AP Physics

Ms. Zimmer

Lesson Title:	**Wave Interference PhET**
AP Objective(s):	Students should understand the principle of superposition, so they can apply it to traveling waves moving opposite directions, and describe how a standing wave may be formed by superposition. Students should understand the basic properties of waves, such as, frequency and amplitude.

AGENDA	KEY POINTS
1. PhET Simulation	Frequency – the number of waves that pass a certain point in a certain amount of time Amplitude – the size of the wave from the equilibrium position Law of superposition = when 2 or more waves meet, the resulting displacement is the algebraic sum of the individual displacements Constructive – two waves add up Destructive – two waves cancel each other out

Time	**Learning Activity**
60	Students will complete a PhET (computer lab) where they analyze wave interference. They will stay on the water tab but may move on to the other tabs if time remains. Part 1 – One source *Students will investigate how changing the frequency and amplitude of the source affects the propagation of the wave.* Part 2 – Two sources *Students will investigate how changing the frequency, amplitude and spacing of the sources affects the waves and how they interact.* Part 3 – Adding a slit *Students will add a slit and investigate how adding a slit affects the propagation of the waves.* Conclusion – students will transfer their knowledge to what they think would happen if they repeated the experiment with sound waves. If time allows, they could conduct the experiment using the sound tab. I'd recommend having headphones handy! Guiding Questions 1. How does varying the amplitude of a wave affect the frequency or wavelength of a wave? 2. What is the difference between the incident and the reflected wave? 3. How does an interference pattern change when the frequency of the waves changes? 4. How does an interference pattern change as the sources move closer together?