CBSE Class 8 Science Notes Chapter 8: Here are the notes for CBSE Class 8 Science Chapter 8 Force and Pressure provided in simple language to help you understand the key concepts. These notes cover important topics such as the definition of force, types of forces, and the concept of pressure.

They are designed to help in your preparation for the Class 10 board exams by making complex ideas more accessible and easier to grasp. Review these notes thoroughly to strengthen your understanding and perform well in your exams.

CBSE Class 8 Science Notes Chapter 8 Force and Pressure Overview

These notes are prepared by the subject experts of Physics Wallah provide a detailed overview of CBSE Class 8 Science Chapter 8 Force and Pressure. They simplify key concepts such as the nature of force, types of forces and the principles of pressure making it easier for students to grasp these important topics.

With clear explanations and detailed insights these notes are designed to enhance your understanding and support effective preparation for your exams.

CBSE Class 8 Science Notes Chapter 8 Force and Pressure PDF

The PDF link for CBSE Class 8 Science Chapter 8 Force and Pressure is available below. This PDF includes detailed notes on the chapter providing clear explanations of key concepts related to force and pressure.

Access the PDF to review the material thoroughly and reinforce your understanding of force and pressure before your exams.

CBSE Class 8 Science Notes Chapter 8 Force and Pressure PDF

CBSE Class 8 Science Notes Chapter 8 Force and Pressure

Below we have provided CBSE Class 8 Science Notes Chapter 8 Force and Pressure for students to help them understand the chapter better and to score good marks in their examination.

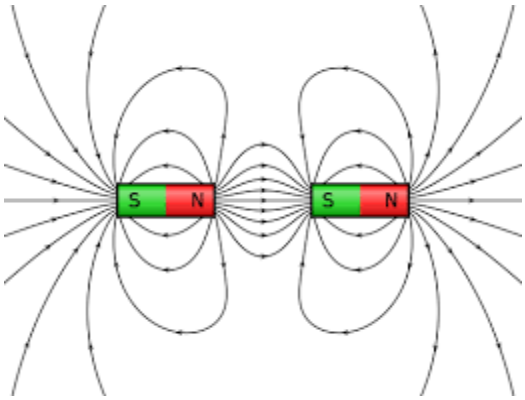
Force – A Push or a Pull

In science, force is defined as a push or pull on an object that arises from the interaction between two objects. Force is characterized by both magnitude and direction, meaning it has a specific strength and a particular direction in which it acts. It is responsible for changing the direction or state of motion of a body.

Push

A push is a type of force that is exerted away from the body. Examples include hitting a snooker ball or kicking a football. These actions apply a force that moves the object away from the source of the push.

Magnetic Force



Magnetic force refers to the attraction or repulsion between two magnetic bodies caused by their poles. This force can either pull magnetic objects together or push them apart, depending on the orientation of their poles.

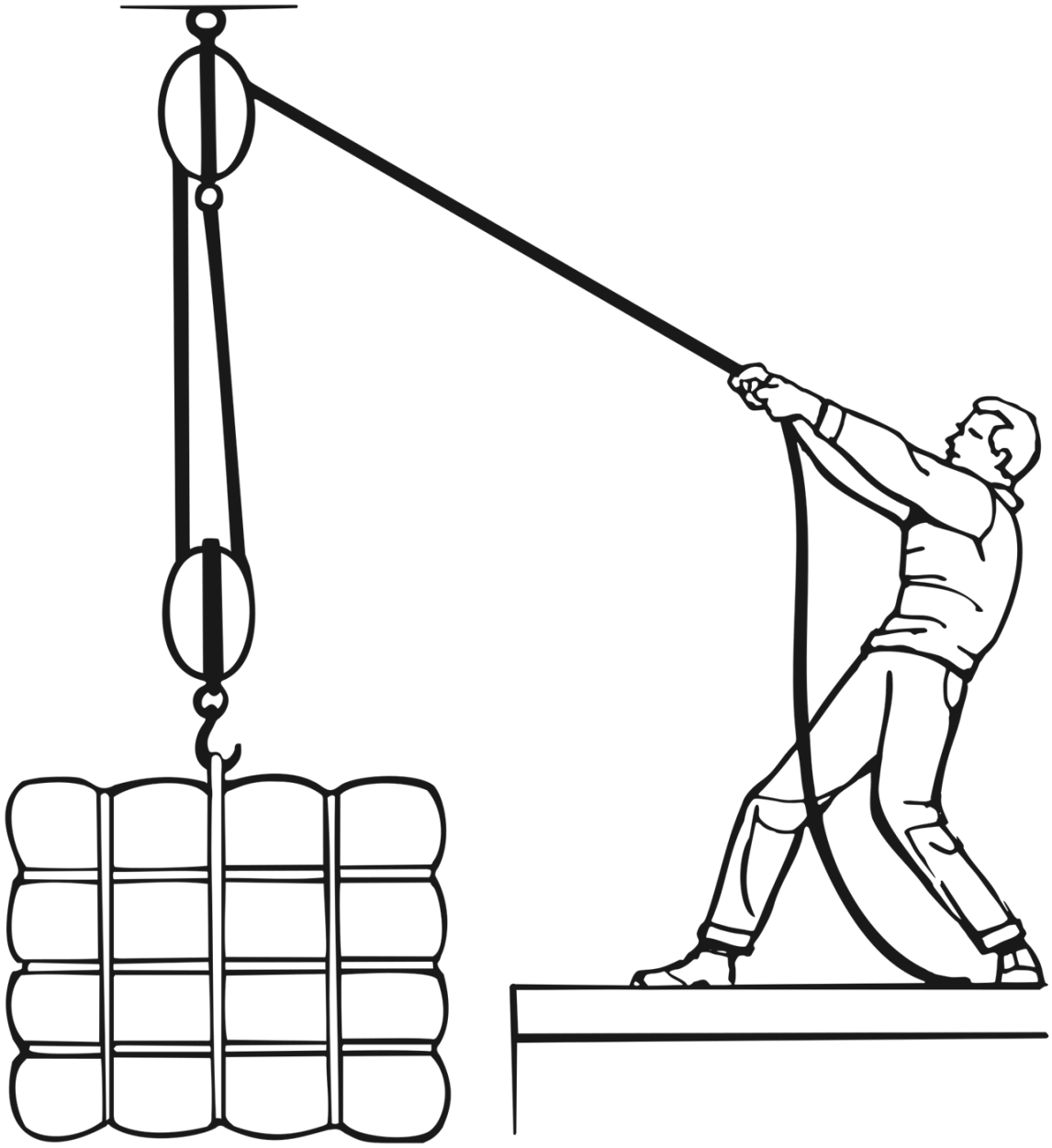
What Is It?

Pull

A pull is a type of force that acts towards the body or the source of the force, drawing an object closer. This can be observed in various everyday activities. For example, when drawing a bucket of water from a well, the force exerted on the rope pulls the bucket upwards, bringing it closer to you.

Another example is playing tug of war, where each team pulls on opposite ends of a rope, trying to draw the rope and thereby the opposing team towards themselves. In both cases, the pulling force is applied towards the person or object exerting the force, changing the object's position relative to the source.

Force



Force is a fundamental concept in physics defined as a push or a pull that causes an interaction between objects. It can change the state of motion or the direction of an object. When you push a door, you apply a force that makes it move.

Similarly, when you pull a cart, the force you apply changes its position. Forces can either accelerate an object, slow it down, change its direction, or even alter its shape. The effect of a force depends on its magnitude (strength) and direction. Essentially, force is responsible for any

change in the state of motion or rest of an object, demonstrating its crucial role in interactions between objects.

Playing With It

Net Force

The net force is the overall force acting on a body when all individual forces are combined. It is the vector sum of all forces applied to the object. The direction of the net force determines the direction of the object's acceleration. For instance, if multiple forces are applied to an object in different directions, the net force is the resultant force that takes into account the magnitude and direction of each force. This net force dictates how the object will accelerate, following Newton's Second Law of Motion.

Frictional Force

Frictional force is the force that resists the relative motion of two surfaces in contact. It acts parallel to the surfaces and opposes the direction of movement or potential movement between the objects. For example, when you slide a book across a table, the frictional force acts against the motion of the book, slowing it down. Frictional force is a type of contact force and is crucial in everyday activities, such as walking or driving, as it prevents slipping and provides traction.

What Can Force Do?

Vector

In physics, a vector is a quantity that has both magnitude and direction. This means that when dealing with vectors, you must specify not only how much of the quantity there is but also the direction in which it acts. Examples of vector quantities include velocity, displacement, weight, momentum, force, and acceleration. Vectors are essential for analyzing forces because they help determine the net effect of multiple forces acting on a body.

When multiple forces are applied to an object, each force can be represented as a vector with both magnitude and direction. To find the net force acting on the object, these individual forces are combined, or "resolved," into one resultant vector. This resultant vector represents the

overall effect of all the forces acting on the object and dictates how the object will move or accelerate.

Example:

Consider a situation where two people push a sled in different directions. One person applies a force of 10 N (Newtons) to the right, while the other applies a force of 5 N to the left. To determine the net force acting on the sled, you would subtract the force applied to the left from the force applied to the right:

Net Force = 10 N (right) - 5 N (left) = 5 N (right)

This net force of 5 N to the right will determine the direction in which the sled accelerates and its overall motion.

Application of Force

Force is an effort that can alter the state of an object, whether it is at rest or in motion. It has the ability to change an object's direction, speed (velocity), and even its shape. For example, pushing a stationary car makes it move, changing its state from rest to motion. Similarly, applying force to a moving car can alter its speed or direction. Aapplying force can deform objects, such as squeezing a sponge or compressing a spring.

State of Motion

The state of motion of an object is characterized by its velocity, which includes both speed and direction. Inertia, a property of matter, describes an object's resistance to changes in its velocity.

Inertia can be defined as the tendency of an object to resist changes in its velocity.

For an object at rest, inertia means it will remain stationary unless acted upon by an unbalanced force. If no external force is applied, the object will not start moving. Conversely, an object in motion will continue to move with the same velocity meaning the same speed and direction—unless an unbalanced force acts on it.

For example, if a car is moving east at 2 m/s, it will keep moving east at the same speed if no forces, like friction or obstacles, interfere. This resistance to changing its velocity is the object's inertia. In essence, inertia explains why objects resist changes to their motion, whether they are at rest or in motion.

Types of Forces

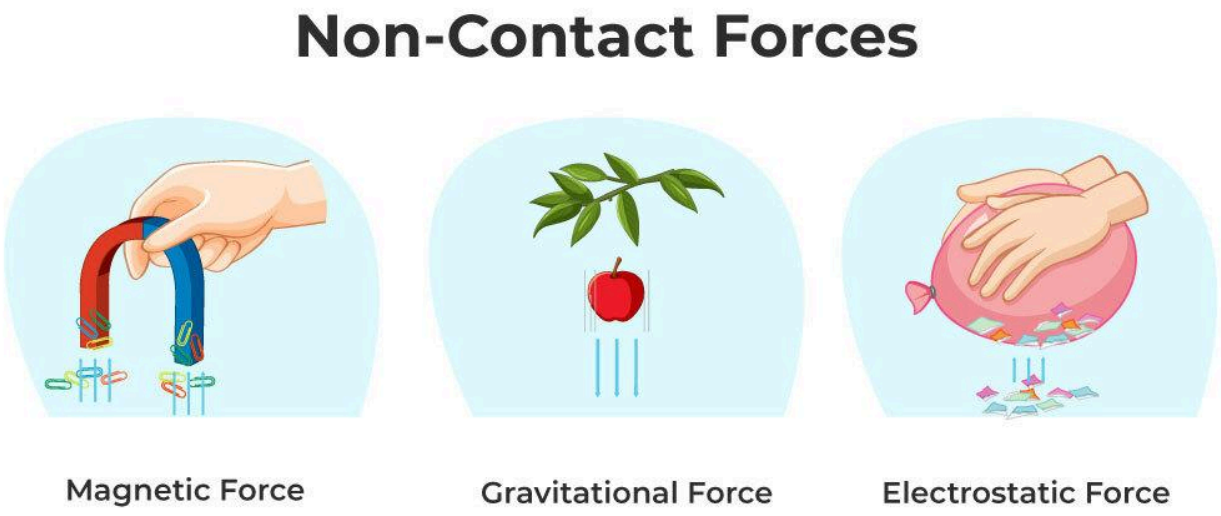
Forces can be broadly classified into two categories based on their interaction type: contact forces and non-contact forces.

1. Contact Forces

Contact forces require physical interaction between objects. They occur when two or more objects touch each other. Common types of contact forces include:

- **Muscular Force**: This force is exerted by the effort of our muscles. It is used in actions such as lifting, pulling, pushing, or pedaling. For example, lifting a heavy box or pedaling a bicycle involves muscular force.
- **Frictional Force**: This force opposes the relative motion between two surfaces in contact. It acts to resist sliding or rolling motion. For instance, when you drag an object across a surface, frictional force acts against the motion, slowing it down.
- **Normal Force**: This is the support force exerted by a surface perpendicular to the object resting on it. For example, when a book rests on a table, the table exerts an upward normal force that balances the book's weight.
- **Tension Force**: This force is transmitted through a string, rope, or cable when it is pulled tight. For example, pulling on a rope in a tug-of-war creates tension force in the rope.

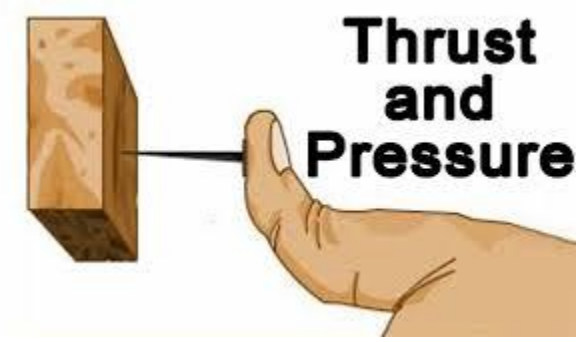
2. Non-Contact Forces



Non-contact forces act over a distance without physical touch. They include:

- **Gravitational Force**: This force attracts objects towards the center of the Earth or any other massive body. It is responsible for keeping us grounded and causing objects to fall.
- **Electromagnetic Force**: This force acts between charged particles. It includes both electric forces (between static charges) and magnetic forces (between moving charges or magnetic materials).
- **Nuclear Force**: This force acts within the nucleus of an atom, holding protons and neutrons together. It is one of the strongest forces but acts over very short distances.

Thrust and Pressure



Pressure

Pressure is defined as the force applied per unit area. It measures how force is distributed over a specific area and is expressed in units of Pascals (Pa) in the International System of Units (SI).

Key Concepts:

Thrust: Thrust is the total force applied perpendicular to a surface. It is essentially the force that causes pressure on that surface.

Distribution of Pressure: Pressure depends on the area over which the force is distributed. For a given force, applying it over a smaller area results in higher pressure. For example:

- **Porters using a round cloth**: Porters place a round cloth on their heads to distribute the weight over a larger surface area, thereby reducing the pressure on any single point and making it easier to carry heavy loads.
- **Sharp Knife**: A sharp knife cuts more effectively because it has a thin edge, concentrating the force over a smaller area and increasing the pressure applied, making it easier to cut through materials.

Pressure in Fluids

In fluids (gases or liquids), pressure is exerted uniformly in all directions within a container. This principle is known as Pascal's law. It means that any change in pressure applied to a confined fluid is transmitted undiminished throughout the fluid. For instance, when you squeeze a balloon, the pressure increases uniformly throughout the balloon, and this pressure is exerted on all parts of the balloon's surface.

Understanding pressure and its applications helps in various practical situations, from engineering to everyday tasks, by illustrating how force and area interact.

Upthrust and Atmospheric Pressure

Upthrust

Upthrust, also known as buoyant force, is the upward force exerted by a fluid on an object placed in it. This force acts opposite to the force of gravity and is responsible for making objects float or rise in fluids like water and air. The magnitude of the upthrust depends on the volume of the fluid displaced by the object and the density of the fluid. According to Archimedes' principle, the buoyant force is equal to the weight of the fluid displaced by the object.

Atmospheric Pressure

Gaseous Pressure: Gases exert pressure in all directions against the walls of their container. This pressure results from the constant collisions of gas molecules with the container's surface.

Atmospheric Pressure: Atmospheric pressure is the force exerted by the weight of the air above us. The atmosphere extends several kilometers above sea level, and the weight of this air column exerts pressure on everything within it. This pressure is balanced by the pressure inside our bodies, which is why we do not feel it. Atmospheric pressure decreases with altitude because there is less air above to exert force.

Understanding upthrust and atmospheric pressure is crucial for applications such as designing ships and submarines, and for understanding weather patterns and altitude-related phenomena.

Benefits of CBSE Class 8 Science Notes Chapter 8 Force and Pressure

Comprehensive Understanding: The notes provide a clear and detailed explanation of the fundamental concepts of force and pressure, including definitions, types of forces, and the principles behind them. This helps students grasp the foundational ideas and their applications in various scenarios.

Simplified Explanations: The notes break down complex concepts into easy-to-understand language and step-by-step explanations, making it accessible for students at different levels of understanding.

Review and Revision: The concise and structured format of the notes makes them an excellent tool for quick review and revision, ensuring that students can efficiently cover the material before exams.

Foundation for Advanced Topics: Understanding the basics of force and pressure lays a strong foundation for more advanced topics in physics, helping students build a solid base for future studies.