Semester-1 Chemistry Core -2

Unit-1 Gaseous State, Lecture-1 Postulates of Kinetics Theory of Gases

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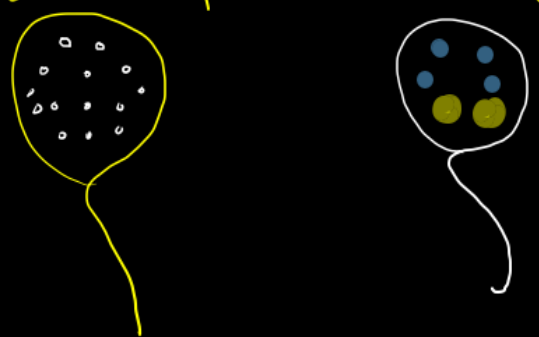
Semester-I, Chemistry Core-2, Lecture-1Unit-1Gaseous State

Postulates / Assumptions of Kinetic Theory of Gases:

The theory was first proposed by Bernoulli (1738) and it was later extended by clausius, Maxwell, Boltzmann, vanderwaal & Jeans.

The main assumptions of Kinetic Molecular theory (KMT) of gases:—

1) Every gas is made up of large no of extremely small particles called molecules. All the molecules of a particular gas are identical in mass & size.



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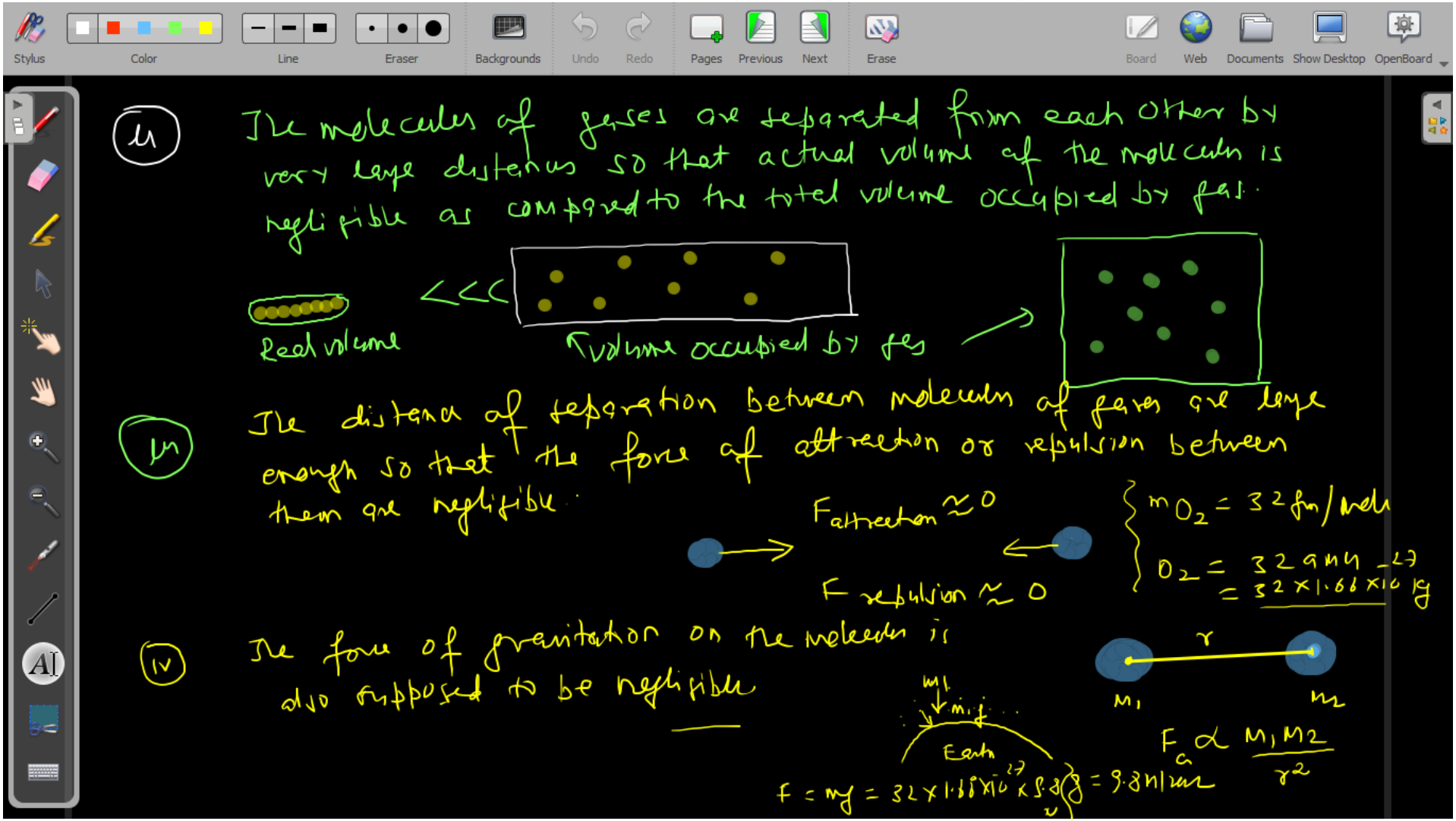

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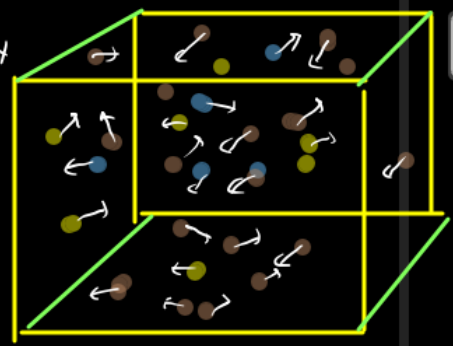
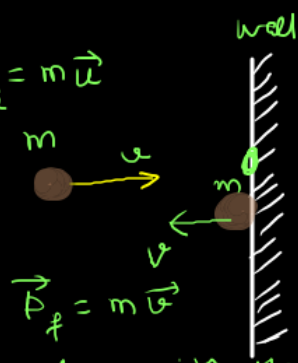
(V) The molecules are supposed to be moving continuously in different directions with different velocities. i.e. they keep colliding with each another & with wall of closed container.



(VI) The molecules of gas exert pressure on the wall of container by the continuous collision with wall.

✓ Pressure = Force / Area



Newton's 2nd Law of motion:

Force ∝ rate of change of momentum

$\propto \frac{dp}{dt} \Rightarrow F = ma$

on collision with the wall

Change in momentum = Δp

$\Delta p = p_f - p_i = mv - mu$

$\frac{\Delta p}{\Delta t} = \frac{mv - mu}{\Delta t} = m\left(\frac{dv}{dt}\right) = ma$

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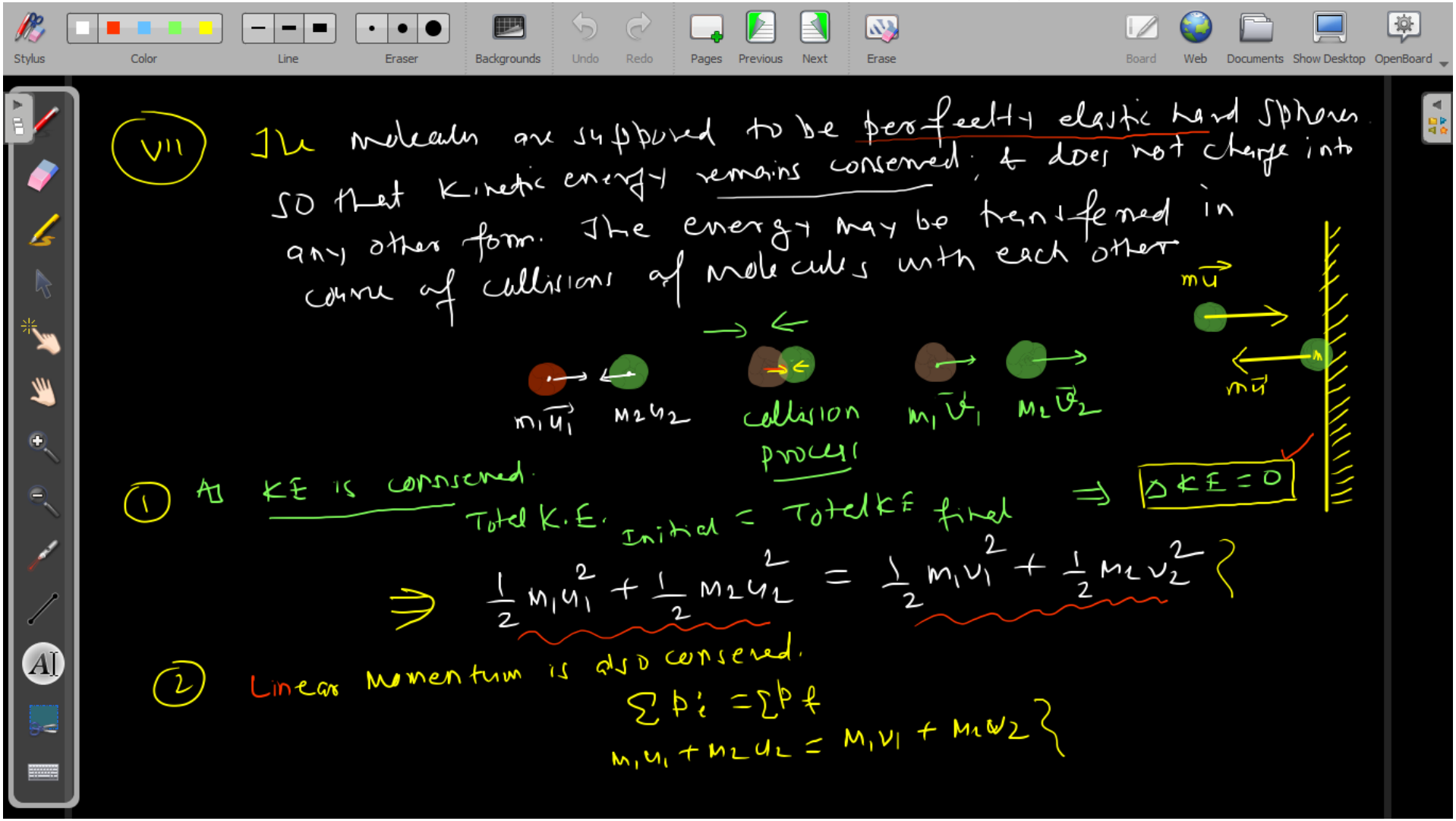

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