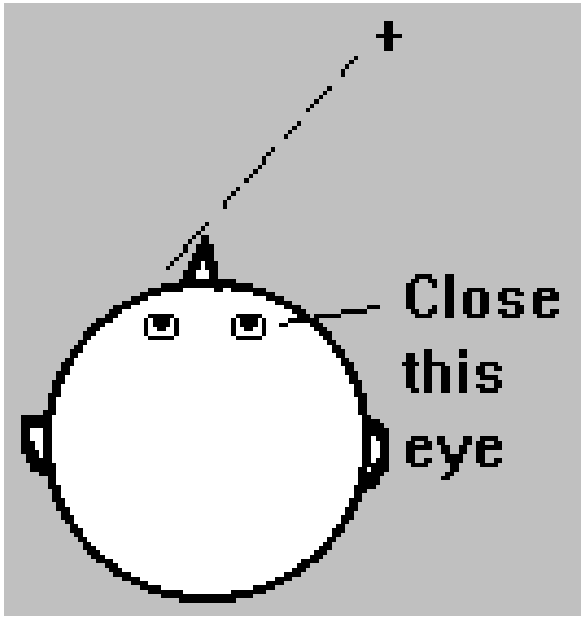
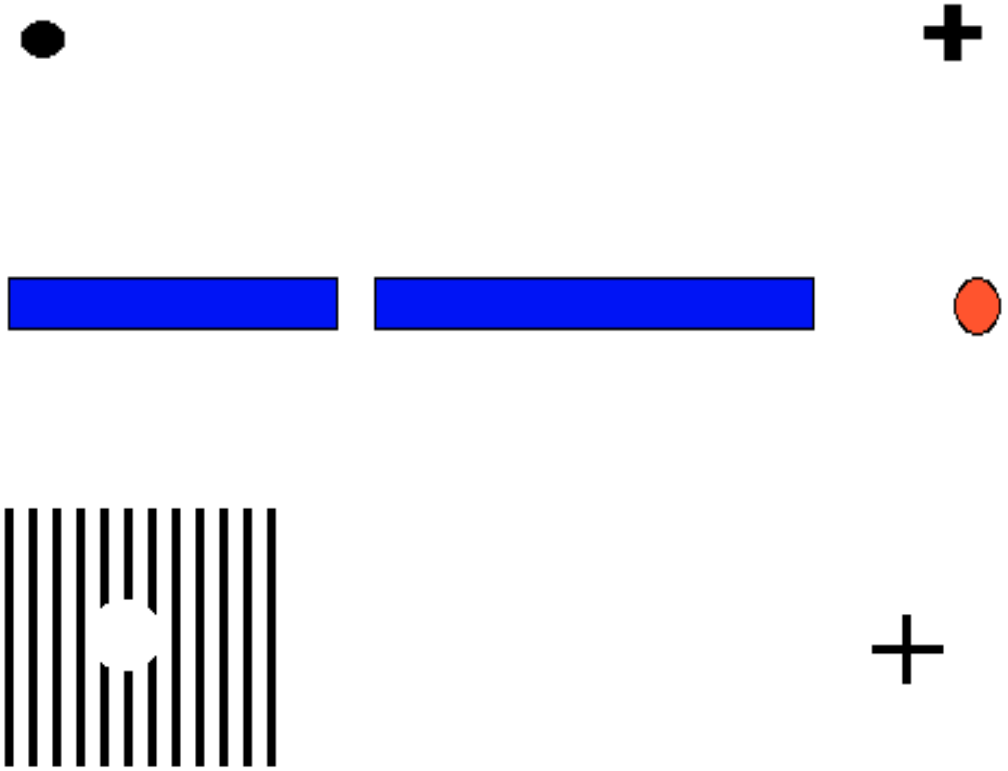
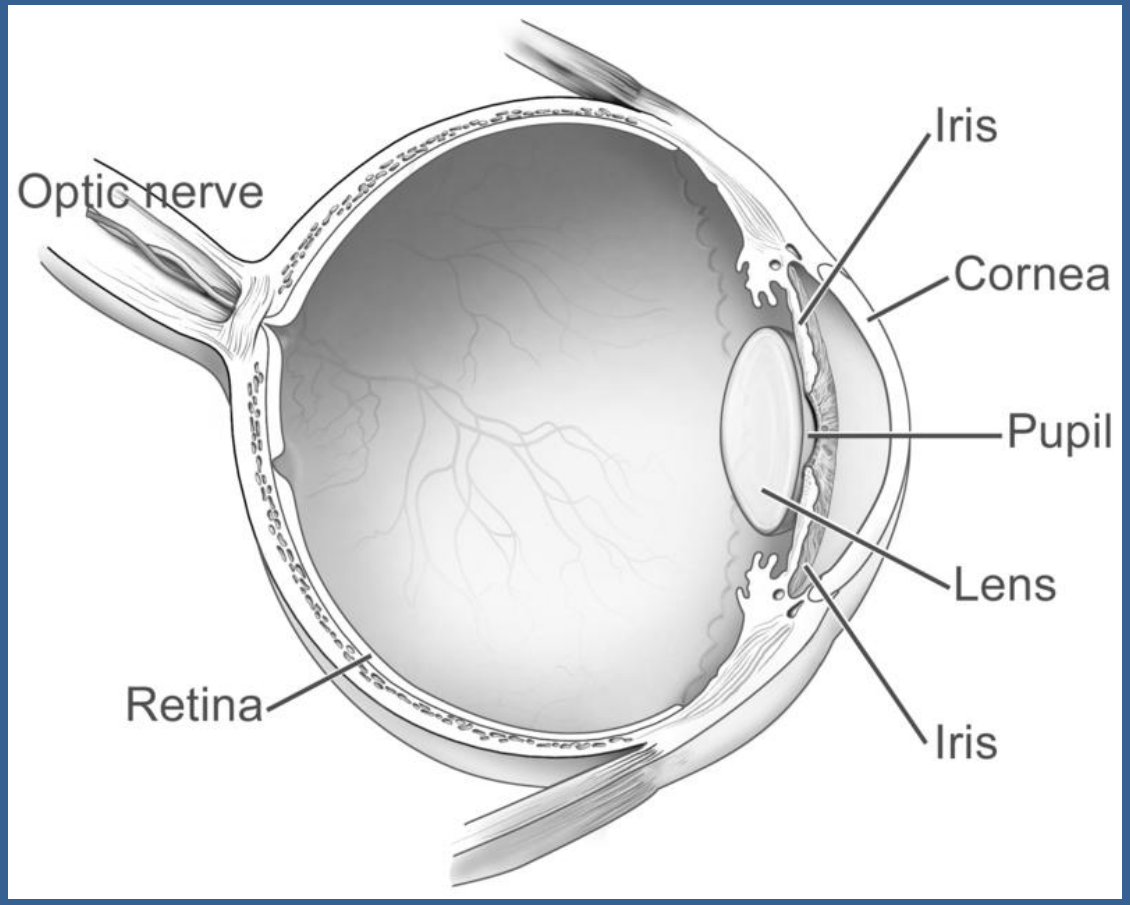
6.P.1.2: Explain the relationship among visible light, the electromagnetic spectrum, and sight.

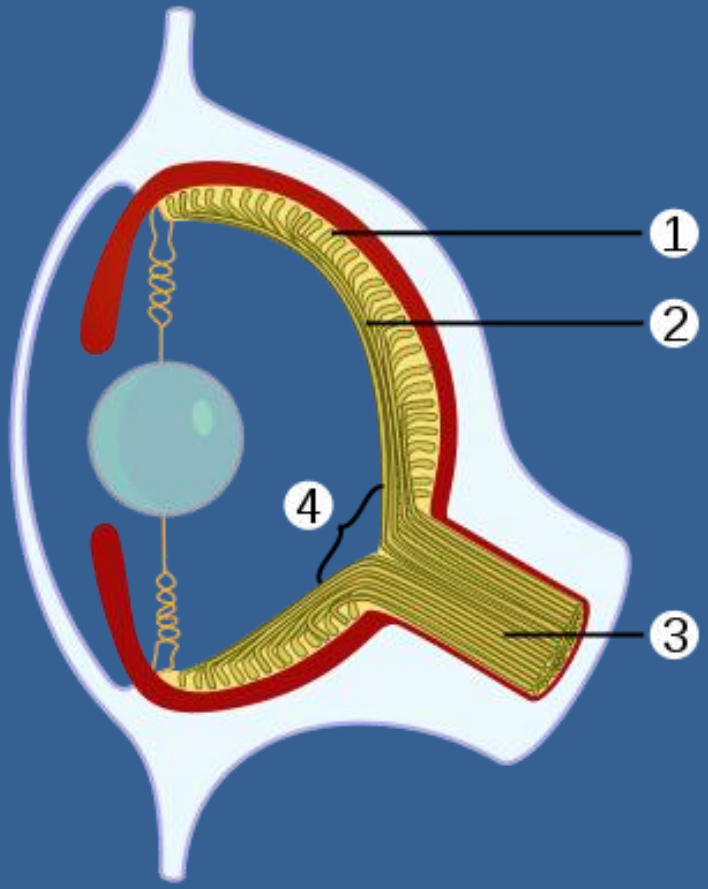
Blind Spot Activity





http://faculty.washington.edu/chudler/chvision.html

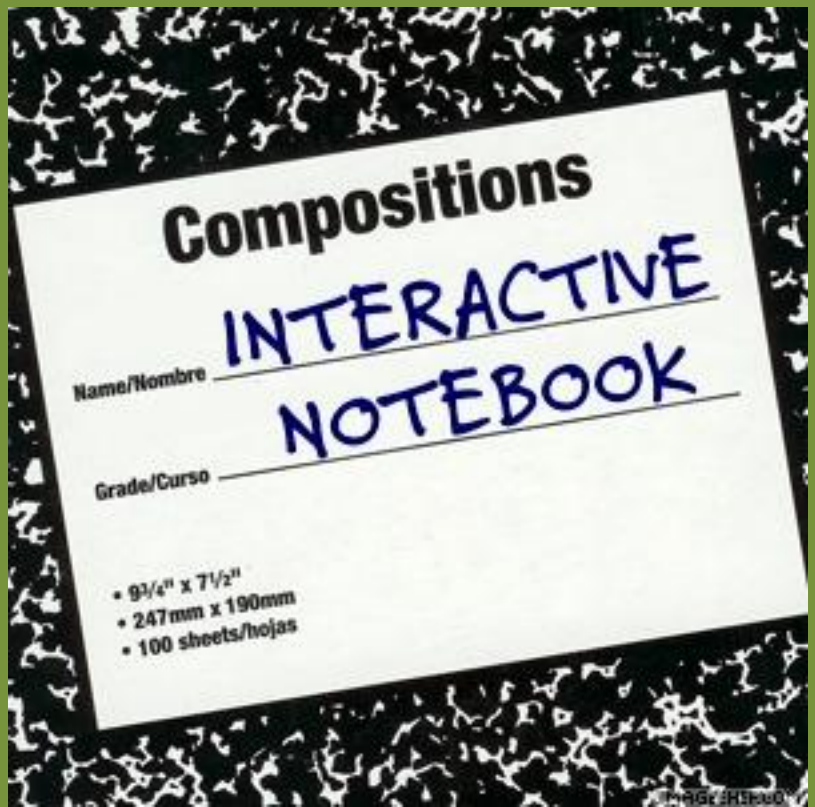

Optic nerve
Iris
Cornea
Pupil
Lens
Retina
Iris


1
2
4
3

Interactive Notebook

Light Vocabulary: GLUE right side of notebook

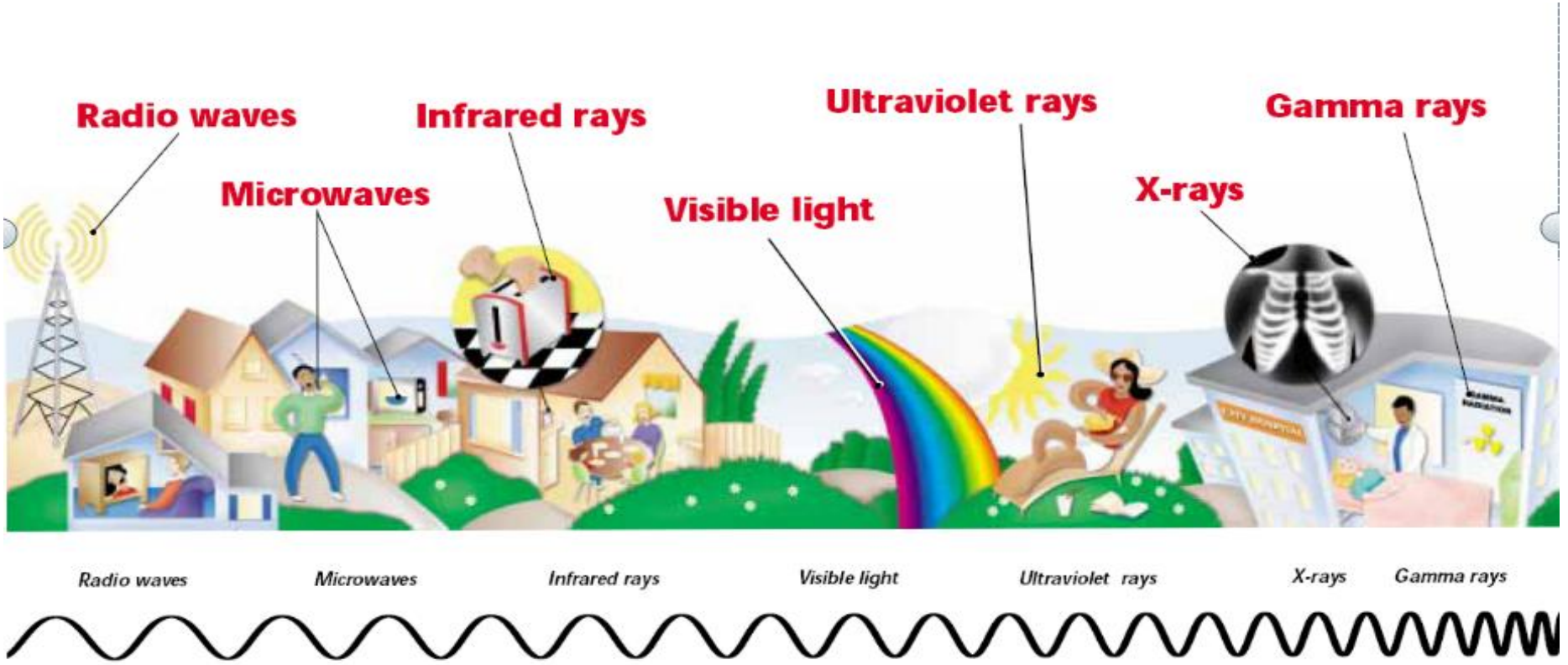
Fill in the blanks with the RED words only



Reminder:

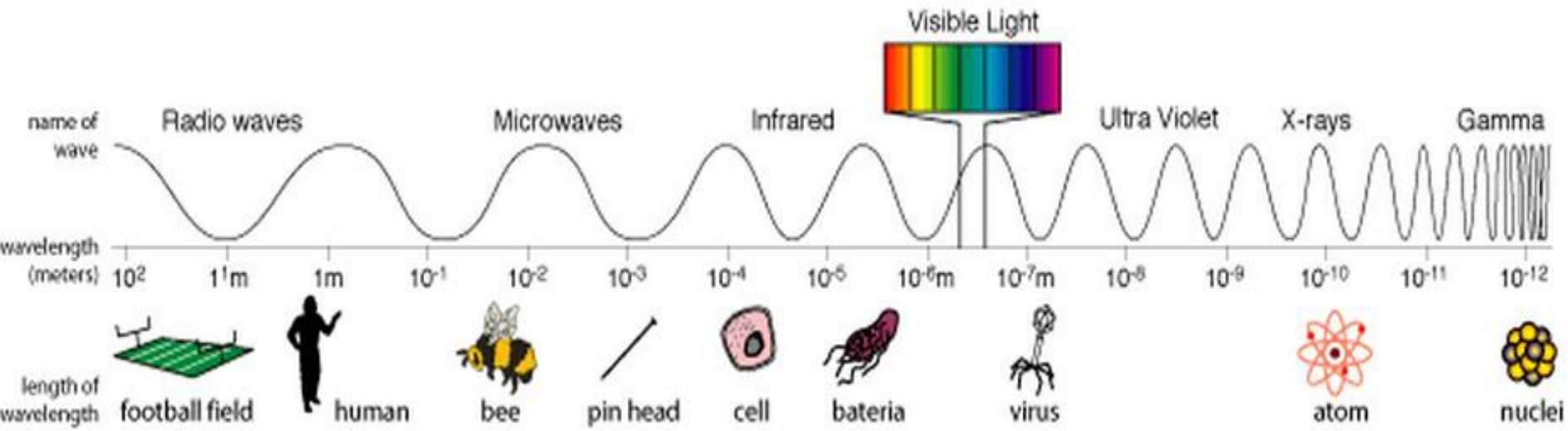
Electromagnetic spectrum:

Visible light and all it's relatives….



These waves do NOT have to travel through a medium (solid, liquid, gas).
These waves CAN travel through a vacuum/nothing (ex. space).

Electromagnetic Spectrum

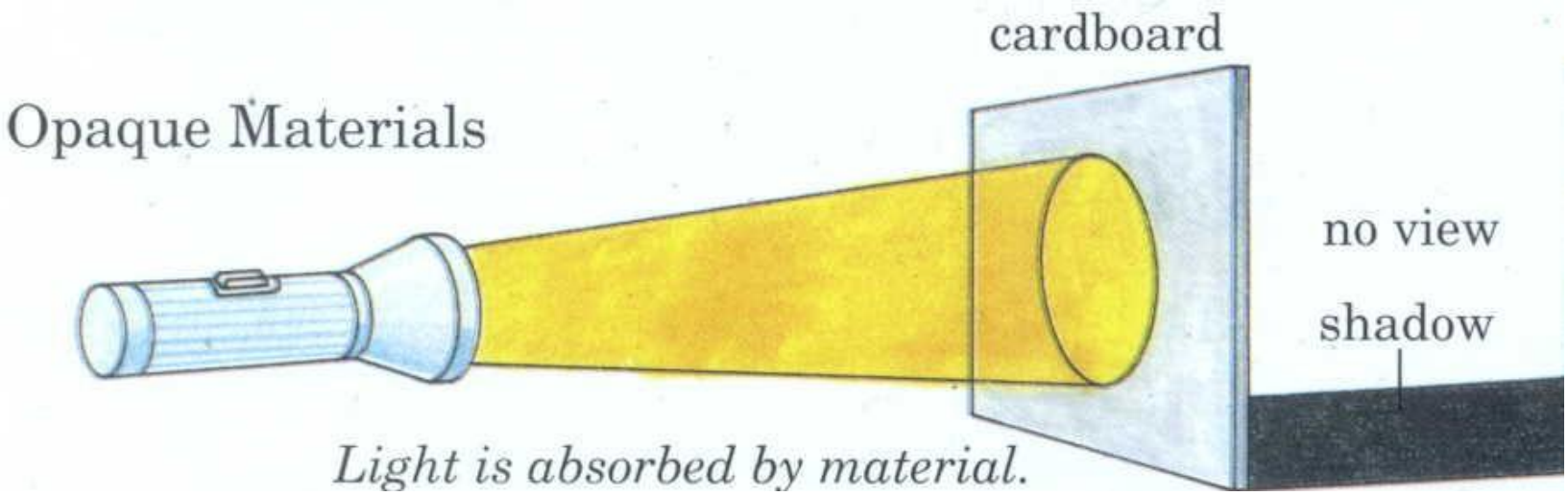


Wavelength getting smaller = waves closer together

Opaque

- Opaque materials: Light can not pass through, thus creating a shadow.

Examples: cardboard, brick, solid wood, door.



Transparent

- Transparent materials: Allows almost all the light to pass through with very little bending or scattering of the rays. You can see through it.

Examples: eyeglasses, empty clear glass, clear window.

Translucent

- Translucent Material: Allows only some light to pass through, yet scatters and bends the rays. You can see through it, but not clearly

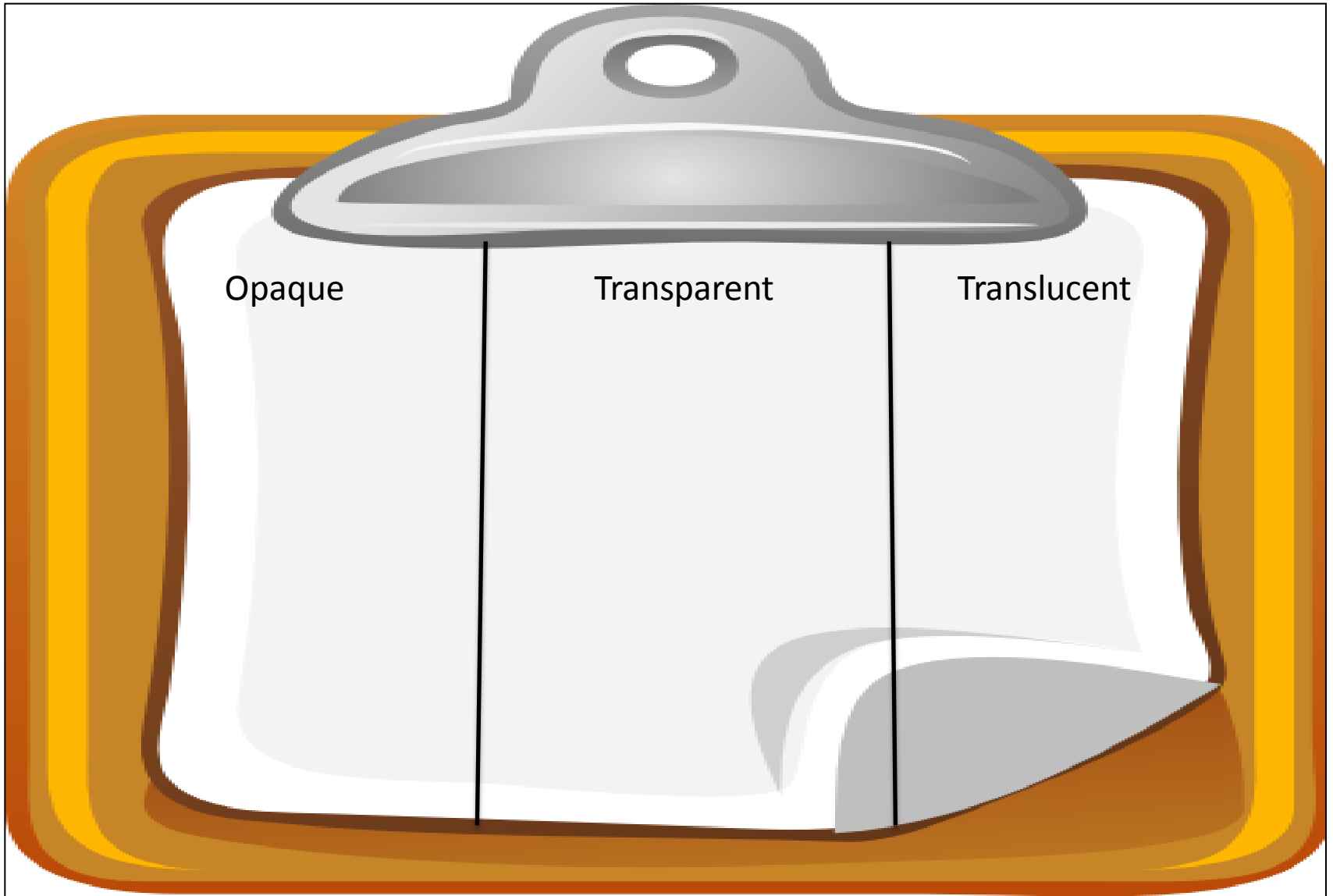
Examples:

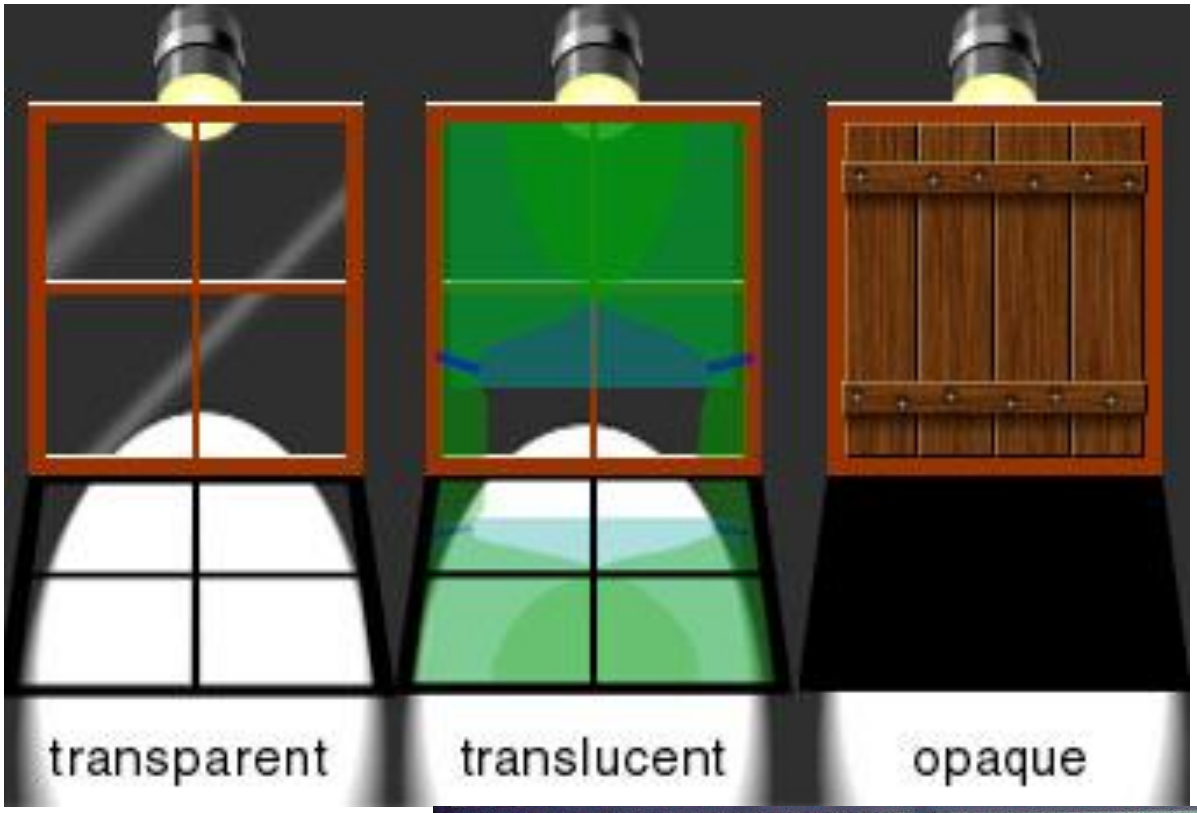
frosted glass

clouds,

thin paper

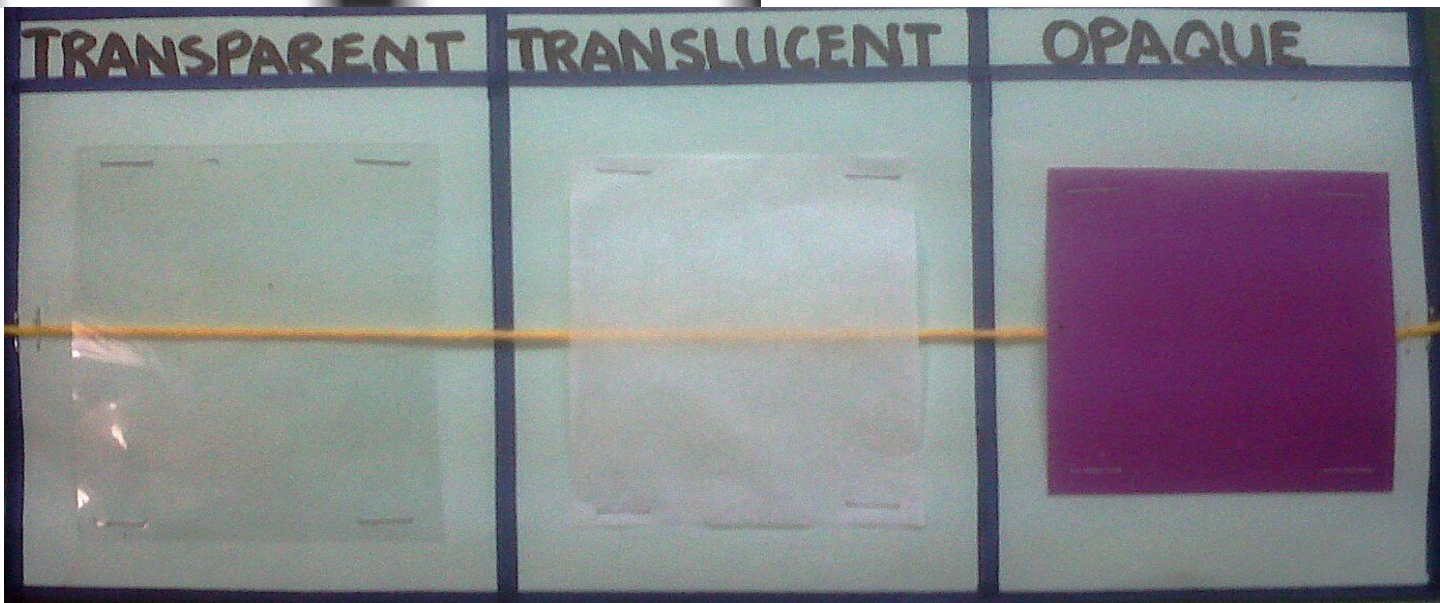
Left side: Discuss, Compare, and Draw





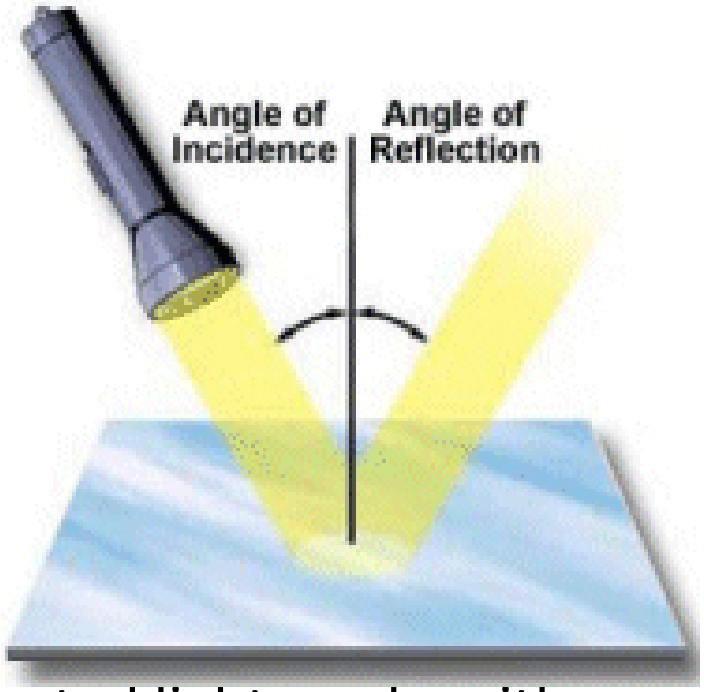
Examples:

Pass around Hands-on examples



Reflection

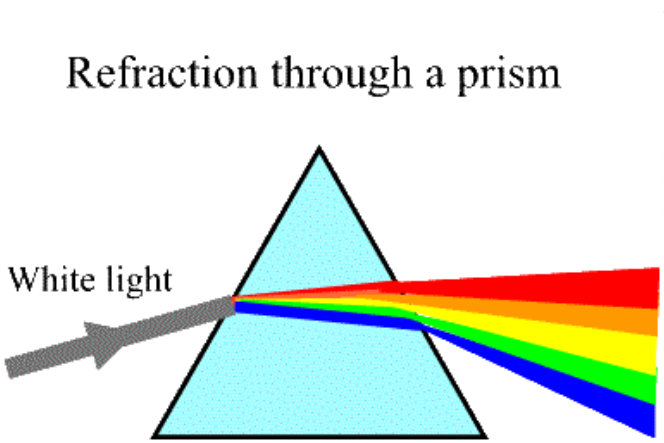
Reflection: When light hits a particular surface and bounces back.

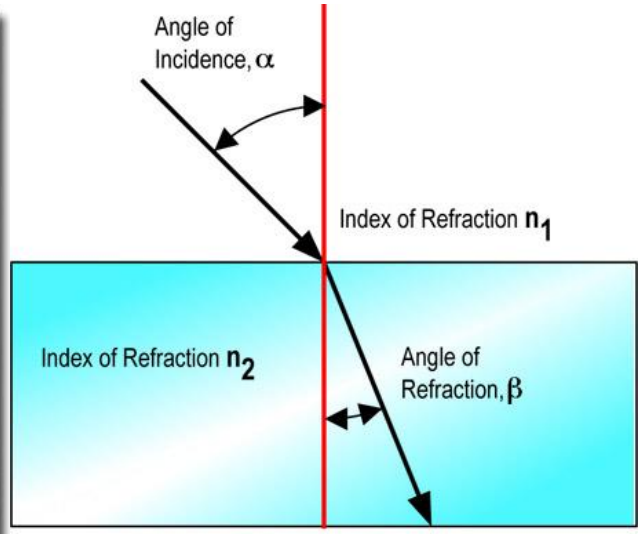


Reflected light can be either partially or completely reflected based on the elasticity of the material. For this reason, metals make good reflective surfaces.

Refraction

- Refraction of Light: The bending of light due to a change in its speed. The differences are caused by the changing speed of the light as it transitions to different mediums.
  - Example: A straw appears bent in a glass of water. A swimming pool appears shallower than it really is.





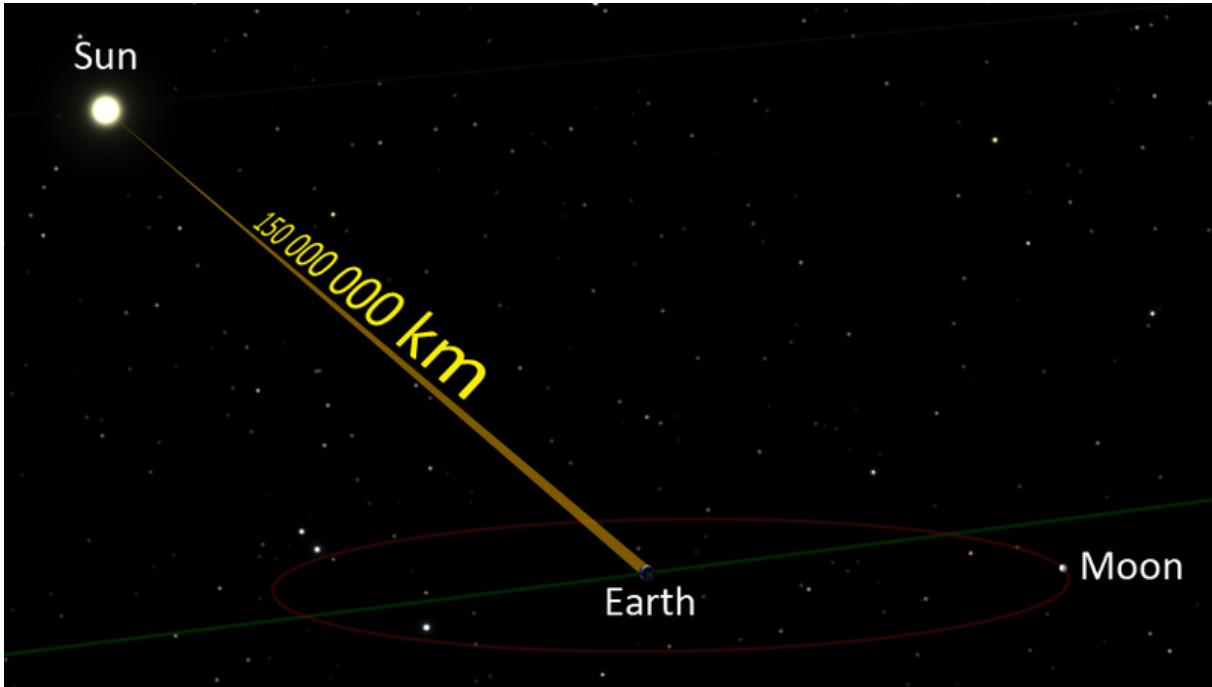
$n_1 \sin\alpha = n_2 \sin\beta$

Refraction

- Light (like all waves) travels at constant speed within a medium.
- The speed changes as light changes medium.
- Light travels faster in less dense mediums.
- Moves slower in more dense mediums.

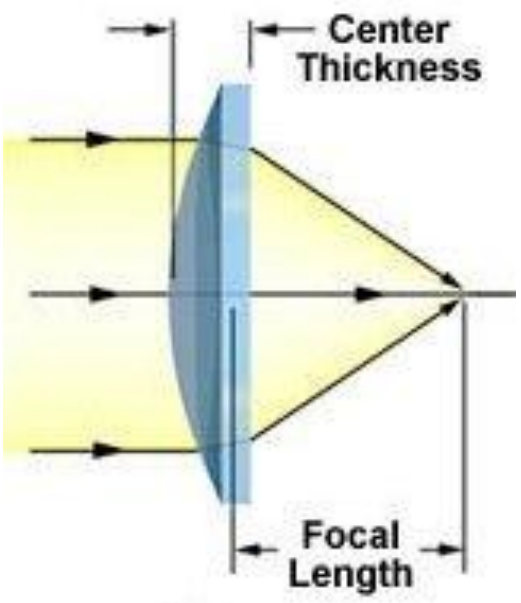
Through a vacuum, light travels at 299,792,458 meters per second.

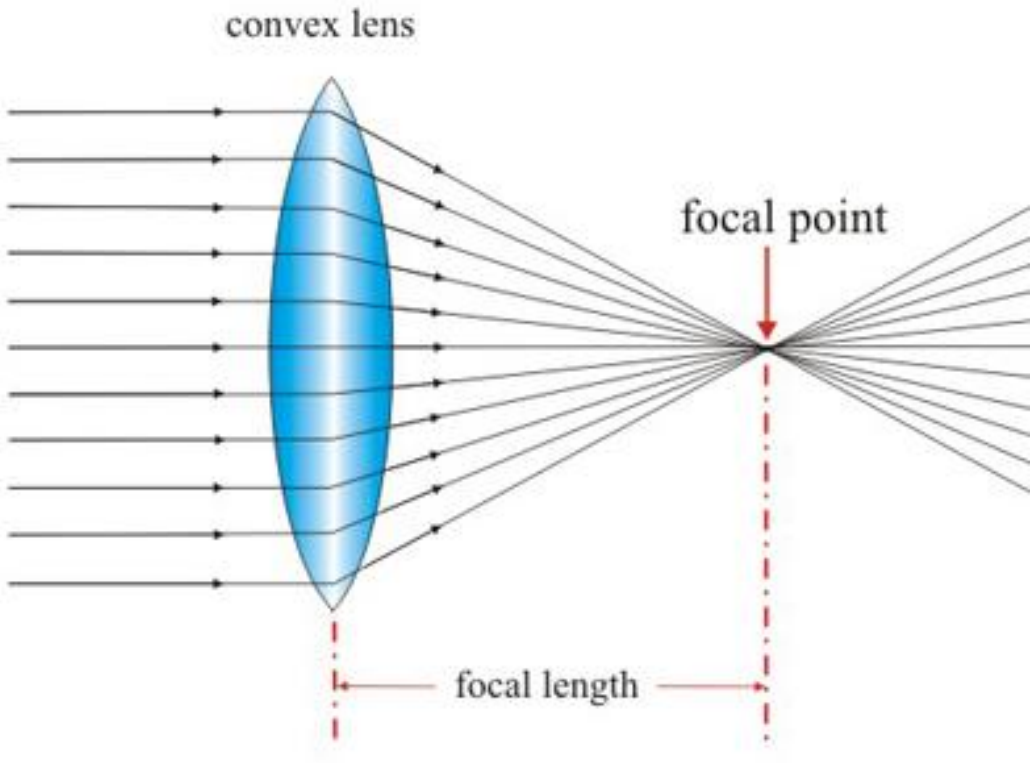
Light takes about 8 min 17 sec to travel from the sun to earth.



Convex Lenses

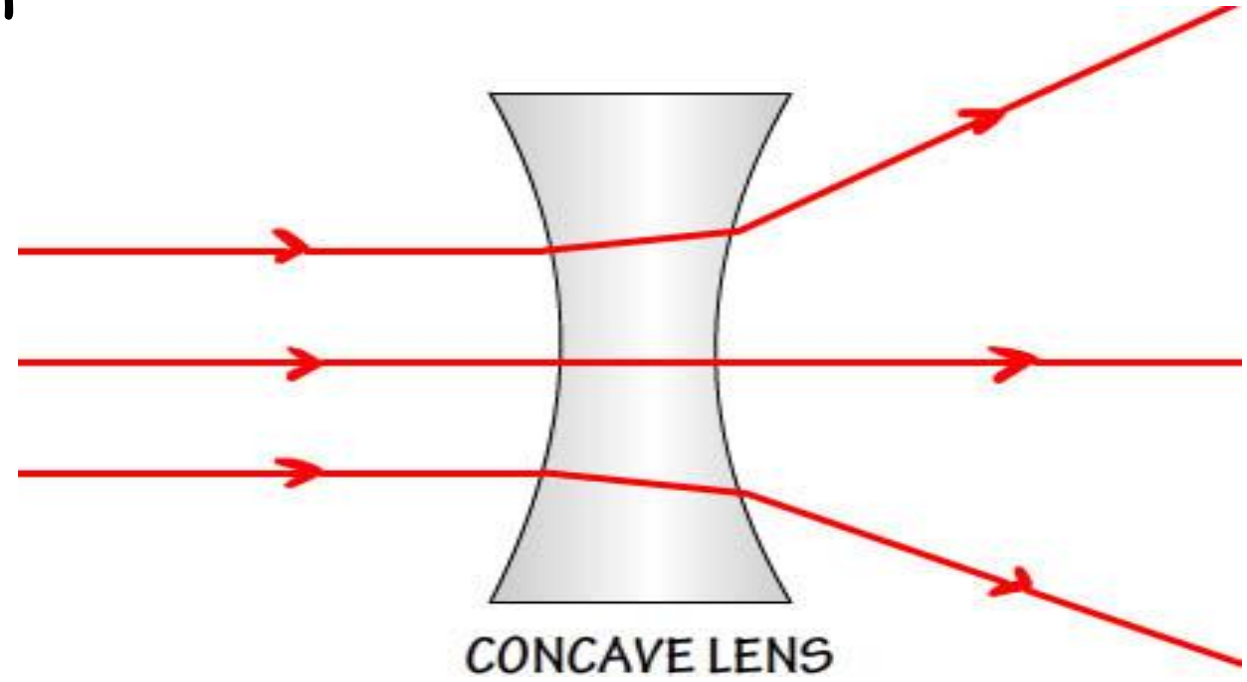
Convex Lenses: Are thicker in the middle then on the edges. Light is refracted inward causing the rays to converge- changing the focal point.





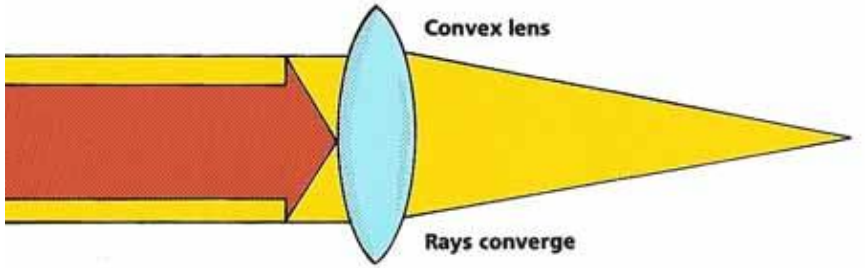
Concave Lenses

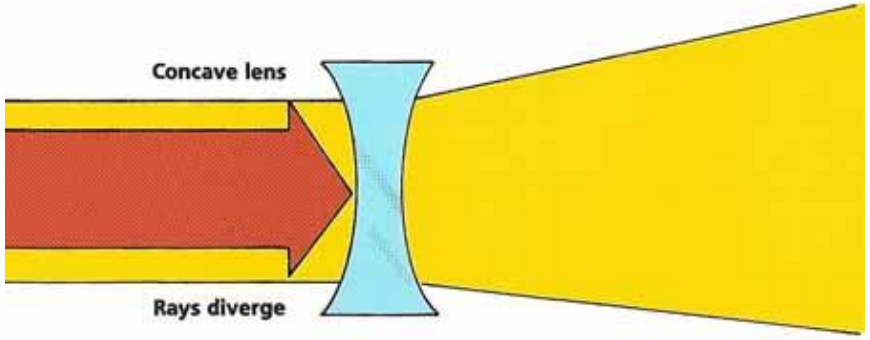
- Concave Lenses: Are thicker on the edges then in the middle. Light refracted outward causing the rays to diverge- changes the focal point



Concave / Convex Lenses

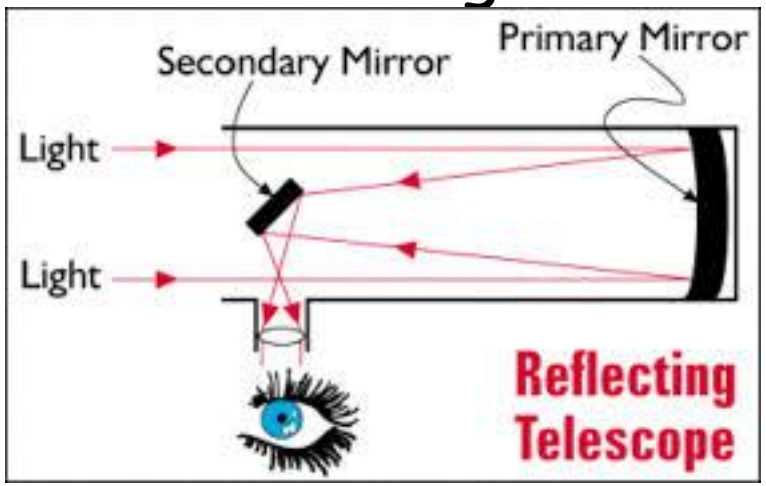
- A convex lens refracts light rays inward. If held close to a person's eyes, they will see an image that is upright and larger than the actual object. If held further away from a person's eyes, they will see an image upside down.
- A concave lens refracts light rays spreading them outward producing an image that is upright and smaller than the actual object.

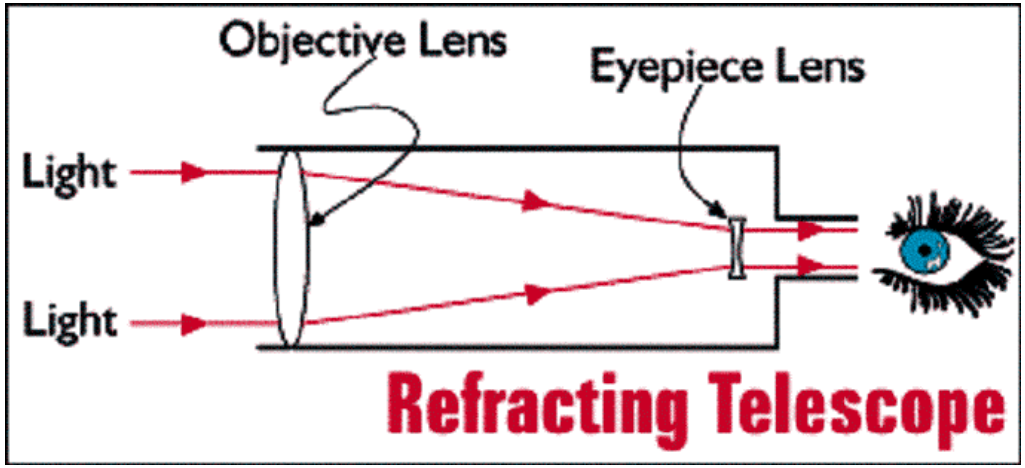




Examples:

- A refracting telescope uses two convex lenses to magnify images in the sky. A reflecting telescope uses a concave mirror, a plane mirror, and a convex lens to do the same job.
- A microscope, like a reflecting telescope, uses a concave mirror, a plane mirror, and a convex lens. Microscopes are used to magnify very small images on slides.





Intro to Light Lab Activities

Exploring Refraction, Convex, and Concave lenses

1. One lab sheet per table.
2. Roles: Supplier, Leader, Recorder 1, and Recorder 2. Note who does what role on your sheet.
3. Everyone must contribute their thoughts to the lab write up.
4. Ms. Samuels will assign the group roles.