# 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

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| SCI.1-PS4-1 | Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. |
| SCI.K-2-ETS1-1 | Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool. |
| SCI.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. |
| SCI.1-PS4-2 | Make observations to construct an evidence-based account that objects can be seen only when illuminated. |
| SCI.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-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

## Assessment Evidence

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| 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. |

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|---|---|
| | Make observations to construct an evidence-based account that objects can be seen only when illuminated.<br>Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.<br>Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light<br>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.<br>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*

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| | 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*

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

## 21st Century Skills & Themes

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| | 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 | | |