

Section 1: Key terms

Pressure	The force per unit area , measured in Pa (which is equal to 1N/m ²).
Density	Mass per unit volume of a substance.
Fluid	A liquid or a gas .
Earth's atmosphere	Relatively thin layer of gases that surround planet Earth .
Atmospheric pressure	The pressure exerted by the weight of the atmosphere .
altitude	The height of an object in relation to sea level .
Upthrust (HT)	The upward force that acts on a body partly or completely submerged in a fluid .
Flotation (HT)	The action of floating in a liquid or a gas .

Section 2: Pressure and surfaces

Pressure is caused when **objects exert forces** on each other, or when a **fluid exerts a force** on an object in contact with the fluid.

Pressure depends on	<ul style="list-style-type: none"> Area of contact on which the force acts Size of the force 	
Calculating pressure	$\text{Pressure} = \frac{\text{force}}{\text{area}}$ $p = F/A$	Pressure – pascals, Pa Force – newtons, N Area – metres squared m ²
Effect of area on pressure	Caterpillar tracks fitted to vehicles increases the contact area that the tracks have to the ground. This reduces the pressure of the vehicle on the ground because its weight is spread over a larger contact area . Useful for driving on sandy, muddy or snow covered ground .	

Section 3: Pressure in a liquid at rest (HT)

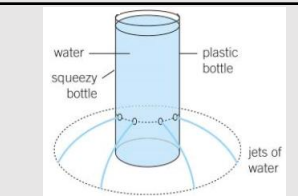
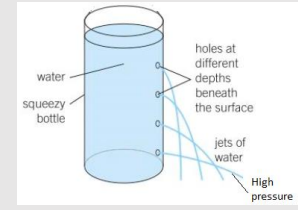
The pressure at the bottom of a column of liquid depends upon:

- Height of the column (higher the column, the greater the pressure.)
- Density of the liquid (greater the density, the greater the pressure.)

Calculating pressure due to column height of a liquid of given density.	$\text{Pressure} = \text{height} \times \text{density} \times \text{gravitational field strength}$ $P = h \times \rho \times g$	Pressure – Pa Height – m Density – m ³ Gravity – N/Kg
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Section 3: Pressure in a liquid at rest continued (HT)

Pressure increases with depth	The further the hole is below the level of water in the bottle, the greater the force which the jet leaves the bottle
Same pressure at same depth	The pressure along the horizontal line is constant (the jets from these holes are at the same pressure.



Section 4: Atmospheric pressure

Air molecules colliding with a surface create atmospheric pressure.	
Atmospheric pressure	At sea level 100kPa Mount Everest 30kPa
Altitude	Atmospheric pressure decreases with higher altitude as the number of air molecules (& hence the weight of air) above a surface decreases as the height above ground level increases.
Density of atmosphere	The atmosphere gets less dense with increasing altitude.

Section 5: Upthrust and flotation. (HT)

When an object floats, it experiences a greater pressure on its base, compared to the top surface. This creates a resultant force upwards called **upthrust**.

The upthrust on an object in a fluid:	<ul style="list-style-type: none"> • Is an upward force on the object due to the fluid • Is caused by the pressure of the fluid
The pressure at a point in a fluid depends on the density of the fluid and the depth of the fluid at that point.	
An object sinks if its weight is greater than the upthrust on it when it is fully immersed. A ship floats because it displaces more water than the weight of the ship hence its weight is equal to the upthrust.	