

Sound

Lesson 7b: My Soundmaker

Grade 1	Length of lesson: 35 minutes	Placement of lesson in unit: 7b of 7 lessons on sound
Unit central question: Why do we hear sound?		Lesson focus question: Why do we hear sound?
Main learning goal: Vibrating objects produce sound. Vibrations travel through air in all directions. Vibrating air can make our eardrums vibrate so we hear sound.		
Science content storyline: All soundmakers vibrate and make the air around them vibrate. These vibrations travel through the air to our ears and make our eardrums vibrate. Then our eardrums send a message to our brains that the vibrations are sound.		
Ideal student response to the focus question: We hear sound because soundmakers vibrate and make the air all around them vibrate. These vibrations travel through the air to our eardrums and make them vibrate too. Then our eardrums send a message to our brains that these vibrations are sound. I can show this by building my own soundmaker.		

Preparation

<p>Materials Needed</p> <ul style="list-style-type: none"> • Science notebooks • Chart paper and markers • Labeled plastic storage bags containing the materials students selected to build their own soundmakers. Each student selected two items from the following materials in the bin: <ul style="list-style-type: none"> • Small plastic containers • Rubber bands • String • Cups • Craft sticks • Ping-Pong balls • Rice grains • Balloons • Pie tins • Tape and other supplies students may need for assembling their soundmakers. 	<p>Ahead of Time</p> <ul style="list-style-type: none"> • Review 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. In particular, you may want to give students time to practice activities in the lesson that will require them to construct explanations in English.
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Lesson 7b General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
8 min	<p>Unit central question/lesson focus question and link to previous lesson: The teacher reviews the unit central question and focus question, <i>Why do we hear sound?</i> Then students draw and write about how they plan to build their own soundmakers using the materials they chose.</p>	<ul style="list-style-type: none"> • Soundmakers can be made from simple materials. To make a sound, these materials must vibrate in some way.
7 min	<p>Setup for activity: The teacher reviews the guidelines students will use to build and explain their own soundmakers with the materials they selected in the previous lesson.</p>	
10 min	<p>Activity: Students build a simple soundmaker using the materials they selected in the previous lesson. Then they describe to a partner how their soundmakers work and use them to explain how they can hear the sound.</p>	<ul style="list-style-type: none"> • All soundmakers vibrate and cause the air around them to vibrate. These vibrations travel through the air to our ears and make our eardrums vibrate. Then our eardrums send a message to the brain that the vibrations are sound.
10 min	<p>Follow-up to activity and synthesize/summarize today's lesson: Using their soundmakers, students create sound stories to explain how they hear sound. Then they practice sharing their sound stories with a partner before sharing them at home.</p>	

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8 min	<p>Unit Central Question/Lesson Focus Question and Link to Previous Lesson</p> <p>Synopsis: The teacher reviews the unit central question and focus question, <i>Why do we hear sound?</i> Then students draw and write about how they plan to build their own soundmakers using the materials they chose.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> • Soundmakers can be made from simple materials. To make a sound, these materials must vibrate in some way. 	Summarize key science ideas.	<p>Show slides 1 and 2.</p> <p>Last time, we used all the ideas we’ve learned about in this unit to answer the central question, <i>Why do we hear sound?</i></p> <p>How did we answer this question? Who can tell me in a few complete sentences why we hear sound?</p> <p>Show slide 3.</p> <p>Very good! Let’s review the key ideas that answer our unit central question.</p> <p>NOTE TO TEACHER: <i>Briefly highlight the key science ideas on the slide that answer the unit central question.</i></p> <p>Show slide 4.</p> <p>In our last lesson, you chose two kinds of materials you could use to build your own</p>	We hear sound because the vibrations from the bell travel through the air to our ears and make our eardrums vibrate. Then our eardrums tell our brains that the vibrations are sound.	

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			<p>soundmakers.</p> <p>Today you'll build your soundmakers with these materials and then use them to explain how we hear sound.</p> <p>When scientists and engineers design something, they often draw a picture and write down their plan for making their design work.</p> <p>That's what I'd like you to do now.</p> <p>Show slide 5.</p> <p>Turn to a new page in your notebooks and draw a picture of your soundmaker. Make sure to show how you'll use the materials you chose. Then write a sentence describing how your soundmaker will make a sound.</p> <p>Be ready to share your drawings and descriptions with the class.</p> <p>NOTE TO TEACHER: <i>Give students a few minutes to draw their pictures and write their descriptions.</i></p> <p>Individual work time.</p> <p>Whole-class share-out: Who would like to share your drawing and description of your soundmaker? First, tell us which materials you chose for building your soundmaker and</p>		

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		<p>Ask questions to elicit student ideas and predictions.</p> <p>Ask questions to probe student ideas and predictions.</p> <p>Ask questions to challenge student thinking.</p>	<p>then share your drawing and description.</p> <p>NOTE TO TEACHERS: <i>If anyone didn't have a chance to share their design plans in the last lesson, give them an opportunity to share first. Invite as many students as possible to share their drawings and descriptions in the allotted time.</i></p> <p><i>During this share-out, ask elicit, probe, and challenge questions to clarify student thinking and correct any misconceptions. At this stage, it's important to challenge student ideas that are scientifically inaccurate.</i></p> <p>ELL support: During the lesson preview, give ELL students time to practice drawing their soundmakers, writing their descriptions, and verbally explaining how their soundmakers work. This will equip them to participate more fully during the lesson.</p>	<p>I chose a plastic container and a rubber band for my soundmaker.</p> <p>I'm going to stretch the rubber band across the container and then pluck the rubber band like a guitar.</p> <p>The rubber band.</p> <p>I'm going to pluck the rubber band really hard and make a loud sound that will make my eardrums vibrate.</p> <p>When the rubber</p>	<p>Can you explain your drawing to us and then share your description? How does your soundmaker work?</p> <p>What will vibrate in your soundmaker?</p> <p>And how will that make a sound that will reach your eardrums?</p> <p>How will the loud sound travel to your eardrums and make them vibrate?</p>

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				<p>band vibrates, that will make the air vibrate. Those vibrations will travel through the air to my eardrums and make them vibrate too.</p> <p>A message that there is a loud sound!</p>	<p>So what message will your eardrums send to your brain?</p>
5 min	<p>Setup for Activity</p> <p>Synopsis: The teacher reviews the guidelines students will use to build and explain their own soundmakers with the materials they selected in the previous lesson.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> • Soundmakers can be made from simple materials. To make a sound, these materials must vibrate in some way. 	<p>Make explicit links between science ideas and activities before the activity.</p>	<p>Show slide 6.</p> <p>Today you're going to pull together all of the ideas we've been learning about in this unit to build the soundmakers you designed.</p> <p>Then you'll practice explaining to a partner how your soundmaker works and how we hear sound so you can explain this to your family at home. Remember, your family members might not know the things you know about sound, so you'll need to be a good teacher and be very clear!</p> <p>In our last lesson, each of you chose two objects to use for building your soundmaker. Now it's time to collect your materials and start building your soundmakers.</p>		

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			<p>NOTE TO TEACHER: <i>Call students to the front and give each student the labeled plastic storage bag containing the materials she or he selected.</i></p>		
10 min	<p>Activity</p> <p>Synopsis: Students build a simple soundmaker using the materials they selected in the previous lesson. Then they describe to a partner how their soundmakers work and use them to explain how they can hear the sound.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> All soundmakers vibrate and cause the air around them to vibrate. These vibrations travel through the air to our ears and make our eardrums vibrate. Then our eardrums send a message to the brain that the vibrations are sound. 	<p>Select content representations and models matched to the learning goal and engage students in their use.</p> <p>Engage students in using and applying new science ideas in a variety of ways and contexts.</p>	<p>Show slide 7.</p> <p>As you build your soundmakers, think about how you might explain them to someone else.</p> <p>What would you tell someone about how your soundmaker works?</p> <p>What would you say about how you can hear the sound it makes?</p> <p>While you're working, I'll walk around the room. So if you need some help, just raise your hand, and I'll come to you.</p> <p>Before we begin, let's make sure everyone has what you need to build your soundmakers. I'll put a box of supplies on your table in case you need tape.</p> <p>NOTE TO TEACHER: <i>Set a timer for 8 minutes and have students start working on their soundmakers. At about 6 minutes, give students a signal to finish building their soundmakers in the remaining time. As students build their designs, monitor their work so they don't try to build anything too complicated.</i></p>		

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		<p>Make explicit links between science ideas and activities during the activity.</p> <p>Ask questions to elicit student ideas and predictions.</p> <p>Ask questions to probe student ideas and predictions.</p> <p>Ask questions to challenge student thinking.</p>	<p>Individual work time.</p> <p>Pairs: Now that you've finished building your soundmakers, I'd like you to pair up with an elbow partner and take turns explaining how your soundmaker works.</p> <p>NOTE TO TEACHER: <i>During this sharing time, circulate from pair to pair and ask students the following questions:</i></p> <p>What is vibrating when you make a sound with your soundmaker?</p> <p>What is happening to the air around your soundmaker?</p> <p>What causes the air to vibrate?</p> <p>How do our ears help us hear sound?</p>	<p>When my soundmaker vibrates, it makes the air around it vibrate.</p> <p>Our ears have eardrums, and when they vibrate, we hear sound.</p>	<p>How do you know there is air out here? What is your evidence?</p> <p>What causes our eardrums to vibrate?</p>

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				<p>Vibrations in the air make our eardrums vibrate.</p> <p>When my soundmaker makes a sound, it vibrates and makes the air around it vibrate. Then the vibrations travel through the air to my ears and make my eardrums vibrate.</p> <p>Our eardrums send a message to our brains that the vibrations are sound.</p>	<p>Why do your eardrums vibrate when your soundmaker makes a sound?</p> <p>How does the eardrum help us hear sound?</p>
10 min	<p>Follow-Up to Activity and Synthesize/Summarize Today's Lesson</p> <p>Synopsis: Using their soundmakers, students create sound stories to</p>	<p>Make explicit links between science ideas and activities after the activity.</p>	<p>Show slide 8.</p> <p>Now it's time for the most important part of our challenge: explaining how we hear sound.</p> <p>First, you'll work on your own to create a sound story about your soundmaker that explains how it works and how you can hear</p>		

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	<p>explain how they hear sound. Then they practice sharing their sound stories with a partner before sharing them at home.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> All soundmakers vibrate and cause the air around them to vibrate. These vibrations travel through the air to our ears and make our eardrums vibrate. Then our eardrums send a message to the brain that the vibrations are sound. 	<p>Engage students in constructing explanations and arguments.</p> <p>Ask questions to elicit student ideas and predictions.</p> <p>Ask questions to probe student ideas and predictions.</p> <p>Ask questions to challenge student thinking.</p> <p>Engage students in constructing explanations and arguments.</p>	<p>the sound it makes.</p> <p>Write your stories in your science notebooks using complete sentences and the words on the slide. You can also draw pictures to illustrate your story.</p> <p>Individual work time.</p> <p>NOTE TO TEACHER: <i>Circulate around the room while students are working on their sound stories. Ask elicit, probe, and challenge questions to clarify and challenge their thinking.</i></p> <p>ELL support: During the lesson preview, give ELL students time to practice writing their sound stories, drawing pictures of their soundmakers, and verbally explaining how they hear sound. This will equip them to participate more fully during the lesson. If possible, have students work in pairs to plan and practice their sound stories.</p> <p>Show slide 9.</p> <p>Pairs: Now I'd like you to share your sound stories with an elbow partner. This will give you a chance to practice your explanations before you share them with your families.</p> <p>Take turns sharing your sound stories. If you're the one sharing, use the words on the</p>		

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		<p>Ask questions to probe student ideas and predictions.</p> <p>Ask questions to challenge student thinking.</p>	<p>slide to tell your sound story. Explain to your partner how your soundmaker works and how you're able to hear the sound.</p> <p>If you're the one listening, pay careful attention to what your partner is saying and be ready to ask questions.</p> <p>As I walk around the room, I may ask questions about your explanations too.</p> <p>NOTE TO TEACHER: <i>Make sure that students explain their ideas about sound accurately. If they don't, clarify and challenge their thinking.</i></p> <p>Show slide 10.</p> <p>When you get home today, tell your sound story to a family member or friend. Explain how your soundmaker works and how you can hear the sound it makes. Try to use the words on the slide in your explanations.</p>	<p><i>A sound story might go like this:</i></p> <p>I made a soundmaker with [names of objects]. The soundmaker vibrated when it made a sound. Then the air all around it vibrated, and the vibrations went to my eardrums. Then my eardrums vibrated and sent a message to my brain, and I heard the sound.</p>	<p><i>Questions to ask as students share their sound stories:</i></p> <ul style="list-style-type: none"> • What's your evidence for this part of your story? • Tell me how you know that. • Why does that happen?