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PHYSICS

Assignment:

Sound Waves Online Lab

Part 1: Movement of Particles

1. What did you observe when you clicked on the green button on the speaker?

After clicking the green button, a series of dark and light areas are formed. When the diaphragm (the yellow part) is pulled to the basket's trough, a dark area is formed. When the diaphragm is pushed to the basket's crests, a light area appears. As the waves fill the plane, these areas become increasingly blurry.

2. What do you observe about the particles BEFORE a wave is created?

There are two kinds of particles on the plane: red and white. The red particles form a grid-like pattern, with four red particles forming the edge of each "tile" The particles also move around but remain in the same relative position.

3. What do the particles do when the amplitude is very low?
(**Hint:** Concentrate on the particles closest to the speaker.)

When the diaphragm meets the traugh of the basket, the particles near the speaker are "pulled" into the diaphragm. When the diaphragm meets the crest of the basket, the particles near the speaker are "pushed" further away from the diaphragm. The particles further away from the speaker are relatively unaltered.

4. What do the particles do with a medium amplitude? How does this differ from the movement of the particles at low amplitude?

The movement of particles is now much more visible. When the amplitude is medium, particles near the speaker are more clearly "pulled" into the point source, rather than just into the diaphragm, as when the amplitude is low. Higher amplitude, as opposed to low amplitude, causes the outer particles to move. Particles closer to the speaker are

5. What do the particles do at the maximum amplitude? How does this differ from the movement of the particles at lower amplitudes?

The particles behave similarly to when the amplitude is set to "medium" It is now clear, however, that even the outer particles are being "pulled" closer to the point source.

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6. What is the relative pressure in the dark area (high or low)? Is this a compression or rarefaction? Explain what is happening here in terms of particles.

The relative pressure is low in the dark areas. This means that the dark areas are rarefaction because the particles are not focused there. When the diaphragm is pulled to the basket's trough, the point source turns into a compression. The particles at the point source are then pushed outwards as the diaphragm is pushed to the basket's

7. What is the relative pressure in the light area (high or low)? Is this a compression or rarefaction? Explain what is happening in this area in terms of particles.

The relative pressure is low in the light areas, indicating that the particles are concentrated there. As a result, the light areas are compression. When the diaphragm is pulled to the basket's trough, the point source turns into a compression. The particles at the point source are then pushed outwards as the diaphragm is pushed to

Part 2: Amplitude and Frequency

8. What happens to the intensity of the sound that is produced as the amplitude increases? When is the sound the softest? When it is the loudest?

As the amplitude increases, the intensity of the sound also increases. The sound is softest when the amplitude is at its minimum. It is loudest when the amplitude is at its maximum.

9. What happens to the pitch of the tone as the frequency increases?

As the frequency increases, the pitch of the tone also increases accordingly.

Part 3: Relationship Between Frequency and Wavelength

10. Data table of frequency and wavelength

Frequency	Wavelength (cm)
Minimum	160.5 cm
3 ticks	107.1 cm
6 ticks	89.5 cm
9 ticks	78.5 cm

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11. What is the relationship between frequency and wavelength?

There is a negative correlation between frequency and wavelength: as the frequency increases, the wave length decreases.