

## Common properties of bodies

## Density

## Determining the density of a solid body - Set of 8 cubes

## Objects of the experiments

1. Determining the densities of different cubes from the masses and volumes
2. Determining the substances the cubes are made of

## Setup



## Apparatus

1 Cubes, set of 8 .....	666 100
1 Single-pan suspension balance 610 Tara .....	315 23
1 Vernier callipers.....	311 52

## Carrying out the experiment

1. Determining the density:
  - Use the vernier callipers to measure the edge lengths of a cube.
  - Calculate the volume of the cube (see D 1.1.1.1).
  - Determine the volume of the other cubes by comparing their sizes.
  - Put a cube on the pan.
  - Equilibrate the balance by shifting the sliding weights.
  - Read the positions of the sliding weights and determine the mass of the cube from them.
  - Calculate the density of the cube from the mass and the volume.
  - Do the same with the other cubes.
2. Determining the substance:
  - Determine the substances the cubes are made of by comparing the calculated values with those from the table.

## Measuring example

Volume of the cubes:  $V = 1 \text{ cm}^3$ 

Cube	Mass $m$ in g	Density $\rho$ in $\text{g/cm}^3$	Substance
1	1.2	1.2	hard rubber
2	0.7	0.7	wood
3	2.7	2.7	aluminium
4	7.0	7.0	zinc
5	7.6	7.6	iron
6	8.5	8.5	brass
7	8.8	8.8	copper
8	11.2	11.2	lead

## Evaluation

1. For determining the density of solid bodies their mass and volume have to be determined. Then the density can be calculated according to the formula  $\rho = \frac{m}{V}$ .
2. By comparing the calculated density with given table values, the substance a body is made of can be determined.