1. Detail of Unit Revision

Subject Name	Physics
Course Name	Physics 02 (Physics Part-2, Class XI)
Module Name/Title	Unit 9:Behaviour of perfect gases and kinetic theory of gases_Revision
Objectives	After going through this lesson, the learners will be able to understand • How to plan for study • How to consolidate the unit
Keywords	Ideal gas, real gas, pressure, mean free path, rms speed, degree of freedom etc.

2. Development Team

Role	Name	Affiliation
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Study Guide

Kinetic Theory of Gases

First of all, read each part of the syllabus

Behaviour of Perfect Gases and Kinetic Theory of Gases:

Equation of state of a **perfect** gas (What is a perfect gas? ideal gas? Why are these terms important?)

Work done in compressing a gas: (Why should work be done on the gas? Can gas do work?)

Kinetic theory of gases - assumptions,

Concept of pressure: (Pressure exerted by a gas on the walls of a container, so our consideration is for enclosed mass of gas)

Kinetic interpretation of temperature; (temperature and kinetic energy are related and this concept addresses it beautifully, you need to read the e-text slowly and understand it. It is significant to get a good grip on the concept)

rms speed of gas molecules; (rms speed-if all molecules were to move with rms speed the net kinetic energy of the enclosed gas would remain the same, as it is, with a wide distribution of kinetic energy of individual molecules)

Degrees of freedom, watch the video for clarity

Law of equi-partition of energy (statement only)

Application to specific heat capacities of gases;

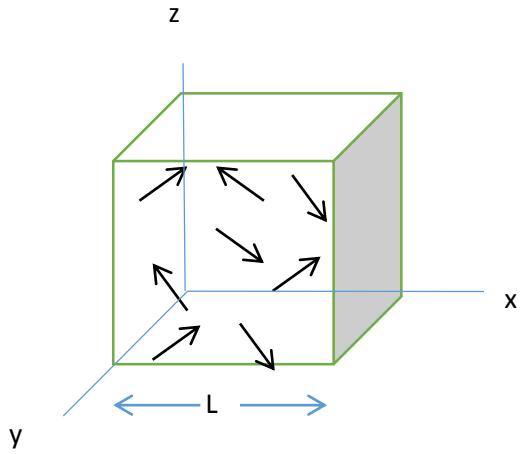
Concept of mean free path,

Avogadro's number

Most of the syllabus requires a high extent of imagination, so relax and understand it, it is ok if the concepts do not look easy for the first time, once you get them right it is a great feeling, so be patient and do it

Suggestions to study the unit

- Read the gas laws Boyle's, Charles's law, pressure law, Dalton's law of partial pressure.
- Understand the ideal gas equation PV= nRT
- Understand relation between Boltzmann's constant (k), gas constant (R) and Avogadro number (N)
- Study the assumptions
- Draw the diagram, and write each step for derivation of pressure exerted by the gas molecules on the walls of the container.



- Use the result and apply it for gas laws
- Derive kinetic energy per molecule and kinetic energy per degree of freedom as $\frac{1}{2}$ KT
- Use the concepts to interpret specific heat of gases, C_p and C_v

Next do problems and answer questions on the unit