# Force & its Interaction

Force is a push or a pull that can change the state of motion of an object.

Force is a vector quantity, which means it has both magnitude and direction.

The unit of force is the newton (N), and it is measured using a spring balance or a dynamometer.

## Types of Forces:

**Contact Forces:**

These forces act when objects are in direct physical contact with each other.

Examples include friction, tension, normal force, and applied force.

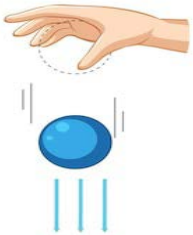
**Non-Contact Forces (Action-at-a-distance):**

These forces can act on objects without direct physical contact.

Examples include gravitational force, magnetic force, and electric force.

**Gravitational Force:**

It is the force of attraction between two objects with mass.



The more massive the objects and the closer they are, the stronger the gravitational force.

Gravitational force is responsible for the weight of an object on Earth.

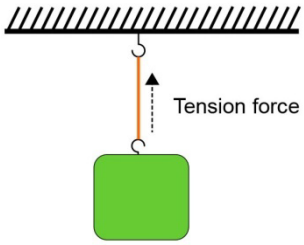
**Frictional Force:**

Friction is a force that opposes the relative motion or tendency of such motion between two surfaces in contact.

It acts in the direction opposite to the motion or intended motion.

Types of friction include static friction (when objects are not moving), kinetic friction (when objects are sliding), and rolling friction (when objects roll).

**Tension Force:**




Tension is the force exerted by a string, rope, or cable when it is pulled tight by forces acting from opposite ends.

It always acts along the direction of the string or rope.

**Normal Force:**

It is the force exerted by a surface to support the weight of an object resting on it.

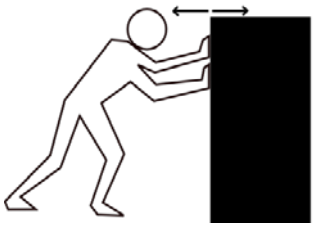
The normal force is always perpendicular to the surface.

**Applied Force:**

Applied force is a force that is applied to an object by a person or another object.

It can be in any direction.

**Newton's Third Law of Motion:**



For every action, there is an equal and opposite reaction.

This law explains how forces always occur in pairs.

**Examples of Force Interactions:**

When you push a book on a table, there's a force of your push and the table's normal force pushing back on the book.