Connecticut Science

Grade 5

Adopted 2010

Science and Technology in Society

4. **Humans have the capacity to build and use tools to advance the quality of their lives.
 This content standard is an application of the concepts in content standard 5.1 and should be integrated into the same unit.** 5.4
    1. Generalize that optical tools, such as binoculars, telescopes, eyeglasses or periscopes, change the path of light by reflecting or refracting it.
    2. Construct simple periscopes and telescopes, and analyze how the placement of their lenses and mirrors affects the quality of the image formed.
    3. Evaluate the best optical instrument to perform a given task.
    4. Design and conduct simple investigations to determine how the shape of a lens or mirror (concave, convex, flat) affects the direction in which light rays travel.
    5. Explain how eyeglasses or contact lenses improve vision by changing the path of light to the retina.
    6. Analyze the similarities and differences between structures of the human eye and those of a simple camera.<table border="1"><tr><td>HUMAN EYE</td><td>CAMERA</td><td>FUNCTION</td></tr><tr><td>Eyelid</td><td>Lens cap</td><td>Protect interior parts</td></tr><tr><td>Pupil</td><td>Lens opening (aperture)</td><td>Allow light to enter</td></tr><tr><td>Cornea, lens</td><td>Lens</td><td>Focus light rays on a point</td></tr><tr><td>Retina</td><td>Film (or digital medium)</td><td>Respond to light resulting in an image</td></tr></table>

Structure and Function

2. **Perceiving and responding to information about the environment is critical to the survival of organisms.** 5.2
    1. Explain the role of sensory organs in perceiving stimuli (e.g., light/dark, heat/cold, flavors, pain, etc.) and sending signals to the brain.
    2. Pose testable questions and design experiments to explore factors that affect human reaction time.
    3. Conduct simple tests to explore the capabilities of the human senses.
    4. Summarize nonfiction text to explain the role of the brain and spinal cord in responding to information received from the sense organs.
    5. Identify the major structures of the human eye, ear, nose, skin and tongue, and explain their functions.
    6. Draw diagrams showing the straight path of light rays from a source to a reflecting object to the eye, allowing objects to be seen.
    7. Describe the properties of different materials and the structures in the human eye that enable humans to perceive color.

Energy Transfer and Transformations

1. **Sound and light are forms of energy.** 5.1
    1. Generalize that vibrating objects produce sound if the vibrations are transferred from the object through another material (e.g., air, a solid, or a liquid).
    2. Demonstrate how the loudness, pitch and quality/timbre of sound can be varied.
    3. Design and conduct investigations to determine factors that affect pitch.
    4. Describe the properties of materials that reflect or absorb sound.
    5. Construct simple musical instruments (e.g., rubber band guitars, drums, etc.) that produce sounds with various pitches, volume and timbres.
    1. Provide evidence that light travels in straight lines away from a source in all directions.
    2. Investigate how light is refracted as it passes through a lens or through one transparent material to another.
    3. Demonstrate that white light is composed of many colors.
    4. Explain that all visible objects are reflecting some light to the human eye.
    5. Contrast the way light is reflected by smooth, shiny objects (e.g., mirror or pool of water) and how it is reflected by other objects.
    6. Measure angles to predict the path of light reflected by a mirror.
    7. Determine whether a material is opaque, transparent or translucent based on how light passes through it.
    8. Design and conduct light absorption experiments that vary the size, length, direction and clarity of a shadow by changing the position of the light-blocking object or the light source.

Earth in the Solar System

3. **Most objects in the solar system are in a regular and predictable motion.** 5.3
    1. Explain the motion of the Earth relative to the sun that causes Earth to experience cycles of day and night.
    2. Construct models demonstrating Earth's rotation on its axis, the moon's revolution around the Earth, and the Earth and moon revolving around the sun.
    3. Distinguish between the sun as a source of light and the moon as a reflection of that light.
    4. Observe and record the moon's appearance over time and analyze findings to describe the cyclical changes in its appearance from Earth (moon phases).
    5. Relate the moon phases to changes in the moon's position relative to the Earth and sun during its 29-day revolution around the Earth.