Unit 3: Color Light and Sound

Content Area: **Science**
Course(s): **Science 4**
Time Period: **January**
Length: **10 weeks**
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Enduring Understandings

Light travels in straight lines.

When light travels from one substance to another, it changes direction.

Light can be absorbed, redirected, bounced back, or allowed to pass through.

The path of reflected or retracted light can be predicted.

Visible light from the Sun is made up of a mixture of all colors of light.

To see an object, light emitted or reflected by that object must enter the eye.

Relationship of applied energy to strength of vibration

and volume of sound.

Some animals depend on their sense of sound.

Sound can travel through all three states of matter.

All sounds are created by vibrations.

Essential Questions

Does everyone see color the same way?

If light changes direction, will the color change as well?

How did the discovery of telescopes help with technology today?

How are electromagnetic waves used in our everyday lives?

How does sound travel differently?

Will your voice change in different places such as in a cave versus a classroom?

What would happen if there was no sound? How would life be different?

Do other senses help you hear?

In what ways can sound be good or bad for you?

Content

Internet Resources

Exploratorium

http://www.exploratorium.edu/afterschool/activities/index.php?activity=137

&firstDisplayedItem=5

The Franklin Institute

http://www.fi.edu/color/

The Science of Light

- http://www.learner.org/teacherslab/science/light/

NASA

- http://science.hq.nasa.gov/kids/imagers/ems/visible.html

PBS Kids – Color and Light

- http://pbskids.org/dragonflytv/show/lightandcolor.html

Science Kids

- http://www.sciencekids.co.nz/sciencefacts/light.html

Educational videos and lessons on sound

- http://www.neok12.com/Sound.htm

Brain Pop

- https://www.brainpop.com

Bill Nye Videos

Scholastic News

- http://magazines.scholastic.com

Readworks

- http://www.readworks.org

Vocabulary:

Absorb

Accurate

Atom

Battery

Chemical

Convert

Electric

Element

Energy

Energy

Evaporate

Evidence

Food

Fossil

Fossil

Skills

Compare and contrast light waves to other waves.

Determine sources of light from natural and man made resources.

Discuss the similarities and differences between concave and convex lenses.

Understand the differences between rays and the effects on the human body and environment.

Use objects to create sound by varying pitch and volume.

Describe and distinguish sound, pitch, volume, and vibrations.

Identify sources of sound through investigations.

Interpret data

Use tools to view color and light such as prisms.

Create sound with various objects.

Standards

SCI.4.4-PS3-1	Use evidence to construct an explanation relating the speed of an object to the energy of that object.
SCI.4.4-PS3-2	Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.
SCI.4.4-PS3-2.3.1	Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution.
SCI.4.4-PS3-3.5.1	Energy can be transferred in various ways and between objects.
SCI.4.4-PS3-1.5.1	Energy can be transferred in various ways and between objects.
SCI.4.4-PS3-2.5.1	Energy can be transferred in various ways and between objects.
SCI.4.4-PS3-1.6	Constructing Explanations and Designing Solutions
SCI.4.4-PS3-1.6.1	Use evidence (e.g., measurements, observations, patterns) to construct an explanation.
SCI.4.4-PS3-2.PS3.A.1	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.
SCI.4.4-PS3-3.PS3.A.1	Energy can be moved from place to place by moving objects or through sound, light, or electric currents.
SCI.4.4-PS3-2.PS3.B.1	Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.
SCI.4.4-PS3-4.PS3.B.1	Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.
SCI.4.4-PS3-3.PS3.B.1	Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.
SCI.4.4-PS3-2.PS3.B.2	Light also transfers energy from place to place.

SCI.4.4-PS3-2.PS3.B.3	Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy.
SCI.4.4-PS3-3.PS3.C.1	When objects collide, the contact forces transfer energy so as to change the objects' motions.
SCI.4.4-PS4-1	Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.
SCI.4.4-PS4	Waves and their Applications in Technologies for Information Transfer
SCI.4.4-PS4-1.2	Developing and Using Models
SCI.4.4-PS4-1.PS4.A.1	Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach.
SCI.3-4.5.1.4.B	Students master the conceptual, mathematical, physical, and computational tools that need to be applied when constructing and evaluating claims.
SCI.3-4.5.1.4.D.1	Actively participate in discussions about student data, questions, and understandings.
SCI.3-4.5.1.4.D.2	Work collaboratively to pose, refine, and evaluate questions, investigations, models, and theories.
SCI.3-4.5.1.4.D.3	Demonstrate how to safely use tools, instruments, and supplies.
SCI.3-4.5.1.4.D.a	Science has unique norms for participation. These include adopting a critical stance, demonstrating a willingness to ask questions and seek help, and developing a sense of trust and skepticism.
SCI.3-4.5.1.4.D.c	Instruments of measurement can be used to safely gather accurate information for making scientific comparisons of objects and events.