

- Light is a form of Electromagnetic radiation or energy that we can see.
- When light travels, it acts both like a wave and a particle.
- When light acts like a particle, scientists call the packets of light photons.
- There are different types of waves. Light travels as a transverse wave.
- Mechanical waves like sound, seismic waves and water waves will not travel without a medium.
- Light does not need a medium to travel (like sound does). (There is light in space but no sound.)
- Light travels 186,000 miles per second. (Light travels about 900,000 times faster than sound in air.)
- Light travels in straight lines called rays, but light spreads out in all directions from its source. (Think of the sun.)
- Scientists call the light we see visible light or white light.
- You can see objects only if they emit light or reflect light.
- The sun is bright because it emits light. The moon is bright because it reflects light.
- Visible Light is the only part of the electromagnetic spectrum that we can see.
- When light travels through a prism, the colors bend according to their wavelength, and separate into red, orange, yellow, green, blue, indigo and violet.
- Name the colors in order from longest wavelength to shortest wavelength. red, orange, yellow, green, blue, indigo, violet
- When sun light bounces off of the moon, this is called reflection.
- When sun light travels through a window and brightens a room in your house this is called transmission.
- The lab table that you sit at looks black because it absorbs all the colors and reflects none.
- Some objects such as glass, water and air allow light to pass through them easily. These substances are Transparent.
- Some objects such as rock salt, ice cubes & wax paper allow some light to travel through but not all; they scatter the light as the light travels through; these objects are Translucent.
- Some objects such as your text book do not allow any light to pass through them. The object either reflects or absorbs the light. These objects are called Opaque.
- Light travels at different speeds through different substances. When light travels from air to water, it slows down and will bend (refract).
- When light bends it is called refraction.
- A lime appears green because it reflects green wavelength and absorbs other wavelengths.
- A red apple will reflect red light and absorb orange, yellow, green, blue, indigo, violet.
- Gamma rays have the shortest wavelength on the electromagnetic spectrum and have the most energy.
- Radio Waves have the longest wavelength on the electromagnetic spectrum and have the least energy.
- Which types of electromagnetic radiation can be dangerous to humans? Gamma, X-ray, ultra-violet
- What is the outermost part of your eye that refracts light, protects the eye and can easily tear? Cornea
- The small hole in the middle of your eye that changes size according to the amount of light is called the pupil.
- The iris is the colored part of your eye (and is a muscle) that controls the size of your pupil.
- Light that enters the eye gets refracted by the cornea and the lens.
- A transparent eye part that changes shape as it focuses on near and far objects; it also bends light lens.
- The ciliary muscles are attached to the lens and change the shape of the lens which allows you to focus properly.
- An upside down image is projected on the retina which is located on the back of your eye.
- The optic nerve sends electrical signals to the brain to allow you to interpret the image.
- Draw a convex lens. Who uses this type of eyeglasses? people who are farsighted
- Draw a concave lens. Who uses this type of eyeglasses? people who are nearsighted
- An eye doctor who can write prescriptions for eye related problems and perform eye surgery Ophthalmologist
- Person who works with corrective lenses and contacts for vision problems Optometrist
- What is an alternative way that people correct vision problems without corrective lenses? Lasik eye surgery
- A LASER emits concentrated light of one wavelength and ONE color.
- FIBER OPTIC CABLES carry light and data over long distances very quickly. (Glass)
- Rainbows form when sunlight gets refracted and reflected through water droplets.
- Name 3 ways that a camera and the eye are similar (page 703):
  - Both have lenses
  - Both have a way to control light entering (pupil-eye / diaphragm camera)
  - both project upside down images (retina / back of camera (film))