

Lessons at a Glance

Science Content: Big Ideas

The Sound Unit concentrates on the following “big ideas” about sound sources and production, as well as about changing sound and hearing sound. Along with the scientific Habits of Mind discussed on page 6, these concepts should be reinforced throughout the unit. The lessons in which each big idea is introduced or is a major focus are indicated in parentheses.

- Sounds are produced by sources all around us. You can describe sounds in a variety of ways. (Lesson 1)
- All sounds are made by vibrations. (Lesson 2)
- Sound travels through air and other materials. Sound travels through some materials better than others. (Lesson 3)
- Sound travels by causing vibrations in the air or in other materials. (Lessons 4–6)
- The shape and parts of the ear allow sound to travel through it so we can hear. (Lesson 6)
- All sounds are made by vibrations. Changing the vibrations changes the sounds. (Lessons 7 and 8)
- You can apply what you know about sound and vibration to design and build musical instruments that can change pitch and volume. (Lessons 9–12)
- Observation is a powerful tool for learning about something, and detailed and accurate descriptions help you communicate your observations. (Observing and Describing Skill Building Activity)

Lesson Overviews

The following overviews briefly summarize each lesson in the Sound Unit. Core lessons are indicated with an asterisk. Suggestions for scheduling and flexible implementation are shown in gray.

Lesson 0: Doing Science

Children sharpen their awareness of scientific thinking as they conduct a self-directed exploration and then reflect on the processes they engaged in. In the context of these experiences, they are introduced to the work of scientists and to the Science Companion “I Wonder” circle, which provides a visual representation of many of the facets of scientific inquiry, exploration, and discovery.

You can find Lesson 0 in the *Teacher Reference Materials*.

Lesson 1: Searching for Sound*

Children focus on listening carefully and making detailed descriptions of sounds as they become “sound detectives” who search for, identify, and describe sounds in their surroundings.

Consider teaching this lesson in two sessions. Session 1 can be taught during language arts. Session 2 involves a walk outside of the classroom (indoors or outdoors).

Lesson 2: What Makes Sound?*

During a science talk, children explore their ideas about how sound is produced. They learn what a vibration is, and that all sounds are produced by vibrations. They generate a variety of sounds by making different materials vibrate.

Consider teaching this lesson in two sessions or conducting it in stations over the course of several days.

Lesson 3: Sound Travels Through Many Things*

Children establish that sound travels through air. Then they experiment with sound traveling through many different materials. They conduct tests to discover that sound travels through some substances better than others.

Lesson 4: How Sound Travels*

Children do an activity that demonstrates how the vibration of a sound source can cause vibrations of other materials. They use this activity as the basis for a basic explanation and discussion of how sound travels.

Lesson 5: Sound Through a String

Children continue to explore sound vibrations and sound transmission as they send secret messages to one another using cup-and-string telephones. While experimenting with their telephones, the children find several ways to affect the transmission of their messages.

Lesson 6: Ears Hear

Children enact how sound travels through the three main parts of the ear to better understand how ears hear.

Lesson 7: Exploring Pitch*

In Session 1 of this two-part lesson, children listen to and compare sounds that have different pitches and describe them as high, middle, or low. In Session 2, children explore ways of changing pitch using a variety of sound-producing materials. They identify which parts vibrate to make a sound, and reflect on the relationship between vibration and pitch.

One or both sessions of this lesson can be taught during music.

Lesson 8: Exploring Volume*

Children experiment with changing the volume of sounds by tapping, blowing, or strumming a variety of materials harder or softer, and by amplifying sounds with a “sound box” and “sound tube.” They identify materials that vibrate to make a sound, and consider the relationship between vibration and volume.

Consider teaching this lesson in two sessions.

Lesson 9: Designing Musical Instruments*

Children apply their knowledge of sound and vibration by using a variety of common materials to design percussion, wind, or stringed instruments. They plan and draw pictures of their designs, and then explain how their instruments will work. The instruments need to be able to change pitch and volume.

Lesson 10: Building Musical Instruments*

Children experiment with using various materials to build the musical instruments they designed in the previous lesson. They redesign their instruments, if necessary, and discuss any problems they have implementing their designs.

This lesson can be taught during art. Children can also work on their instruments during available free time in the classroom.

Lesson 11: Refining Musical Instruments*

Children work with a “building buddy” to evaluate, refine and, if necessary, redesign their musical instruments.

This lesson can be taught during art. Children can also work on their instruments during available free time in the classroom.

Lesson 12: Sharing Instruments*

Children demonstrate the musical instruments they designed and built. They explain what parts of their instruments are vibrating to produce sound and then demonstrate and explain how to change the pitch and volume. The children also reflect on the design and building process, describing the problems they encountered and evaluating how well their instruments meet the initial design criteria.

Skill Building Activity: Observing and Describing

Children practice making accurate and detailed descriptions before and after observing a familiar object. In doing so, they discover the importance of careful observation and detailed description in science.