The Gaseous State

1. **Properties**
    a. Gases may be compressed
    b. Gases expand to fill their containers uniformly
    c. All gases have low density
    d. Gases may be mixed – there is always room for more
    e. Confined gases exert constant pressure on the walls of their container uniformly in all directions
2. **Kinetic Theory of gases – Ideal Gas Model**
    a. Gases consist of particles moving all the time and in straight lines
    b. Particles collide with each other and with the walls of the container without loss of energy
    c. Gases behave as independent particles – zero intermolecular forces
    d. Gas particles have space between them
    e. The volume occupied by the actual particles equals zero compared to the volume of space they occupy
3. **Gas measurements**
    a. Pressure – Force exerted on the sides of the container by the moving particles
        i. Tool - Barometer
        ii. Units
            1. Kilopascal
            2. Torr
            3. Atmospheres
            4. mmHg
    b. Temperature – describes the kinetic energy of the particles
        i. Tool – thermometer
        ii. Units
            1. Celsius, Fahrenheit
            2. Kelvin
    c. Volume – Litres
    d. Density – Mass/Volume
    e. Moles – Mass/Molar Mass
4. **Standards**
    a. STP – 273 K (0° C), 101.325 kPa
    b. SATP – 298 K (25° C), 100 kPa