



Provincial Department of Education - Sabaragamuwa – Week School

Subject – Science

Week – 26th-30th Nov, 2020

Grade - 10

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Remember how you make footprints on the ground while you walk on a sandy ground, How does this happen? It's because of the weight of your body puts some thrust towards the ground. You will feel a push on your shoulder as you are lifting the school bag. It is caused by the weight of your bag. In such cases, there is a scientific term you have learned to describe the resulting thrust on a certain surface. It is "Pressure".

(1) The force is called "Pressure". Pressure is a quantity. The standard measuring unit of pressure is

Pressure = $\frac{\text{Force}}{\text{Area}}$

(2) Pressure is caused by solids as well as liquids. Engage in the following activities to study the nature of pressure in a fluid column.

- i. Fill a polythene bag with water. Then lift it up and pierce with a pin in several places. What observations could you get?

What conclusion can you draw from those observations ?

- ii. Take a plastic bottle with a height of about 25cm. Above 2cm from the bottom of the bottle, drill 5 small holes at equal distances. What observations did you see ?

What conclusion can you draw from those observations ?

- iii. Take a plastic bottle with a height of about 25cm. Make 4 equally spaced (approximately 5cm) holes in a row from bottom to top. Hold the bottle at some height from the ground level and fill the water. What observations did you see ?

What conclusion can you draw from those observations ?

(3) Liquid pressure does not depend on the shape of the liquid column but only on the vertical height. Set up a suitable demonstration for it. Name the material used and draw the set up.

(4) List the 4 properties of liquid pressure according to the activities you have done above.

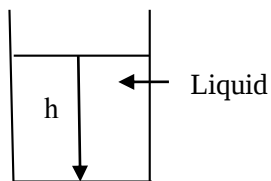
(5) Use the example here to build a statement for liquid pressure based on the statement you obtained for “pressure” at (1) above.

Density of liquid filled into the vessel below = ρ (Row symbol)

Liquid column height = h

Liquid pressure at the bottom of the vessel = P

Gravitational acceleration = g



Let's find the volume of the liquid column placed above unit area of the vessel.

Volume = Area x Height = $1 \times h = h$

The mass of the liquid column in that volume = The density of the liquid x Volume

= x

If the weight of the liquid column = W ,

W = Mass of the liquid column x Gravitational acceleration

W = x g =

Pressure =
.....

Therefore; Liquid pressure = Weight of the liquid column
Area

P =
.....

P = **$h\rho g$**

(6) A fish is swimming at a 10m depth in the sea. Calculate the pressure, caused by seawater on that fish (Consider density of seawater is 1050 kgm^{-3} and gravitational acceleration is 10 ms^{-2})