SPH3U: Interference

Recorder: _____
Manager: _____
Speaker: _____
0 1 2 3 4 5

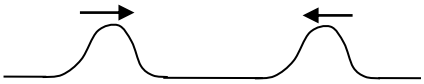
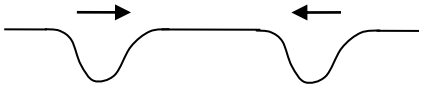
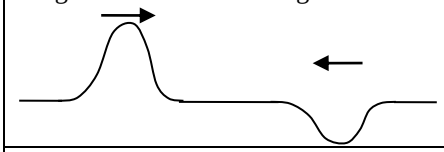
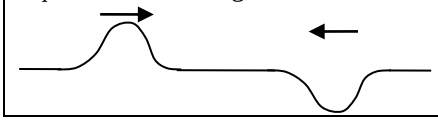
What happens when two waves travel through the same medium and meet? Let's find out!

A: When Waves Meet

1. What happens to the sound when two people are talking, each producing sound waves, and these waves arrive at the same point in space and overlap? Have you ever been in the middle of such a conversation? What do you hear?

2. What happens when waves or pulses meet? Answer based on the short video from the website

3. Draw your observations of the spring when the pulses overlap and after they have overlapped.

Before	Overlapping	After
Two crests 		
Two Troughs 		
Large crest and small trough 		
Equal crest and trough 		

4. Describe what happens when the waves overlap.

5. Do the waves bounce off one another or do they travel through one another?

When two ideal waves overlap, one does not in any way alter the travel of the other. While overlapping, the displacement of each particle in the medium is the sum of the two displacements it would have had from each wave independently. This is the *principle of superposition* which describes the combination of overlapping waves or *wave interference*. When a crest overlaps with a crest, a *supercrest* is produced. When a trough and a trough overlap, a *supertrough* is produced. If the result of two waves interfering is a greater displacement in the medium *constructive interference* has occurred. If the result is a smaller displacement, *destructive interference* has occurred.

6. Label each example in the "Overlapping" column of your chart as either constructive or destructive interference.