

PHYSICS LINK**● Visible Light and the Atmosphere**

The atmosphere has a number of effects on the light that you see. The wavelengths of visible light that are most readily scattered by the fine dust in the air are the shorter ones. You see these wavelengths as blue and violet. Thus the sky looks blue when the air is clear. Larger particles, such as water droplets in clouds or fog, scatter most of the wavelengths of visible light. This effect makes the sky look white—a combination of all colors. At high altitudes, where the atmosphere is less dense, there are few particles to cause scattering. As a result, the sky looks dark blue. In space, the sky is black.

A rainbow is another example of the effects of the atmosphere on light. A rainbow is caused by the separation of sunlight into a spectrum of colors by raindrops. Refraction, or bending, of light rays in the raindrops separate white light into the entire visible spectrum. You can see these colors when you face the water droplets with the sun behind you.

A mirage is an optical illusion created by the atmosphere. Light rays are refracted as they pass through a boundary between hot air and cool air. You may have seen a mirage on a summer day when water seemed to appear on the dry pavement of a highway. This mirage occurs when a layer of cool air reflects the sky onto a layer of hot air close to the ground. When the light rays enter the hot air, they are bent upward, causing the sky to appear as a pool of water on the pavement. This is called an *inferior mirage*.

A distant mountain that seems to be suspended in the sky is called a *superior mirage*. This type of mirage forms when light rays pass through a layer of warm air above into cool air below.

Are the light rays in a superior mirage bent upward or downward?