`Of course. Here is a quick snapshot of the key formulas and concepts from the chapter on the Kinetic Particle Model of Matter for your revision.

Key Concepts 📝

- **States of Matter & Particle Arrangement**:
  - [cite_start]**Solids**: Particles are close together and vibrate in **fixed positions** in a regular pattern. [cite: 729, 782] [cite_start]They have a **definite shape and volume**. [cite: 728]
  - [cite_start]**Liquids**: Particles are still close together but can **slide past one another**. [cite: 736] [cite_start]They have a **definite volume** but take the shape of their container. [cite: 734]
  - [cite_start]**Gases**: Particles are **far apart** and move randomly and at **high speed**. [cite: 744, 818] [cite_start]They have **no definite shape or volume**. [cite: 743]
- **Changes of State**:
  - [cite_start]**Melting**: Solid to liquid. [cite: 715]
  - [cite_start]**Boiling/Evaporation**: Liquid to gas. [cite: 716, 741]
  - [cite_start]**Condensation**: Gas to liquid. [cite: 749]
  - [cite_start]**Solidification**: Liquid to solid. [cite: 739]
- [cite_start]**Brownian Motion**: The **random, haphazard motion** of microscopic particles (like smoke) caused by collisions with smaller, invisible molecules (like air). [cite: 871, 873, 874] [cite_start]This is important evidence for the kinetic particle model of matter. [cite: 871]
- [cite_start]**Gas Pressure**: This is caused by the **force from a huge number of gas particles colliding** with the surfaces of their container. [cite: 841, 842, 847]
  - [cite_start]Increasing **temperature** (at constant volume) makes particles move faster, causing more frequent and violent collisions, thus **increasing pressure**. [cite: 918, 919]
  - [cite_start]Decreasing **volume** (at constant temperature) means particles are closer together, so they collide with the walls more often, **increasing pressure**. [cite: 921, 939]
- [cite_start]**Absolute Zero (0 K or -273°C)**: This is the lowest possible temperature, where **particle motion ceases** and a substance has no internal energy. [cite: 836, 837, 1016, 1018]

Key Formulas ➗

- [cite_start]**Boyle's Law (Constant Temperature)**: The pressure of a fixed mass of gas is inversely proportional to its volume. [cite: 984]
  $p_1V_1 = p_2V_2$
  - p = pressure (in Pa, atm, etc.)
  - V = volume (in m^3, cm^3, etc.)

- [cite_start]**Pressure Law (Constant Volume)**: The pressure of a fixed mass of gas is directly proportional to its absolute temperature. [cite: 1087]
  $\frac{p_1}{T_1} = \frac{p_2}{T_2}$
- [cite_start]**Charles' Law (Constant Pressure)**: The volume of a fixed mass of gas is directly proportional to its absolute temperature. [cite: 1078]
  $\frac{V_1}{T_1} = \frac{V_2}{T_2}$
- **Combined Gas Law**:
  $\frac{p_1V_1}{T_1} = \frac{p_2V_2}{T_2}$
  - p, V = pressure and volume
  - [cite_start]T = **MUST** be in the absolute temperature scale (Kelvin). [cite: 1106]
- **Temperature Conversion**:
  $T(K) = \theta(^\circ C) + 273$
  - **T(K)** = Temperature in Kelvin
  - $\theta(^\circ C)$ = Temperature in Celsius