

Pressure:

- Definition: Pressure is the force exerted per unit area.
- Unit: The unit of pressure is the Pascal (Pa),
- Formula: $P = \frac{F}{A}$

Liquid Pressure: The pressure exerted by liquid to the surface is called liquid pressure/

- Unit: Same as general pressure - Pascal (Pa).
- **Formula $P = \rho hg$**

- Properties:

- Increases with depth.
- Depends on the density of the liquid.

Factors Affecting Liquid Pressure:

- Depth: Liquid pressure increases with depth.
- Density: Higher density increases liquid pressure.
- Gravity: Liquid pressure is influenced by gravity.

Pascal's Law:

Pascal's Law states that when pressure is applied to a confined fluid, it is transmitted uniformly in all directions.

- Mathematical Relationship: $\frac{F_1}{A_1} = \frac{F_2}{A_2}$

Applications of Pascal's Law:

- Hydraulic Systems: Used in car brakes, hydraulic lifts.
- Hydraulic Press: Utilized in various industries for shaping and molding.

Upthrust:

- Definition: The upward force exerted by a fluid on a submerged or floating object.
- Formula: Upthrust = Weight of liquid displaced
= $V\rho g$

Archimedes' Principle:

- In Simple Language: Archimedes' Principle states that an object merged in liquid experienced an upward force equal to the weight of the liquid displaced.
- Mathematical Relation: Upthrust = Weight of liquid displaced = weight of object in air – weight of object in water

Law of Flotation:

- Definition: An object will float in a fluid if the weight of the fluid it displaces is equal to its own weight.
- Application: Design of ships, lifebuoys.