

Scientists Ideas on Density

We call the relationship of an object's mass to its volume its *density*. Every material has a mass that can be weighed and a volume of space that it occupies. However, the relationship between a material's mass and volume varies from one kind of material to another. For example, a bucket of rocks has a much greater mass than an equal-sized bucket of air. Therefore, a useful way to describe an object is to determine its mass per unit of volume, called density. Per refers to division, as in miles per hour (distance divided by time). So density is the measure of an object's mass divided by its volume (density = mass/volume). Scientists and mathematicians use the Greek character rho (ρ) to represent density. Also, as the gram (g) is the basic metric unit of mass, and the cubic centimeter (cm^3) is the basic metric unit of volume, density (ρ) is usually expressed in grams per cubic centimeter (g/cm^3).

Examples:

As the volume of a given mass decreases, the density increases. For example, take a marshmallow and squish it down to the smallest possible volume. The squished marshmallow contains the same mass as the original, but now this mass occupies a much smaller volume, so the density has increased.

As the amount of mass within a given volume increases, the density increases. For example, say you have a regular marshmallow filling a container with a given volume and six of the 'squished' marshmallows filling an identical container. The density of the 'squished' marshmallows is greater than the single marshmallow since there is more mass contained in identical volumes.

As the amount of mass within a given volume decreases, the density decreases. For example, take the example above of the six marshmallows squished into a container. If you were to remove one of the marshmallows the others would tend to expand to fill the space left by the removed marshmallow. The density of the marshmallows would decrease as a result of having less mass in identical volumes.