

Englewood Public School District

Science

Grade 1

Third Marking Period

Unit 4: Light and Sound

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.

Time Frame: 20 – 25 days

Enduring Understandings:

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.

Essential Questions:

How can you prove that you can only see something when someone shines a light on it or if the object gives off its own light?

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Standards	Topics and Objectives	Activities	Resources	Assessments
1-PS4- 2: Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.	Topics	<u>Light It Up!</u>	<u>Assessing Light Knowledge:</u>	Formative Assessments:
	Light and Sound Twenty-First Century Themes and Skills include: <ul style="list-style-type: none"> • Environmental Literacy • The Four C's 	Part 1: Students review various light resources found in the classroom and review prior knowledge. (1-PS4-2)	Student Rubric <u>Teacher Rubric</u> <u>Light It Up!</u> <ol style="list-style-type: none"> 1. <u>Parent Letter</u> 2. <u>Science vocabulary</u> 3. <u>Slinky</u> 4. <u>Light Sources Recording Sheet</u> 	Do Now/Ticket to Leave Journal Entry Plan and conduct investigations collaboratively to produce data to

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.

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 (firsthand or from media) to construct an evidence-based account for natural phenomena.

Objectives

Light It Up!

Students will be able to identify different light sources.

Are You Afraid of the Dark?

Students will discover that objects need light to be seen.

What Makes Sound?

Students will plan and construct an investigation of sound.

Light

Students will experiment with different items to categorize them by ability of light to pass through them.

Part 2: Students walk around school and make a list of all items that provide illumination in their science journals. Students discuss their findings as a whole group. (CRP4), (NJLSA.R2)

Part 3: Students report their findings to the class in pairs. Students then play an Illumination Concentration Game to reinforce the topics introduced. (CRP8)

Are You Afraid of the Dark?

Part 1: Read the book and discuss with students the difference between light and dark.

Part 2: Students

5. Concentration: Light Sources
6. Science Journal
7. What makes things illuminate?

Are You Afraid of the Dark?

1. The Pout-Pout Fish in the Big-Big Dark By Deborah Diesen
2. Vocabulary - Are You Afraid of the Dark?
3. Pinhole Box (1 Pinhole Box for each partnership)
4. Pinhole Box Recording sheet
5. Images for recording sheet
6. Science vocabulary
7. Science Journal
7. Do objects need light to be seen?

What Makes a Sound?

Sound Recording Sheet

- Bin #1 drums
- Bin #2 Tuning forks
- Bin #3 Stretched strings (a classic tissue box guitar)
- Bin #4 Bells
- Bin #5 Triangles

If you have more students, two groups can use the same materials or you can add bins of materials like shakers, cymbals, or tambourines. See what your music teacher can spare for a day or two!

Light:

- Flashlight
- Experiment
- Money
- Experiment
- Paper & Pencil
- Flashlight
- Clear Plastic Wrap
- Wax Paper
- Cardboard
- Mirror
- Prediction Worksheet

serve as the basis for evidence to answer a question. Think, Pair, Share.

Benchmark Assessment:

Exact Path

Summative Assessments: **Light It Up!**

Student writing in science journal

Are You Afraid of the Dark?

Pinhole Record Sheet

Students Science Journal

How Sound is Made?

Student Recording Sheet

Response in Science Journal

Light:

Observation and Results Worksheets

1-PS4-4:

Use tools and materials provided to design a device that solves a specific problem.

will work in pairs, attempting to hide objects from their partner in a pinhole box.

Part 3: Students discuss results and record their answers to the question in their science journals. (CRP6), (8.2.2.C.1)

Expand: Watch a short video to explain how light works with our eyes to see objects. Students will revise their answer based on new information provided. (1-PS4-2), (W.1.8)

What Makes Sound?

Part 1: Students create a KLEWS chart based on their knowledge of sound.

Part 2: Student groups cycle

- Results Worksheet
- KWL Chart
- Definition Sheet
- Clear plastic cup
- Water
- Penny
- Prediction Worksheet
- Results Worksheet
- KWL Chart

Video's:

<https://www.youtube.com/watch?v=LCEqlvHFIhM>

<https://kids.nationalgeographic.com/explore/youtube-playlist-pages/youtube-playlist-sound/>

Additional Text:

Hearing Sounds by Sally Hewitt

All About Sound by Lisa Trumbauer

Alternative Assessments:

Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. Create a rubric for sound.

Design simple tests to gather evidence to support or refute ideas about cause and effect relationships. Record results in science journal.

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,

through different stations with different instruments. Student groups record their findings in their science journal. Then the whole class has a discussion about how sound is made.
(1-PS4-4)

Light:

Step 1: In small groups, students test each object with a flash light and then place them into one of the categories: Transparent, Translucent, Opaque.

Step 2: Experiment two – have students review prompt and have them record findings in their journals. After completing the test. Have students look through the

glass)
– Translucent (wax paper, thin cloth)
– Opaque (cardboard, construction paper)
– Reflective (a mirror, a shiny metal spoon)

Ask three questions about the topic to check for understanding.

cup and record their results: can see the penny, cannot see the penny, and see a portion of the penny.

Step 3: Students then choose two items of their own and categorize them. They present their findings to the class for discussion.
(W.1.7, SL.1.1, 6.1.4.B.8, 9.2.4.A.2)

Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders.

Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.

ELL/ESL students: Students will be supported according to the recommendations for “can do’s” as outlined by WIDA – https://www.wida.us/standards/CAN_DOs/

This particular unit has limited language barriers due to the physical nature of the curriculum.

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure student work will be reviewed to determine support.

This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations.

More time and will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges related to the complexity in planning and carrying out Investigations and analyzing and interpreting data.

English Language Learners	Special Education	At-Risk	Gifted and Talented
<ul style="list-style-type: none"> ● Use peer readers ● Speak and display terminology ● Teacher modeling ● Peer modeling ● Provide ELL students with multiple literacy strategies ● Word walls ● Give page numbers to help the students find answers ● Provide a computer for written work ● Provide two sets of textbooks, one for home and one for school ● Provide visual aides ● Provide additional time to complete a task ● Use graphic organizers 	<ul style="list-style-type: none"> ● 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) ● Utilize modifications & accommodations delineated in the student's IEP ● Work with paraprofessional ● Use multi-sensory teaching approaches. ● Work with a partner ● Provide concrete examples ● Restructure lesson using UDL principals (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA) ● Shorten assignments to 	<ul style="list-style-type: none"> ● Using visual demonstrations, illustrations, and models ● Give directions/instructions verbally and in simple written format. Oral prompts can be given. ● Peer Support ● Increase one on one time ● Teachers may modify instructions by modeling what the student is expected to do ● Instructions may be printed out in large print and hung up for the student to see during the time of the lesson. ● Review behavior expectations and make adjustments for personal space or other behaviors as needed ● Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their 	<ul style="list-style-type: none"> ● Curriculum compacting ● Inquiry-based instruction ● Independent study ● Higher order thinking skills ● Adjusting the pace of lessons ● Interest based content ● Real world scenarios ● Student Driven Instruction ● 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. ● Collaborate with after-school programs or clubs to extend learning

	focus on mastery of key concepts	community <ul style="list-style-type: none"> • 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) 	opportunities.
Interdisciplinary Connections: ELA - NJSL/ELA: NJLSA.R2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. 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). W.1.8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. 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.			
Social Studies: 6.1.4.B.8: Compare ways people choose to use and distribute natural resources.			
Career Ready Practices: CRP6: Demonstrate creativity and innovation. CRP4: Communicate clearly and effectively and with reason. CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.			
Integration of 21st Century Standards NJSL 9: 9.2.4.A.2: Identify various life roles and civic and work-related activities in the school, home, and community.			
Integration of Technology Standards NJSL 8: 8.2.2.C.1: Collaborate with peers to illustrate components of a designed system.			
Key Vocabulary: Communicate: to share information or feelings			

Dark: when there is little or no light
Ear: a structure on an animal used for hearing
Eye: a part of the body that detects light. Humans and animals have eyes.
Hear: to sense using your ears. Hearing is one of the five senses.
Light: energy that flows in all directions from a radiant source.
Light source: anything that makes light, such as the Sun, a lightbulb, or a flame.
Observe: to use your senses to get information
Opaque: materials that do not allow light through
Reflect: to bounce off an object
Sound: vibrations that you hear

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations</p> <ul style="list-style-type: none"> Plan and conduct investigations collaboratively to produce evidence to answer a question. (1-PS4-1),(1-PS4-3) <p>Constructing Explanations and Designing Solutions</p> <ul style="list-style-type: none"> 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> <p><i>Connections to Nature of Science</i></p> <p>Scientific Investigations Use a Variety of Methods</p> <ul style="list-style-type: none"> Science investigations begin with a question. (1-PS4-1) Scientists use different ways to study the 	<p>PS4.A: Wave Properties</p> <ul style="list-style-type: none"> Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) <p>PS4.B: Electromagnetic Radiation</p> <ul style="list-style-type: none"> 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>PS4.C: Information Technologies and Instrumentation</p> <ul style="list-style-type: none"> People also use a variety of devices to 	<p>Cause and Effect</p> <ul style="list-style-type: none"> 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>-----</p> <p>Connections to Engineering, Technology, and Applications of Science Influence of Engineering, Technology, and Science, on Society and the Natural World</p> <ul style="list-style-type: none"> People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)

world. (1-PS4-1)	communicate (send and receive information) over long distances. (1-PS4-4)	
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