# Sound Teacher Guide, Grades 3-5

| Science Standards | ELA Standards |
|---|---|
| **Next Generation of Science Standards**<br>**4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.<br>**4-PS3-3.** Ask questions and predict outcomes about the changes in energy that occur when objects collide.<br>**4-PS4-1.** Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.<br><br>**Ohio's Learning Standards, Science**<br>**Table 1:** Nature of Science, 3-5 (page 9)<br>**Table 2:** Ohio's Cognitive Demands of for Science (page 13)<br><br>**3.PS.3:** Heat, electrical energy, light, sound and magnetic energy are forms of energy.<br>**5.PS.2:** Light and sound are forms of energy that behave in predictable ways. | **Ohio's Learning Standards, English Language Arts Writing Standards 3-5**<br>**W.3-5.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.<br>**W.3-5.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br><br>**Speaking and Listening Standards K-2**<br>**SL.3-5.1-6** |

## Activate Prior knowledge

***Write or draw what you know about sound.***

Students will activate prior knowledge about the concepts of sound by writing or drawing anything they know about sound. Have students share. Be sure to revisit that an object vibrates to make sound.

## Song By Zak Morgan

*Sound Waves* by Zak Morgan

## Sound Travel – Test it out! Share your results!

***Sound is produced by vibrating objects and requires a medium to travel through.***

Students will explore how sound travels through different forms of matter. Students will work with a partner to test sound traveling through a solid (table) and a gas (air). One student will put their ear to the table while their partner stands at the other end of the table and taps on it with a pencil. Next the student will stand up and continue to listen to their partner tap on the table. Students will be asked to record what they hear and if the sound changes. Have partners switch roles. Students are then asked to extend their learning to liquid.

Students will discuss as a group their findings. Ask students to predict what medium or matter sound travels best through. Sound travels best through solid, then liquid, then gas. This is because molecules in a solid are packed against each other. When a sound vibration begins, it can move more rapidly and effectively through the molecules.

## More To Explore – Sound Meets a New Medium

***What happens to a sound when it comes in contact with a new medium? You'll need a rubber band, cup, and towel to test it out!***

Students will explore what happens to sound as it travels. By plucking a rubber band students will test what happens to a sound when it encounters a hard solid (cup), and a soft solid (towel).

Have students discuss:

***What happens to the sound from plucking the rubber band when it meets a new medium? Does the sound or volume change? Can more than one thing happen? What have you experienced with what happens to the sound of a yell you make in different places, for example a field versus a cave or gym?***

## Extension Opportunities

**Suggested Read Alouds:**

*Meet the Orchestra* by A. Hayes

*How Does Sound Change? Light and Sound Waves Close Up* by R. Johnson

*Oscar and the Bat: A Book About Sounds* by G. Waring

# The Ear Teacher Guide, Grades 3-5

| Science Standards | ELA Standards |
|---|---|
| **Next Generation of Science Standards**<br>**4-PS3-2.** Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.<br>**4-PS4-3.** Generate and compare multiple solutions that use patterns to transfer information.<br>**Ohio's Learning Standards, Science**<br>**Table 1:** Nature of Science, 3-5 (page 9)<br>**Table 2:** Ohio's Cognitive Demands of for Science (page 13)<br>**3.PS.3:** Heat, electrical energy, light, sound and magnetic energy are forms of energy.<br>**5.PS.2:** Light and sound are forms of energy that behave in predictable ways. | **Ohio's Learning Standards, English Language Arts Writing Standards 3-5**<br>**W.3-5.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.<br>**W.3-5.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br>**Speaking and Listening Standards K-2**<br>**SL.3-5.1-6** |

## Activate Prior knowledge

***Write or draw what you know about sound and the human ear.***

Students will activate prior knowledge about the concepts of sound and the human ear by writing or drawing anything they know about the topic. Have students share. Be sure to revisit that an object vibrates to make sound.

***Why do you think the thin stretched membrane (skin) that divides the outer ear from the middle ear is called an eardrum? Draw what you imagine when you hear the word eardrum.***

Students will continue to explore the human ear and how it works by thinking and reading about the eardrum. Students

## Song By Zak Morgan

*Three Cheers For My Ears!* by Zak Morgan

## Communication - Test it out! Share your results!

***Draw or write some different ways people use sound and the human ear to communicate?***

Have students share different ways sound and the human ear are used for communication. Discuss the "Fun Facts!" box about communication.

## More To Explore - Using Sound For Communication - Test it out! Share your results!

***Can you create a drum beat that can be used for communication? Work with a partner to develop different beats to communicate with one another.***

Students with a partner will create different beats to send communications to one another.

***How did you and your partner communicate with one another? How was using the beat of a drum to communicate and how the human eardrum works similar?***

Discuss with students connecting this work with what was discussed earlier about the eardrum and its function in the process of hearing.

## Extension Opportunities

**Suggested Read Alouds:**

*Sounds All Around* by W. Pfeffer
*Thunder Cake* by Patricia Polacco
*Sosu's Call* by Meshack Asare
*Jackrabbit McCabe and the Electric Telegraph* by L. Rozier

# Matter Teacher Guide, Grades 3-5

| Science Standards | ELA Standards |
|---|---|
| **Next Generation of Science Standards**<br>**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.<br>**5-PS1-1.** Matter and Its Interactions, Develop a model to describe that matter is made of particles too small to be seen.<br><br>**Ohio's Learning Standards, Science**<br>**Table 1:** Nature of Science, 3-5 (page 9)<br>**Table 2:** Ohio's Cognitive Demands of for Science (page 13)<br><br>**3.PS.1:** All objects and substances in the natural world are composed of matter.<br>**3.PS.2:** Matter exists in different states, each of which has different properties.<br>**4.PS.1:** When objects break into smaller pieces, dissolve, or change state, the total amount of matter is conserved. | **Ohio's Learning Standards, English Language Arts**<br>**Writing Standards 3-5**<br>**W.3-5.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.<br>**W.3-5.10** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.<br><br>**Speaking and Listening Standards K-2**<br>**SL.3-5.1-6** |

## Important Vocabulary

Matter - anything that has mass and takes up space.
Mass - measurement of how much matter is in an object. The more matter there is in an object, the greater the mass.
Volume - a measure of the amount of space an object occupies.

## Song By Zak Morgan

*Lorna Doon*e by Zak Morgan

## Activate Prior knowledge

***Write or draw what you know about matter.***
Students will activate prior knowledge about the concepts of matter by writing or drawing anything they know about the topic. Have students share.

## Different States of Matter

***Draw or write objects that can be sorted into the different states of matter.***
Students will draw or write different examples of the states of matter - solid, liquid, and gas. When students are finished, discuss the following questions.
***What did you think of? Were any of the states of matter easy or hard to come up with ideas for? What are some properties that solids have in common? Liquids? Gases?***

## Song By Zak Morgan

*The Atom Family!* by Zak Morgan

## Prove It! – Test it out! Share your results!

***How can you "see" something that is too small to be seen? Design a way to show that a gas is matter, it has mass and takes up space.***
Have students design by themself or with a partner a way to prove a gas takes up space and has mass.
***How will you show it has mass? How will you show it takes up space?***

## Song By Zak Morgan

*The Electron* by Zak Morgan

## Extension Opportunities

**Suggested Read Alouds:**
*Professor Astrocat's Atomic Adventure,* by D. Walliman
*What's Smaller Than a Pygmy Shrew?* By R. Wells
*Matter: See It, Touch It, Taste It, Smell It,* by D. Stille
*Change It! Solids, Liquids, Gases and You*, by A. Mason