

Name _____

Sound Explorations

Activity 1 – Phone Disco or the Dancing Pepper

Procedure:

- Turn off the vibrate alert. Turn ringtone up to high and place a mobile phone in a tall glass.
 - Stretch a small piece of cling wrap over the glass and tighten. Secure with rubber band.
 - Sprinkle pepper (or paper disco dancers) on the cling wrap.
 - Use a second phone to call the phone in the glass.
1. What did you observe with the pepper or the paper dancers? **The pepper or paper dancers will begin to move. The vibrations traveled from the phone, through the molecules in the air, through the cling wrap to the pepper or paper dancers.**
 2. Conservation of energy means that energy cannot be created or destroyed. Explain how this demonstration supports that statement. **Energy is not created or destroyed. It is transferred from one form to another.**
 3. List one energy transformation that occurs in this demonstration. **Answers vary.**

Activity 2 - Tuning Fork Explorations

Procedure:

- To produce a sound with a tuning fork, hold the handle and strike tines on a rubber stopper or your knee. Hitting the tuning fork on a hard surface may bend the tines.
4. One at a time, strike two different length tuning forks. How are the sounds different? **Each tuning fork has a different pitch.**
 5. Why are the sounds different? **The tuning forks have different length tines. This results in a unique wavelength and frequency giving it a different pitch.**

Procedure:

- Strike a tuning fork and place in a dish of water.
 - Repeat with a different tuning forks.
6. Describe what happens and why it happens. **The water splashes because the vibrations of the tuning fork are transferred to the water.**

Procedure:

- Strike the tuning fork and place the handle on the bone behind your ear.
7. Explain your experience and why this happened. **Bone is a solid and sound travels fastest through a solid, so it should sound louder.**

Procedure:

- Have a partner hold a string attached to a ping pong ball. Strike a tuning fork. Bring the tuning fork near the ping pong ball.
8. What happens to the ping pong ball? **The ping pong ball begins to bounce because of the transfer of energy from the tuning fork.**

Activity 3 – Duck Call with a Straw

Procedure:

- Use your fingers or teeth to squeeze and flatten the end of a straw.
- Cut flattened end to a point.
- Flatten again with your teeth.
- Blow into flattened end causing the straw to vibrate and “quack like a duck”.
- Cut off the end of the straw to change the length and blow to compare the sound.



9. Compare the sounds with two different straw lengths? **The longer straw has a lower pitch (slower vibrations) and the shorter length has a higher pitch (faster vibrations.)**
10. Using the word “wavelength”, explain why the straws have different sounds? **The longer straw has a longer wavelength and lower frequency. The shorter straw has a shorter wavelength and higher frequency.**
11. What part of the sound wave have you changed? **The wavelength is changed.**

Activity 4 – Water Whistle

Procedure:

- Using your scissors, cut partially through the straw. The cut should be ALMOST all the way through the straw but leave a small piece uncut to keep the two straw sections attached.
- Bend the straw into a right angle at the cut being careful not to break the straw segments
- Fill a cup or glass $\frac{3}{4}$ full of water. Slide the longer section of straw into the water.
- Keeping the straw at a 90° angle, place your lips on the shorter end of the straw and blow with a light, constant breath.

12. What happens to the pitch when you change the length of the straw underwater? **When the column of air inside the straw changes, the pitch changes. The more air inside the column, the lower the pitch. Less air (or shortening the straw) creates a higher pitch.**

Activity 5 – Craft Stick Harmonica

Procedure:

- Using the craft sticks, toothpick, paper and rubber bands, follow your teacher’s instructions.

13. What is vibrating to produce the sound? **The paper**