

INTEGRATING BIOLOGY**● How Fish Maintain Neutral Buoyancy**

Buoyancy is an object's ability to float. An object will float if the water it displaces has a mass greater than the object's mass. It will sink if the water it displaces has a mass less than its own mass. But if an object displaces its own mass in water, it will neither float nor sink. Instead, it will remain suspended in the water as a result of what is called neutral buoyancy.

Neutral buoyancy creates a feeling of weightlessness, as if gravity did not exist. In reality, the downward force of gravity is equal and opposite to the upward force of the water. A goldfish in water illustrates this principle in action.

The Swim Bladder Regulates Buoyancy

A goldfish has a small, lined sac in its abdomen called the swim bladder. Gases from nearby blood vessels can diffuse into and out of the swim bladder as needed. When the goldfish needs to rise to the surface, for instance, gases diffuse into the swim bladder and cause it to inflate. With the help of the swim bladder, the goldfish can maintain neutral buoyancy.

Your Turn to Think

1. What is buoyancy?
2. Give an example of something that is buoyant and something that is not buoyant.
3. Define neutral buoyancy.
4. Explain in your own words how a goldfish can remain suspended in water in the middle of a fishbowl without moving its fins.