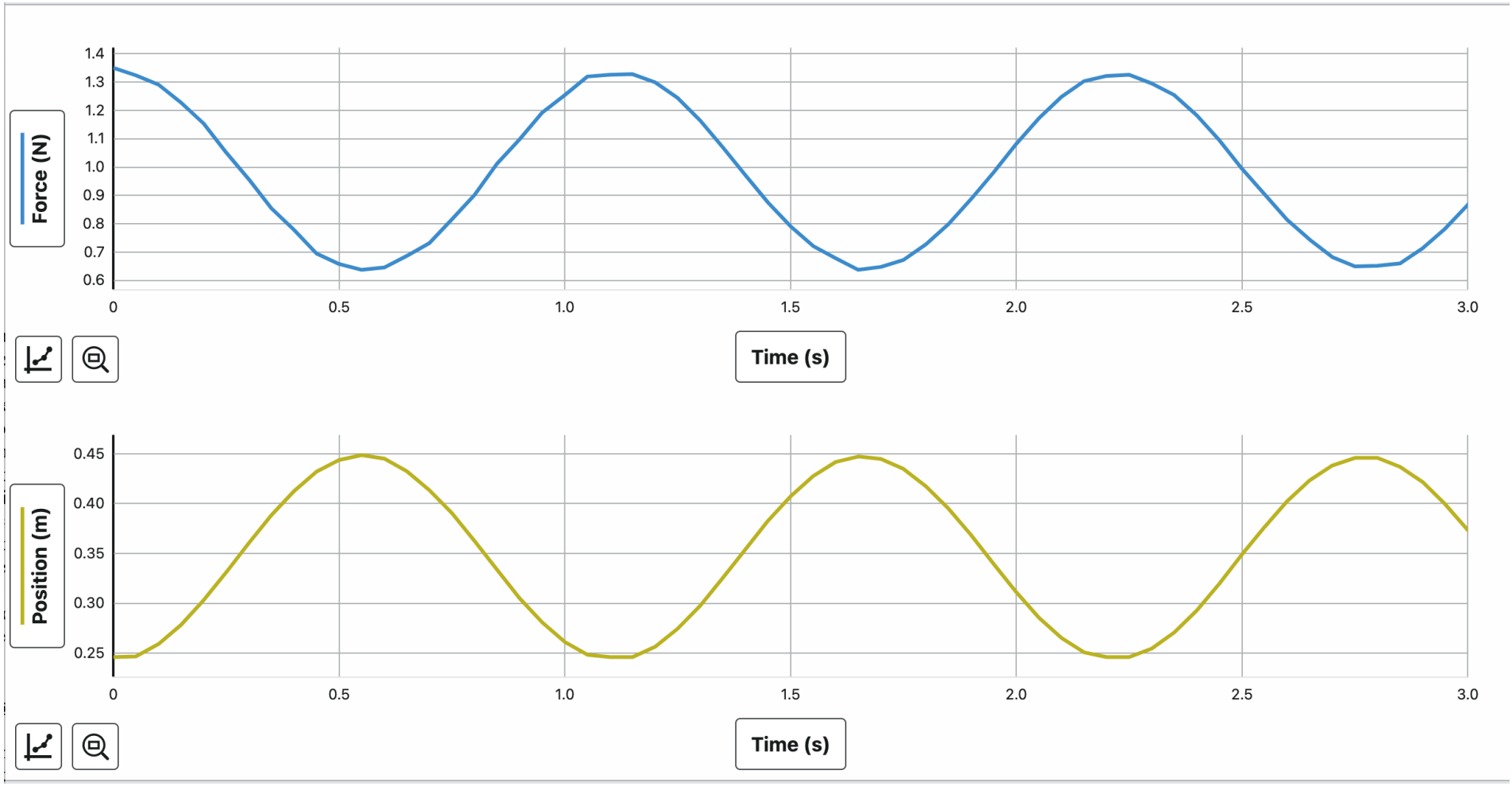
Texas Instruments Motion Detector connect to DIG1 (protected by cage!)



Option 3: Connected thru LabQuest Mini

Tips for Success

- Lift *upward* from equilibrium and release the mass to start it bobbing up and down.
- Do **not** pull *downward* and release! You may inadvertently "launch" the mass!



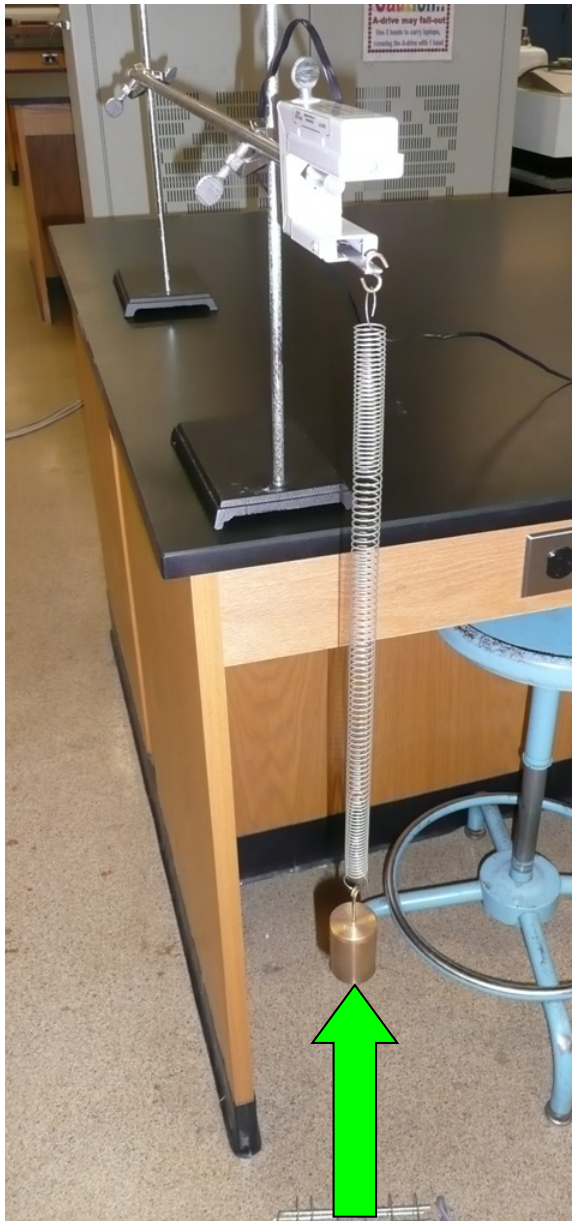
Typical result should look similar to this – smooth sinusoidal curves for both Force and Position

Position

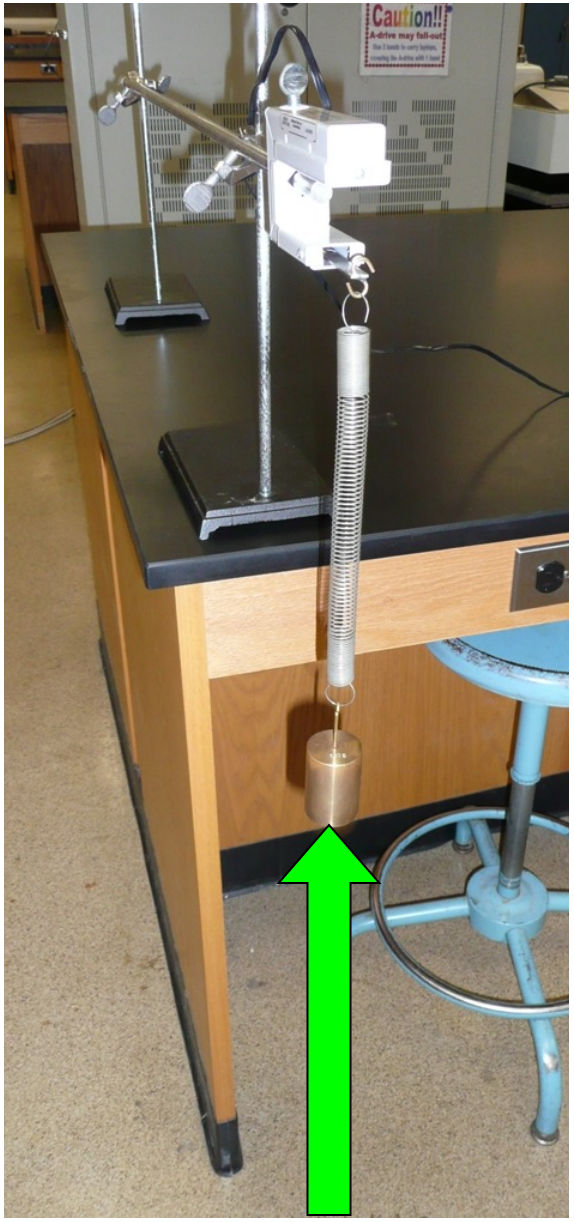
- The motion detector will be used to measure the motion of the mass bobbing up and down.
- Object must be at least a certain distance away from the detector for proper function. If object gets too close the position will record as a “flat line”.
- Be patient with the setup – adjust and repeat if necessary to get a nice, smooth sinusoidal graphs of position and force.

Force

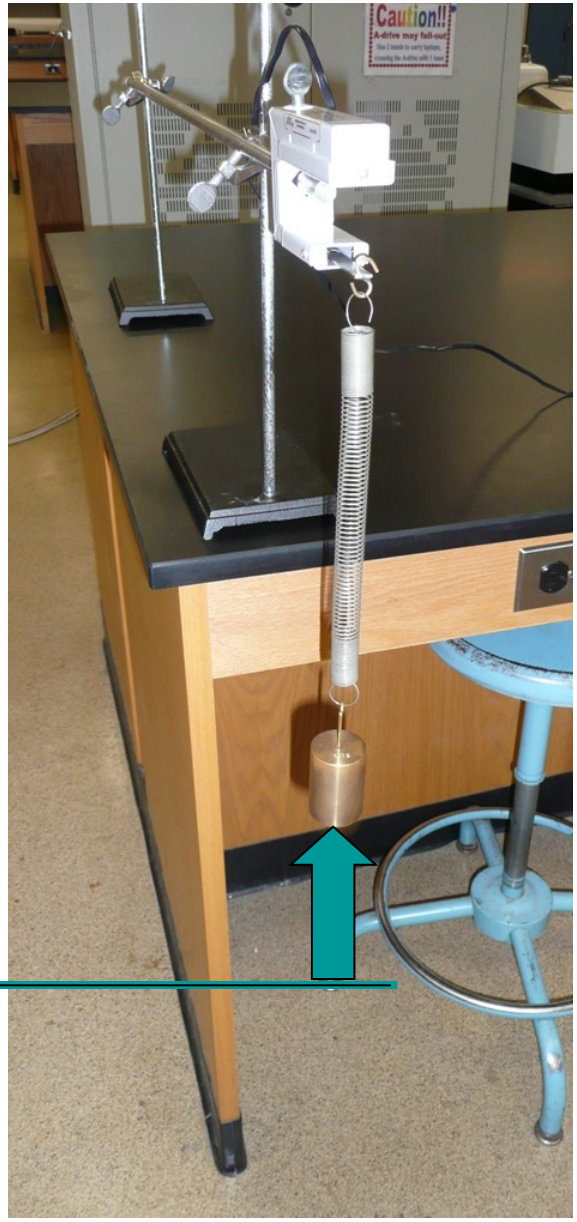
- The force of the spring acting on the mass is to be measured by the force sensor.
- In order to get a correct reading the force sensor must be calibrated (see directions).
- The sensor will measure *only* the force of the spring – the mass is affected by what other force(s)?

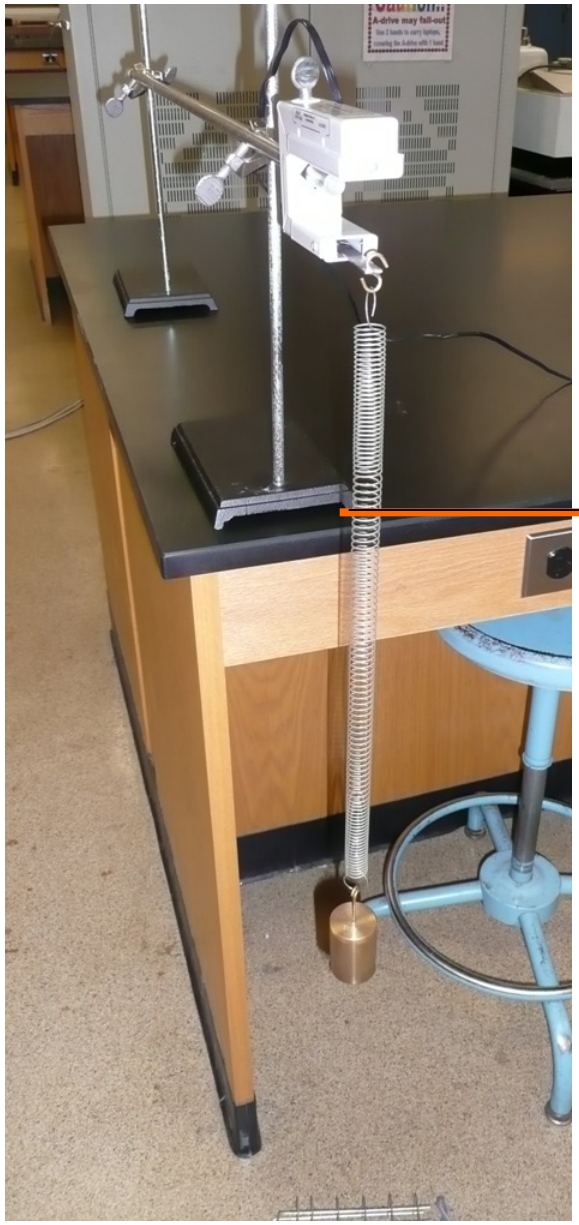


Position

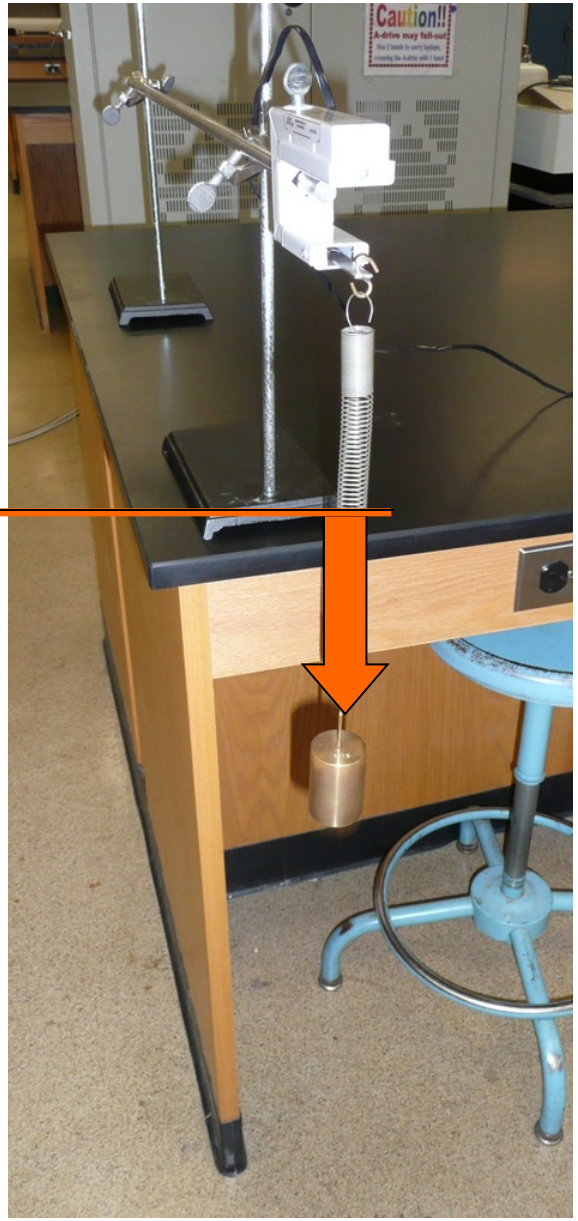


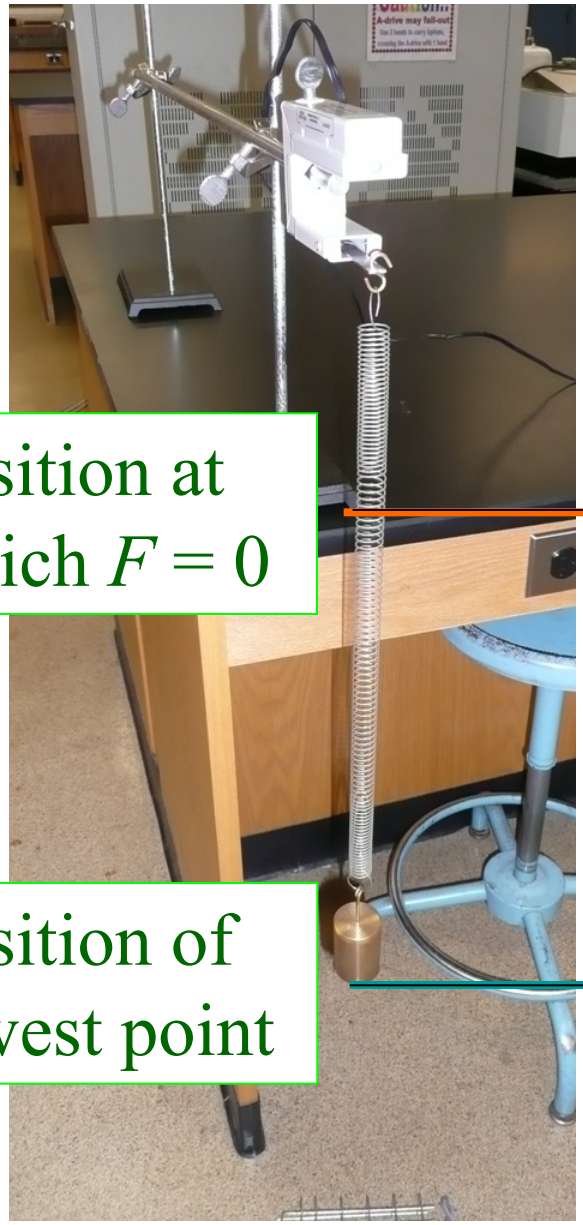
Height





Elongation



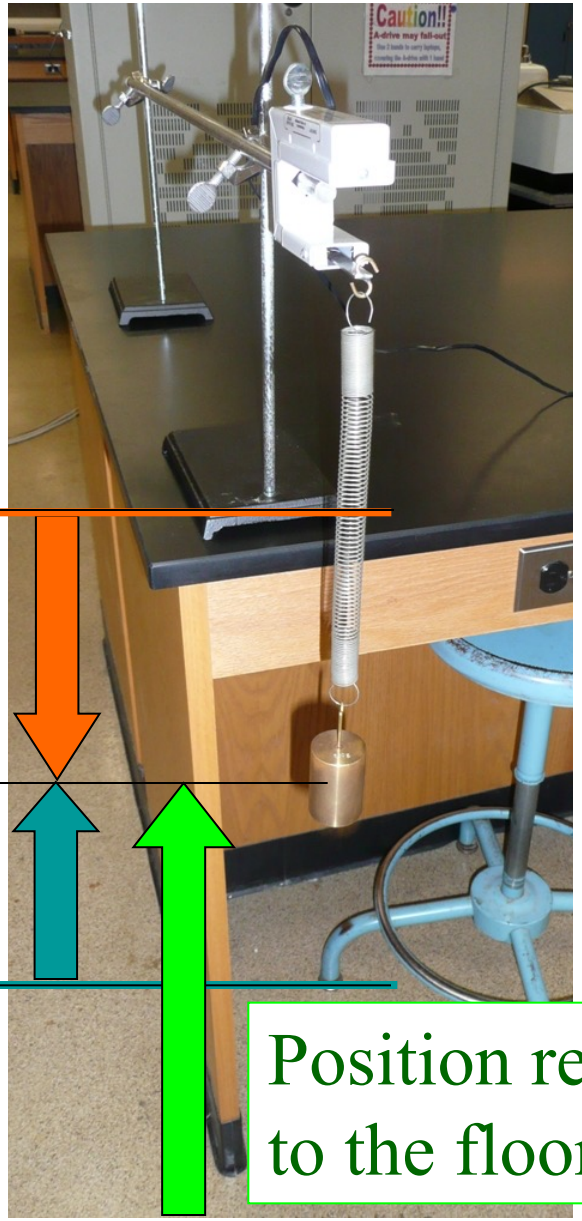


Position at which $F = 0$

Elongation

Height

Position of lowest point



Position relative to the floor

You will need to adjust the appearance of each graph before printing…

SHM Energy (Iris erika raksha).cmbl

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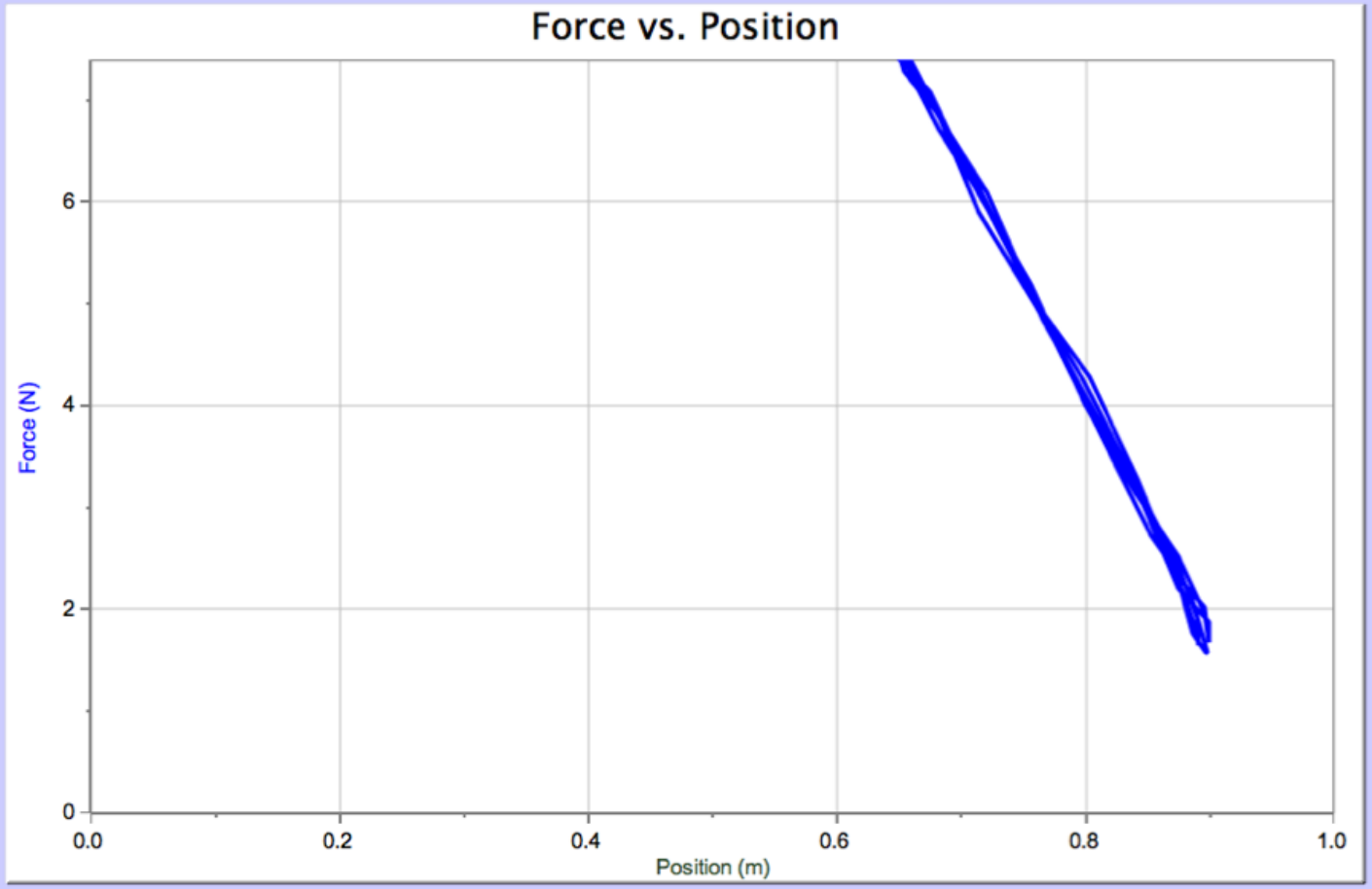
No Device Connected



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