Speed of Waves – Investigation

Key Questions:
1. Do waves move at a constant speed through a medium?
2. What factors affect the speed of a wave?

Transverse Pulses

Teacher Demonstration: Measuring the speed of a wave in a **heavy** coiled wave.

Tension: ___LOW_____   Medium: ____HEAVY SLINKY_____

# of lengths of spring	Distance (m)	Time (s)	Speed (m/s)
2			
2			
		Average Speed	

Student Investigation:

☒Mark out 5 metres on the floor with masking tape. Stretch the spring to this length. Measure the **approximate tension**. ***Don't change this over the three trials***.

SMALL AMPLITUDE WAVE   Tension: __LOW___   Medium: ___LIGHT SLINKY____

# of lengths of spring	Distance (m)	Time (s)	Speed (m/s)
2			
2			
		Average Speed	

LARGE AMPLITUDE WAVE

# of lengths of spring	Distance (m)	Time (s)	Speed (m/s)
2			
2			
		Average Speed	

What affect does the amplitude have on the speed of the wave?

Is the speed of the wave constant (or at least close to constant) in the spring?

SPH3U   Name: _____   Date: _____

☒Increase the tension in the spring. Not too much!

Tension: __HIGH_   Medium: __LIGHT SLINKY___

# of lengths of spring	Distance (m)	Time (s)	Speed (m/s)
2			
2			
		Average Speed	

What affect does increasing the tension in the spring have on the speed of the wave?

Longitudinal Pulses

☒ Set the tension to the higher tension from the first investigation. Send a longitudinal pulse through the spring.   Tension: _HIGH___   Medium: _LIGHT SLINKY____

# of lengths of spring	Distance (m)	Time (s)	Speed (m/s)
2			
2			
		Average Speed	

Is the speed of the wave constant (or close to constant) in a longitudinal wave?

CONSLUSIONS:

1. What can you conclude about the speed of a wave through a medium?

2. What factor does not affect the speed of a wave?

3. What are two factors that affect the speed of a wave?

4. What factor would you change in the *heavy* coiled spring in order to get its speed to match the speed of the *lighter* spring if both were at the same tension?