# GRADE FOUR
## PHYSICAL SCIENCE: FORMS OF ENERGY – LIGHT AND SOUND

**Standard 4.P.4:** The student will demonstrate an understanding of the properties of light and sound as forms of energy.

**4.P.4A. Conceptual Understanding:** Light, as a form of energy, has specific properties including color and brightness. Light travels in a straight line until it strikes an object. The way light reacts when it strikes an object depends on the object's properties.

**Performance Indicators:** Students who demonstrate this understanding can:

**4.P.4A.1** Construct scientific arguments to support the claim that white light is made up of different colors.

**4.P.4A.2** Analyze and interpret data from observations and measurements to describe how the apparent brightness of light can vary as a result of the distance and intensity of the light source.

**4.P.4A.3** Obtain and communicate information to explain how the visibility of an object is related to light.

**4.P.4A.4** Develop and use models to describe how light travels and interacts when it strikes an object (including reflection, refraction, and absorption) using evidence from observations.

**4.P.4A.5** Plan and conduct scientific investigations to explain how light behaves when it strikes transparent, translucent, and opaque materials.

**4.P.4B. Conceptual Understanding:** Sound, as a form of energy, is produced by vibrating objects and has specific properties including pitch and volume. Sound travels through air and other materials and is used to communicate information in various forms of technology.

**Performance Indicators:** Students who demonstrate this understanding can:

**4.P.4B.1** Plan and conduct scientific investigations to test how different variables affect the properties of sound (including pitch and volume).

**4.P.4B.2** Analyze and interpret data from observations and measurements to describe how changes in vibration affects the pitch and volume of sound.

**4.P.4B.3** Define problems related to the communication of information over a distance and design devices or solutions that use sound to solve the problem.