**Wave on a String Online Lab**

***Instructions****: Follow the instructions below,* ***record your observations and data in your journals.***

**Procedure**

1. Click on <https://phet.colorado.edu/en/simulations/category/physics>
2. Find 🡪 Sound & Waves 🡪 Wave on a String 🡪 Click the green “Run Now” button
3. First, set **damping to zero** on the green control panel at the top center of the screen. In the bottom right, select **“No End.”** Wiggle the wrench to create a single pulse on the top side of the string.
   1. **Draw** your observations of this pulse as it travels to the fixed end.
   2. **Label** the different parts of the wave
4. **Reduce the tension** and send another pulse.
   1. Describe the differences between this pulse and the previous one.
5. **Change to “Oscillate”** in the bottom left to produce a continuous stream of pulses. Check the **“rulers” box** and the **“timer” box**.
   1. Do not change the amplitude or tension settings during this experiment.
   2. Use the ruler to measure the wavelength of your wave (the distance from crest to crest).
   3. Leave the damping setting at zero.
6. For five different frequencies, **measure the wavelength** of the wave produced. **Record** the tension setting and amplitude used. **Record** your frequencies and measured wavelengths in a table similar to the one shown below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Trials** | **Frequency**  **(Hz)** | **Wavelength**  **(m)** | **Wave Speed** |
| 1 |  |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| 4 |  |  |  |
| 5 |  |  |  |

1. What is the relationship between frequency and wavelength?
   1. Sketch a graph of wavelength vs. frequency showing this relationship.
2. What is the relationship between wave speed and frequency?
   1. Sketch a graph of wave speed vs. frequency showing this relationship.
3. Repeat step 5 for a **new amplitude setting** using the same tension setting as in step 5.
   1. What is the effect of amplitude on the wave speed?
4. Repeat step 5 for a **new tension setting** using the same amplitude setting as in step 5.
   1. What is the effect of tension on the wave speed?