Density

Anytime a scientist says a "density" of anything,
they mean whatever that thing is, divided by volume.

Energy density u = Energy/volume Units: J/m^3

Number density N = Number/volume

Examples:

Air (at STP) has a number density $N = 2.69 \times 10^{25}$ molecules/m^3.

Interstellar space has a number density $N \sim 1$ atom/cm^3 = 10^6 atoms/m^3

Mass density ρ = mass/volume

Whenever anyone says just "density," they usually mean *mass* density.

Examples:

Liquid water at STP has: $\rho = 1$ gram/cm^3 = 1 g/cm^3

Solid iron has: $\rho = 7$ g/cm^3.

Solid lead has: $\rho = 14$ g/cm^3.