

Homemade Wind Chimes

DURATION

45–60 minutes

OVERVIEW

Whether it's the intricate notes played by an expert guitarist or a toddler banging on pots and pans, all sound travels to our ears as a wave. The length and frequency of sound waves produces different pitches. Shorter waves produce higher pitches and longer waves produce lower pitches. But music doesn't have to be created by expensive instruments; beautiful music can come from most everyday objects. In fact, country and bluegrass music has its roots in homemade instruments. In this activity, students will use what they know about vibrations and sound waves to create a wind chime from found objects.

Students and their families can experiment with different materials to create their wind chimes. Everyday object like PVC pipes, paper towel rolls, or plastic bottles. They will see what sounds are produced with various materials. Changing the size of the materials also affects the sound, and students will use their knowledge of ratios to relate the size of the object to the pitch of the sound. Families can choose the materials that they find make the most pleasing sounds and turn them into a wind chime that will add beautiful music to their home.

DRIVING QUESTION

How do the types and sizes of materials used in making a wind chime affect the pitch of sound produced?

MATERIALS

The great thing about this activity is that you can make it as simple or as complex as you like, using any sorts of materials. Found objects can make beautiful-sounding wind chimes, or you can enhance your wind chimes by purchasing materials you like from a hardware or home store.

- Something to make the sound—Found objects in the shape of tubes, like cardboard, PVC, or even metal work great
- Something to hang everything, like multipurpose or craft wire, chain, or string
- Something to clang or ring the chimes – Found objects in the shape of a sphere or disc work well, like a rock, coin, or ball
- Something from which to hang all the chimes, like a paper plate, a wheel, a coat hanger, or a piece of matte-board or wood
- Something to cut your materials, like wire cutters or scissors
- Pliers if you are using any sort of chain or wire

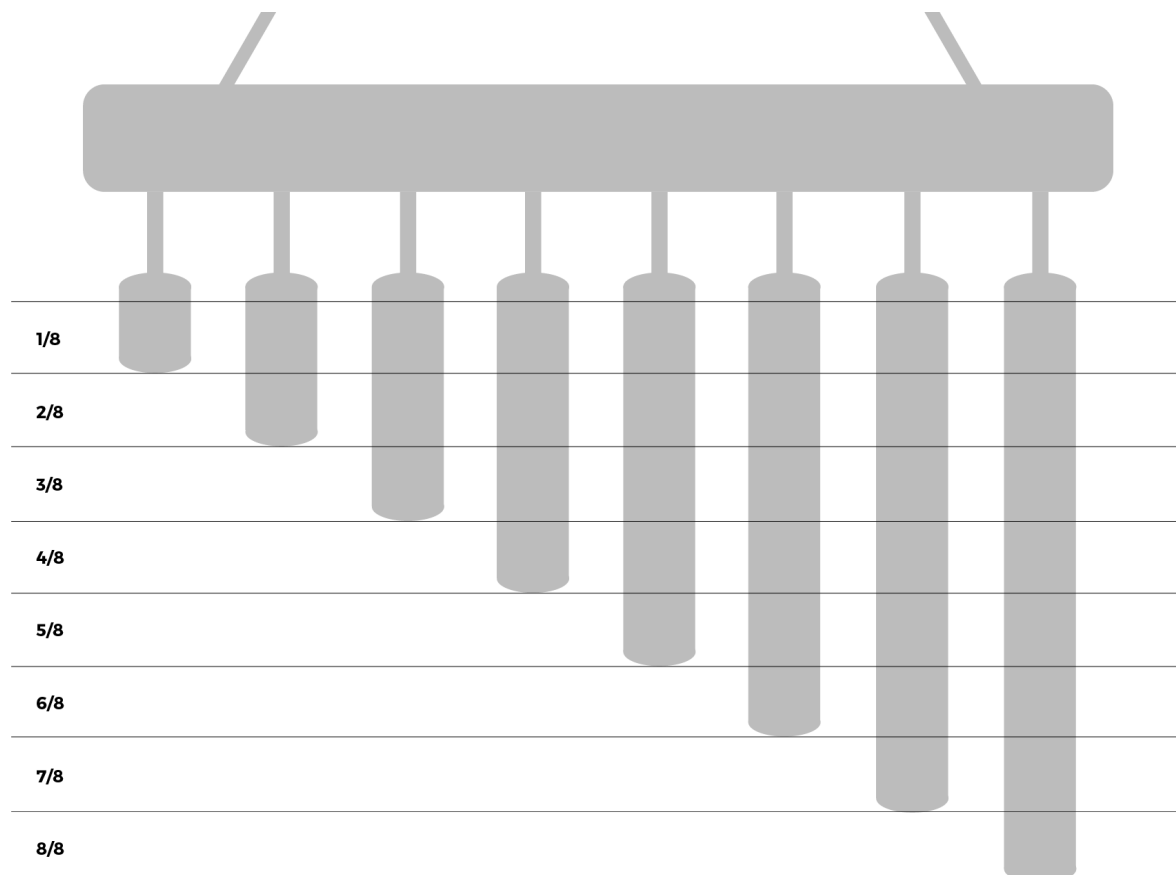
BACKGROUND INFORMATION

Have you ever thought about how sound is produced? Sound is actually a type of energy created by small movements or vibrations. When an object vibrates, it disturbs the molecules around it and creates waves. This happens just like waves are created in a pool of water when you throw something into it. Sound waves move through air, water, or even solid objects until they reach your ears. This means that sounds can change depending on what medium they travel through!

One of the best ways to visualize this is by creating wind chimes. Wind chimes are bits of materials of different sizes hung up to sway in the wind. As the wind blows the chimes, they clap against each other and make interesting noises. You've probably noticed that wind chimes can be created out of any number of materials, and they all sound different. The type of material as well as the size of the chimes determines the type of sound created. In this activity, you will work with your family to build wind chimes out of any material you like.

Typical wind chimes have eight chimes or tubes of material, to produce eight different musical notes. These reflect what is known as a scale, or an order of sounds, in music. Since sound moves as a wave, the size of the chime matters. The larger the chime, the longer it takes the sound wave to travel, and the deeper the note will be. The smaller the chime, the shorter it takes the sound to travel, and the higher the note will be. When you lay out all eight of the chimes side by side, you will see that there is a pattern. Each note is a ratio of the scale. If your smallest chime is 1 unit long, your next will be 2, then 3, etc. Your longest chime will be the equivalent of 8 units. So your shortest chime is equal to 1/8th of your longest chime.

As you create your chimes, experiment with different lengths to see what notes are produced.



PREPARATION

- Plan ahead with your family and brainstorm items you might want to use as your chimes.
- Collect your materials.
- Create a plan with an adult for safely cutting your materials.

ENGAGE

Discuss with your family the sounds you hear around you.

- How does that sound reach your ears?
- Have you ever listened to someone talking under water?
- Does it sound different? Why do you think that is?
- What sounds beautiful to you?

EXPLORE

Explore the materials you have around you—pots and pans, shoes, different containers, craft tubes—everything makes noise!

- What sounds are you hearing?
- Does wood sound different than metal when you knock on it?
- Do solid objects sound different than hollow objects?
- Does the size of the object matter?

INVESTIGATE

Investigate different materials you would like to use for your wind chimes. Test out PVC pipe, cardboard tubes of different lengths, different sized utensils, rocks, cups, popsicle sticks, sticks from your yard—anything interesting in your environment that you think might make a good wind chime. Find items that come in different sizes so that you can create chimes with different notes. If you can find or create eight different objects to make a full musical scale, that's great! If not, make yours with fewer chimes to have fewer notes.

CREATE

After you've decided on your materials, build your wind chime with your family. You will need to:

- Create 8 or fewer different sized chimes using the materials of your choice. If you are able to customize the sizes of the chimes, use the ratios you learned about in Background Information to make eight different notes. Be sure to get an adult's help if you are cutting any of your materials. You can also take this opportunity to decorate your chimes.
- Create a small but heavy clapper that will bang on the chimes in the wind. You can use the same materials you used for the chimes or find something different, like a coin or ball.
- Hang your chimes in a circle around the clapper. You might attach them to a coat hanger that you've bent into a circle, a thick paper plate, or a circular piece of matte-board or wood.

REFLECT

Hang up your chimes and observe how they work. Listen to the different sounds they make as they blow in the breeze. Do they work well? Do you like the sound they make? If not, what could make them work better? Would a different material make a different sound? Are the chimes too heavy to be blown by a slight breeze? Or are they too light?

Talk with your family about what you've learned throughout the process of making your chimes. Were there any points at which you struggled? How did you resolve those?

Enjoy the beautiful music you created with your wind chimes!