Physics **Name** _____

Wavelength vs. Frequency Makeup **Date** _____

Objective: Determine the mathematical relationship between wavelength and frequency.

Procedure –

This lab will be performed using **PhET "Waves on a String" HTML 5 version (damping = 0, oscillate, fixed end)**. It will be helpful to use the pause button, the "step" button to the right of play/pause and to switch between slow motion & normal mode. Reset the simulation between each trial.

- Choose a frequency setting on the simulation. Write it down in the first column below.
- With the string paused in the baseline position, hit the play button on the stopwatch. Putting the simulation in slow motion mode will be helpful. When you hit play the wave will start to oscillate going first above the baseline and then below. When the green dot gets back to the baseline this represents 1 wave cycle. Allow the wave to oscillate 5 times. After the final wave cycle hit the pause button. Write this value for time in the second column below.
- Calculate the frequency using the number of oscillations and time. Remember the definition of frequency is *the number of oscillations per time*. Write this number in the third column below. If you did this correctly both frequency values should be the same (or very close)!
- Measure the wavelength of the wave using the ruler. With some of the lower frequencies you might not see a full wavelength between the oscillator and the clamp. Make sure to adjust your measured value to reflect a full wavelength!

Data

Frequency (simulation setting)	Time for desired # of oscillations	Frequency (Hz)	Wavelength (m)

Graph – ***Use logger pro to provide a sketch of the analyzed variables.***

Conclusions – ***Always answer these questions for a "relationship" lab.***

- What is the relationship between wavelength and frequency?

- What is the general equation of the resulting line/curve?

- What is the translated equation?

- If you double the independent variable, specifically what happens to the dependent variable?