Sound Stations Lab

Name: _____Date: _____ Period: _____

In your groups proceed to each of the stations and complete the questions below. The stations may be in a different order than what is listed here. WAIT until the teacher tells you to move to rotate.

Resonance Air Tubes
Swing the Resonance Air Tube above your head until you hear a note. Increase the speed until you hear a different note.
1. How many different notes, with different pitches, can you make?

2. What *part* of this sound wave must be changing if you hear a different *pitch*?

Rubber Band Guitar
Create a rubber band guitar out of the rubber bands and box by putting the rubber bands around the box. Experiment with rubber band of different thicknesses and different amounts of tension.

Circle the term that makes the statement true:
1. A (thicker) (thinner) rubber band makes a low pitched sound.

2. A (tighter) (looser) rubber band makes a high pitched sound.

Coat Hanger Music
Notice that there are two strings connected to the wire coat hanger. Loop one end of each string around your fingers, one string per hand, and place your fingers in your ears. Swing the coat hanger until it hits something with your fingers still in your ears and listen.
1. What do you hear? Describe the sound you hear.

2. Take your fingers out of your ears and swing the coat hanger against something again. What changes about the sound you hear?

3. The sound wave you hear is traveling through two different mediums, first the string and then the air. Which medium is denser?

4. If a medium is denser, how will the wave speed change?

Ol' Bottle Instrument
Put a small amount of water in the glass bottle. Blow across the top of the bottle and hear the sound. Now add water to the bottle so that the water level is higher and blow across the top of the bottle again.

Circle the term that makes the statement true:
1. A high water level in the bottle makes a (high) (low) pitched sound.

2. A low water level in the bottle makes a (high) (low) pitched sound.

Vibrating Ruler
Hold a ruler so that it hangs over the side of a table. Slightly bend the ruler over the end of the counter then let it go. Watch the movement of the ruler and listen to the sound. Try changing the length of the ruler that is hanging off the table and repeat.

Circle the term that makes the statement true:
1. If (more) (less) of the ruler is hanging off the table the sound that it makes is high pitched.

2. If more of the ruler is hanging off the table the sound that it makes is (low) (high) pitched.

Internal Radio
Put a plastic straw over the pencil that is attached to the motor. Notice that the motor is attached to a music player but there are no speakers attached. Bite down on the pencil *with the straw over it* so that the pencil is going across your face. Plug your ears and turn the music player on.
1. What do you hear?

2. If all sounds are caused by vibrations, what is vibrating to make the sound you hear if there are no speakers playing?

Singing Glasses
Fill the glass partially with water and wash your hands. Hold the stem of the glass with one hand and with the other, rub one finger (preferably the middle or pointer finger) around the edge of the glass. Continue until you hear a constant sound. Change the level of the water in the glass and repeat.

Circle the term that makes the statement true:
1. A glass with (more) (less) water in it produces a higher sound.

2. What is vibrating to produce the sound you hear?

Rainstick
Rotate the rainstick and listen to the sound it makes. Nails have been nailed into the tube at different intervals so that the beans strike them as they fall due to gravity. Think about how the rainstick works and produces sound.

1. What is making the sound you hear?

2. What would happen to the sound if the nails were less frequent in the tube?

Conclusion Questions:
1. a. Is sound a mechanical or electromagnetic wave?

b. Is sound a transverse or longitudinal wave?

2. All sounds are produced from what? Why does this produce sound?

3. All waves that travel through the same medium (like air) travel at the same speed. If two different sounds are in the same medium but have different pitches (frequencies), what other part of the wave must be different?