

LEMBAR KERJA

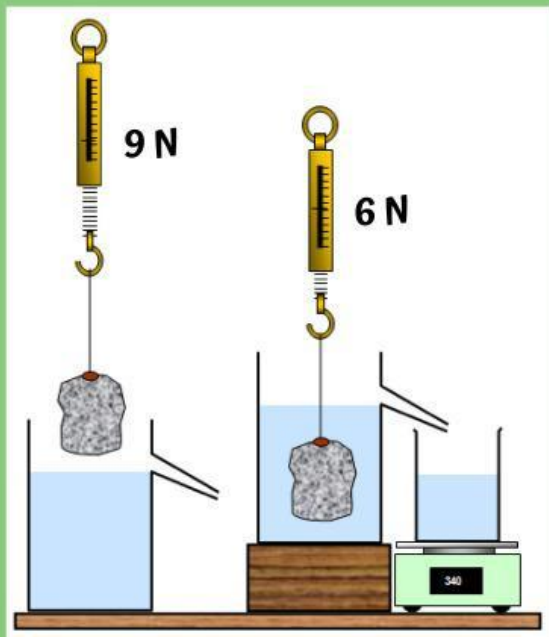
Perhatikan Video Berikut!

HUKUM ARCHIMEDES



1 Percobaan Archimedes

Perhatikan gambar percobaan Archimedes berikut!



Dari gambar percobaan tersebut, jika diketahui massa jenis zat cair 1000 kg/m^3 dan percepatan gravitasi di tempat tersebut 10 m/s^2 , berapakah volume benda tersebut?

Penyelesaian

$$W_{bu} = \text{ } \text{ N}$$

$$W_{ba} = \text{ } \text{ N}$$

$$\rho = \text{ } \text{ kg/m}^3$$

$$g = \text{ } \text{ m/s}^2$$

$$F_a = W_{bu} - W_{ba}$$

$$F_a = \text{ } \text{ N} - \text{ } \text{ N} = \text{ } \text{ N}$$

$$F_a = \rho V g$$

$$3 \text{ N} = \text{ } \text{ kg/m}^3 \times V \times \text{ } \text{ m/s}^2$$

$$V = \frac{\text{ } \text{ N}}{\text{ } \text{ kg/m}^3 \times \text{ } \text{ m/s}^2}$$

$$V = \text{ } \times 10^{-4} \text{ m}^3$$

$$= \text{ } \times 10^{-4} \times 10^{\text{ }} \text{ cm}^3$$

$$= \text{ } \times 10^2 \text{ cm}^3 = \text{ } \text{ cm}^3$$

2

KAPAL LAUT



X Sumber : pixabay

Kapal dengan berat 20.000 N membawa awak kapal sebanyak 10 orang dengan berat rata-rata 600 N. Kapal tersebut mengangkut barang dengan berat 19.000 N. Berapakah volume minimal badan kapal yang ditunjuk X agar kapal tidak tenggelam ? Jika massa jenis air 1.000 kg/m^3 . dan percepatan gravitasi bumi $g = 10 \text{ m/s}^2$

Penyelesaian

$$W_{\text{kapal}} = \text{ } \text{ N}$$

$$W_{\text{awak kapal}} = \text{ } \times \text{ } \text{ N} = \text{ } \text{ N}$$

$$W_{\text{barang}} = \text{ } \text{ N}$$

$$\rho = \text{ } \text{ kg/m}^3$$

$$g = \text{ } \text{ m/s}^2$$

$$V = \dots ?$$

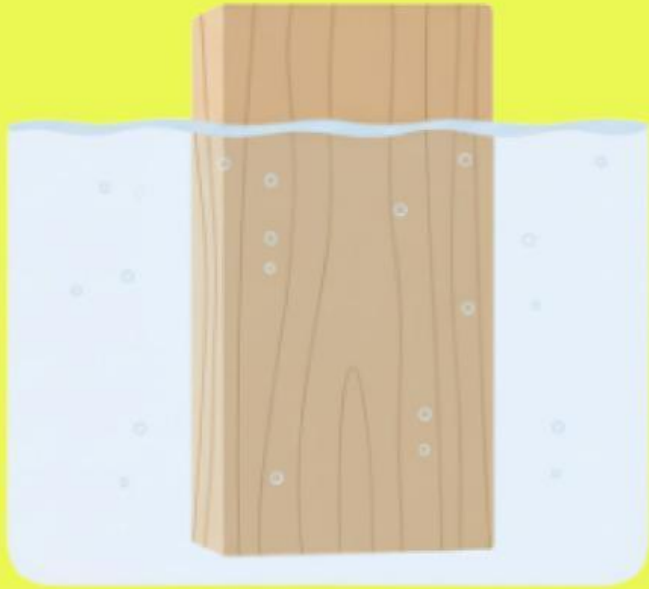
$$F_a = W$$

$$\rho V g = W_{\text{kapal}} + W_{\text{awak kapal}} + W_{\text{barang}}$$

$$\text{ } \text{ kg/m}^3 \times V \times \text{ } \text{ m/s}^2 = \text{ } \text{ N} + \text{ } \text{ N} + \text{ } \text{ N}$$

$$\text{ } \text{ kg/m}^2\text{s}^2 \times V = \text{ } \text{ N}$$

$$V = \frac{\text{ } \text{ N}}{\text{ } \text{ kg/m}^2\text{s}^2} = \text{ } \text{ m}^2$$

3**BALOK KAYU**

Sebuah balok kayu dimasukkan dalam air ternyata $\frac{4}{5}$ volume kayu tercelup dalam air. Maka berapakah massa jenis kayu tersebut? Massa jenis air 1000 kg/m^3 .

Penyelesaian

$$\rho_{\text{air}} = \text{ } \text{ kg/m}^3$$

$$V_{\text{celup}} = \frac{4}{5} V_{\text{benda}}$$

$$\rho_{\text{benda}} = \dots ?$$

$$\rho_{\text{benda}} \times V_{\text{benda}} = \rho_{\text{air}} \times V_{\text{celup}}$$

$$\rho_{\text{benda}} \times V_{\text{benda}} = \text{ } \text{ kg/m}^3 \times \frac{4}{5} V_{\text{benda}}$$

$$\rho_{\text{benda}} = \frac{4}{5} \times \text{ } \text{ kg/m}^3$$

$$= \text{ } \text{ kg/m}^3$$