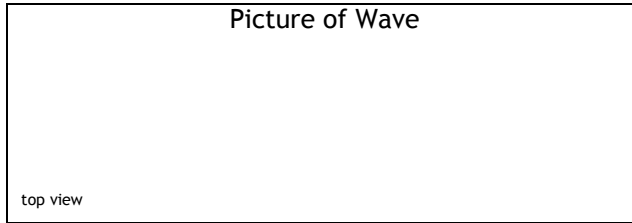


To set up this lab, stretch a long slinky between two seated lab members. The slinky should be resting on the ground.  
To send a wave pulse (one single crest), a student holding the end should pluck the slinky with their free hand.  
Practice sending pulses back and forth with your partner.

**Part I - Wave Types**

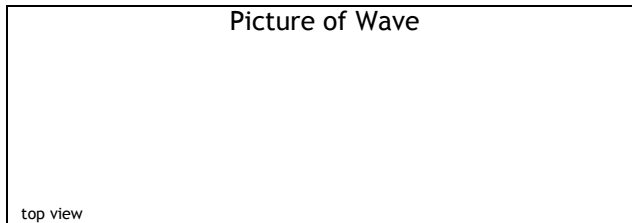
Transverse and Longitudinal Waves

Create a transverse wave on your spring.



Characteristics of Transverse Wave

Create a Longitudinal wave on your spring.



Characteristics of Longitudinal Wave

**Part II - Speed of Waves**

Investigate what variables alter the speed a pulse travels on the spring (hint: only one of these will change speed)

	Change the frequency of the wave	Change the wavelength of the wave	Change how much the spring is stretched	Change the amplitude of the wave
Did speed change?				

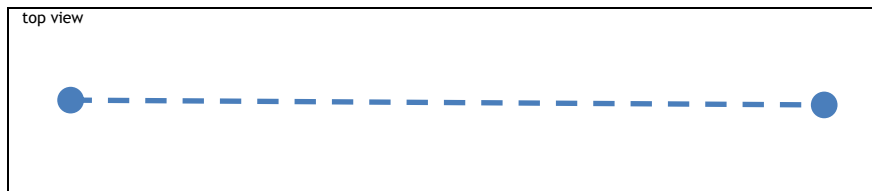
Based on your chart above and your observations, make a statement below on how to increase wave speed

Make a statement below regarding what will **NOT** change wave speed

**Part III - Frequency and Wavelength**

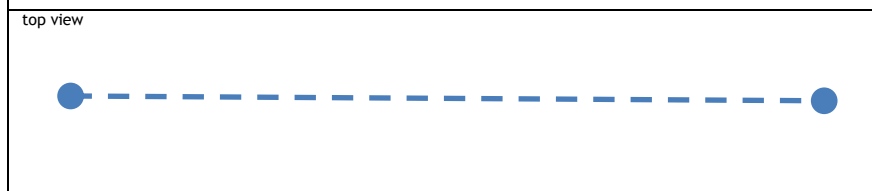
In the spaces below, draw the corresponding pictures

Create waves with high frequency and draw them at right



How many waves are in this picture?

Create waves with low frequency and draw them at right



How many waves are in this picture?

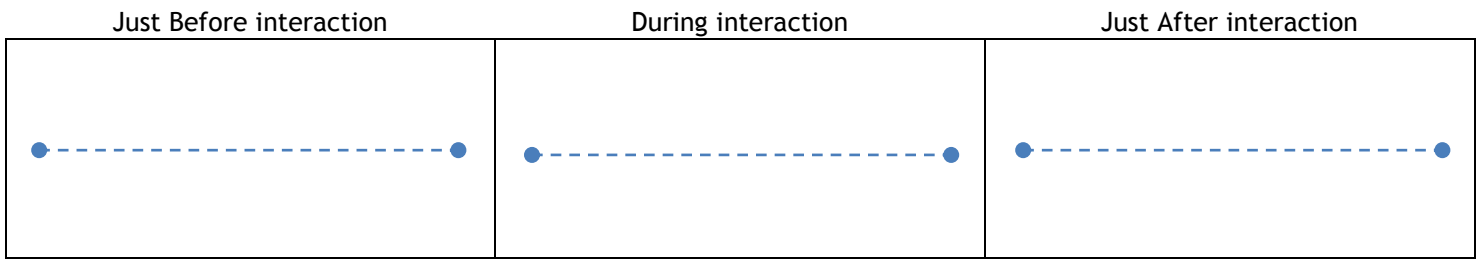
Based on your pictures above, how is frequency related to the length of the wave?

One of the equations we have is  $V=f\lambda$ . Based on part II and part III, give evidence that the equation works

**Part IV - Wave Interference**

Interference happens when two separate waves interact. You and your lab partners will each create a pulse at different sizes to observe interference.

In the space below, draw the waves before during and after they interact.



Based on your observations, what happens when two waves interfere?

---

**Part V - Wave reflection**

You will do this portion of the lab on the computers. Go to Phet.Colorado.Edu and find and run “Wave on a String.”

Set up your string to have a fixed end, and set damping (friction) to zero. What happens when a pulse hits a rigid end?

Set up your string to now have a loose end. What happens when a pulse hits a loose end?

---

**Part VI - Summary Questions**

- 1) What is the difference between a transverse and longitudinal wave?
- 2) What does the speed of the wave depend on? (frequency and wavelength are not the answer)
- 3) What effect will changing frequency have on a wave?
- 4) Sound waves can travel through steam, water and ice. In which medium would sound travel the fastest?
- 5) A man on a beach measures 2 seconds and 5 meters between two crests. What is the wave speed?