Mass, volume, density

- **Mass of an object describes the amount of matter contained in it. Mass is denoted by *m*.**

Units of mass are kilograms (kg), grams (g), tons, pounds, ounces, etc.

- **Volume of an object tells us how much space does the object take up. Volume is denoted by *V*.**

Units of volume are liters(l), milliliters (ml), cubic meters (m^3), gallons, etc.

- **Density is a property of a material: it tells us how much mass is contained in a given volume of the material. It tells us how tightly the matter is packed. Density is denoted by ρ (Greek letter "rho").**

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} \quad \textbf{or} \quad \rho = \frac{m}{V}$$

Homework 10

Problem 1

Find the density of an alloy that is made of 2 kg of copper and 1 kg of aluminum.

Density of copper is 8900 kg/m^3; density of aluminum is 2700 kg/m^3. Assume that the volume of the alloy is equal to the combined volume of its components.
Hint: find the volumes of copper and aluminum first

Problem 2 (problem about the pirate continued).

Previous problem: A pirate gives you a cube that he claims is made of pure gold. The side of the cube is 4 cm. You measure its mass and find that it is 900 grams. Is the pirate lying to you? Gold density is 19.3 g/cm^3. We found that the pirate in lying.

Unable to argue with physics, the pirate admits that he lied to you. He assures you that the cube is a mixture of silver and gold. How much of it is silver and how much is gold? Silver density is 10.5 g/cm^3.