

Force & Pressure



Forces are due to an interaction

- An interaction of one object with another object results in a force between the two objects.
- The combination of all the forces acting on an object is called net force.



Contact forces :

A force that is exerted only when two objects are touching.

- **Muscular force** : The force resulting due to the action of muscles.
- **Friction** : Friction is a force that resists motion.
- **Tension** : Tension is force exerted by string, ropes, fibres, and cables when pulled.
- **Normal force** : The force perpendicular to the surfaces of objects in contact.

01

Force

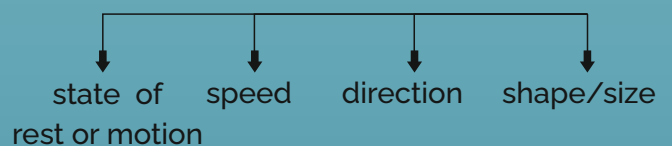
- A push or a pull acting on some object is called a force.
- SI unit of force - Newton ; C.G.S. unit of force - Dyne
- 1 Newton = 10^5 Dyne
- Force is a vector quantity.

02

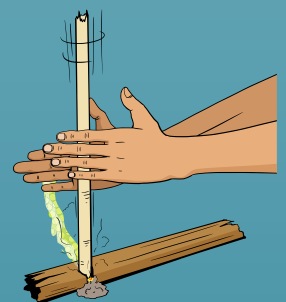
03

Effects of force

A force can change the object's


04

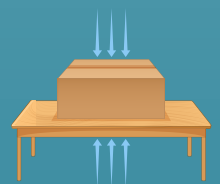

Muscular Force



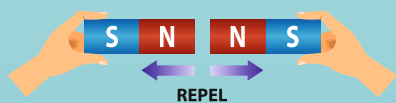
Frictional Force



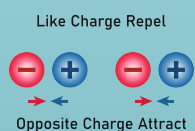
Tension



Normal Force



Magnetic Force



Electrostatic Force



Gravitational Force

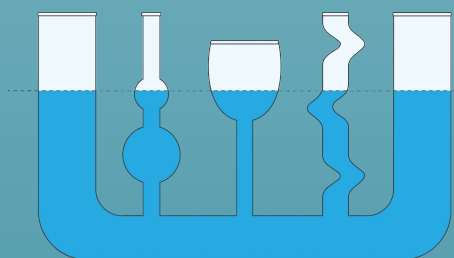
Pressure

Pressure is the force per unit area that is applied on the surface of an object

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

- SI unit of pressure – Pascal
- C.G.S unit of pressure – dyne cm⁻².

$$1 \text{ Pa} = 1 \text{ N/m}^2 = 1 \text{ N m}^{-2}$$



Atmospheric pressure

- The pressure exerted by the air present in the atmosphere is known as atmospheric pressure.
- Barometer is used to measure the atmospheric pressure.

05

Non contact forces

A non contact force is a force that one object exerts on another when they are not touching.

- Magnetic force** : The force exerted by a magnet on a piece of iron or on another magnet.
- Electrostatic force** : The force exerted by a charged body on another charged body or uncharged body.
- Gravitational force** : Objects fall towards the Earth because it pulls them.

06



07

Pressure exerted by liquids and gases

- Pressure increases with depth.
- It does not depend on the area of the surface in contact or the shape of the liquid column.
- Pressure acts in all directions.

08

