

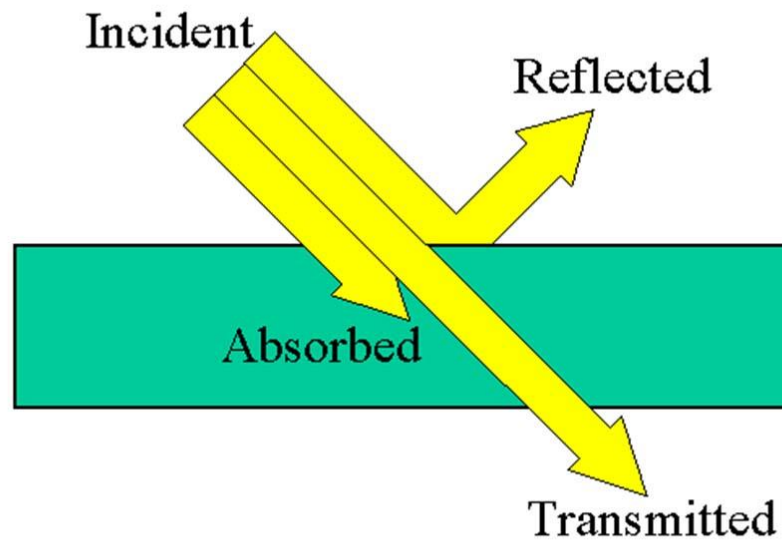
LIGHT

CHAPTER 18



18.1 Light and Color

- When light strikes an object, the light can be reflected, transmitted, or absorbed.



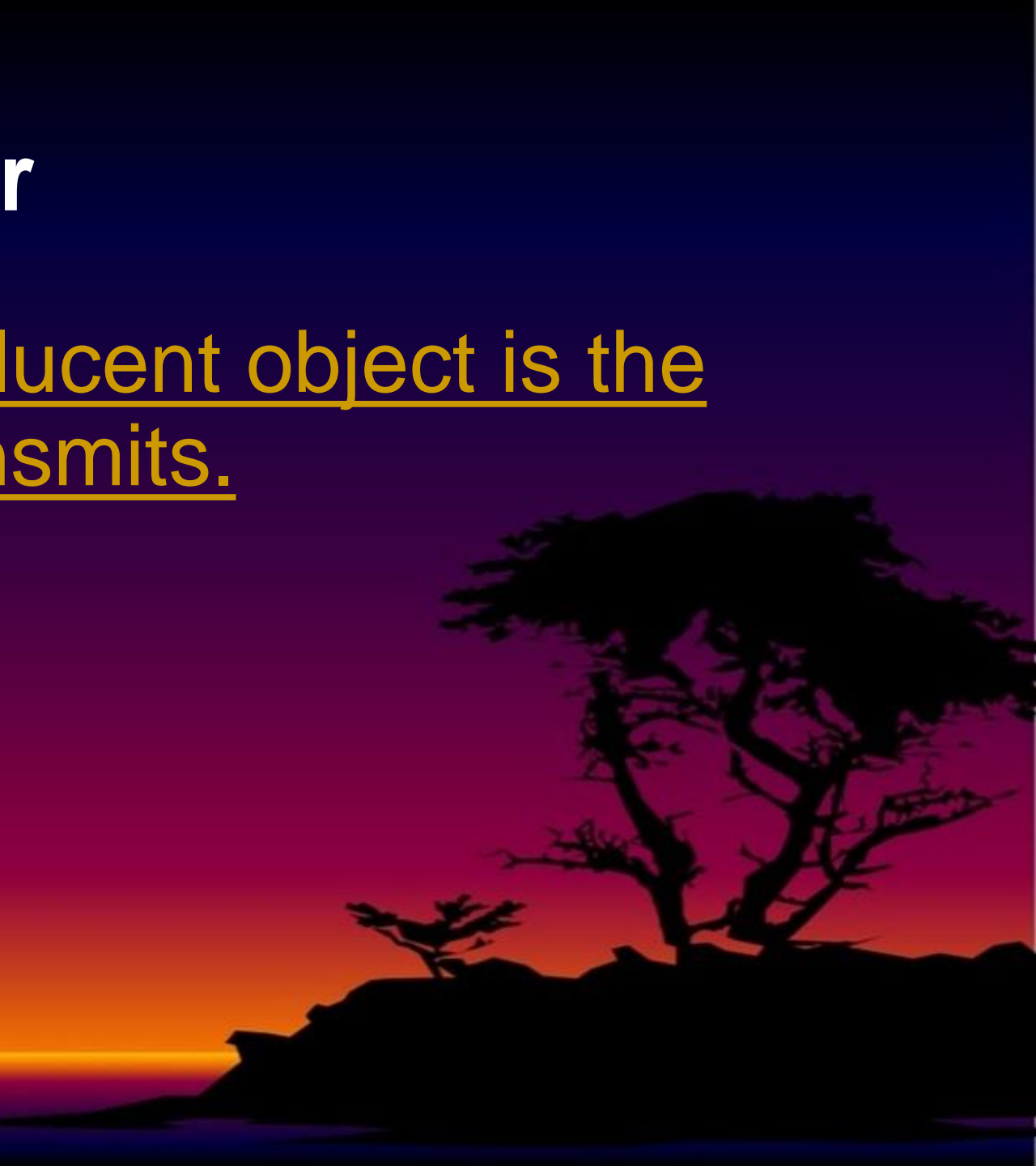
18.1 Light and Color

- An opaque object is the color of the light it reflects



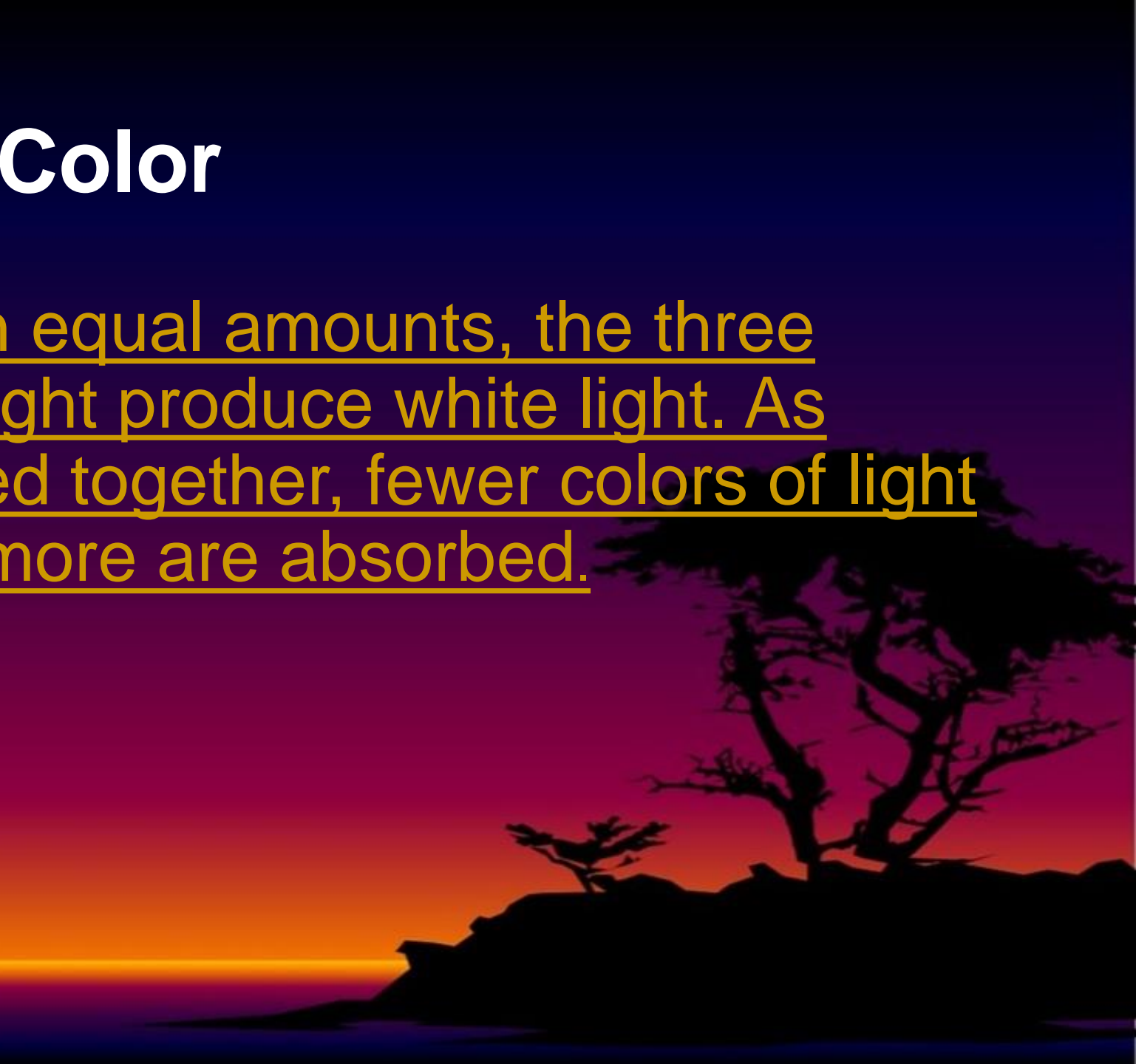
18.1 Light and Color

- A transparent or translucent object is the color of the light it transmits.



18.1 Light and Color

- When combined in equal amounts, the three primary colors of light produce white light. As pigments are added together, fewer colors of light are reflected and more are absorbed.



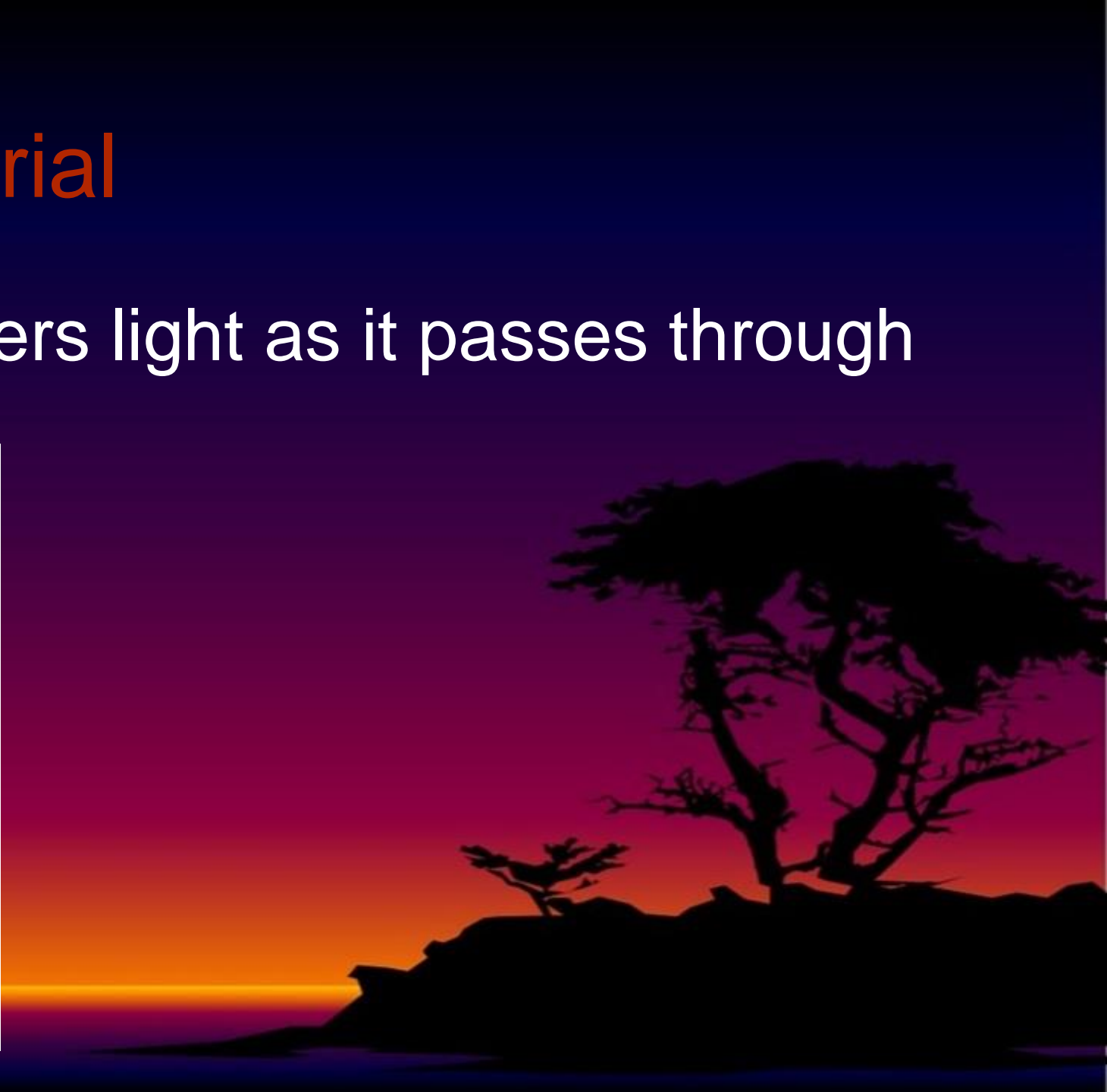
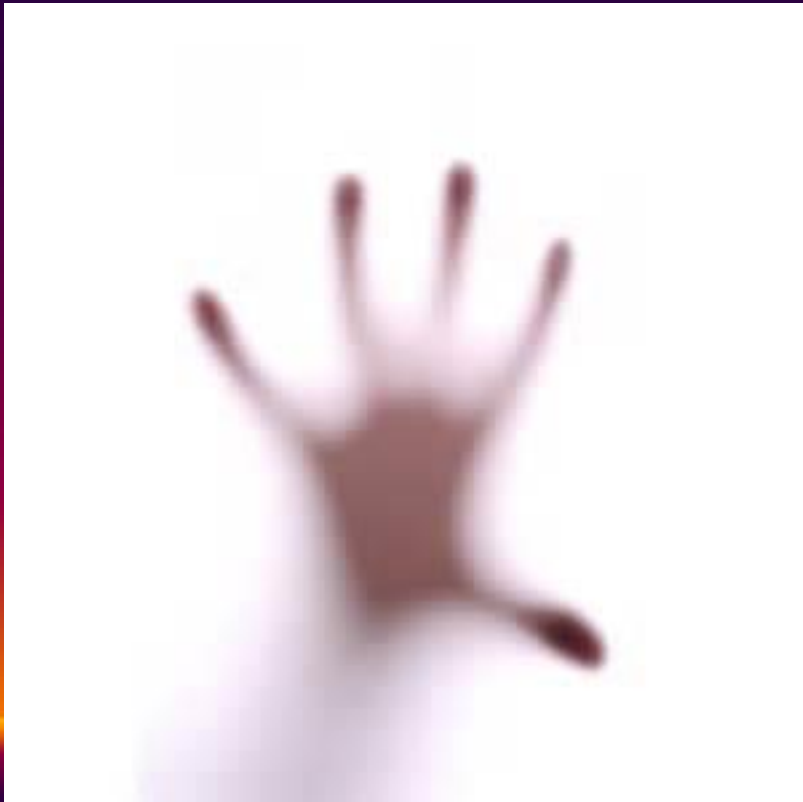
Transparent material

- A material that transmits light without scattering it.



Translucent material

- A material that scatters light as it passes through



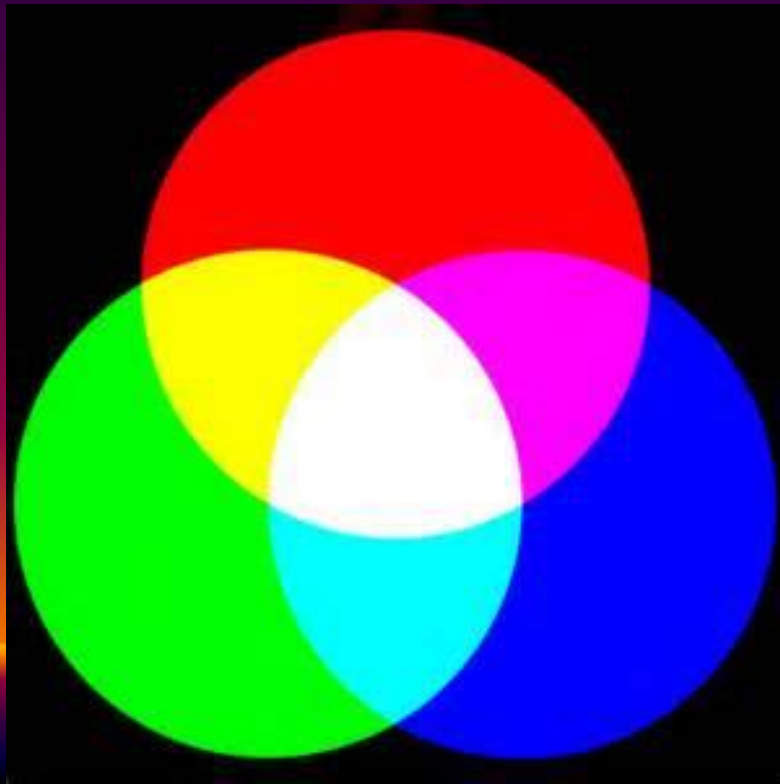
Opaque material

- A material that reflects or absorbs all of the light that strikes it.



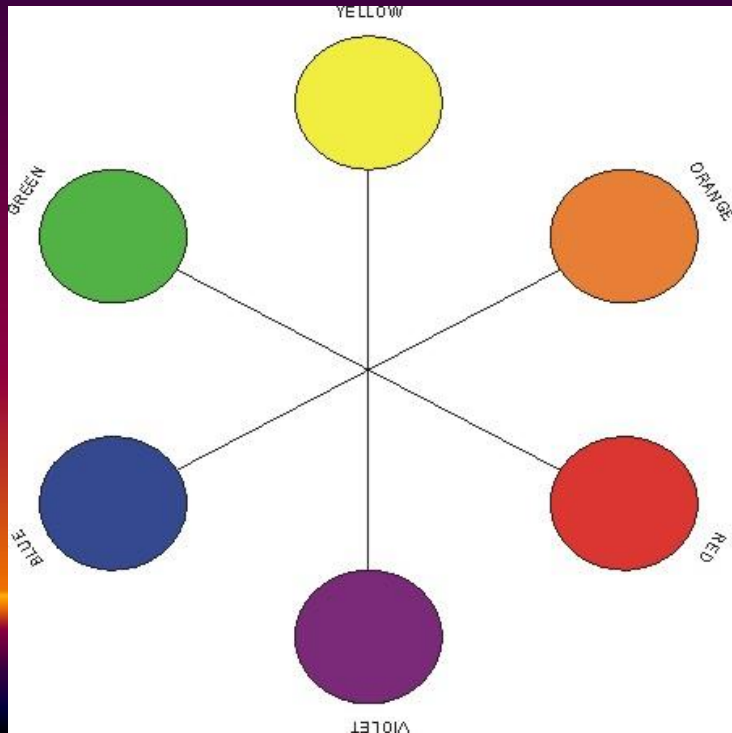
primary colors

- Three colors that can be used to make any other color.



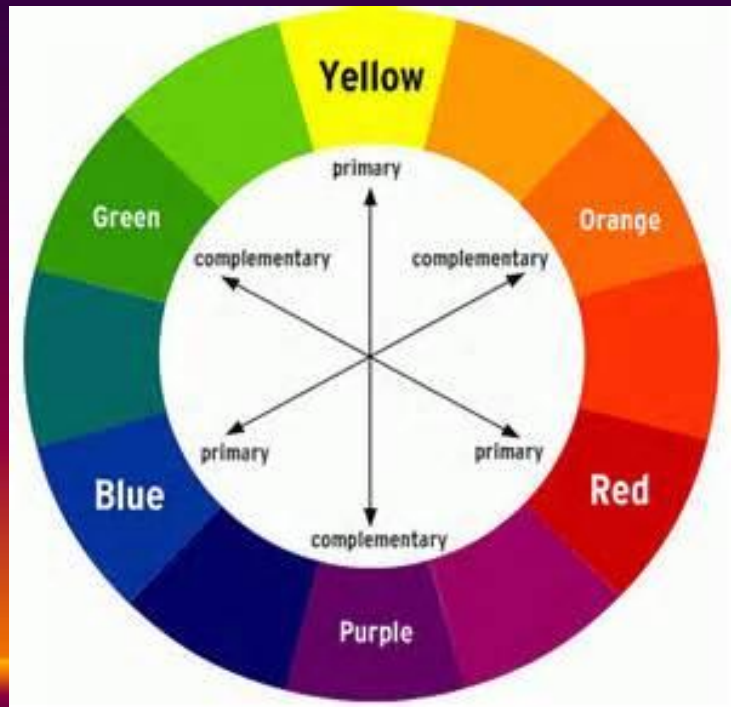
secondary colors

- Any color produced by combining equal amounts of any two primary colors.



Complementary colors

- Any two colors that combine to form white light or black pigment.



pigment

- A colored substance used to color other materials.



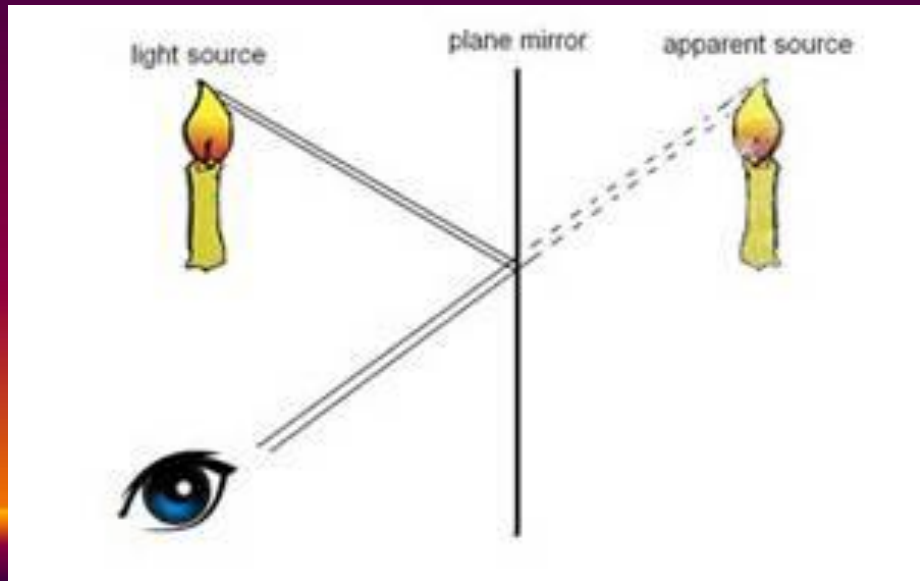
18.2 Reflection and Mirrors

- There are two types of reflection—regular reflection and diffuse reflection.



18.2 Reflection and Mirrors

- A plane mirror produces a virtual image that is upright and the same size as the object.



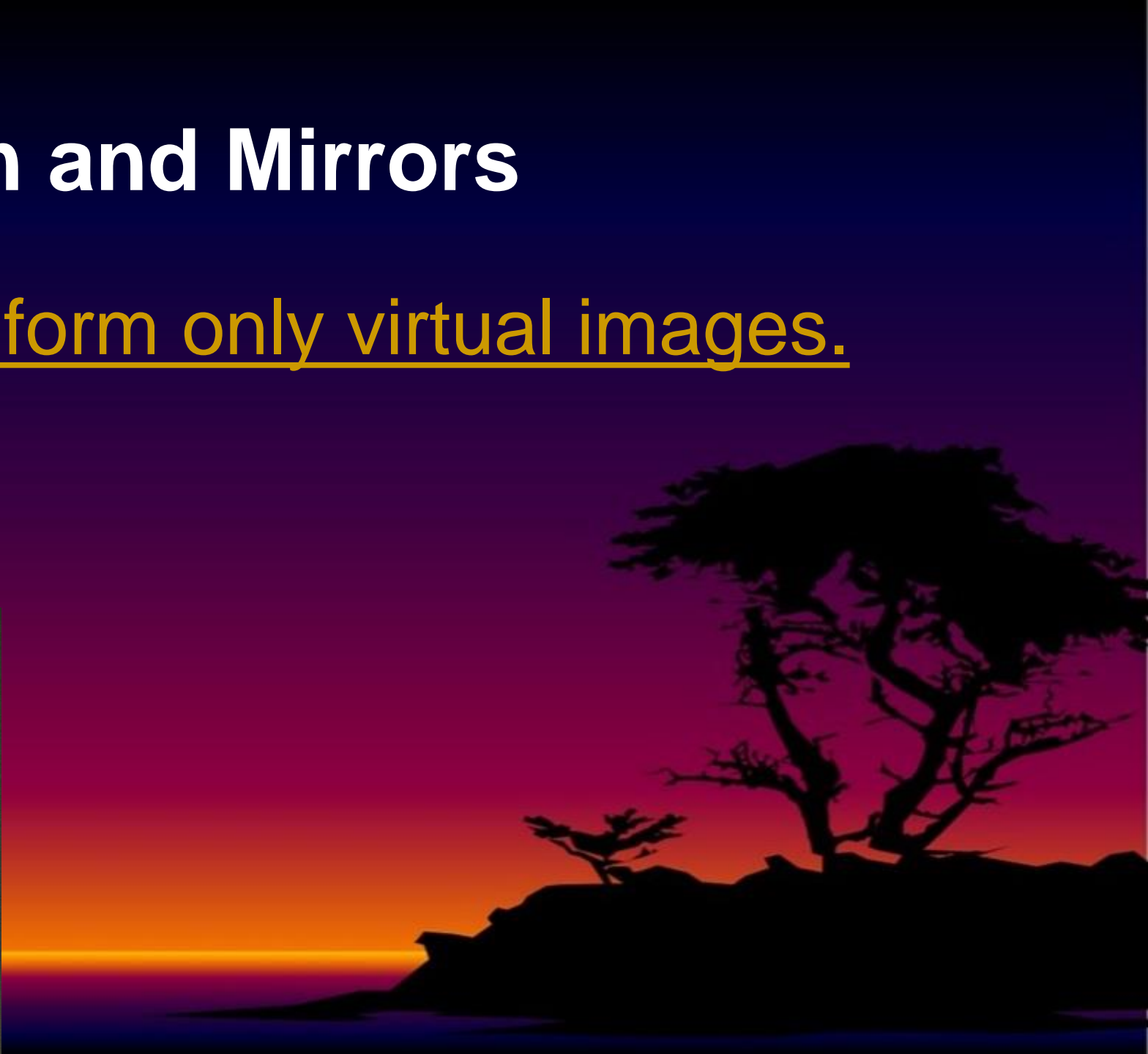
18.2 Reflection and Mirrors

- Concave mirrors form virtual or real images.



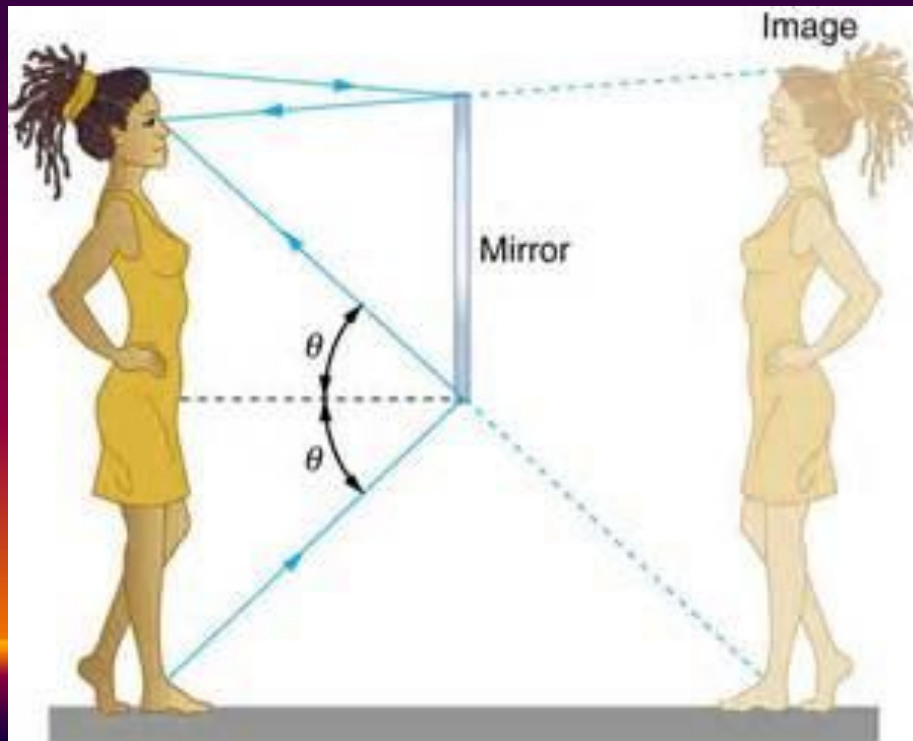
18.2 Reflection and Mirrors

- Convex mirrors form only virtual images.



ray

- A straight line used to represent a light wave.



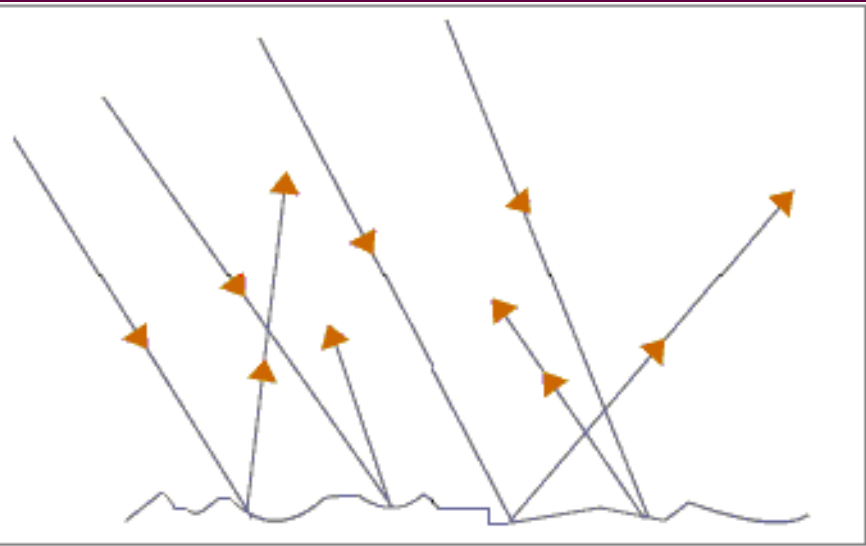
regular reflection

- A reflection that occurs when parallel rays of light hit a smooth surface and all reflect at the same angle.



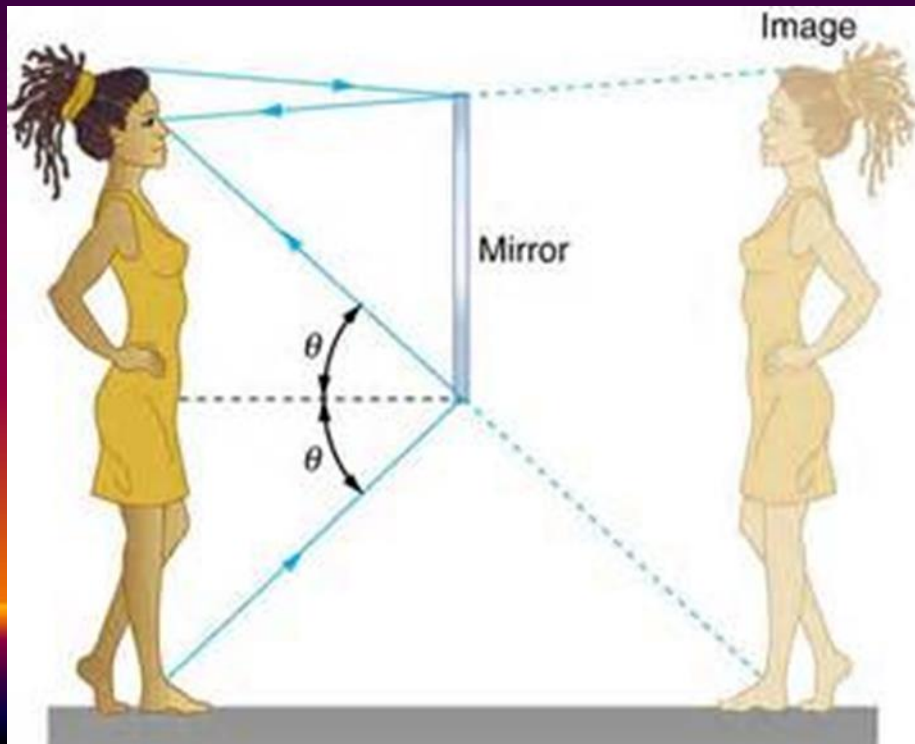
diffuse reflection

- A reflection that occurs when parallel rays of light hit a rough surface and reflect at different angles.



plane mirror

- A flat mirror that produces an upright, virtual image the same size as an object.



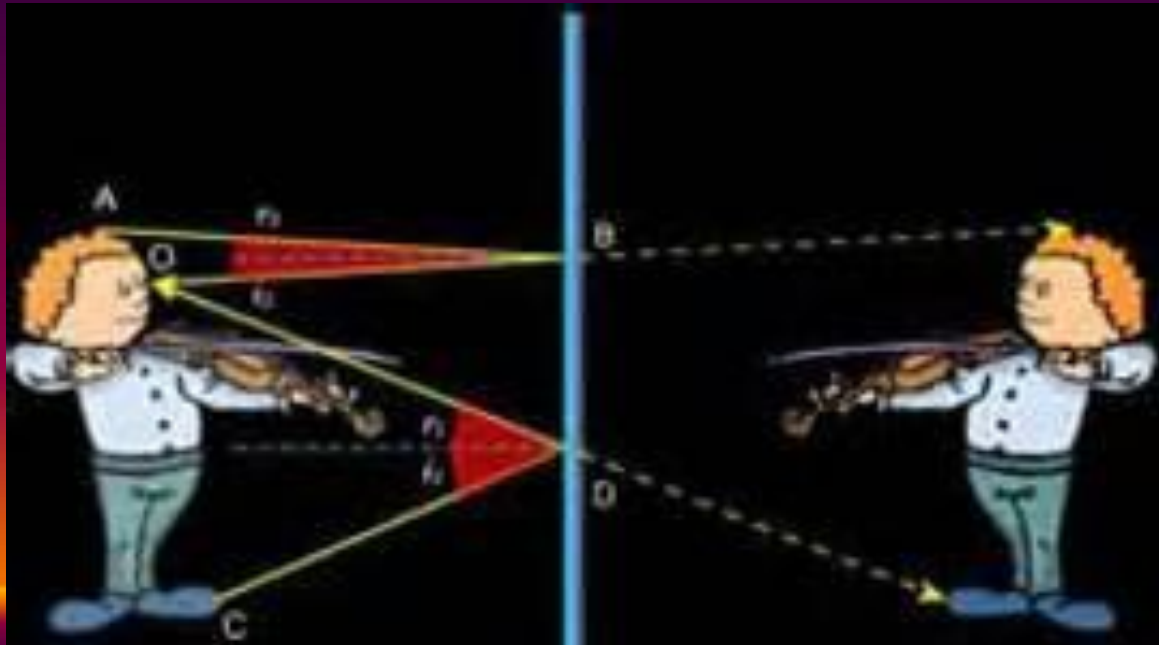
image

- A copy of an object formed by reflected or refracted rays of light.



virtual image

- An upright image formed where rays of light appear to meet or come from



concave mirror

- A mirror with a surface that curves inward.



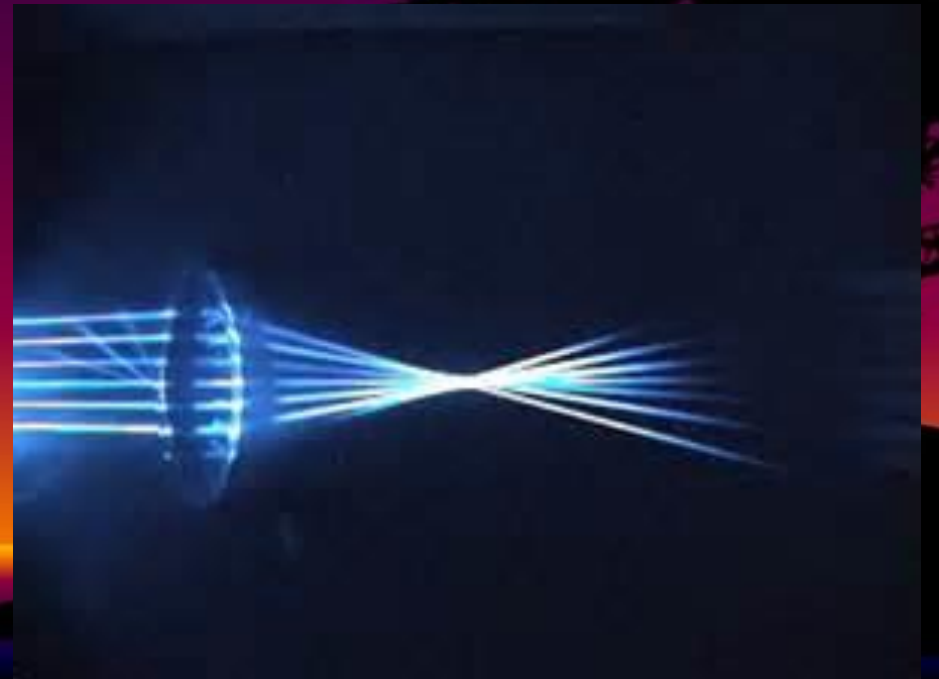
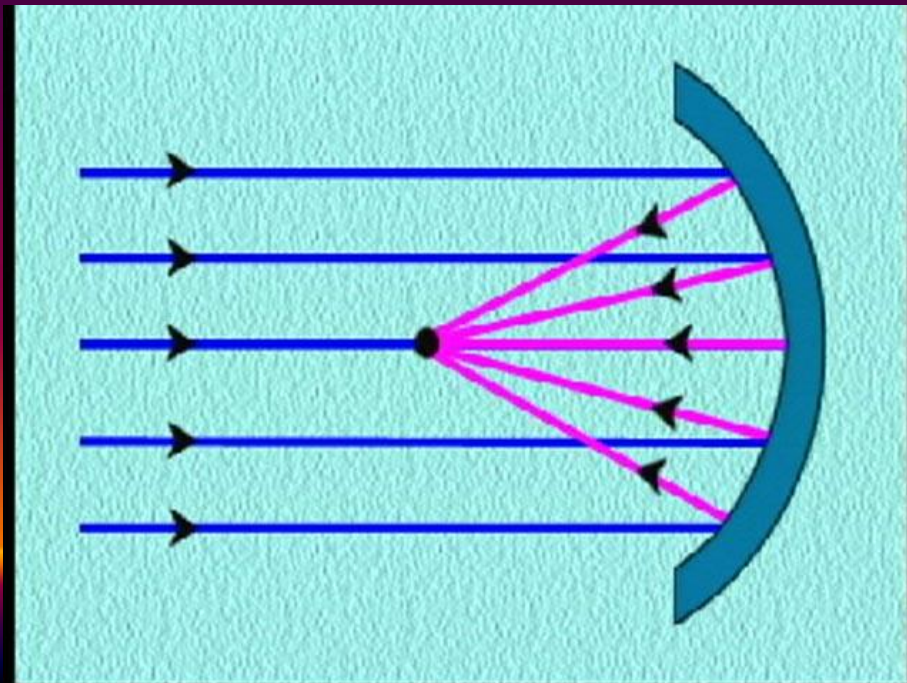
optical axis

- An imaginary line that divides a mirror in half.



focal point

- The point at which light rays parallel to the optical axis meet, or appear to meet, after being reflected or refracted by a mirror or lens.



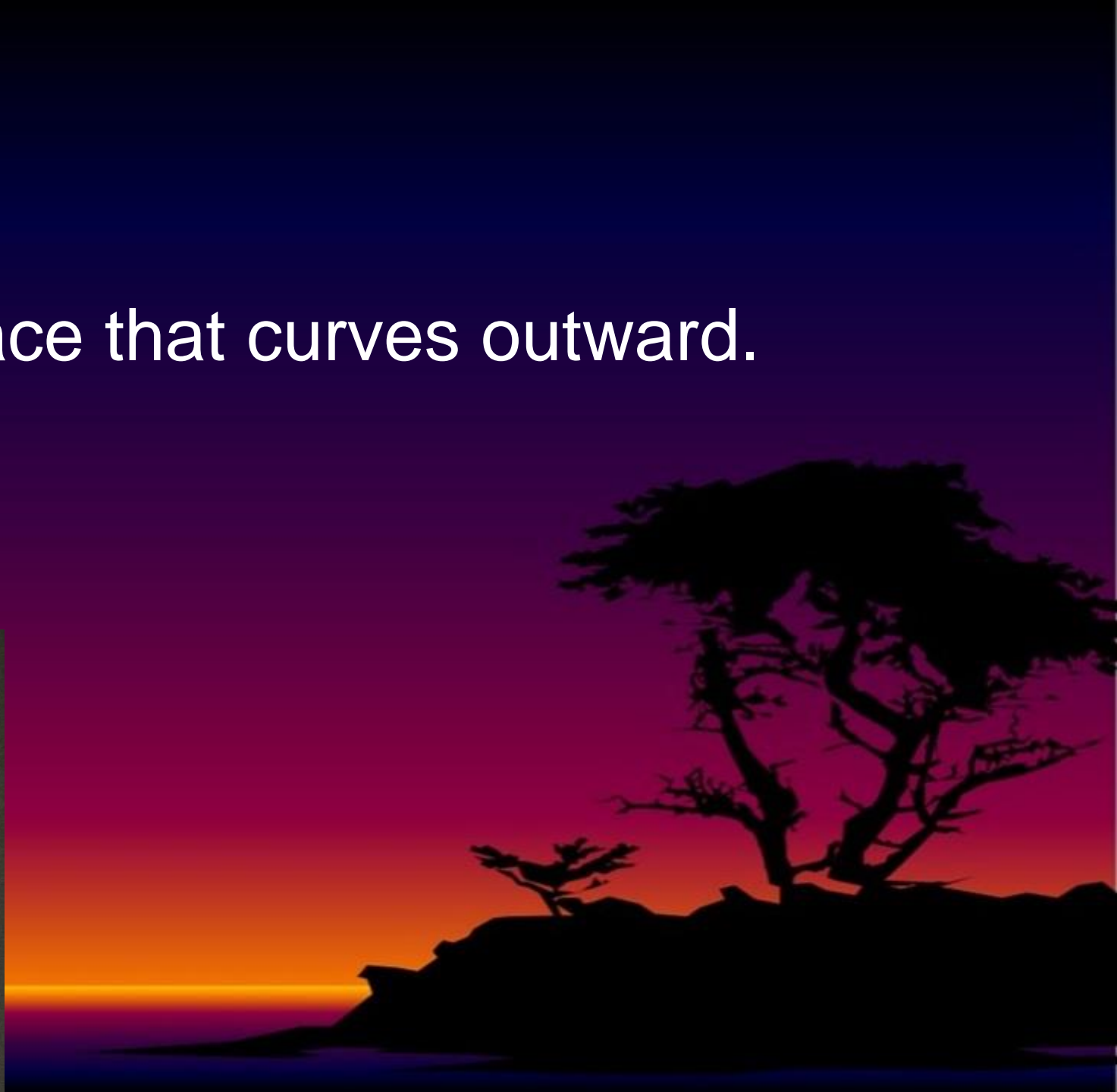
real image

- An upside-down image formed where rays of light meet.



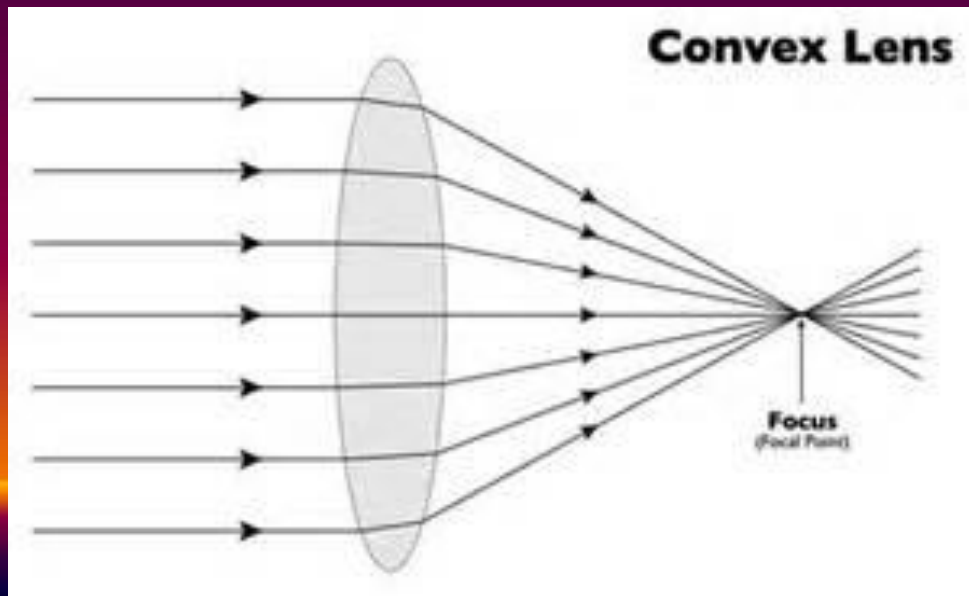
convex mirror

- A mirror with a surface that curves outward.



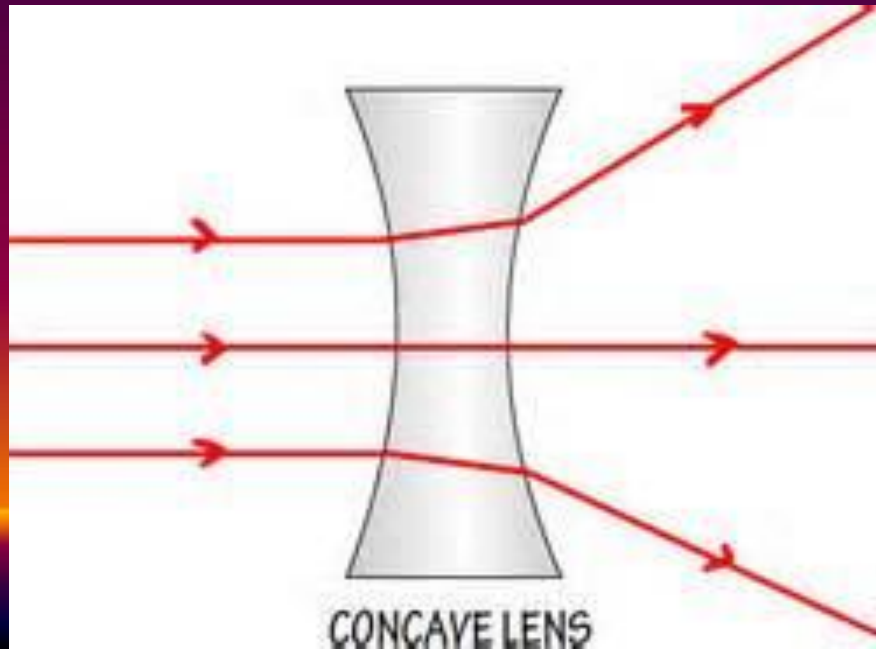
18.3 Refraction and Lenses

- A convex lens can form virtual images or real images.



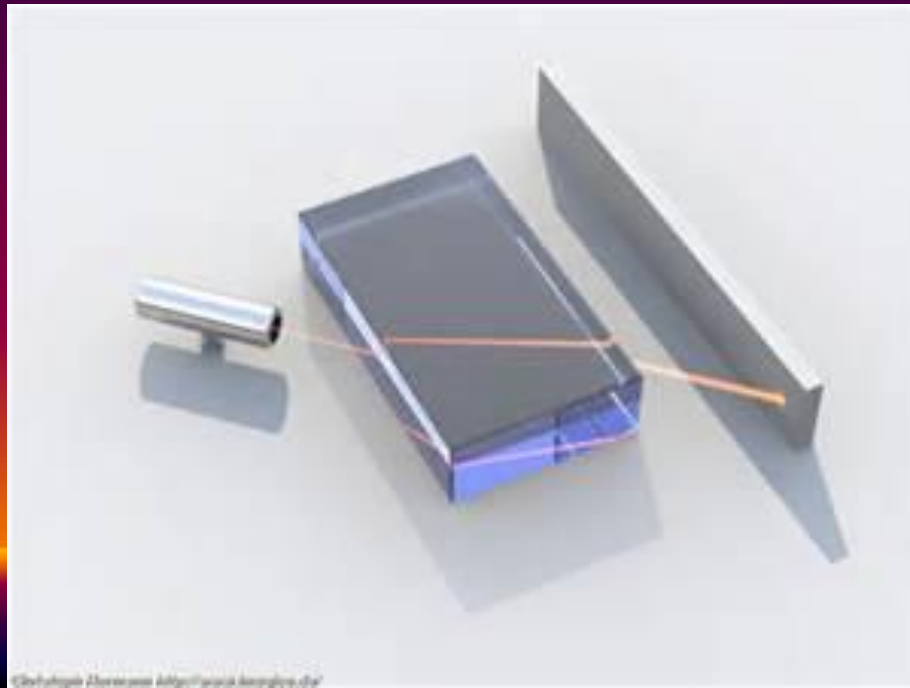
18.3 Refraction and Lenses

- A concave lens can produce only virtual images



index of refraction

- A measure of the amount a ray of light bends when it passes from one medium to another.



mirage

- An image of a distant object caused by refraction of light as it travels through air of varying temperature.



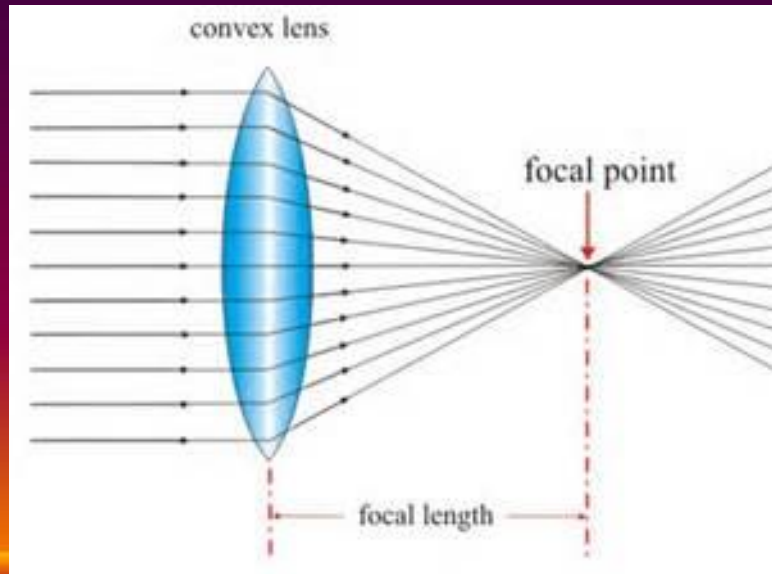
lens

- A curved piece of glass or other transparent material that is used to refract light.



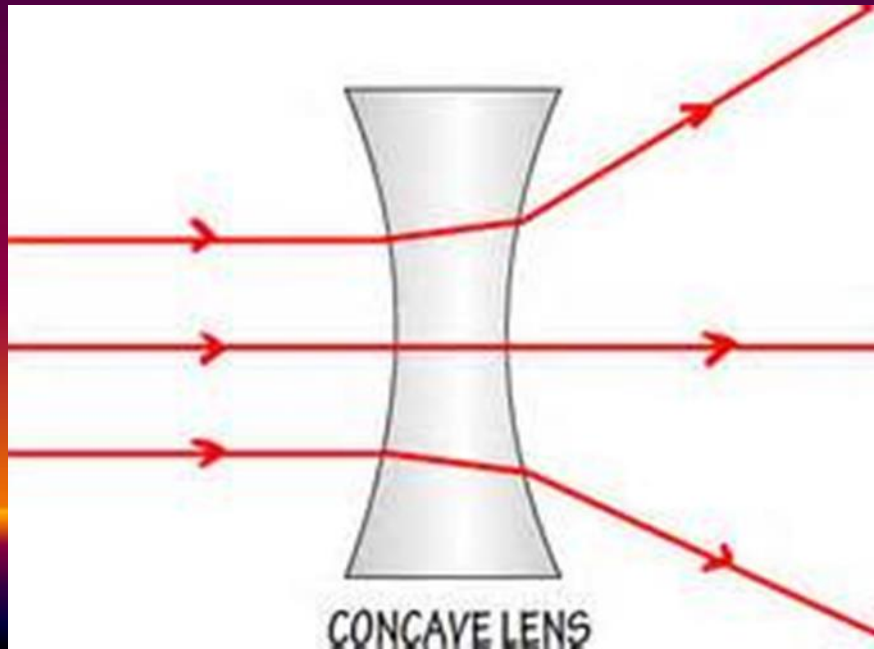
convex lens

- A lens that is thicker in the center than at the edges.



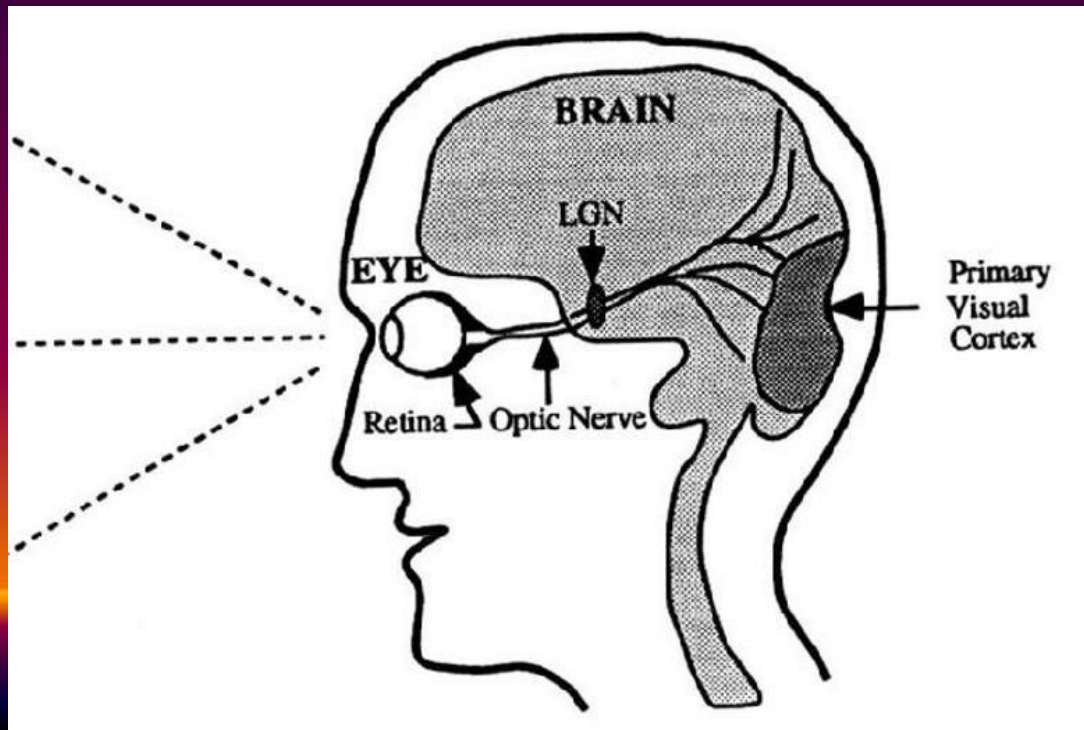
concave lens

- A lens that is thinner in the center than at the edges.



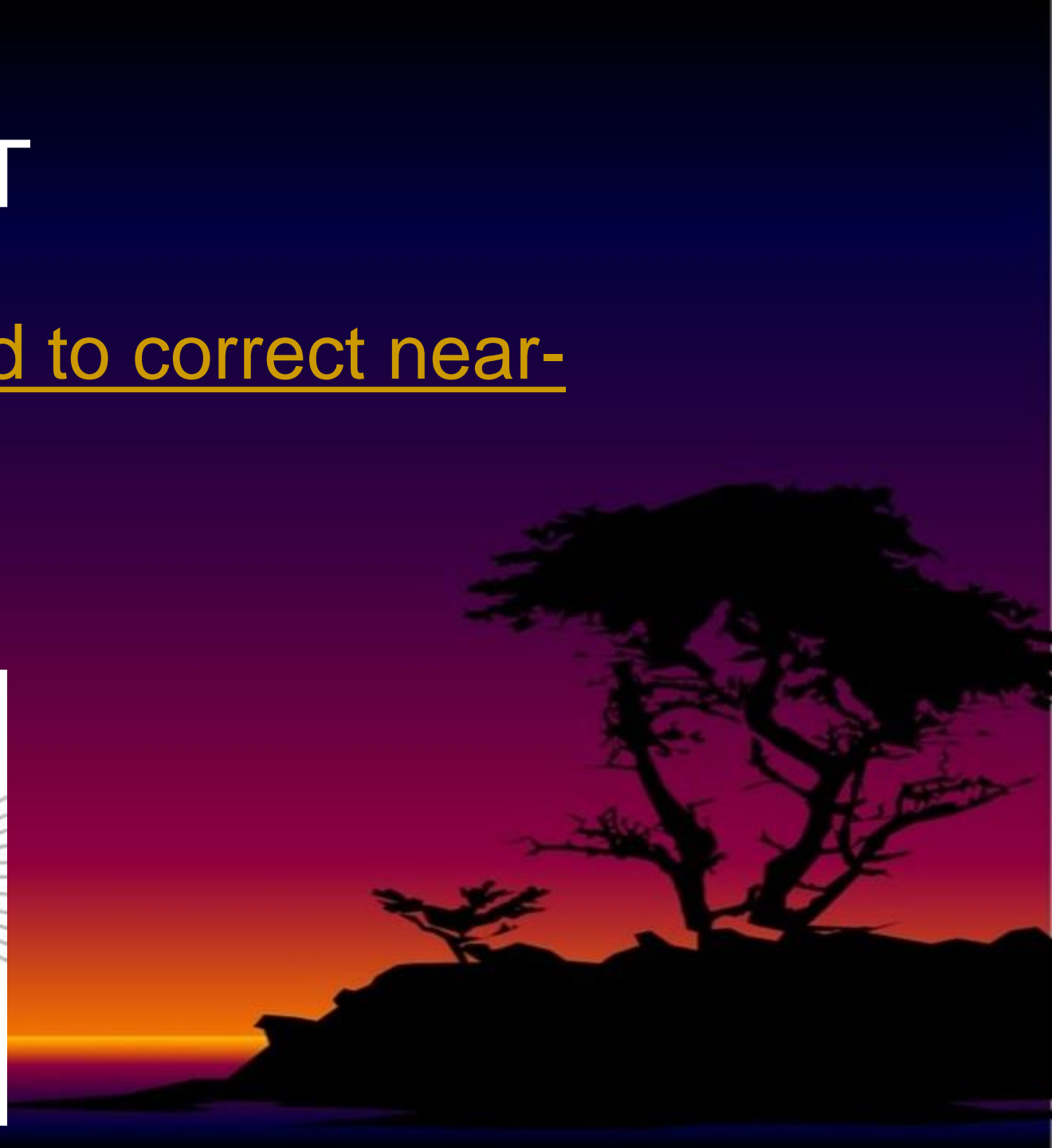
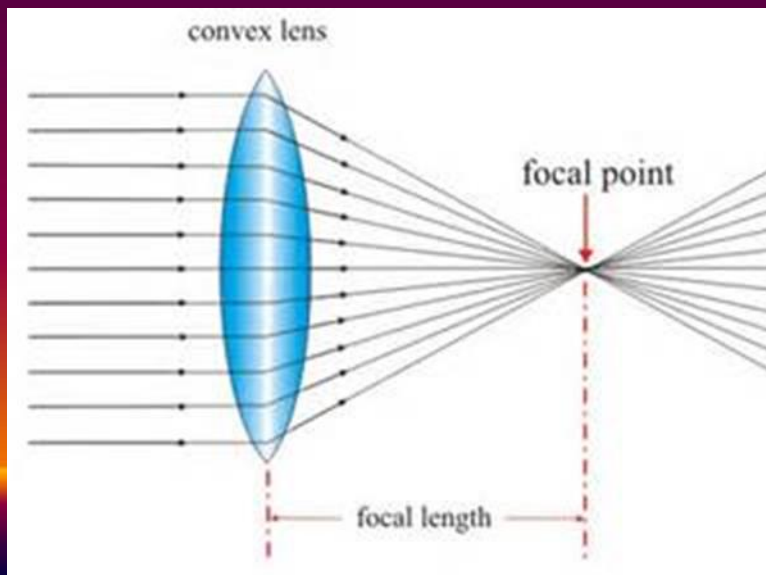
18.4 SEEING LIGHT

- You see objects when a process occurs that involves both your eyes and your brain.



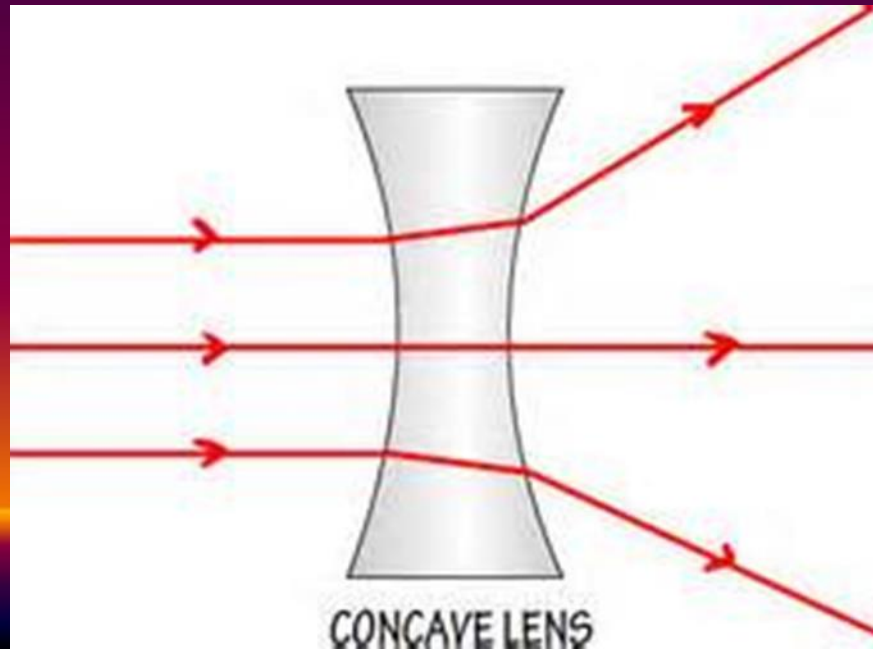
18.4 SEEING LIGHT

- Convex lenses are used to correct near-sightedness.



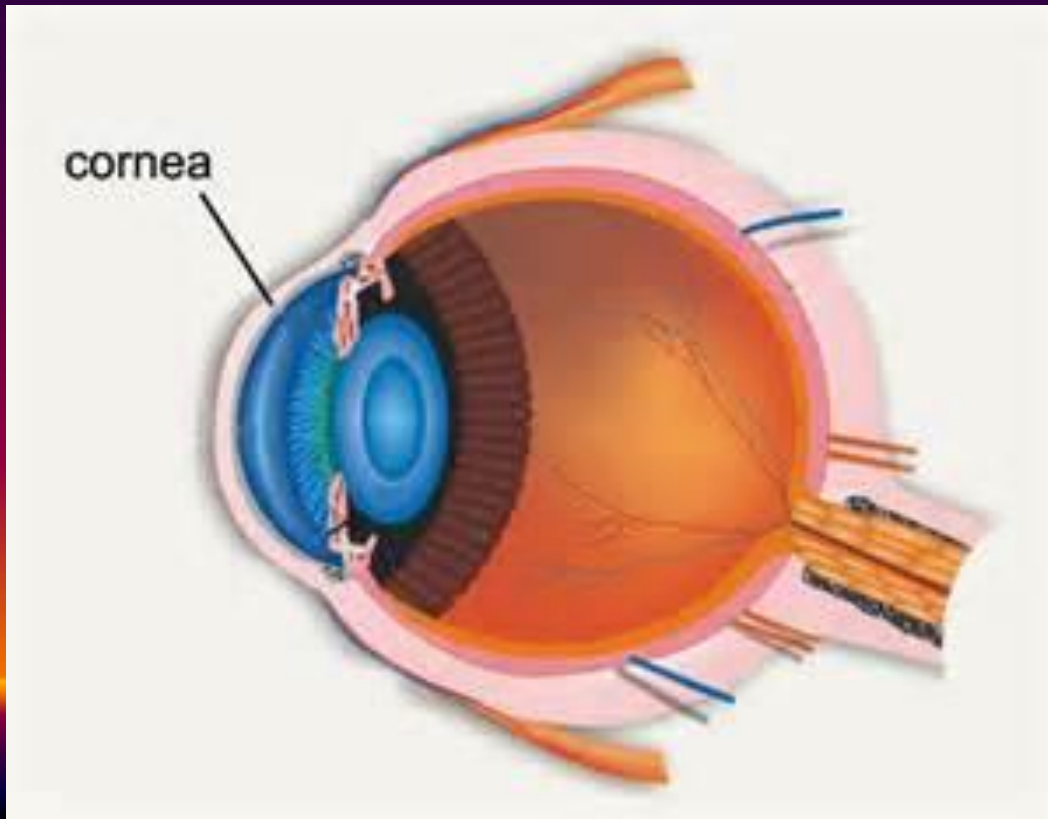
18.4 SEEING LIGHT

- Concave lenses are used to correct farsightedness.



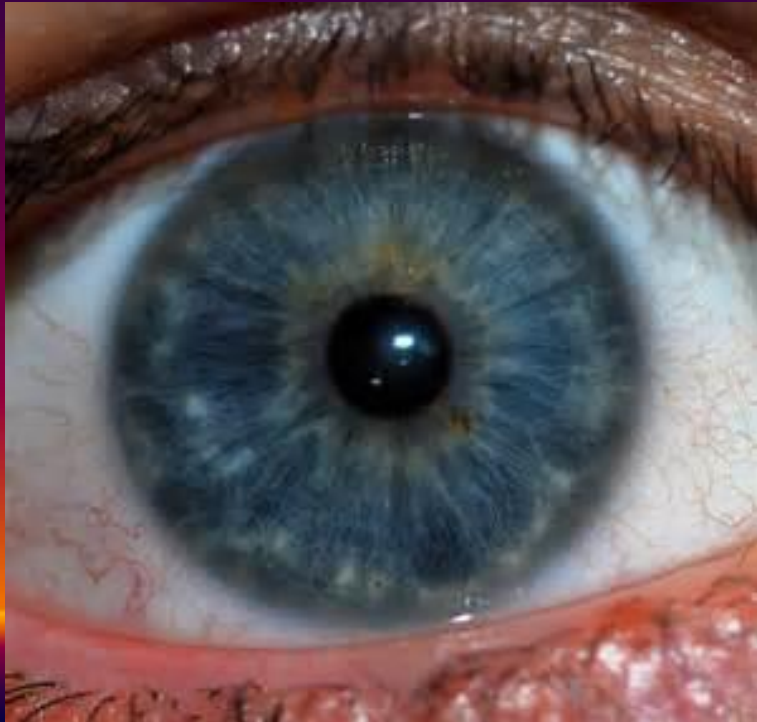
cornea

- The transparent front surface of the eye.



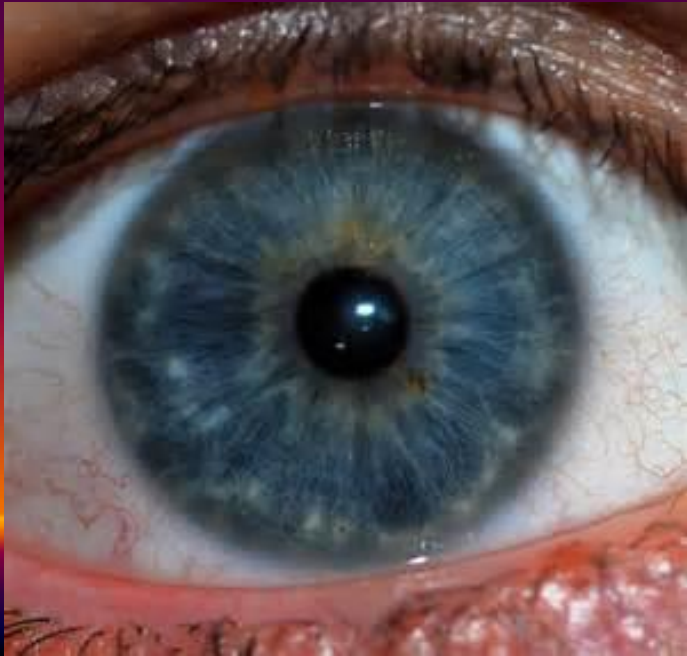
pupil

- The opening in the center of the iris through which light enters the inside of the eye.



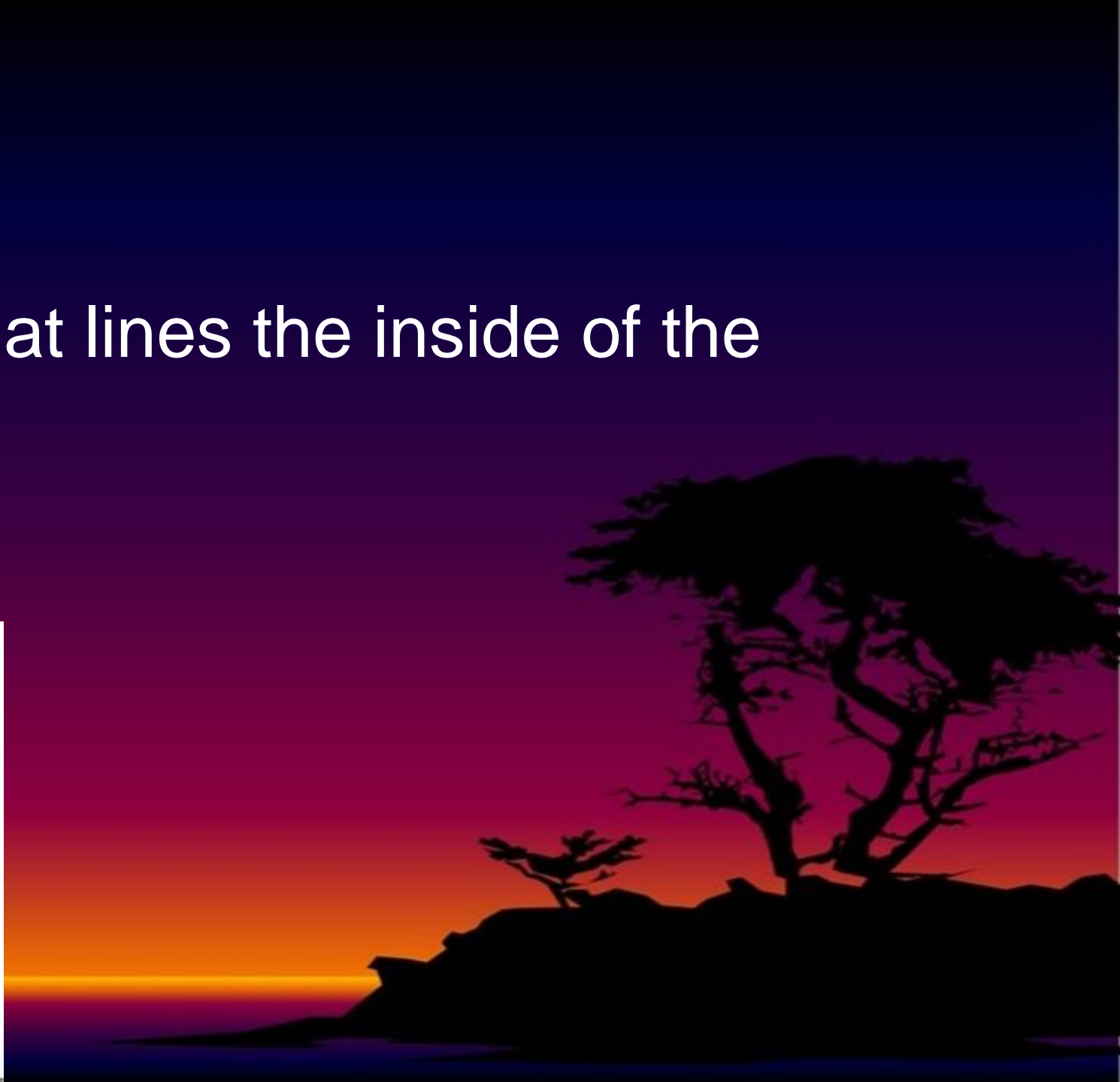
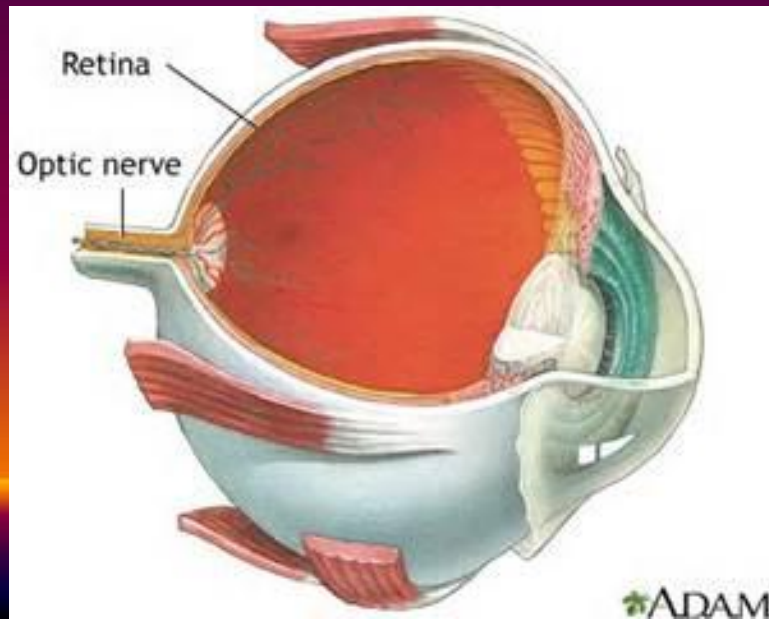
iris

- The ring of muscle that controls the size of the pupil and gives the eye its color.



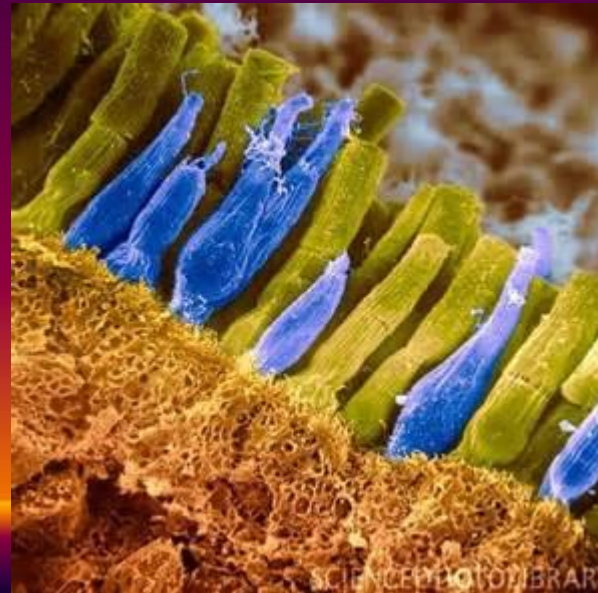
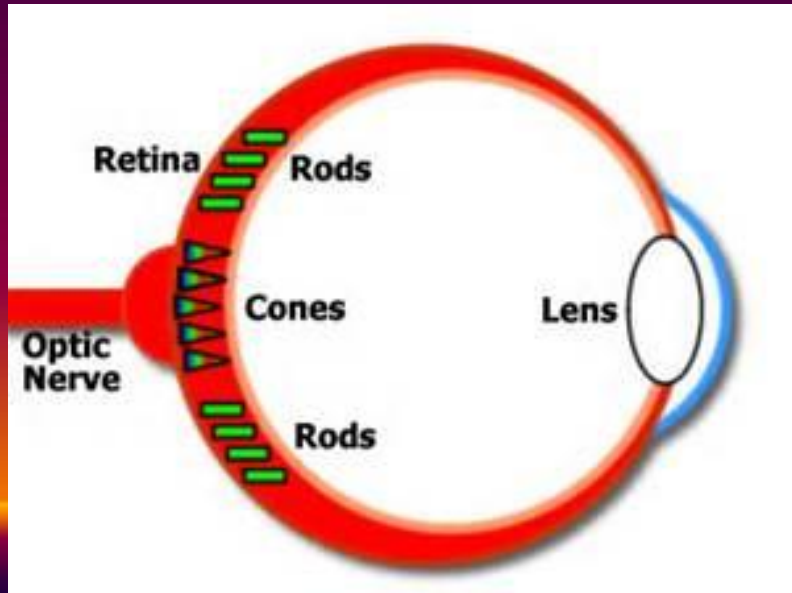
retina

- The layer of cells that lines the inside of the eyeball.



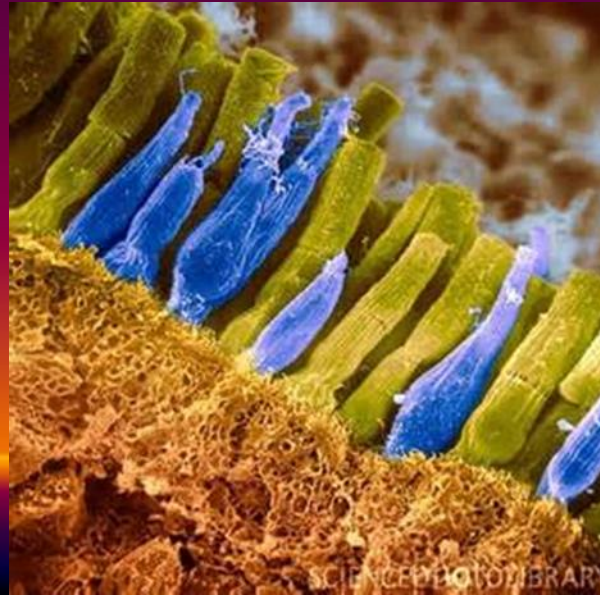
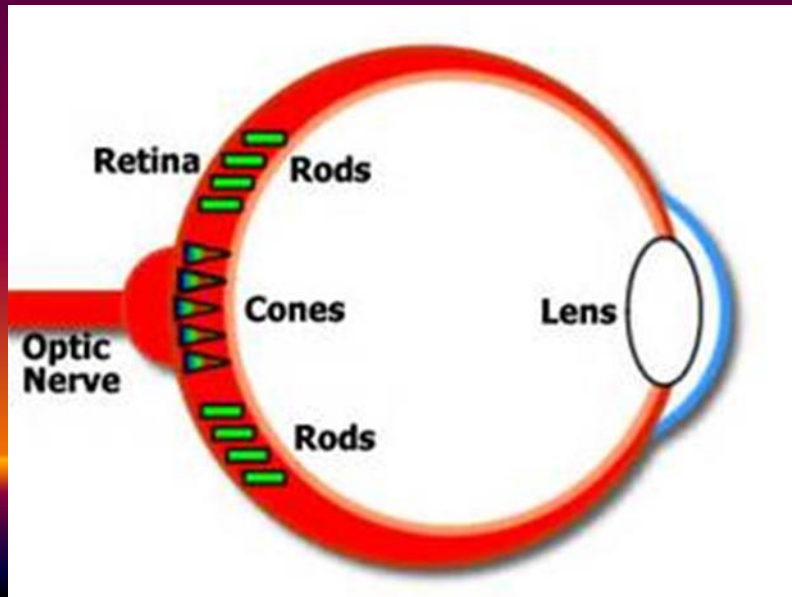
rods

- Cells in the retina that detect dim light.



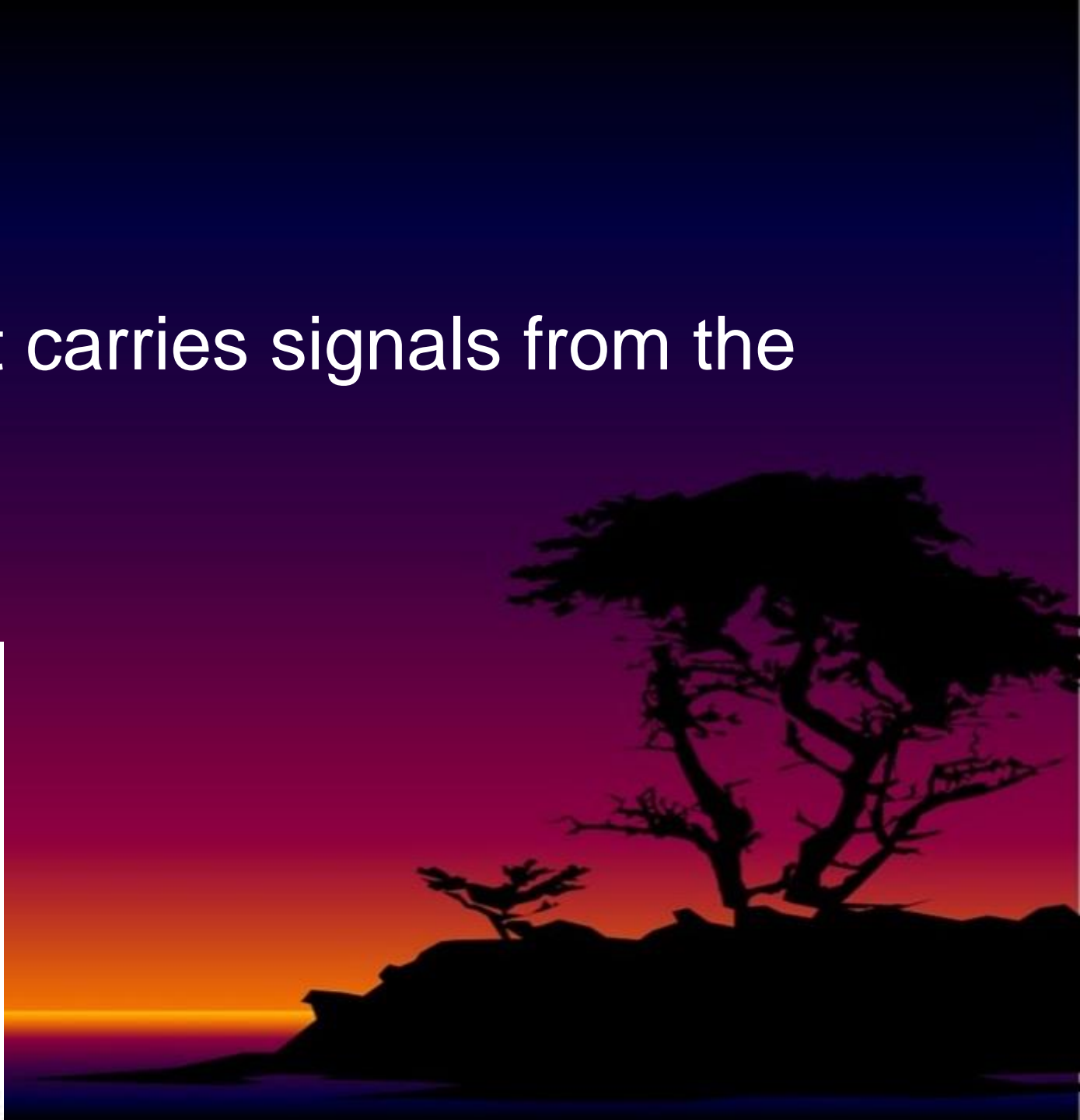
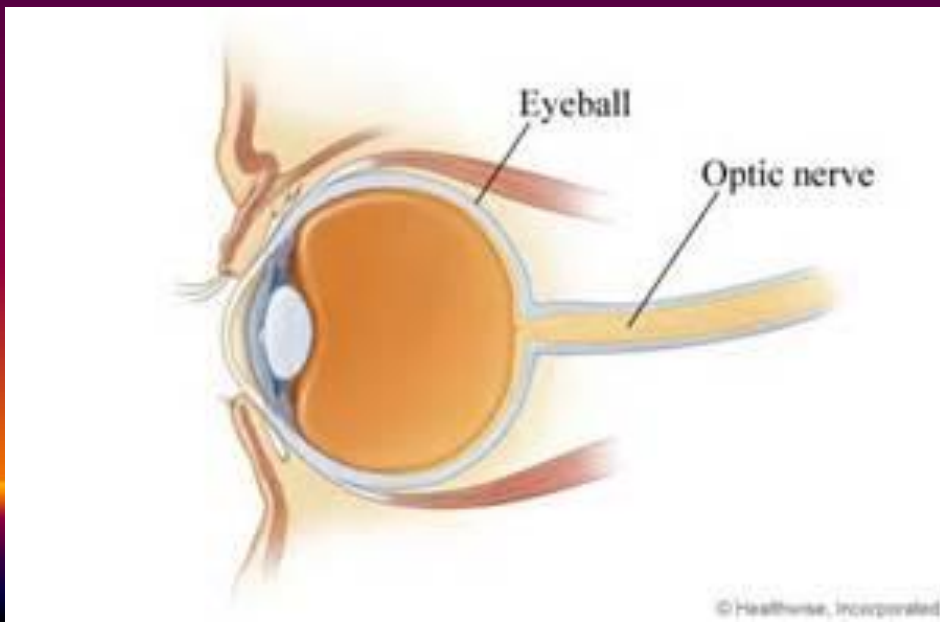
cones

- Cells in the retina that respond to and detect color.



optic nerve

- Short, thick nerve that carries signals from the eye to the brain.



nearsightedness

- A condition that causes a person to see distant objects as blurry



farsightedness

- A condition that causes a person to see nearby objects as blurry.



18.5 USING LIGHT

- Telescopes use lenses or mirrors to collect and focus light from distant objects



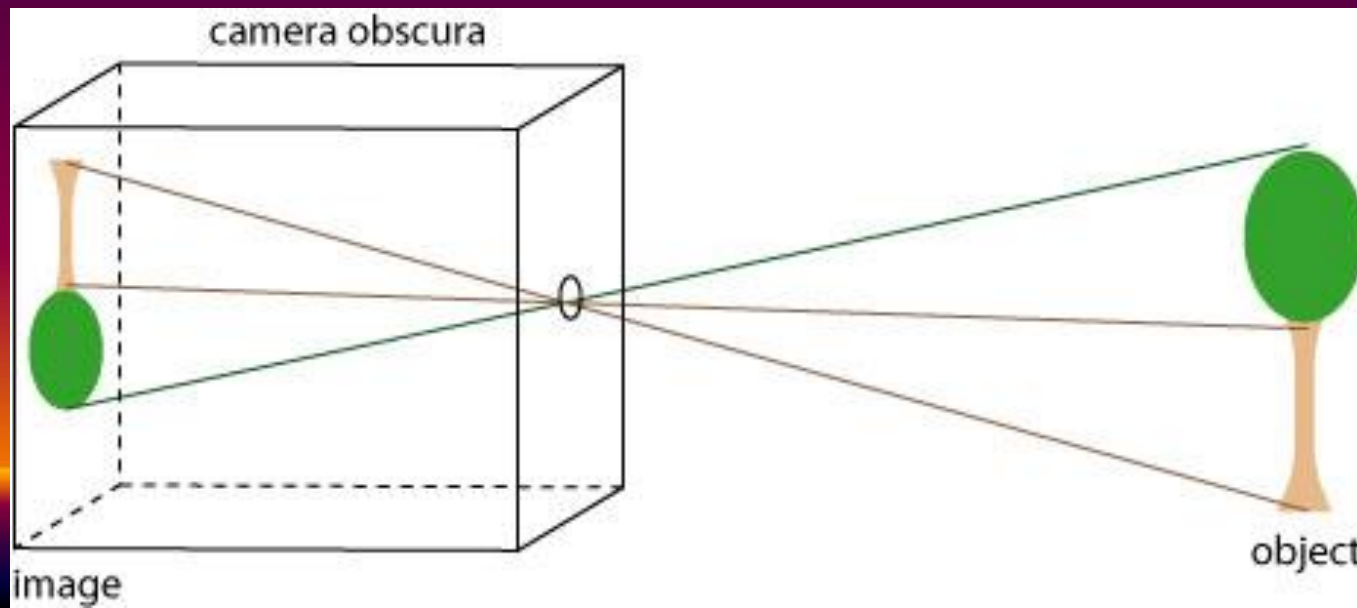
18.5 USING LIGHT

- A microscope uses a combination of lenses to produce and magnify an image.



18.5 USING LIGHT

- The lens of a camera focuses light to form a real, upside-down image on film in the back of the camera.



18.5 USING LIGHT

- Laser light consists of light waves that all have the same wavelength, or color. The waves are coherent, or in step.



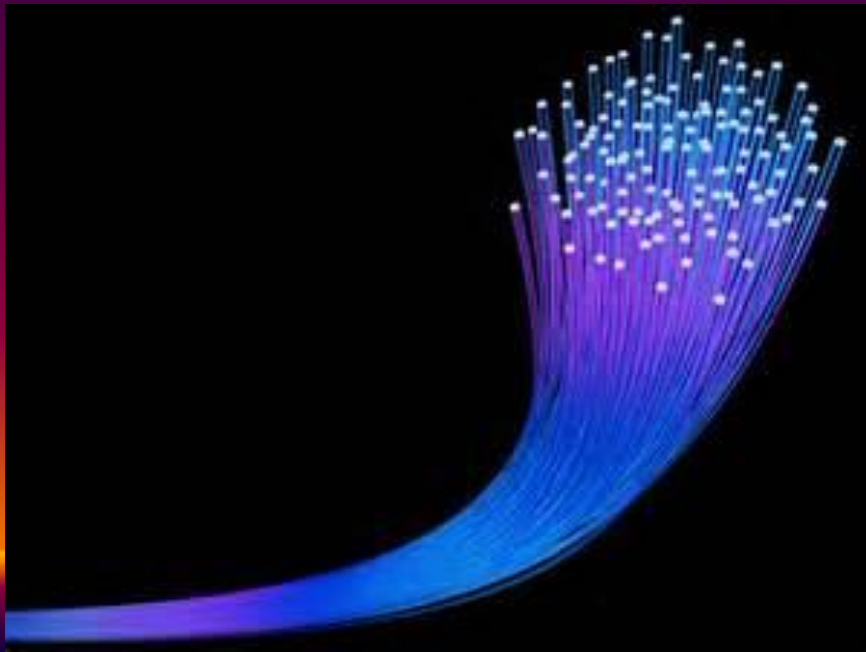
18.5 USING LIGHT

- In addition to their use by stores, industry, and engineers, lasers are used to read information on compact discs, create holograms, and perform surgery.



18.5 USING LIGHT

- Optical fibers can carry a laser beam for long distances because the beam stays totally inside the fiber as it travels.



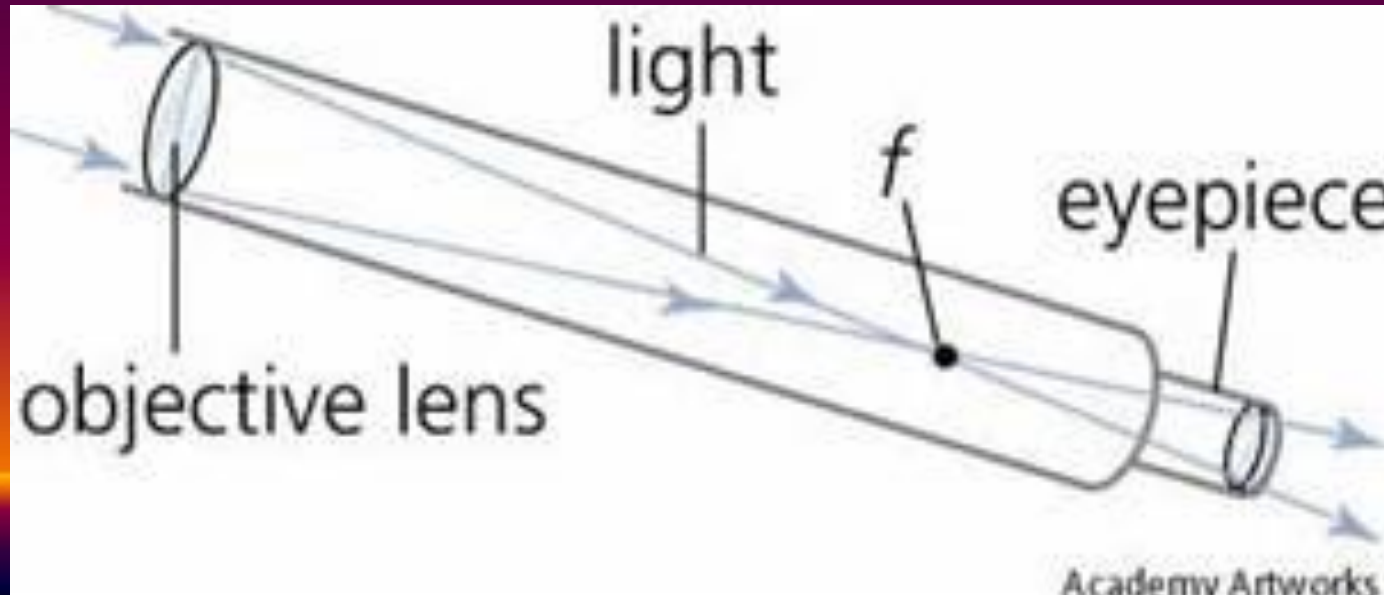
telescope

- An optical instrument that forms enlarged images of distant objects.



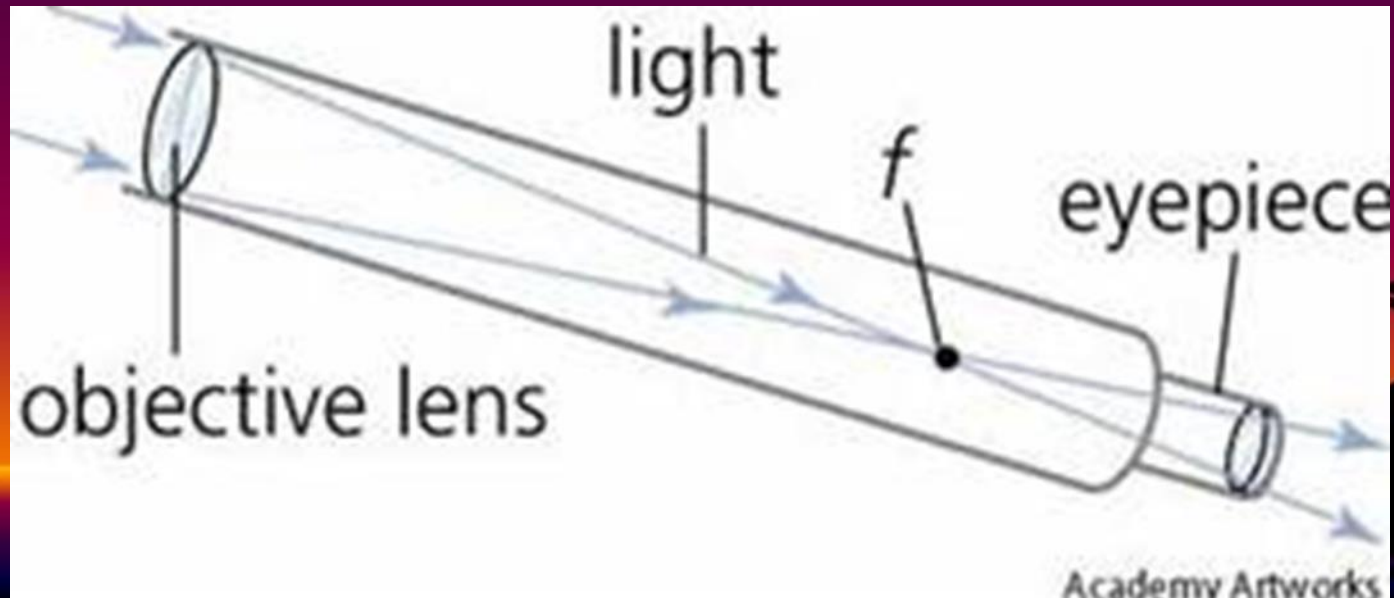
refracting telescope

- A telescope that uses two convex lenses to form images.



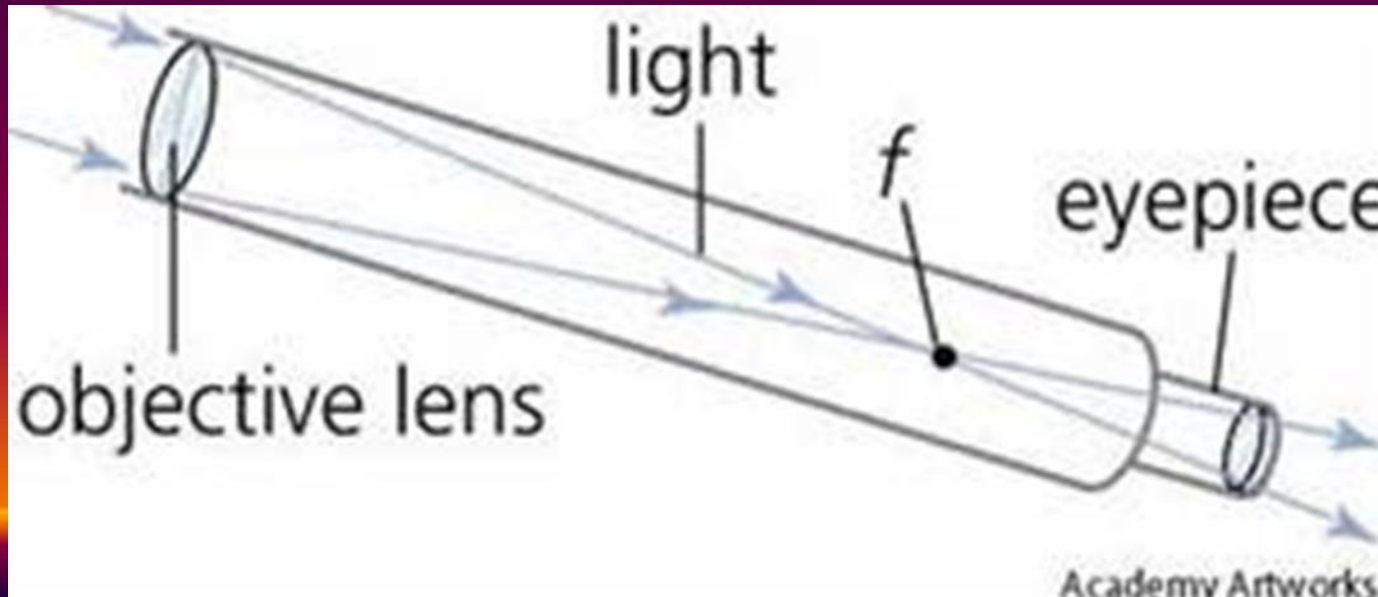
objective

- A lens that gathers light from an objects and forms a real image.



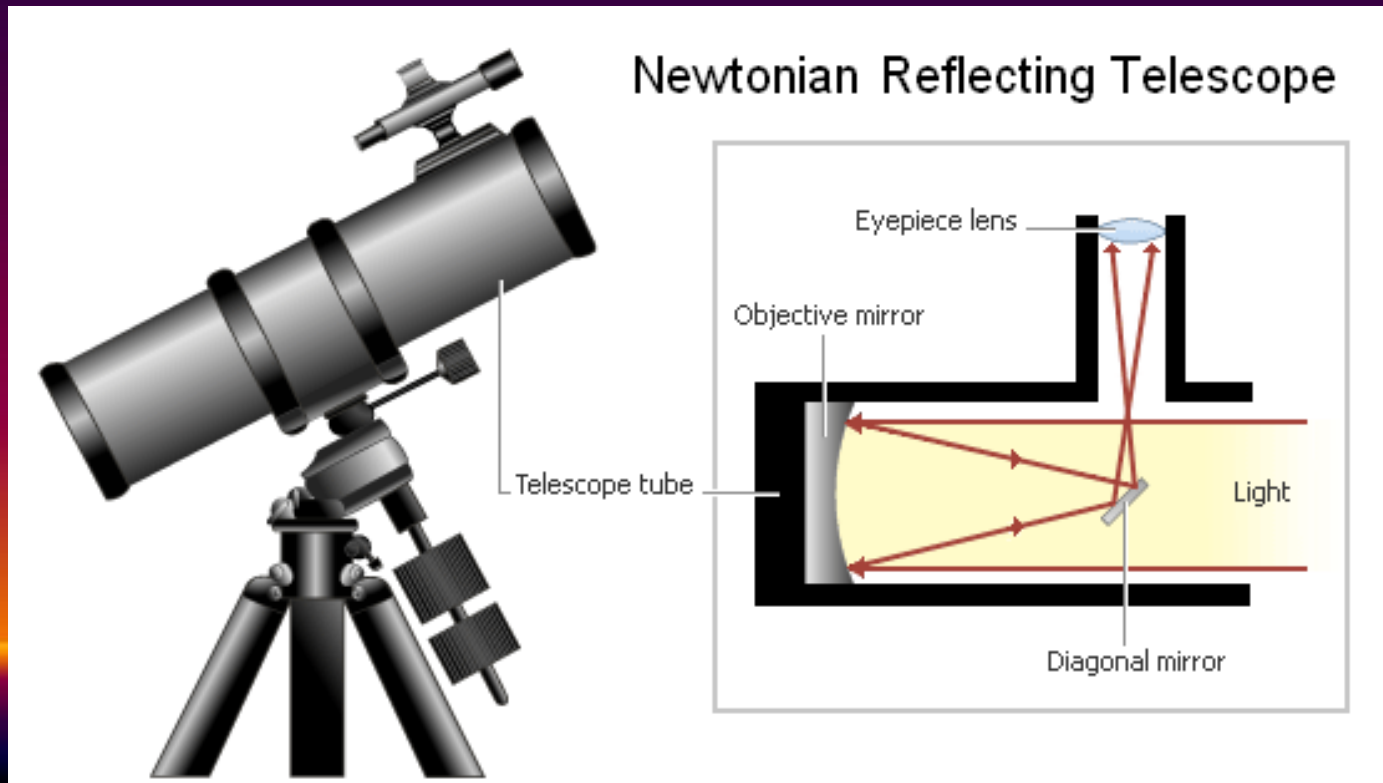
eyepiece

- A lens that magnifies the image formed by the objective.



reflecting telescope

- A telescope that uses a concave mirror to gather light from distant objects.



microscope

- An optical instrument that forms enlarged images of tiny objects.



camera

- An optical instrument that uses lenses to focus light, and film to record an image of an object.



laser

- A device that produces a narrow beam of coherent light.



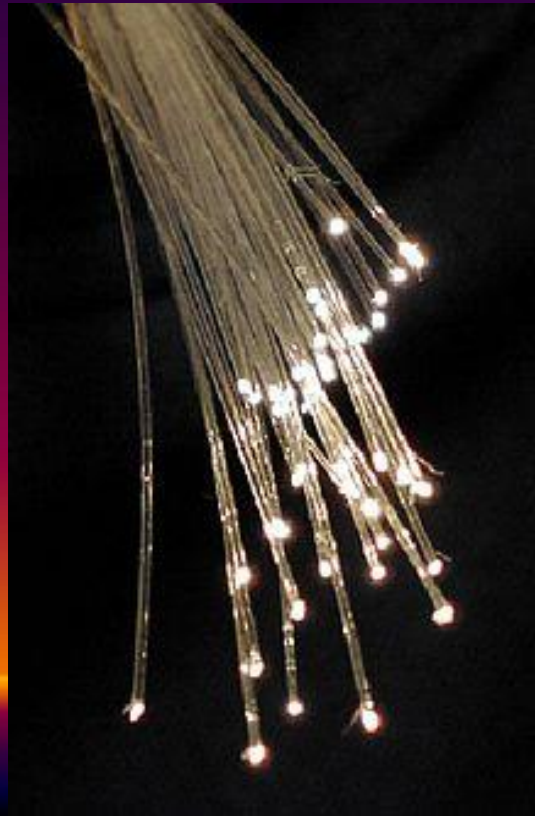
hologram

- A three dimensional photograph created using lasers.



optical fiber

- A long, thin strand of glass or plastic that can carry light for long distances without allowing the light to escape.



total internal reflection

- The complete reflection of light by the inside surface of a medium

