

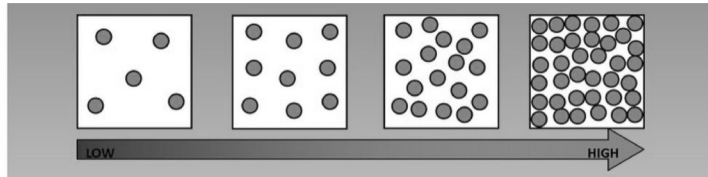
## Density

How heavy (*mass*) and object is based on the objects size (*volume*)

**Mass** – The amount of matter, the pushing of one object on another due to gravity

**Volume** – The size of an object in space

**Mass** = g, kg, **Volume** = mL, L



The *space between particles* along with atom size are the main factors that determine the density of a material

## Density and States

### Solids

Particles are packed tightly together in solids. Metals can vary in density based on their type.

### Liquids

Particles are touching each other but are not as tightly packed giving Liquids lower density

### Gases

Particles are spread apart leading to the lowest density in nature.

Metal	Density (lb/in <sup>3</sup> )	Specific Gravity
Magnesium	.064	1.77
Aluminum	.098	2.70
Titanium	.161	4.51
Chromium	.250	6.92
Zinc	.258	7.14
Tin	.264	7.30
Stainless Steel (Type 410)	.278	7.70
Iron/Steel	.284	7.87
Stainless Steel (Type 304)	.285	7.90
Muntz Metal	.303	8.39
Cartridge Brass	.308	8.53
Commercial Bronze	.318	8.80
Monel	.319	8.83
Nickel	.321	8.90
Nickel Silver	.323	8.95
Copper	.323	8.96
Silver	.379	10.49
Lead	.409	11.34
Gold	.687	19.32

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## Density Formula

Calculating Density

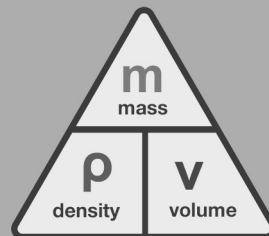
density

mass

$$\rho = \frac{m}{V}$$

volume

thecalculatorsite.com



density = mass ÷ volume  
mass = density × volume  
volume = mass ÷ density

## Solving with the Density Equation

### Density

Denoted by the Greek letter rho ( $\rho$ )

Density describes the **mass (m)** present within a specified **volume (V)**

$$m = \rho \times V \quad V = \frac{m}{\rho}$$

Density

$$D = \frac{m}{V}$$

Mass from Density

$$m = D \cdot V$$

Volume from Density

$$V = \frac{m}{D}$$

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