Light Energy

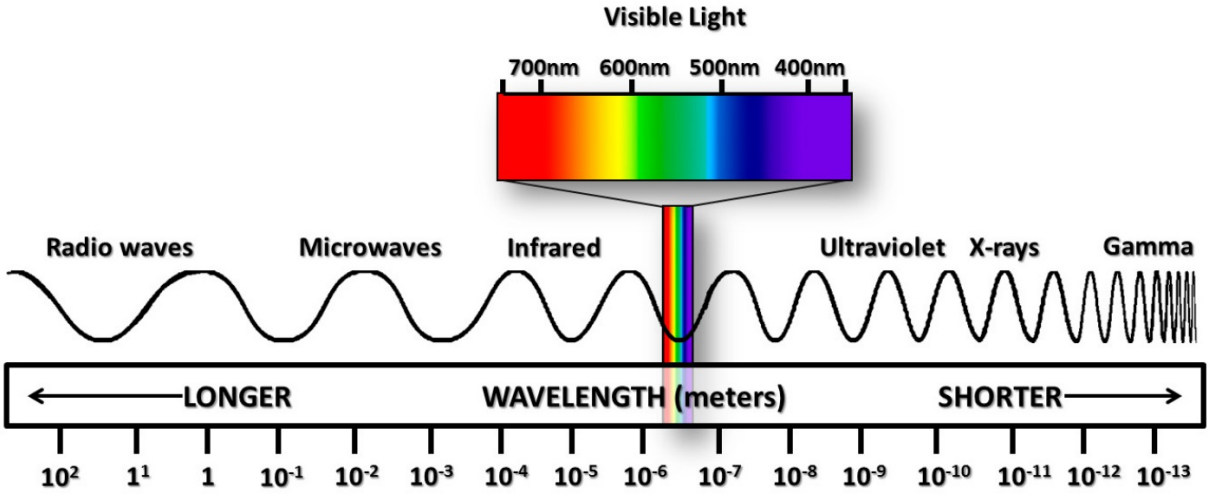
Light is energy that moves in waves. These waves travel in a straight line away from the source of the light.

Artificial light comes from heating something up or running a current through it.

Natural light comes from nature: sunlight or bioluminescence.

Consider the items below. Identify the type of light.

The full spectrum of light energy is called the electromagnetic spectrum.

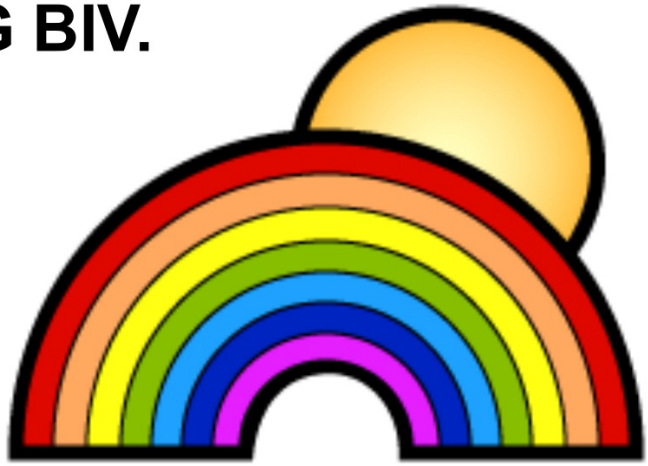


Visible light is the only portion of the spectrum that is visible to the naked human eye.

The colors of the visible spectrum vary according to wavelength. Warm colors have a slower wavelength than cool colors.

To remember the order of the colors, think ROY G BIV.

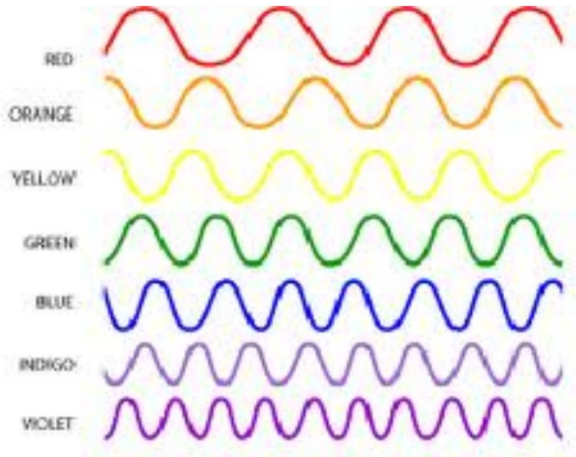
Red
Orange
Yellow
Green
Blue
Indigo
Violet



Wavelength and Frequency

Red has a long slow wavelength.

Violet has a short fast wavelength.



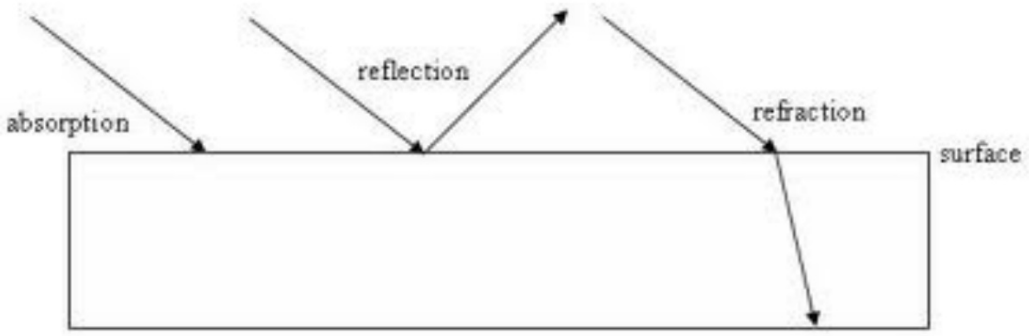
Light energy can travel through space.

It can also travel through some matter.

As far as we know, nothing can move faster than light.

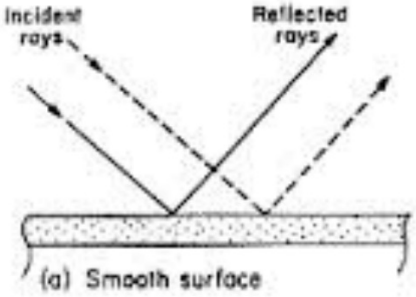
Light travels fastest through air or gas than it does liquids or solids.

When light hits an object, the light can be absorbed, bounce off, or go through the object.

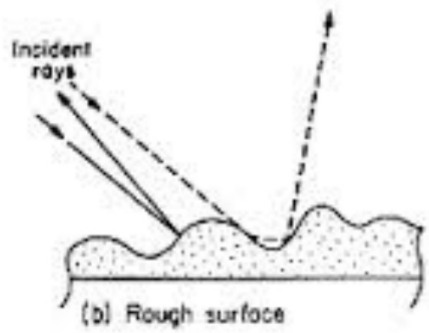


Reflection is the bouncing of light from a surface.

Reflected light is what lets you see an object.



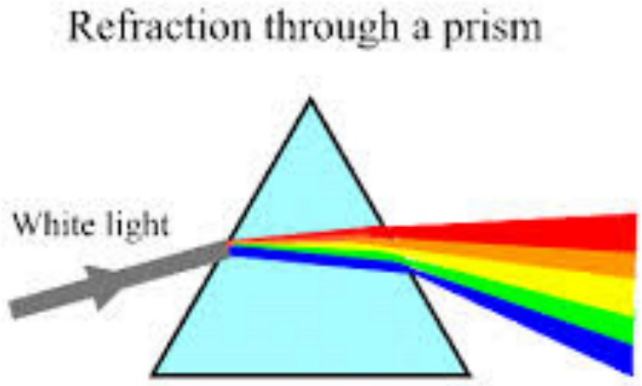
Light reflects off smooth surfaces in a pattern. That is why you see your reflection in a mirror.



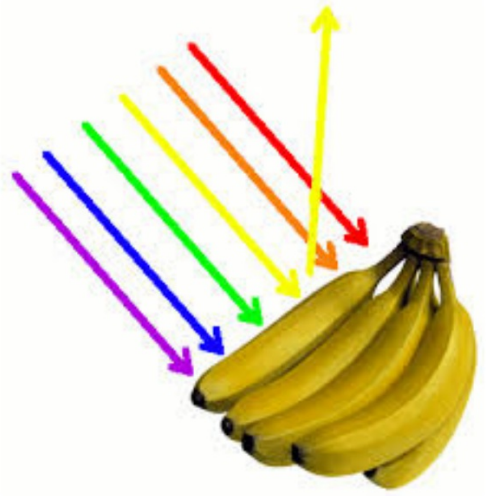
Light scatters when reflected off of rough surfaces.

Refraction is the bending of light as it moves between different types of matter.

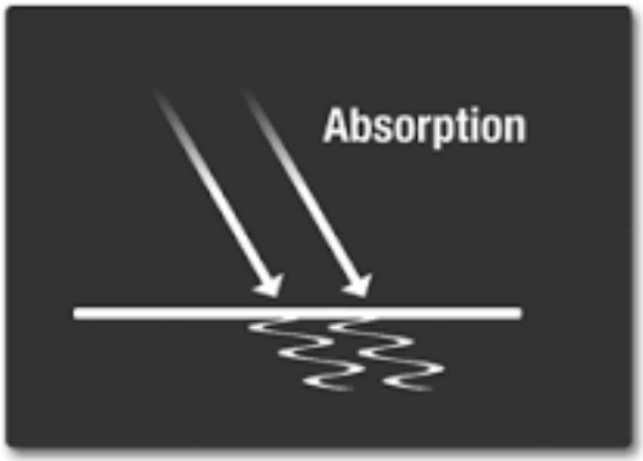
Water, glass, and chrystal refract light.



Objects absorb most light energy and reflect back one wave in the color spectrum.
Bananas absorb all waves except yellow, which is reflected back to your eye.



- **Dark objects absorb more light than light-colored objects.**



Black objects absorb all colors in the light spectrum.

White objects reflect all colors in the light spectrum.

When objects allow only part of the light that hits them to pass through, they are translucent.

Transparent objects allow almost all the light that hits them to pass through.

Opaque objects do not let any light pass through.

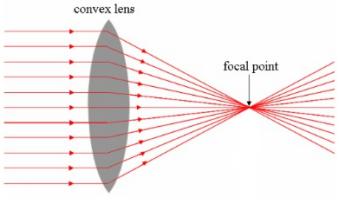
The closer the opaque object is to the light source, the larger the shadow will be.

lenses

lens is a curved transparent object that refracts light

convex lens is thickest in the middle, bends light waves toward the thickest part

- sometimes the image is upside down
- image is larger



concave lens is thickest at the edges, bends light waves toward the thickest part

- image is right side up
- image is smaller