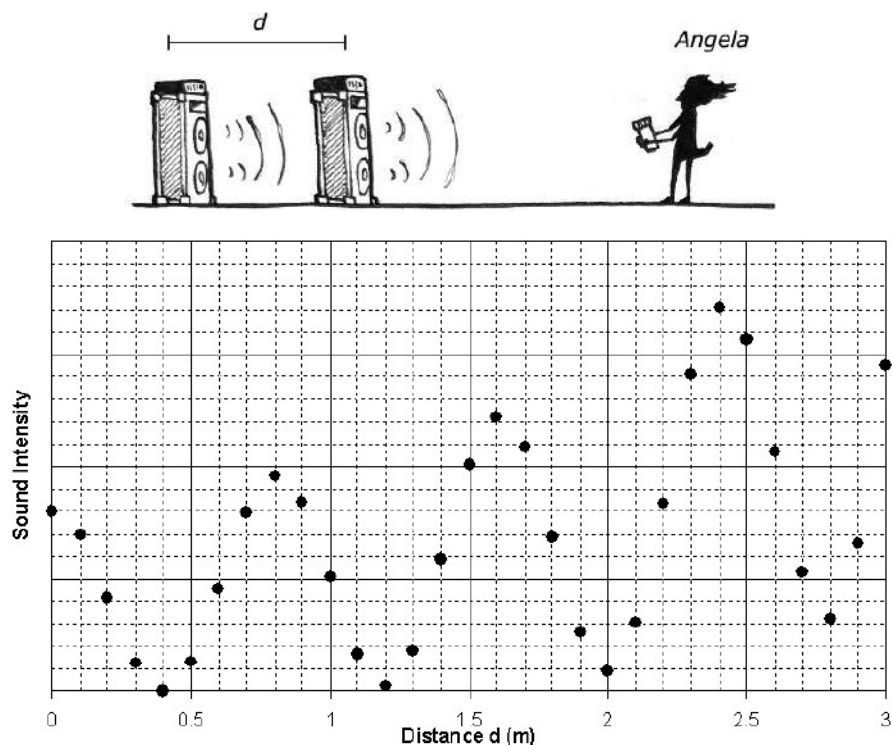


NAME _____

DATE _____

Scenario

Carlos, Dominique, and Angela are given two speakers that emit the same single tone in phase. The sound energy emitted by each speaker every second is also the same. The students are using the speakers to experimentally estimate the speed of sound. To do this, they set the speakers together 5 m away from Angela, who is holding an apparatus that measures sound intensity.



On each trial, the students move one speaker a distance d closer to Angela, who holds the intensity measuring apparatus, while keeping the other speaker 5 m away. The students plot data of the sound intensity recorded as a function of distance d that the one speaker is moved forward.

Data Analysis

PART A: Explain why the sound intensity increases and decreases as the one speaker is moved closer to Angela. Draw diagrams showing waves being emitted by both speakers to support your explanation.

10.L Interference of Sound

PART B: The frequency emitted by the speakers is 440 Hz. By taking one or more values from the graph, obtain an estimate of the speed of sound. Explain your thought process.

PART C: As the one speaker moves a greater distance d (and closer to Angela), the maxima in the above graph become greater and the minima in the graph also increase. Explain why this occurs in terms of wave intensity and wave superposition. Draw diagrams to support your explanation.
