Unit 3: Sound and Light

Content Area: **Science**
Course(s):
Time Period: **Full Year**
Length: **Full Year**
Status: **Published**

Unit Overview

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

Enduring Understandings

When something vibrates it can make sounds and things move back and forth quickly.
Objects can be seen in the dark when it gives off its own light.
Shadows are the dark spots made when something blocks light.
We can solve a problem by drawing a picture or making a model

Essential Questions

How do they make silly sounds in cartoons?
Where do sounds come from?
What if there were no windows?
Can you see in the dark?
How could you see a secret message from someone far away?
How do boats find their way in the fog?

Learning Objectives

Design simple tests to gather evidence to support or refute ideas about cause and effect relationships.
Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
Make observations (e.g., in a completely dark room, using a pinhole box, using video of a cave explorer with a flashlight) to construct an evidence based account that objects can be seen only when illuminated (from an external light source or by an object giving off its own light).
Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question.
Plan and conduct an investigation to determine the effect of placing objects made with different materials in

the path of a beam of light. Materials can be: − Transparent (clear plastic, glass) − Translucent (wax paper, thin cloth) − Opaque (cardboard, construction paper) • Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
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.
Ask questions based on observations to find more information about the natural and/or designed world.
Define a simple problem that can be solved through the development of a new or improved object or tool.
Ask questions, make observations, and gather information about a situation people want to change improved object or tool. • Develop a simple model based on evidence to represent a proposed 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. • Use tools and materials provided to design a device that solves a specific problem. • Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance. • Examples of devices could include: A light source to send signals Paper cup and string telephones A pattern of drum beats.

Standards: Content

K-2-ETS1-1	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.
1-PS4-1	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.
1-PS4-2	Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.
K-2-ETS1-2	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.
1-PS4-3	Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.
K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
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.

Standards: Interdisciplinary

RI.CR.1.1	Ask and answer questions about key details in an informational text (e.g., who, what, where, when, why, how).
RI.CI.1.2	Determine main topic and retell a series of key details in informational texts (e.g., who, what, where, when, why, how).
RI.IT.1.3	Describe relationships among pieces of information (e.g., sequence of events, steps in a process, cause-effect and compare-contrast relationships) within a text.
RI.TS.1.4	With prompting and support, explain major differences between books that tell stories and books that give information, identifying various text features (e.g., headings, tables of contents, glossaries, electronic menus, icons) to locate key facts or information in a text while drawing on a wide reading of a range of text types.

RI.PP.1.5	Distinguish between information provided by pictures or other illustrations and information provided by the words in a text.
RI.MF.1.6	With prompting and support, use text features (e.g., diagrams, tables, animations) to describe key ideas.
RI.CT.1.8	Identify similarities in and differences between two informational texts on the same topic (e.g., characters, experiences, illustrations, descriptions, or procedures).
W.IW.1.2.A	Introduce a topic.
W.IW.1.2.B	Develop the topic with facts or other information and examples related to the topic.
W.IW.1.2.C	Provide a conclusion.

Assessment Evidence

Formative	Teacher observations, Class discussions, Lab Activities, Key concepts and vocabulary quizzes, Science Starter's/Do Nows, Open Ended Responses, Modeling, Simulations, Innovators Monthly Research, Lab Activities, Vocabulary Responses, Exit Questions, Interactive Digital Assessments embedded in Exploring Science Digital Book
Summative	Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. Make observations to construct an evidence-based account that objects can be seen only when illuminated. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light Other summative assessments will include but are not limited to: projects, summative tests, lab skills demonstrations, and vocabulary quizzes.
Alternative & Benchmark	Alternative - Read to the student and chart oral responses. Word banks, sentence frames, oral responses, graphic organizers, observations, portfolios of student work, orally administered assessments, and anecdotal notes. Benchmark – LinkIt Benchmark Assessment, Teacher Generated Assessments
Assessment Evidence Resource	

Instructional Resources

Smartboard, Computers, Websites and digital interactives/models, Multi-media presentations, Video Streaming, Brain Pop, Middle School Science, Generation Genius Digital Curriculum, Mystery Science Digital Curriculum, Amplify Digital Curriculum, Microsoft 365, Primary and Secondary Source Documents, Assorted lab materials.

Instructional Resource List

Curricular Mandates

Below are the curricular requirements as defined in NJ Administrative Code and Statute

	Amistad		Diversity, Equity, and Inclusion
	Holocaust		LGBT and Disabilities (Grades 6-12)
	Climate Change		Asian American & Pacific Islander

Social Emotional Learning (SEL) Competencies

NJ Social and Emotional Learning Competencies & Sub-Competencies

X	Self-Awareness		Relationship Skills
X	Responsible Decision-Making	X	Social Awareness
	Self-Management		

21st Century Skills & Themes

	Global and Cultural Awareness		Technology Literacy		Planning and Budgeting
	Creativity and Innovation		Financial Institutions		Risk Management and Insurance
	Information and Media Literacy		Digital Citizenship		Economic and Government Influences
	Critical Thinking and Problem Solving		Credit Profile		Career Awareness and Planning
	Civic Financial Responsibility		Financial Psychology		