

Feb 21

5. Light Interacts with Matter

NOTES

Light can change speed and direction when it interacts with matter.

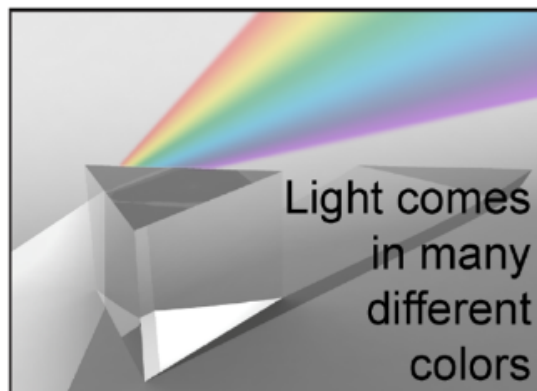
Light reflects off shiny mirrors BUT
refracts if passes through water



6. Light is Comprised of Many Colors

NOTES

White light is composed of many colors. It can be *dispersed* (separated) using a prism.



Sources of Light

There are many different sources of light:

1) **Incandescent sources** - is when an object can be heated to such a high temperature that it gives off visible light.

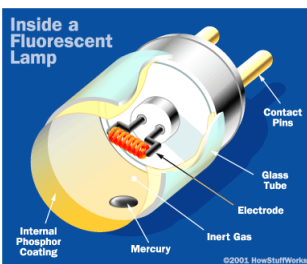
Pathway: Electrical → Thermal → visible

Ex) A regular Light bulb, candle flames

2) **Fluorescent Sources** - High energy, driven through a tube and the mercury inside will give off ultraviolet (UV) light immediately.

Pathway: Ultraviolet → Energy absorbed by particles → visible

Ex) Black Light, Lights in classroom (long tubes)



Example) Fluorescent light in school. An electrical current from the lead in wires and electrodes cause the mercury vapor inside the tube to give off ultraviolet radiation. A phosphor coating on the inside of the tube absorbs the UV energy. This causes the coating to glow, thus producing light that you can see.

Fluorescent Advantage over Incandescent

- no thermal energy involved so less heat/ energy lost (Energy efficient)
- bulbs are cool to touch

Fluorescent Disadvantage over Incandescent

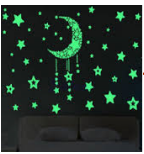
- expensive
- mercury & phosphorus are toxic thus making them harder to dispose of

Sources of Light_{continued}

3) **Phosphorescent sources** - is when light particles are absorbed then released later as light.

Pathway: Ultraviolet → Energy absorbed by particles → visible

Ex) glow in the dark stickers



4) **Chemiluminescent sources** - chemical reactions that release energy

Pathway: Chemical → visible

Ex) glow sticks

[The Science Of Glow Sticks \(youtube.com\)](#)



In a glow stick you have breakable barrier that separates two liquid. Bending the stick causes the barrier to break thus mixing the two liquids to cause a chemical reaction that relaes light.

5) **Bioluminescent sources** - unusual source but it is used by sea animals that usual live deep in the ocean where the sunlight does not reach. Jelly fish use this source of light energy.

Pathway: Chemical → visible

Ex) Jelly Fish

[Why Is \(Almost\) All Bioluminescence in the Ocean? \(youtube.com\)](#)

