Matter

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What is Matter?

Matter is anything that takes up space and has mass.

Properties of Matter

Mass

Mass is a measure of the amount of matter in an object
Mass is measured in kilograms.
On the moon an astronauts mass stays the same that it was on Earth.

Volume

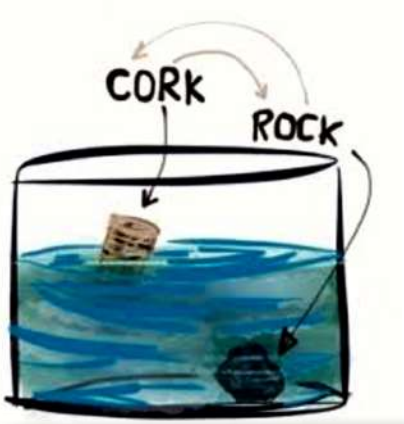
Volume describes how much space a sample of matter takes up.
Volume is measured in milliliters.
To measure the volume of a solid you have to multiply its height times its length times its weight.

Mass and Weight: Are They Different?

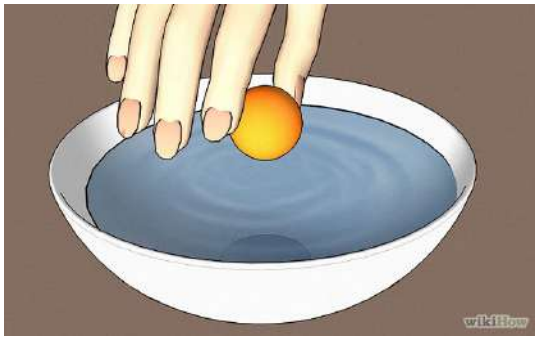
Mass vs. Weight	
Mass	**Weight**
Mass is measured in kilograms. Mass is the measure of the amount of matter in an object. To measure mass you can use an equal-pan balance. On the moon an astronauts mass stays the same as it did on Earth because the astronaut still takes up the same amount of space.	Weight is measured in newtons. Weight is the force of gravity between Earth and the object. To measures weight you can use a pan scale. On the moon an astronaut would weigh less because there is less gravity on the moon because the gravity doesn't pull as hard.

Density

The density of an object tells how massive something is for its size. It compares an object's mass with its volume.



$$\frac{\text{Mass}}{\text{Volume}}$$



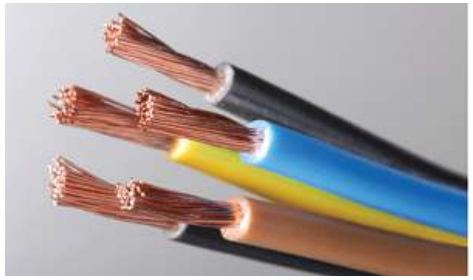
As long as the temperature does not change the density of an object stays the same. Density determines an objects ability to sink or float. An object floats in a liquid when the object's density is less than the liquid's density. A beach ball is filled with air, so a beach ball can float because air is less dense than water. A high density means that many particles are packed together into agiven space. A low density means that only a few particles fill that space. It is easier to float in the Dead Sea because salt water is denser than fresh water. People can float higher in the Dead Sea than in ocean water. If two objects have the same volume the denser object will be heavier. Each material has its own density.

Conductor or Insulator?

Some materials conduct energy well. These materials allow energy to flow through them easily.

Other materials insulate against the passage of energy. They do not readily permit energy to flow.

Copper wire is a conductor



Plastic is an insulator

Matter

Four properties of matter are mass, volume, weight, and density.

Some jobs that use matter are scientists, engineers.

Conductors and Insulators

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