



Build A Sound Machine: The Science Of Pitch!

 Science •  30 min •  Ages all • Grade mixed

Explore the fascinating world of sound by building your very own instrument. Discover how vibrations create different pitches and connect sound to emotions and patterns.

Our goal is for your child to Explain how vibrations create sound and pitch., Identify and manipulate factors that change the pitch of a sound., Design and construct a simple instrument using household materials..

What You Need

Rubber Bands • Empty Containers • Scissors



Scan To Tailor

Every child learns differently, and this is just the baseline. Scan to jump into the app and easily tailor this lesson to match your child's exact learning level and see how Mai will guide this lesson.



Ready for more adventures? Explore our **Sparks Hub** in the app

Lesson Blueprint

A simple, hands-on lesson that guides your child through curiosity, exploration, and reflection.



Mai's Tips

1. **Encourage older children to think about frequency (how fast something vibrates) and amplitude (how big the vibration is) as the scientific terms for pitch and loudness:** Even without explicitly using the terms, they can grasp the concepts.
 2. **Remember that the goal is experimentation and discovery, not perfection:** Celebrate every attempt, especially when things don't go as planned, as those are often the biggest learning moments.
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Prep Before Session

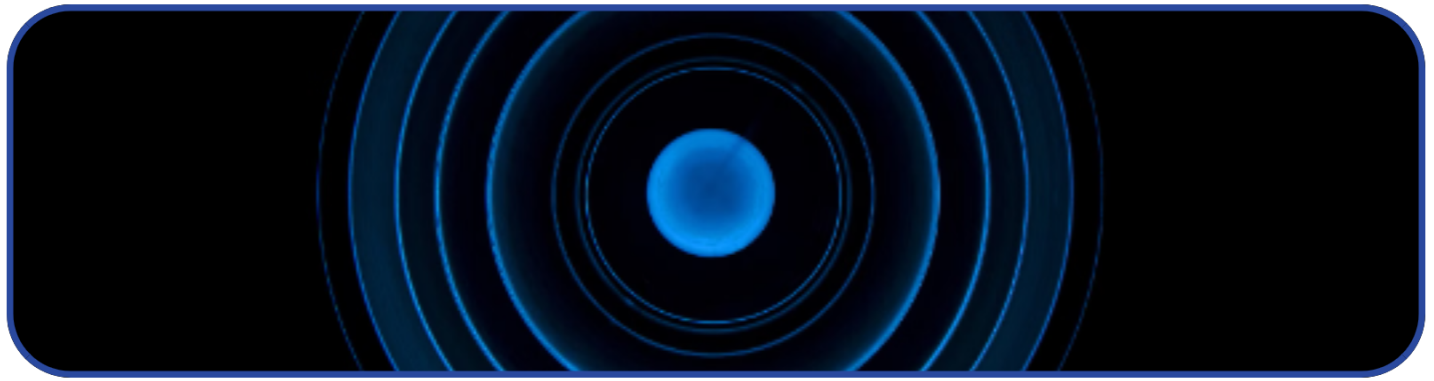
1. Gather the materials and choose a safe, comfortable place for the activity.
2. Read through the lesson once so you know where the child will make predictions, test ideas, and reflect.



1 Introduction 5 Min

1. Start by asking your child about their favorite kind of music or instruments. Encourage them to make some sounds with their voice or body, like clapping, stomping, or humming. Ask them to describe what they notice about these sounds. Spark their curiosity with questions like: 'What's your favorite sound to make or to hear?' and 'Have you ever wondered what makes different musical instruments sound so unique?' The stage is done when your child can identify a few different sounds and express curiosity about how they are made.

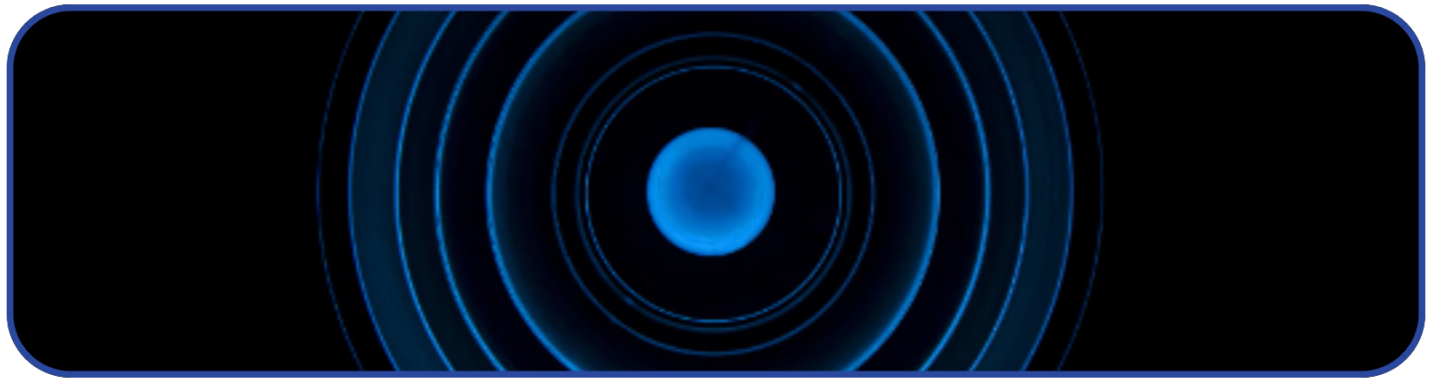
 **Done when:** Student can identify a few different sounds and express curiosity about how they are made.



2 Explore & Plan 8 Min

1. Help your child gather the materials: rubber bands, empty containers, and scissors. Let them freely manipulate the rubber bands and containers. Encourage hands-on exploration without a specific goal at first. Ask open-ended questions to guide their observations: 'What happens if you stretch the rubber band more?' and 'Does the size of the container change anything when you stretch a rubber band over it?' Then, prompt them to think like scientists: 'How might we use these materials to create different sounds?' and 'What do you think sound **is**?' The stage is done when your child has brainstormed at least two ideas for using the materials and made a prediction about how to change a sound.

 **Done when:** Student has brainstormed at least two ideas for using the materials and made a prediction about how to change a sound.



3 Discussion 6 Min

1. Engage your child by asking for their predictions based on their earlier exploration: 'What do you predict will happen when you pluck a tightly stretched rubber band compared to a loose one?' and 'And what about a long rubber band versus a short one – how do you think that changes the sound?' If they get stuck, demonstrate by re-stretching a rubber band. Explain that sound is made by 'vibrations' – things moving back and forth very quickly. The speed of these vibrations determines the 'pitch' of the sound. Pitch is how high or low a sound is; a fast vibration makes a high pitch, and a slow vibration makes a low pitch. Ask: 'What do these differences tell us about how sounds are created and changed?' The stage is done when your child can articulate a connection between stretching/length and the pitch of a sound.

 **Done when:** Student can articulate a connection between stretching/length and the pitch of a sound.



4 Activity 9 Min

1. Now it's time to build! Support your child as they construct their own 'DIY Music Maker' using the rubber bands and containers. Let them lead the design and problem-solving, offering encouragement and help with tricky steps like securing rubber bands. If scissors are needed for modifications, ensure they are used safely. Encourage them to experiment with stretching rubber bands across containers, trying different tensions and lengths to create a range of high and low sounds, or 'pitches'. Ask them: 'What discoveries will you make as you build and play?' and 'How can you make a sound higher? How can you make it lower?' The stage is done when your child has constructed an instrument and can demonstrate making at least two different pitches.

 **Done when:** Student has constructed an instrument and can demonstrate making at least two different pitches.



5 Summary 2 Min

1. Celebrate your child's efforts and their amazing 'DIY Music Maker' creation! Ask them to share their favorite part of the activity and one new thing they learned. Pose reflective questions such as: 'What was the most surprising thing you discovered today about making high and low sounds, or pitches?' and 'How does understanding how sound works help us appreciate the music we hear every day?' Briefly connect their DIY instrument to real-world instruments like guitars or violins. End by asking: 'How does music make you feel?' The stage is done when your child shares one key takeaway or discovery from the activity.

 **Done when:** Student shares one key takeaway or discovery from the activity.

Beyond The Lesson

Fuel their curiosity beyond the lesson with bonus sparks.



Table Talk

Musicians, instrument makers, and even sound engineers all use the science of sound every day.



Did You Know?

Everyday objects can reveal surprising science when we slow down and observe them.



Challenge

Can you try to play a simple tune like 'Twinkle Twinkle Little Star' on your new instrument? Or try using different materials to make sounds, like spoons on glasses filled with water?

Quick Recap Quiz 4 Min

Check what your young scientist remembers. Each question includes a Parent Tip to help them find the answer without giving it away.

1. What Causes Sound?

☐ Stillness

☒ Vibrations



Sound is created by things moving back and forth very quickly!

2. How Can You Make A Rubber Band Produce A Higher Pitch?

- ☐ Make it longer
- ☒ Stretch it tighter

 Think about how a guitar string works – tighter means higher!

3. Why Do Different Instruments Sound Different?

- ☐ They are different colors
- ☒ They vibrate in different ways

 Each instrument has its own unique way of vibrating air.

4. What Kind Of Emotion Might A Slow, Low-Pitched Sound Evoke?

- ☐ Excited or happy
- ☒ Calm or sad

 Think about the music in a movie when something peaceful or reflective happens.