

Grade 1 - Unit 3 - Sound and Light

Unit Focus

Students will engage in several inquiry-based lessons that allow them to explore the properties of light and sound. Students will investigate how light can move and travel and how vibrations and sound are related. Students will apply their understanding of sound and light to explore how people and animals use sound and light to communicate. To conclude this unit, students will use their content knowledge and the Engineering Design Process to design and build a device that uses sound to communicate over a distance.

Stage 1: Desired Results - Key Understandings

Established Goals

Next Generation Science

Elementary Standards: 1

- Make observations to construct an evidence-based account that objects can be seen only when illuminated. *1-PS4-2*
- Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. *1-PS4-3*
- 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*

Next Generation Science Standards (DCI)

Science: 1

- Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. *ETS1.1.B1*
- Objects can be seen if light is available to illuminate them or if they give off their own light. *PS4.1.B1*
- People also use a variety of devices to communicate (send and receive information) over long distances. *PS4.1.C1*
- 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. *PS4.1.B2*
- Sound can make matter vibrate, and vibrating matter can make sound. *PS4.1.A1*

Student Growth and Development 21st Century Capacities Matrix

Creative Thinking

- Design: Students will be able to engage in an appropriate process to refine their product. *MM.2.3*

Collaboration/Communication

- Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. *MM.3.2*

Transfer

- T1** Create models to explore complex systems, show mastery of key science concepts, and/or develop solutions through creation of a product open to testing and redesign.
- T2** Communicate effectively based on purpose, task, and audience to promote collective understanding and/or recommend actions.

Meaning

Understandings

- U1** Light reflects off some objects but goes through other objects (which explains why shadows happen).
- U2** Sound can make matter vibrate, and vibrating matter can make sound.
- U3** Living things detect light and sound.
- U4** People use light and sound to communicate.

Essential Questions

- Q1** Why do we see shadows in some places and not in others?
- Q2** How is sound created? How does it travel?
- Q3** How do I communicate without words or pictures?

Acquisition of Knowledge and Skill

Knowledge

- K1** Sound can make matter vibrate, and vibrating matter can make sound.
- K2** Sound can travel through air, solids, and liquids.
- K3** Light is needed in order to see.
- K4** Different materials affect how light travels (reflection).
- K5** Light and sound are used to communicate.
- K6** **Vocabulary:** vibration, illumination, translucent, opaque, transparent, reflect, shadow, decibel

Skills

- S1** Apply understanding of the properties of light and sound to create communication devices.