**Wave Investigation**

**Investigative Question:** What effect does frequency and amplitude have on wavelength in waves?

**Procedures**:

1. Access the ‘Waves on a String’ simulation through the link on the Google Classroom Assignment.
2. Make sure that the green box in the left corner is set to Oscillate and the box to the right has a NO end.
3. Play with the Amplitude in the bottom box. ✎ What do you see happen to the wave on the string when you increase the amplitude?
4. Play with the Frequency in the bottom box. ✎ What do you see happen when you increase the frequency?
5. Click on the Rulers button on the bottom box. Then set the amplitude and frequency to the values below. Measure the wavelength (the distance from the top of one wave to the next). ✎ Record the wavelength.

|  |  |  |
| --- | --- | --- |
| **Amplitude (cm)** | **Frequency (Hz\*)** | **Wavelength (cm)** |
| 1.25 cm | 2.05 Hz |  |

\*Hz stands for Hertz, which means ‘how many times a second’.

**Design Your Experiments**

Use the previous data as a control. Design an experiment where the wavelength is the responding variable. Answer the following questions: What happens to wavelength when you vary amplitude? What happens to wavelength when you vary frequency? Record data to support your answers. Remember you should only be changing one manipulated variable at a time.

**A. What happens to wavelength when you vary amplitude?**

**✎ Evidence:** (your data)

|  |  |  |
| --- | --- | --- |
| **Amplitude (cm)** | **Frequency (Hz\*)** | **Wavelength (cm)** |
| 1.25 cm | 2.05 Hz |  |
|  |  |  |
|  |  |  |

**✎ Claim:** (answer to the question)

**✎ Reasoning:** (explain how your evidence proves your claim)

**B. What happens to wavelength when you vary frequency?**

**✎ Evidence:** (your data)

|  |  |  |
| --- | --- | --- |
| **Amplitude (cm)** | **Frequency (Hz\*)** | **Wavelength (cm)** |
| 1.25 cm | 2.05 Hz |  |
|  |  |  |
|  |  |  |

**✎ Claim:** (answer to the question)

**✎ Reasoning:** (explain how your evidence proves your claim)

**Analysis/Reflection**

✎ Write a short reflection about a time where you’ve seen waves (can be water waves [i.e. at the ocean or in a bathtub] or strings/ropes, etc) and describe what you remember about the amplitude, frequency, and wavelength of these waves and how they might have changed. Use those terms in your story and describe what they mean.