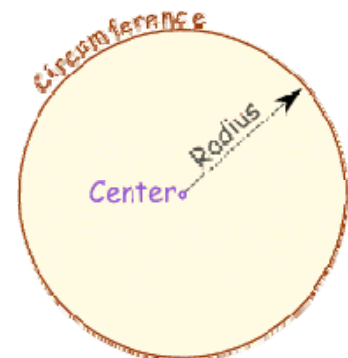


# What is Buoyancy?

## Definitions and Equations



- Buoyancy:** The property of a body that enables it to float on the surface of a liquid or in a fluid. Buoyancy is the upward force acting on an immersed or floating body by the supporting fluid. This conception of the term conveys the idea that *volume*, alone, determines buoyancy and that the upward force exerted on the immersed or floating body equals the weight of the fluid which it displaces.
- Positive Buoyancy:** Exists when the weight of the body is less than the weight of an equal volume of the displaced fluid.
- Neutral Buoyancy:** Exists when the weight of the body is equal to the weight of an equal volume of the displaced fluid. A body in this state remains suspended, neither rising nor sinking, unless acted upon by an outside force.
- Negative Buoyancy:** Exists when the weight of the body is greater than the weight of an equal volume of the displaced fluid and the body sinks.
- Stability:** Stability is that property of a body that causes it, when disturbed from a condition of equilibrium, to develop forces, or moments, that tend to restore the body to its original condition.
- Equilibrium:** Equilibrium is a state of balance between opposing forces.
- Archimedes Principle:** Archimedes Principle states that the buoyant force on a submerged object is equal to the weight of the fluid that is displaced by the object.
- Mass:** A measure of how much matter is in an object.
- Weight:** The downward force caused by gravity on an object. Weight = mass \* gravity
- Volume:** The amount of space enclosed by a shape or object, how much 3-dimensional space (length, width, and height) it occupies. For a volume of water in a cylindrical bucket, Volume= Area\*height of water, or  $V=A*h$ , or  $V= \pi r^2h$ .
- Area:** The amount of space inside the boundary of a flat (2-dimensional) object such as a triangle or circle. For a circle,  $Area=\pi r^2$ .
- Radius:** The distance from the center to the edge of a circle. It is half of the circle's diameter.
- Pi:**  $\pi = 3.141592..$



### Sources:

<http://www.maritime.org/fleetsub/chap5.htm>

[http://www.grc.nasa.gov/WWW/k-12/WindTunnel/Activities/buoy\\_Archimedes.html](http://www.grc.nasa.gov/WWW/k-12/WindTunnel/Activities/buoy_Archimedes.html)

<http://www.mathsisfun.com/>