Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour: \_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Properties of Sound

Do Now: Brainstorm – What do you know about sound?

Notes:

Sound waves are *\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* with alternating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ pressure regions.

* It is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wave

Reminder: What is wavelength?

* What is the unit for wavelength? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Wavelength is also important to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Musical instruments use the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a sound to create different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reminder: What is frequency?

* What is the unit for frequency? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Pitch:**

* When the frequency \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the pitch gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* When the frequency \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the pitch, gets \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Loudness:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Decibel (dB):** the most common unit used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Reminder: What is amplitude?

* What is the unit for amplitude? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Volume:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Too much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or volume is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ thing.

Range of Sound:

* About 35 – 50 dB is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ speaking volume.
* About \_\_\_\_\_\_\_\_\_\_ dB is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Anything over 80 dB, like a dance club or gun shot, can cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| **Decibel level (dB)** | **Sound** |
| 0 | Softest sounds you can hear |
| 20 |  |
|  | purring cat |
| 60 |  |
|  | vacuum, truck traffic |
| 100 | chain saw |
| 115 |  |
|  | this sound hurts |
| 140 | jet engine 30 m away |
|  | rocket engine 50 m away |

**Sound Activity: How high can you hear?**

Background: The accepted range of frequencies the human ear can hear ranges from a low of 20 Hz to a high of 20,000 Hz. Actually, there is a tremendous variation within this range, and people’s hearing changes greatly with age and exposure to loud noises.

Instructions

* Connect sound generator to a timer set to measure FREQUENCY
* Connect speaker to the sound generator
* Turn the timer on; you should hear a sound and the timer should measure frequency near 440 Hz.
* Adjust the frequency knob and see how low it will go.
* With your group, agree on a frequency that you would say sounds “LOW”, record that number in the table
* Do the same for a frequency you classify as MEDIUM, HIGH and VERY HIGH

|  |  |
| --- | --- |
| **Description** | **Frequency (Hz)** |
| Low |  |
| Medium |  |
| High |  |
| Very High |  |

* Next you are going to determine individually the HIGHEST and LOWEST frequency that you as an INDIVIDUAL can hear
* One at a time, begin with the frequency at 440 Hz. Then adjust the frequency HIGHER until you can no longer hear the sound. BE HONEST. When you can no longer hear the sound, say stop and record the frequency on the timer.
* Put the timer back to 440 Hz. Slowly adjust the timer LOWER until you can no longer hear the sound. Record the frequency at which you can no longer hear the sound.
* **Record your data for highest frequency heard in the class data sheet on the smart board**

|  |  |  |
| --- | --- | --- |
| Group Member Name | Highest Frequency Heard (Hz) | Lowest Frequency Heard (Hz) |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Analysis Questions:

1. Was it easy for everyone in your group to agree on a frequency for low, medium, high and very high sounds? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_What could make this difficult? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Who in your group can hear the greatest range (lowest to highest) of frequencies? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What factors could make this experiment unreliable or inaccurate? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_