Unit 5- Communicating with Light and Sound

Content Area: **Science**
Course(s): **Science 1**
Time Period: **May**
Length: **25 Days**
Status: **Published**

Unit Summary

Students continue to develop their understanding of the relationship between sound and vibrating materials as well as between the availability of light and the ability to see objects. Students apply their knowledge of light and sound to engage in engineering design to solve a simple problem involving communication with light and sound. The crosscutting concepts of structure and functionand influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for the disciplinary core ideas. Students are expected to demonstrate grade-appropriate proficiency in constructing explanations anddesigning solutions, asking questions and defining problems, and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Standards

CCSS.Math.Practice.MP5	Use appropriate tools strategically.
MA.1.MD.A.1	Order three objects by length; compare the lengths of two objects indirectly by using a third object.
MA.1.MD.A.2	Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.
LA.W.1.2	Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
LA.W.1.7	Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions).
LA.W.1.8	With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.
LA.SL.1.1	Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.
LA.SL.1.1.A	Follow agreed-upon norms for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
LA.SL.1.1.B	Build on others’ talk in conversations by responding to the comments of others through multiple exchanges.
LA.SL.1.1.C	Ask questions to clear up any confusion about the topics and texts under discussion.
LA.SL.1.2	Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
LA.SL.1.3	Ask and answer questions about what a speaker says in order to gather additional information or clarify something that is not understood.
LA.SL.1.5	Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
SCI.1.1-PS4-4	Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.

SCI.1.1-PS4-3	Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.
SCI.1.1-PS4-2	Make observations to construct an evidence-based account that objects can be seen only when illuminated.
SCI.1.1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
TECH.8.1.2.A.CS1	Understand and use technology systems.

Student Learning Objectives

Students will learn to...

- Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
- Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
- Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

Essential Questions

- How can light or sound be used to communicate over a distance?

Enduring Understandings

Students will understand that...

- Sound can make matter vibrate, and vibrating matter can make sound.
- Objects can be seen if light is available to illuminate them or if they give off their own light.
- 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.
- People also use a variety of devices to communicate (send and receive information) over long distances.

Application

Students will be able to independently use their learning to…

- design simple tests to gather evidence to support or refute student ideas about causes.
- depend on various technologies in their lives; human life would be very different without technology.

Skills

Students will be skilled at...

- planning and carrying out investigations to answer questions or test solutions to problems building on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
- planning and conducting investigations collaboratively to produce data to serve as the basis for evidence to answer a question.
- constructing explanations and designing solutions building on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.
- making observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
- using tools and materials provided to design a device that solves a specific problem.
- beginning science investigations with a question.
- using different ways to study the world.