

# Light Energy

## What happens when light hits a surface?

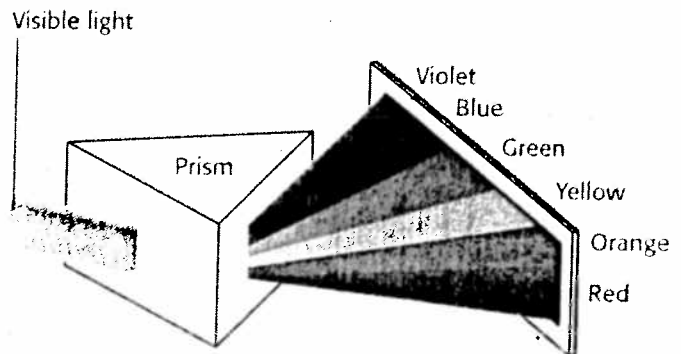
When light hits a surface, it can be reflected, transmitted, or absorbed. What happens depends on the material light strikes.

Light can **reflect**, or bounce off, the surface of some materials. When you see your reflection in a pool of water, it is because light reflects from the water's surface.

Light can also be passed, or **transmitted**, through a material. All light waves travel at the same speed through the same material. But as light moves from one material to another, its speed changes. This change in speed causes light to bend, or **refract**. When visible light is transmitted through a prism, each color is bent a slightly different amount. That's because each color has a slightly different frequency. This bending separates the colors, allowing us to see each one.

Eyeglass lenses refract light to help people see better. Refracting telescopes and cameras also use lenses to refract light and form images.

When light strikes an object, some colors of light are **absorbed**, or taken in, by the object. Other colors of light are reflected. The color you see is the color of light that the object reflects. A cherry appears red because it reflects red light and absorbs all other colors.



A prism refracts visible light into the colors of the rainbow.

### Show What You Know

Use these terms to complete the sentences:

**absorbs   transmits   reflects   refracts**

1. Light \_\_\_\_\_ through a glass window.
2. As light passes through a lens, it \_\_\_\_\_.
3. A leaf appears green because it \_\_\_\_\_ green light and \_\_\_\_\_ all other colors of light.

# The Electromagnetic Spectrum

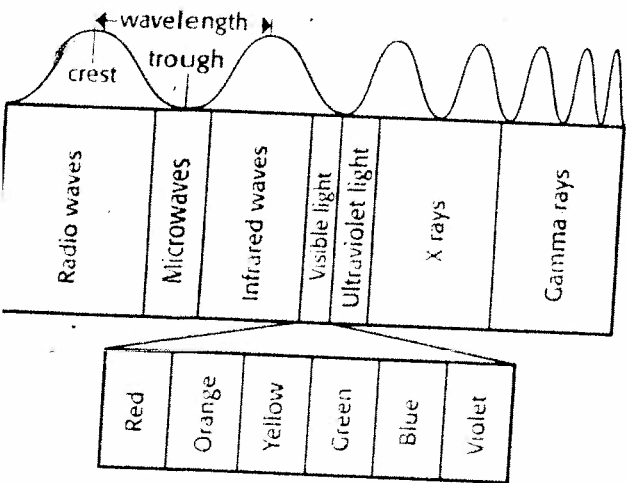
**What are the different forms of light?**

Light is a form of energy. It is produced from other forms of energy. For example, electrical energy changes into light energy in a light bulb. Chemical energy is changed into heat and light energy in a fire. Nuclear energy in the sun produces sunlight.

Light travels as waves that move straight out in all directions from their source. Light waves have certain properties. The lowest part of a wave is

the **trough**. The top part of a wave is the **crest**. The distance from one crest to the next crest of a wave is the **wavelength**. Another wave property is **frequency**. The number of waves that pass a point in one second is the frequency of a wave. Waves with long wavelengths have low frequencies. Waves with short wavelengths have high frequencies. A wave's wavelength and frequency determine its properties.

All forms of light make up what is known as the **electromagnetic spectrum**. In the electromagnetic spectrum, a light wave is classified according to its wavelength and frequency. For example, X rays have very short wavelengths and very high frequencies. Radio waves have very long wavelengths and low frequencies. Light you can see, or visible light, includes a range of colors based on the wavelengths and frequencies of their waves.



## Show What You Know

The energy of a light wave depends on the wave's frequency. The higher the frequency, the higher the amount of energy the wave carries.

1. What type of light waves carry the most energy?

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2. What color of visible light carries the least amount of energy?

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