Name_____ Period_____ Date_____

| CONCEPTUAL PHYSICS | Demonstration |
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*26.9 Sound: Interference*

# SOUND OFF

## Purpose
In this demonstration, you will hear a dramatic effect of the interference of sound.

## Required Equipment and Supplies
Stereo radio, tape, or CD player with two moveable speakers, one of which has a DPDT (double pole double throw) switch ***or*** a means of reversing polarity (such as switching red and black wires).

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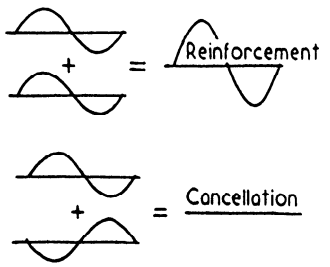
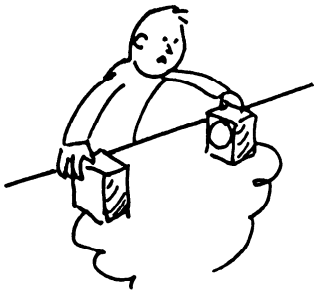
## Discussion
Interference is a behavior common to all waves. With water waves we see it in regions of calm where overlapping crests and troughs coincide. We see the effects of interference in the colors of soap bubbles and other thin films where reflection from nearby surfaces puts crests coinciding with troughs. In this activity we'll dramatically experience the effects of interference with sound!




## Procedure
Play the stereo player with both speakers in phase (with the plus and minus connections to each speaker the same). Play it in mono mode so the signals of each speaker are identical. Note the fullness of the sound. Now reverse the polarity of one of the speakers (either by physically interchanging the wires or by means of the switch provided). Note the sound is different—it lacks fullness. Some of the waves from one speaker are arriving at your ear out of phase with waves from the other speaker.

Now place the speakers facing each other at arm's length. The long waves are interfering destructively, detracting from the fullness of the sound. Gradually bring the speakers closer to each other. What happens to the volume and fullness of the sound heard? Bring them face-to-face against each. What happens to the volume now?



## Summing Up
1. What happens when to the volume of sound when the face-to-face speakers are switched so both are in phase?

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2. Why is the volume so diminished when the out-of-phase speakers are brought together face to face? And why is the remaining sound so "tinny"?

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3. What practical applications can you think of for canceling sound?

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