Unit 1 -Waves (Light)

Content Area: **Science**
Course(s): **Science 1**
Time Period: **Marking Period 1**
Length: **MP 1-2**
Status: **Published**

Open Sci Ed

Lesson 1: Anchoring Phenomenon- What happens when we try to read under covers?

- Phenomenon- Reading can be easier or harder depending on the cover materials.
    - Connect to our own experiences related to reading under covers.
    - Engage in a shared experience of reading under different cover materialsCreate a class Notice and Wonder chart
    - Read a book about how scientists use models and create an initial model to explain our ideas about the differences when reading under each cover material.

Lesson 2: Investigation- Where is light coming from around us?

- Phenomenon- Light comes from different objects inside and outside of my classroom
    - Go on a scavenger hunt to make observations about where light comes from.
    - Read a book about light and light sources in different communities.
    - Discuss how a light source can make a space brighter.
    - Create Our Growing Ideas chart to keep track of what we figure out.

Lesson 3: Investigation- How can we test what happens when the same light shines on different materials?

- Phenomenon- The same light shining on different materials can look bright or dim on the other side.
    - Read about how scientists plan and carry out investigations.
    - Collaboratively plan and carry out an investigation to test what happens when different materials are placed under light from the same light source.
    - Share our data and consider what additional data we need to answer our questions about light shining on materials.

Lesson 4: Investigation- What happens when we shine the same light on different materials?

- Phenomenon- Different materials allow different amounts of light to pass through.
    - Revisit our investigation plan to decide how we can collect more data about the effects of placing materials in a beam of light
    - Test and sort materials based on what we observe happens with the light.
    - Gather information from an infographic to determine which materials are transparent, translucent, or opaque.

Lesson 6: Investigation-Can we see without light? Why or why not?

- Phenomenon- Whether you can see an object depends on the amount of light shining on it.
    - Make observations of an object illuminated by different amounts of light in a pinhole box.
    - Make connections to a video and book, both about the experiences of children trying to see

with little to no light.
    - Use evidence to explain if we need light to see.

Lesson 7: Investigation- Some materials make a beam of light change direction.

- Phenomenon- Whether you can see an object depends on the amount of light shining on it.
    - Investigate what happens when light shines on a reflective surface.
    - Read a newspaper article about using reflective materials when it is dark.
    - Add new experiences and ideas about reflective materials to Our Growing Ideas chart.

Lesson 8: Investigation- Some materials make a beam of light change direction.

- Phenomenon- Whether you can see an object depends on the amount of light shining on it.
    - Investigate what happens when light shines on a reflective surface.
    - Read a newspaper article about using reflective materials when it is dark.
    - Add new experiences and ideas about reflective materials to Our Growing Ideas chart.

Essential Questions

- What is light?
- How does light travel?
- Can we still see transparent things when there is no light?
- Can we use light that we see to send a message?
- How can we read under covers when it is dark?

Big Ideas

In this unit, students investigate light. They investigate light and illumination and use those investigations to create simple devices that allow them to communicate across a distance. Students will understand that objects can only be seen when light is available to illuminate them. They will explore the idea that people use devices and senses to send and receive information. This unit begins with a shared experience of trying to read under covers made of different materials in the dark. Students plan and carry out investigations together to produce evidence that can answer their questions about the phenomenon. Through these investigations, students gather data about how transparent, translucent, opaque, and reflective materials cause light to pass through, be blocked, or change direction. Students also make observations to figure out that a light source is needed to illuminate objects so they can be seen. They also use observations to develop models that explain why it was brighter or dimmer under the different covers during their initial (anchoring phenomenon) experiences and, eventually, use a new model to explain how they can successfully read under covers that block light. At the end of the unit, students apply these ideas to write an informational text to communicate information about reading under covers to members of their community.

Cross-Curricular Integration

Integration Area: English Language Arts

- CCSS.ELA-LITERACY.RI.1.1- Ask and answer questions about key details in a text.
- CCSS-ELA-LITERACY.RI.1.3- Describe the connection between two individuals, events, ideas, or pieces of information in a text.
- CCSS-ELA-LITERACY.RI.1.4- Ask and answer questions to help determine or clarify the meaning of words and phrases in a text.

- CCSS-ELA-LITERACY.W.1.8- - With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-2), (1-PS4-3)

- CCSS-ELA-LITERACY.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.
- CCSS-ELA-LITERACY.SL.1.1B- Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
- CCSS-ELA-LITERACY.SL.1.1C- Ask questions to clear up any confusion about the topics and texts under discussion.
- CCSS-ELA-LITERACY.SL.1.2- Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
- CCSS-ELA-LITERACY.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.
- CCSS-ELA-LITERACY.SL.1.4-Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly.
- CCSS-ELA-LITERACY.L.1.4- Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 1 reading and content, choosing flexibly from an array of strategies.
- CCSS-ELA-LITERACY.L.1.5C- Identify real-life connections between words and their use (e.g., note places at home that are cozy).
- CCSS-ELA-LITERACY.L.1.6-Use words and phrases acquired through conversations, reading and being read to, and responding to texts, including using frequently occurring conjunctions to signal simple relationships (e.g., because).

Activity: Students will design a way to deliver a secret message using a color code and flashlight. to Students will have collaborative conversations to make predictions. Students will recall information from the experiment to write and record their observations.

Activity: Students will explain how to read under covers when it is dark to members of our community in a class book. Students will write individual explanations for one page of the class book. They will select text features to organize their individual pages into a book using Light in Our Communities as an example. Students will collaboratively assemble the class book and communicate their ideas to our audience by presenting our class book.

Integration Area: Mathematics

- CCSS-MATH-1.G.A.1 Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

- CCSS-MATH-1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Climate Change

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.

- Activity: In this unit, students will be able to design a stained glass window using parchment paper and tissue paper as they consider materials from the perspective of how much light they let through.
- Activity: In this unit, students will create a stoplight shaped illustration to communicate using light and color with their peers. Students will work in partnerships to develop a system of communication without sound.

Diversity

Objective: Students will understand that Braille is a type of receptive communication.

Activity: Students will watch Braille Alphabet video and observe their name letters. Then students will copy their Braille letter dots onto paper. Finally, students will make raised glue dots on top.

CSDT Technology Integration

8.1.2.AP.2: Model the way programs store and manipulate data by using numbers or other symbols to represent information

Activity: Students will use Pebble Go to learn about Light and Sound.

Resources

Primary Resources

- Mystery Science
- OpenSci Ed

Core

- Sounds and Vibrations: How Do They Make Silly Sounds in Cartoons? (Mystery Science)
- Sounds and Vibrations: Where Do Sounds Come From? (Mystery Science)
- What If There Were No Windows? (Mystery Science)
- Light and Illumination: Can You See In the Dark? (Mystery Science)
- How could you send a secret message to someone far away? (Mystery Science)
- How Do Boats Find Their Way In the Fog? (Mystery Science)

Supplemental

- Instrument Sound Lab
- Types of Communication Tools Activity