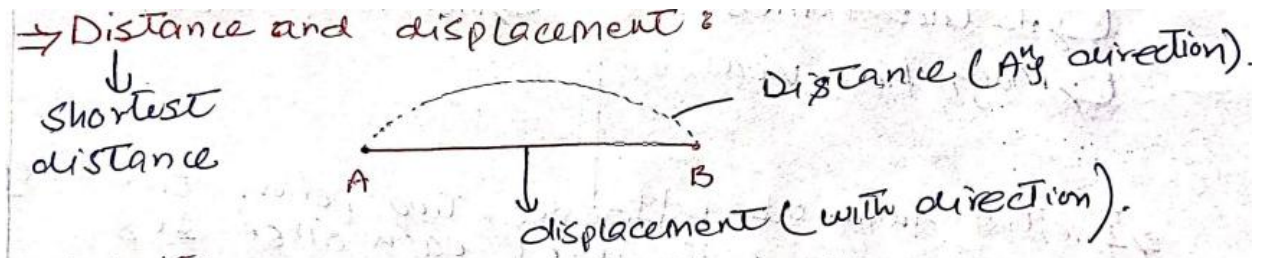


LECTURE BASIC 01 ON SOLAR SYSTEM IBES

- When light hit to prism it devide into 07 colours, called Dispersion.
- Sun light is white due to fusion reaction.

Sr. No.	Vector Quantities	Scalar Quantities
1.	Magnitude + Direction	Magnitude only
2.	Weight	Speed
3.	Velocity	Area
4.	Acceleration	Mass
5.	Displacement	Density
6.	Force	Temperature

Distance & Displacement:

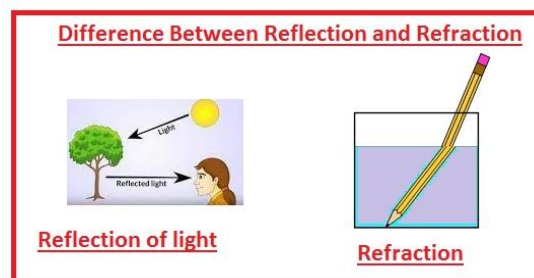


Reflect:

Reflection is the bouncing back of light when it strikes a smooth surface i.e. Echo of Sound

Refract:

Refraction is the bending of light rays when it travels from one medium to another i.e. Mirage.



- When we cook food in cooker the boiling point increases.
- It difficult to cook on Mountain due to low atmospheric pressure.
- Short Sightedness is known as Myopia which can be corrected by using concave lens.

- Far Sightedness can be correct by using Convex Lens.

Concave Mirror:

Rare view mirror (inside of car), use in homes, magnified view.

Convex Mirror:

Car's outside mirror i.e Give small view and not magnified.

- **Inertial frame of reference:**

- Two persons travelling in a car are in rest w.r.t each other its inertial frame of reference.

- **Non Inertial Frame of Reference:**

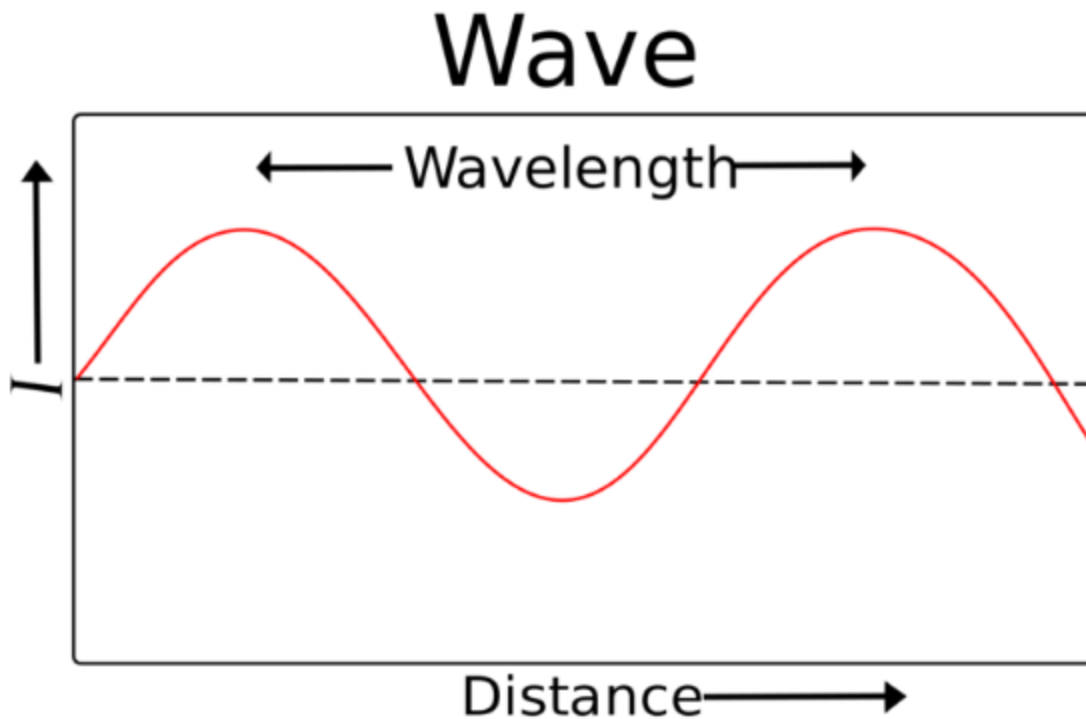
- Two persons during travelling in a car are in rest w.r.t each other but moving w.r.t person who is not travelling and watching the car standing out of the car. It is known as Non Inertial frame of reference.

- Visible Spectrum is 380 nano meters to 700 nanometres.

- More than 700 nm spectrum is Infra Red ray.

- Red light have longest wavelength.

- Blue light have shortest wavelength.



Wavelength Formula

$$\text{Wavelength} = \frac{\text{Velocity}}{\text{Frequency}}$$

- **Wave length = one cycle.**

- **Eco:** Reflection of Sound
- Velocity on car meter is instantaneous velocity.

<u>GALILEO GALILEE</u>	<u>ISAAC NEWTON</u>
Italian	English
Laws of falling bodies	Use mirror in telescope and increased 40% view
Planetary motion that which he watched from telescope using lens	Presented Three Laws of Motion
Discover Jupiter and Sun	Universal Law of Gravitation
Born in 1564	Born in 1643
Discovered that Sun is the Centre (Heliocentric)	
Both are Fathers of Phsyscs.	

- **Photoelectric Effect:** Emission of Electron when heat hits to any material.
- **Photoelectric effect:** theory by Einestein got Nobel prize.
- Robert Hooke defined, Stress & Strain=**Young's Modlus.**
- **Electromagnetic force:** Force between moving charged particles.
- **Powerful forece = 10^{36}**
- Dr. Abdu-Slam combined strong and weak electromagnetic force and got noble prize.

Formula

$$F = G \frac{m_1 m_2}{r^2}$$

F = force

G = gravitational constant

m_1 = mass of object 1

m_2 = mass of object 2

r = distance between centers of the masses

- **Atom:** Particle that can be divided and have nucleus in center.
- **Electron:** Negative, JJ Thomson → 1897 → $6 \cdot 10^{-28}$, Smallest and Lightest.
- **Proton:** Positive → Discovered by Rutherford → 1909, $= 6 \cdot 10^{-27}$.
- **Neutron:** No charge → James Chedwik → 1932 $6 \cdot 10^{-24}$
- **X-Ray:** Discovered by William Roentgen in 1895.
-

INTRODUCTION TO SOLAR SYSTEM

- Theory presented by Nicolas Copernicus from Poland.
- Total planets are Eight.
- **Formula: My Very Efficient Mom Just Served Us Noodles (1. Mercury 2. Venus 3. Earth 4. Mars 5. Jupiter 6. Saturn 7. Uranus 8. Neptune).**
- **Revolve:** To orbit around anything.
- **Rotate:** To rotated / Move around at its own Axis.
- Due to **Rotation** Days and Nights occurs.
- Due to **Revolution** Seasons and Years changes.
- All planets **revolve** around the sun from **West to East** Except Venus & Uranus which revolves from East to West.
- **Venus and Uranus Revolves + Rotate**
- **Constellation** is a group of stars i.e Southern Cross, Five Stars and Great Bear stars.
- **11 Jupiters are equal to 1 Sun.**
- Jupiter is known as **Guard of earth.**
- **Inner planets** are known as Terrestrial or Rocky Planets.
- **Outer planets** are known as Gasses Planets which are Jupiter and Saturn.
- Uranus and Neptune are Cold Planets.

LAWS OF MOTION

- **Isaac Newton** from UK gave the Laws of Motion.
- **1ST Law of motion:** Body/ Rest/ Motion until force applied.
- **2nd Law of motion** is $F = m \cdot a$ (Force=Mass+ Acceleration)
- **3rd Law of Motion:** Every action has reaction but in opposite direction.
- **Einstein:** Belongs to Germany, said Everything is moving, presented Theory of Special Relativity which is $E=MC^2$
- He also said if some objects moves with the speed of light it will convert in into Energy but nobody can achieved the speed of light.
- Sun contains 73% of Hydrogen and 26% Helium.
- Universe came into existence about 13.8 million years ago.
- **Singularity**
- **Big Bang** Theory presented by George Lemaitre.
- **Edwin Hubble** said "Universe Expanding".
- **Galaxy:** a system of millions or billions of stars, together with gas and dust, held together by gravitational attraction.
- **Formation of Nebula** clouds of dust and gasses due to exposure of gasses.
- Most abundant Element in the universe is Hydrogen, which is the lightest and in table of metals in periodic table.

- **Hydrogen** is a burning Gas.
- **Helium** is not a burning gas also filled in Bloons and used by swimmers.
- **H+H=Hydrogen= Fusion Reaction (Uncontrolled), we get energy in the form of Photons i.e Packet of light.**
- These Photons comes on earth surface.
- **Fusion reaction: 02 Atom, Combine as like on sun.**
- **Chemical reaction:** Matter wastes could not be Recovered i.e Burning of paper.
- Oxidation: Rusting of Steel, Loss of Electron.
- Water Convert into gas not a chemical reaction, water vapour can be recovered.
- Nebula Expanded with fusion and Stars Formed and Sun.
- **Step 1.Nebula→ 2. Fusion→ 3. Stars created→ 4. Planets Formed.**
- **Galaxy** is cluster, its shape is Spiral.
- Path of Galaxy is Elliptical.
- **Our Galaxy is Milky-way Galaxy which is near to Andromeda.**
- **Planetary System:** Galaxy and Celestial Objects in the form of Groups.
- **Celestial Bodies:** Sun and Planets.
- Largest Source of Fresh water are Glaciers.
- **Galaxy in**
- **1. Nebula → Star→ White Dwarf → Neutron Star → Complete Age → Black Hole.**
- Pluto→ Dwarf, excluded in 2006 because of fusion Ended in it.
- Astroid (Big Pieces of Stones) → Comets (Small Pieces)→Meteor (Shooting Stars)→Meterode (if absolves in air)→ Metroite (fall on earth)
- Sun is 150 million Km from Earth's surface.
- Sun's deepest part is called **Photosphere.**
- Sun's Outer surface is called **Corona.**
- Sun Revolve around Galaxy around 250 million km.
- **Sun Nearest** star is Alpha Centauri is far about 4.26 Light Year.
- One **light year** is equal to 9.46 trillion years.
- 12 Zero are in **Trillion.**
- **1. Mercury:**
 - Smallest Planet
 - Closet Plant
 - Fastest Plant
 - Ring-less Plant
 - No Moon/ Satellite

➤ **2. Venus:**

- Hottest Planet of Solar System.
- Due to green house effect its surface absorbs CO_2 , It produces heat, that's why Venus is call the Morning and evening Star.
- Earth's Twin planet because of its mass and size which is almost equal to Earth. Earth Mass $\rightarrow 6 \times 10^{24}$, Venus Mass $\rightarrow 6 \times 10^{23}$
- Venus rotates from East to West, Slowest Planet because of high Concentration of Gasses.
- Brightest Planet of Solar System.
- Longest Day equal to 243 Earth's Day.
- Sister of Earth.
- No Natural Satellite.

➤ **3. Earth:**

- Only 1310 Sphere
- Most Dense planet.
- 5th Largest Planet.
- Radius is 6378 km.
- Diameter is 12756 km .
- Circumference is 40075 km.
- Rotates from West to East.
- One Natural Satellite which is Moon.

➤ **4. MARS:**

- Red Planet \rightarrow 02 Satellites.

➤ **5. JUPITAR:**

- Guard of Earth \rightarrow 79 Satellites
- 11 Earth are equal to 01 Jupiter
- It attracts all stones falling and saves Earth and due to attraction.
- Stores orbit around the Jupiter.
- It does not have the mass as like sun therefore less fusion on its surface.
- Fastest Gassy Planet.

➤ **6. SATURAN:**

- Rings Visible \rightarrow have 82 Satellites

➤ **7. Uranus:**

- Rotates East to West as like Venus.
- Green Planet (H_2 , CH_4 , He) 8 Gases are present.

- It is called Ice giant planet → Cool planet.
 - 27 Satellites.
- **8. NEPTUNE:**
- Coldest → Farthest → Ice giants Plant.
- **Size Wise list of planets:**
- 1. Jupiter, 2. Saturn, 3. Uranus, 4. Neptune, 5. Earth, 6. Venus, 7. Mars 8. Mercury.