

Quinton Township School  
First Grade  
Science - Unit 4

**Grade 1 Science Unit 4: Light and Sound**

**Key: Careers Technology Interdisciplinary Studies**

**Unit Summary - Marking Period 4 10 Days**

In this unit of study, students develop an understanding of the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. The idea that light travels from place to place can be understood by students at this level by placing objects made with different materials in the path of a beam of light and determining the effect of the different materials. The crosscutting concept of *cause and effect* is called out as an organizing concept for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in *planning and carrying out investigations*, *constructing explanations*, and *designing solutions*. Students are also expected to use these practices to demonstrate understanding of the core ideas.

**Student Learning Objectives**

Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. (1-PS4-1)

Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. (1-PS4-4)

**Objectives Aligned with National Geographic Resources: Approximate Time Frame: 10 days**

Day 1

- Explain that vibrating matter can make sound.

Day 2-3

- Demonstrate that vibrating matter can make sound.

Days 4-5

- Work with a partner to plan and conduct an investigation to provide evidence that vibrating materials make sound.
- Use evidence from their investigation to explain results to others.

Day 6

- Explain that sound can make matter vibrate.

Days 7-8

- Demonstrate that sound can make matter vibrate.

Days 9-10

- Work with a partner to plan and conduct an investigation to provide evidence that vibrating materials make sound.
- Use evidence from their investigation to explain results to

others.

**Unit Sequence:**

<i>Part A: How is sound made?</i>	
Concepts	Formative Assessments

<p>· People depend on various technologies in their lives.</p> <p>· Human life would be very different without technology.</p>	<p><i>Students who understand the concepts can:</i></p> <ul style="list-style-type: none"><li>● Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. [Clarification Statement: Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork.]</li><li>● Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* [Clarification Statement: Examples of devices could include a light source to send signals, paper cup and string “telephones,” and a pattern of drum beats.] [Assessment Boundary: Assessment does not include technological details for how communication devices work.]</li></ul> <ul style="list-style-type: none"><li>● Exit Tickets</li><li>● Journal Responses</li><li>● End of Unit Assessment</li></ul>
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**Common Core State Standards/Learning Targets:** 1-PS4-2, 1-PS4-3, and 1-PS4-1, W.1.2, W.1.7, W.1.8, SL.1.1, MP.5, 1-MD.A.1, 1-MD.A.2, 8.1, 8.2

## Modifications

*(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: All Standards, All Students/Case Studies for vignettes and explanations of the modifications.)*

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals ([http://www.cast.org/our-work/about-udl.html#VXmoXcfD\\_UA](http://www.cast.org/our-work/about-udl.html#VXmoXcfD_UA)).

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p data-bbox="281 285 600 347"><b>Planning and Carrying Out Investigations</b></p> <p data-bbox="218 358 659 776">Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3)</p> <p data-bbox="256 821 625 883"><b>Constructing Explanations and Designing Solutions</b></p> <p data-bbox="218 894 659 1385">Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1- PS4-2) Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)</p>	<p data-bbox="705 297 1283 394"><b>PS4.A:</b> Wave Properties Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1)</p> <p data-bbox="705 407 1308 829"><b>PS4.B:</b> Electromagnetic Radiation Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2) Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1- PS4-3)</p> <p data-bbox="705 837 1234 971"><b>PS4.C:</b> Information Technologies and Instrumentation People also use a variety of devices to communicate (send and receive information) over long distances. (1- PS4-4)</p>	<p data-bbox="1482 233 1751 261"><b>Crosscutting Concepts</b></p> <p data-bbox="1356 297 1556 321"><b>Cause and Effect</b></p> <p data-bbox="1335 358 1850 464">Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1),(1-PS4-2),(1-PS4-3)</p> <hr data-bbox="1335 488 1780 496"/> <p data-bbox="1346 537 1885 605"><b>Connections to Engineering, Technology, and Applications of Science</b></p> <p data-bbox="1335 643 1839 708"><b>Influence of Engineering, Technology, and Science, on Society and the Natural World</b></p> <ul data-bbox="1381 740 1892 849" style="list-style-type: none"> <li>● People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)</li> </ul>

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**Connections to Nature of Science**

**Scientific Investigations Use a Variety of Methods**

- Science investigations begin with a question. (1-PS4-1)
- Scientists use different ways to study the world. (1-PS4-1)