

Class 8 Force and Pressure

What is a Force?

The first topic in Class 8 Force and Pressure is what does Force mean? A force is simply defined as a push or a pull on a particular object. For instance, when someone pushes a car in a particular direction and the car moves in the direction of the applied force. This action is called force. Similarly, if you kick a ball in a particular direction or pull open a door, you use force to do these activities.

As per the Class 8 chapter on Force and Pressure, the use of force requires interaction between at least two objects. For instance, when you push a table or pull a chair, this action is considered a force because there is an interaction between two objects.

There are different forms of forces:

- When we apply force in the same direction, it adds to one another. For instance, if A is pushing a table in one direction and B decides to help A move the table and applies force from the same direction then the force adds to one another.
- When we apply force on an object from two different directions then it creates a difference between the two forces. For instance, if A is pushing table in one direction by applying force and B starts to push the table in the opposite direction, then whoever uses greater force would win.

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What is the Magnitude?

According to NCERT Class 8 Force and Pressure, Magnitude refers to the measurement of the strength/amount of the applied force.

What are the Effects of a Force?

Here are the major effects of a force as per Class 8 Force and Pressure:

- Force can change the state of motion
A force changes the state of motion by moving a still object or by stopping a moving object. If you kick a stationary ball or pick a book, you do so by the use of force and change the state of an object. Similarly, if you catch a ball while playing, you stop a moving object.
- Force can also change the direction of the moving object
For instance, while applying a game of volleyball, the direction of the ball is moved according to the force applied.
- Force can change the shape of an object
If force is applied to an object then the shape of that object can be shaped as well. For instance, if you apply force to a lump of clay, you can mould it however you want.

What are the Different Types of Forces?

There are certain forces that are a result of contact while others are called non-contact forces. Let's find out what contact and non-contact forces are:

Contact Forces

The Class 8 chapter on Force and Pressure elaborates upon the two types of Contact Forces which are Muscular and Friction forces:

Muscular Force

A muscular force is defined as a force that is the outcome of the use of muscles. For instance, when you pick up a ball or push open the door or when bulls pull carts. All these actions are a result of muscular force applied by the person. It is a contact force because the interaction between the two objects is possible only through physical contact.

Friction Force

The force of friction can also change the state of an object. Friction force always acts on moving objects and the direction of this force is always opposite to the object in motion. For instance, when a moving ball stops, it is an example of this force. Friction is a result of contact between two surfaces that is why it is called a contact force.

Non-Contact Forces

The three types of Non-Contact forces are Magnetic force, Electrostatic force and Gravitational force. Let's understand the definitions of each of these non-contact forces as per Class 8 Force and Pressure.

1. **Magnetic Force:** Magnets exert a force similar to push and pull action on other magnets without any form of contact. This is why the magnetic force is called a non-contact force.
2. **Electrostatic Force:** Electrostatic force is a force applied by a charged body on another charged or uncharged body.
3. **Gravitational Force:** The gravitational force is the force that pulls all objects towards the earth surface. For instance, when a coin falls or when the tap water falls towards the floor, it is a result of the force of gravity.

What is Pressure?

Now that we have covered the concept of force in Science, let's understand the latter part of the Class 8 Force and Pressure that focuses on the topic of Pressure. When force is applied to the per unit area of a surface, it is called pressure. If the surface area decreases, the pressure increase simultaneously when the surface area increase, pressure decreases. For instance, when we put the sharp edge of a nail against the wall to drill it in because that end provides a small surface area so that adequate pressure and force can be applied.

The formula for pressure is – $\text{Pressure} = \text{Force}/\text{Area}$

The pressure exerted by Liquids and Gases. Both liquids and gases exert pressure on the inner walls of the container they are kept in. For instance, if there is a hole in a water bottle, the water will leak out because of the pressure exerted by water on the bottle. Similarly, gases apply pressure on the inner surface of the container. If we will up a

balloon with air, the pressure inflates the balloon and if we don't trap the opening then the air will escape.

Atmospheric Pressure

The pressure exerted by the air around us is called atmospheric pressure. This pressure is a result of the weight of gases in the earth atmosphere around us. This air pressure is equal to the pressure inside our bodies that is why we are not crushed by the air pressure. For instance, when a rubber sucker is pressed on a surface, all the air between the cup and the surface escapes, as a result, the rubber sucker clings to the surface because of the immense air pressure acting on it.

The force of air pressure is great. To prove the same, a german scientist, Otto von Guericke, joined two metallic hemispheres and removed all the air out of the two hemispheres. The scientist used 16 horses, eight on each side to separate the attached hemisphere but they failed because of the absence of air inside and the force of air pressure.