



Force and Pressure



CLASS 8 SCIENCE NCERT

Introduction to Force

What is Force?

Definition: A force is a push or a pull.

□ Examples

- Pushing the door
- Pulling a suitcase
- Kicking a football

Forces are acting around us all the time.

A force can start or stop motion.



Force

Vector quantity



Force as a Vector Quantity

Force has:

- **Magnitude (strength)**
 - **Direction**
-
- Represent force using arrows.
 - Changing direction changes the effect.

Effects of Force

1. **Move a Stationary Object**
2. **Stop a Moving Object**
3. **Change Speed**
4. **Change Direction**
5. **Change Shape or Size**



Force can change the state of object

Move a Stationary Object

PUSHING THE STATIONARY BOOK ON THE TABLE

The example of the **stationary cart** (or a football) shows that an object at rest has a speed of zero.

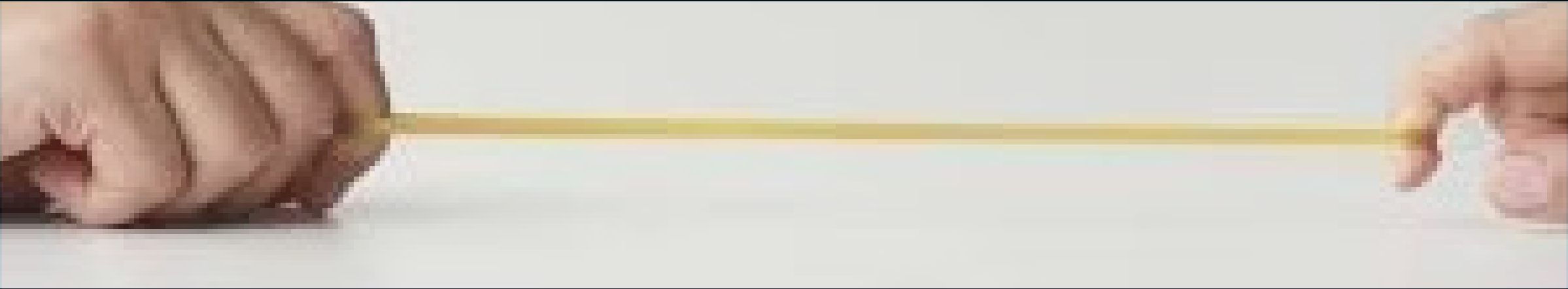
- **The Concept:** When you apply a force (a push), the object gains speed.
- **NCERT Key Point:** Force is required to make a stationary object move. Without an external force, the cart would stay still forever.

Force can change the state of object-

Stop a Moving Object

- When you apply brakes to a bicycle or a goalkeeper stops a moving football, you are applying force in the **opposite direction** of the motion.
 - **The Concept:** If the force is applied in the direction opposite to the motion, it results in a decrease in the speed of the object.
 - **NCERT Key Point:** If the force is large enough, the speed becomes zero, bringing the object to a complete stop.





Effects of Force – Change in Shape

- A force can change the shape of an object.

🔗 MINI ACTIVITY: PRESS A SMILEY BALL.

Examples:

Pressing a sponge

Stretching a rubber band

Squeezing a stress ball



Effects of Force – Change in Speed

Force can:

- Increase speed
- Decrease speed

Examples:

- Pushing a trolley
- Applying brakes on a bicycle

Effects of Force – Change in Direction

- Force can change direction of motion.
- Example:
 - Hitting a moving cricket ball



Types of Forces

Two main types:

1. Contact Forces
 - a. Muscular force
 - b. Friction force
2. Non-Contact Forces
 - a. Magnetic force
 - b. Gravitational force
 - c. Electrostatic force



Muscular Force

- Force applied using muscles.
- It is a **contact force**.
- Examples:
 - Lifting school bag
 - Pushing table
 - Kicking football

ACTIVITY:


Two students push a desk together. Observe increased force.



Frictional Force

- ☐ **Friction is the force that opposes motion between two surfaces in contact.**
- ☐ Acts opposite to motion.

 **ACTIVITY:** 

 **RUB HANDS TOGETHER →**
FEEL HEAT.

- Examples:
 - Walking
 - Brakes
 - Writing with pencil

Non - Contact Force

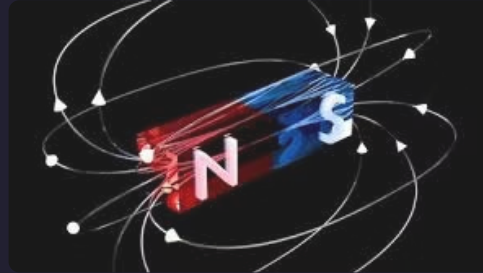


Gravitational Force

- Force by which Earth attracts objects.
- Acts towards the center of Earth.


Examples:

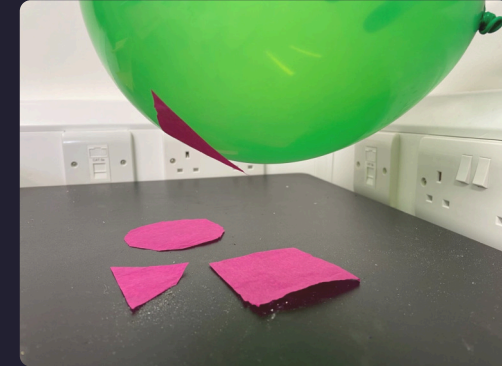
- Falling apple
- Objects thrown up return



Magnetic Force


- Force exerted by magnets.
- Attracts iron, nickel, cobalt.
- **Like poles repel; unlike poles attract.**
- Non-contact force.

 Bring magnet near pins.



Electrostatic Force

- Force due to electric charges.
- Non-contact force.

 Activity:
Rub balloon on hair → Attract paper bits.

Balanced and Unbalanced Forces

- **Balanced Forces:** Equal forces in opposite directions → No change in motion.
- **Unbalanced Forces:** Unequal forces → Change in motion.

