

What is Buoyancy?



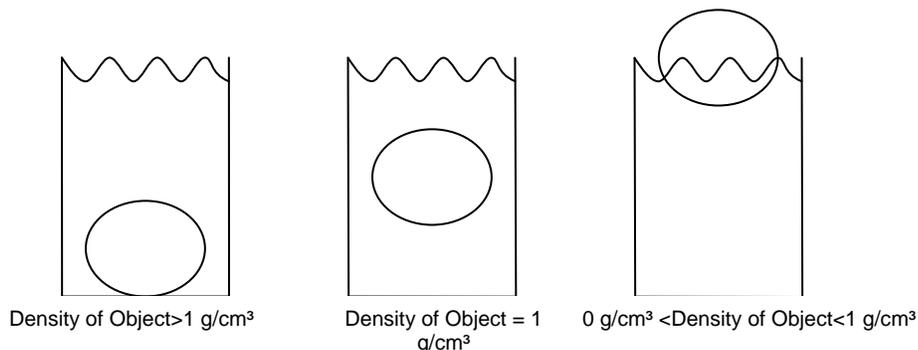
Have you ever wondered why massive boats and ships weighing hundreds of tons float while small objects like rocks sink? Have you ever wondered why when you inhale in a pool you float and when you exhale you sink to the bottom even though you weigh the same? This phenomenon can be explained by the scientific principle called **buoyancy**.

Buoyancy is the upward force that an object feels from the water and when compared to the weight of the object, it is what makes an object float, sink, or remain **neutrally buoyant** in the water.

When an object floats, the upward buoyant force exerted by the water is greater than the downward force of the weight of the object. You can also understand this concept with numbers. If an object's density is less than water's density (1 g/cm^3), it will float.

When an object sinks, the weight of the object is greater than the upward buoyant force exerted by the water and its density is greater than 1 g/cm^3 . When an object is neutrally buoyant, meaning it neither sinks nor floats, then the weight of the object is equal to the upward buoyant force exerted by the water.

When neutrally buoyant in water, the object also has the same density as water. Neutral buoyancy is a very important principle in the sea perch competition. Just like a real submarine, you will want your sea perch to be able to submerge below the surface of the water without just sinking to the floor.



When you start to build your sea perch, you will want to consider this principle. We can calculate just how much buoyancy your sea perch will need in order to be neutrally buoyant if we understand **Archimedes' Principle**.

Archimedes' said that the upward buoyant force is equal to the weight of the displaced volume of liquid. So, if you were to fill a bucket of water to the top, put an object in there (like your perch!), and collect all of the water that spilled over the side and weigh it, you would be measuring the buoyant force exerted by water on your perch!