

13.1 The Nature of Gases

Kinetic energy - the energy an object has because of its motion

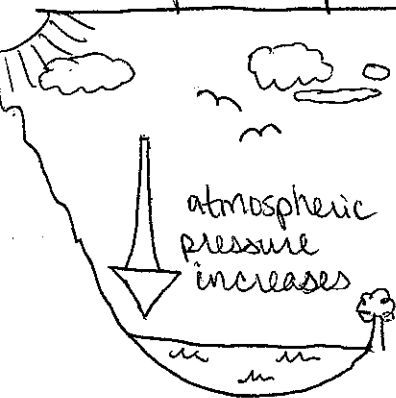
Kinetic theory - all matter consists of tiny particles that are in constant motion

- ① particles in a gas are far apart and have insignificant volume.
- ② The motion of the particles in a gas is rapid, constant, & random - as a result gases fill their containers and have many collisions
- ③ All collisions between particles in a gas are perfectly elastic, meaning kinetic energy is transferred without loss.

Gas pressure - results from the force exerted by a gas per unit surface area of an object which results from particle collisions

Vacuum - an empty space with no particles & no pressure

Atmospheric pressure - the collisions of atoms and molecules in the Earth's atmosphere with objects



Barometer - a device used to measure atmospheric pressure

Pascal (Pa) - the SI unit of pressure

Standard atmosphere (atm) - the pressure required to support 760 mmHg in a barometer at 25°C

$$1 \text{ atm} = 760 \text{ mmHg} = 101.3 \text{ kPa}$$

The average kinetic energy of particles in a substance is directly related to the substance's temperature.

$$\text{Temp. } \uparrow = \text{KE } \uparrow$$

$$\text{Temp. } \downarrow = \text{KE } \downarrow$$

Remember absolute zero?? *No motion*