Sound
Lesson 1a: Soundmakers

Grade 1	**Length of lesson:** 45 minutes	**Placement of lesson in unit:** 1a of 7 lessons on sound
Unit central question: Why do we hear sound?		**Lesson focus question:** How can we tell if something is making a sound?
Main learning goal: To produce sound, objects must move back and forth quickly (vibrate).		
Science content storyline: In science, evidence is what we find out or understand that that helps us know something. We can find evidence of sound by using our senses. In addition to hearing a sound, we may also be able to see and feel an object moving back and forth quickly. This is called *vibrating*. To produce a sound we can detect with our senses, an object or some other kind of material must vibrate.		
Ideal student response to the focus question: Other than hearing a sound, we can tell that something is making a sound because it vibrates. We may be able to see and feel the vibrations.		

Preparation

Materials Needed • Science notebooks • Chart paper and markers • 2 pencils (for teacher demo) • Plastic ruler, 12" (1 per pair) **Student Handouts** • 1.1 Soundmakers, Part 1 (1 per student)	**Ahead of Time** • Read the Sound Content Background Document. • **ELL support:** Meet with ELL students in advance and introduce them to the lesson content, structure, materials, and activities so they know what's expected of them and can participate more fully in the lesson. Working with data tables may be new to many ELL students whose families have limited formal schooling, so take time to orient them to the handout. Explain the table format and what columns and rows are. Also demonstrate the ruler activity and introduce the words *evidence*, *data*, and *vibrate/vibrating/vibrations*.

Lesson 1a General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
5 min	**Introduction and unit central question:** The teacher introduces the unit central question, *Why do we hear sound?* and records students' initial ideas about sound on a circle map.	
8 min	**Lesson focus question:** The teacher introduces the focus question, *How can we tell if something is making a sound?* and defines the word *evidence.* Then students work in pairs to come up with evidence that two pencils produced sound when the teacher tapped them together.	• In science, *evidence* is what we find out or understand that helps us know something. We can find evidence that objects produce sound.
5 min	**Setup for activity:** The teacher demonstrates how to use a ruler as a soundmaker and introduces the data table students will use during the activity to help them determine whether they can detect sound using their senses (hearing, seeing, and feeling).	• We can use our senses to detect sound.
10 min	**Activity:** Students use a ruler as a soundmaker and gather evidence with their senses that it's making a sound.	• When an object makes a sound we can hear, we can sometimes see or feel the soundmaker moving back and forth quickly.
10 min	**Follow-up to activity:** Students share their evidence from the ruler investigation; then the teacher introduces the word *vibrate.*	• An object or some other kind of material must vibrate to make a sound we can detect with our senses. *Vibrate* means "to move back and forth quickly." • We know that an object is making a sound if we hear it. Seeing or feeling vibrations are also evidence that an object is making a sound.
6 min	**Synthesize/summarize today's lesson:** Students work in pairs to answer the focus question; then they share their ideas and evidence in a class discussion.	
1 min	**Link to next lesson:** The teacher announces that in the next lesson, students will explore another kind of soundmaker and see if they can find more evidence of sound.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
5 min	**Introduction and Unit Central Question** **Synopsis:** The teacher introduces the unit central question, *Why do we hear sound?* and records students' initial ideas about sound on a circle map.	Ask questions to elicit student ideas and predictions.	**Show slide 1.** Every single day, we hear a lot of different sounds. From the time we wake up in the morning until we go to bed at night, we hear sounds all around us. In this new unit, we're going to learn about sound. **Show slide 2.** What comes to mind when you think of sound? What sounds do you hear first thing in the morning? What sounds do you hear at school? What sounds do you hear when you get home from school?	The alarm clock. Noises coming from the kitchen. The bell ringing. The loudspeaker. Lots of talking. Music from the music room. The TV.	

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			What sounds do you hear when you're outside playing? **Show slide 3.** What are some other words for sound? **NOTE TO TEACHER:** *Draw a circle map on chart paper and write the word* Sound *in the middle. Then ask students to come up with other words for sound (synonyms) and words that describe different sounds. Add these words to the outer circle on the map. Accept all answers at this point.* What words can we use to describe different sounds?	The computer. My brother or sister. My dad or mom making supper. Birds singing. Dogs barking. Cats meowing. Children yelling. Music. Talking. Yelling. Whistling. Loud or soft. Screechy.	

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			NOTE TO TEACHER: *As a follow-up, ask students to find pictures of things they experience outside of school that make noise and bring them to class next time to post on the circle map.* **Show slide 4.** Our job over the next few days is to figure out the answer to a very important question: *Why do we hear sound?* This is the unit central question we'll keep in mind throughout this series of lessons on sound. Write this question in your science notebooks and draw a double-lined box around it. **NOTE TO TEACHER:** *Write this question on the board for students to refer to throughout the unit. Demonstrate for students how to draw a double-lined box around the question.* Why do you think we hear sound? Let's hear some of your ideas. **NOTE TO TEACHER:** *Record students' ideas on chart paper. At the top of the chart, write the title "Our Ideas about Why We Hear Sound."*	Low or high. Objects make sound. Sound comes out of things.	Can you say more about how objects make sound?
		Ask questions to elicit student ideas and predictions.			

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				Things crash into other things and make a sound. We hear sound because we have ears. Our ears go out and pick up the sounds. The sounds go into our ears.	Do you have an example in mind? Do you have any ideas about how our ears can hear sound?
8 min	**Lesson Focus Question** **Synopsis:** The teacher introduces the focus question, *How can we tell if something is making a sound?* and defines the word *evidence.* Then students work in pairs to come up with evidence that two pencils produced sound when the teacher tapped them together. **Main science idea(s):** • In science, *evidence* is what we find out or	Set the purpose with a <u>focus question</u> or goal statement.	These are great ideas! Over the next few days, we'll add to our ideas about why we hear sound. We'll also talk about how objects make sounds, how these sounds get to our ears, and what our ears do to help us hear sound. **Show slide 5.** I have another question for you: *How can we tell if something is making a sound?* This is our *lesson focus question*. Each day we'll have a focus question to think about.		

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	understand that helps us know something. We can find evidence that objects produce sound.	Ask questions to elicit student ideas and predictions. Make explicit links between science ideas and activities **before** the activity.	The science ideas that help us answer these focus questions will also help us answer our unit central question, *Why do we hear sound?* Write this focus question in your science notebooks and draw a box around it. **NOTE TO TEACHER:** *Write the focus question on the board for students to refer to throughout the lesson.* What ideas do you have for answering our focus question? What might tell us that something is making a sound? Yes! Hearing a sound is one way we know that something is making a sound. We call this *evidence.* Have you ever heard the word *evidence*? What do you think it might mean? So evidence is like a clue, isn't it? Scientists use evidence, or clues, to help them	We can hear the sound. Evidence is like fingerprints or DNA that helps the police find out if someone did something bad. The police or detectives look for evidence.	

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			understand how things work. **NOTE TO TEACHER:** *Write the word* evidence *on the board and/or post it on a word wall. Have students repeat the word aloud as a class and then write it in their notebooks. Try to do this for each new vocabulary word you introduce throughout this unit.* **ELL support:** Have ELL students create a picture dictionary and add new vocabulary words to it throughout the unit. **Show slide 6.** *Evidence* is what we find out or understand that helps us know something. Hearing sound with our ears is evidence that something is making a sound. Scientists are like detectives, but instead of using evidence to solve crimes, they use it to figure out how the world works, like why we hear sound. **Show slide 7.** What evidence of sound can you find if I tap two pencils together? Let's see! **NOTE TO TEACHER:** *Tap two pencils together and ask students to look for evidence*		

Highlight key science ideas and focus question throughout.

Ask questions to elicit student ideas and predictions.

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			of sound. Alternatively, you could have pairs tap their pencils together during the Turn and Talk. **Turn and Talk:** Watch and listen carefully as I tap these pencils together. Look for evidence that the pencils are making a sound. Then turn and talk with an elbow partner about any evidence of sound you noticed. Be ready to share your ideas with the class. **Whole-class share-out:** So what evidence did you find that showed the pencils were making a sound? Start your answer with the words "Our evidence of sound is …." **NOTE TO TEACHER:** *Students may only be able to come up with evidence that they heard a sound.* What other evidence did you find that tells us the pencils were making a sound? In a moment, we'll look for other evidence that can tell us whether something is making a sound.	Our evidence of sound is that we could hear a clicking sound. Our evidence of sound is that we could see the pencils touching each other.	
5 min	**Setup for Activity** **Synopsis:** The teacher demonstrates how to use a	Make explicit links between science ideas and activities **before** the activity.	First, I'm going to try making a sound with a new soundmaker. See if you can find any evidence of sound.		

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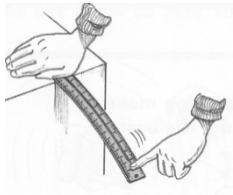
	ruler as a soundmaker and introduces the data table students will use during the activity to help them determine whether they can detect sound using their senses (hearing, seeing, and feeling). **Main science idea(s):** • We can use our senses to detect sound.	Select content representations and models matched to the learning goal and engage students in their use.	**NOTE TO TEACHER:** *Hold up a 12-inch plastic ruler so that everyone can see it. Then lay the ruler on a desk or table and extend it 6 or 7 inches beyond the edge of the surface. Hold the ruler firmly in place with one hand as shown in the image below. With the index finger of your other hand, press down on the opposite end of the ruler and then quickly let go. The ruler should make a vibrating sound.*  For today's activity, you'll pair up with a partner and try this ruler experiment yourselves. Then you'll record your evidence on a data table. I'm going to give you a handout now, and I want you to use your glue sticks to glue it into your notebooks. **NOTE TO TEACHER:** *Distribute handout 1.1 (Soundmakers, Part 1) and have students use their glue sticks to glue the handout into their science notebooks. Give students time to perform this task before orienting them to the handout.* **Show slide 8.**		

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			Let's look at the handout. On the left side of the page, you'll see a picture of a ruler and words that tell you what to do with the ruler to make a sound. Across the top row of the table are columns with words and pictures. The first column shows a sentence starter, "My evidence of sound is that …." The other three columns show pictures of an ear, an eye, and a hand, with words below them. In the blank space below each column, you'll write down the evidence of sound that you hear, see, and feel when you pluck your rulers. For example, if you *hear* something when you pluck the ruler, write or draw what you heard under the ear column. If you *see* something when the ruler is making a sound, write or draw what you saw under the eye column. And if you *feel* something when the ruler is making a sound, write or draw what you feel under the hand column. **ELL support:** Make sure ELL students understand what the words column and row are referring to. You may want to post these terms on the word wall for students to refer to as needed.		
10 min	**Activity** **Synopsis:** Students use a	Make explicit links	**Show slide 9.** Now I'd like you to pair up with an elbow		

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	ruler as a soundmaker and gather evidence with their senses that it's making a sound. **Main science idea(s):** • When an object makes a sound we can hear, we can sometimes see or feel the soundmaker moving back and forth quickly.	between science ideas and activities **during** the activity. Select content representations and models matched to the learning goal and engage students in their use.	partner and take turns making a sound with your ruler just like I did. Use your ears, eyes, and hands to see if you can find any evidence that the ruler is making a sound. Watch and listen carefully to what happens when you push down on the ruler and then let go. Talk with your partner about what you hear, see, and feel. Try to use all three of your senses to find evidence that tells you the ruler is making a sound. But don't write your evidence on your data tables now. We'll do that after our investigation. So are you ready to make some sounds? **NOTE TO TEACHER:** *Have students pair up with an elbow partner; then give each pair a ruler. Ask students to watch carefully as you demonstrate again how to make a sound with the ruler. Then direct pairs to set up their rulers, using the picture on the handout as a guide.* *Reinforce measurement skills by telling students to extend their rulers 6 inches beyond the edge of the table. Help them find the 6-inch mark on their rulers by giving them hints, such as "It's halfway on the ruler, or in the middle." Once students have set up their rulers, have them take turns making sounds.*		

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			During the activity, circulate around the room and provide support as needed. Encourage students to try to make different sounds by plucking the ruler in different places or adjusting the length of the ruler from the edge of the table (using a shorter or longer extension). Ask them what evidence they're finding that the ruler is making a sound and what senses they're using. Ask them how they might draw what they hear, see, or feel. Encourage them to talk about their observations with their partners. **Pairs work time.** **Whole class:** OK, everyone, I'd like you to put your rulers down and find your handouts. Think about the evidence you found that the ruler was making a sound. What did you hear, see, and feel? Then write and draw your evidence on your handouts for each column. Let's complete the first column together. **NOTE TO TEACHER:** *Project a copy of the handout on a document reader and work through the first column together.* What evidence of sound did you hear with your ears? How would you describe what you heard?	The ruler went *buzz*.	

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			Why do you think this is evidence that the ruler was making a sound? What could you write or draw on your handout to record this evidence of sound? Where should you record this evidence? OK, under the picture of the ear, I'd like everyone to write or draw the evidence of sound that you heard. **Individual work time.** **Pairs:** Now I'd like you and your partner to finish the handout together. First, talk about any other evidence of sound you *heard* and write or draw it on your handouts under the ear. Then talk about the evidence of sound you *saw* and write or draw it on your handouts under the eye. Finally, talk about the evidence of sound you *felt* and write or draw it under the hand. Each of you should complete your own handout. **NOTE TO TEACHER:** *Give pairs several minutes to complete the handout.*	I think it's evidence because I could hear the sound with my ears. I could write the word *buzz*. Under the picture of the ear on the handout.	
10 min	**Follow-Up to Activity**		**Show slide 10.**		

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	Synopsis: Students share their evidence from the ruler investigation; then the teacher introduces the word *vibrate.* **Main science idea(s):** • An object or some other kind of material must vibrate to make a sound we can hear. *Vibrate* means "to move back and forth quickly." • We know that an object is making a sound if we hear it. Seeing or feeling vibrations are also evidence that an object is making a sound.	Make explicit links between science ideas and activities **after** the activity. Engage students in analyzing and interpreting data and observations. Engage students in communicating in scientific ways.	What evidence did you find to show that your rulers made a sound? When you share your evidence, use the sentence starter "My evidence of sound is that …." **NOTE TO TEACHER:** *Project a copy of the handout on a document reader and fill in the table as students share their evidence.* What evidence did we already record on the handout in the ear column? What did you write or draw on your handouts? Did you record any other evidence of sound that you heard? Now let's talk about the evidence you saw. What did you write or draw in the eye column? Remember to use the sentence starter "My evidence of sound is that …."	My evidence of sound is that I heard the ruler buzz. My evidence of sound is that the ruler sounded bouncy. It went *boing-boing*! My evidence of sound is that I saw the ruler wiggling. I saw the ruler	Tell us more about the "bouncy" sound you heard. Can you show me how the ruler was wiggling?

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			What evidence of sound did record in the hand column? What did you feel that told you the ruler was making a sound? **NOTE TO TEACHER:** *If some students didn't find any evidence of sound from feeling the ruler vibrate, have a student who recorded that evidence come up and demonstrate the activity.* Let's look at the evidence we recorded on our data table. How many different kinds of evidence did we find to show that the rulers were making sound? What kinds of evidence did we find? **ELL support:** For additional ELL support, consider using a role-play in which students act out what they think happens when the ruler is plucked. Have students perform the role-play in groups of three, with one student as the ruler, one student as the hand (plucking gently), and one student acting out the vibrations. To give students a deeper, more active understanding of the science ideas, they could take turns playing different roles.	moving up and down. My evidence of sound is that the ruler felt funny. It felt buzzy when it moved while I was holding it against the table. Three! We could hear the ruler make a buzzing sound. We could see the ruler moving up and down a lot. We could feel the ruler bouncing under our hands.	What do you mean by "the ruler felt funny"? Tell me more about the ruler feeling "buzzy."

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		Highlight key science ideas and focus question throughout.	**Show slide 11.** Scientists use the word *vibrate* to describe objects that back and forth quickly like our rulers. Objects vibrate when they make sounds. Can you say that word with me? *Vibrate*. **NOTE TO TEACHER:** *Write the word* vibrate *on the board or the word wall so that students can see it throughout the unit.* We'll talk more about objects vibrating in other lessons this week.		
6 min	**Synthesize/Summarize Today's Lesson** **Synopsis:** Students work in pairs to answer the focus question; then they share their ideas and evidence in a class discussion. **Main science idea(s):** • An object or some other kind of material must vibrate to make a sound we can detect with our senses. *Vibrate* means "to move back and forth quickly." • We know that an object is making a sound if we	Highlight key science ideas and focus question throughout. Engage students in making connections by synthesizing and summarizing key science ideas. Engage students in constructing explanations and arguments.	**Show slide 12.** Today's focus question is *How can we tell if something is making a sound?* Look at your handouts and the kinds of evidence you found that helped you know the ruler was making a sound. How can this evidence help us answer our focus question? **Turn and Talk (3 min):** Share one kind of evidence with an elbow partner that would help you know whether an object is making a sound. Make sure each of you shares a different kind of evidence. Use the sentence starter on the slide when you share your ideas:		

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	hear it. Seeing or feeling vibrations are also evidence that an object is making a sound.	Engage students in communicating in scientific ways.	*My evidence of sound is that _____.* **NOTE TO TEACHER:** *Give pairs a few minutes to share their evidence. As you circulate around the room, listen carefully to make sure students are using the word* vibrate*,* vibrating*, or* vibrations *in their answers and are correctly describing their evidence as hearing the sound or seeing or feeling vibrations when an object makes a sound.* **Whole-class share-out:** Now let's hear your ideas for answering our focus question, *How can we tell if something is making a sound?* **NOTE TO TEACHER:** *Have students sit in a circle for this discussion; then announce that you'll ask each pair of students to share the evidence that would tell them whether an object is making a sound. Go around the circle in a round-robin and have pairs share their evidence of sound. Summarize each response on chart paper and review these statements to wrap up the lesson.* At the beginning of our lesson, we talked about the sounds we hear every day. What were some of those sounds?	Alarm clocks. The school bell ringing. Kids yelling.	

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			What is one way you can tell that something or someone around you is making a sound? Start your sentence with the words "My evidence of sound is that …." What is another way you can tell that something or someone around you is making a sound? What do you see or feel that is evidence of sound? **NOTE TO TEACHER:** *Challenge students to use the word* vibrate *in their responses (e.g., "Can you use the word* vibrate *in your sentence?").*	My evidence is that I can hear the sound when my friend yells. My evidence of sound is that I can see the alarm clock shaking or vibrating. My evidence of sound is that if I put my hand on the alarm clock to turn it off, I can feel it vibrate.	
1 min	**Link to Next Lesson** **Synopsis:** The teacher announces that in the next lesson, students will explore another kind of soundmaker and see if they can find more evidence of sound.	Link science ideas to other science ideas. Ask questions to elicit student ideas and predictions.	**Show slide 13.** Today we gathered evidence that objects like pencils and rulers make sounds. Next time, we'll explore another kind of soundmaker. Do you think we'll be able to hear, see, and feel evidence of sound for this soundmaker, too?	Maybe not.	Why do you think

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		Ask questions to probe student ideas and predictions.	**NOTE TO TEACHER:** *Elicit a variety of ideas during this discussion. Probe students' ideas, but don't challenge them at this point. In the next lesson, you'll have opportunities to challenge student thinking.*	Well, I didn't see anything move when the pencils tapped together.	that? Interesting evidence. We'll have to investigate that next time too.