

Name \_\_\_\_\_

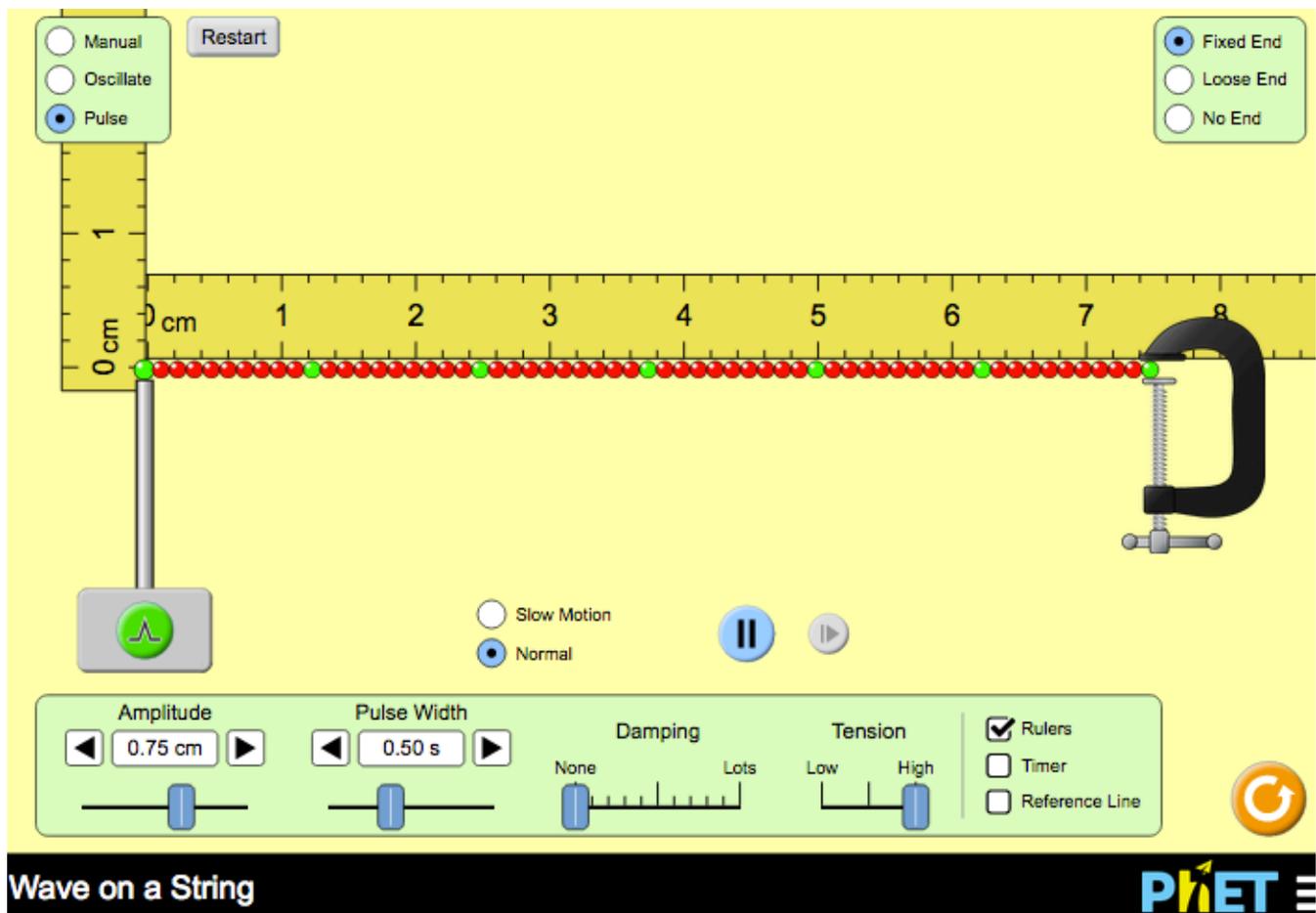
Date \_\_\_\_\_

Learning Goals:

- I will be able to measure wavelength on a transverse wave.
- I will be able to explain how amplitude is not related to frequency or wavelength.
- I will be able to explain how frequency and wavelength are inversely related.

Set UpClick on the [Wave On A String Link](#). (HTML5)

1. Set the top controls to **Pulse** and **Fixed End**.
2. On the bottom menu:
  - Move the **Damping** slider to None
  - Keep the **Tension** at High
  - Check mark **Rulers**, and move the rulers to look like the image below.



The green button will send a single pulse:



First Activity: Amplitude

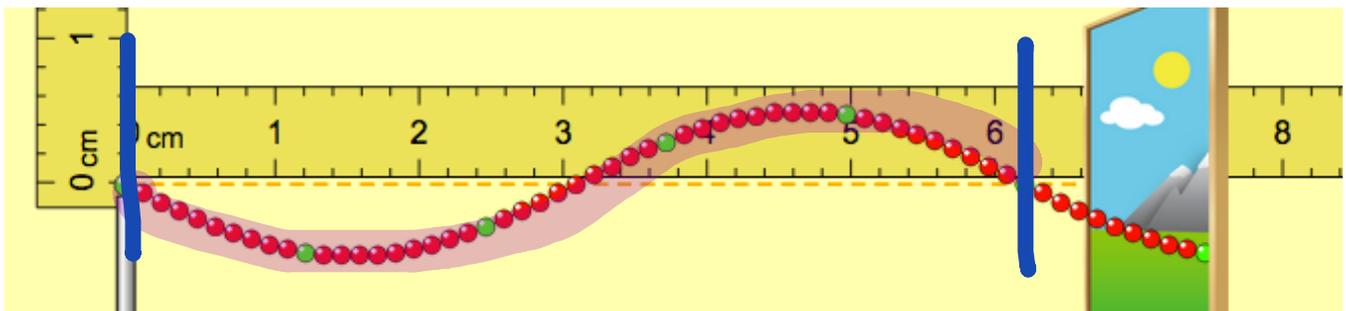
1. Hit the green button once to generate a pulse. What happens to the pulse when it reaches the fixed end? It reflects back under the equilibrium
2. To stop the wave but keep all settings the same, click Restart. 
3. Which slider will adjust the starting height of the wave? amplitude
4. What is the maximum height possible? 1.25 cm
5. Which slider makes the height of the wave decrease as it travels? damping

Second Activity: Wavelength and Amplitude

- Set your controls to  Oscillate and  No End.
  - Select Slow Motion  Slow Motion
  - Set amplitude at 0.50 cm and frequency at 1.00 Hz.
  - Use the pause button to stop the wave for easier measurement.
6. Move the horizontal ruler to measure the wavelength. Remember: Crest to Crest or Trough to Trough. Such as in the image below.

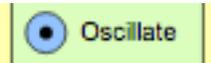
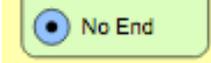
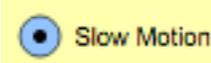
Each tiny mark on the ruler equates to 0.2 cm

Wavelength #1 = 6.2 cm



7. Double the amplitude so it is now at 1.00 cm, but keep the frequency at 1.00 Hz.
8. Restart the wave. Play the oscillation, then pause it.
9. Move the horizontal ruler to measure the wavelength. Wavelength #2 = 6.2 cm
10. How does the wavelength #1 compare to wavelength #2? SAME
11. Did changing the amplitude affect the wavelength? NO

### Third Activity: Wavelength and Frequency

- Set your controls to  and  and 
- Keep amplitude at 1.00 cm and change the frequency to 1.50 Hz.
- Use the pause button to stop the wave for easier measurement.

12. Move the horizontal ruler to measure the wavelength. **Wavelength #3 = 4.1 cm**

13. Set the frequency so it is now at 2.00 Hz, but keep the amplitude at 1.00 cm.

14. Restart the wave. Play the oscillation, then pause it.

15. Move the horizontal ruler to measure the wavelength. **Wavelength #4 = 3.1 cm**

16. Set the frequency so it is now at 3.00 Hz. Keep the amplitude at 1.00 cm.

17. Restart the wave. Play the oscillation, then pause it.

18. Move the horizontal ruler to measure the wavelength. **Wavelength #5 = 2.0 cm**

19. Summarize your data in the chart below.

Data #	FREQUENCY (Hz)	WAVELENGTH (cm)
#1	1.00 Hz	6.2
#2	1.00 Hz	6.2
#3	1.50 Hz	4.1
#4	2.00 Hz	3.1
#5	3.00 Hz	2.0

20. Why did the summary chart not include any information about the amplitude?

Amplitude does not affect the wavelength or the frequency.

21. Did changing the frequency affect the wavelength? YES

22. As the frequency increased, what happened to the wavelength? \_\_\_\_\_

The wavelength decreased.

23. What happens to the wavelength of a wave if the frequency is doubled?

The wavelength is 1/2 the original.

24. What happens to the wavelength of a wave if the frequency is tripled?

The wavelength is 1/3 the original.