

Chapter 2

Waves

- Electromagnetic waves are created when a source of energy causes a medium to vibrate.
- Waves that require a medium through which to travel are called mechanical waves.
- The maximum distance that the particles of a medium move from the rest position is the amplitude of the wave.
- The distance between two corresponding parts of a wave is the wave's wavelength.
- The unit associated with amplitude is the frequency.
- Frequency is measured in units called hertz.
- When light passes from air into water it slows down.

Electromagnetic Waves

- Electromagnetic waves have some electrical properties and some magnetic properties.
- The range of electromagnetic waves placed in a certain order is called the electromagnetic spectrum.
- An electromagnetic wave is made of electric and magnetic fields at right angles to one another.
- Electromagnetic waves that have wavelengths slightly shorter than those of visible light are called ultraviolet rays.
- When a police officer uses radar for speed control, the officer is using radio waves.
- Ultraviolet rays help your body produce vitamin D.

Transparent, Translucent, Opaque

- Frosted glass and wax paper are translucent.
- Clear glass, water, and air are examples of transparent material.
- A transparent material transmits light.

Combining Light

- A tomato would appear black under blue light.
- A white carpet will appear red when viewed through a red filter because the filter transmits red light only.

- Colored substances that are used to color other materials are called pigments.
- Mixing two primary colors together produces a secondary color of light.
- Any two primary colors of light combined in equal amounts produce a secondary color.

Mirrors

- When the surface of a mirror curves inward, like the inside of a bowl, it is called a concave mirror.
- A plane mirror produces virtual and upright images.
- A flat sheet of glass with a silver-colored coating on one side is a plane mirror.
- A real image is formed where light rays meet at a point.
- The law of reflection states that the angle of reflection equals the angle of incidence.
- Refraction occurs when a light ray enters a new medium at an angle, causing it to change speed and direction.

Optical Tools

- A telescopes use lenses or mirrors to collect and focus light from distant objects.
- A camera uses lenses to focus light rays and record an image of an object on photographic film.
- The eyepiece of a telescope or microscope magnifies an image.