LEARNING IN PLACE

LESSON PLAN

Subject: Grade 6 Science **Lesson:** Harnessing Light Waves in the 18th Century

Standard Addressed: Explain the relationship among visible light, the electromagnetic spectrum, and sight. (NC.6.P.1.2)

Objective:

- Students will be able to explore and describe the ways visible light interacts with various materials.

Materials Needed:

- Device for showing *Harnessing Light Waves in the 18th Century* video
- "Harnessing Light Waves in the 18th Century" activity sheet

Outline:

- Prior to this lesson, students should know light moves in transverse waves and transmits energy.
- Show the 8 ½ minute video, Harnessing Light Waves in the 18th Century (https://youtu.be/DvxW05lNmjc).
- Discuss the activity prompt.
- Students finish the activity independently or with a partner.

Take It Further: Students explore their own homes or outdoor environments to find examples of places where light waves are interacting with materials in interesting ways. Students photograph or describe the way light is behaving.

Cross-Curriculum Connection: Students research pinhole cameras and make their own using recycled materials.

LEARNING IN PLACE

HARNESSING LIGHT WAVES IN THE 18th CENTURY

Grade 6 Science

Student Name: _____ Date: _____

PART 1: VISIBLE LIGHT AND COLOR

Use this picture to explain how Martha Elizabeth sees the outside of her house as yellow.

Step 1: Light from the sun

_____

_____

_____

Step 3: _____

_____

_____

_____

_____

Step 2: The house absorbs _____

_____

and reflects _____

The video showed examples where light waves were reflected, as well as instances in which light waves were refracted.

Describe an example of light waves being reflected.

_____

_____

Describe an example of light waves being refracted.

_____

_____

PART 3: TRANSPARENT, TRANLUCENT AND OPAQUE

Different materials react differently to light waves. The following materials were shown in the video.

Label each material as being "transparent", "translucent", or "opaque".

1. The oiled paper used in the Illumination: _____
2. The window in front of the tub of water: _____
3. The materials used to construct the walls in the attic: _____

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HARNESSING LIGHT WAVES IN THE 18th CENTURY

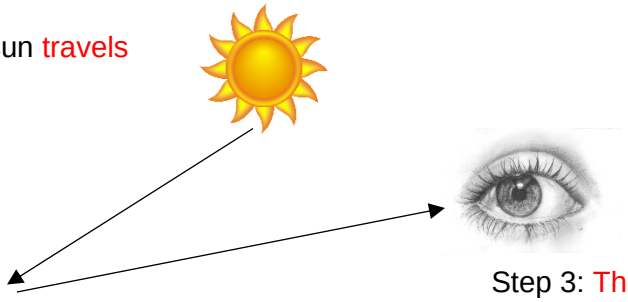
Grade 6 Science

Answer Key

PART 1: VISIBLE LIGHT AND COLOR

Use this picture to explain how we see that the Miksch house is yellow.

Step 1: Light from the sun travels in waves to the house.



Step 3: The wavelengths of light that are yellow reflect (bounce) off the house and travel to the eye.

Step 2: The house absorbs all wavelengths of light of the visible light spectrum except yellow (red, orange, green, blue, indigo, and violet) and reflects yellow.

PART 2: REFLECTION AND REFRACTION

The video showed examples where light waves were reflected, as well as instances in which light waves were refracted.

1. Describe an example of light waves being reflected.
Possible answers include:
descriptions of places where wavelengths of various colors are reflected and perceived; description of light waves reflecting (bouncing) off the tin sconce; description of light waves reflecting (bouncing) off ceiling or walls

2. Describe an example of light waves being refracted.
Possible answers include:
description of light waves refracting (bending) when looking at the flower stem in a jar of water; description of light waves refracting (bending) when traveling through the oiled paper of the illumination; description of light waves refracting (bending) when entering the globes of the shoemaker's lamp

PART 3: TRANSPARENT, TRANLUCENT AND OPAQUE

Different materials in the video reacted differently to light waves.

Label each material as being "transparent", "translucent", or "opaque".

1. The oiled paper used in the Illumination: translucent
2. The window in front of the tub of water: transparent
3. The materials used to construct the walls in the attic: opaque