PRINCIPLE, RELATIVE DENSITY KEY POINT

- The total force acting perpendicular on a given surface is called thrust.
- Thrust acting upon a unit area is called pressure. Its S.I. unit is Pascal denoted by ‘P’
- Thus, pressure =Thrust/Area of contact
- Archimedes’ principle states that when a body is immersed partially or fully in a fluid, it experiences an upward force that is equal to the weight of the fluid displaced by it.
- Archimedes' Principle is used in designing ships and submarines. The lactometers and hydrometers used for measuring the purity of a sample of milk and for determining the density of the liquids are based on this principle.
- Buoyancy can be defined as the tendency of the fluid to exert an upward force on an object, which is wholly or partially immersed in a fluid.
- The S.I. unit of buoyant force is Newton.
- This upward force that acts on an object when immersed in a fluid is called buoyant force.
- Two main factors on which the buoyant force depends are: (i) Density of the fluid. (ii) Value of acceleration due to gravity at that place.
- when an iron nail is placed on the surface of water it sinks whereas ship made up of iron floats. This is because size or volume of the ship is more.
- if the density of the liquid is more than the density of the material of the body then the body floats due to the buoyant force exerted by it and vice-versa.
- Density of a substance is the mass of the substance contained in a unit volume of that substance.
- Density of an object is given as Mass/Volume
- Buoyant force experienced by a body when submerged in a liquid depends on the volume of the body and the density of the liquid.
- The density of a substance is one of its characteristic properties and used to determine the purity of any substance.
- Floating and Sinking depends on density of water and the density of an object
- If the density of an object is less than the density of water it floats. This means that the up thrust of water on an object is greater than the weight of the object.

- If the density of an object is more than the density of water it sinks. This means that the up thrust of water on an object is less than the weight of the object.
- Therefore objects of density less than that of a liquid float on the liquid. The objects of density greater than that of a liquid sink in the liquid.
- Two forces act on an object immersed in water. One is the gravitational force, which pulls the object downwards, and the other is the buoyant force, which pushes the object upwards.
- If the upward buoyant force is greater than the downward gravitational force, then the object comes up to the surface of the water
- The density of the substance is more than the density of water (1 g/ cm3) than it will sink in water.
- Relative density of a substance is the ratio of density of substance to the density of water. It is also called specific gravity.
- Relative density = Density of substance/density of water
- Relative density of a substance help us determine the purity of a substance by measuring its relative density Examples: We use lactometer to differentiate between pure and impure(measure the impurity) milk. We can measure the impurity of water using hydrometer.
- What is meant by the statement relative density of gold is 19.3?
- It means that gold is 19.3 times denser than an equal volume of water. Those objects whose relative density is less than one will float in water and those greater than one will sink.
- 5 kg of cotton occupies more space than 5 kg of iron. The particles of iron are closely packed while that of cotton are loosely packed. The amount of iron packed in a unit volume is more. This explains as to why iron is heavier than the same volume of cotton.
- In Physics, word density help us to describe the lightness or heaviness of different substances