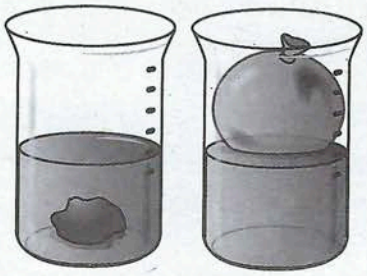
The **weight** of an object is how strongly gravity pulls on the object. A greeting card held in one hand feels different from a thick book held in the other hand. The difference between the two is weight.

The mass of an object affects its weight. An object with more mass weighs more than an object with less mass if they are the same substance. For example, a five-pound bag of sugar has less mass but more weight than a one-pound bag of feathers. In daily life, weight is measured by ounces, pounds, and so forth. Scientists, however, measure weight in newtons (represented by N). One newton (N) equals 0.225 pounds, so a newton is about one-fourth of a pound.

Weight is also affected by a planet's mass. A planet with greater mass has greater gravity than a planet with less mass. This means the same object weighs more on a planet with greater mass than it does on a planet with less mass. In other words, a person's weight changes from planet to planet!

Any object will either sink or float when it is placed in a fluid. Sinking and floating are related to the property of buoyancy. **Buoyancy** is an object's resistance to sinking. When a marble is placed in a glass of water, the marble will sink because the water moves out of the way. If an eyelash is placed in a glass of water, the eyelash will float. It is not dense enough to push the water out of the way. If an object is denser than the fluid, the object will sink. If the fluid is denser than the object, the object will float. Fluids can float on top of other fluids if they have different densities; for example, oil floats on water.



This means the buoyancy of an object depends on its density (density = mass ÷ volume). Changing either the volume or the mass of an object will affect its buoyancy.

Surface tension also affects buoyancy. Surface tension creates a type of skin or very thin covering on the surface of the fluid because the fluid's particles pull toward one another. A very lightweight object can "float" because of surface tension. Objects that are very spread apart, like lightweight, long-legged water bugs, also will rest on top of water because of the surface tension.

Exercise

1. Name two things that affect weight. _____

   _____

2. What is buoyancy? _____

   _____

3. What determines an object's buoyancy? _____

4. Changing which two things can affect an object's buoyancy? _____

   _____

5. Is resting on surface tension the same as floating? _____