#1 | Ms. Cuming

Sound Lab # 1 How Can Vibrations Be Musical?

Date: Jan. 31st **Name & Partners:** _____

Purpose: To observe how music can be made by vibrations from the body or simulate how a kazoo can work like a woodwind instrument.

Hypothesis: I predict that the hole in the tube will cause sound vibrations of the paper, I think sound is made from the tissue paper vibrating when I speak or sing.

Materials:

-10 X 10 tissue paper -elastic bands
-hole punch -card board tubes
-colours (toilet paper or paper towel roll)

Procedure:

1. Punch a hole near the top of a cardboard tube.
2. Use an elastic band to hold the tissue paper over the end of the tube opposite of the hole.
3. Sing into the open end of the tube. Record you observations of what you hear and see. What causes those sounds?
4. The loudness of sound is called the volume. Sing louder into the tube. How does this change what you see and hear?

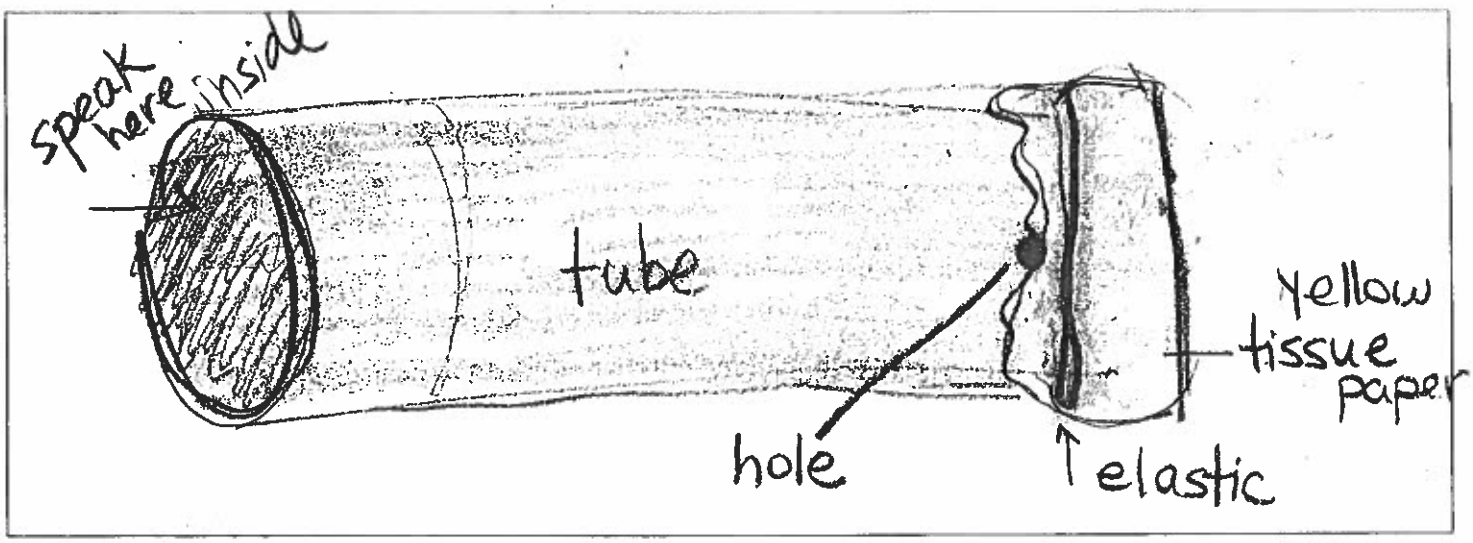
Observations: Answer the questions in complete sentences, draw and colour illustrations to support your understanding of concepts:

1. Explain how sound is like a wave.
   Sound vibrations travel by waves)))))
2. What makes vibrations when you talk? Touch your neck, where do you feel the vibrations. Explain. In my neck - my vocal cords vibrate when I talk.
3. How did you make your kazoo sound louder and softer?
   I sing louder or softer.
4. List and explain 2 ways you can make your kazoo sound louder and softer.
   I poked a small hole on the tissue paper - It vibrated more, When I use a low voice it vibrates less.
5. Describe how the kazoo is the same and different from regular instruments.
   A kazoo doesn't need a reed like brass instruments. It is like a recorder with the air column and holes. From

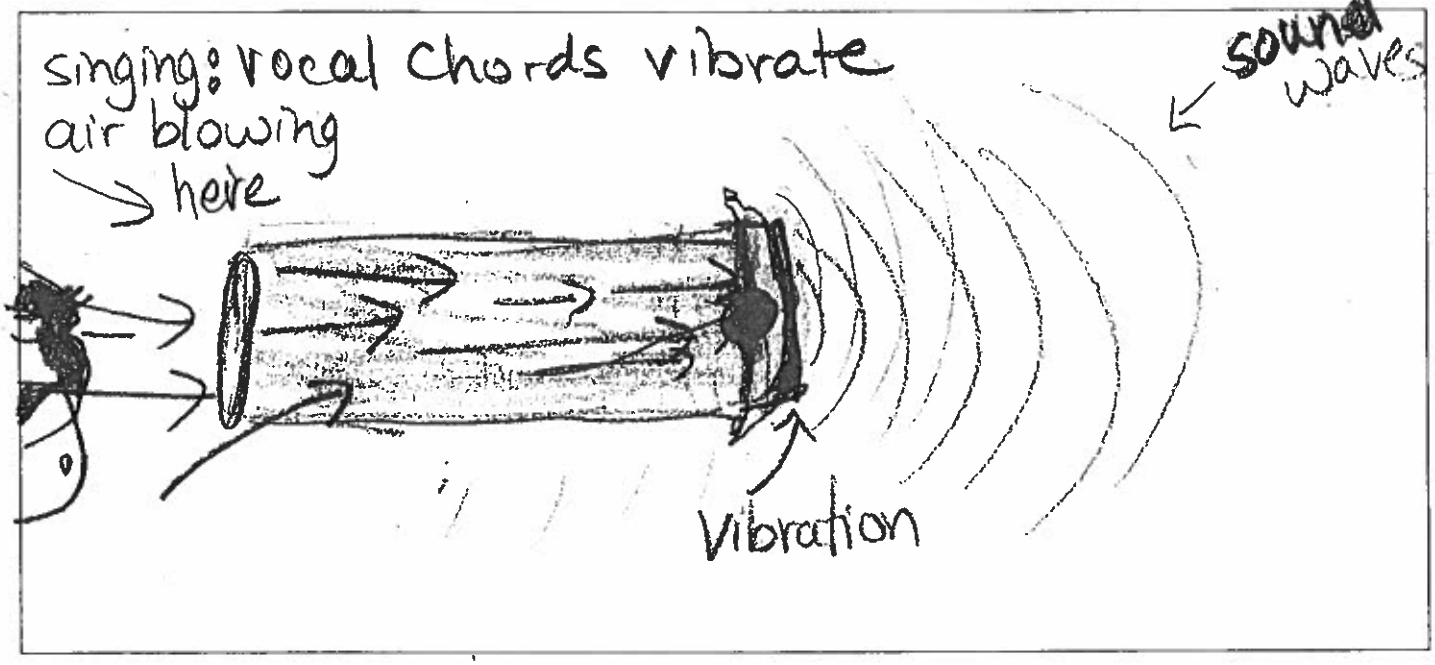
Continued

Illustrate, colour and show by using arrows and explaining by using a caption:

Draw you kazoo from a side view: label the parts of your instrument (include the hole)



Illustrate your kazoo when you sing into it: the air flow using arrows, where the kazoo is vibrating to make sound



Conclusion: My prediction was incorrect, the tissue paper was where vibration took place because when I poked a hole it became high pitch sounding.

#2

Ms. Cuming

Sound Lab # 2, Sound Vibrations Travel

Date: Feb. 7th **Name & Partners:** _____

Purpose: To observe that sound is made of vibrations that travel and cause movement.

Hypothesis: I predict that the sound vibrations of the tuning fork will affect the salt the move when in direct contact with the tuning fork.

Materials:

-10 X 10 plastic wrap -small yogurt container -measuring spoons
-1 ml of salt -tuning fork -250 ml of water

Procedure:

1. Stretch a piece of plastic wrap over the top of a yogurt cup and tie with an elastic band.
2. Sprinkle a few grains of salt onto the plastic wrap.
3. Hit the tuning fork once on the edge of your shoe. Listen. Now hold the tuning fork close to the salt without touching it. What do you hear? What do you feel? Draw a picture of what you see.
4. Hit the tuning fork two times on the edge of your shoe. Listen. Now hold the tuning fork close to the salt without touching it. What do you hear? What do you feel? Draw a picture of what you see.
5. Hit the tuning fork once on the edge of your shoe. Listen. Now hold the tuning fork close and touch the plastic wrap with the tuning fork. What do you hear? What do you feel? Draw a picture of what you see.
6. Repeat these steps but this time fill the container with water (remove the salt). Fill out the chart.
7. Complete the table, illustrate observations and explain results.
8. Refer to your original hypothesis, confirm or refute whether correct or not and why in your conclusion

Observations: Answer the questions in complete sentences after filling out the chart.

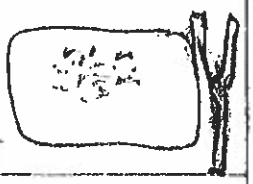
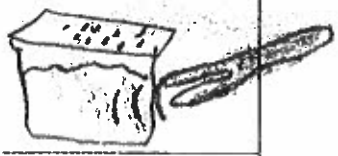
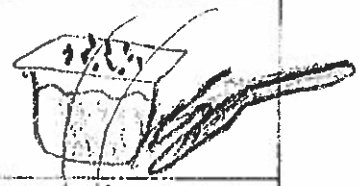
How can sound make the salt or water move?
The soundwaves and vibrations cause movement.

What difference did it make when you hit the tuning fork on your shoe more than once?
The more strikes, the more vibrations occur.

What happened when you touched the side of the yogurt container with the tuning fork?
Explain why this happened? The vibration causes a grunt and transfers the vibration to the cup but also stops the vibration of the fork.

What do you think makes the sound of the tuning fork?
When the molecules contract and expand the movement or vibration causes a humming sound.

#2 Continued.

Action	I heard:	I felt/saw	Picture
Tuning fork struck once and held close to salt (no touching)	ping on shoe	the tuning fork vibrates salt did not move	
Tuning fork struck twice and held close to salt (no touching)	ping two times	the tuning fork vibrates not much movement of salt	
Tuning fork struck once and touching plastic wrap	Ping one time, buzz when touch	the vibration made the salt move	 Small movement
Tuning fork struck twice and touching plastic wrap	ping twice, buzz when touch	the salt popped up and spread	 pops a bit
Tuning fork struck once and held close to water (no touching)	ping	the water moved a little Salt moved a little	
Tuning fork struck twice and held close to water (no touching)	ping ping	the water moved and salt moved a little more	
Tuning fork struck once and touches container.	ping grunt	the water moved and the salt popped	
Tuning fork struck twice and touches container.	ping ping grunt	When the vibrating tuning fork touches, the water churns the salt pops.	

Conclusion: My prediction was Correct. The salt moved more from the vibrations of direct contact with the tuning fork

#3.

Sound Lab # 3 Yogurt Cup Telephones

Date: Feb. 28th **Name & Partners:** _____

Purpose: To investigate how string thickness can affect how sound resonates through a telephone receiver.

Hypothesis: I predict that fishing line string will make sound waves louder and more clear.

Materials:

-2 plastic yogurt cups with a hole in the bottom
-one 2 metre string -one 2 metre of fishing wire
-one 2 metre of hemp line -one 2 metre of dental floss

Procedure:

1. Thread one end of string through the hole of one of the containers. Tie a large knot at the end of the string (so that the string cannot be pulled through the hole). Repeat the same to the other end through another cup.
2. Hold one end of this telephone. Have your partner take the other end and go as far as possible until the thread is stretched tight.
3. Take turns talking and listening on the telephone. Record the results of what you hear (clear, loud, soft, muffled?).
4. Repeat each of these steps with all the types of string: hemp line, fishing wire and floss. Record the results.
5. In your observations, which material receives the most clearly. Describe the properties of each material-how does the thickness affect the volume?

Observations: Answer the questions in complete sentences after filling out the chart.

Can you hear your partner talk through all the different types of string? Yes, I could hear muffles on all tight strings.

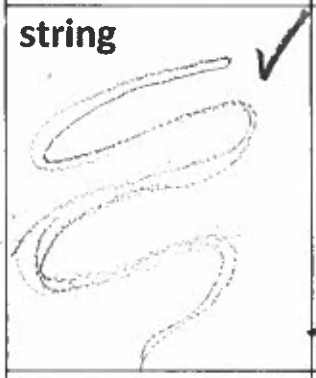
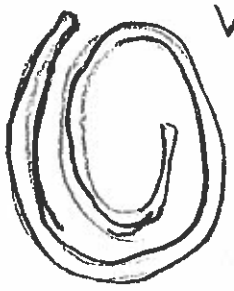
Is it louder or quieter when the string is not tight? Why or why not?

It is quieter or not heard at all. Sound waves don't travel through the string.

Which material resonates the best? Why do you think that is?

The string because its fibers are tight.

Conclusion: My prediction was incorrect because the string had the best volume and clarity. I predicted the fishing line.

Material	Describe properties & draw illustration	Describe how loud, clear, and sound when the string is tight	Describe how loud, clear, and sound when the string is loose
string  ✓	-thin (3mm thick) soft, white light weight -fuzzy fibers	-it was heard clearly	-Couldn't hear anything
hemp line  X	-frayed -coarse -bumpy texture (3.5mm thick) -yellowish-brown colour -waxy -thicker + heavier than string	-it was barely heard	-Couldn't hear anything
floss  X	-verg thin -smells minty (1mm thick) -waxy or greasy -white colour -plastic-flat	-It was muffled	-Couldn't hear at all
fishing line  ✓	-clear or translucent -thick (1.5 mm thick) -hard plastic -curly	-it was heard clearly	-Couldn't hear at all