2017

DENSITY

EXPERMENT REPORT

GROUP (G)

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Objectives

The experiment was carried out to use different types of materials to find the volume and most importantly the density of the materials. The experiment was involved team members of the group to test this experiment and verify the density.

In this experiment, we will measure the mass and volume of different materials. Then using the data to explore the relationship between the mass and volume of the materials and to calculate their density. Measuring the volume

- To determine the densities of different materials such as timber, metals, cylindrical-shaped objects and irregularly shaped objects.
- Plot the graph of mass versus volume =density

Theory

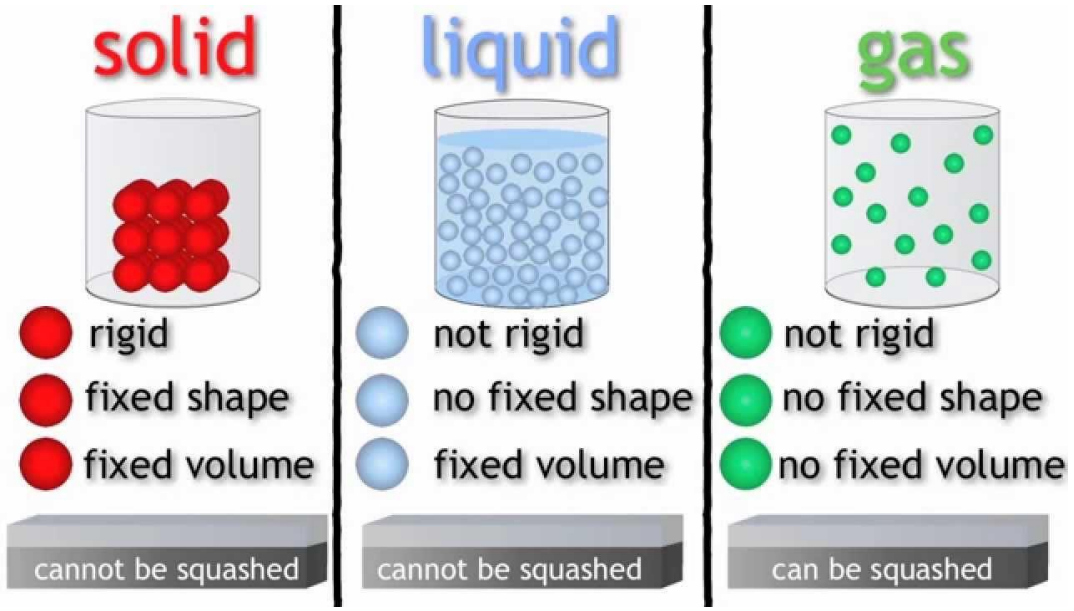
Density is defined as the ratio of a substance's mass to the volume it occupies. The substance of density is the relationship between the mass of the substance and how much space it takes in the volume.

The formula for density is:

Density = Mass/Volume

The density can be applied to the gas, liquid or solid. The density of the materials can vary depending on the room temperature or pressure applied to the materials

The gas is having the biggest impact due to its density. If the pressure will be increased on the materials, then it decreases its volume, which means it will increase its density.



Apparatus

In this experiment, the materials that are required for this experiment are listed below with materials shown in the photo.

- Rectangular shaped objects (hard Wood timber and plywood)
- Beakers
- Metals (Steel, copper and aluminium)
- Cylindrical shaped objects
- Irregularly shaped objects
- Scaler
- Vernier calliper

Procedure

At the very beginning of the experiment, our first action was taken place during the class with members of the group to:

- Setting up the experiment
- Measuring the volume of the materials shapes by calculating the length, diameter and height of the materials
- Measuring the weight of the materials onto the scaler
- Write down the materials information onto the result section to verify the D= m/v
- Measure the volume using the water displacement method

The experiment was carried out with team members, when the wood piece was dropped into the water beaker the wood was floating on the water and when heavy materials are dropped into the water the metal dived into the water. However, the situation is the same with the Irregularly shaped objects.

Result

Timber

Material	Mass (g)	Length (cm)	Width (cm)	Height (cm)	Volume (cm^3)	Density (calculated) (g/cm^3)
Hardwood	127	10.7	39.8	5.1	2171.9	0.058
Softwood	43	6.87	3.99	4	109.6	0.80
Plywood	30	7	4.12	1.87	53.93	0.56

Metals

Material	Mass (g)	Length (cm)	Width (cm)	Height (cm)	Volume (cm^3)	Density (calculated) (g/cm^3)
Copper	100.5	2.5	1.4	2.3	8.05	12.48
Aluminium	35	1.8	2.6	2.1	9.82	3.56
Steel	254	253	4.9	2.4	2975.28	0.09

Cylindrical shaped objects

Material	Mass (g)	Diameter (cm)	Radius (cm)	Height (cm)	Volume (cm^3)	Density (calculated) (g/cm^3)
Copper	146.5	3.15	1.575	2.05	16.0	9.16
Aluminium	30	1.55	0.775	1.95	3.68	8.15
steel	64.5	1.4	0.7	3.1	4.77	13.52

Irregular shaped objects

Material	Mass (g)	Volume (cm^3)	Density (g/cm^3)
Stone 1	218	72	3.03
Stone 2	180.5	60	3.01
Stone 3	139	51	2.73

Discussion of result

The discussion that was involved during the conversation between members of the group about this experiment was the group decided to split the team into two to get the volumes of the shapes done because the time was getting short and the work was a lot.

The team worked separately to write down the weight and volume of the materials shapes.

Conclusions

The density at all points of a homogeneous object equals its total mass divided by its total volume. The mass is normally measured with a scale or balance; the volume may be measured directly (from the geometry of the object) or by the displacement of a fluid.

To determine the density of a liquid or a gas, a hydrometer, a dasymeter or a Coriolis flow meter may be used, respectively. Similarly, hydrostatic weighing uses the displacement of water due to a submerged object to determine the density of the object.

Appendices

This experiment will improve our skills in the future where the density skills are required especially the way boats float on the water, this can be extremely used full information for engineers to design something that could float onto the water.

By doing this project:

- We improved our knowledge about density.
- We improved our communication skills.
- Improved our practical skills.

References

1. By “NCCA”

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2. By “Wikipedia”

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