



Date: _____ Name: _____

Guiding Question:
How do the properties of amplitude and frequency affect wavelength?

What do the words in the box below mean?

crest	amplitude
trough	frequency
line of origin	oscillate vs. pulse
wavelength	

Draw a labelled diagram to show what the words in the box mean.

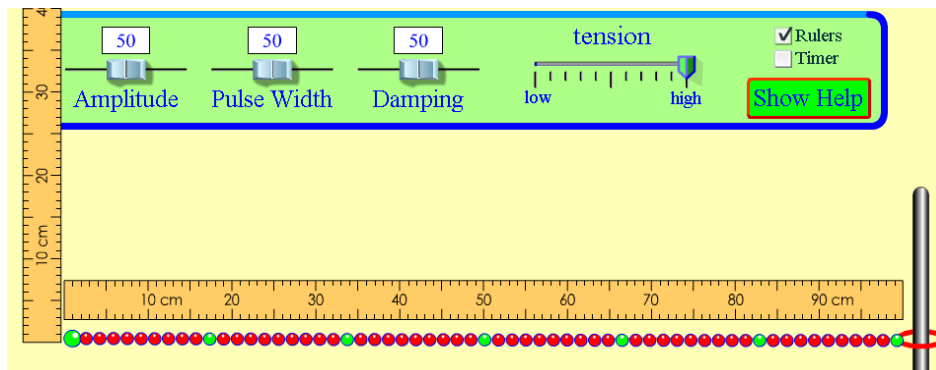
Start:

1. Open the link: <http://physicsk910.weebly.com/sim-wave-on-a-string.html>
2. Use the Wave on a String simulation on Mr D's website.
3. For this activity you will be **collecting data** to explore three properties of a wave:
 - a. **amplitude**
 - b. **wavelength**
 - c. **frequency**
4. **Explore** the simulation with your partner. **Be sure to click on all the buttons.**



Section A - For the first set of investigations, we will look at amplitude.

- A1.** You need to be on Pulse Loose End
A2. The rest of your screen should be set up like this:



Look over the data table, below, and discuss with your partner how to get the data you need.

Pulse moves the wave.


Amplitude setting	Height of wave at the start (be sure your ruler is lined up correctly)	Distance ring moves on pole (end)
100		
50		
5		

- A3.** What happened to the energy at the end of the wave when we changed the amplitude – make notes. **Be prepared to share your thoughts on this with the class**

- A4.** Repeat **Section A** – using Fixed End and then No End
 Why didn't we use these options for the experiment with the amplitude button?



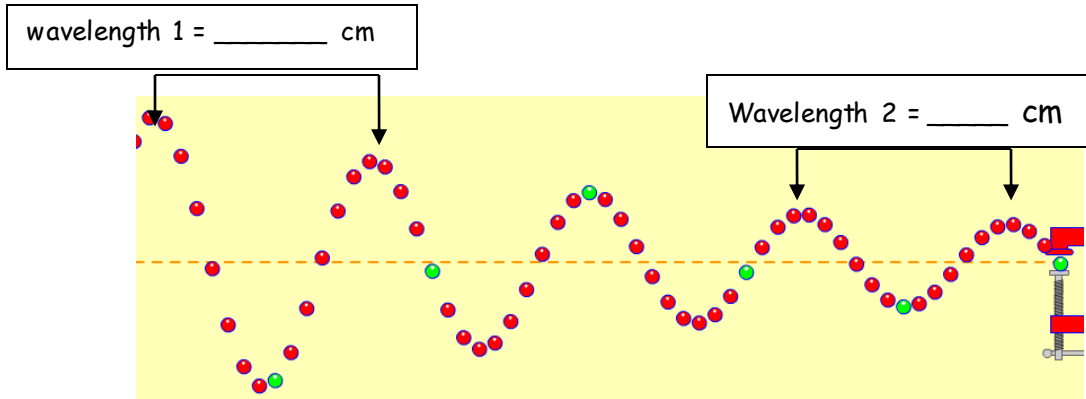
Section B - For this next part we will investigate *wavelength*.

B1. You need to be on  **Oscillate**


B2. The rest of your screen should be set up like we did for number 6.



B3. Try out the **step** button after you hit pause. This may be useful for collecting data.

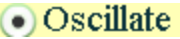



Amplitude Setting	Wavelength 1 (cm)	Wavelength 2 (cm)
100		
50		
5		

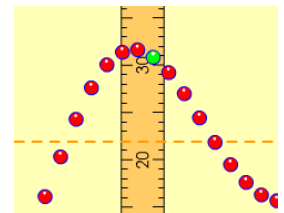
B4.  Think about the wavelength of the two waves you measured. Think about how similar or different they were. Be prepared to share your thoughts with the class. Make some notes



Section C - For the third set of investigations, we will look at frequency.

- C1.** You need to be on  **Oscillate**
- C2.** Open both the ruler and timer
- C3.** Controlled variables:
Amplitude and damping should be left on 50 and tension stays on "high"
Remember, to stop or slow the wave use pause/play and 
- C4.** Look over the data table below and discuss how you will collect the data you need.
- C5.** Before you begin... try a little **practice using the timer:**
Turn the timer on, off and reset the timer while waves are moving.

- C6.** Practice **counting waves** passing a given point:
 - a. Move the vertical ruler so that it is along the wave's path.
 - b. This will be the point where you watch waves pass and count them.
 - c. Count 5 waves passing the ruler.
 - d. Change the frequency and count again.




- C7.** Fill in the table by working together counting the waves and using the timer.

Data:

Frequency	Time interval	Number of waves:			Average number of waves counted in 10 second period	Number of waves in 1 second frequency**
		Trial #1	Trial #2	Trial #3		
100	10 seconds					
50	10 seconds					
10	10 seconds					

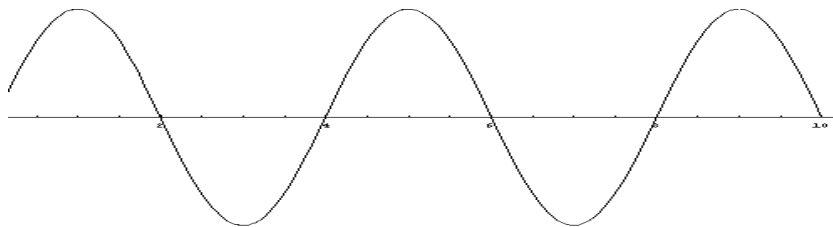
To find **frequency, divide the **average** number of waves counted by the **time interval**.

- C8.**  Talk about the data.
Decide on a way your group can explain wave **frequency** to the class.
Write your idea(s) here:



C9. Our data show that the higher the number chosen for the frequency on the slider, the _____ the number of waves passing _____ in a certain amount of _____

C10. Use arrows, or draw on the wave, to show what will happen when the **amplitude** is **increased**:



C11. Use arrows, or draw on the wave, to show what will happen when the **frequency** is **increased**:

