moxi at home

DIY Guitar.

Experiment with sound by building a musical instrument with materials like string, rubber bands, and cardboard.

The inspiration for this activity!
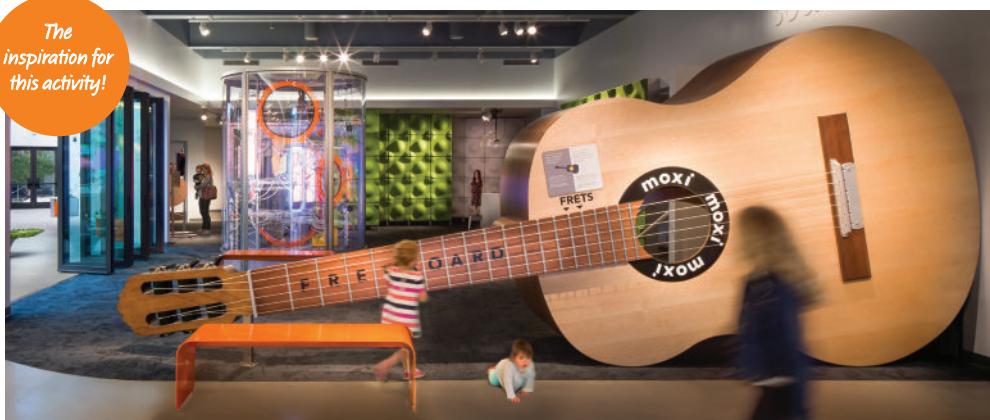
MOXI Exhibit Connection	Giant Guitar
Age	6+
Time	N/A
Category	Tinkering, Sound

Design Challenge

Build an instrument with strings that can change pitch by getting tighter or looser.

Materials

Below are some ideas for supplies, but be creative! What else could you use for each of the categories below? Your home is a creative tool chest waiting to be discovered!

Strings	Instrument Body	Extras	Tools
• Rubber bands	• Cardboard box	• Clothespins	• Scissors
• Shoelaces	• Tupperware bowl	• Chopsticks	• Tape
• Fishing line	• Tin can	• Pencils	
• String	• Plastic jug	• Popsicle sticks	
• Yarn	• Cereal box	• Ruler	

Instructions

Try biting on a string and pulling it tight while you strum.

What do you notice?

Play around with the length of your strings. What differences do you notice when you pluck a short string versus a long string? What kind of sound will your instrument have?
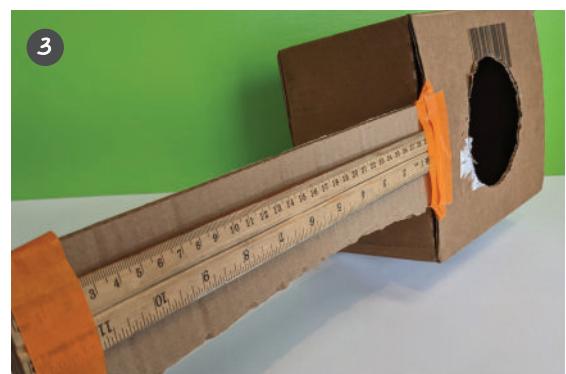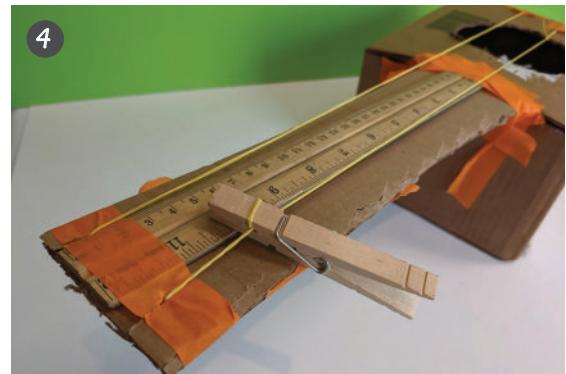
1. A homemade guitar can be simple or complex! Either way, first you need to find the right strings. What sounds do strings make when they are loose and when they are pulled tight? Compare the different sounds you make and pick your favorite sounding material.

2. Build a body. You need to stretch your strings over an instrument body with a sound hole. You can cut a hole into a box to make a sound hole, or find something that is hollow and has an opening on one side, like a bowl or tube.

   You can hold strings in place to test how they sound, but eventually you'll want to attach them. If you don't have tape, try putting a knot in your string and sliding it through a small cut in the cardboard.

3. To add more notes to your guitar, add a fretboard where you can press down on the strings.

4. For even more control of the sound, try wrapping the top end of your strings around something that you can turn to tighten or loosen the string.

5. What else can you add to make your instrument one-of-a-kind? You might end up inventing something brand new!

Activity Extensions

Why stop here?
Keep the MOXI musical fun going!

innovate   Design a capo for your instrument. A capo is a small clamp that holds down the strings to change the pitch and make your strings sound higher.

interact   Make more instruments and have a jam session. Try making a bass guitar with a deeper sound or some percussion instruments like drums or maracas.

**improvise**   Make up a song or learn how to play a simple classic like "Mary Had a Little Lamb".

Guitar Anatomy

Music Words:

Pitch – The "lowness" or "highness" of a sound. Pitch is the rate at which vibrations are produced. Low sounds like the rumble of a truck engine have long wavelengths. High sounds like the squeak of a mouse have short wavelengths.

Sound hole – an opening in the top surface of a stringed instrument to enhance vibration and resonance.

Resonance – a long loud, clear, and deep quality of sound.

Tuning pegs · Head · Fretboard · Strings · Frets · Neck · Body · Sound board · Sound hole · Bridge
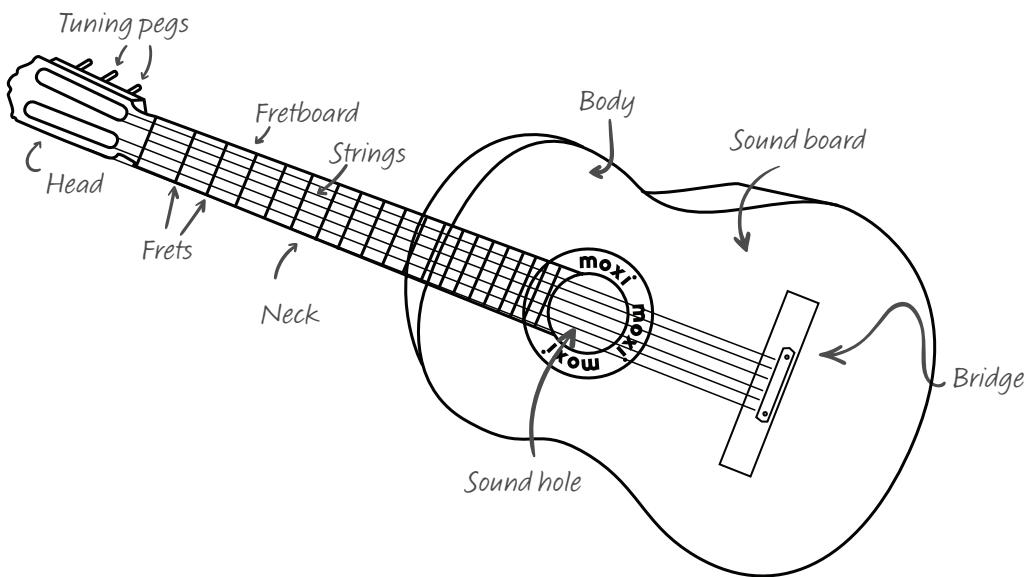
Ask an Engineer

What is sound?

"Sound can be thought of as pressure waves that travel through air, water, and even solid materials. Those pressure waves cause your eardrum to vibrate. Our ears take that mechanical energy from the vibrating air and change it into tiny electrical signals that are then sent to our brains. Finally, our brains decode that signal as the perception of sound!"

–Conor Watson, Acoustical Engineer at SONOS

Make + Share!
Be sure to share your creations and tag us **@moxisb** and use **#moximade** and **#moxiathome** so we can join in on the fun, share your projects, and inspire others!

moxi
The Wolf Museum of Exploration + Innovation