Sound
Lesson 5a: Where Does Sound Go?

Grade 1	**Length of lesson:** 36 minutes	**Placement of lesson in unit:** 5a of 7 lessons on sound
Unit central question: Why do we hear sound?		**Lesson focus questions:** When something makes a sound, where does the sound go? What is our evidence?
Main learning goal: Sound moves in all directions away from the source.		
Science content storyline: When something makes a sound, the sound moves away from the soundmaker in all directions. The sound doesn't stop moving when we detect it.		
Ideal student response to the focus questions: When something makes a sound, the sound moves away from a soundmaker in all directions. The sound doesn't stop moving when a person hears it.		

Preparation

Materials Needed • Science notebooks • Chart paper and markers • Bell **Student Handouts** • 5.1 Which Way Will the Sound Move? (1 per student)	**Ahead of Time** • Review the Sound Content Background Document. • On chart paper, create a chart titled "Where Did the Sound Go?" Then draw a bell in the middle and stick figures representing students in a circle around the bell. • **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. Also orient students to the handout and how to complete it. Reinforce the concept that air plays an important role in our ability to hear sound. Review key vocabulary terms, as needed.

Lesson 5a General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
2 min	**Link to previous lessons:** To review what students have learned about sound, the teacher introduces a new soundmaker—a bell—and elicits ideas about what will happen if the bell makes a sound.	• For us to hear sound, it must move from a vibrating object to our ears. • When soundmakers vibrate, the air around them vibrates. These vibrations move through the air to our ears, and we hear sound.
1 min	**Lesson focus questions:** The teacher introduces the focus questions, *When something makes a sound, where does the sound go? What is our evidence?*	
8 min	**Setup for activity:** Students draw pictures to predict where they think sound will go when the bill rings.	• Sound begins at a soundmaker and travels away from it in all directions.
10 min	**Activity:** To test students' predictions, the teacher rings the bell in a large room; then students consider where the sound started and where it went.	
8 min	**Follow-up activity:** Students share their ideas about where sound goes and support their claims with evidence from the bell investigation.	
5 min	**Synthesize/summarize today's lesson:** Students pair up to answer the focus questions using what they learned from the bell investigation.	• Sound begins at a soundmaker and travels away from it in all directions. • We can draw vibrations in the air to show that sound moves away from a soundmaker in all directions.
2 min	**Link to next lesson:** The teacher summarizes key science ideas from today's lesson and announces that next time, students will collect more evidence about where sound goes.	

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2 min	**Link to Previous Lessons** **Synopsis:** To review what students have learned about sound, the teacher introduces a new soundmaker—a bell—and elicits ideas about what will happen if the bell makes a sound. **Main science idea(s):** • For us to hear sound, it must move from a vibrating object to our ears. • When soundmakers vibrate, the air around them vibrates. These vibrations move through the air to our ears, and we hear sound.	Ask questions to elicit student ideas and predictions. Ask questions to probe student ideas and predictions. Engage students in using and applying new science ideas in a variety of ways and contexts. Ask questions to challenge student	**Show slides 1 and 2.** Today we're going to use a new soundmaker to show how sound moves. Who can tell me what kind of soundmaker this is? **NOTE TO TEACHER:** *Hold up the bell so students can see it.* Based on what you already know about sound, what do you think will happen when I ring this bell? For this bell to make a sound, what has to happen first? What does a bell do when it makes a sound? When a bell rings, what happens in the space between the bell and our ears? How does the sound move from the bell to our ears? **NOTE TO TEACHERS:** *By now, students should accurately describe these science ideas. If they don't, challenge their*	It's a bell! It'll make a dinging sound! You have to ring it! It vibrates back and forth. The air vibrates. It moves through the air. The vibrations move through the air to	What moves through the air?

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		thinking.	*thinking and ask them to consider the evidence they collected in previous lessons.* When I ring the bell, do you think the sound will only go from the bell to my ears?	our ears. We know there is air between the bell and our ears. We saw the video of how vibrations in the air move from a soundmaker to our ears. The air vibrates and carries the vibrations to our ears. Yes, because the Slinky only went in one direction when it vibrated. No, because we all heard the sound of the tuning fork, and we were in different places around the circle.	Why do you think that? What evidence do you have?
1 min	**Lesson Focus Questions** **Synopsis:** The teacher	Set the purpose	**Show slide 3.** In today's lesson, we'll test your ideas		

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	introduces the focus questions, *When something makes a sound, where does the sound go? What is our evidence?*	with a focus question or goal statement.	about what will happen when I ring the bell. We'll also think about some new focus questions: *When something makes a sound, where does the sound go? What is our evidence?* Write these questions in your science notebooks and draw a box around them. **NOTE TO TEACHER:** *Write the focus questions on the board for students to refer to throughout the lesson.*		
8 min	**Setup for Activity** **Synopsis:** Students draw pictures to predict where they think sound will go when the bill rings. **Main science idea(s):** • Sound begins at a soundmaker and travels away from it in all directions.	Make explicit links between science ideas and	First, let's go over the handout we'll be using for our investigation. **NOTE TO TEACHER:** *Distribute handout 5.1 (Which Way Will the Sound Move?) and orient students to the activity.* **ELL support:** Orient ELL students to the handout in advance so they understand what the bell represents and what they're expected to do. Give them an opportunity to practice drawing their predictions on the handout. **Show slide 4.** This handout shows a picture of a bell that's similar to the one I showed you earlier. When I ring the bell, where do you		

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		activities **before** the activity. Ask questions to elicit student ideas and predictions. Select content representations and models matched to the learning goal and engage students in their use.	predict the sound will go? Use what you already know about sound to make a prediction on your handout about where you think the sound will go when the bell rings. First, sketch yourself across from the bell on your handout. Then draw a picture showing where you think the sound will move after the bell rings. You can use wavy or curvy lines, dots, or anything else you can think of to represent the sound vibrations. You may also add other things to your pictures if you want, such as people, chairs, desks, doors, and windows. Be prepared to share your drawings and predictions with the class. **NOTE TO TEACHER:** *Give students 2–3 minutes to draw their predictions on their handouts. It's likely that most students will draw sound moving only from the soundmaker to their own ears.* **Individual work time.** **Show slide 5.** **Whole-class share-out:** Who would like to share your prediction with us and explain your drawing? Where do you think the sound will go when the bell rings?		

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			First, who can tell me where the sound will start? Right! The sound will start at the bell. Now where did you predict the sound will go? **NOTE TO TEACHER:** *Record student predictions on chart paper for later reference. You may want to start the share-out with some simple predictions that show sound traveling in only one direction. Students usually depict this by showing sound going straight from the soundmaker to their ears.*	The sound will start at the bell. I think the sound vibrations will go straight to my ears. Because the sound from the tuning fork, came straight to my ears. The tuning fork made vibrations, and the air carried the vibrations to my ears. They'll probably go to your ears, too.	What makes you think that? How do you think the sound from the tuning fork traveled to your ears? Do you think the vibrations from the bell will go anywhere else in the room? Why do you think the sound will go to my

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			You've shared some interesting ideas. Next, we'll test your predictions and find out what happens when I ring the bell. But first, I need everyone to give me your drawings. **NOTE TO TEACHER:** *Collect all of the drawings to use during the activity. Then look for predictions that show the sound moving from the bell to the student's ear and stopping. You should find a number of drawings with this prediction. Hold up a few of these drawings for the class to see.* It looks like several of you predicted that the sound will go to your own ears. To test our predictions, we're going to move our investigation to a larger room. **NOTE TO TEACHER:** *Take students to the gym, the cafeteria, or another large space. Make sure that no other class or group is in the room. A long hallway will work if it's relatively quiet and you won't disturb other classes. Also make sure to bring the handouts with students' predictions. For this investigation, students will listen to the sound of the bell from different positions around a circle. The distance from the bell to each student should be approximately the same.*	Because you're closer to the bell.	ears, too?

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			ELL support: Make sure to preview this activity with ELL students so they understand what is expected of them and are equipped to participate more fully in the activity.		
10 min	**Activity** **Synopsis:** To test students' predictions, the teacher rings the bell in a large room; then students consider where the sound started and where it went. **Main science idea(s):** • Sound begins at a soundmaker and travels away from it in all directions.	Highlight key science ideas and focus question throughout. Make explicit links between science ideas and activities **during** the activity.	**NOTE TO TEACHER:** *In the larger room, have students sit on the floor in a wide circle around you. Make sure they're all approximately the same distance from the bell. Then walk them through the instructions for the investigation.* As we test our predictions, think about our focus questions for today: *When something makes a sound, where does the sound go? What is our evidence?* Now let's test *[X's]* prediction that shows sound starting at the bell and traveling to *[his/her]* ears. Like in the drawing, *[X]* is sitting on the floor away from me. When I ring the bell, I'll ask *[X]* if *[he/she]* can hear the sound. **NOTE TO TEACHER:** *Hold up the student's drawing for everyone to see. Then ring the bell and ask the student the following questions.* Did you hear the sound?	Yes.	

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			Did you predict this would happen?	Yes!	Why did you predict you would hear the sound?
			If anyone else heard the bell, raise your hand. **NOTE TO TEACHER:** *Most, if not all, students should indicate that they heard the bell.*		
		Engage students in analyzing and interpreting data and observations.	What do you think that means?	The sound didn't just go to *[X's]* ears.	
			Where did the sound go?	To my ears! To my ears, too!	How do you know?
				Because I could hear it clearly in my ears.	
			Do you think the sound of the bell went to every single person in the circle? Raise your hand again if you heard the bell. **NOTE TO TEACHER:** *Again, most or all students should raise their hands.* How could so many of you hear the same sound?		

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			What did most of us predict about where the sound would go?	Because it went to all those places. Most of us said it would only go to our own ears.	Was that what happened?
			So what do you think is happening in this direction when the bell rings? **NOTE TO TEACHER:** *Point toward one student.*	No. The sound went to everybody's ears. The bell vibrates and then makes the air over there vibrate too.	Is the air only vibrating in that one direction?
			And what do you think is happening in this direction when the bell rings? **NOTE TO TEACHER:** *Point in the opposite direction. You may want to have students cover their ears and think about how this affects their ability to hear the bell and why.*	No! The air is vibrating in that direction, too! Because everyone in that part of the room could hear the bell too!	What makes you think that?
			And what about in this direction? What happens there when the bell rings? **NOTE TO TEACHER:** *Point in another direction.*	The air vibrates over there, too.	And what happens to the vibrations?

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			So is the air vibrating in all of these different directions? Great job, everyone! Let's return to our classroom so we can talk more about where the sound went.	The air carries them to everyone's ears. Yes! Because if all of us can hear the bell in different directions, the air must be vibrating and carrying the vibrations to all of our ears.	Where to they go? How do we know?
8 min	**Follow-Up to Activity** **Synopsis:** Students share their ideas about where sound goes and support their claims with evidence from the bell investigation. **Main science idea(s):** • Sound begins at a soundmaker and travels away from it in all directions.	Engage students in analyzing and interpreting data and observations. Make explicit links between science ideas and activities **after** the activity.	**Show slide 6.** So did everyone hear the bell ring? Where did the sound start? Where did the sound go?	Yes! The sound started at the bell. It went everywhere in the room!	How do you know the sound went everywhere in the room? What's your evidence?

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				Because no matter where we were sitting, we heard the bell ring.	
			Show slide 7. Next, let's compare your predictions to what happened when the bell rang. **NOTE TO TEACHER:** *Display the chart ("Where Did the Sound Go?") that you made in advance, showing a bell in the middle and students in a circle around the bell.* We started with a bell and all of you sitting in a circle around it. Did everyone hear the bell?	Yes. I was in front of the bell. I was sitting behind the bell.	Where were you sitting when you heard the sound?
			So the sound of the bell reached each	The vibrations from the bell moved all over the room!	What does that tell you?

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			person's ears. **Show slide 8.** Now look at the predictions you drew. What's missing from your drawings? What would you change or add to make them better? Did you show all of your classmates in your drawings? What would you need to add to your drawings so they show where the sound of the bell actually went?	No. I only drew myself. I showed the vibrations going to my ears. No. I need to add other kids sitting in around the bell in a circle. I need to draw vibrations going from the bell to the	And where did you show the sound vibrations going? Did you show the vibrations going anywhere else? Do you need to add anything else?

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			OK, take a minute or two and make changes to your drawings to show what actually happened when the bell rang. **NOTE TO TEACHER:** *Give students 1–2 minutes to revise their drawings.*	other kids, too. Because the vibrations went to everyone's ears, not just mine.	Why do you need to add more vibrations?
5 min	**Synthesize/Summarize Today's Lesson** **Synopsis:** Students pair up to answer the focus questions using what they learned from the bell investigation. **Main science idea(s):** • Sound begins at a soundmaker and travels away from it in all directions. • We can draw vibrations in the air to show that sound moves away from a soundmaker in all directions.	Highlight key science ideas and focus question throughout. Engage students in making connections by synthesizing and summarizing key science ideas.	**Show slide 9.** Today we've been thinking about the focus questions, *When something makes a sound, where does the sound go? What is our evidence?* **Turn and Talk:** Turn to an elbow partner and share your ideas for answering these questions based on what you learned today. Then write your answers in your science notebooks using the sentence starter on the slide: *When something makes a sound, the sound goes_____. My evidence is _____.* Be prepared to share your ideas and evidence with the class.		

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			NOTE TO TEACHER: *As pairs discuss their ideas, circulate around the room and listen to their conversations. Make sure students recognize that sound moves in all directions, not just to their own ears.* **Whole-group share-out:** Let's hear your ideas for answering today's focus questions. Make sure to include your evidence.	When something makes a sound, the sound goes to my ears. I want to add that the sound goes to *everyone's* ears. I want to add that the sound goes in all directions.	How do you know? What's your evidence? Does anyone agree or disagree? Do you have anything to add?
2 min	**Link to Next Lesson** **Synopsis:** The teacher summarizes key science ideas from today's lesson	Summarize key science ideas.	**Show slide 10.** So far we've learned that all soundmakers vibrate and cause the air around them to		

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	and announces that next time, students will collect more evidence about where sound goes.	Link science ideas to other science ideas.	vibrate. These vibrations move in waves through the air to our ears. Our eardrums send a message to our brains, and we hear sound. Today we learned that sound travels in all directions, not just from a soundmaker to one person's ears. We all heard the bell ring even though we were in different positions around the circle. **Show slide 11.** Now we have more ideas and evidence to help us answer our unit central question, *Why do we hear sound?* **Show slide 12.** Next time, we'll do some more testing to see where the sound goes when the bell rings and whether the sound stops moving when someone hears it.		