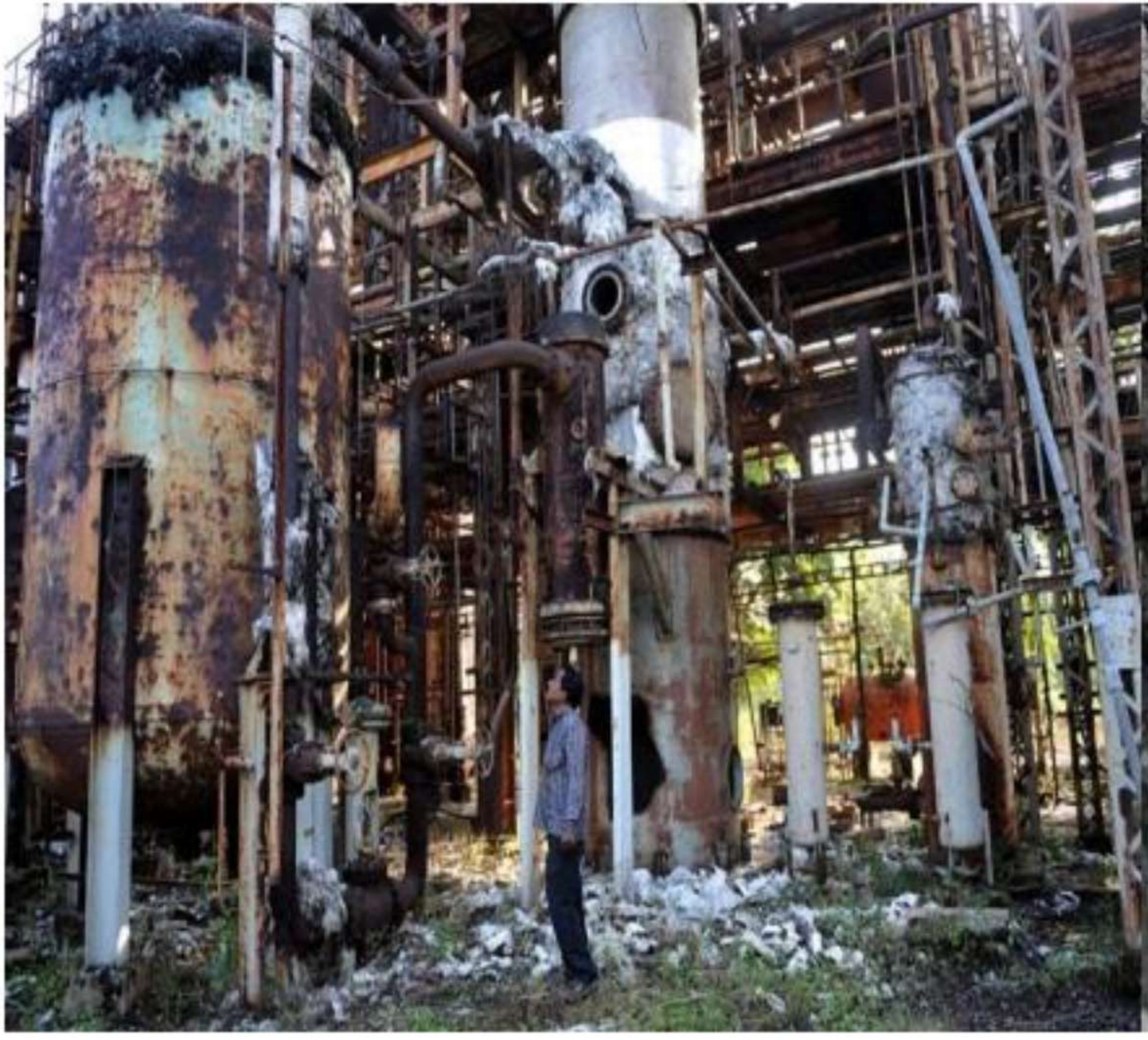
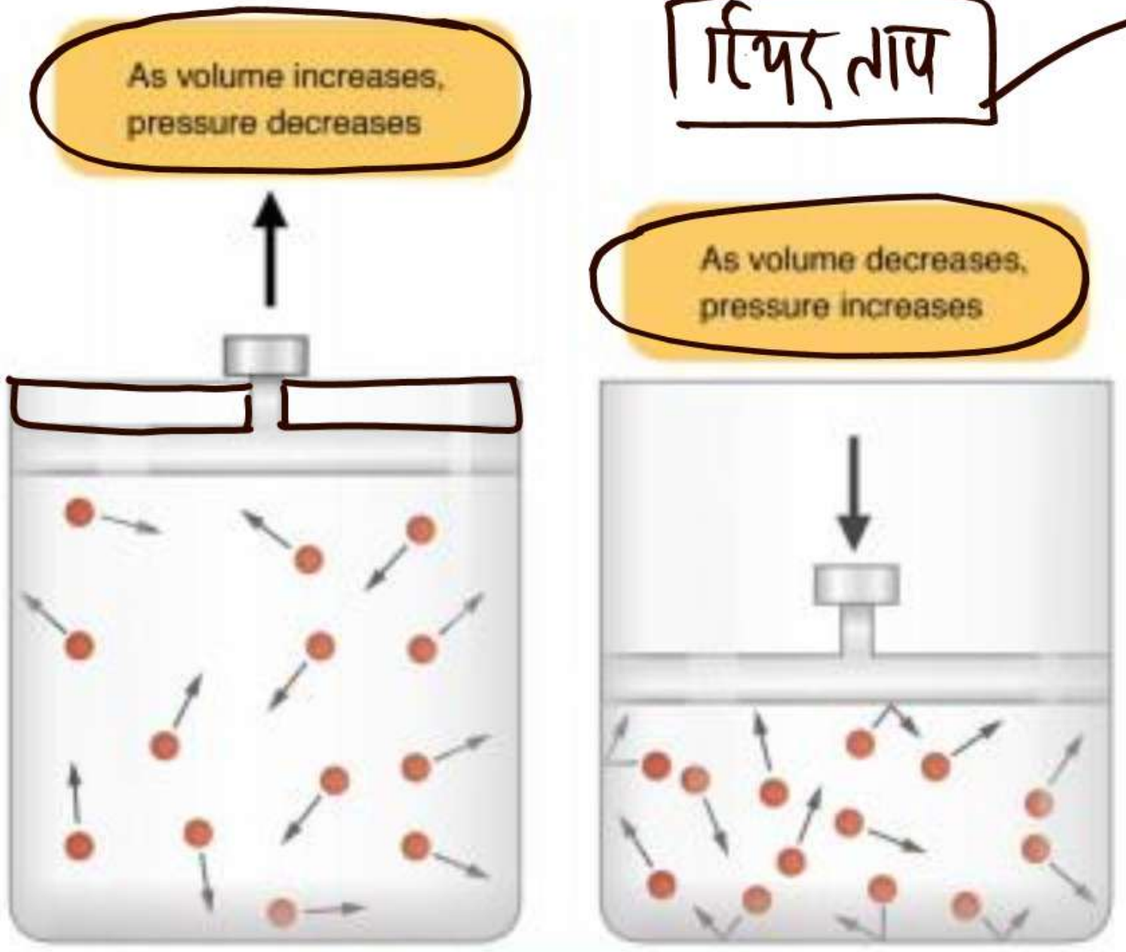
Gaseous law



बॉयल का नियम (Boyle's law)

स्थिर ताप

निश्चित मात्रा का आयतन - दाब, व्युत्क्रमानुपाती



$$pV = k$$
$$p_1V_1 = p_2V_2$$
$$p = k/V$$

गैस निश्चित मात्रा

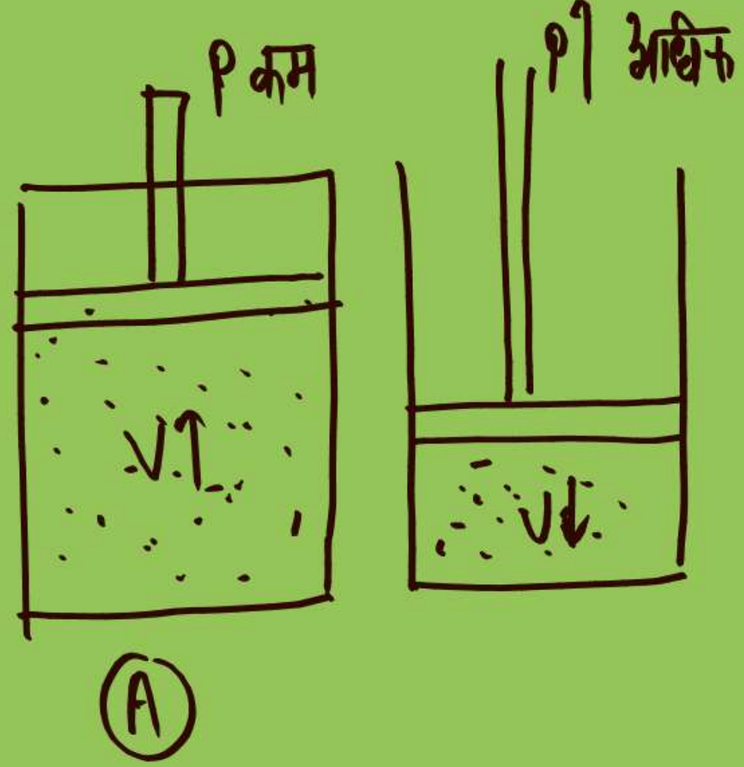
(T) Constnt → दाब ↑ आयतन ↓

⇓

दाब ↓ आयतन ↑

$V \propto \frac{1}{P}$

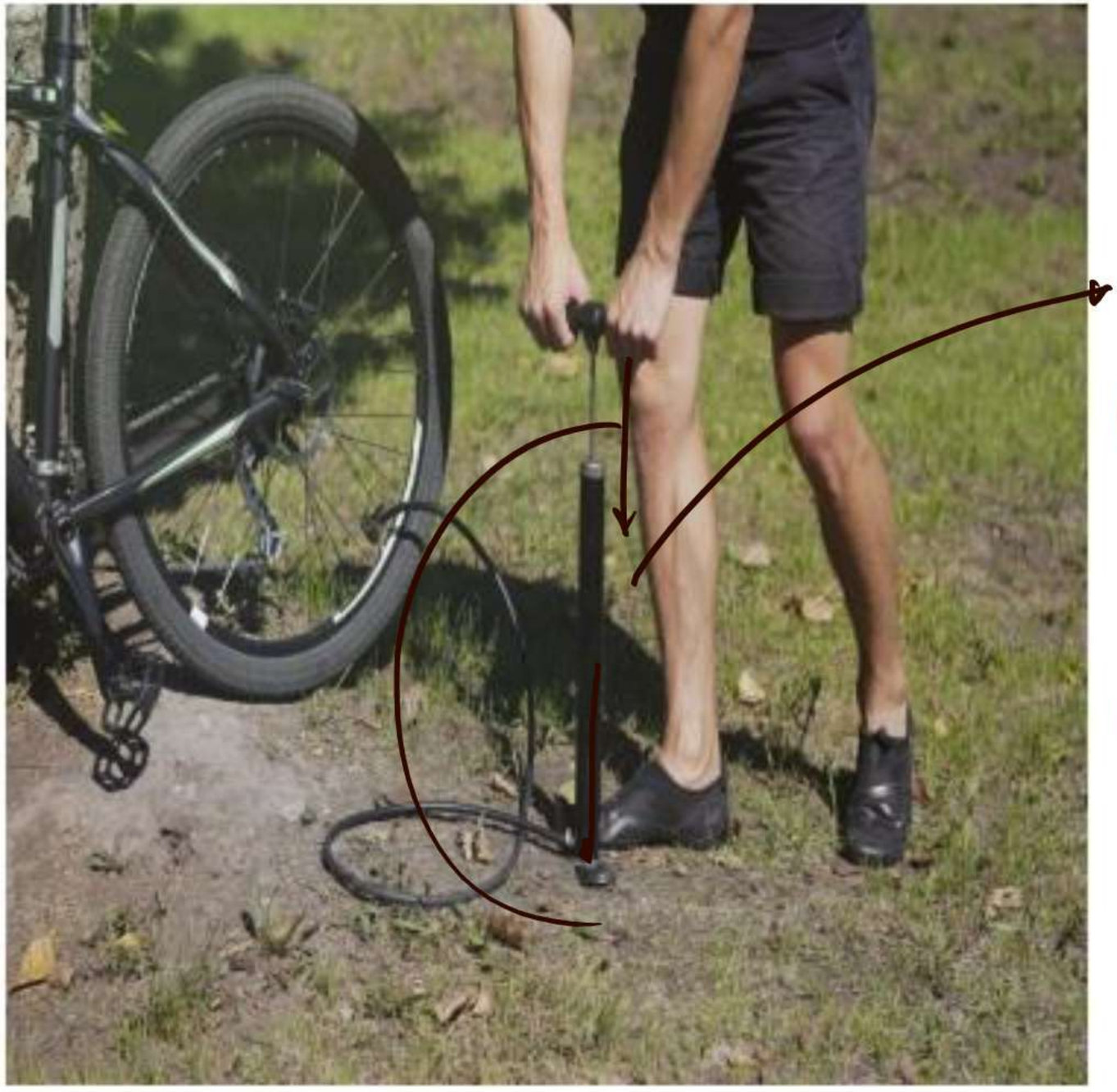
$PV = k$ (नियतांक) $\Rightarrow P_1 V_1 = P_2 V_2$



रसायन विज्ञान : भौतिक रसायन विज्ञान

Main Topic

- Gaseous law
- Solution
- Physical and Chemical Changes
- Acid Base and Salt
- Radioactivity
- Oxidation and Reduction
- Chemical Reactions and Energy Changes
- Chemical Bond



साइकलमें

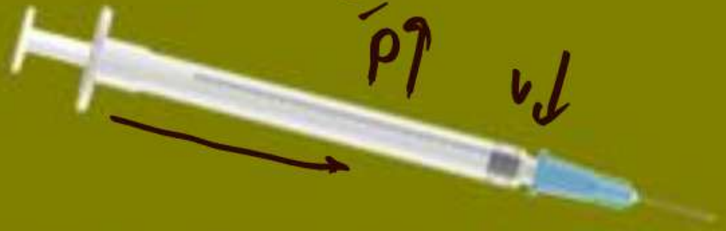
हवा पम्प

वॉपस

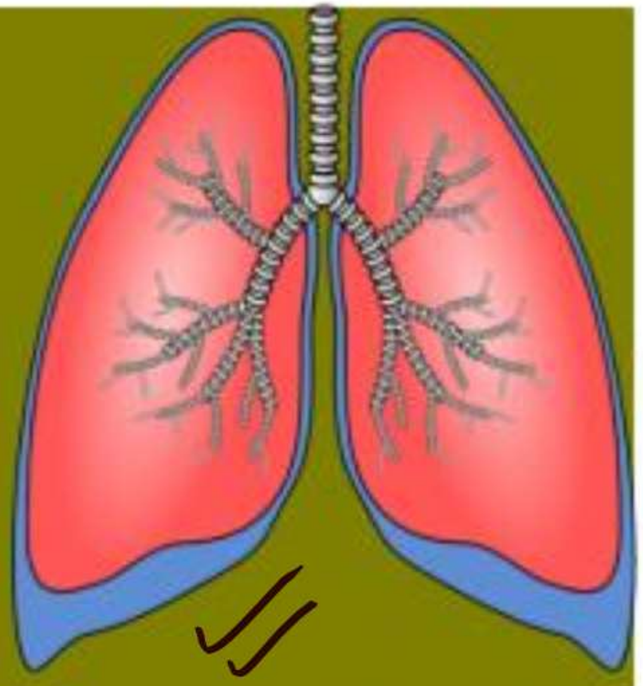
अब समझा

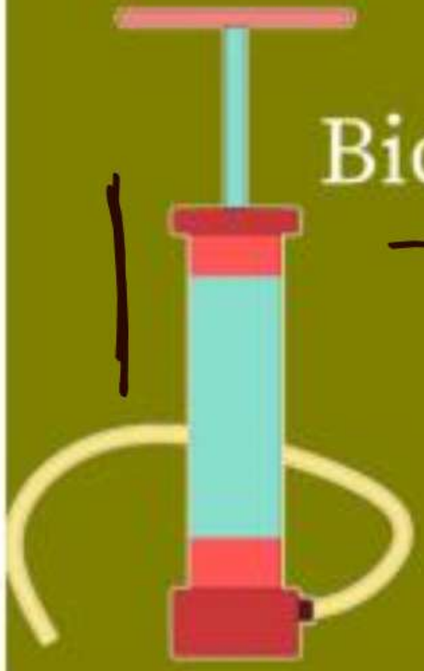
Examples of Boyle's Law

Syringe



Lungs



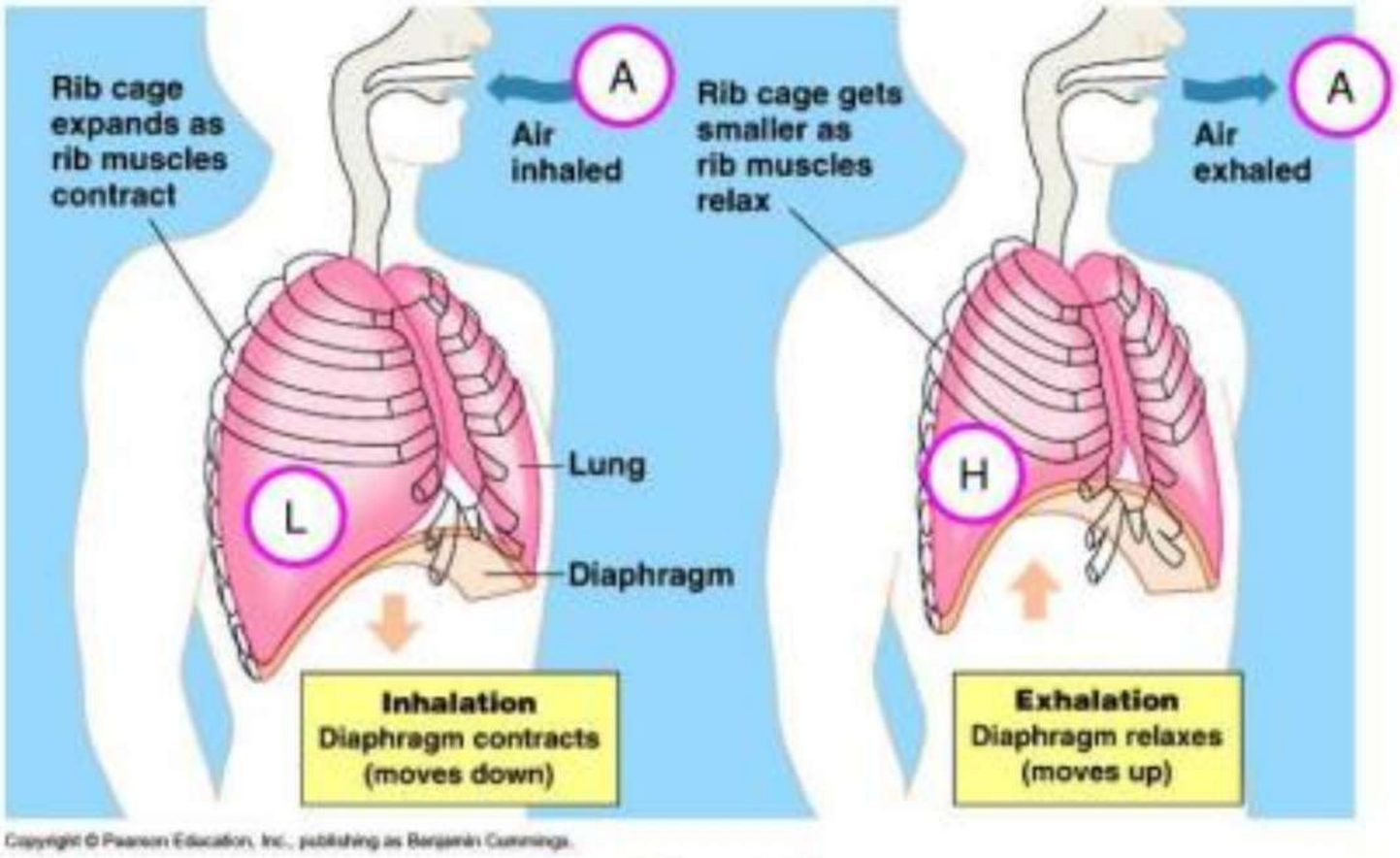


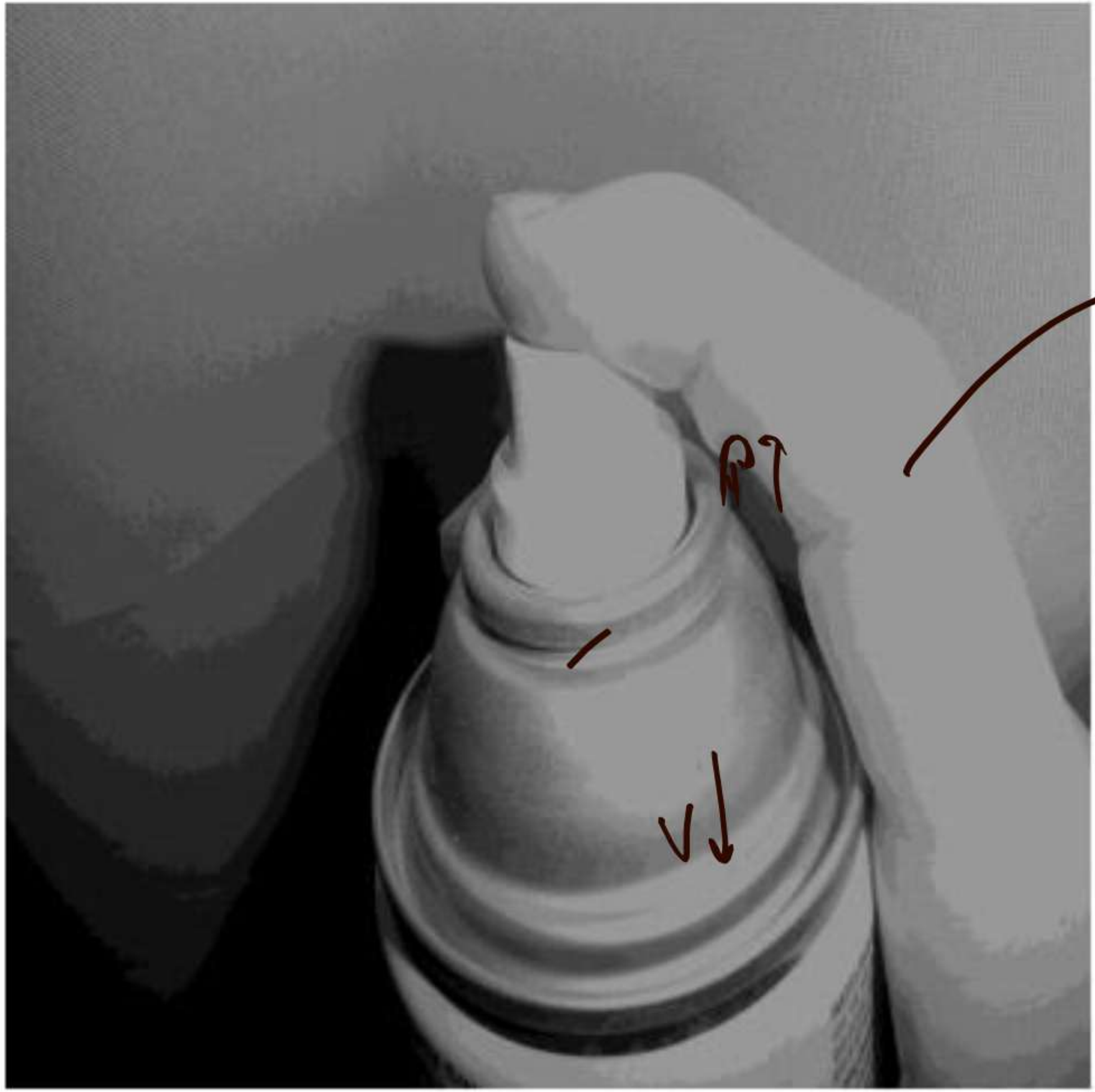
Bicycle pump

Underwater fish

A scube diver

Breathing & Boyle's Law





स्प्रे / फोम का डिब्बा उपयोग में लाना

चार्ल्स का नियम (Charles law)

स्थिर दाब पर → किसी गैस की निश्चित मात्रा का आयतन उसके तापमान के समानुपाती होता है

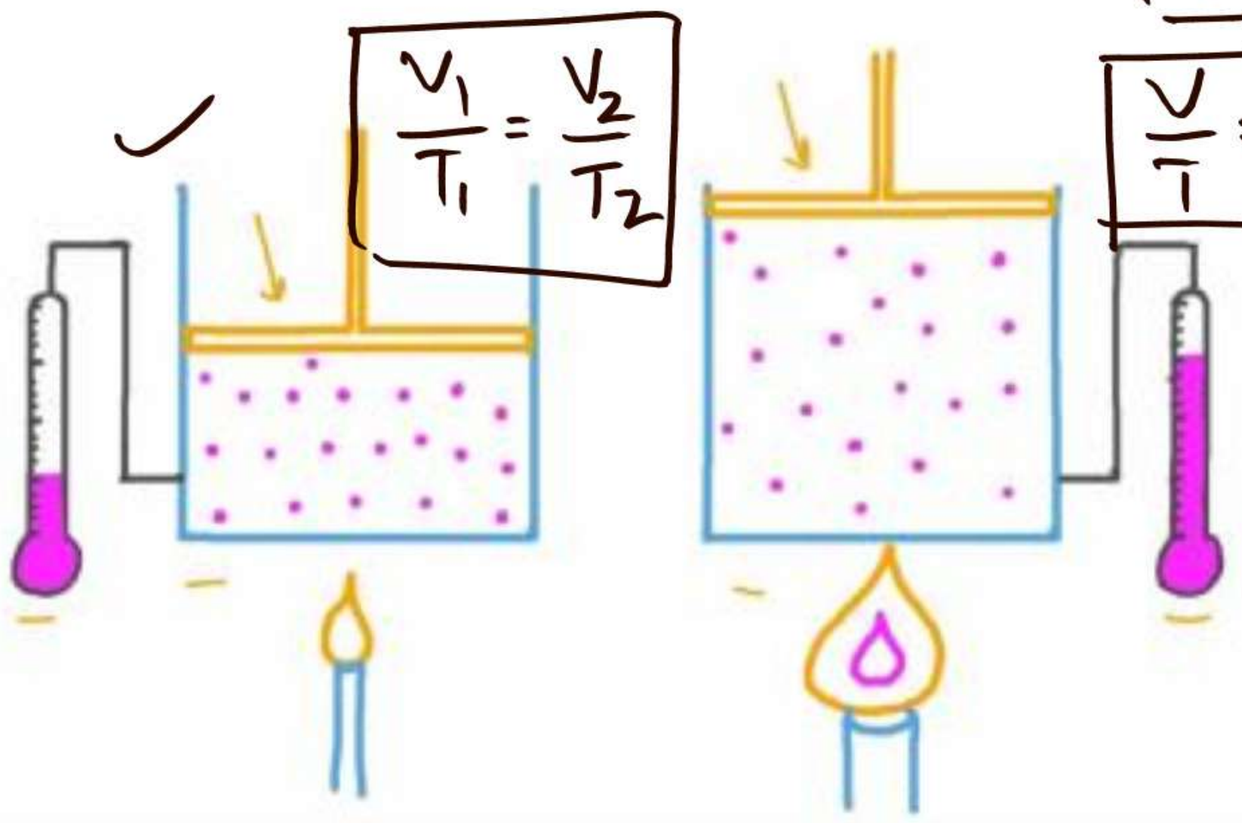
CHARLES LAW

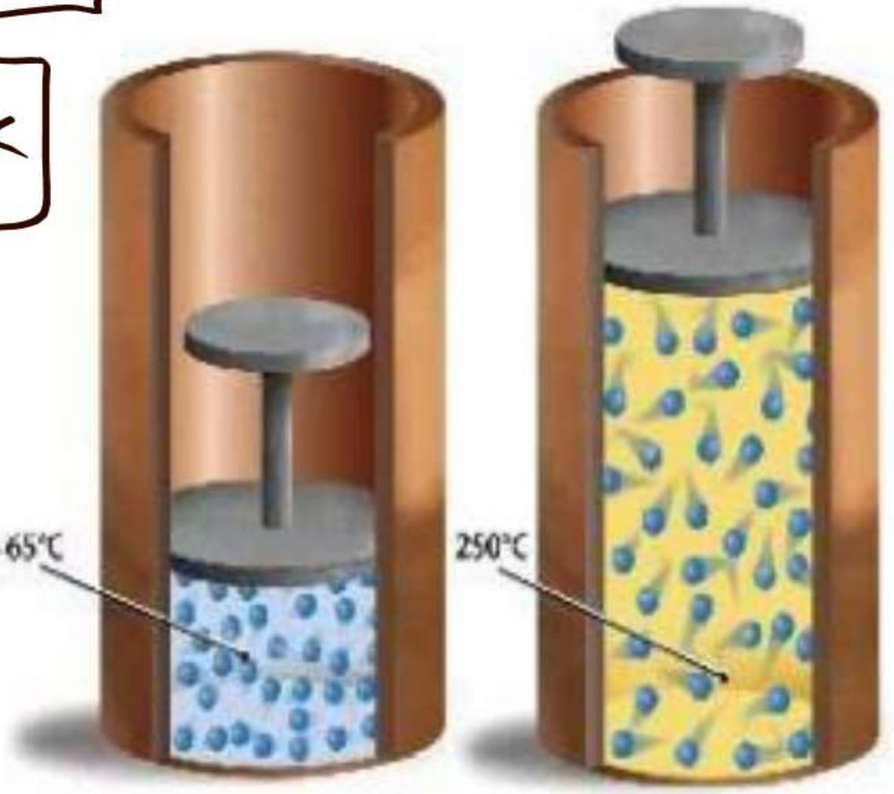
Charles's Law

$V \propto T$

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

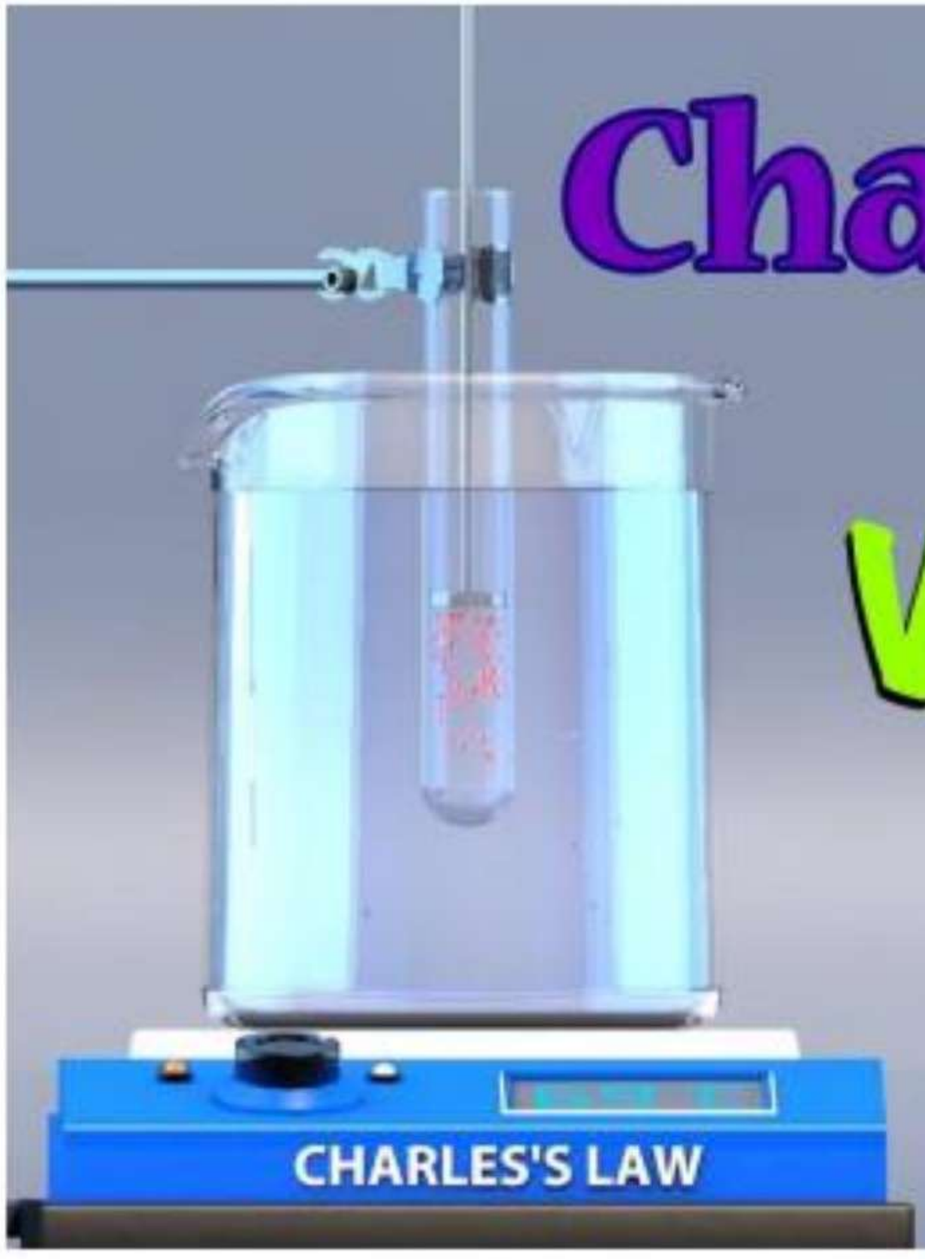
$\frac{V}{T} = K$





Charles's Law

$V = kT$



Charles's law in everyday life

Gas at lower temperature —volume smaller

Use burner to heat air in balloon

Gas particles move faster—balloon canopy stretches

Fill in balloon

Larger balloon—displaces more air balloon rises & hot air less dense

Image FreeSVG PD

Avogadro's law

गैस की मात्रा (n)
व
उसके आयतन (V)
सम्बन्ध

$V \propto n$

$n\uparrow$ $V\uparrow$	$n\downarrow$ $V\downarrow$

Avogadro's Law's Formula

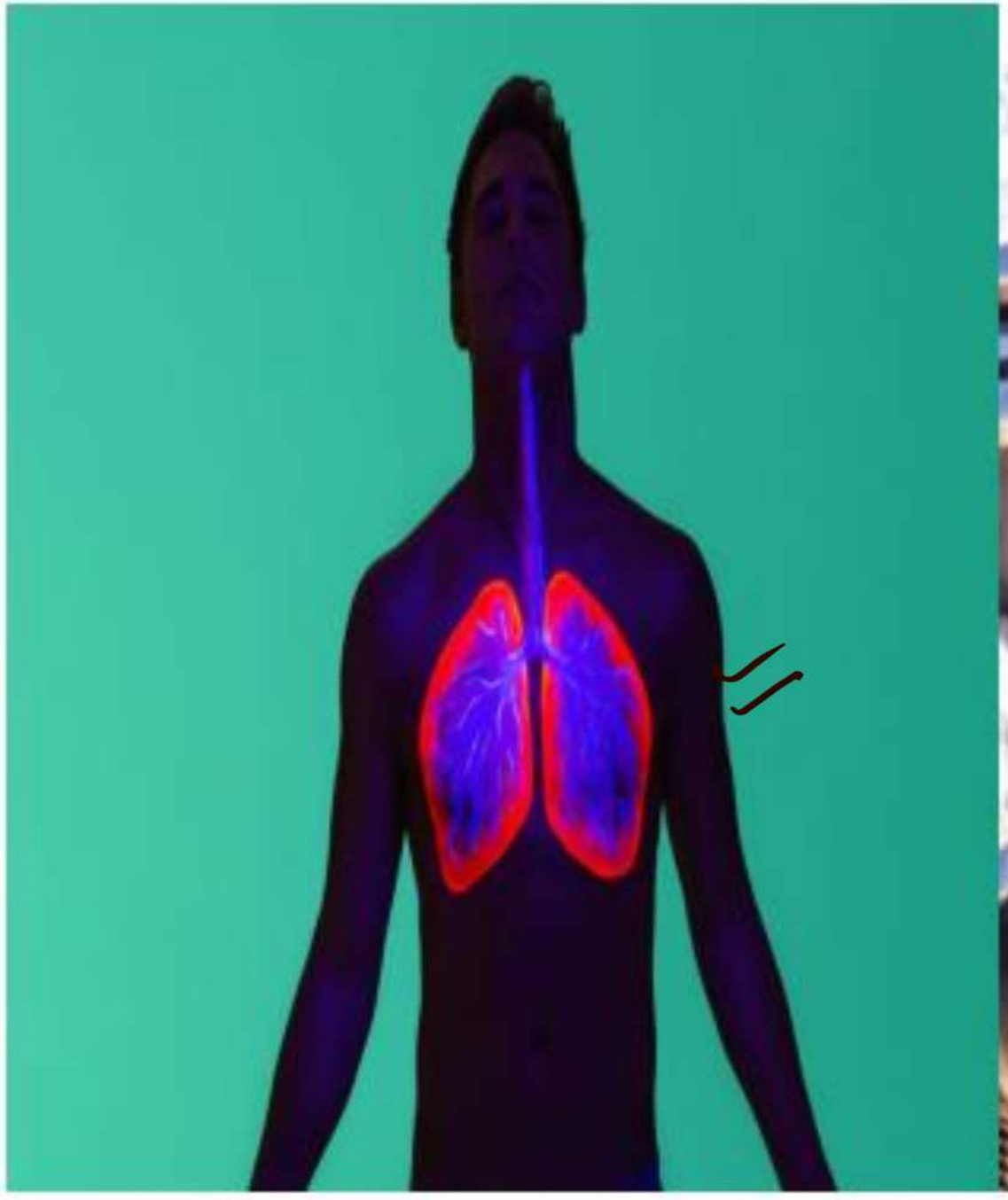
$V \propto n$ or $\frac{V}{n} = k$

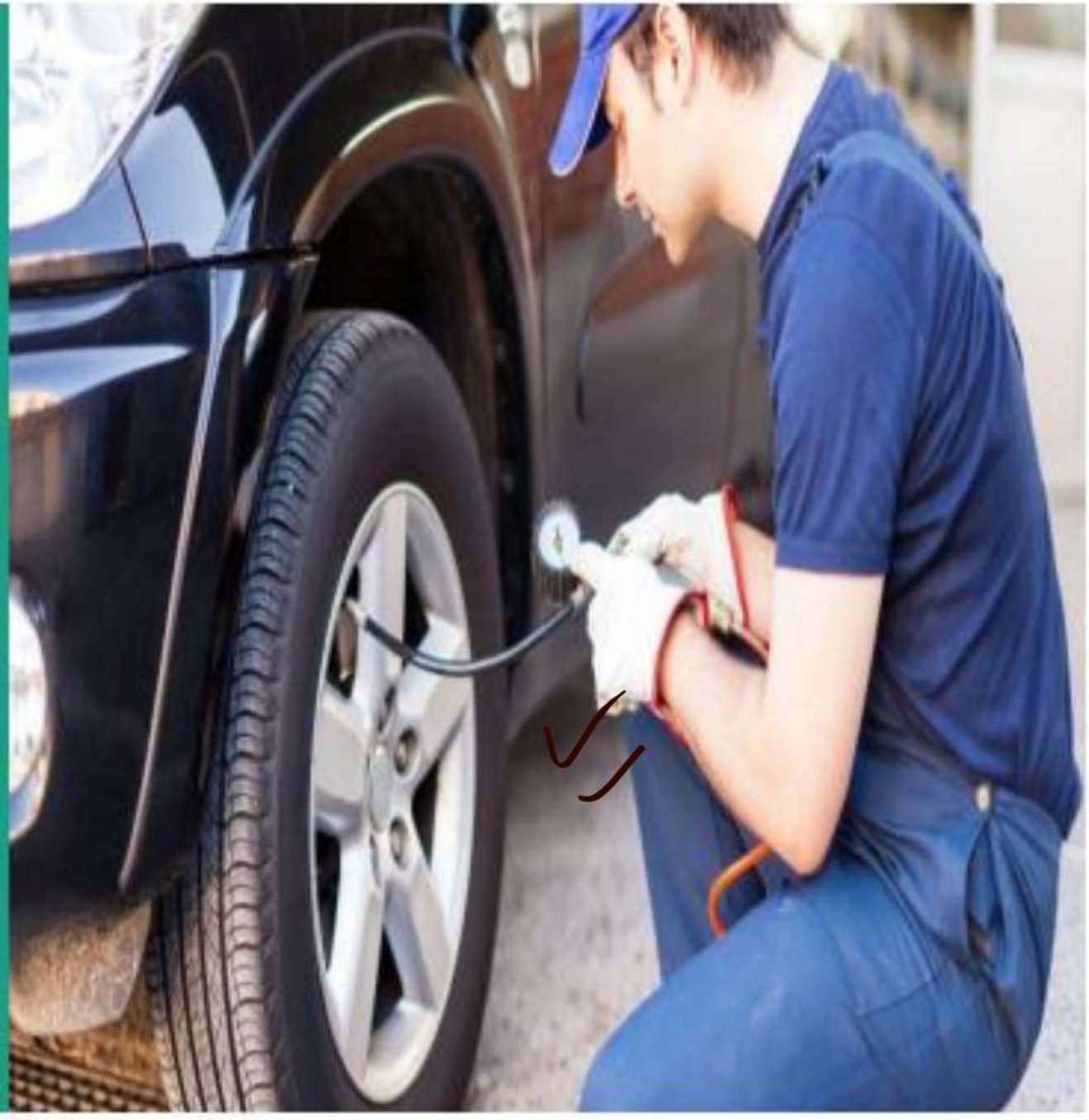
Where,

V = Volume of gas
n = Numbers of moles of the gas
k = a Constant

It can be rewritten as

$$\frac{V_1}{n_1} = \frac{V_2}{n_2}$$





Ideal Gas Equation

$V \propto \frac{1}{P}$

$V \propto T$

$V \propto n$

Ideal Gas Law

$$PV = nRT$$

निष्पत्ति क

$PV = nRT$

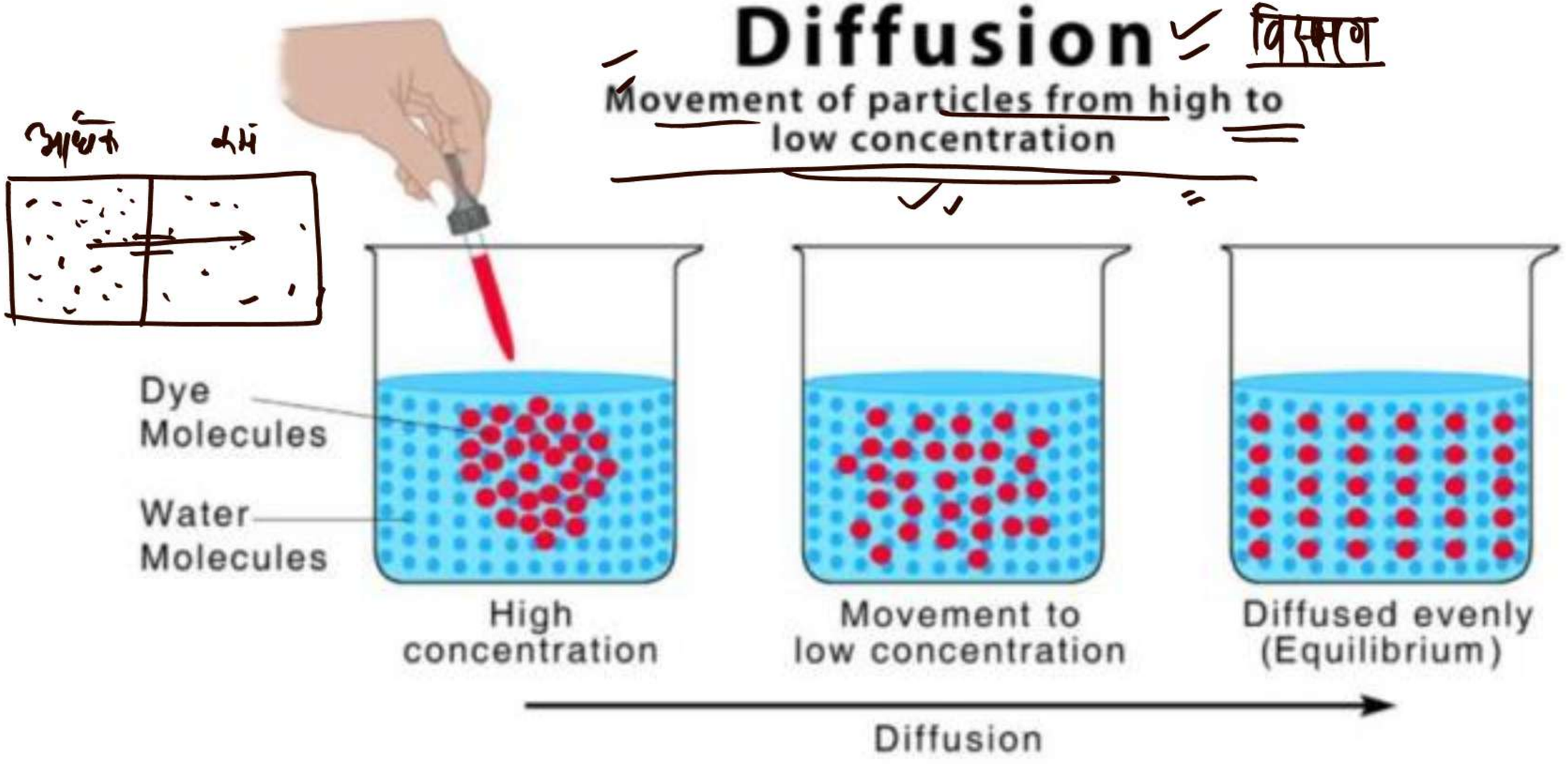
Brings together gas properties.

Can be derived from *experiment* and *theory*.

$V \propto \frac{nT}{P}$ $\Rightarrow$ $PV = nRT$


zero

Graham's law of diffusion



Diffusion Rate

* स्थिर ताप व दाब पर किसी गैस के विसरण की दर

उसके घनत्व के वर्गमूल के व्युत्क्रमानुपाती होती है

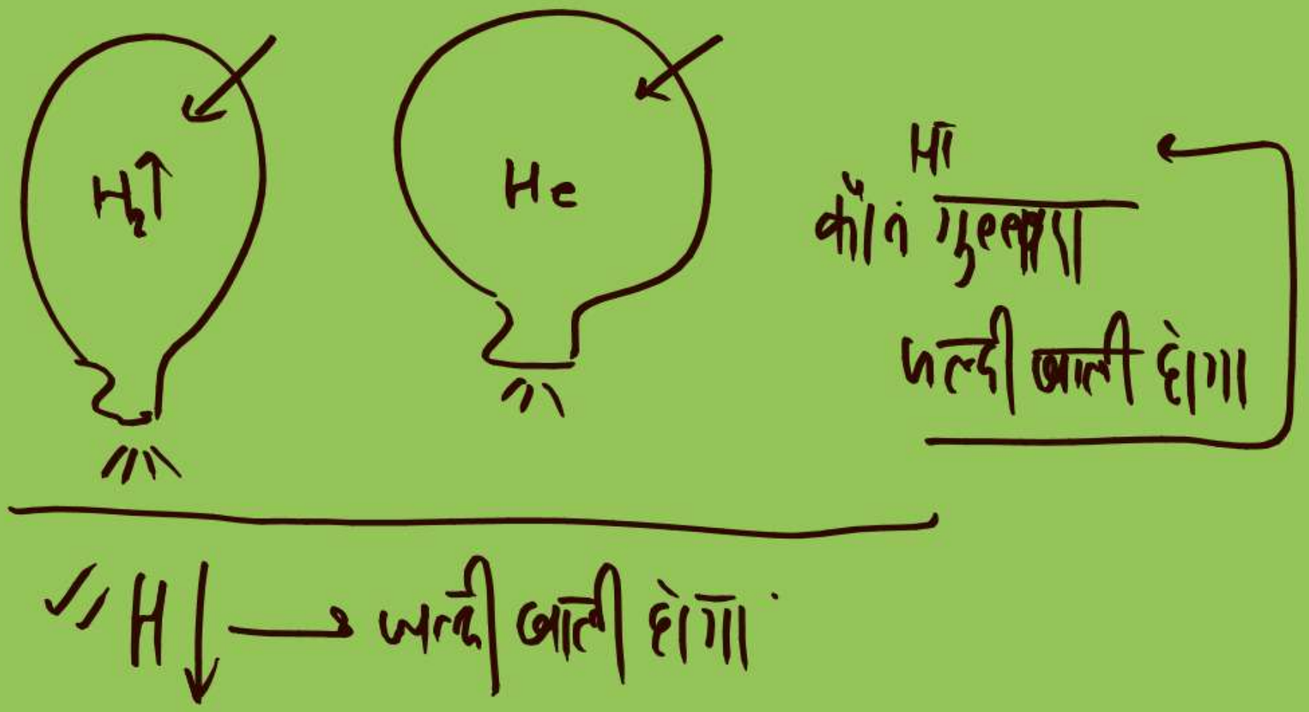
$$\frac{r_1}{r_2} = \sqrt{\frac{d_2}{d_1}}$$

अनुप्रयोग

धूपबत्ती / अगरबत्ती

मोमबत्ती गैस काण्ड

Note: Atomic Number | अणुभार बढ़ने पर - विसरण की दर कम ↓

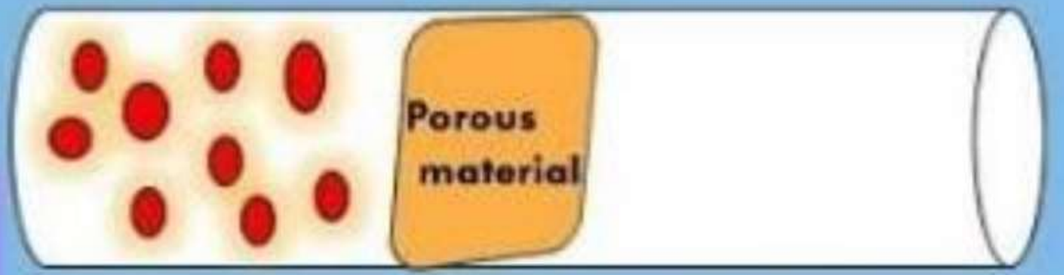


Liquidation of Gas

LIQUEFACTION OF GAS

ক্রান্তিক তাপমাত্রা

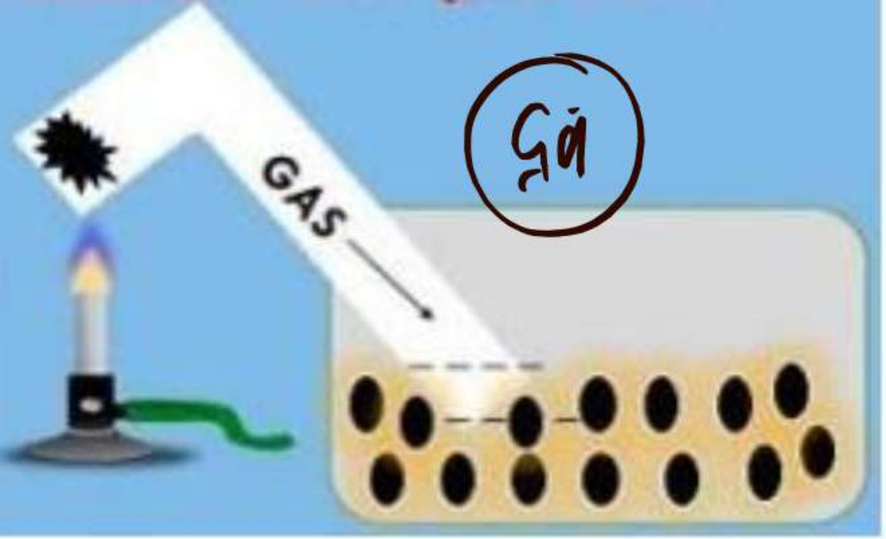
CHANGE OF GASES INTO LIQUID STATE



High pressure Low pressure

LOW TEMPERATURE

HIGH PRESSURE



भौतिक रसायन विज्ञान

भाग - 3

- रेडियो सक्रियता
- रासायनिक बंधन
- ऑक्सीकरण और अपचयन

Radioactivity

किरणों उत्सर्जन

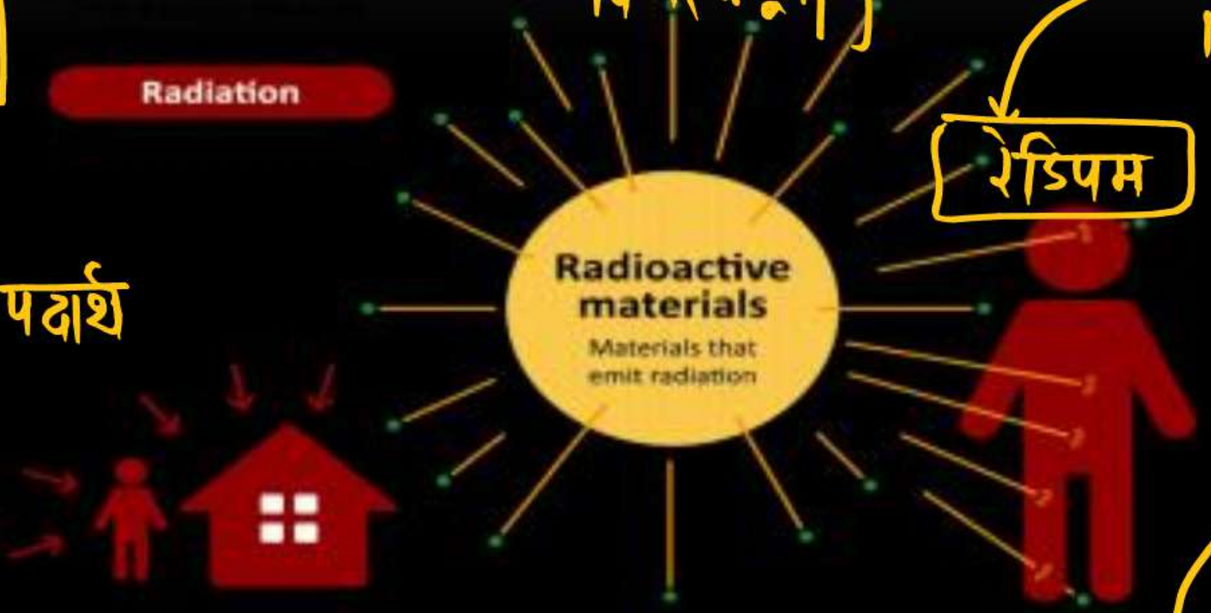
↓

रेडियोसक्रिय पदार्थ

$\frac{\lambda}{\rho} > 1.5$

Radioactivity

Radiation



Sv (Sieverts)

Bq (Becquerels)

Degree of impact of radiation on the human body

Amount of radiation emitted by radioactive materials

Note: मैडम क्यूरी
पियरे क्यूरी
→ यूरेनियम → अयस्क → पिचब्लेंड

रेडियम

Note: हेनरी बैकुरल

रेडियो सक्रियता

↓

जनक

→ रेडियोसक्रिया → बैकुरल

मापन

सीवर्ट

Radiation in Daily Life

Natural Radiation

10
Unusually high natural radiation dose in downtown Guarapari, Brazil

5
Average annual dose to aircrew flying 800 hours per year

Food/drinks

Radon gas from ground

Cosmic rays

Buildings/soil

2.4
Annual natural background radiation

0.08
Air passage from Hong Kong to North American

Effective dose (mSv)

10

1

0.1

0.01

Man-made Radiation

20
Annual dose limit for radiation worker

6.6
Average effective dose from CT scan

1.0
Annual dose limit for general public (except medical exposure)

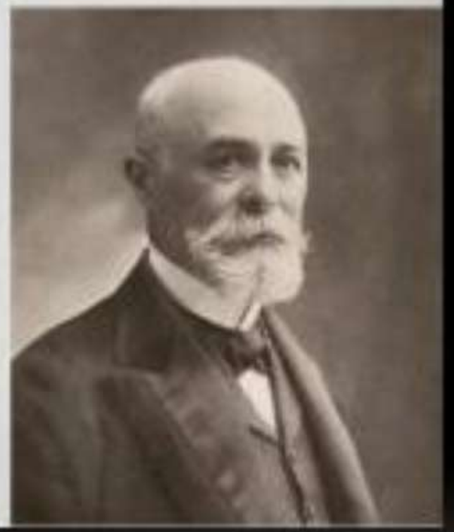
0.6
Average effective dose from single abdominal x-ray

0.13
Average effective dose from mammogram

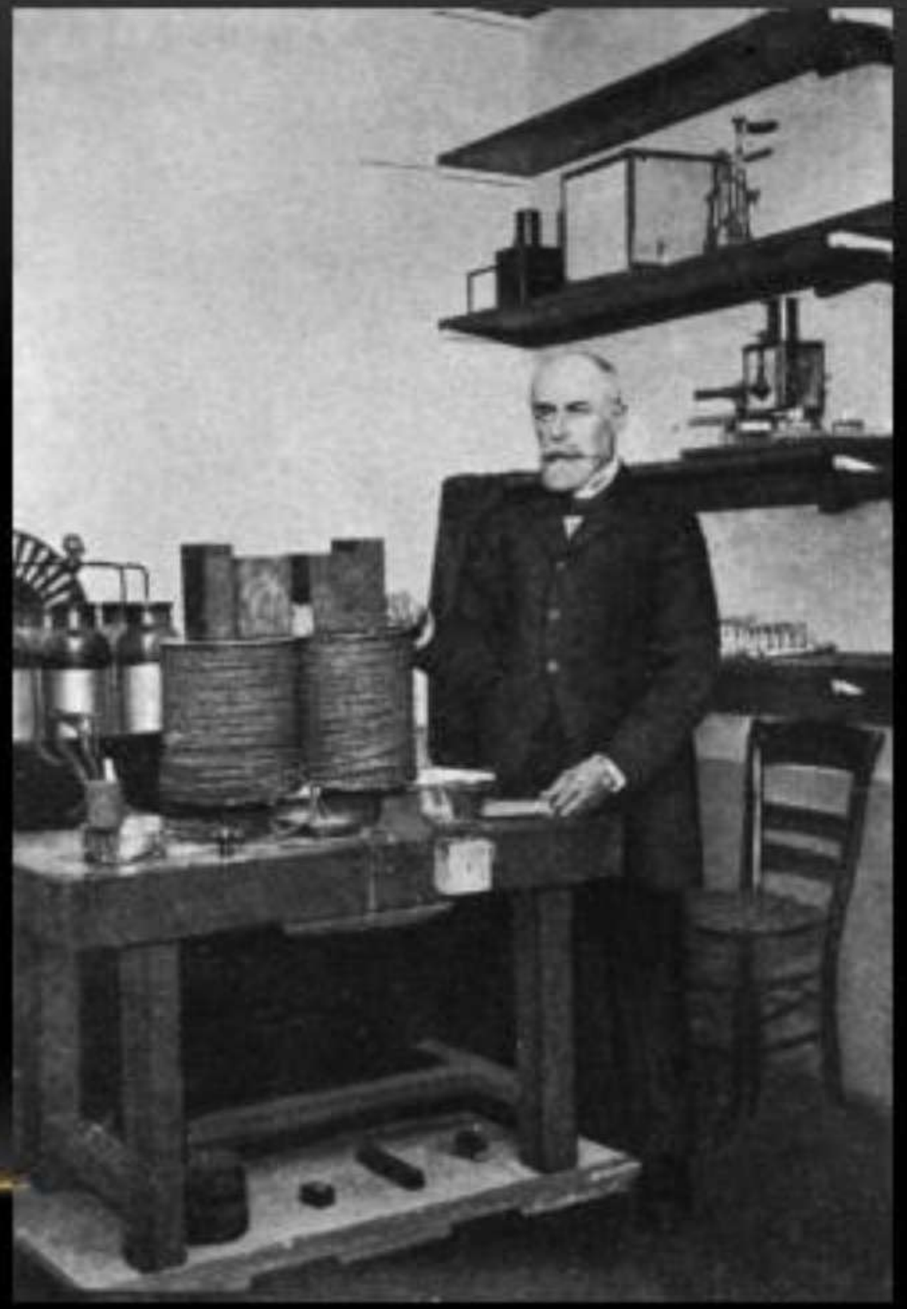
0.05
Average effective dose from single chest x-ray

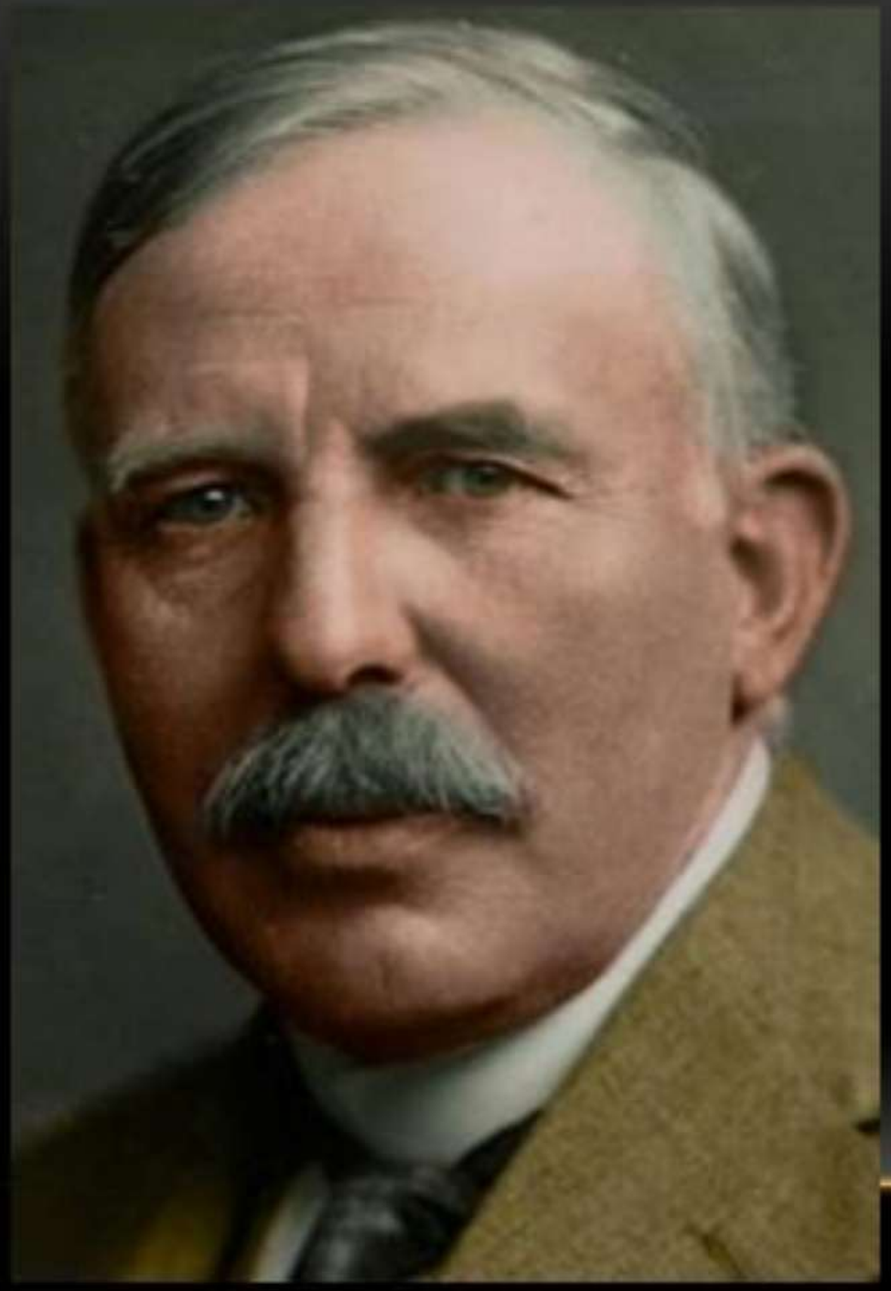
1896 – Henri Becquerel

- Discovered Radioactivity
- Phosphorescence
  - Uranium salts



- Nobel Prize in 1903





Inventor Figures

Paul Ulrich Villard

Gamma ray is discovered by French chemist and physicist, Paul Ulrich Villard in 1900 while studying the radiation emanating from Radium, Polonium and Uranium. He finds that gamma-ray can not be deflected by magnetic fields.

Radio Active Rays