

Unit 4: Sound and Light

WEEK 7 Lesson 1

**Science and Engineering**  
Using the Engineering Design Process

<b>Big Ideas</b>	Vibrating materials make sound. Sound makes materials vibrate. Materials interact with light in different ways. Light and sound travel. Humans and other animals communicate with light and sound. People innovate and invent to solve problems.
<b>S &amp; E Guiding Question</b>	What is the Engineering Design Process?
<b>Content Objective</b>	I can use the engineering design process to design technology that uses light or sound to send a message over a distance. (Practice 3, 1.K-2-ETS1-1, 1.K-2-ETS1-2)
<b>Language Objective</b>	I can ask and answer questions about my design to gather additional information or clarify something that I do not understand. (SL.2.1.b)
<b>Vocabulary</b>	<b>design:</b> to plan something for a specific purpose <b>engineer:</b> someone who designs and builds engines, machines, or structures <b>technology:</b> any thing, system, or process that people create to make things easier or to solve a problem
<b>Materials and Preparation</b>	For information about the Engineering Design Process and to prepare for this and upcoming lessons, review the <a href="https://www.eie.org/why-eie">EiE website</a> . ( <a href="https://www.eie.org/why-eie">https://www.eie.org/why-eie</a> ). A free poster of the Engineering Design Process graphic can be downloaded here. <ul style="list-style-type: none"><li>● Engineering Design Process slides</li><li>● Engineering Design Process cards</li><li>● chart paper and marker</li><li>● Science and Engineering journals</li><li>● children’s work in progress</li></ul>

	<p>On the whiteboard, write the following questions.          For my Look and Listen! project, I have already _____.          I am in the _____ part of the engineering design process.          Some challenges with my project are: _____.          The next thing I need to do for my project is _____.</p>
<p><b>Opening</b> 4 minutes</p>	<p><i>Last week, we started talking about engineering and technology.          What is technology?</i>          Harvest, affirm, and clarify children’s responses.</p> <p><i>What does an engineer do?</i>          Harvest, affirm, and clarify children’s responses.</p> <p><i>Last week, we started talking about the Look and Listen! project. For the next few weeks, you will work as engineers to develop or improve tools for sending a message using sound and light. We will learn about how inventors, innovators, and engineers design technology. For this project, we will be following the Engineering Design Process. This process will help us organize our project.</i></p>
<p><b>Investigation</b> 10 minutes</p>	<p>Show and read the slides one at a time to walk through the Engineering Design Process. Simultaneously, create a class chart using the Engineering Design Process cards and marker, leaving the center blank.</p> <div> <p>The diagram is titled "Engineering Design Process" and shows a circular flow of five steps around a central goal. The steps are: Ask (represented by a red question mark), Imagine (represented by a brain icon), Plan (represented by a notepad and pencil icon), Create (represented by a wrench and gear icon), and Improve (represented by a person climbing stairs icon). The central text reads "The Goal".</p> </div> <p>Pause on slide 2.  <i>Let’s think about our “Look and Listen!” project. What is the problem we are trying to solve?</i>          In the center of the chart write Goal: to create a tool for children in K1 to send a message using sound or light.</p>

	<p><i>What are some ways other people have solved this problem? What tools do people use to send messages using sound or light?</i></p> <p>Harvest several responses.</p> <p>Continue showing and reading the slides. Stop on slide 8.  <i>Turn and talk to your partner. Where is your Look and Listen! project in the engineering design process? Are you at Ask? Imagine? Plan? Create?</i></p> <p>Refer to the questions on the board to support conversation, and encourage children to take turns talking and to ask each other questions.</p>
<p><b>Journal Writing</b> 12 minutes</p>	<p>Distribute children’s science and engineering journals and writing tools.  <i>Spend a few minutes writing and drawing to describe where you are in the engineering design process right now. If you have ideas about what you will do next or how you can improve your design, include that in your writing.</i></p>
<p><b>Closing</b> 1 minute</p>	<p>Invite a few children to share their conversations and journal entries.</p>
<p><b>Standards and Practices</b></p>	<p><b>1.K-2-ETS1-1.</b> Ask questions, make observations, and gather information about a situation people want to change that can be solved by developing or improving an object or tool.*</p> <p><b>1.K-2-ETS1-2.</b> Generate multiple solutions to a design problem and make a drawing (plan) to represent one or more of the solutions.*</p> <p><b>Practice 3.</b> Planning and carrying out investigations</p>
<p><b>Ongoing assessment</b></p>	<p>Listen in on children’s conversations and review their journals.</p> <p>What are they planning?  How are they thinking about next steps?  What feedback do they offer each other?</p>

**Notes**

