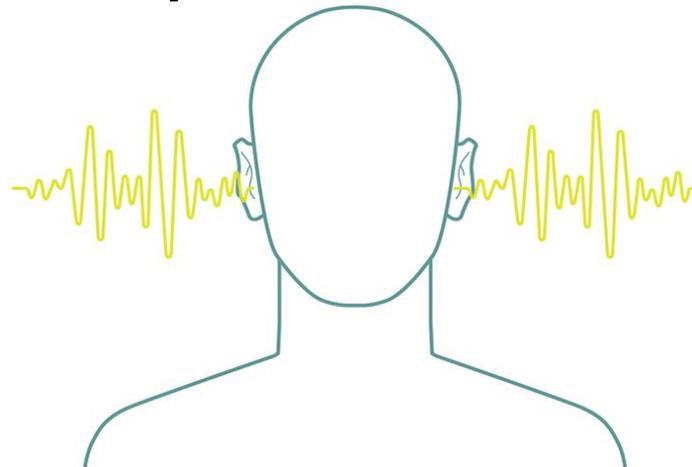


Exploring Sound and Pitch

An Engineering Design Challenge Using Recyclable
Materials

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The Arts in STEM: Advancing Meaningful Integration
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Why a Water Xylophone?

The activity:

- Combines art, science, and creativity
- Encourages family engagement and hands-on learning at home
- Uses recyclable and everyday materials to promote sustainability



Students will explore:

- The effect of water levels and jar sizes on pitch
- How soft vs. hard tapping varies with glass jars

Objective :

- To support collaboration in virtual or in-person setting
- To apply the Engineering Design Process

Materials

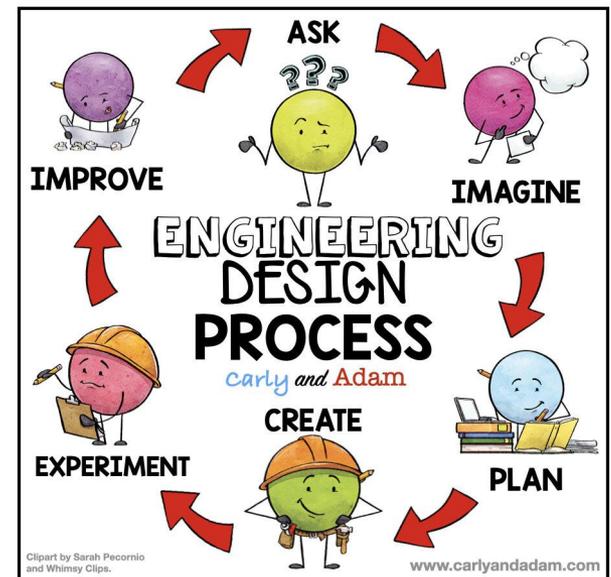
- 3 - 4 Glass jars of different sizes (more is ok)
- Tap water
- Food coloring (optional - to add visual flair)
- Metal spoon or wooden stick
- Tray or towel (optional - for clean workspace)

Teacher Note: Using different jar sizes introduced a variety of tones beyond water levels.

From Concept to Creation

- Brainstorm instrument types and chose xylophone
- Experiment with water levels and jar shapes to test pitch
- Test pitch changes using tapping forces and utensils
- Refine layout for aesthetic and sound quality
- Add color to connect sound with visual identity (Jamaican :))

Initial Design + Final Instrument



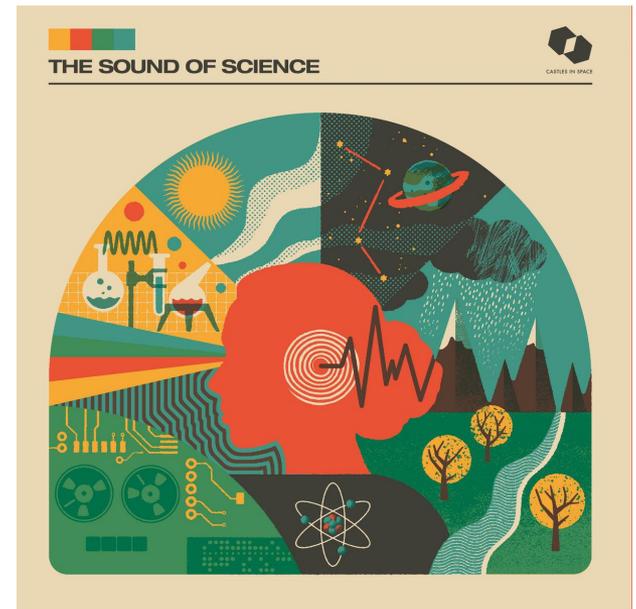
The Science of Sound

Pitch: Determined by water level and jar size (less water = higher pitch)

Volume: Controlled by the strength of the tap

Vibration: Sound is created by vibrations in the jar and water

NGSS Connection: Waves and their Applications in Technologies for Information Transfer



Making It Meaningful at Home

- This will encourage students to involve family in testing or performing
- This is great for virtual learners using household items
- This will promote dialogue about recycling, sound, and creativity
- Students will be able to present findings and demonstrate concepts



Final Demonstration

In this video, you will see:

- High vs. low pitch
- Soft vs. loud volume
- How the design was improved through trial and error
- Explore sound and music
- The use of recyclable materials in STEM innovation