

## Natural Vibrations

*Discover sounds around us and how they are created through vibration.*

### Big Idea

Sound is created by vibration.

### Standards

<b>1.A</b> Demonstrate understanding through age-appropriate responses.	<b>10</b> Begin to make predictions and collect data information.
<b>11.A</b> Develop beginning skills in the use of science and engineering practices, such as observing, asking questions, solving problems and drawing conclusions.	<b>12.C</b> Explore the physical properties of objects.
<b>12.D</b> Explore the concepts of force and motion.	<b>13.B</b> Use tools and technology to assist with science and engineering investigations.

### Materials

- Spoon
- String: yarn, dental floss, kitchen twine, shoelace, etc.
- Scissors
- Tabletop or hard flat surface
- Paper and pencil (optional)

### Setup

Clear off a tabletop or long flat surface for working space.

### Directions

1. Tap spoon on working space or a hard object. **Q.** What do you hear?
2. Encourage children to close their eyes and press their hands or lay head on table, then tap the surface with spoon. **Q.** What did you feel? You can also try placing ear on floor (hardwood works best) and have another person walk or run in place.
3. So far vibrations have been traveling through long, flat surfaces, how about through string?
4. Cut a piece of string about the length of one arm. Hold the ends of string together to find the middle. Tie the spoon to the middle.
5. Hold each end of the string and let the spoon dangle in midair. Gently swing spoon so it taps the table or another hard object. **Q.** What did you feel?

6. Tie a loop on each end of the string and place loops on both thumbs, cover both ears with flat hands and bend slightly forward to let the spoon dangle (see video demonstration). Try to gently tap spoon on a hard object or have another person tap the spoon with hard object like another spoon or a key. **Q.** How has the sound changed? What do the vibrations feel like?
7. Repeat this experiment with different objects around the house. **Q.** How does the sound change if you tap on a soft, stuffed animal?
8. Sounds are all around us, you extend this activity by sitting quietly and listening or feeling for vibrations. Bring children to an area where they can sit or stand to feel vibrations. For example, along a sidewalk where they can feel the rumble of traffic passing by, or a playground where they can listen for sounds and feel vibrations from running feet and bouncing balls.
9. Have the children write their observations and/or draw pictures of what they think sound/vibration looks like. Have the children try to write down as many sounds as they can name. **Q.** Is that the sound of a bulldozer or a crane? Is that buzzing coming from a car or the refrigerator?
10. Have children share their list or pictures and record results of the sounds the children listed.

*Investigation Questions:*

*Q. If you hear a bird chirping, how is that sound made?*

*Q. When the wind makes a rustling sound in the trees, how is vibration made?*

*Q. How many of the sounds you hear are sounds you have gotten used to, such as the hum of the refrigerator, the gurgling of the water fountain or the beeping of the microwave?*

## **Vocabulary**

**Vibrate:** to shake slightly and quickly, or to cause something to do this, in a way that is felt rather than seen or heard

**Vibration:** quivering or trembling motion