

Science and Technology: Grade 4

Energy and Control: Light and Sound Energy

Overall Expectations

- demonstrate an understanding of the characteristics and properties of light and sound

Specific Expectations

Understanding Basic Concepts

- identify a variety of natural and artificial light sources (e.g., the sun, a candle, a light bulb);
- describe the behaviour of light, using their observations, and identify some of its basic characteristics (e.g., that it travels in a straight path, bends as it passes from one medium to another, and is reflected off shiny surfaces);
- distinguish between objects that produce their own light and those that reflect light from another source (e.g., candles and the sun emit their own light; the moon reflects light from the sun);
- identify, through observation, colour as a property of light (e.g., use prisms to show that white light can be separated into colours);
- predict the location, shape, and size of a shadow when a light source is placed in a given location relative to an object;
- investigate and compare how light interacts with a variety of optical devices (e.g., kaleidoscopes, periscopes, telescopes, magnifying glasses);
- recognize, using their observations, that sound can travel through a substance (e.g., place a vibrating tuning fork in a shallow dish of water and describe what happens to the water; place rice on a drum-head and describe what happens to the rice when the drum is tapped);
- recognize that sounds are caused by vibrations;

Matter and Materials: Materials that Transmit, Reflect or Absorb Light or Sound

Overall Expectations

- investigate the properties and characteristics of light and sound energy
- demonstrate an understanding that light and sound are forms of energy with specific characteristics and properties

Specific Expectations

Understanding Basic Concepts

- distinguish between objects that emit their own light (e.g. stars, candles, light bulbs) and those that reflect light from other sources (e.g. moon, safety reflectors, minerals)
- describe properties of light including light travels in a straight path, can be absorbed, reflected and refracted
- describe properties of sound, including sound travels in a straight path can be absorbed or reflected

Developing Skills of Inquiry, Design and Communication

- use the skills of technological problem solving to design and build an optical device (e.g. periscope, kaleidoscope) that uses some of the properties of light
- use appropriate vocabulary, including correct science and technology terminology such as natural, transparent, translucent, opaque, artificial, beam of light, pitch, loudness, and vibration, in describing investigations, explorations and observations