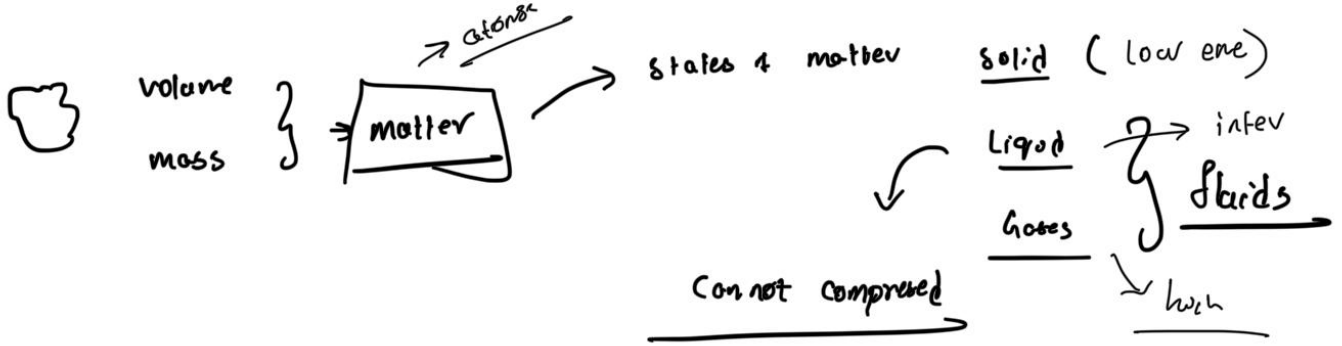
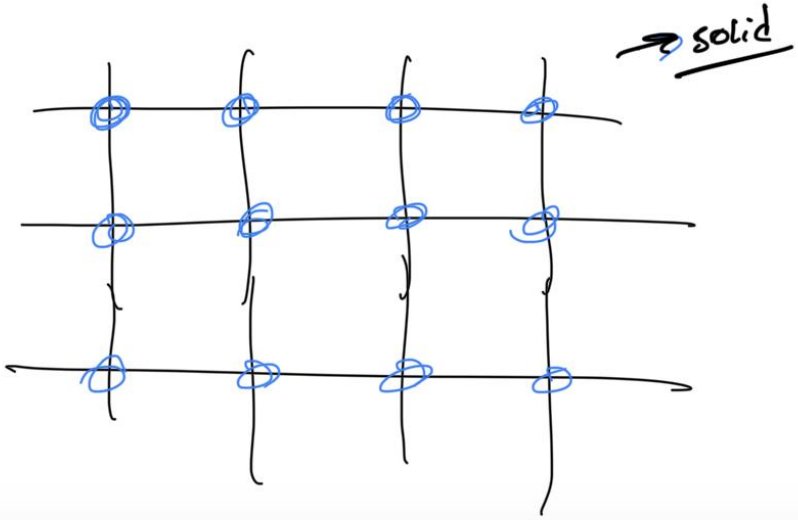
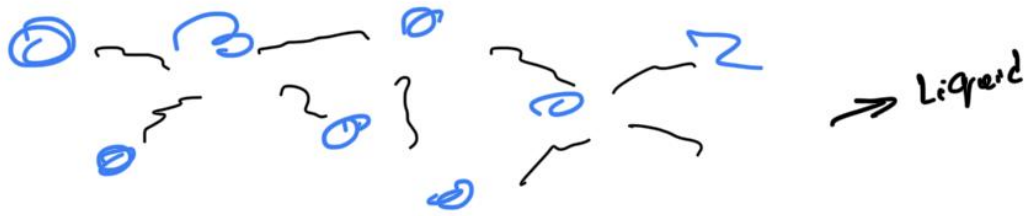
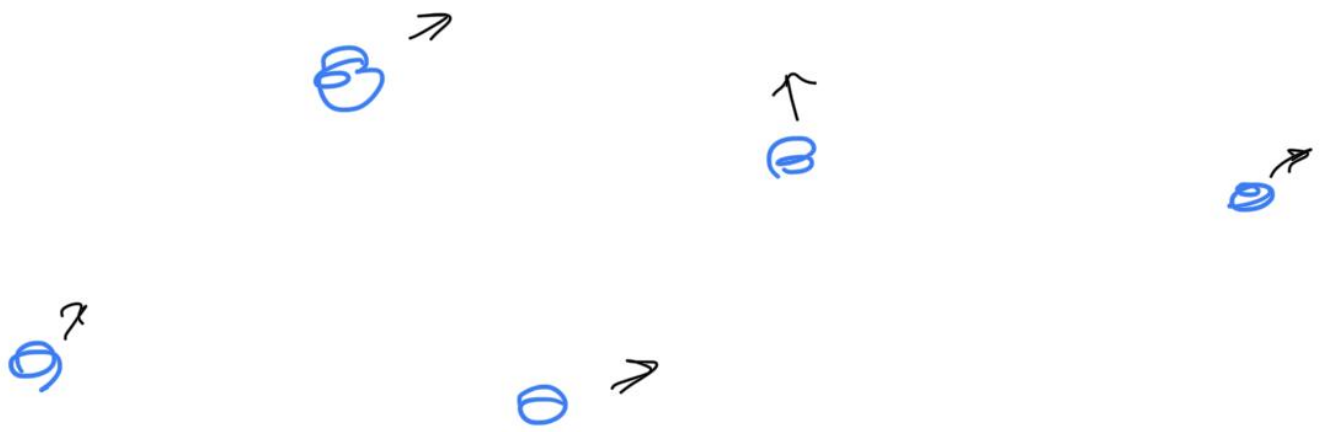
SAT: 12-OCT

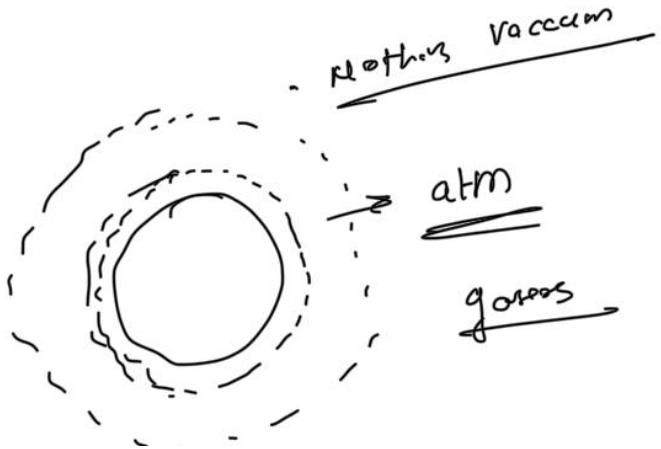
FLUIDS

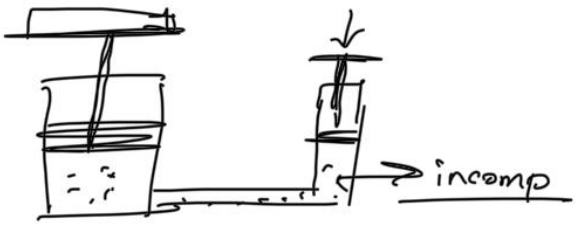


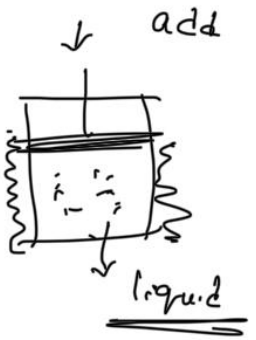


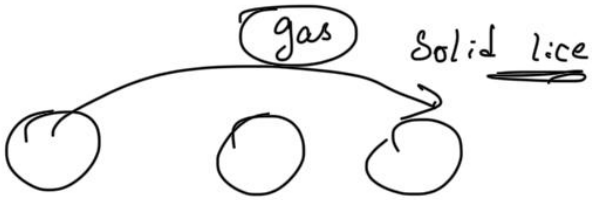

Liquid




Nothing vaccum
atm
gases



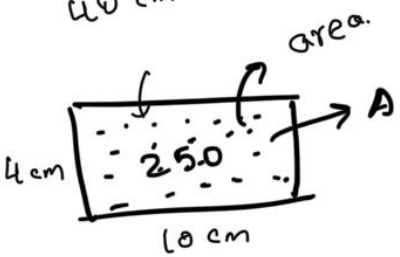




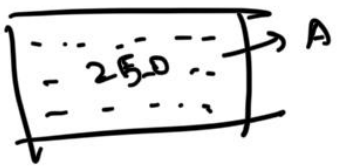
→ Does volume changes if you compress liquids ? NO.

$\frac{250\ N}{40\ cm^2}$ ↓ → Force per unit area ⇒ $6.25\ N\ cm^{-2}$

(pressure)



A →



A →

$A = a \cdot b$

$40\ cm^2$

m g

$F = m \cdot g$

$50\ (10)$

$F = 500\ N$

* Find the force acting on a surface whose area (rectangular) is 40 cm^2 and the pressure acting on the surface is 6.25 N cm^{-2}

$$p = \frac{F}{A} \Rightarrow 6.25 = \frac{F}{40} \Rightarrow F = 6.25 \times 40$$

$$= 250 \text{ N}$$

$$4 \overline{)25} \; 6.25$$

24

10

8

2

→ Studied by pascal (Pa)

$$1 \text{ N/m}^2 = 1 \text{ Pa}$$

* convert the 6.25 N cm^{-2} into pascals.

$$100 \text{ cm} = 1 \text{ m}$$

$$1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$1 \text{ cm}^2 = \left(\frac{1}{100}\right)^2 \text{ m}^2$$

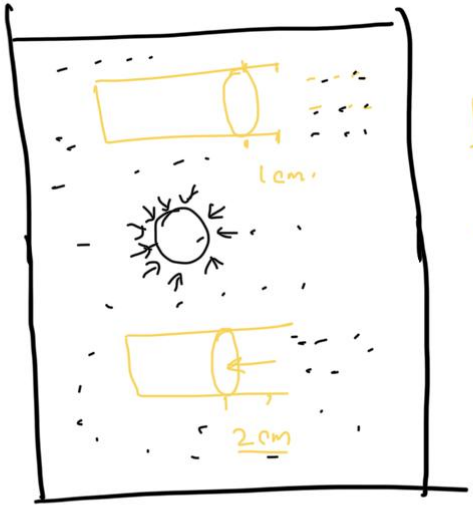
$$1 \text{ cm}^2 = 10^{-4} \text{ m}^2$$

$$\frac{6.25\ N}{1\ cm^2} = \frac{6.25\ N}{10^{-4}\ m^2} \Rightarrow \frac{6.25 \times 10^4}{10^{-4} \times 10^{-4}}\ N\ m^{-2} \rightarrow 62.5 \times 10^3\ N\ m^{-2}$$

62.5×10^3 Pa → 62.5 kPa

kPa = 10^3 Pa

Mpa = 10^6 Pa



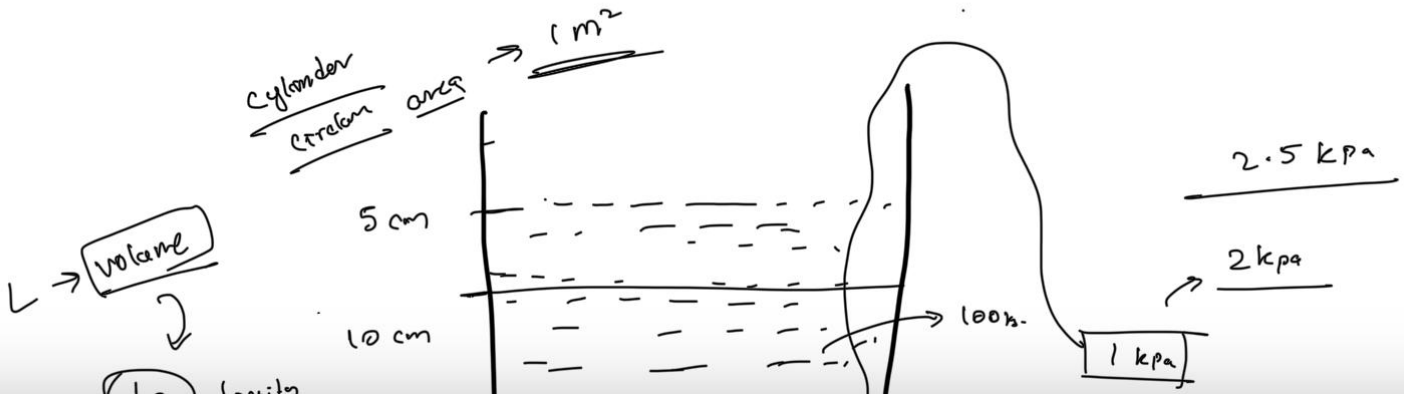
↓ 1m

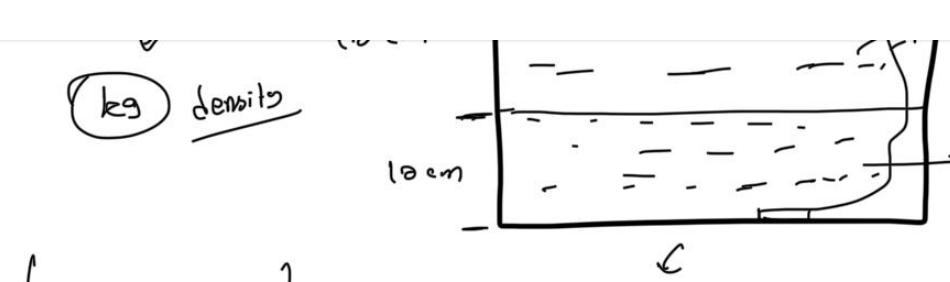
↓ 2m

↓

more deeper you go

high pressur you experian





$\frac{1000\ N}{1\ m^2} \Rightarrow 1000\ N\ m^{-2}$

$10^3\ N\ m^{-2}$

$1k\ pa$

* Find the mass in kg for 1 L of water. Given the density of water is 1000 kg / m^3 [Note: density of Liquid (kg m^3) = $\frac{\text{mass of the liquid (kg)}}{\text{volume (m}^3\text{)}}$]

[1000 L = 1 m^3]

→ Density of oil ?

→ why does oil floats?

2D

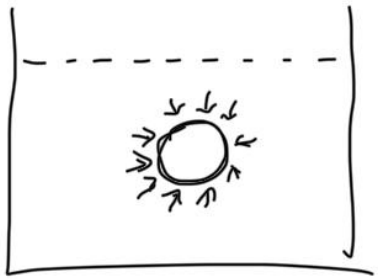
→ πR^2 (area - m^2)

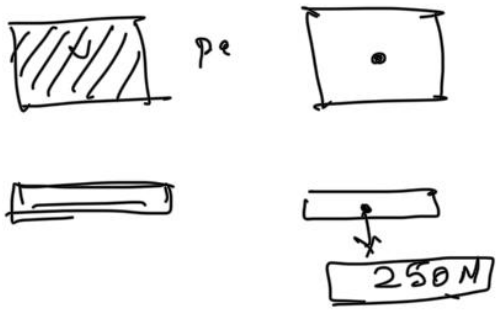
→ $2\pi R$ (circum → m)

3D

→ $4\pi r^2$ (area - of the sphere) →

→ $\frac{4}{3}\pi r^3$ (volume) → m^3





- Find the Force acting on a spherical ball when a pressure of 1 pa is applied ~~on~~ ~~a~~ by the liquid on the balls surface. Assume r = 1 cm.