Density and Specific Gravity

**What Is Density?**

Density is the measure of the amount of mass per volume.

It's typically expressed in units of grams per cubic centimeter, kilograms per cubic meter, or pounds per cubic inch.

Density is expressed by the formula

ρ = m/V where

ρ is the density
m is the mass
V is the volume

**What Is Specific Gravity?**

Specific gravity is a measure of density relative to the density of a reference substance. It's often abbreviated as *sp gr*.

[Specific gravity](https://www.thoughtco.com/definition-of-specific-gravity-604652) is also called [relative density](https://www.thoughtco.com/definition-of-relative-density-605608) and is expressed by the formula:

Specific Gravitysubstance = ρsubstance/ρreference

The reference material could be anything, but the most common reference is pure water. One example is salt water aquarium enthusiasts measure the amount of salt in their water by specific gravity where their reference material is fresh water. The units cancel each other out, so specific gravity is just a number. If a material has a specific gravity less than 1, it will float on water.

**Converting Between Density and Specific Gravity**

Specific gravity values aren't very useful except for predicting whether or not something will float on water and for comparing whether one material is more or less dense than another.

However, because the density of pure water is so close to 1 (0.9976 grams per cubic centimeter), specific gravity and density are nearly the same value so long as the density is given in g/cc. Density is very slightly less than specific gravity.