

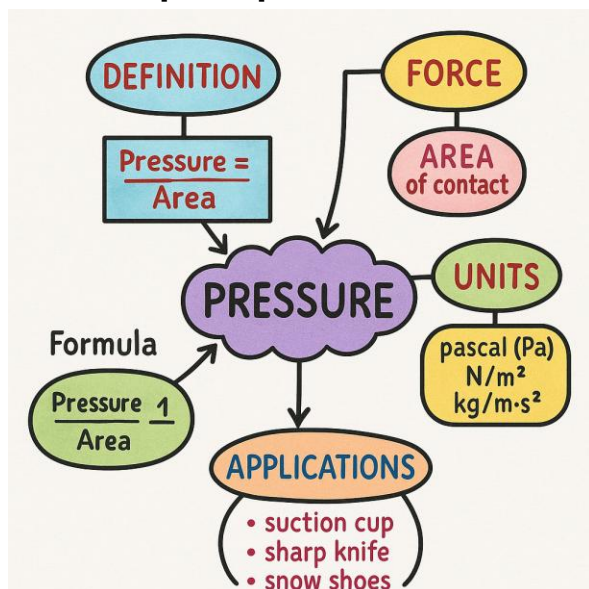
## Pressure

### I Word Focus

- ★ Pressure
- ★ Force
- ★ Area
- ★ Atmospheric Pressure
- ★ Pascal (Pa)
- ★ Density
- ★ Fluid Pressure

### II KWL

### III Concept Map



### IV Q and A

#### 1. Why does atmospheric pressure decrease as we go higher in altitude?

Atmospheric pressure decreases with altitude because the air gets thinner as we go higher. At sea level, the air is denser, and more air molecules are pushing down on us, creating higher pressure. As we go higher, there is less air above us, so the weight of the air decreases, leading to lower atmospheric pressure.

2. **Differentiate between atmospheric pressure and fluid pressure.** How do they differ in terms of their application?

Aspect	Atmospheric Pressure	Fluid Pressure
Definition	The pressure exerted by the weight of the air in the Earth's atmosphere on objects and surfaces.	The pressure exerted by liquids or gases at rest or in motion, acting in all directions.
Cause	Caused by the weight of the air molecules in the atmosphere.	Caused by the weight of the fluid molecules and their movement.
Direction	Acts downward, toward the Earth's surface.	Acts in all directions (up, down, sideways) within the fluid.
Variation with Altitude	Decreases as altitude increases (higher in the sky).	Fluid pressure increases with depth (e.g., in oceans or lakes).
Measurement	Measured with a <b>barometer</b> in <b>Pascals (Pa)</b> or <b>atm</b> .	Measured with a <b>manometer</b> or pressure gauges, typically in <b>Pascal (Pa)</b> .
Examples	Air pressure at sea level (1 atm), high and low-pressure weather systems.	Pressure in water at different depths, pressure in a tire or hydraulic brake systems.

### 3. How is pressure applied in various real-life situations?

- **Hydraulic Systems:** Used in machines like car brakes and lifts. Pressure is applied through fluids to lift heavy objects using a small amount of force.
- **Airplanes:** Air pressure is used to create lift, with higher pressure under the wings and lower pressure above them.
- **Weather:** Atmospheric pressure affects weather patterns. High-pressure areas bring clear skies, while low-pressure areas bring stormy weather.
- **Medical Devices:** Blood pressure is a measure of the pressure exerted by circulating blood on the walls of blood vessels.
- **Cooking:** In pressure cookers, pressure is applied to increase the boiling point of water, speeding up cooking.
- **Diving:** Pressure increases as a diver goes deeper into the ocean, affecting the body and equipment.
- **Machinery:** Pressurized gases are used in pneumatic systems to power tools and machines.

### 4. What is Atmospheric Pressure?

**Atmospheric Pressure** is the force exerted by the weight of the air above us on everything it touches. It is the pressure exerted by the Earth's atmosphere on the surface of the Earth and all objects within it. The air in the atmosphere is made up of gases, and the weight of these gases presses down on everything at the Earth's surface.

- **It Decreases with Altitude:** As you go higher up in the atmosphere (like climbing a mountain or flying in an airplane), the atmospheric pressure decreases. This is because there is less air above pushing down.
- **Measured in Pascals (Pa):** Atmospheric pressure is commonly measured using a unit called the **Pascal (Pa)**, but it is often expressed in **atmospheres (atm)** or **millimeters of mercury (mmHg)** in everyday life.
- **Average Pressure at Sea Level:** At sea level, the average atmospheric pressure is around **101.3 kPa (kilopascals)** or **1 atm**.

5. A person is standing on the ground with a **total weight** of 600 N (Newtons). The area of the soles of their shoes is **0.3 m<sup>2</sup>**. Calculate the pressure exerted by the person on the ground.

**Force (F)** = 600 N (the weight of the person)

**Area (A)** = 0.3 m<sup>2</sup> (the area of the soles of the shoes)

Pressure=Force/ Area

Pressure= 600 /0.3

**= 2000 Pa**

The **pressure** exerted by the person on the ground is **2000 Pascals (Pa)**.