

# Light and Shadows

## General Learner Expectations

Students will:

**4-9 Identify sources of light, describe the interaction of light with different materials, and infer the pathway of a light beam.**

## Specific Learner Expectations

Students will:

1. Recognize that eyes can be damaged by bright lights and that one should not look at the Sun-either directly or with binoculars or telescopes.
2. Identify a wide range of sources of light, including the Sun, various forms of electric lights, flames, and materials that glow (luminescent materials).
3. Distinguish objects that emit their own light from those that require an external source of light in order to be seen.
4. Demonstrate that light travels outward from a source and continues unless blocked by an opaque material.
5. Describe changes in the size and location of Sun shadows during the day-early morning, to midday, to late afternoon.
6. Recognize that opaque materials cast shadows, and predict changes in the size and location of shadows resulting from the movement of a light source or from the movement of a shade-casting object.
7. Distinguish transparent materials from opaque materials by determining if light passes through them and by examining their shadows.
8. Classify materials as transparent, partly transparent (translucent) or opaque.
9. Recognize that light can be reflected and that shiny surfaces, such as polished metals and mirrors, are good reflectors.
10. Recognize that light can be bent (refracted) and that such objects as aquaria, prisms and lenses can be used to show that light beams can be bent.
11. Recognize that light can be broken into colours and that different colours of light can be combined to form a new colour.
12. Demonstrate the ability to use a variety of optical devices, describe how they are used, and describe their general structure. Suggested examples include: hand lens, telescope, microscope, pinhole camera, lightsensitive paper, camera, kaleidoscope. Students meeting this expectation will be able to provide practical descriptions of the operation of such devices, but are not required to provide theoretical explanations of how the devices work.