

The Buoyant Force

An upward force called the buoyant force is exerted by a fluid on any object in the fluid. It is caused by the pressure exerted by the fluid on the object. Pressure within a fluid increases with depth. The bottom of an object is deeper in the water than the top. As a result, the pressure on the bottom of the object is greater than the pressure on the top of the object. This results in a net upward force called the buoyant force. Gravity pulls downward while the buoyant force pushes upward. If the buoyant force is greater than the weight of the object, the object floats. If the weight of the object is greater than the buoyant force, the object sinks.

The buoyant force is exerted on the lower surface of an object in a fluid. The larger the surface area of the object is, the greater the buoyant force is. For this reason, a flat piece of aluminum foil floats, but if the same piece is crumpled, it sinks. The buoyant force is the difference between the downward pressure on the top of an object in a fluid and the upward pressure on the bottom of an object in a fluid. As depth increases, both of these pressures increase by the same amount. As a result, the buoyant force remains the same regardless of the depth.



Answer the questions below based on your reading and on your understanding of buoyancy.

1. Where does the buoyant force come from? _____

2. A floating cork is pushed under water. What happens to the size of the buoyant force on the cork as it is pushed deeper and deeper? Explain. _____

3. A toy boat and a solid ball are each made out of the same mass of metal. Which is more likely to float? Why? _____

4. What causes a helium balloon to float away when you let go? _____

