

**Intro:**

We'll be studying the wave properties of sound. Most of the wave behavior is the same as on waves on a string but there are some differences. One is that sound waves normally travel in three dimensions rather than one. This means that, for instance, interference can vary as you move around a room. Another is that there is a special set of units for "loudness" or intensity. Finally, since we can move with respect to the medium carrying sound (i.e. air), there is a new phenomenon called Doppler shift.

We may also start on electric fields, perhaps on Monday.

**Due Monday, March 2****Reading:**

- Wednesday: HRW 17.1 - 17.8
- Friday: HRW 17.8 - 17.9
- Monday: HRW 21.1 - 21.4
- Next Wednesday: HRW 21

**Physics Topics:**

- Intensity
- Beats
- Group velocity
- Doppler Shift
- Interference in space and time

**Problems:**

From material in classes through Friday, February 27.

- (1) HRW 17.1
- (2) HRW 17.7
- (3) HRW 17.51
- (4) Two loudspeakers are placed 3.00 m apart. They emit 440 Hz sounds in phase. A microphone is placed 3.20 m from a point midway between the two speakers, where an intensity maximum is recorded. (a) How far must the microphone be moved to the right (moved parallel to the line between the speakers) to find the first intensity minimum? (b) Suppose the speakers are reconnected so that the 440 Hz sounds are out of phase ( $\Delta\phi = \pi$ ). At what positions are the intensity maximum and minimum now?

**Lab:**

Speed of Sound

**A look ahead...**

We will study *fields*, starting with Chapter 21.