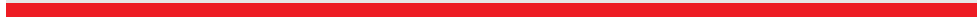




**DENSITY
SPHERE**

INSTRUCTION MANUAL

Ref. QLB017



Description:

Demonstrates the dependence of density of a liquid on the temperature. Comprises a hollow sphere, with a sealed mouth, carefully adjusted to float in cold water and sink in the hot water due to change in density as a result of change in volume.

Specific Gravity

The specific gravity is the ratio of density of an object with respect to a reference substance. We generally take water as reference substance having density of 1 gram per milliliter or 1 gram per cubic centimeter. The object will sink or float depends on the specific gravity of the object. When the specific gravity is greater than one, the object will sink, and when the specific gravity is less than one, then the object will float.

$$\text{Specific Gravity} = \frac{\text{Density of the object}}{\text{Density of the water}} = \frac{\rho_{\text{object}}}{\rho_{\text{H}_2\text{O}}}$$

Density

An object's density is a measure of how compact or heavy it is, in a given volume. We measure density in mass per unit volume which is written using measures like grams per milliliter (g/mL), grams per cubic centimeter (g/cm³), or kilograms per liter (kg/L).

Experiment: Demonstration of the variation of Density with Temperature.**Theory:**

The mass m of any substance is equal to its volume V multiplied by its density. When a substance is heated, its mass m does not change. So, when its volume increases as the temperature rises, its density must decrease. This change in density is not particularly significant in solids but it is very important in liquids and gases (which can flow).

Components Required:

- Density sphere
- container (Not Included)

Procedure:

1. Fill the ball with the water.
*The weight of ball including water, screw and washer should be equal to the weight mentioned on the ball.
2. Dip the ball in a container of normal tap water.
*The temperature of water should be equal to a room temperature i.e. 24°C approx.
3. You will observe that the ball is floating on the water.
4. Add the hot boiled water in the container.
5. You will observe that as the temperature of the water in container will increase, the ball will start dipping completely in the container.