GIRLS' HIGH SCHOOL AND COLLEGE , PRAYAGRAJ

WORKSHEET-2

SESSION 2020-2021

CLASS 8 (A,B,C,D&E)

SUBJECT-PHYSICS

Note- Parents please ensure that the student takes the reference of the chapter form the links mentioned below.

Link-   Eureka Can - https://www.youtube.com/watch?v=pN5S95G4vBM
          Finding Density -   https://www.youtube.com/watch?v=5eTsKLQgST0
                                   https://www.quora.com/How-will-you-determine-the-density-of-a-liquid-using-a-density-bottle

CHAPTER 2- PHYSICAL QUANTITIES AND MEASUREMENT

In the previous worksheet we have seen that to measure the density of substance, we need to know the mass and volume of the substance. We also learnt how to measure the mass of a given substance by using spring balance and physical balance.

We will now learn to measure the volume of a substance.

MEASURING THE VOLUME OF AN IRREGULAR SOLID

The volume of an irregular solid can be measured by using a Measuring cylinder or Eureka can.

## MEASURING THE VOLUME OF AN IRREGULAR SOLID USING MEASURING CYLINDER

The solid is tied with a thread and dipped inside a measuring cylinder. The water displaced by the body is equal to the volume of the solid. Thus the difference between the readings of the water level with and without the solid gives the volume of the solid. The following care should be taken while using the measuring cylinder

1.   The measuring cylinder should be large enough for the body to move inside it.

2.   The amount of water should be enough for the body to be completely immersed in it.
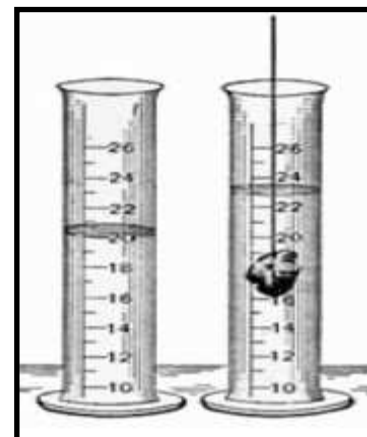
MEASURING THE VOLUME BY USING EUREKA CAN

A eureka can is a container with a spout .To measure the volume of a solid ,the can is filled to the level of the spout with water , so that any excess water spills out through the spout. A measuring cylinder is placed under the spout. A solid is then slowly immersed in the water and the water displaced by the solid pours out of the spout into the measuring cylinder. The level of water in the measuring cylinder gives the volume of the solid. The density of the solid can then be calculated by using the formula $density(\rho) = \frac{mass}{volume}$
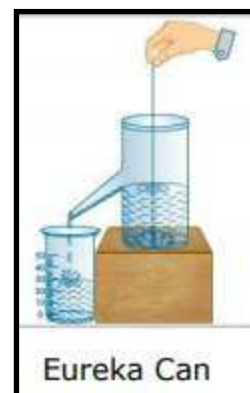
DETERMINING THE DENSITY OF A LIQUID

The density of a liquid changes markedly with temperature. Generally density of a liquid is measured at room temperature (27^0C)
To determine the density of a liquid we need to know mass of the given volume of liquid. This can be done in two ways-

USING A MEASURING CYLINDER

To measure the mass of a liquid first weigh the empty measuring cylinder then pour into the liquid upto a certain mark (the volume that you want to take), with the help of a pipette. Measure the mass of the cylinder again. The difference between the two masses gives the mass of the given volume of the liquid.

USING SPECIFIC GRAVITY BOTTLE

A specific gravity or a relative density bottle is a small thin- walled glass bottle used to measure the density or the relative density of a liquid. Here we will learn how to use it to measure the density of a liquid. The specific gravity bottle has a fixed capacity that is marked on it. It is generally 50 cc or 25 cc. It has a glass stopper that has a thin hole to allow the excess liquid to pour out. When the bottle is filled with the liquid and the stopper is pushed in, some liquid flows out of the hole .The volume of the liquid that remains inside the bottle is the volume marked on the bottle.

To find the density of the liquid first weigh the empty bottle with the stopper (let this mass be m1) then fill-in the liquid and weigh the bottle again (let this mass be m2) .The difference of these two masses gives you the mass of the liquid .Let the capacity of the bottle be V .Density can be calculated as -   Density $=\frac{m2-m1}{V}$

The relative density of a substance is the ratio of its density to the density of a standard substance (usually water).Since the density is mass per unit volume, the relative density of the substance can also be expressed as the ratio of the mass of a given volume of a substance to the mass of the same volume of water .

The Relative Density has no unit

$$RD = \frac{density\ of\ a\ substance}{density\ of\ water} = \frac{mass\ of\ any\ volume\ of\ substance}{mass\ of\ the\ same\ volume\ of\ water}$$

A-   ANSWER IN DETAIL
Draw a labelled diagram of specific gravity bottle and explain how to use it to find the density of a liquid.

B-   ANSWER IN SHORT
1.   Explain how to find out volume of an irregular solid using eureka can.
2.   What precautions should be taken while measuring the volume of an irregular solid using measuring cylinder?
3.   Define relative density and write its formula.

C-   FILL IN THE BLANKS
1.   Pipette is used to measure the ……………of a liquid.
2.   The relative density has ……..unit.
3.   The density of a liquid varies markedly with………