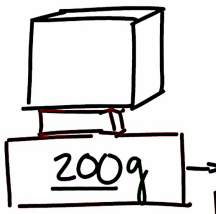
States of Matter Review

Solid



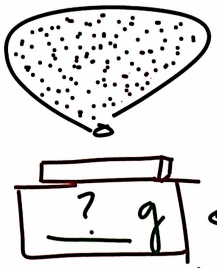
Fixed Volume
Fixed Shape

→ Can Measure mass ←

Liquid

Fixed Volume
Variable Shape

gas



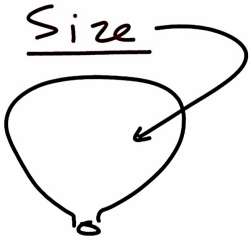
Variable Volume
Variable Shape

← Can't directly Measure Mass

Basic Properties of Gases

Volume

Size



Liters (L)

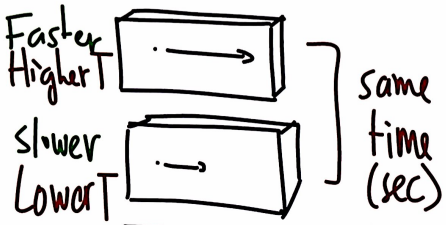
Pressure

Collisions

Pressure (atm)

Temperature

Speed Particles



Temperature (k)

Boyle's Law

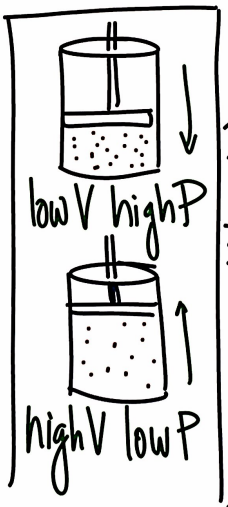
P is an indirect rel. w/ V [T const.]

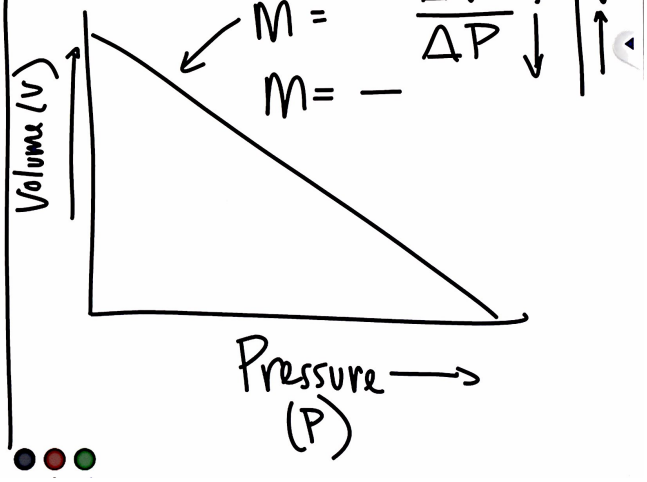
$P_1V_1 = P_2V_2$

start ending

$P_1V_1 = k$

(k needs constant)





Charle's Law

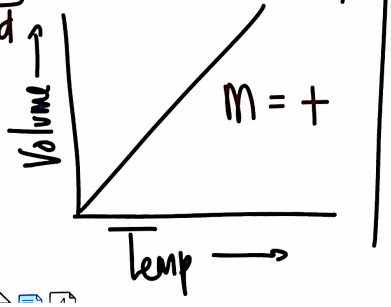
T = Rate (speed) Particle

V is direct rel. w/ T [P const.]

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ start end

$\frac{V}{T} = k$

$m = \frac{\Delta V}{\Delta T}$



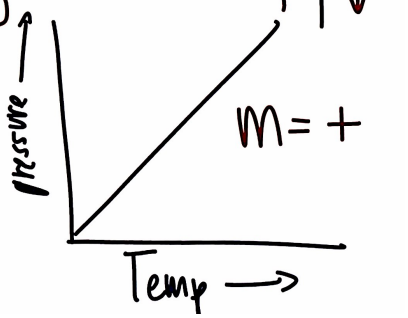
Gay-Lussac's Law

P is direct rel. w/ T [V const.]

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$ start end

$\frac{P}{T} = k$

$m = \frac{\Delta P}{\Delta T}$



Combined Gas Law

P is ind. to V P and V dir. T

$$\underbrace{\frac{P_1 V_1}{T_1}}_{\text{start}} = \underbrace{\frac{P_2 V_2}{T_2}}_{\text{end}}$$

$P_1 V_1 = P_2 V_2$ (Indir.)

$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ (direct)

$\frac{P_1}{T_1} = \frac{P_2}{T_2}$ (direct)

P_1 V and T all effect the gas system.