



Sound of an Orchestra

In this activity, Beaver Scouts will experiment with producing sounds that have different pitches and different strengths. In the process, they will observe the vibrating nature of sound and how different characteristics of a vibrating object can affect the pitch and strength of the sound.



PREPARATION:

- A week before the activity, you can ask the parents to bring in small plastic or cardboard containers for Beavers to make their instruments. The container should be able to withstand the pressure of stretched rubber bands.
- Plan for the instruments and the sub-woofer in advance if you do not have them readily available.
- You can bring in a laptop to your meeting place to share the video of the glass bottle instrument with the Beavers after they do the experiments.

THE ACTIVITY:

- In the Dancing Water/Oobleck activity, Beavers will be able to see how different noise frequencies create different patterns of vibration in water and in Oobleck. Allow the Beavers to play with the volume and the frequency to create different patterns. When you increase the volume, the water drops jump higher because the sound has more energy. When you increase the frequency, you will see more ripples in the water.
- You can try this activity with Oobleck to make the effects more dramatic and interesting. You can make Oobleck by mixing two parts of cornstarch with one part of water. Oobleck is a non-Newtonian mixture, which means that it shows characteristics of both liquids and solids. When calm, it acts as a liquid—but when agitated, it behaves like a solid. This means that Oobleck will demonstrate some interesting reactions when poured on the subwoofer. You can allow Beavers to play with the Oobleck a little bit before you begin the experiment.

- For the Building a musical instrument out of water activity, you have to create multiple stations so that Beavers can work in small groups. When Beavers strike the bottle, the glass vibrates. The more water there is inside the bottle, the slower the vibrations, creating a lower pitch.
- For the Rubber bang guitar activity, you can provide rubber bands in different sizes so that Beavers can create different stretches and pitches easily.

BACKGROUND INFORMATION ON THE SOUND OF AN ORCHESTRA:

All sounds are made by vibrations of molecules through which the sound travels. For instance, when a drum or a cymbal is struck, the object vibrates. These vibrations make air molecules move. Our voice is generated by the vibration of vocal cords. Brass instruments produce sound by vibrating air. String instruments produce sound by vibrating strings. Percussion instruments produce sound by vibrating a surface.

SUGGESTED TIMING:

- Dancing Water: 15 minutes
- Different vibrations, different sounds: 10 minutes
- Building a musical instrument out of water and glass: 20 minutes
- Rubber band guitar: 20 minutes
- Review: 10 minutes

ONLINE RESOURCES:

- Fun with water and a speaker
- Dancing Oobleck: Cornstarch and Water
- Sound and Vibration
- Glass bottle music
- Rubber band instrument

