

# Can You See The Music?

Collaboration -The Data Game: Name That Noise!

Grades: 5-8

Time: 20-30 minutes

Subject: Physics

Topics: Sound, Wave Properties



## Overview

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Group experiments with **frequency**, wave, and amplitude. Inverse square law. Visualize music such as Beethoven or capture a noise - or even a name that noise game!

## Background

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Sound travels in waves. The sounds we hear, high or low, can be "seen" using tools that visualize **sound waves**. Using the **frequency** program on databot<sup>™</sup>, it's easy to see the frequency of sounds you are hearing. Sound frequency corresponds to "pitch" or tone. So the higher the frequency, the higher the pitch. Frequency is measured in cycles per second, or Hertz (Hz). Adult humans have a normal voice range from 85 Hz to 255 Hz. Children have a lower range



## Objectives

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Understand & Recognize:

- That sound is transmitted in waves.
- A **microphone** (sound sensor) vibrates from sound waves and converts this vibration to electrical energy.

## What You'll Need

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- databot<sup>™</sup> + Arduino IDE

## Prep (5 mins)

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- In your groups, review all the Arduino proposed project ideas that everyone created.

## Collaboration (25 mins)

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*\*This group project can be done as a whole classroom together or in small groups.*

- Sort Arduino proposed projects, and challenge yourselves to see if you can come up with ways to combine the ideas into a more complex project. *Do something AWESOME!*
- *Who in the class can sing the highest frequency, the lowest?*
- *Who in the class can sing a controlled note with the highest decibel level.*

*\*This classroom collaboration is an extension of the Experiment, "Arduino Saves the World!" Review the educator notes associated with the Experiment and the more extensive information provided in the Overview section if necessary.*

Great job! Now for a new kind of adventure, the next step is a Code Challenge. Learn how to take control through programming. Good luck!

## Next Step, Code Challenge!

### Educator Resources

#### References:

Wikimedia Commons

<https://commons.wikimedia.org/wiki/File:Gnome-mime-sound-openclipart.svg>

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