



LIGHT

how it works

CSS 6c

HOW LIGHT MOVES

Straight Line unless altered by what
moving in.



LIGHT SCATTERS AS GOES

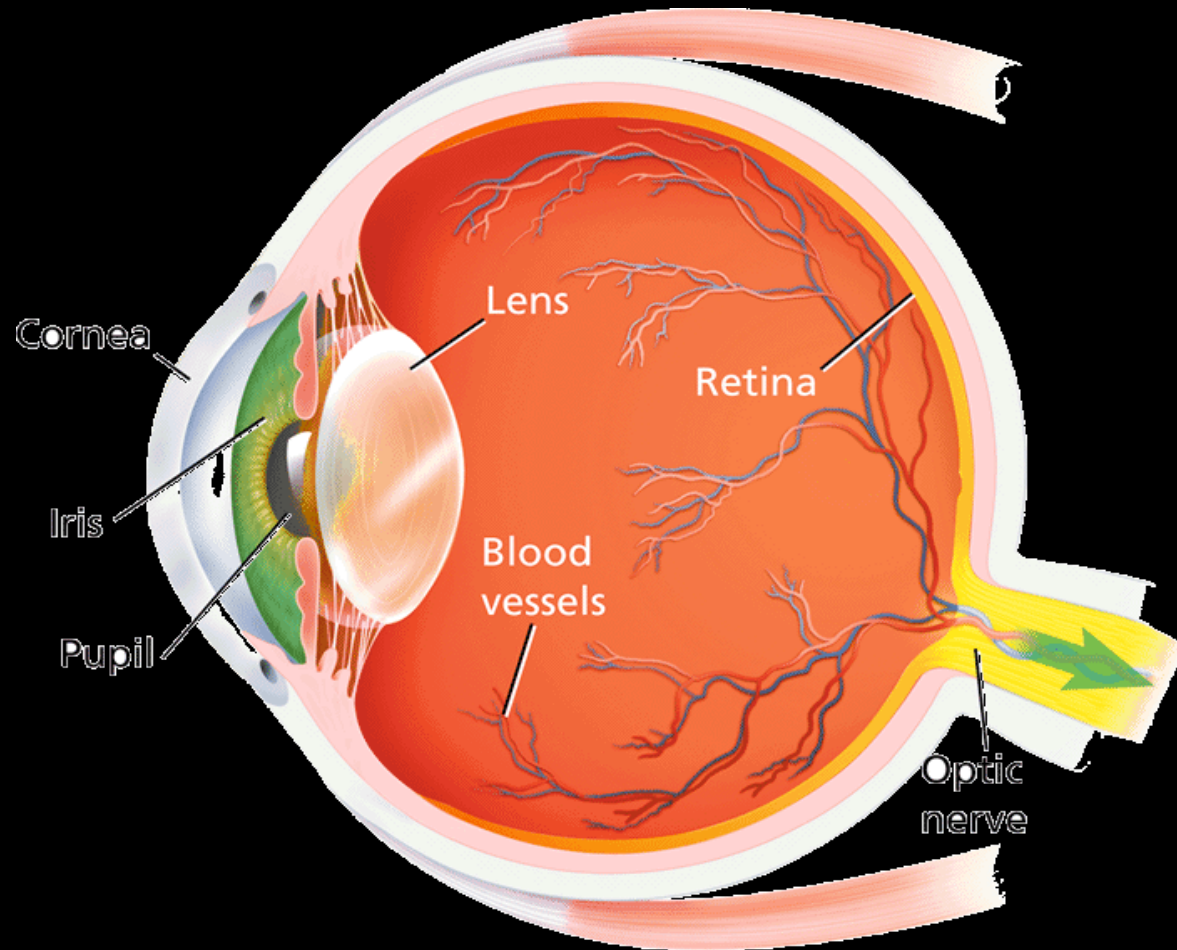
Light scatters and loses energy the further away from its source.



SCATTERING

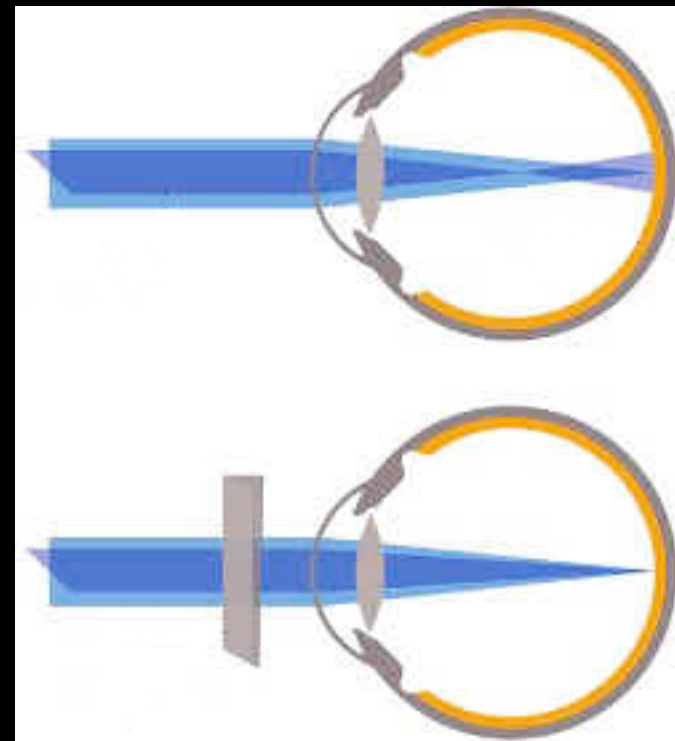
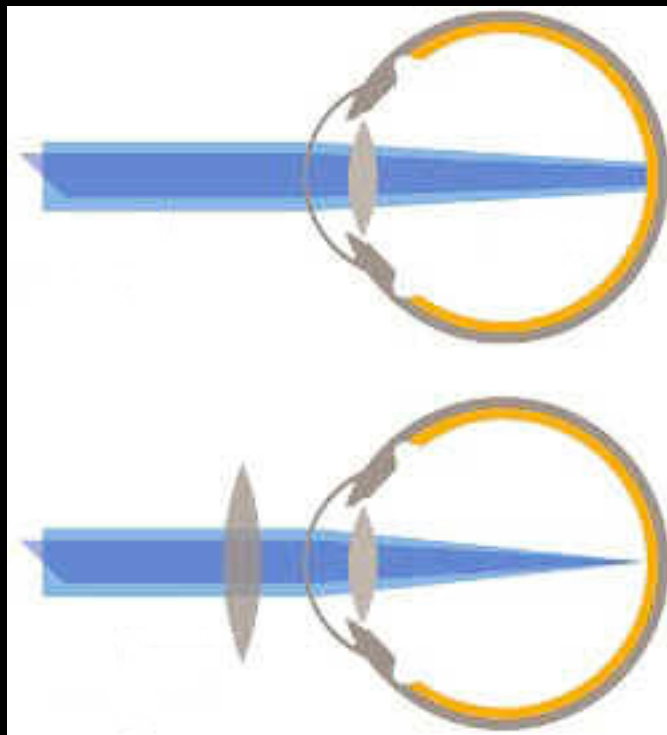
- Light released and spreads in all directions.
 - Why room is even with light.
 - Sky blue: shortest wavelengths, spread more.

Vision: response to the stimulus of light.



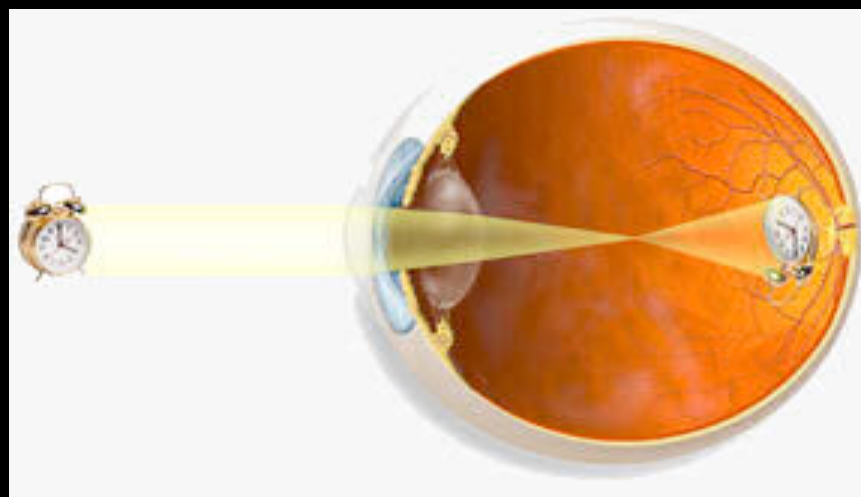
CSS6b

Scattered light enters the Eye



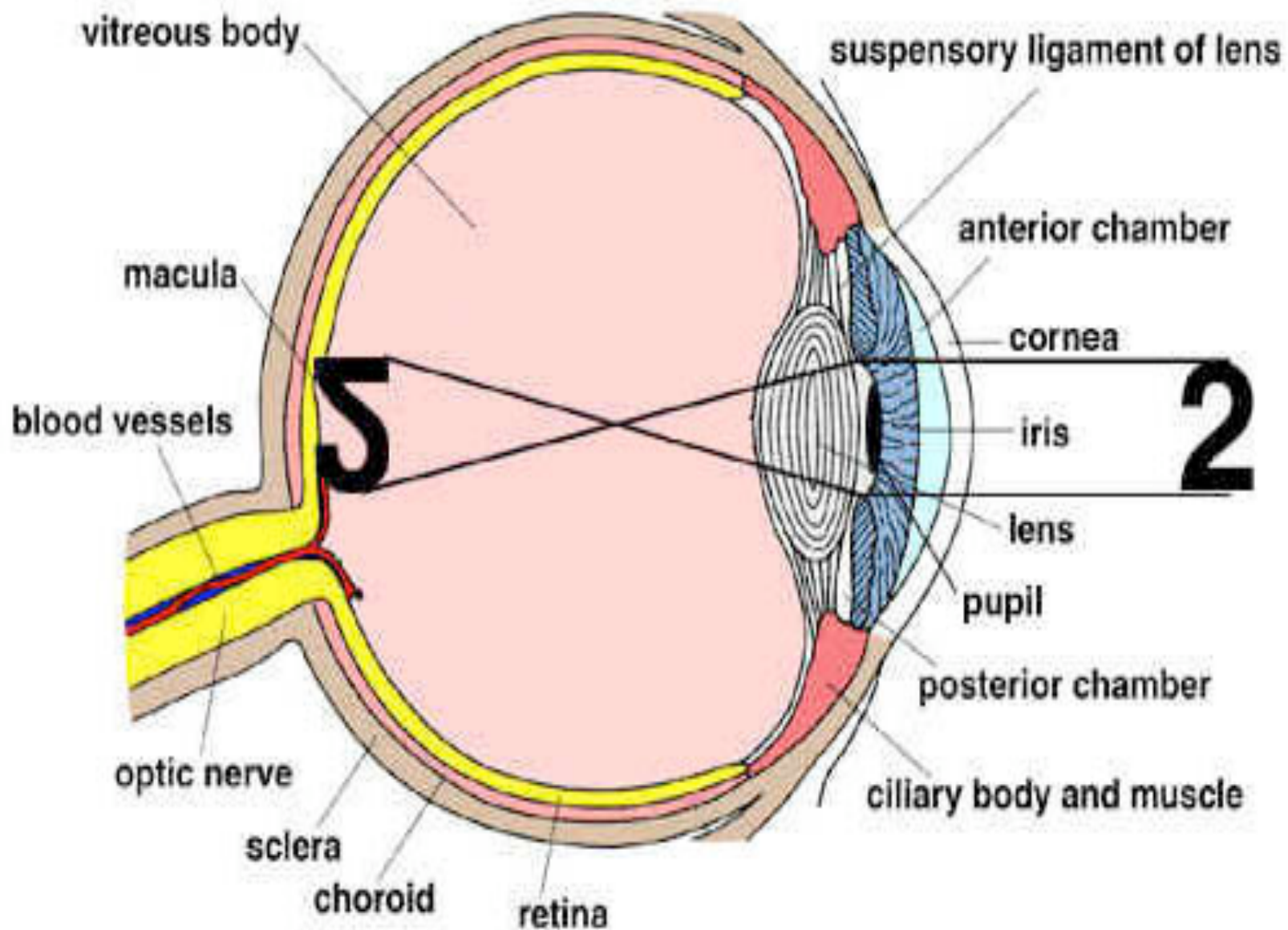


ONCE ENTERS

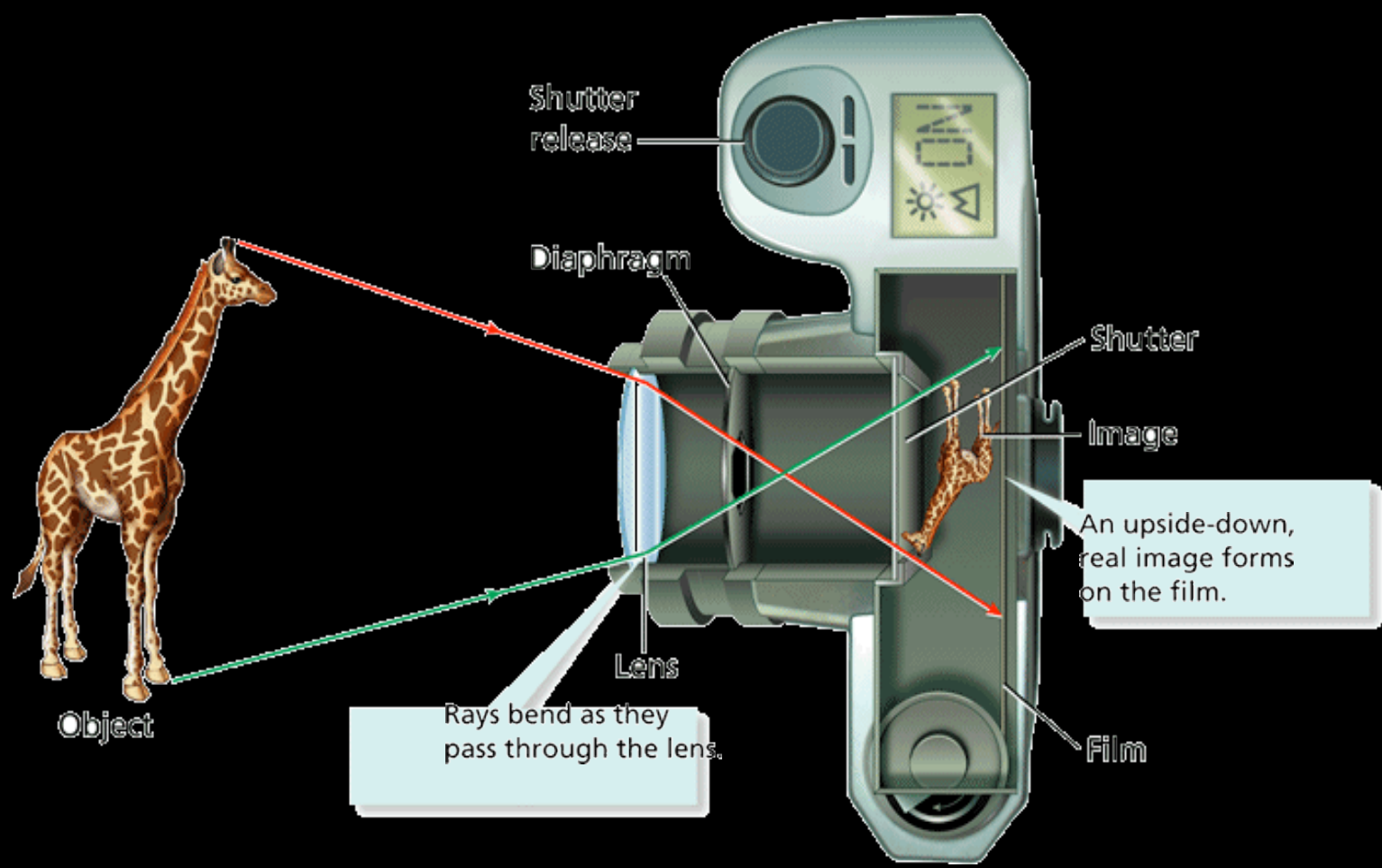


LIGHT SEEN





The eye works like a camera.



LENSES con't

CONVEX

-brings image to focal point.

Image is larger and upside down.

ie: eye,
microscope,
magnifying glass.

CONCAVE

-spreads image out.

-image is smaller and upright.

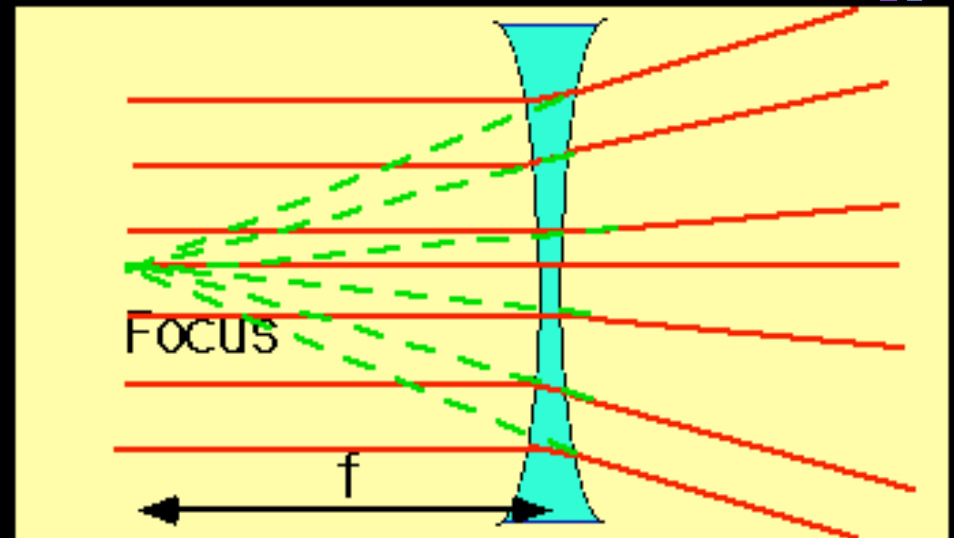
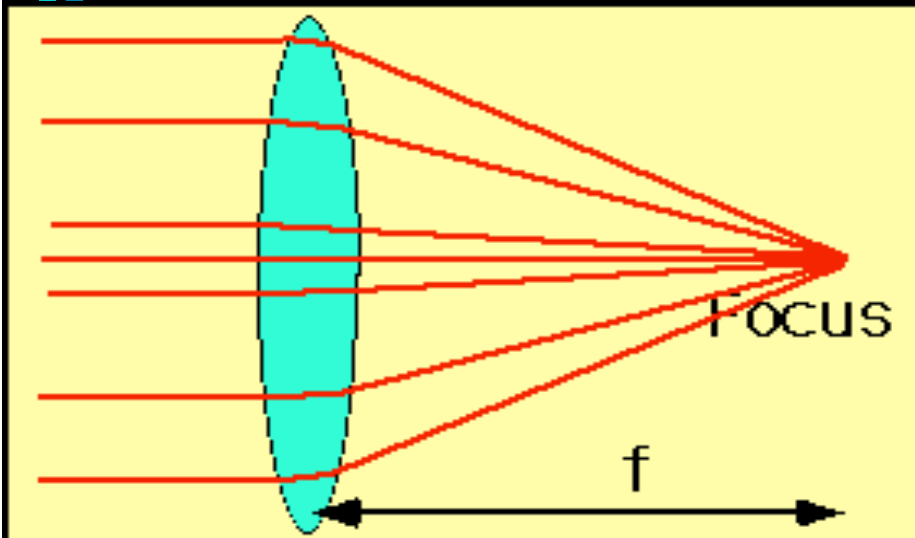
ie: corrective glasses.

CSS 6d

LENSES

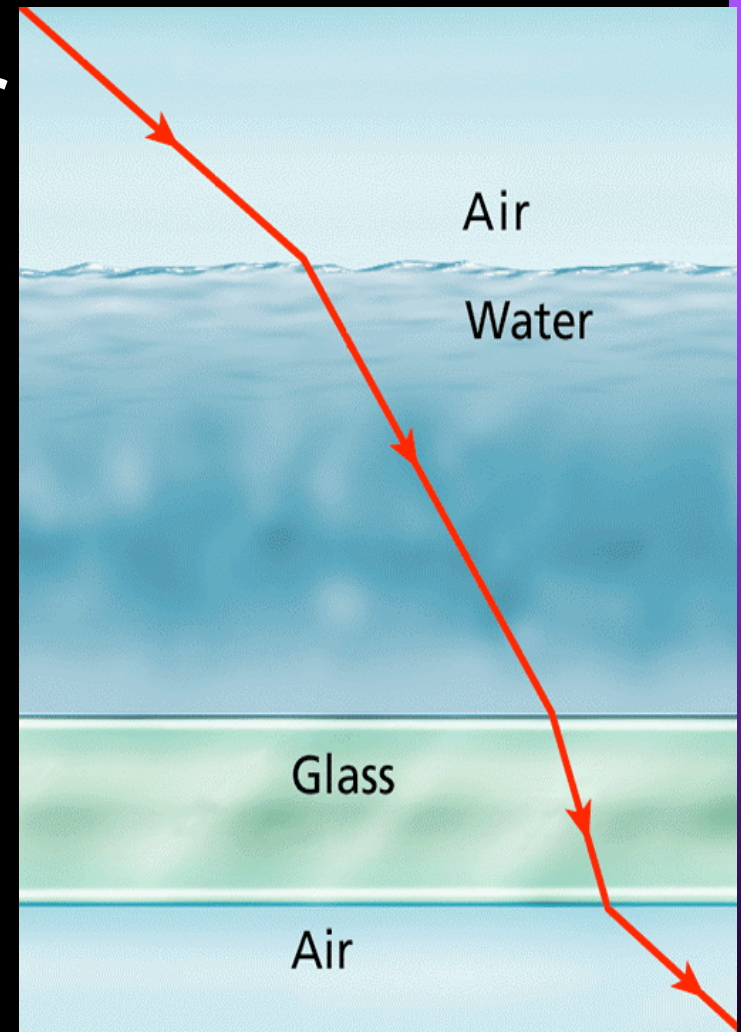
Alter direction of light.

- Concave-spreads out.
- Convex- brings to focal point.



Refraction of Light

When light rays enter a medium at an angle, the change in speed causes the rays to bend, or change direction.



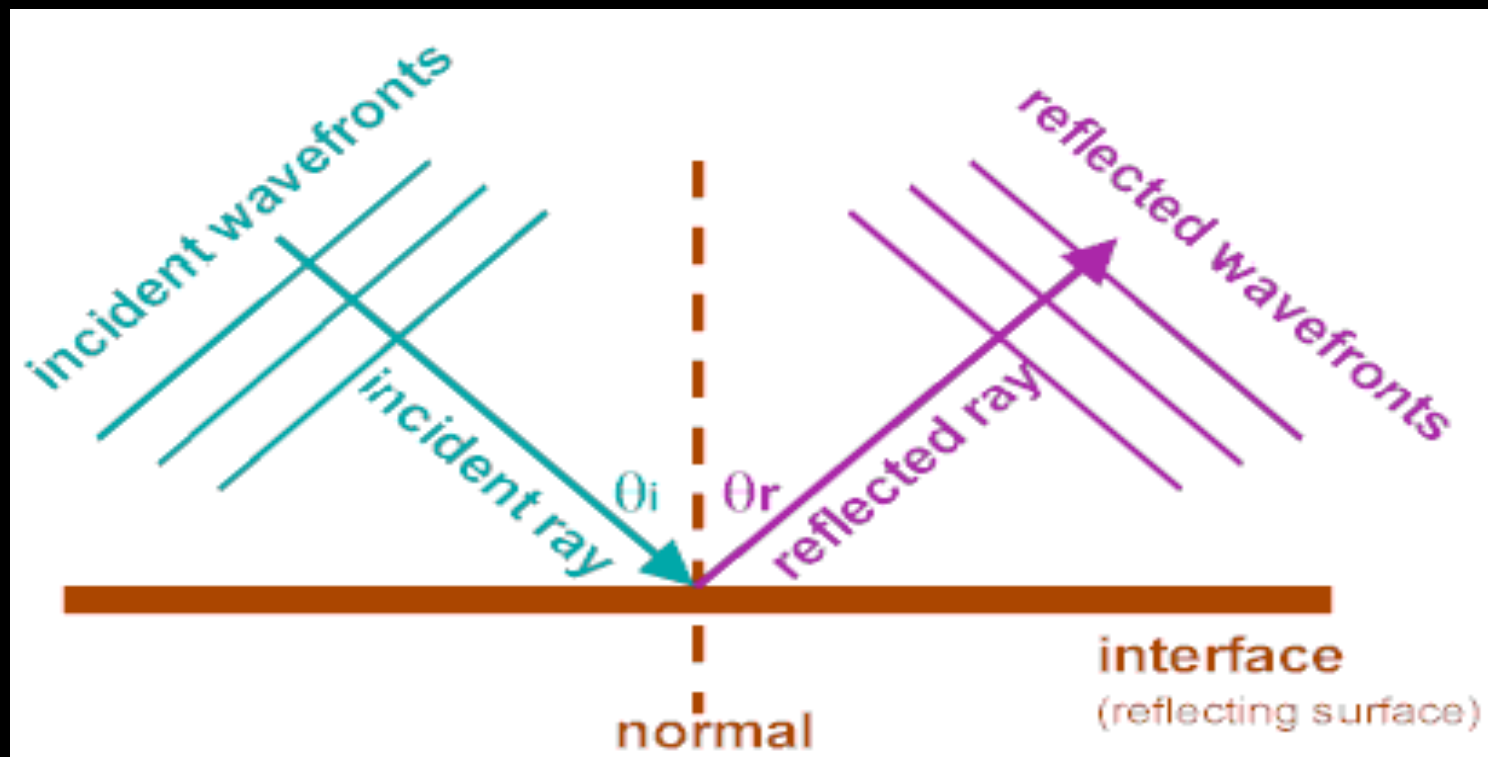
REFRACTION

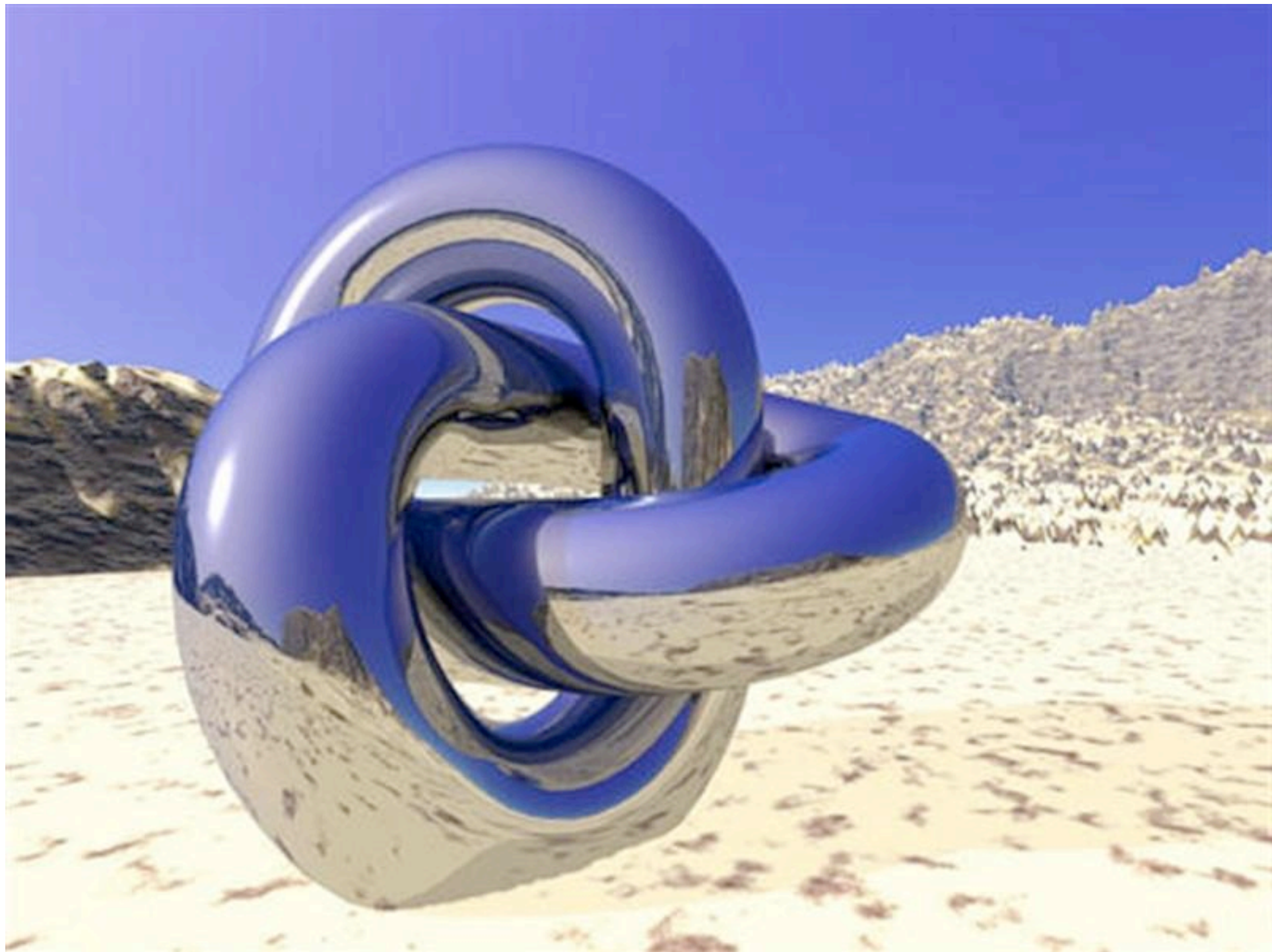
- The change in direction and speed.
- Moving from water to air, light changes angles and speed of travel.



REFLECTION


Light bounces off surface at same angle it hits.





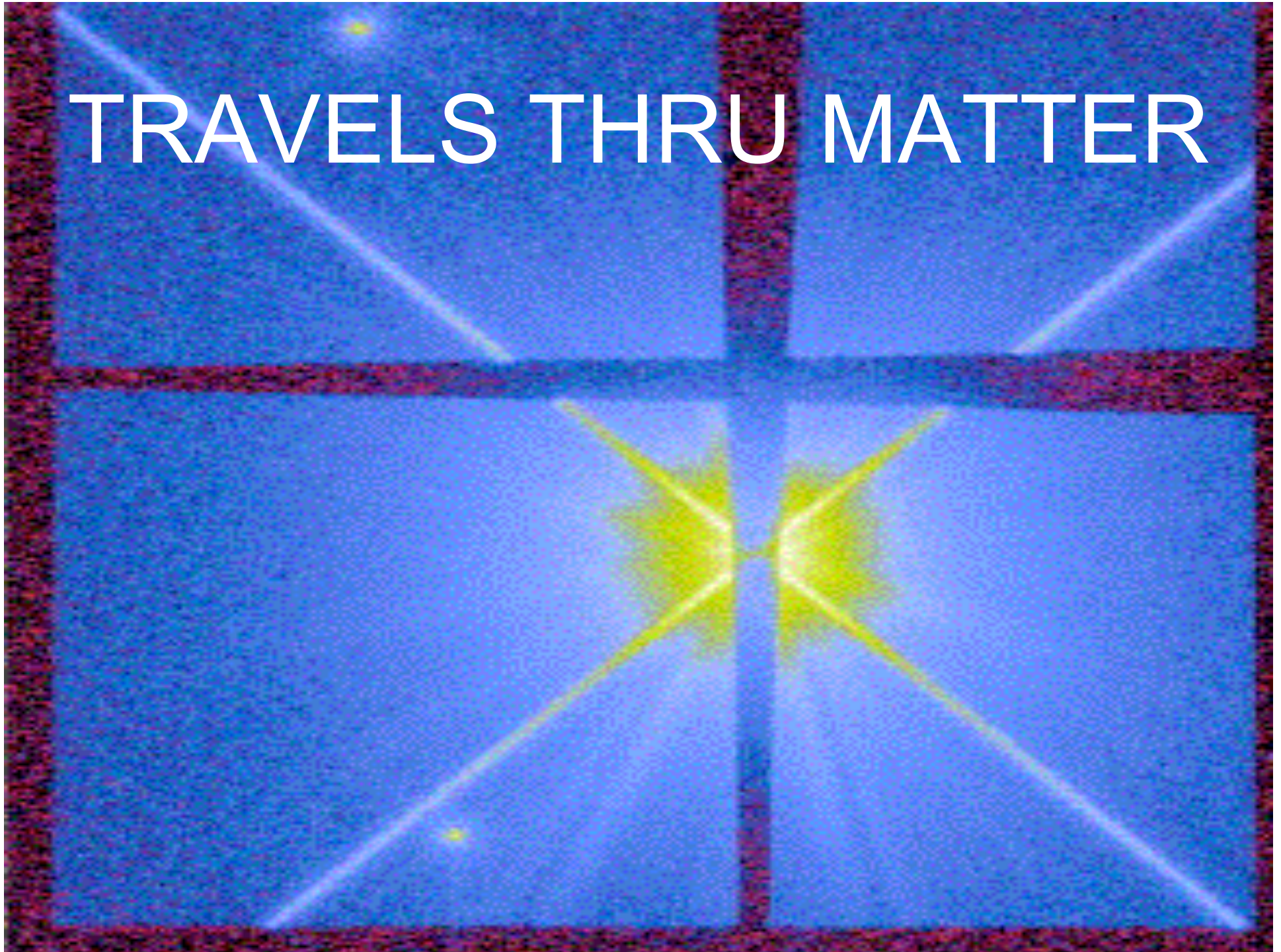
ABSORPTION

- LIGHT IS TAKEN IN BY AN OBJECT (MATTER) AND HOLDS IT.
- ENERGY TRANSFERRED FROM LIGHT TO HEAT.
- AIR PARTICLES DIMINISH LIGHT.



SCIENCE
LIGHTS UP
MY LIFE

TRAVELS THRU MATTER



CSS6f

INTERACTS WITH MATTER

TRANSMISSION

- Light goes straight unless changes what it travels through.
- Travels through matter: gases (air), liquids (water) and solid (glass).

TRANSMISSION:

Terms for mediums

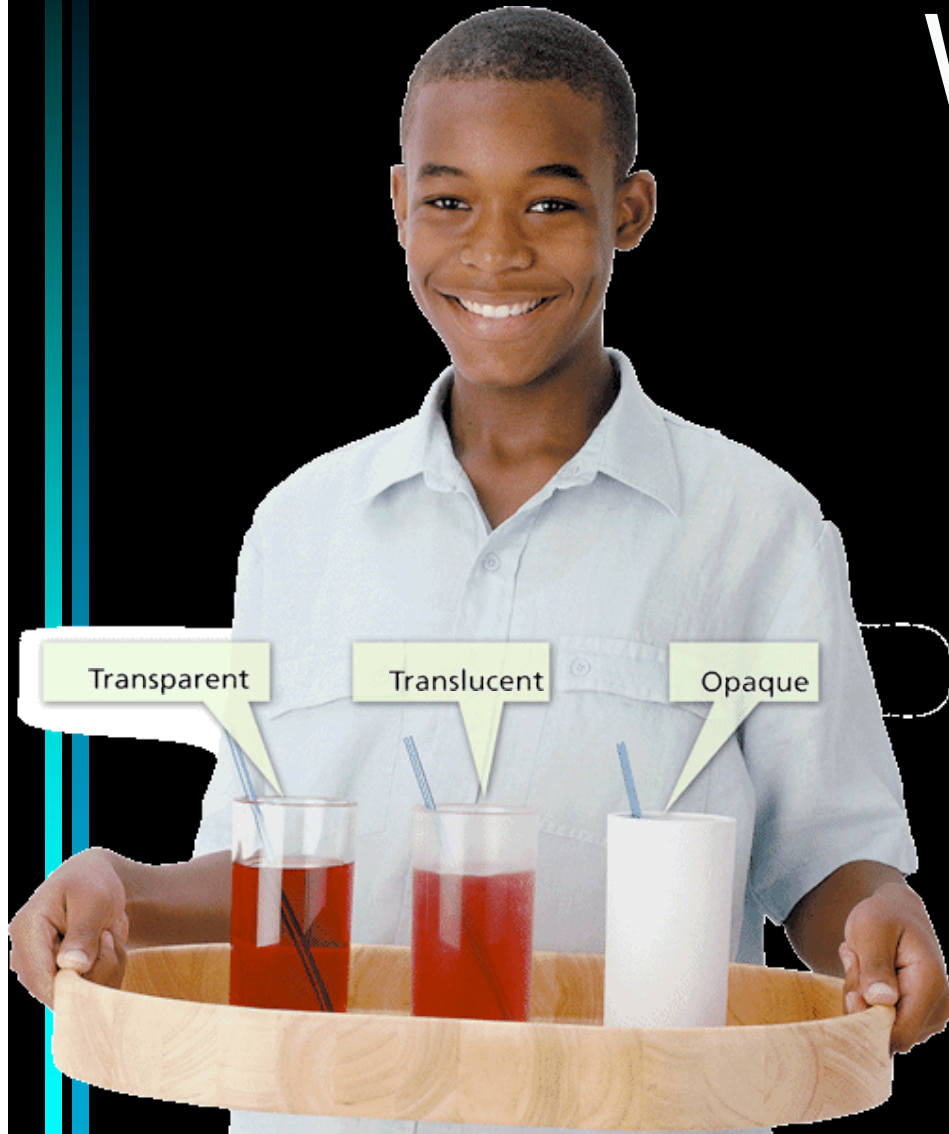
- Transparent- allows all light through.
- Translucent- allows some light through.
- Opaque- allows no light through.



CLEAR=TRANSPARENT
SMOKY=TRANSLUCENT
SOLID=OPAQUE



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



REVIEW

Light with Matter

TRANSMISSION- light going through

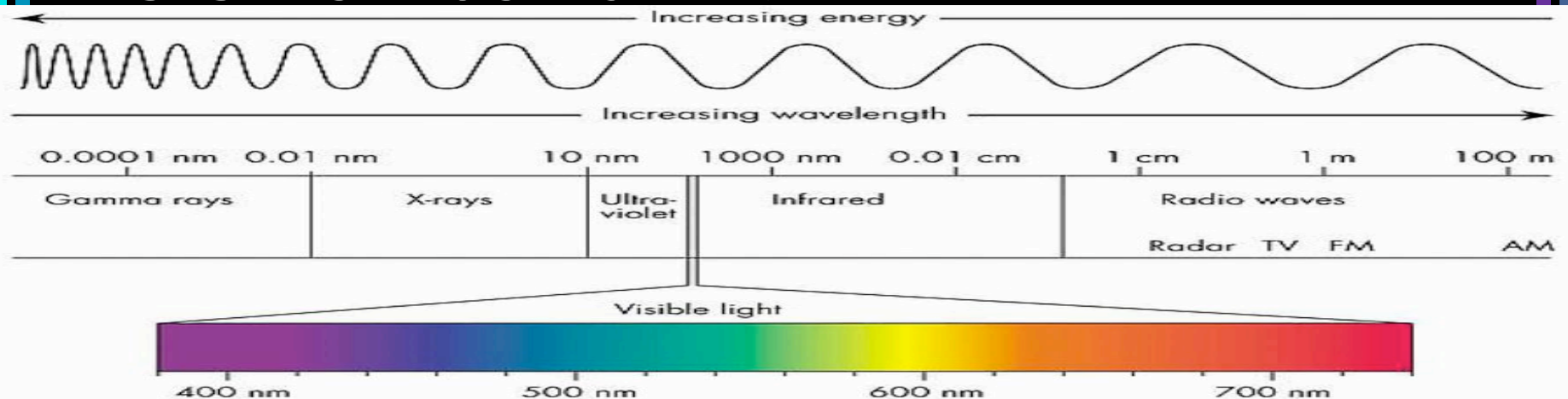
REFRACTION-light bending.

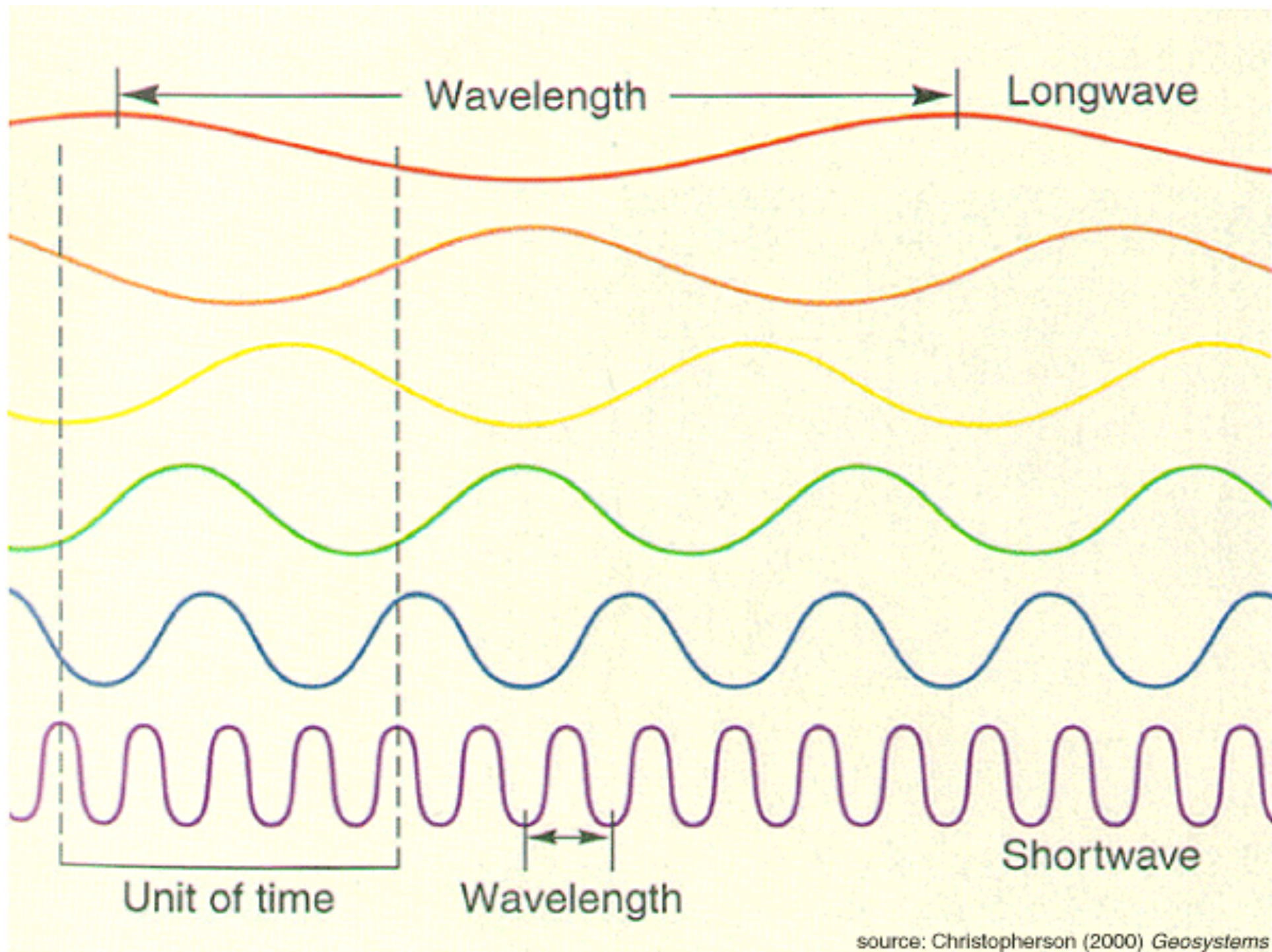
ABSORPTION- light absorbed.

REFLECTION- light bouncing off.

LIGHT - WHAT WE SEE

- **LIGHT**- energy by wavelengths at a level we can see.
- **EM Spectrum**- variety of wavelengths and frequency. Light is small band within.





Terms to help understand:

WAVELENGTH

Anything that causes a disturbance and transmits energy through matter.
(ie: ripple on pond)

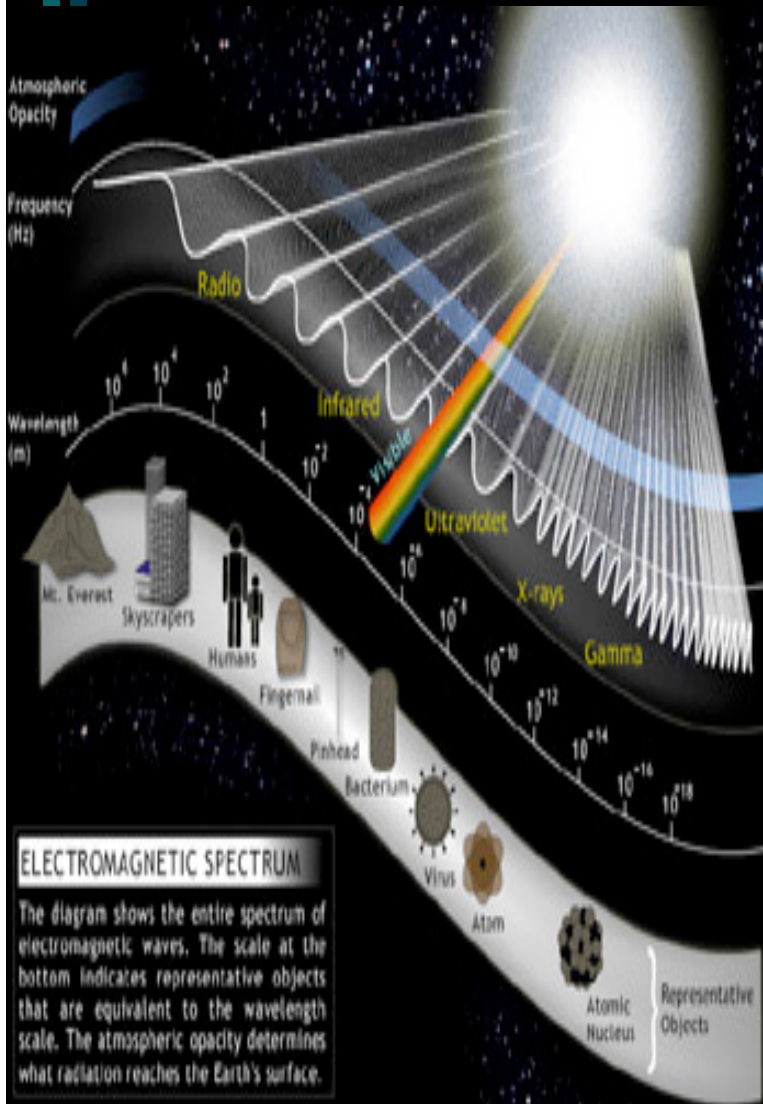
FREQUENCY

Number of waves in set time.
Decides energy level.

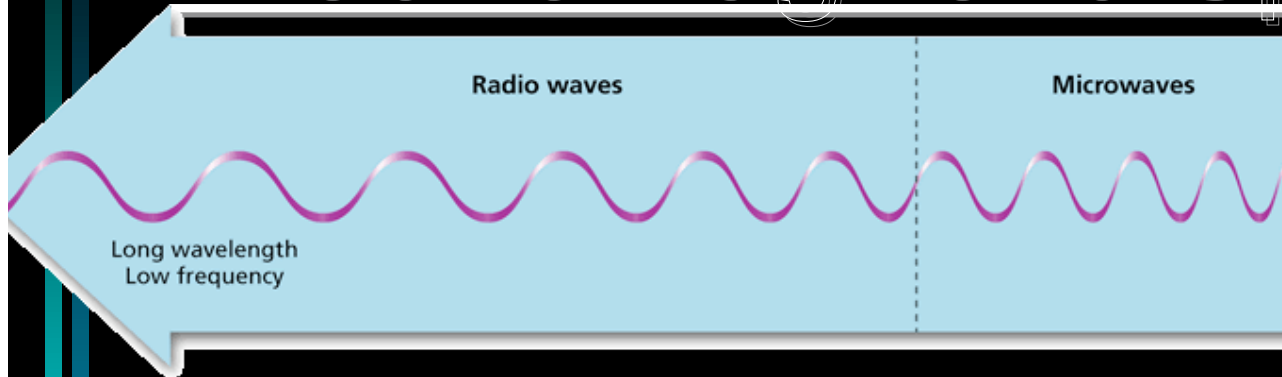
EM ENERGY:

Long wavelengths +
Low frequency =
LOW ENERGY

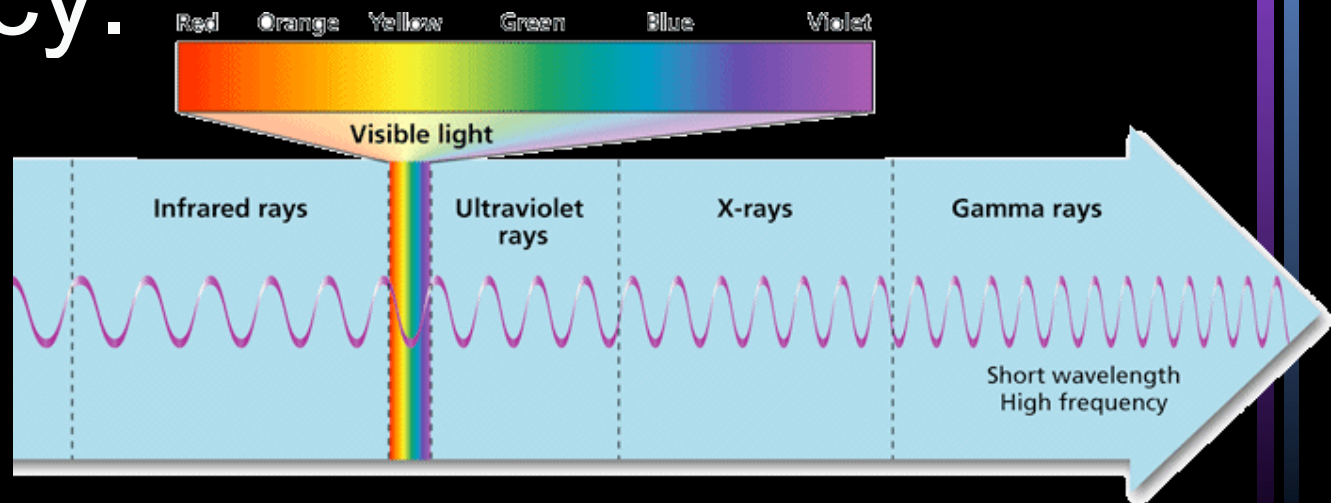
Short wavelengths +
High frequency =
HIGH ENERGY



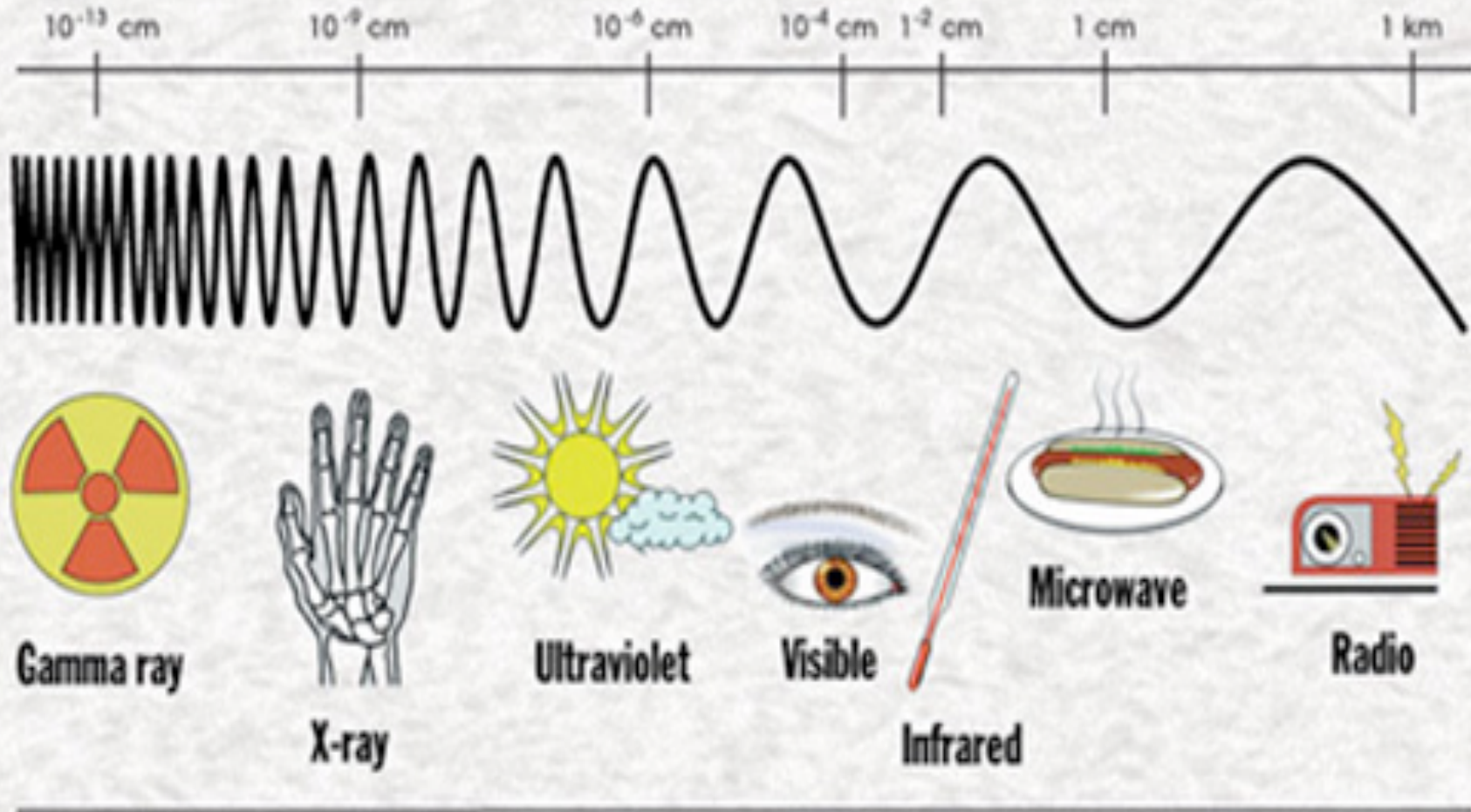
Electromagnetic Spectrum



Range of waves in order of frequency.



The Electromagnetic Spectrum



Electromagnetic Waves

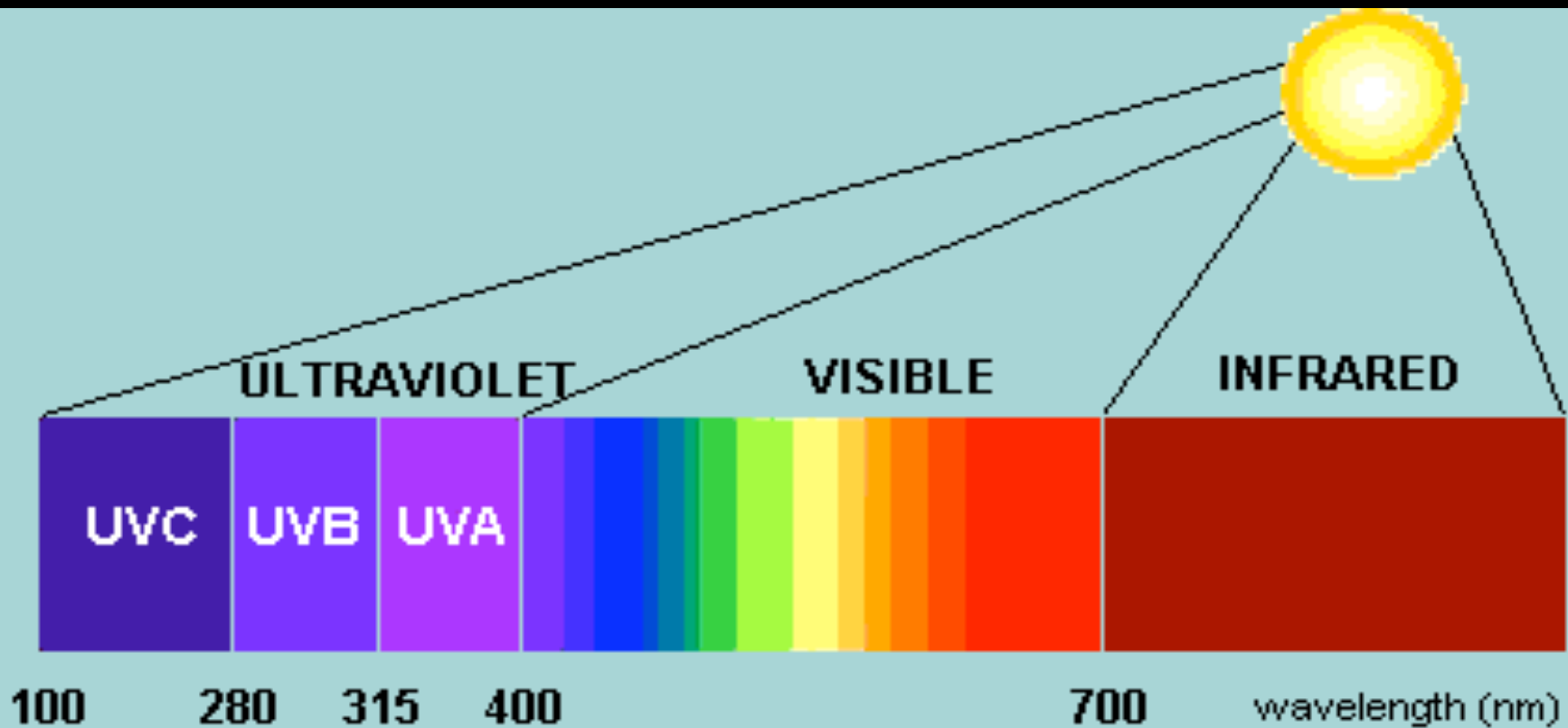
You are being “showered” all the time by waves.



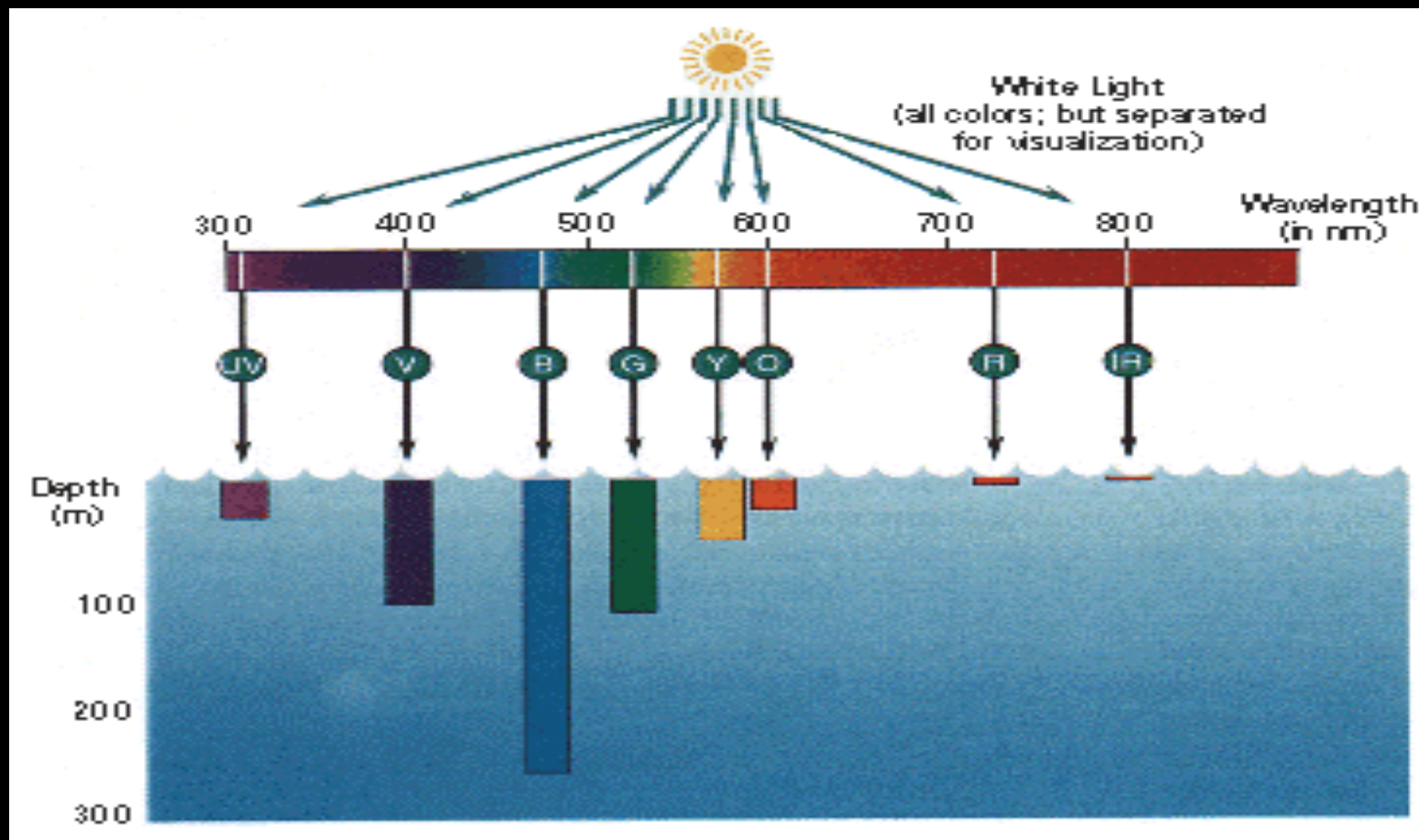
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VISIBLE LIGHT

(part of EM spectrum)



Light travels thru water



(why we see blue best)

TO SEE COLOR

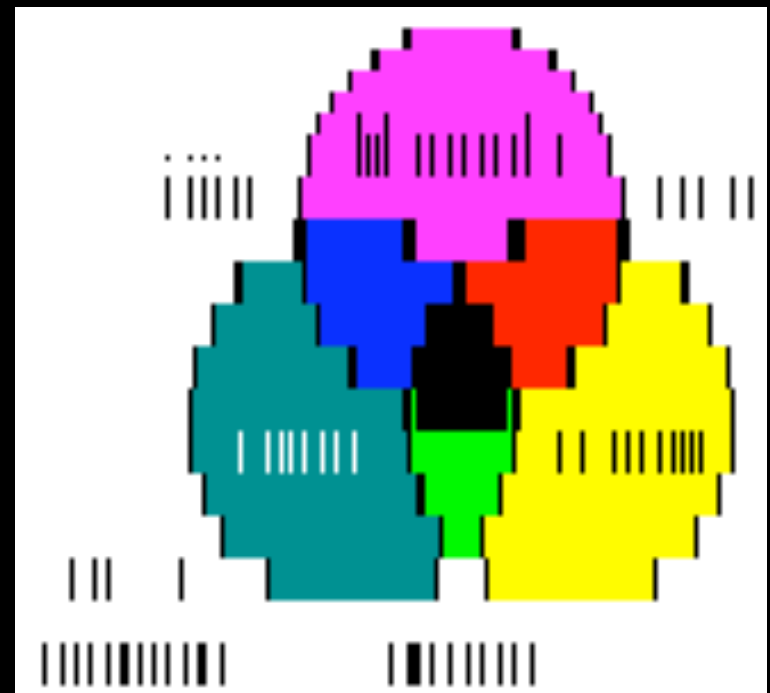
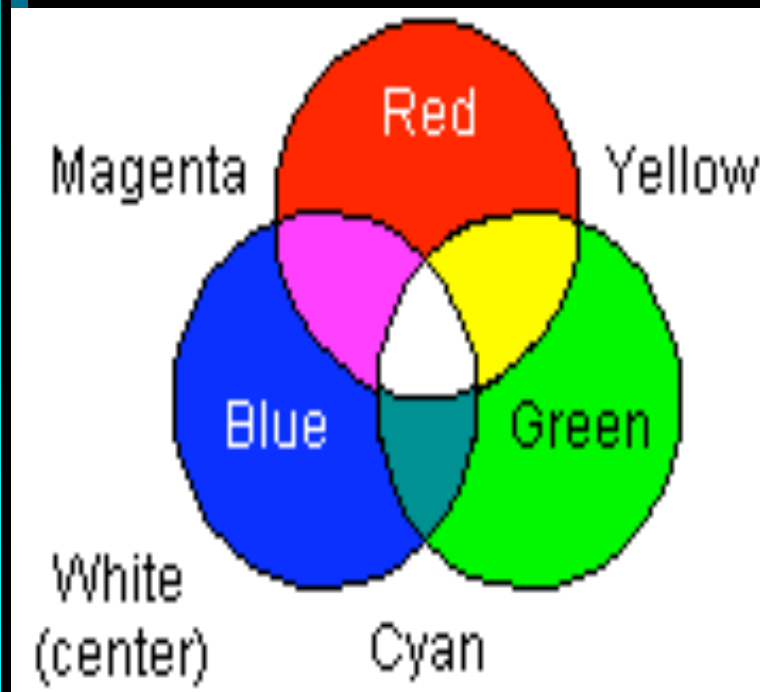
- Different colors represent different wavelengths.
- Blue- smaller wavelengths
- Red- larger wavelengths
- Color Order: ROY G BIV
red, orange, yellow, green,
blue, indigo, violet

CSS 6e

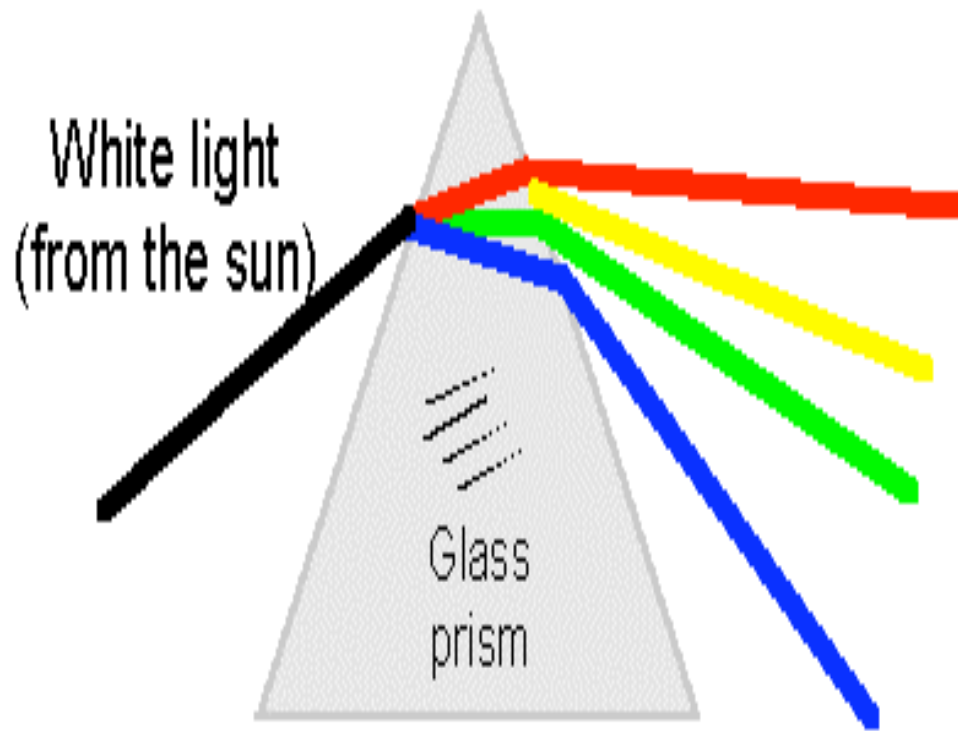
WHITE LIGHT

Adding color
makes WHITE

Deleting color
makes BLACK



MANY COLORS = WHITE



WHITE LIGHT

- Mixture of many color/wavelengths
- All colors reflected.
- Enters the eye's retina
 - 3 cones:red, blue & green
 - Rods-shades

COLOR

-decided by what absorbed.

If object
absorbs then
hides color.

- All color
absorbed =
black

If object reflects
color then
see.

- All color
reflected =
white



