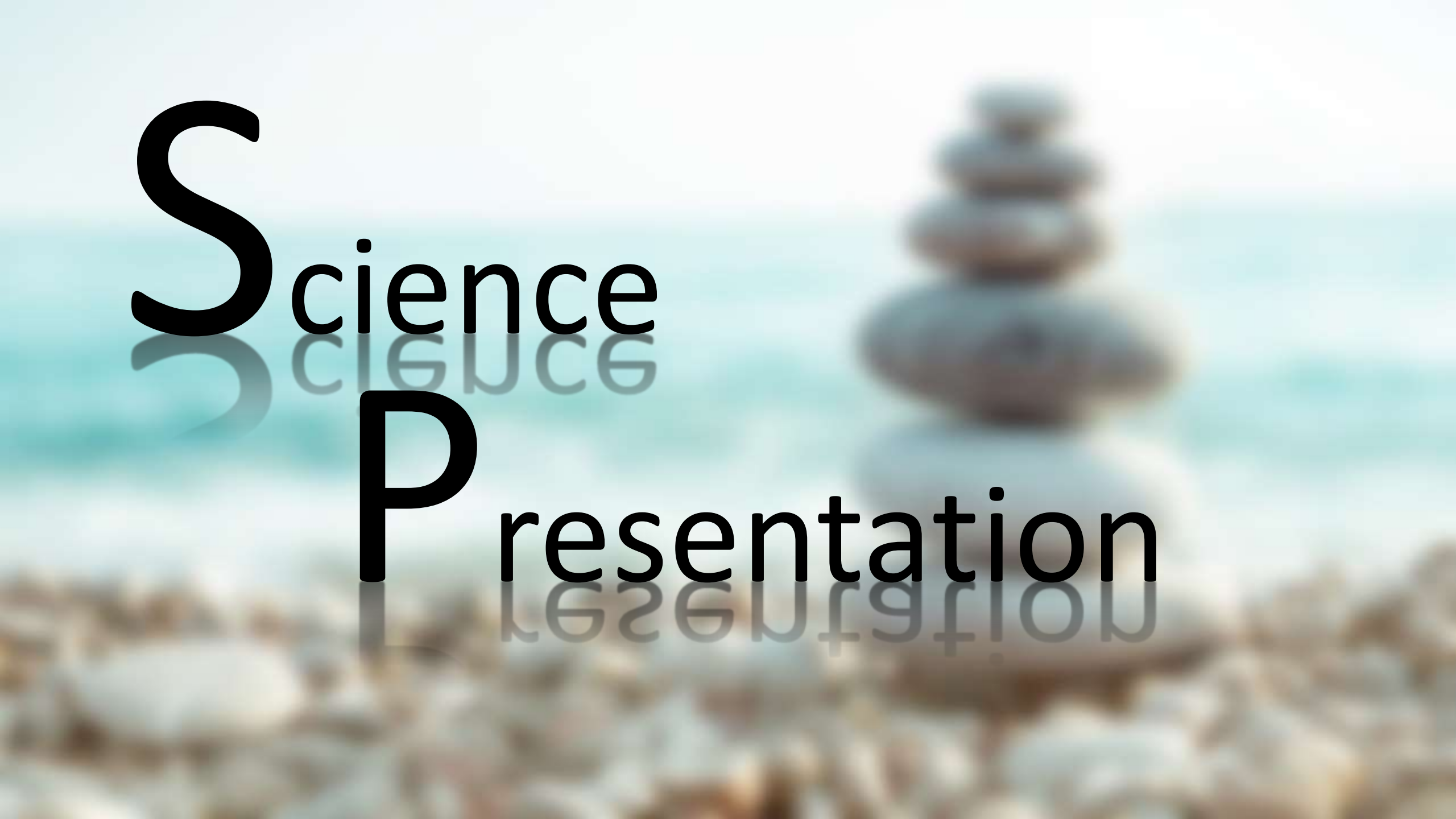
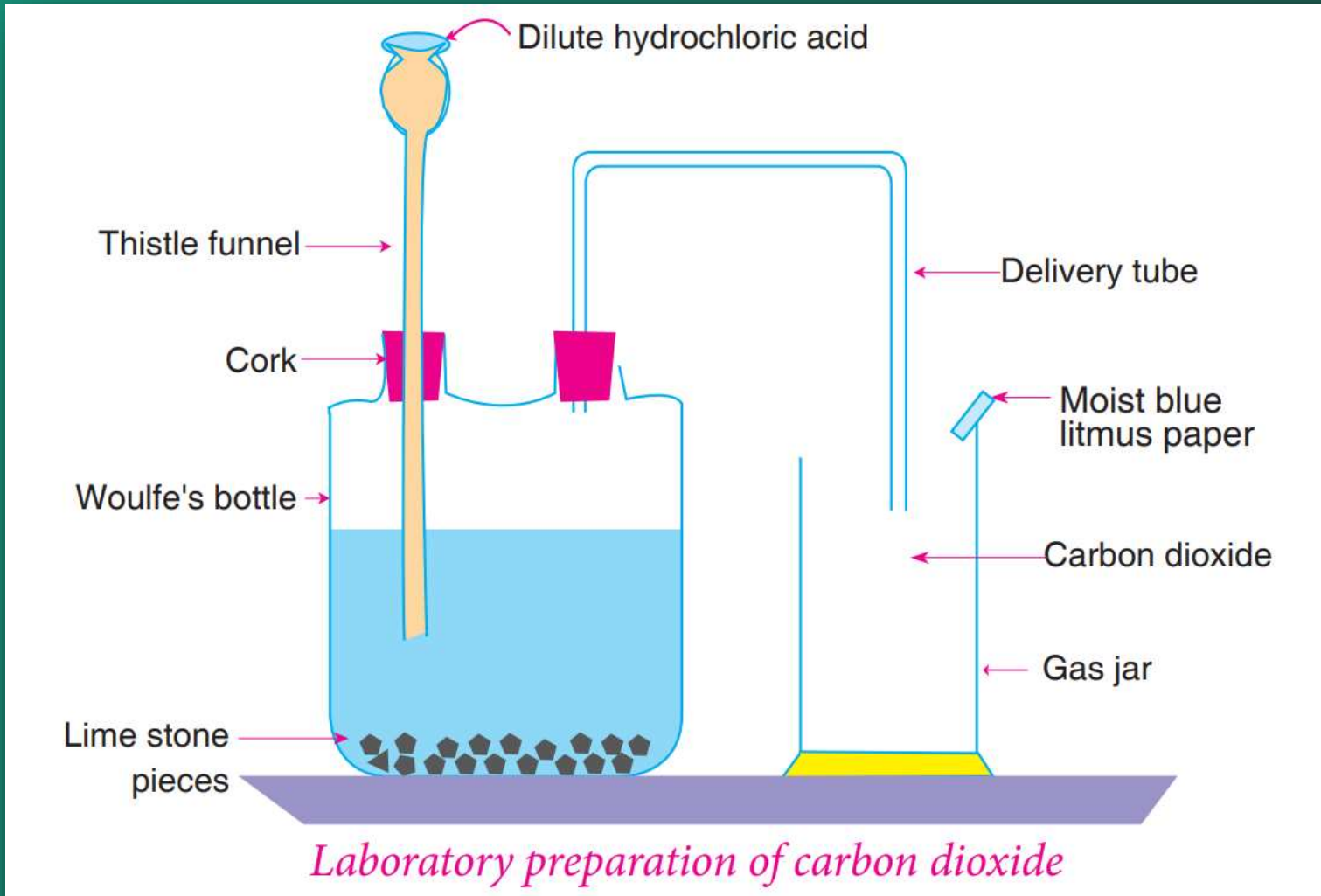


The background is a soft-focus photograph of a coastal scene. In the foreground, a stack of smooth, grey stones is visible on the right side. The middle ground shows a rocky shore with various sized stones in shades of grey and brown. The background features a calm sea with light blue and white waves under a bright, hazy sky.

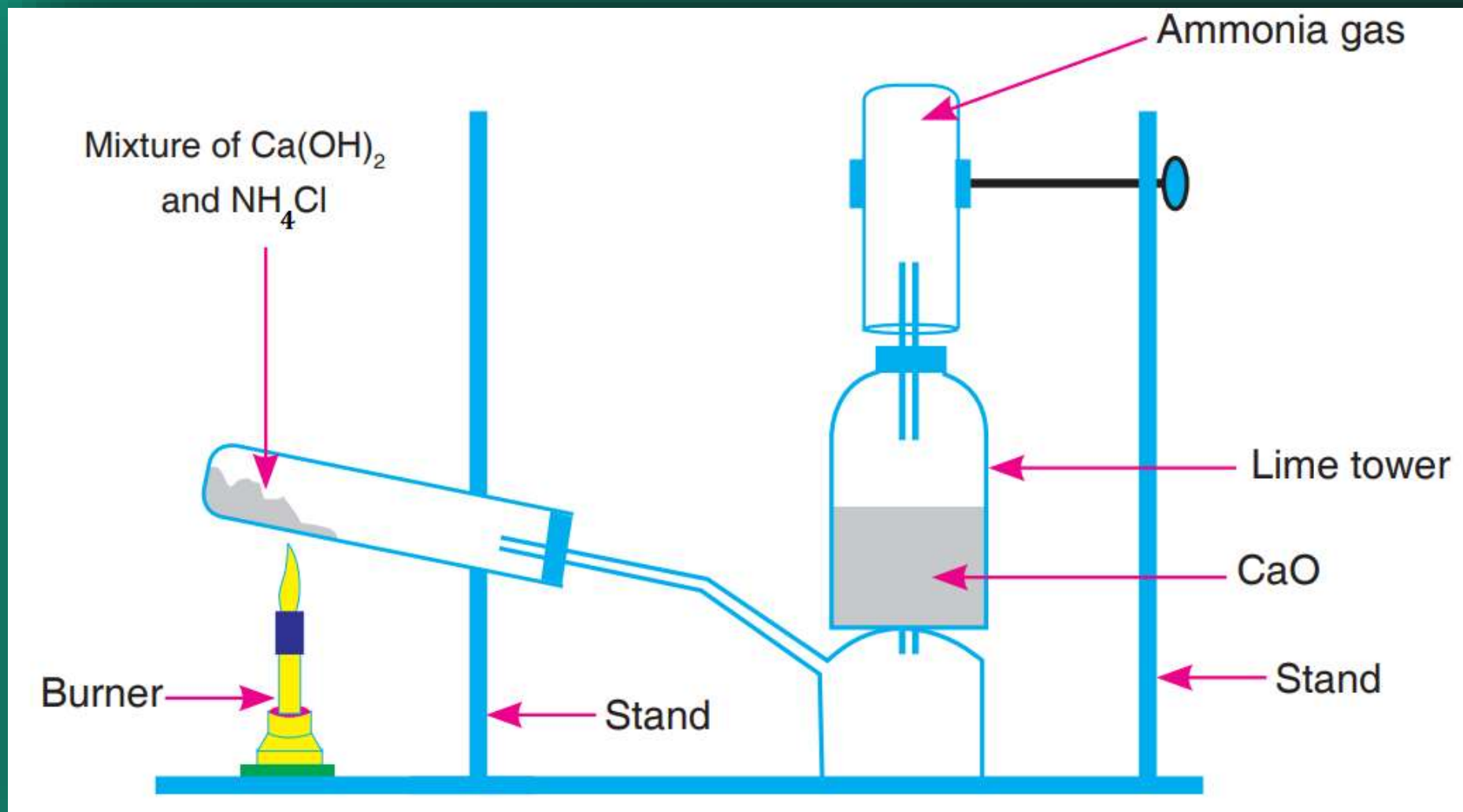
Science Presentation

Step: 1

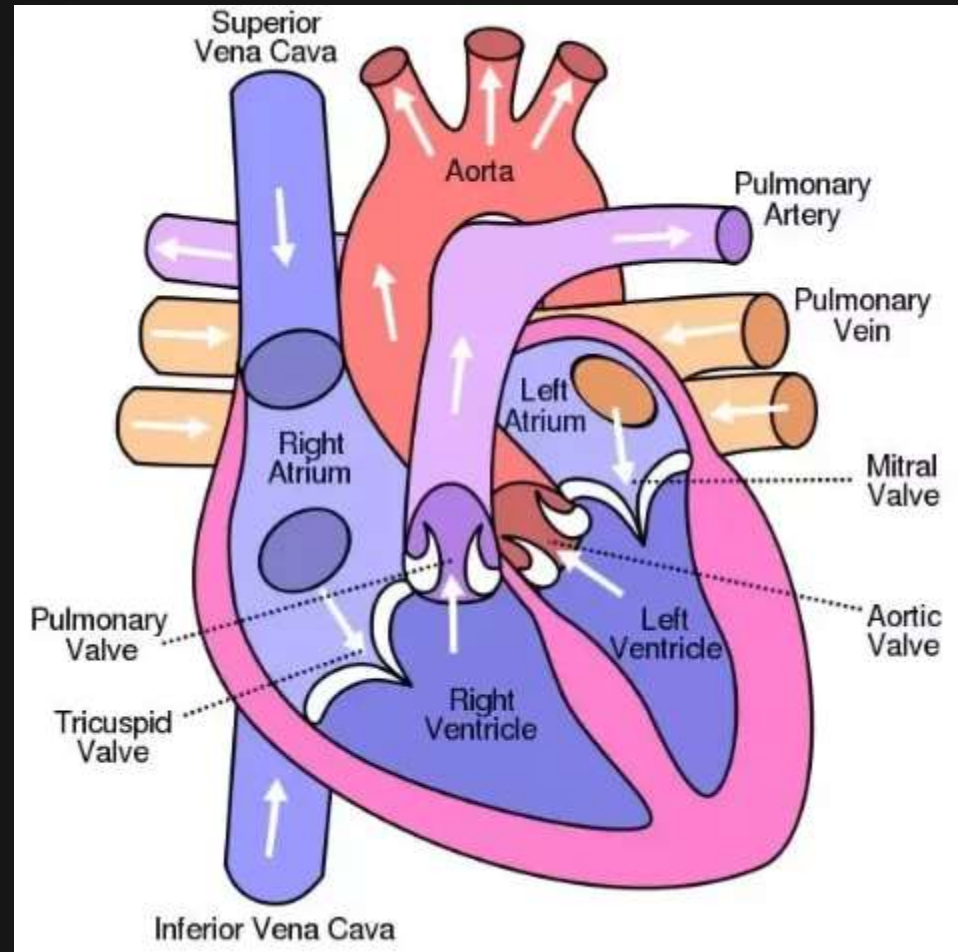
Laboratory Preparation of Carbon Dioxide



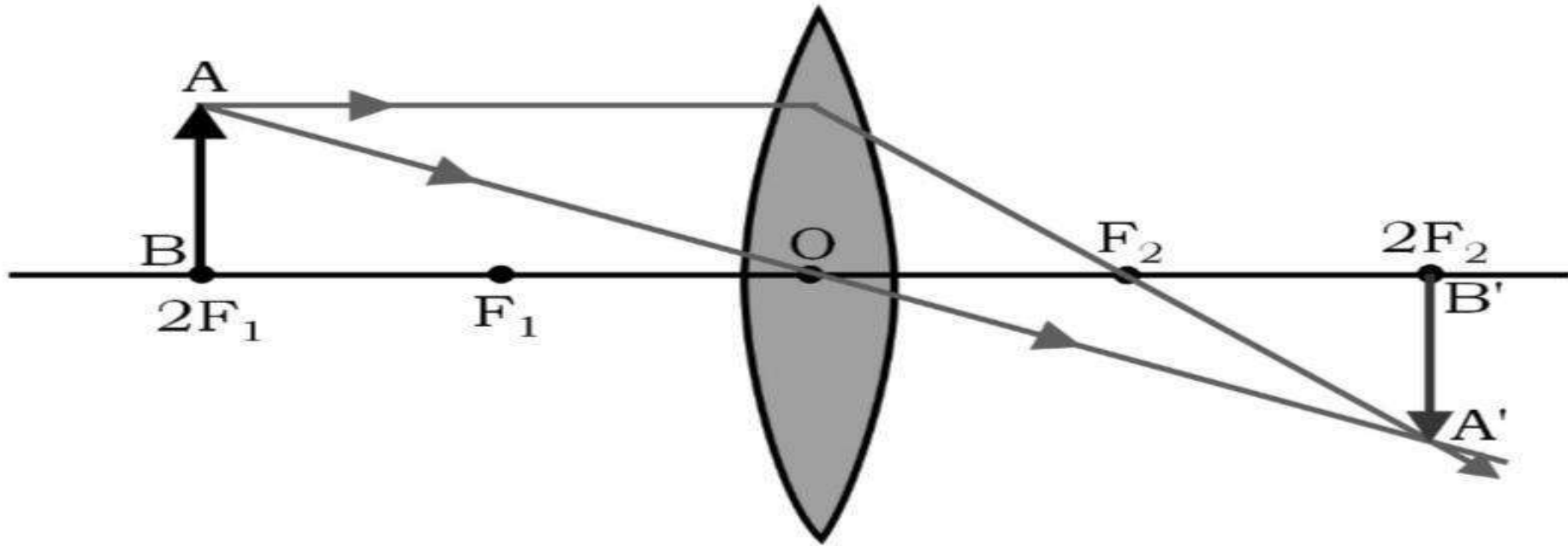
Laboratory Preparation of Ammonia Gas



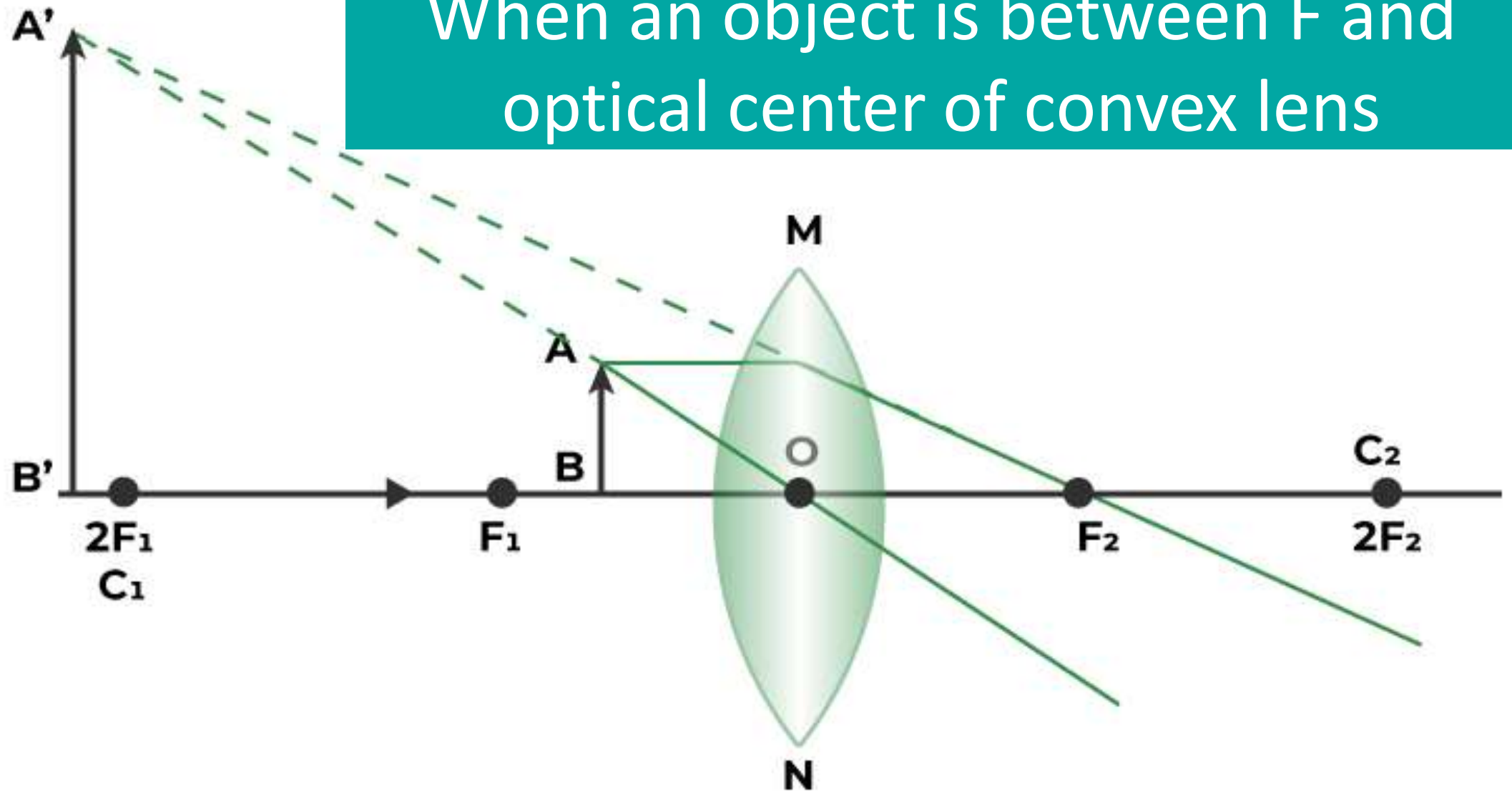
Internal Structure of Heart



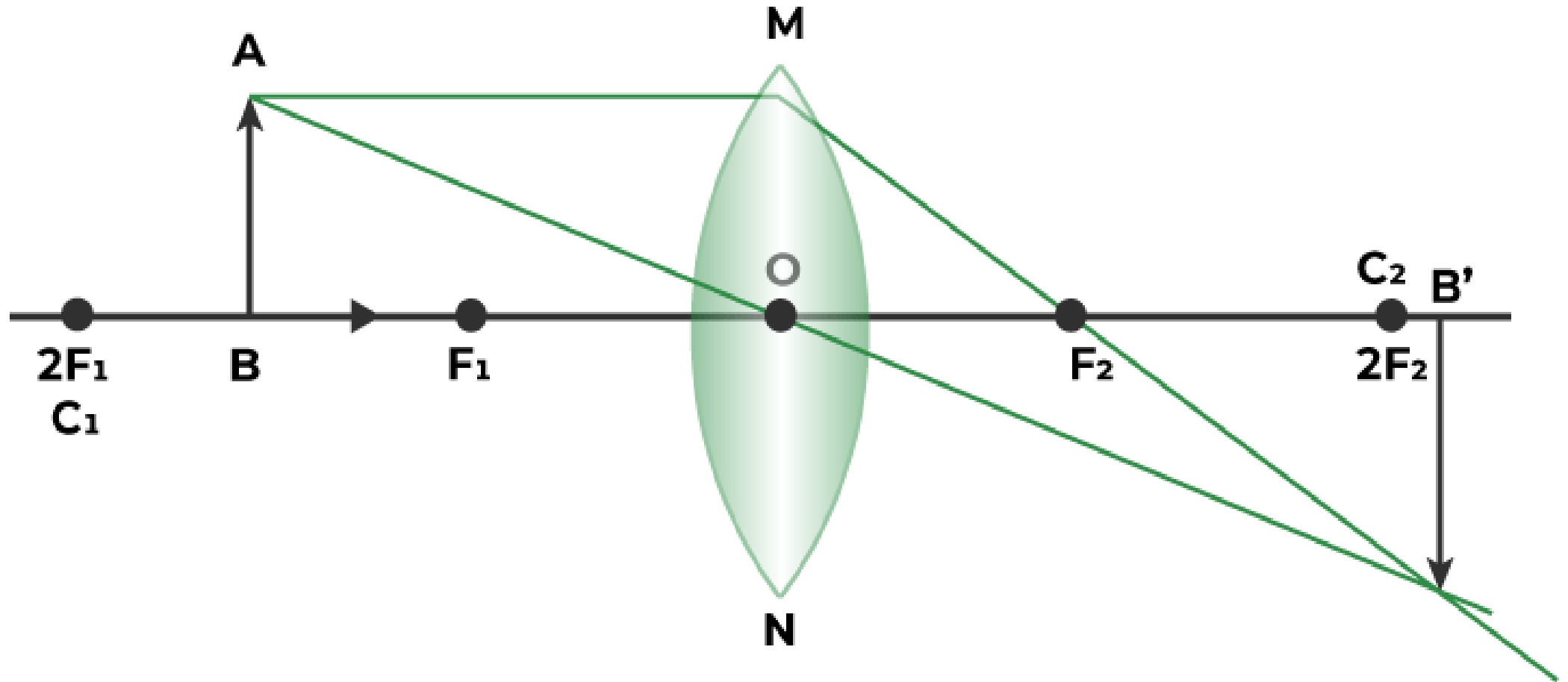
When object is at $2F$ of convex lens



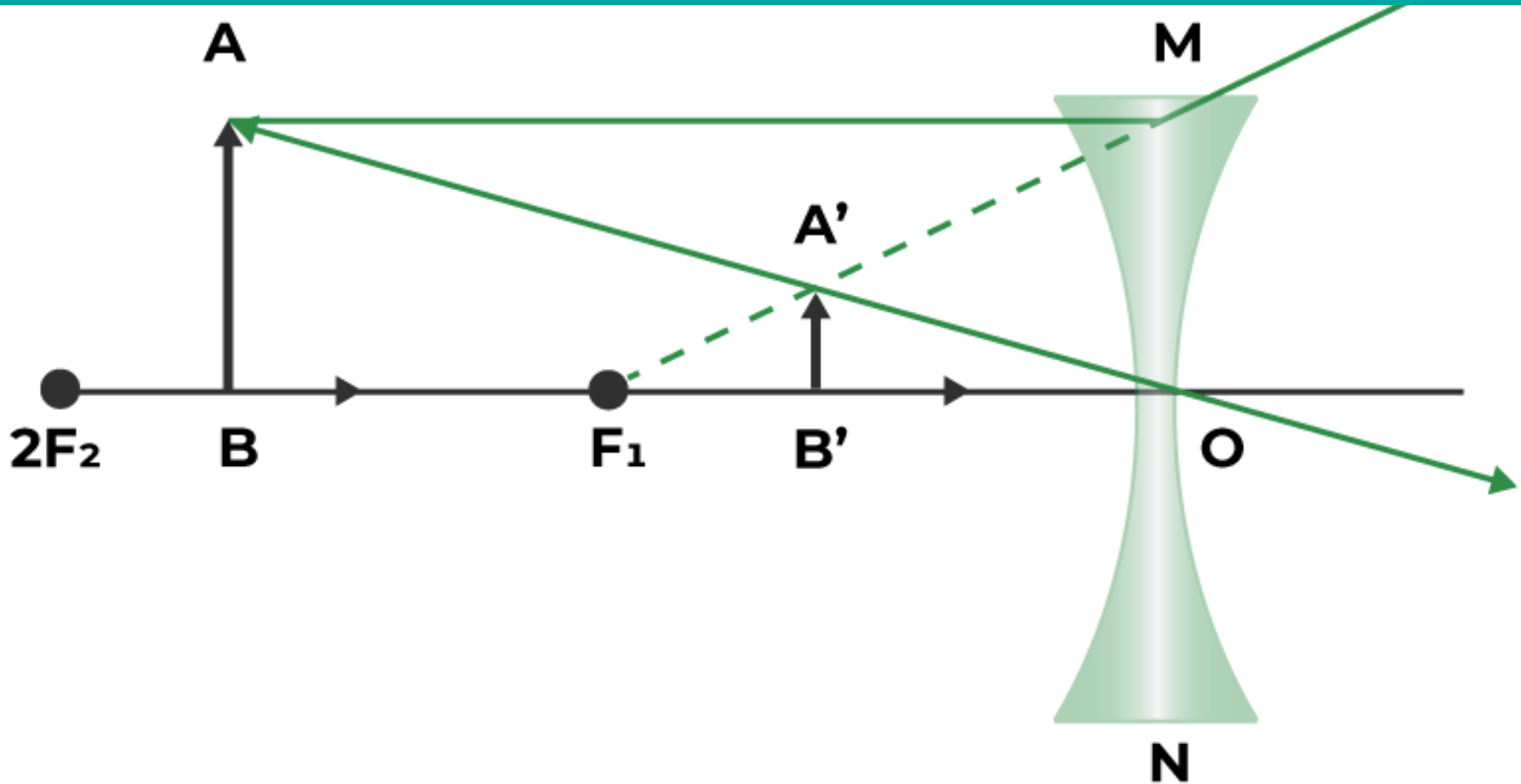
When an object is between F and optical center of convex lens



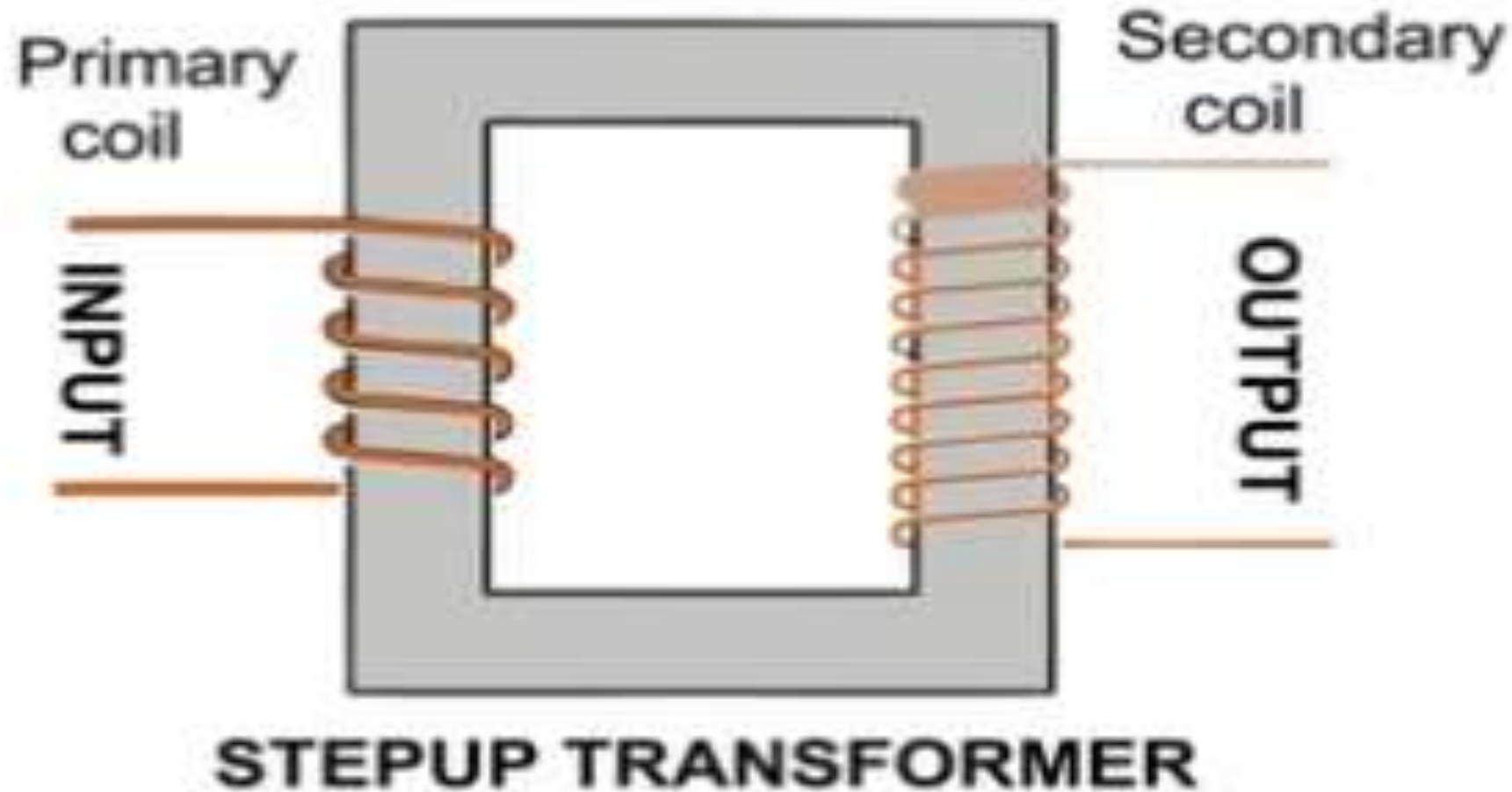
When an object is between F and $2F$
before the convex lens



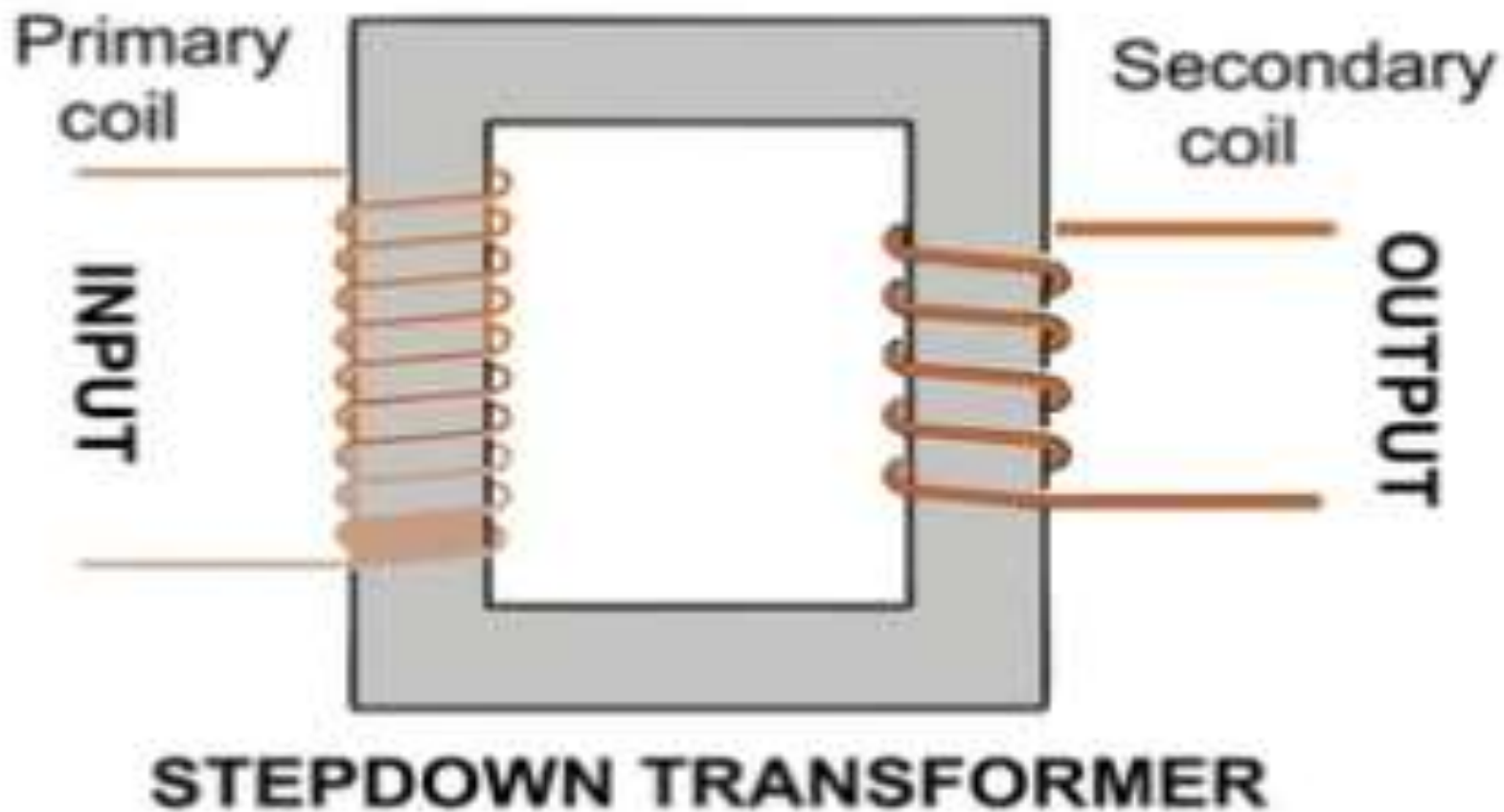
When an object is between infinity and optical centre of concave lens

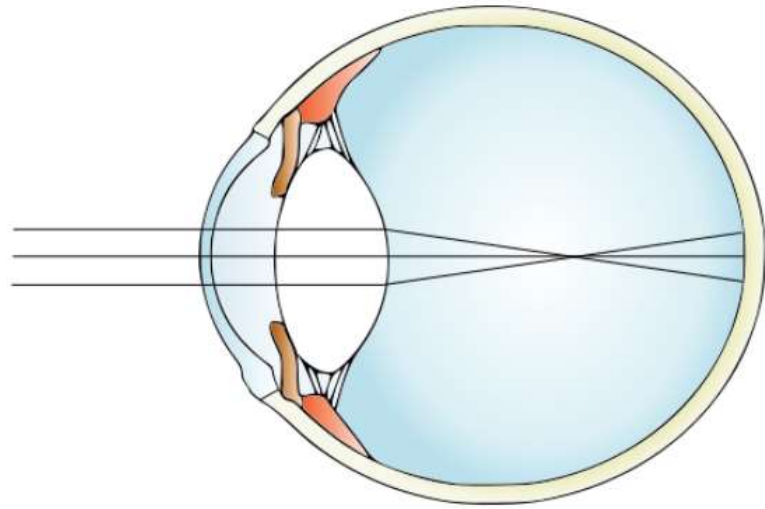


Step up transformer



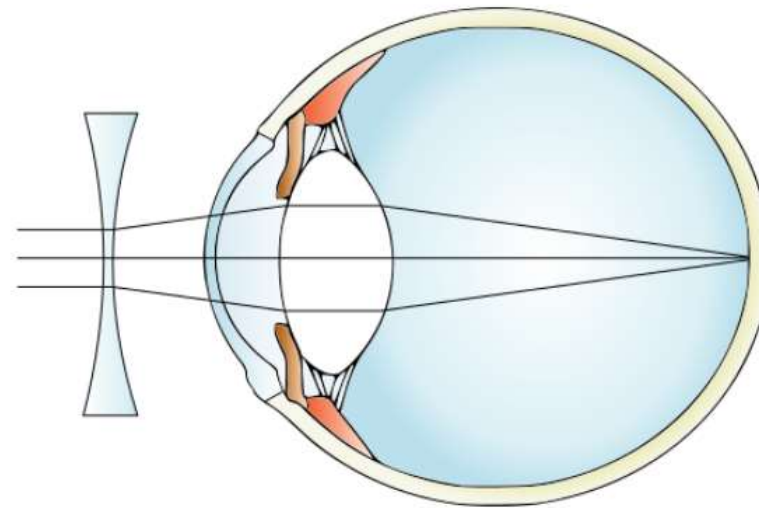
Step down transformer





**Eye With
Myopia**

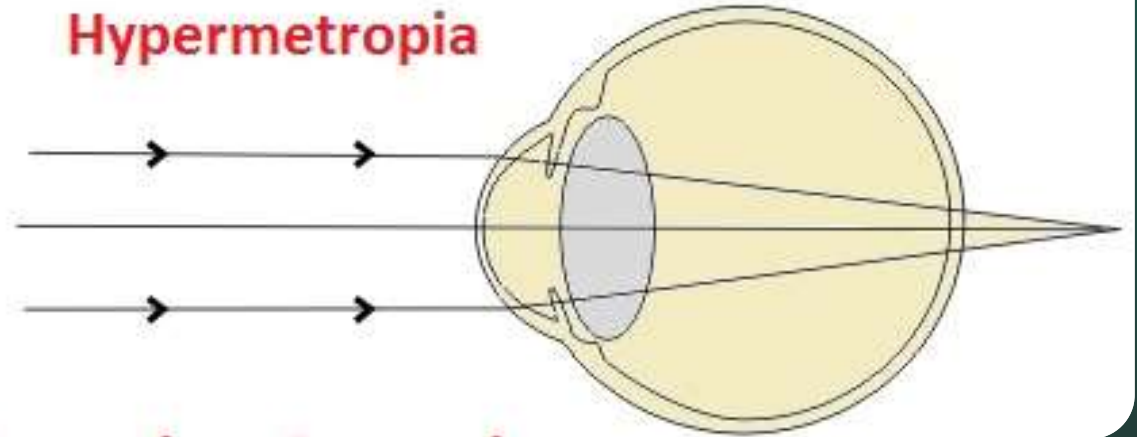
Short sight and its Correction



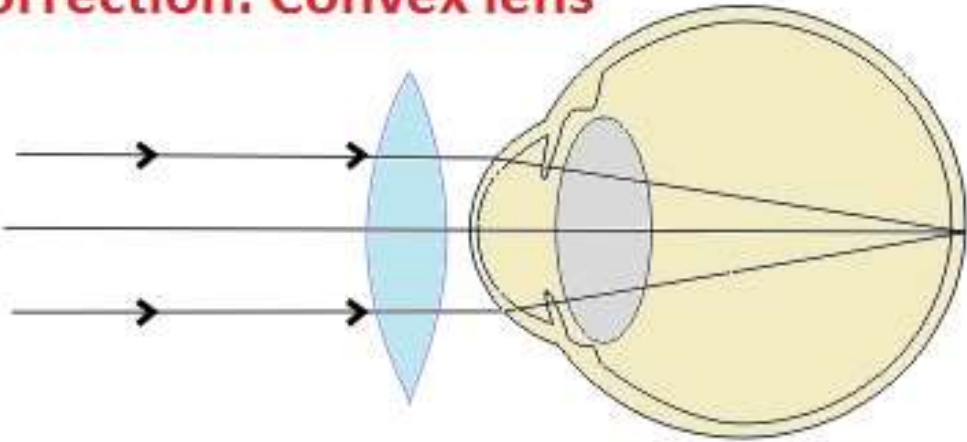
**correction
of myopia**

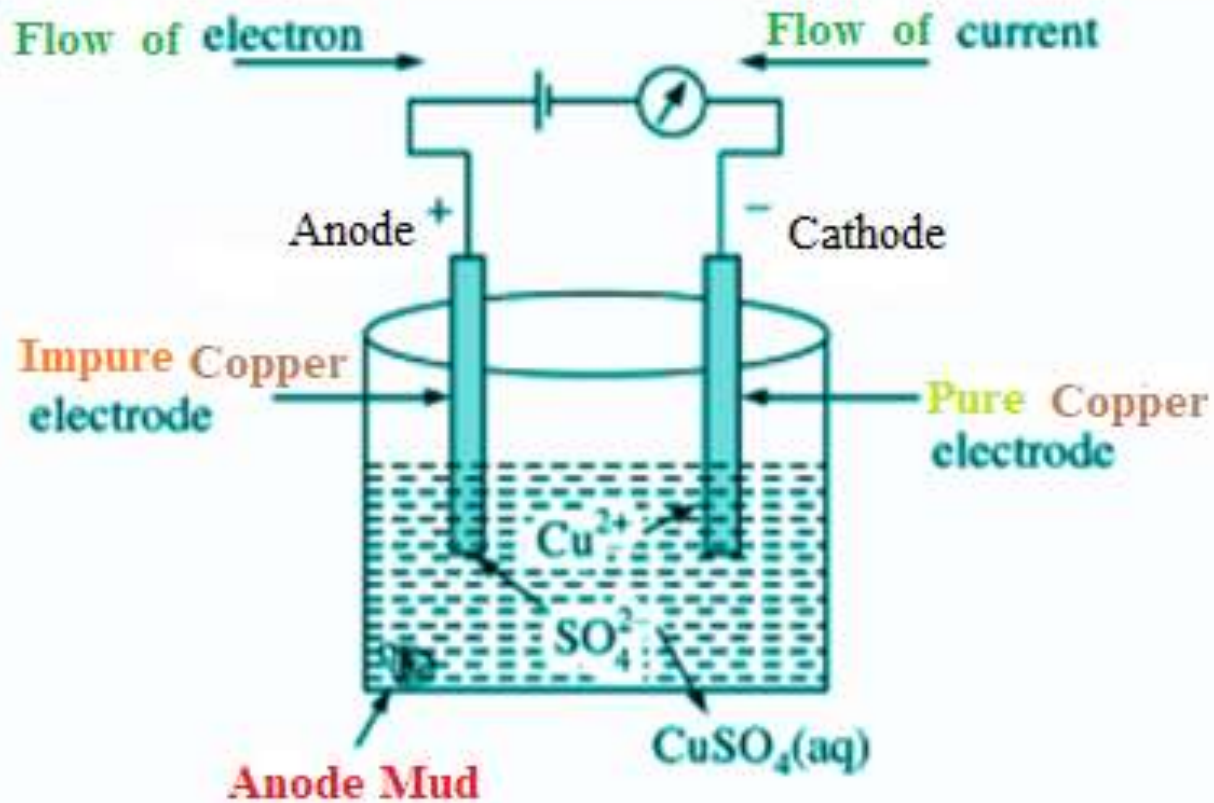
Long sight and its Correction

Hypermetropia



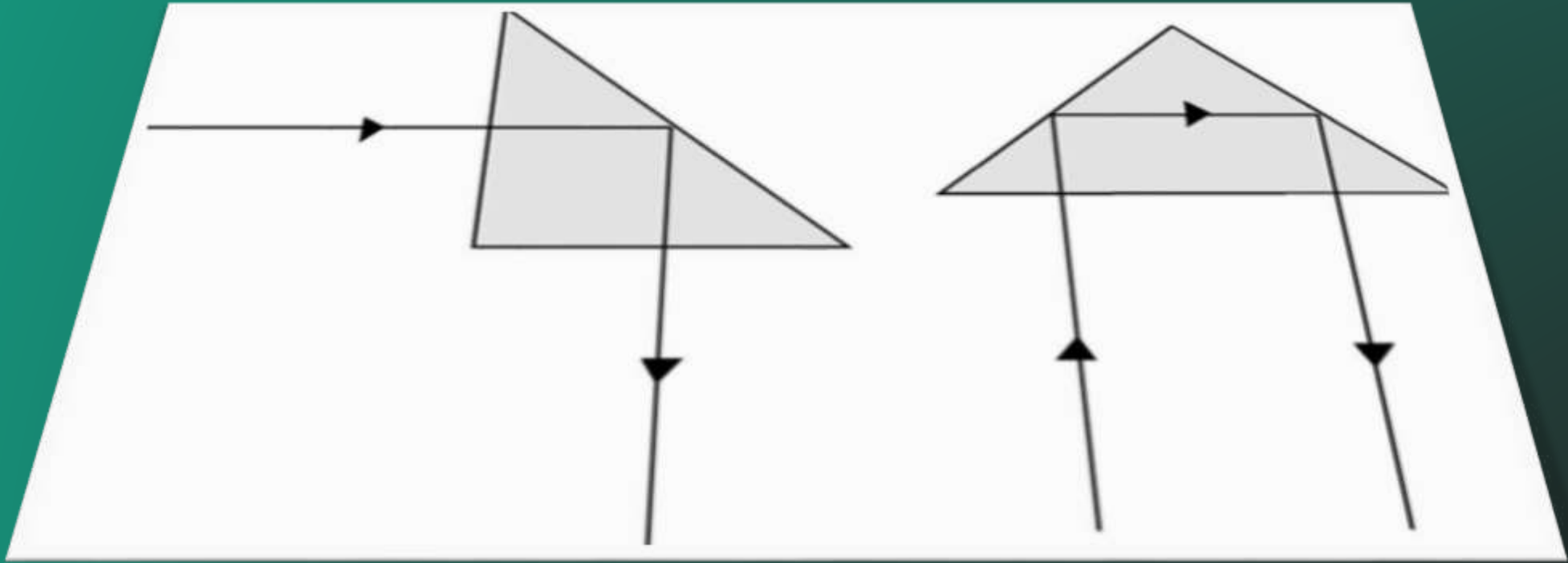
Correction: Convex lens



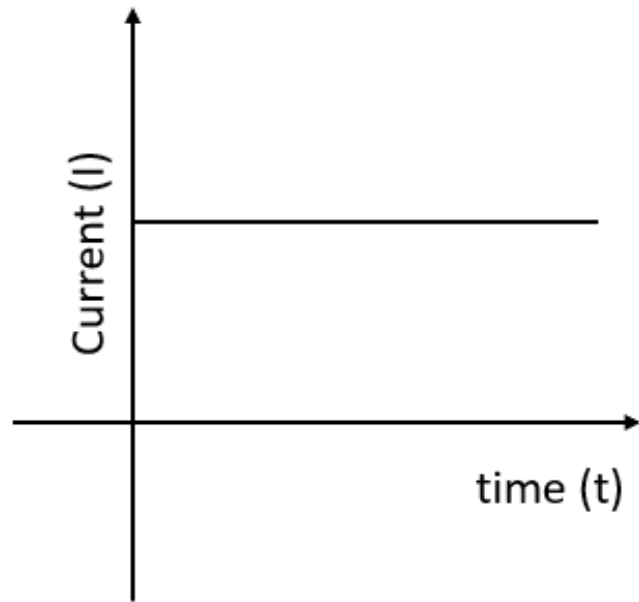


Electrorefining of Copper

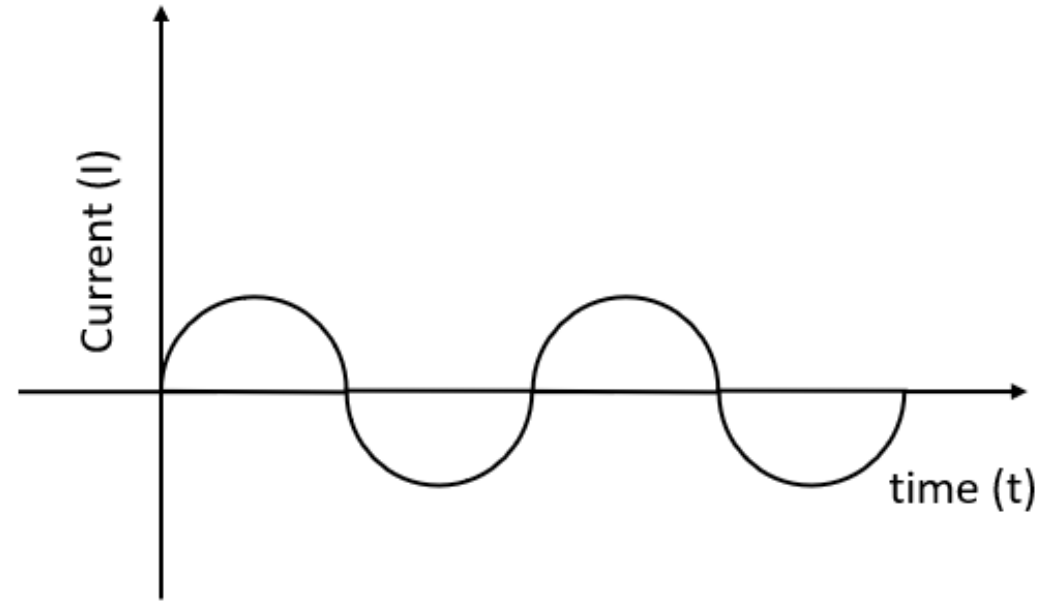
Total internal reflection in prism



Current time graph of AC and DC



Direct Current

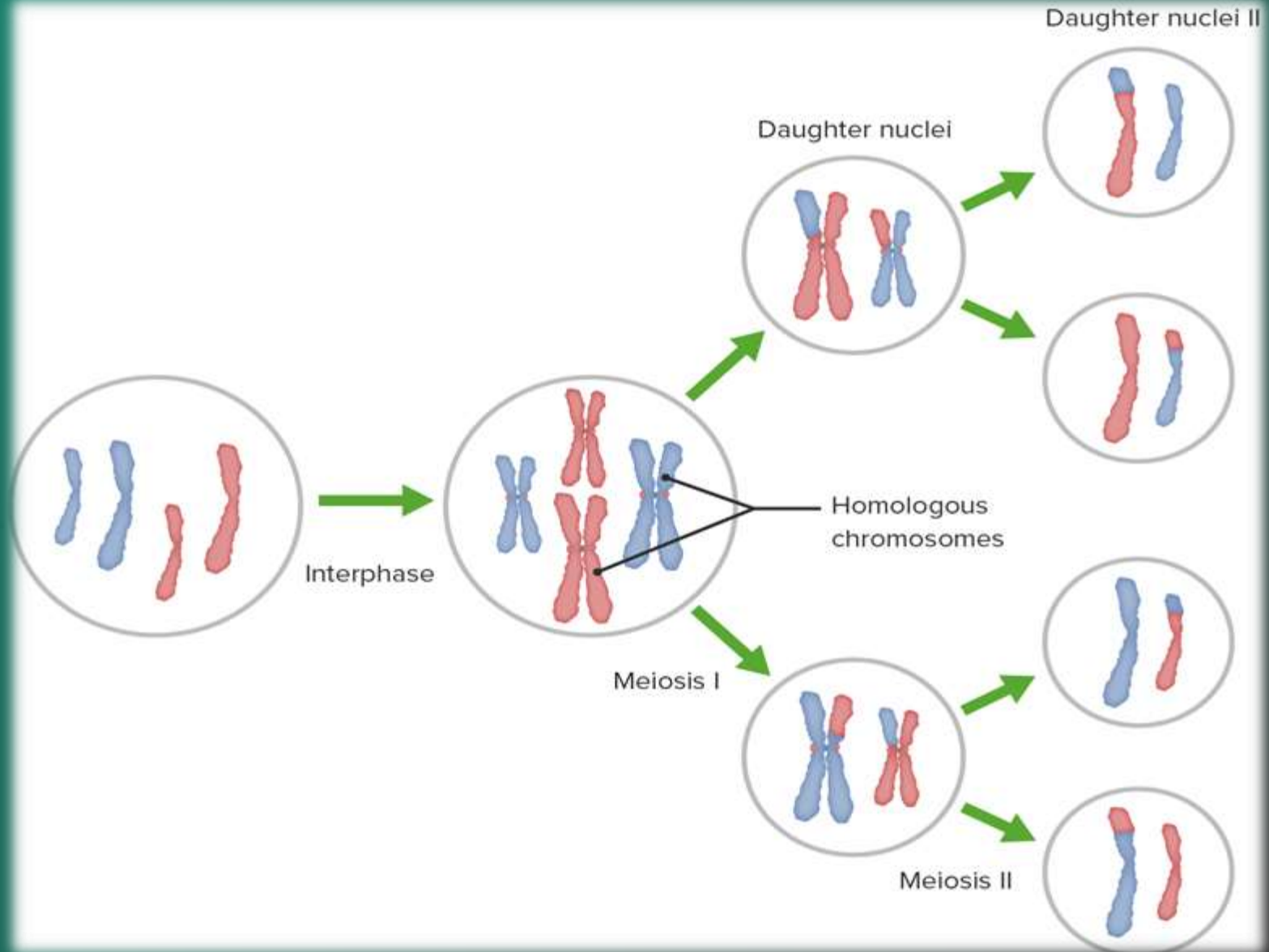


Alternating Current

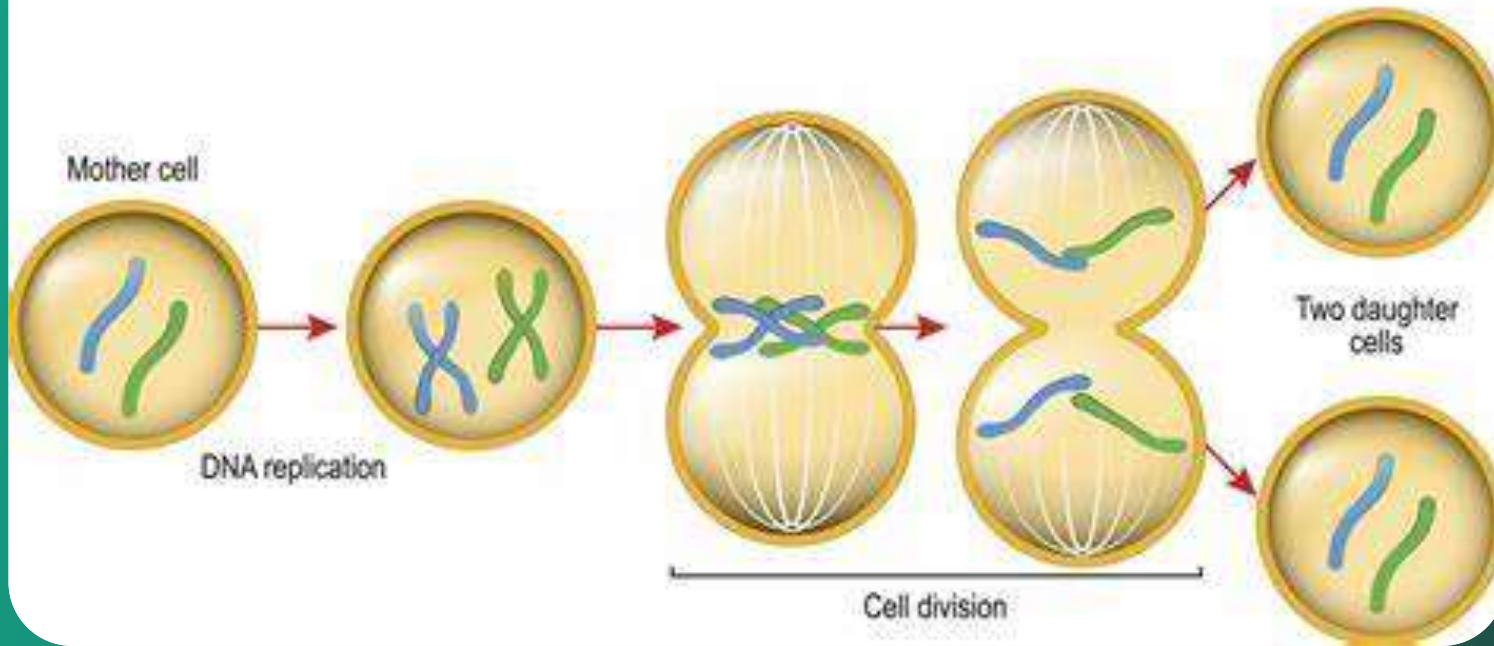
Direct Current

Alternating Current

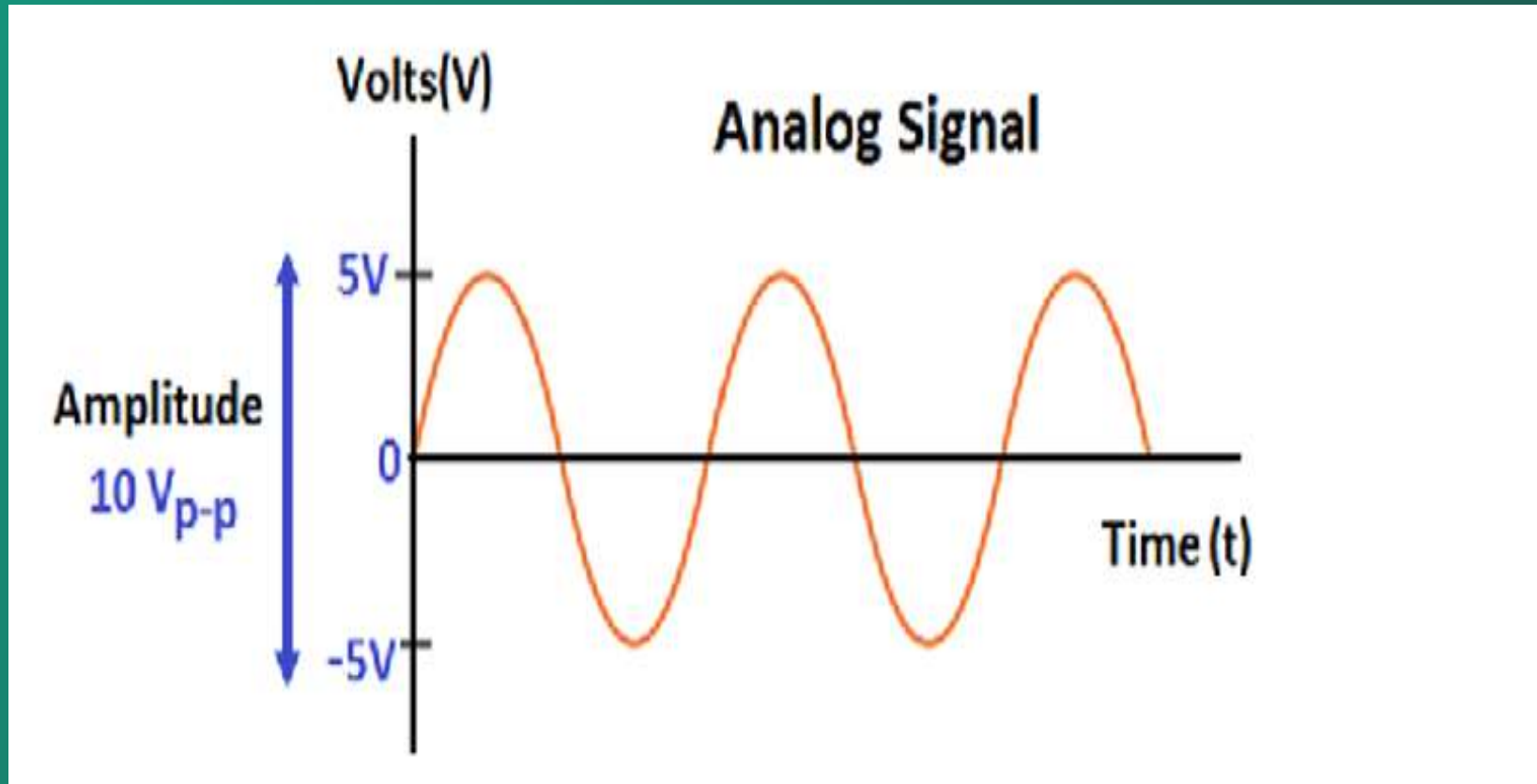
Meiosis



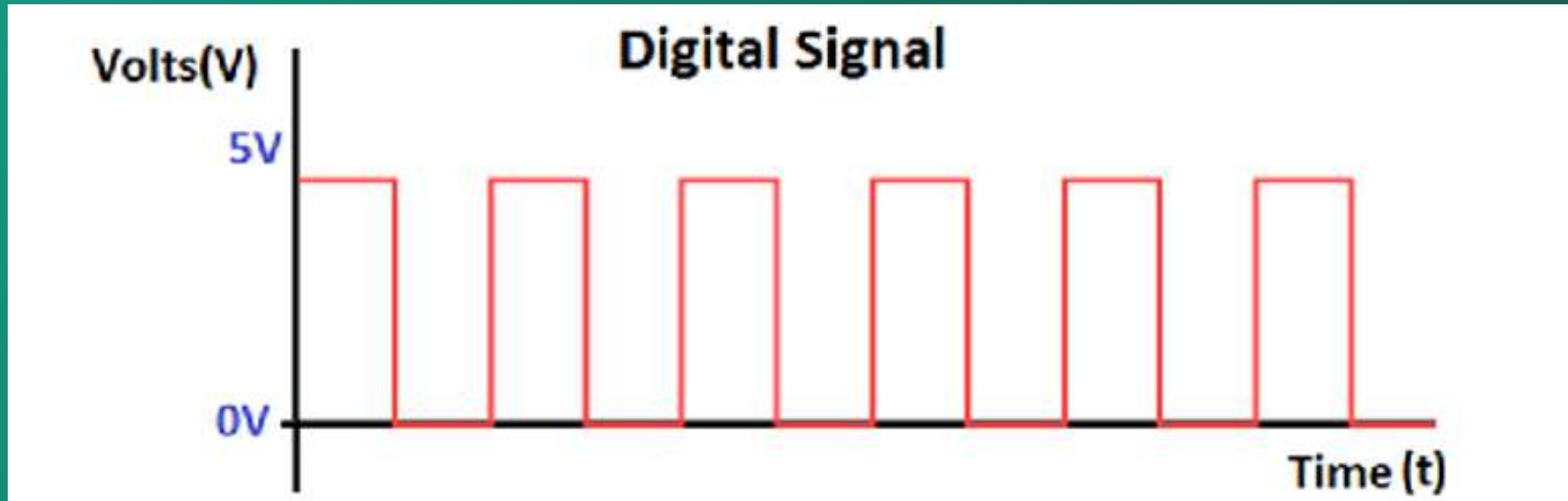
MITOSIS



Mitosis

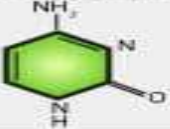


Sine wave represents analog signals

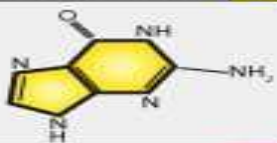


Digital signal is represented by square wave.

CYTOSINE **C**



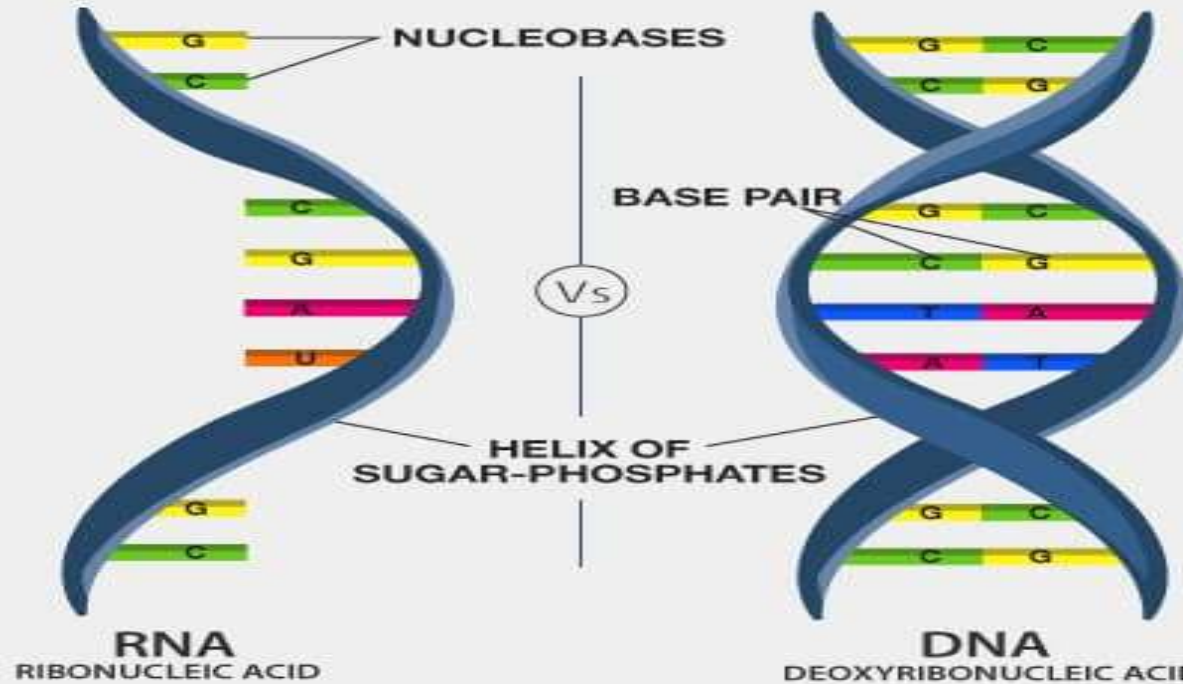
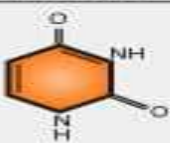
GUANINE **G**



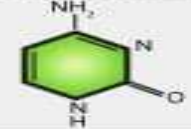
ADENINE **A**



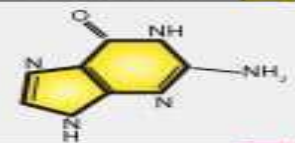
URACIL **U**



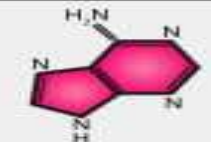
CYTOSINE **C**



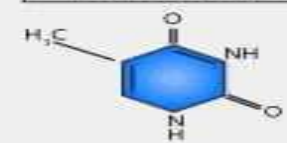
GUANINE **G**



ADENINE **A**

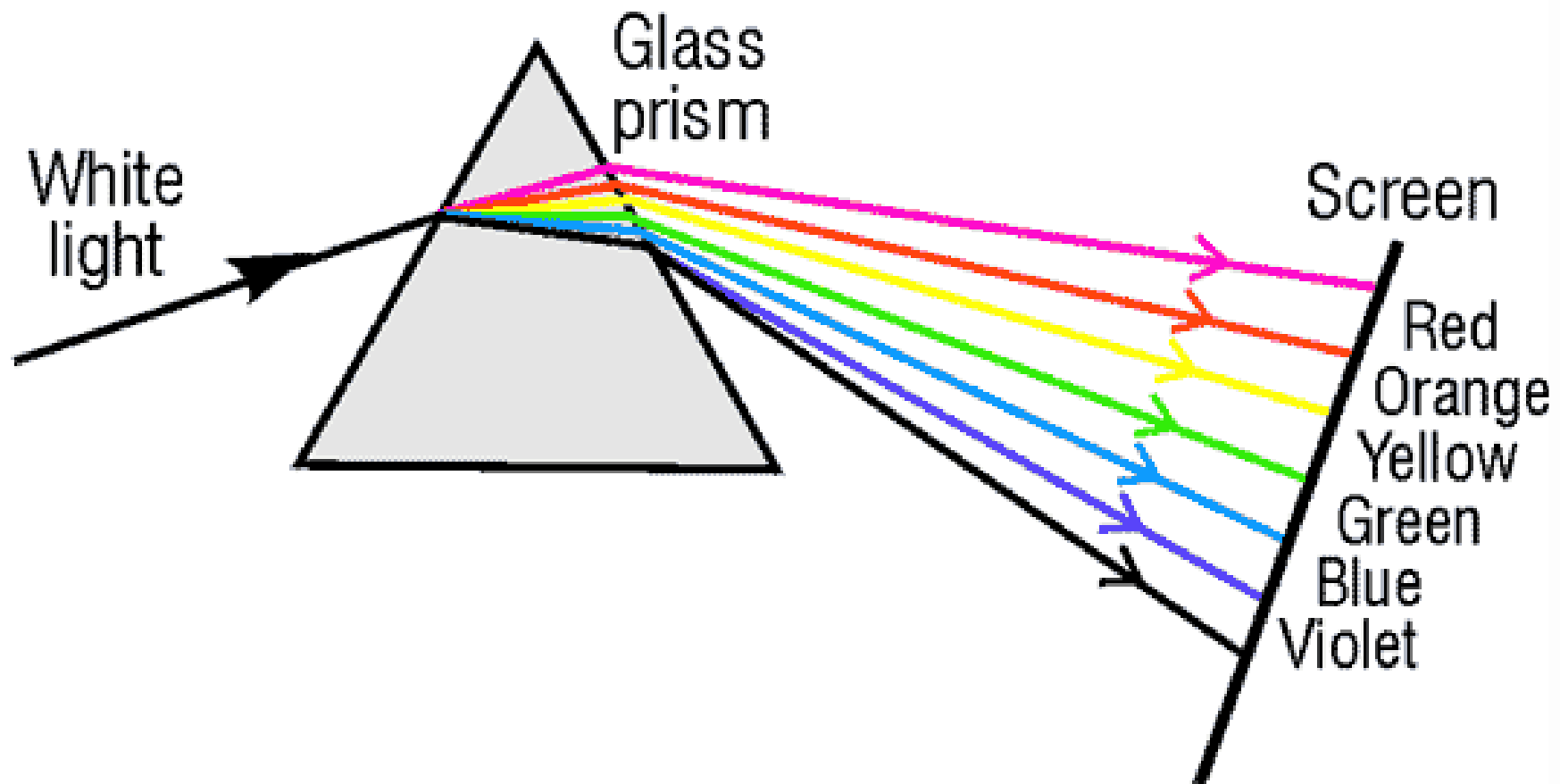


THYMINE **T**

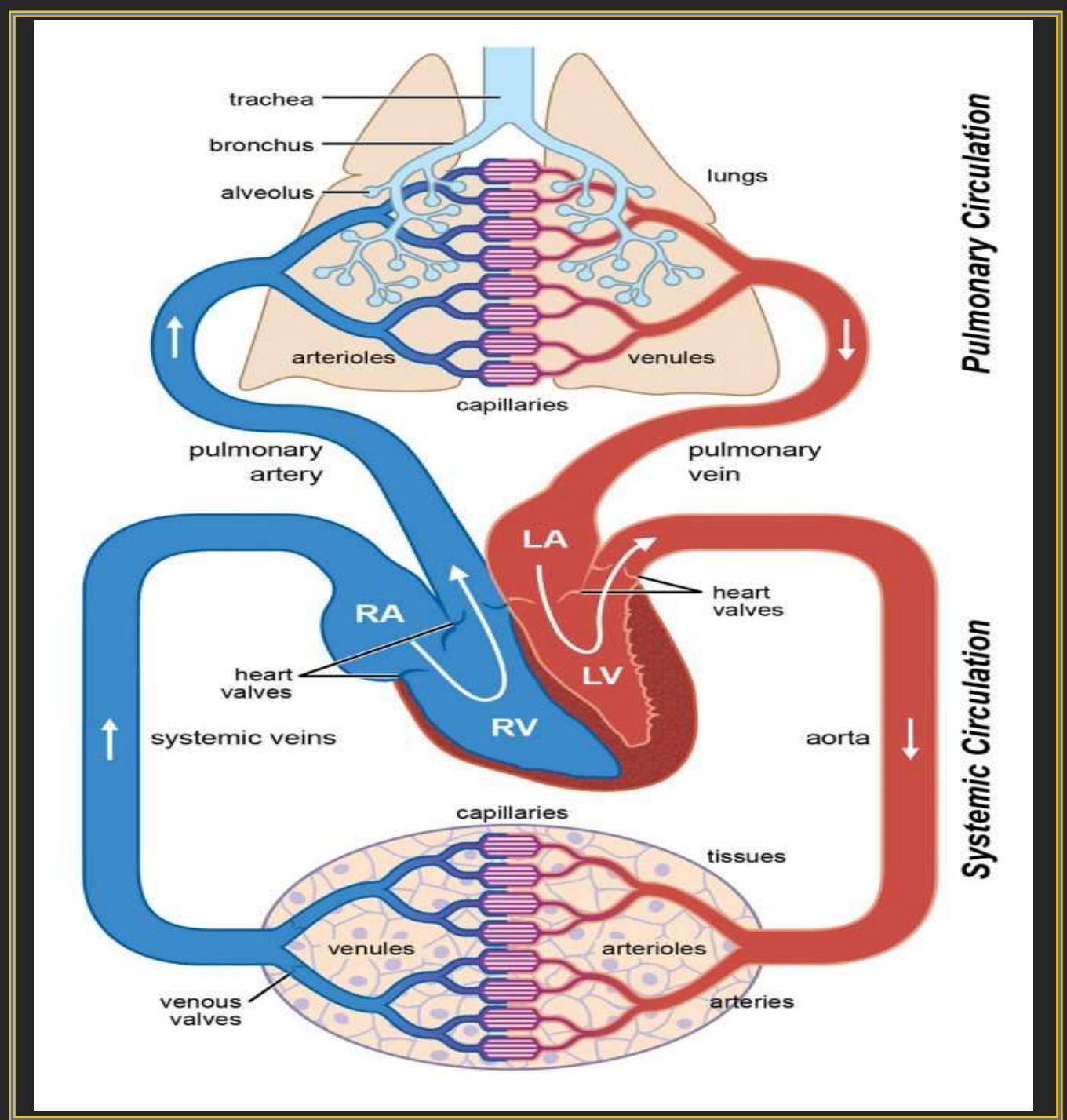


RNA and DNA

Dispersion of light

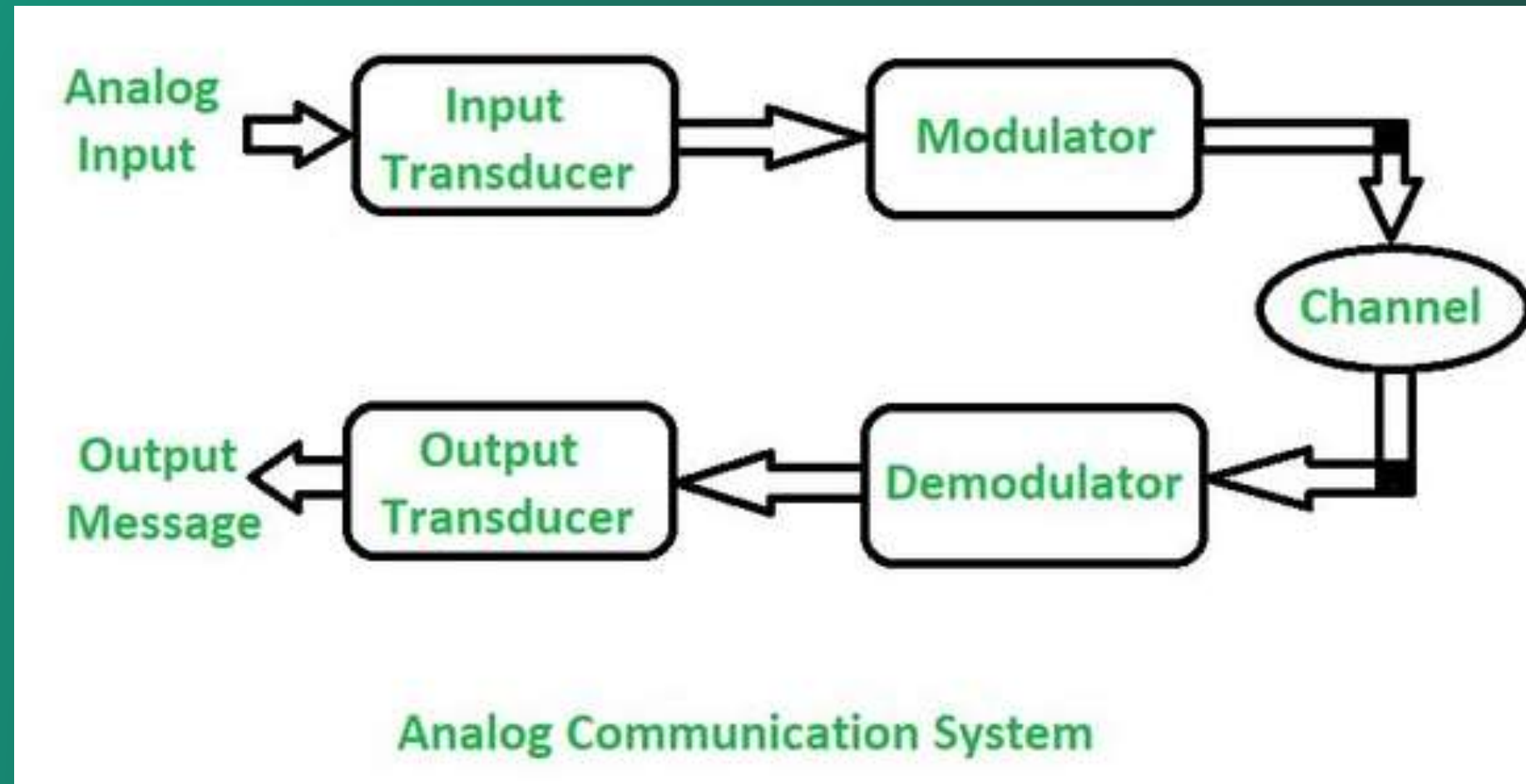


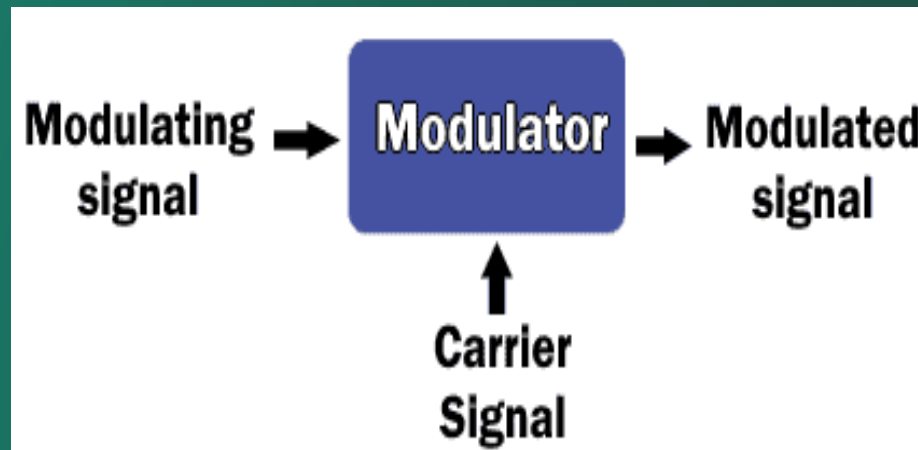
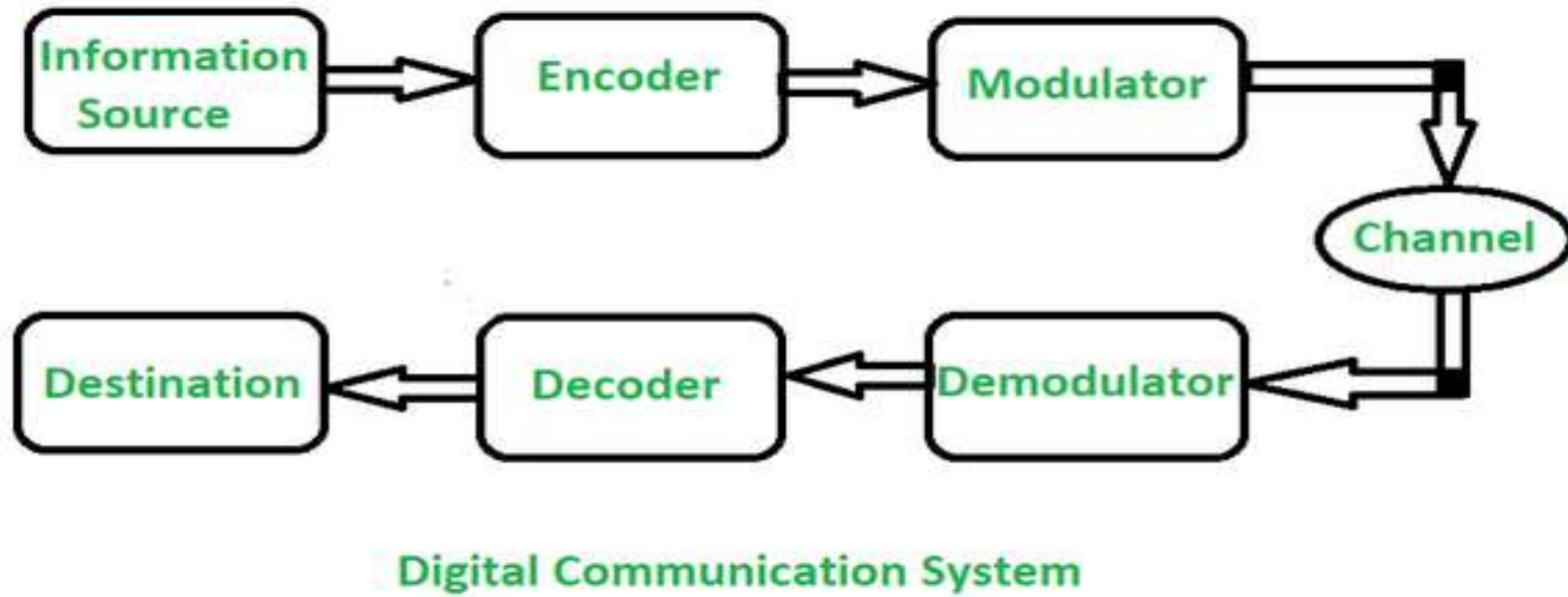
Blood Circulation



The components of analogue communication are:

Analog input → Input transducer → modulator →
channel → demodulator → output transducer →
output signal

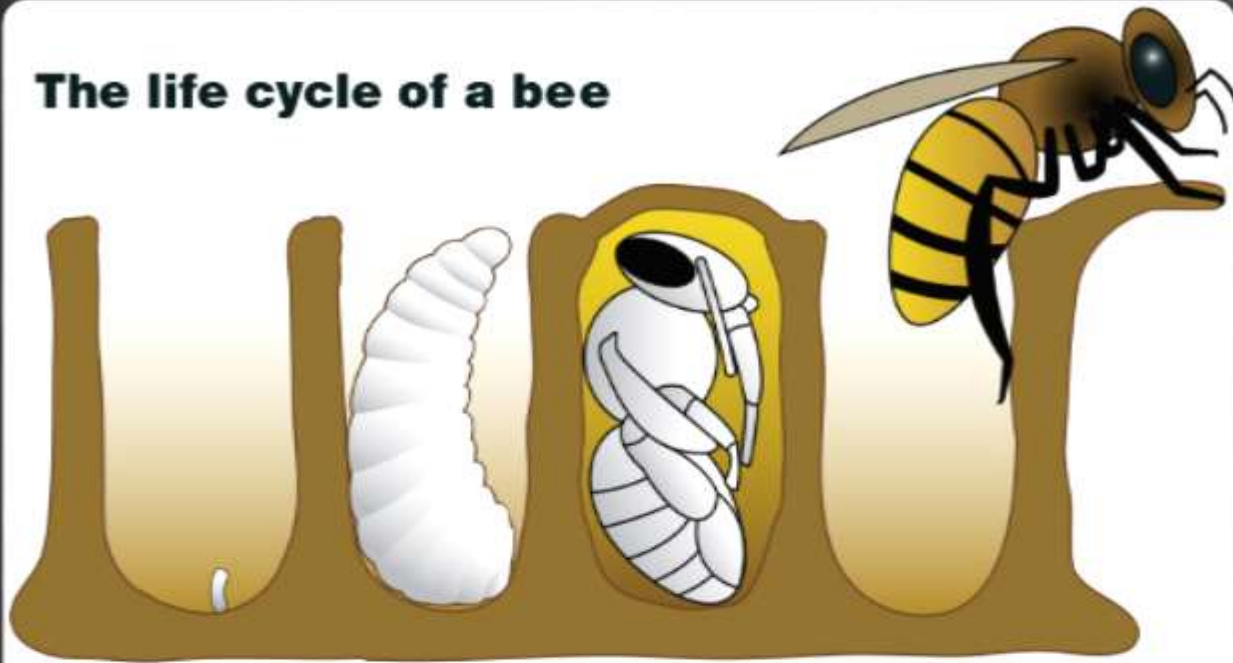




The broadband transmission channel

Step: 2

The life cycle of a bee



Egg

Larva

Pupa

Adult

Egg

Larva

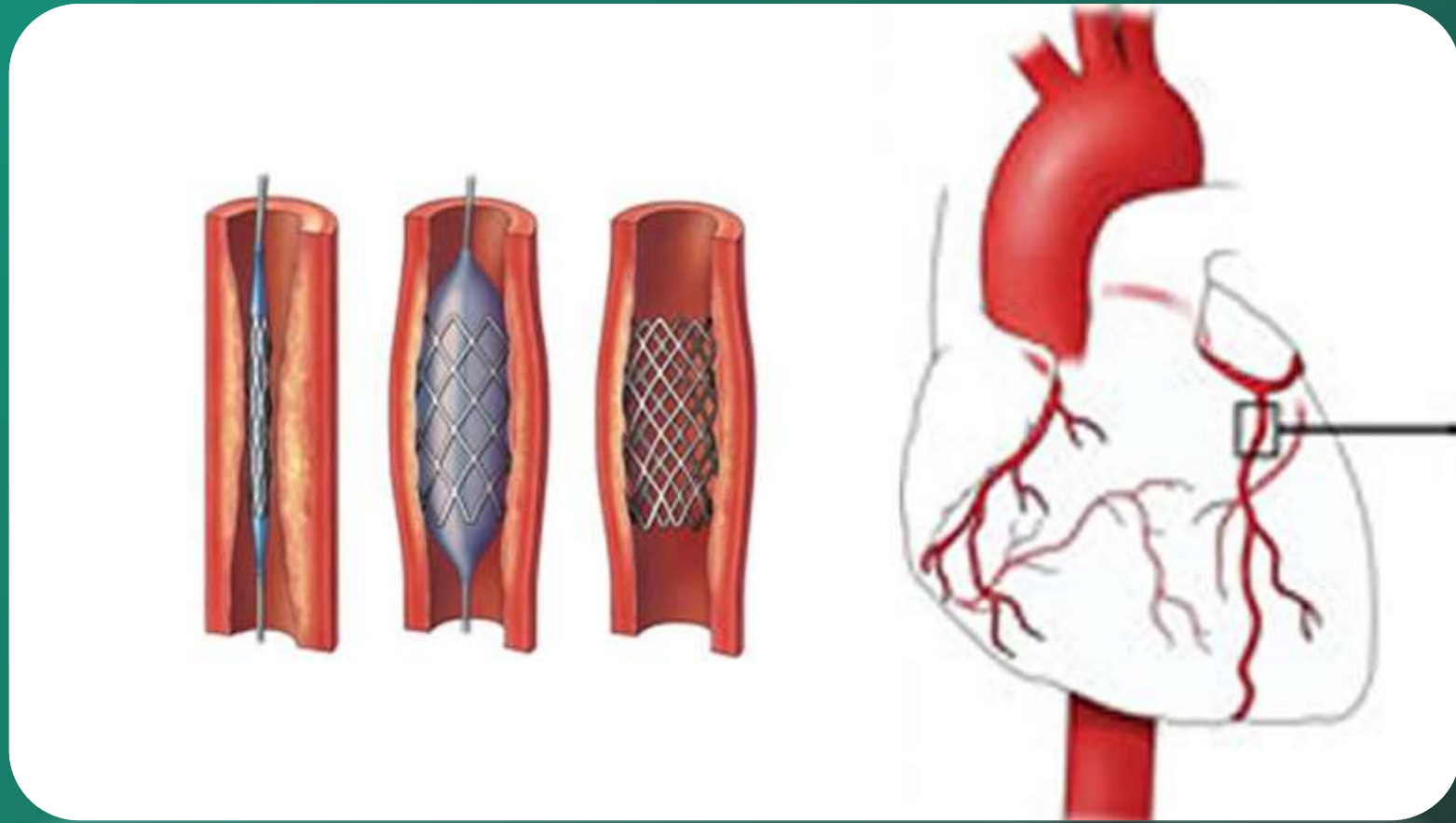
Pupa

Adult

Life cycle of bee

IVF

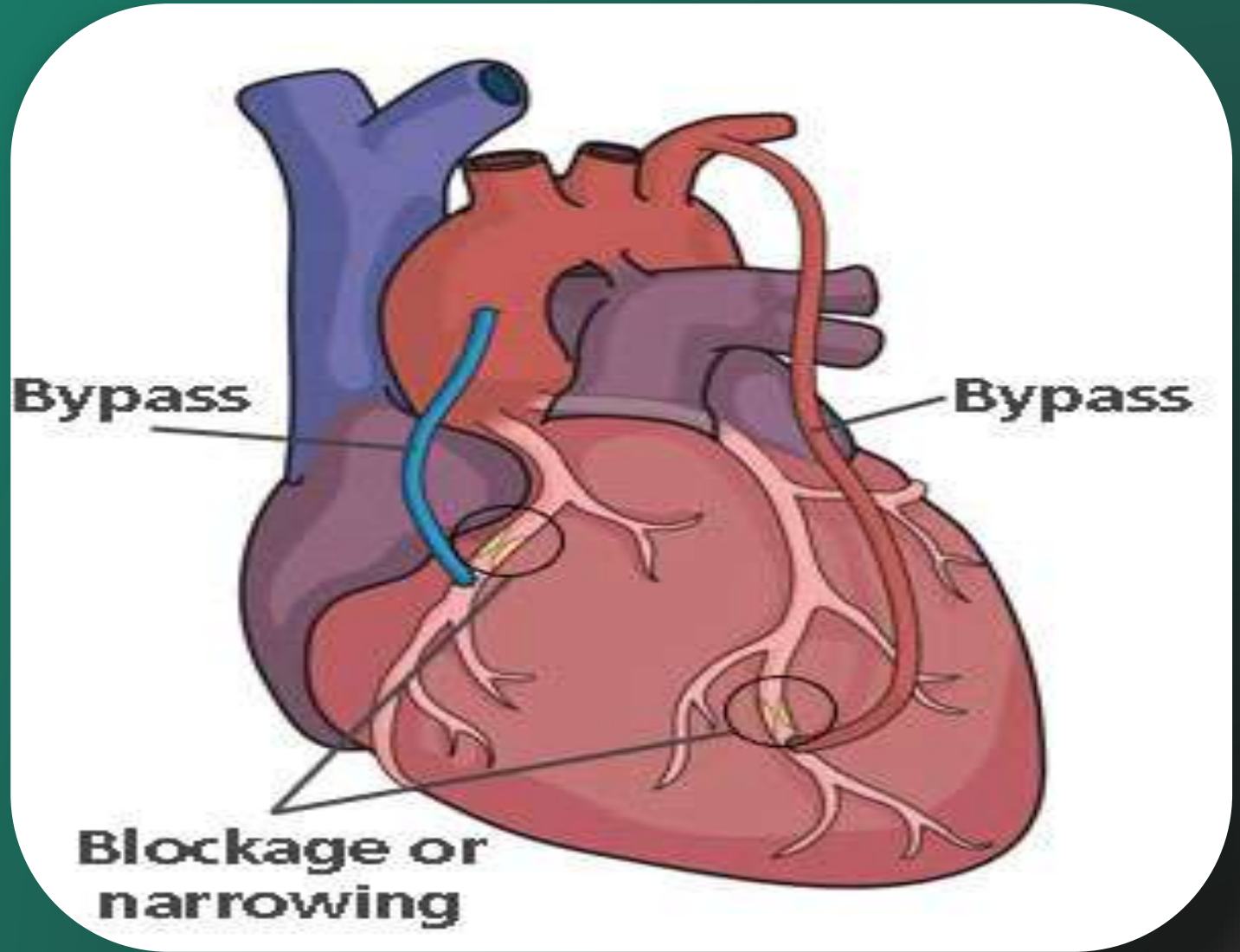




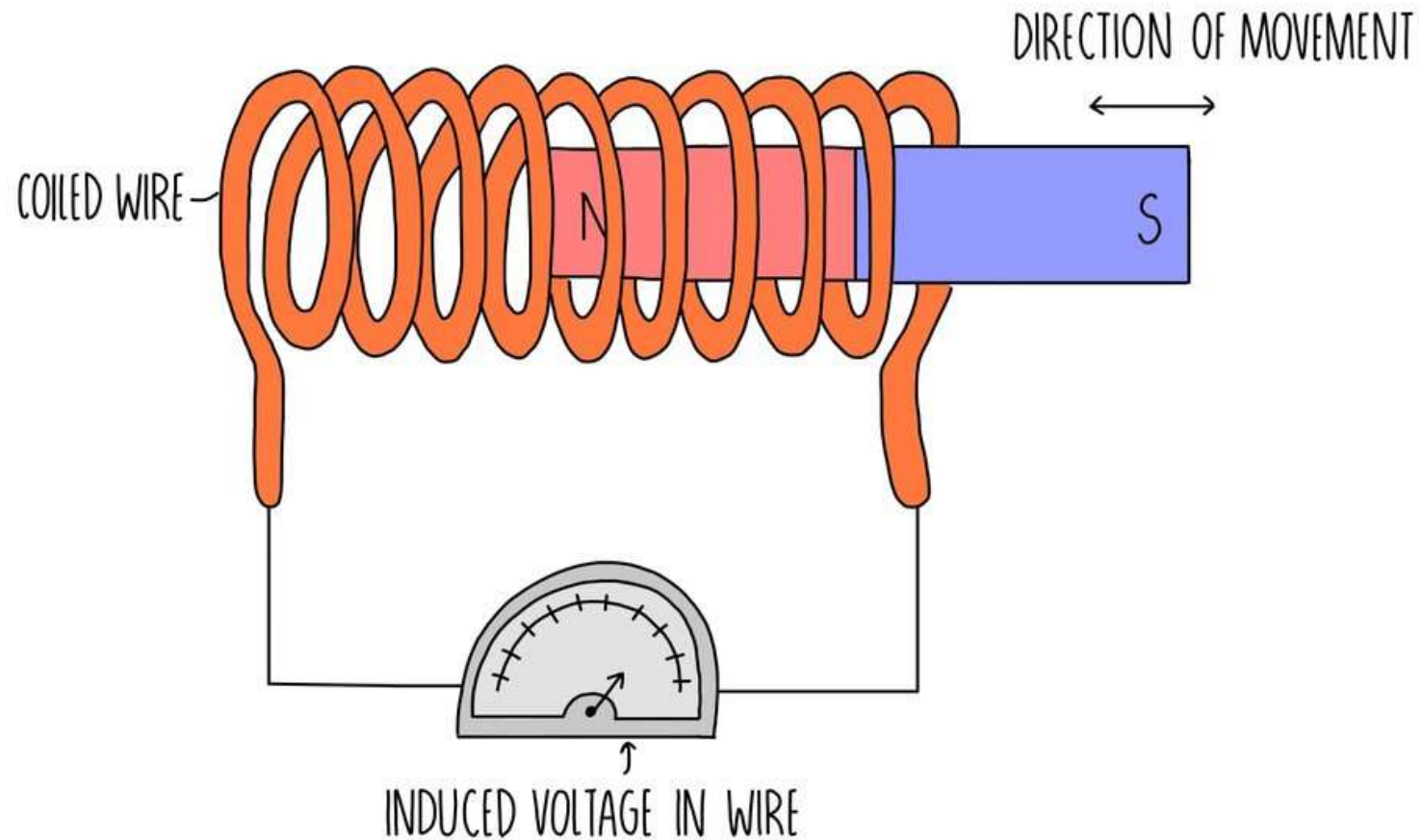
Angiography

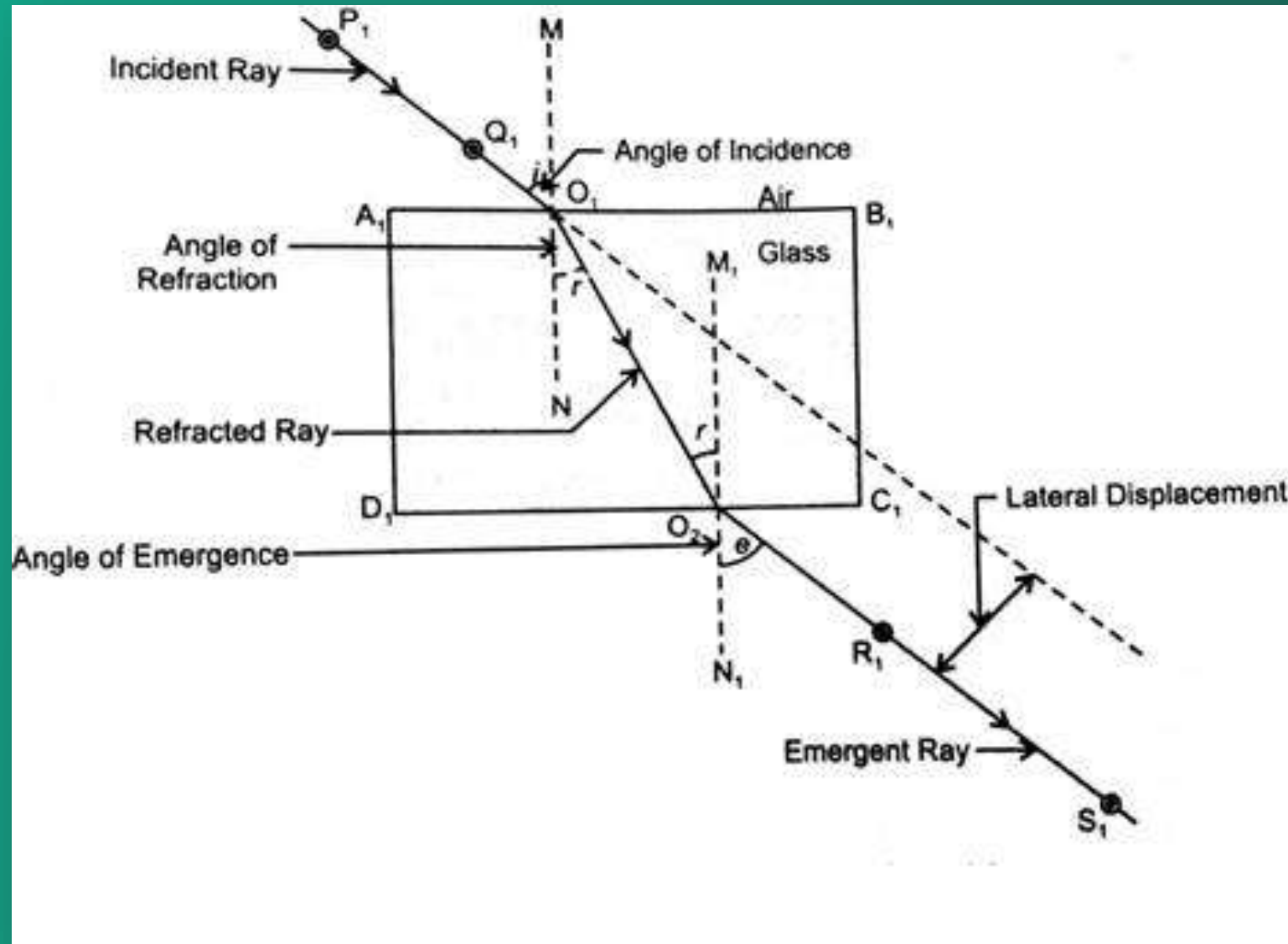
Open heart surgery

Coronary Artery Bypass Grafting (CABG)

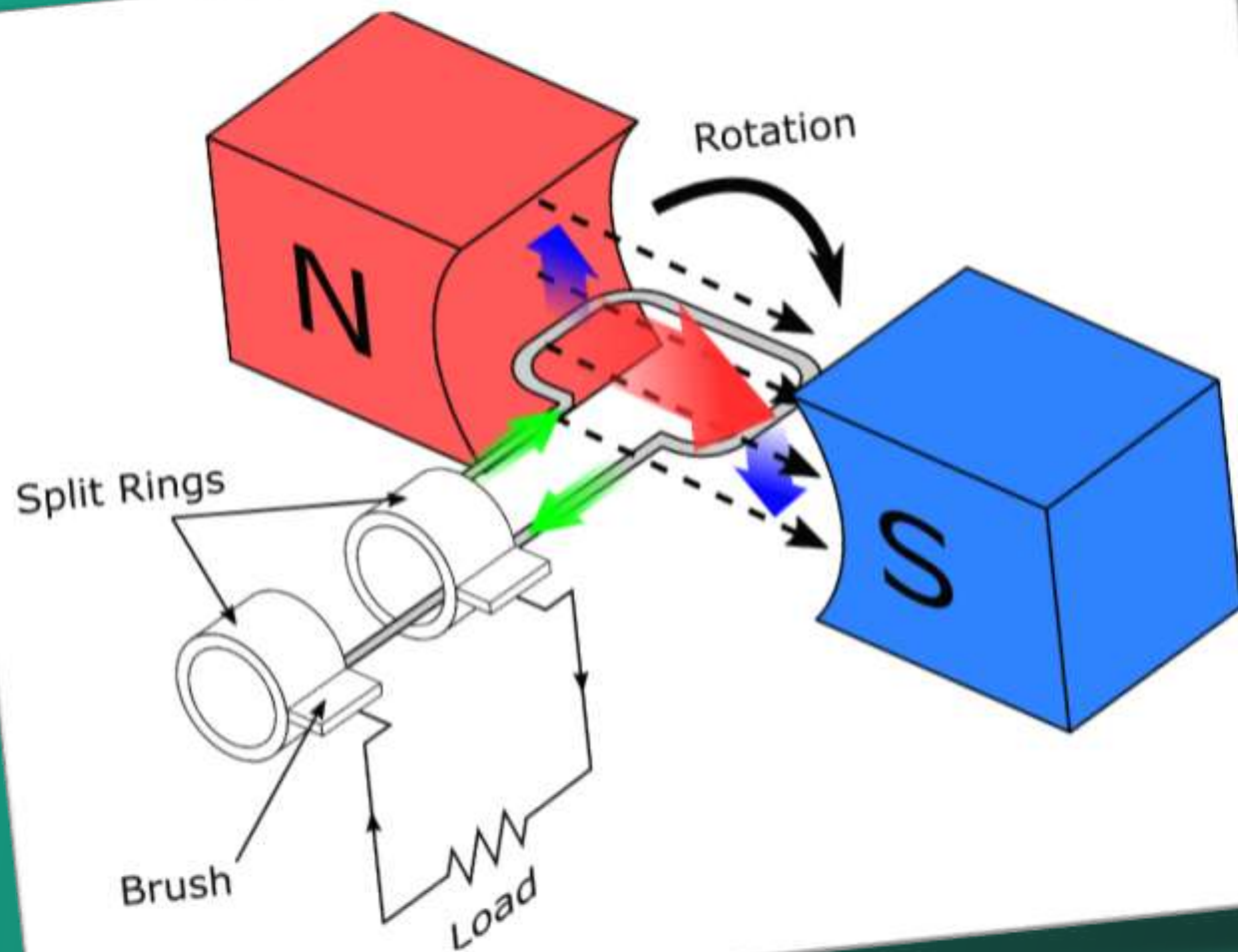


Electromagnetic induction



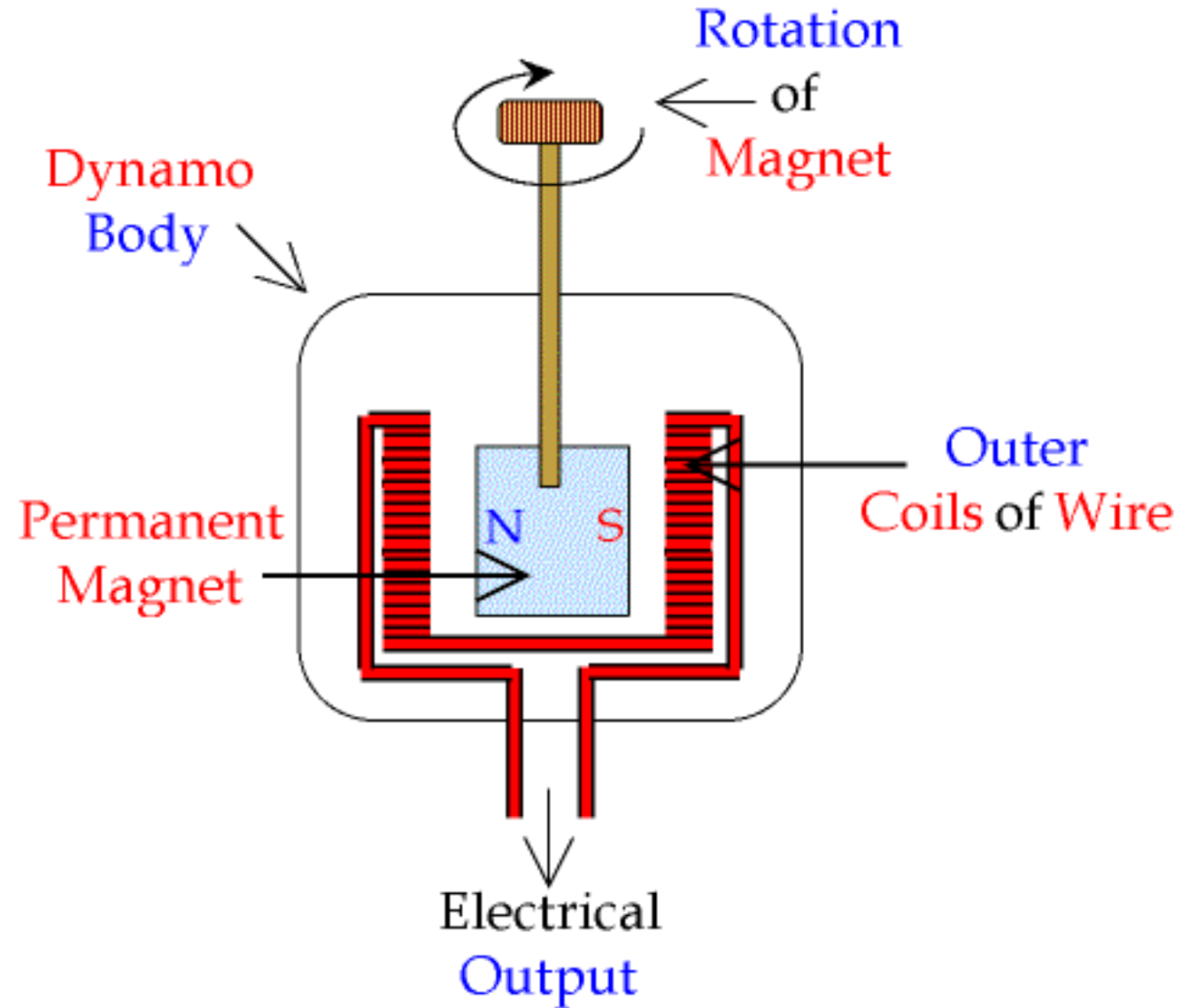


Refraction through glass slab

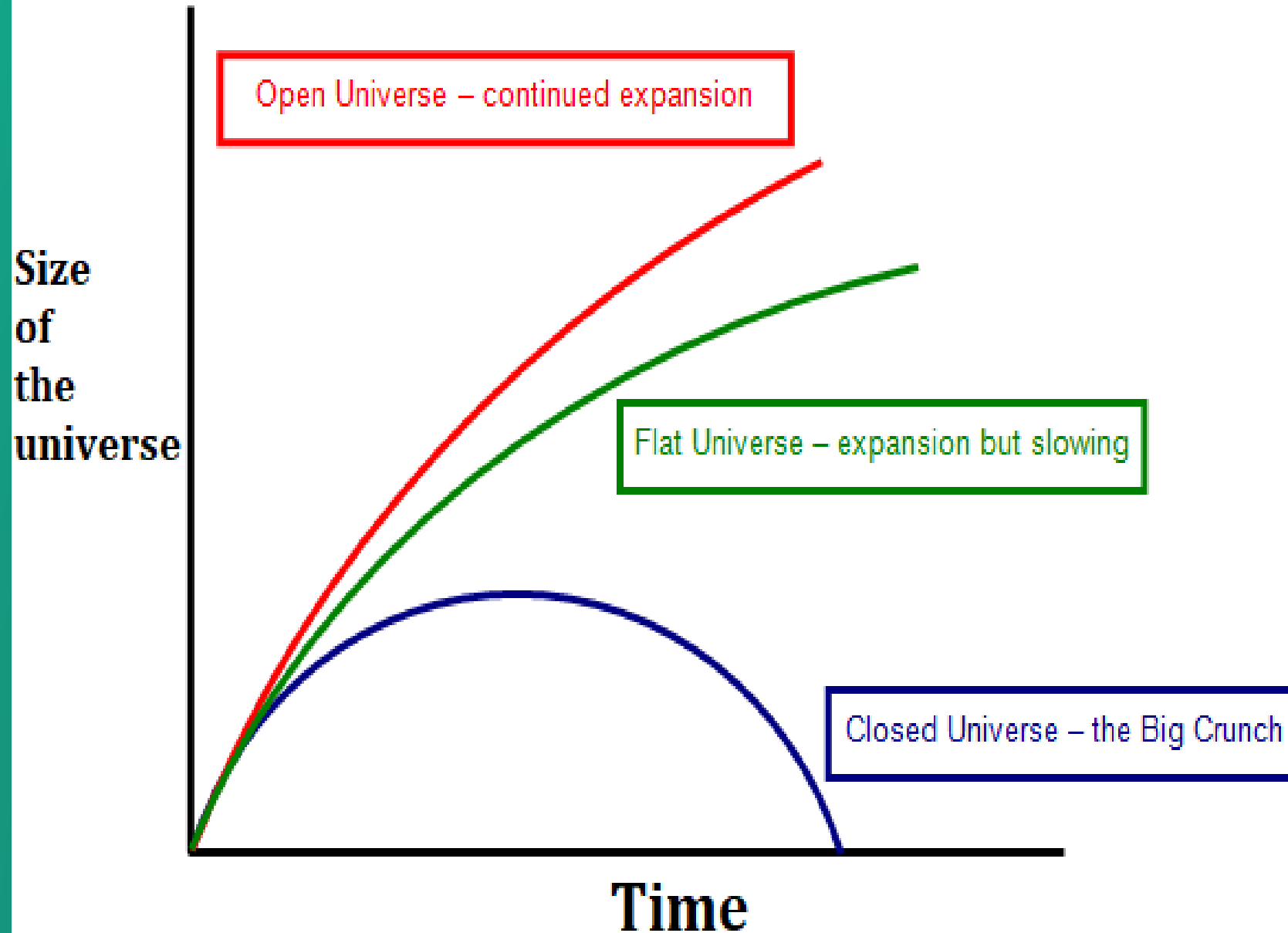


AC Generator

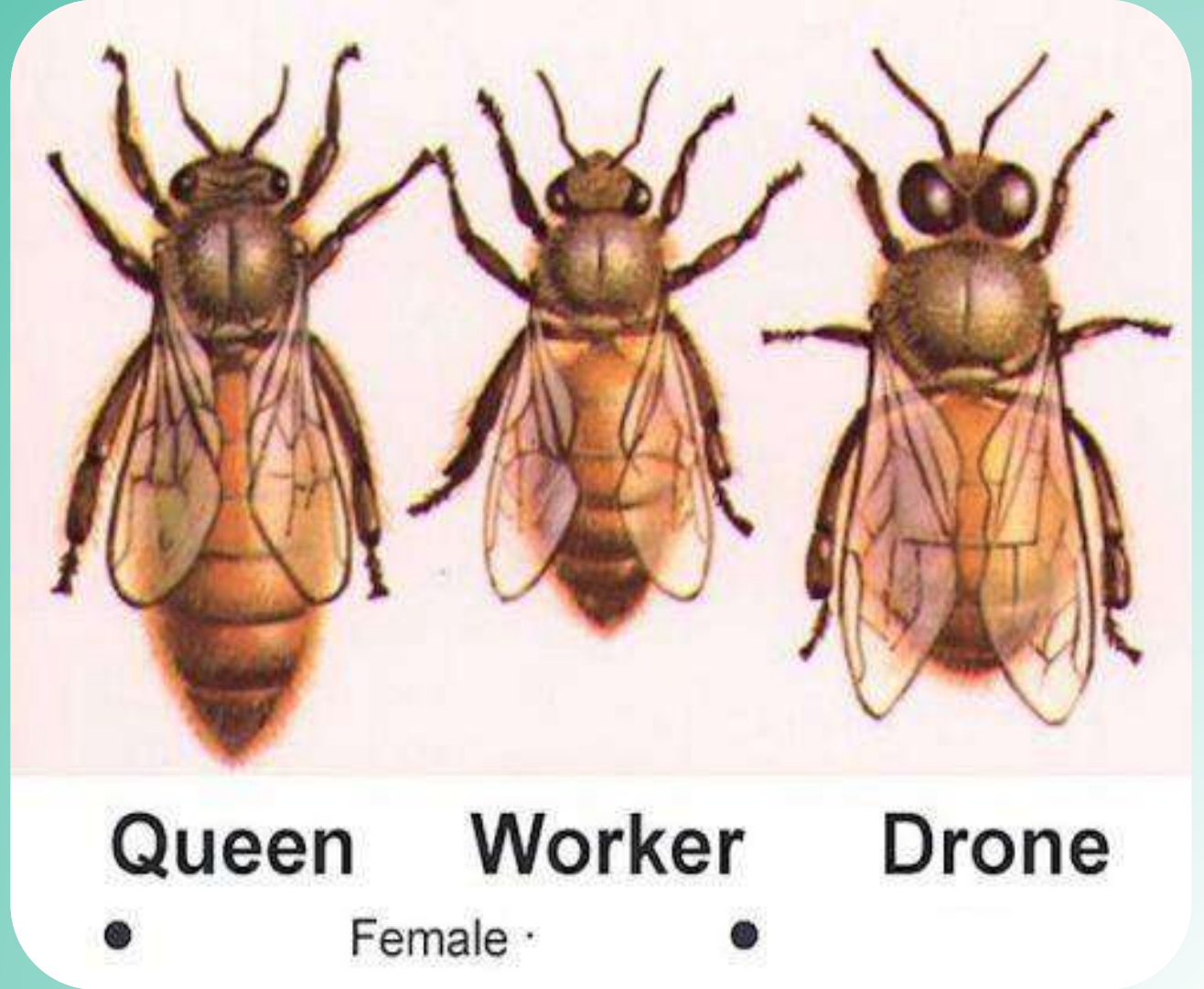
Bicycle dynamo



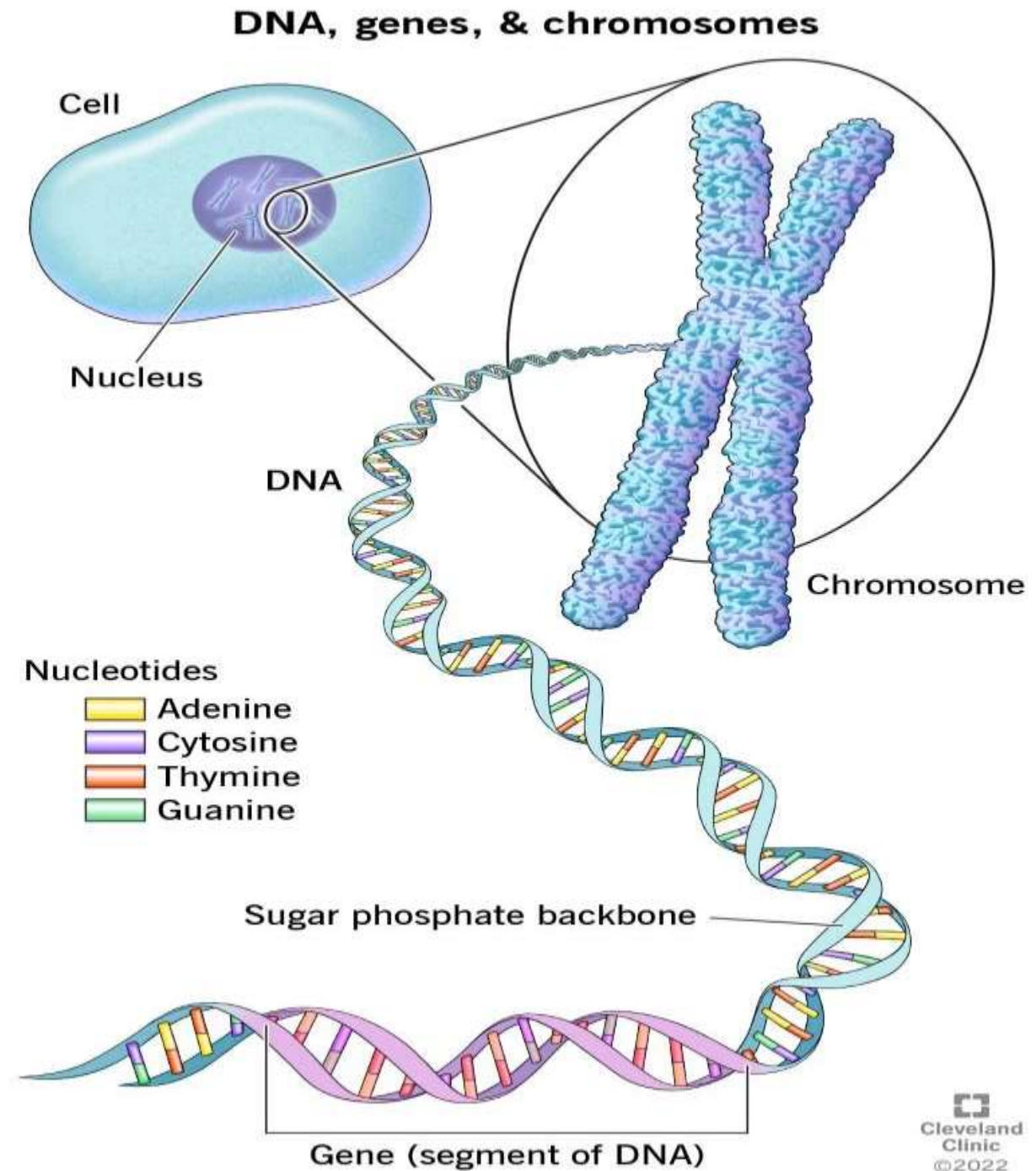
Types of the universes



Types of Bees

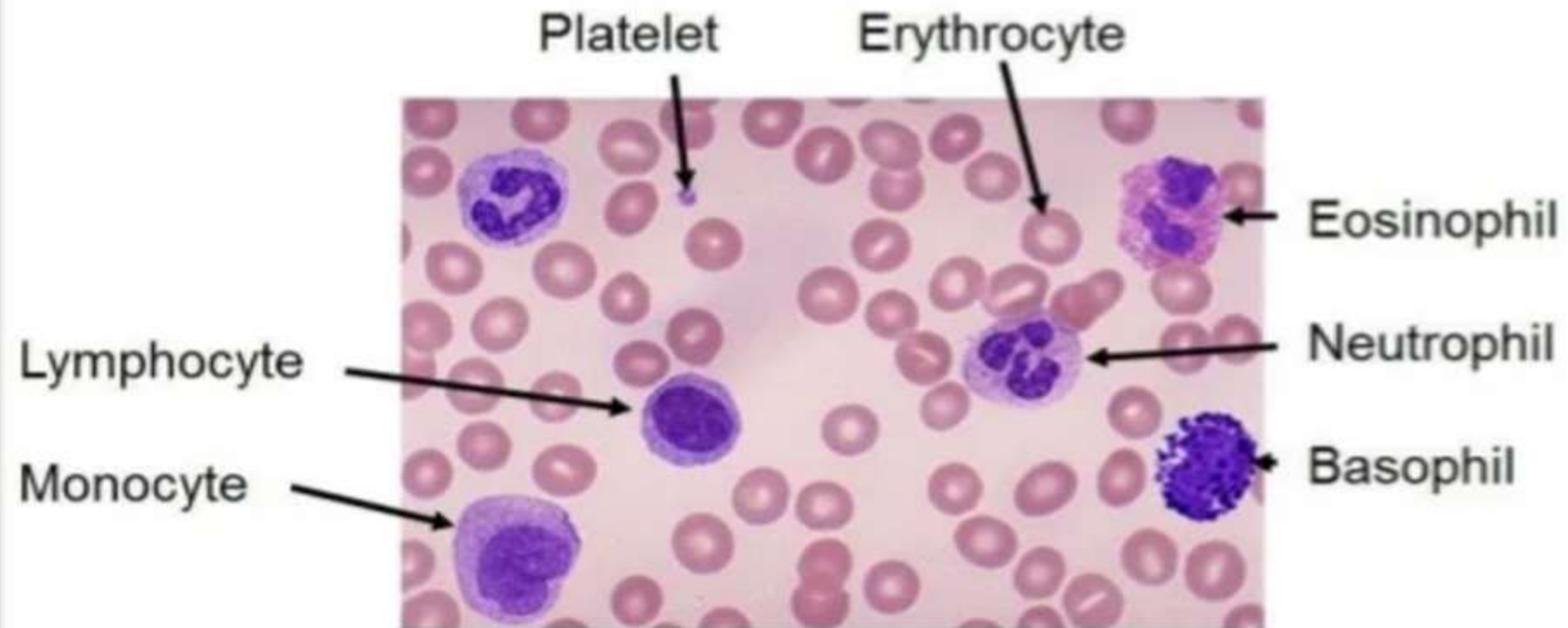


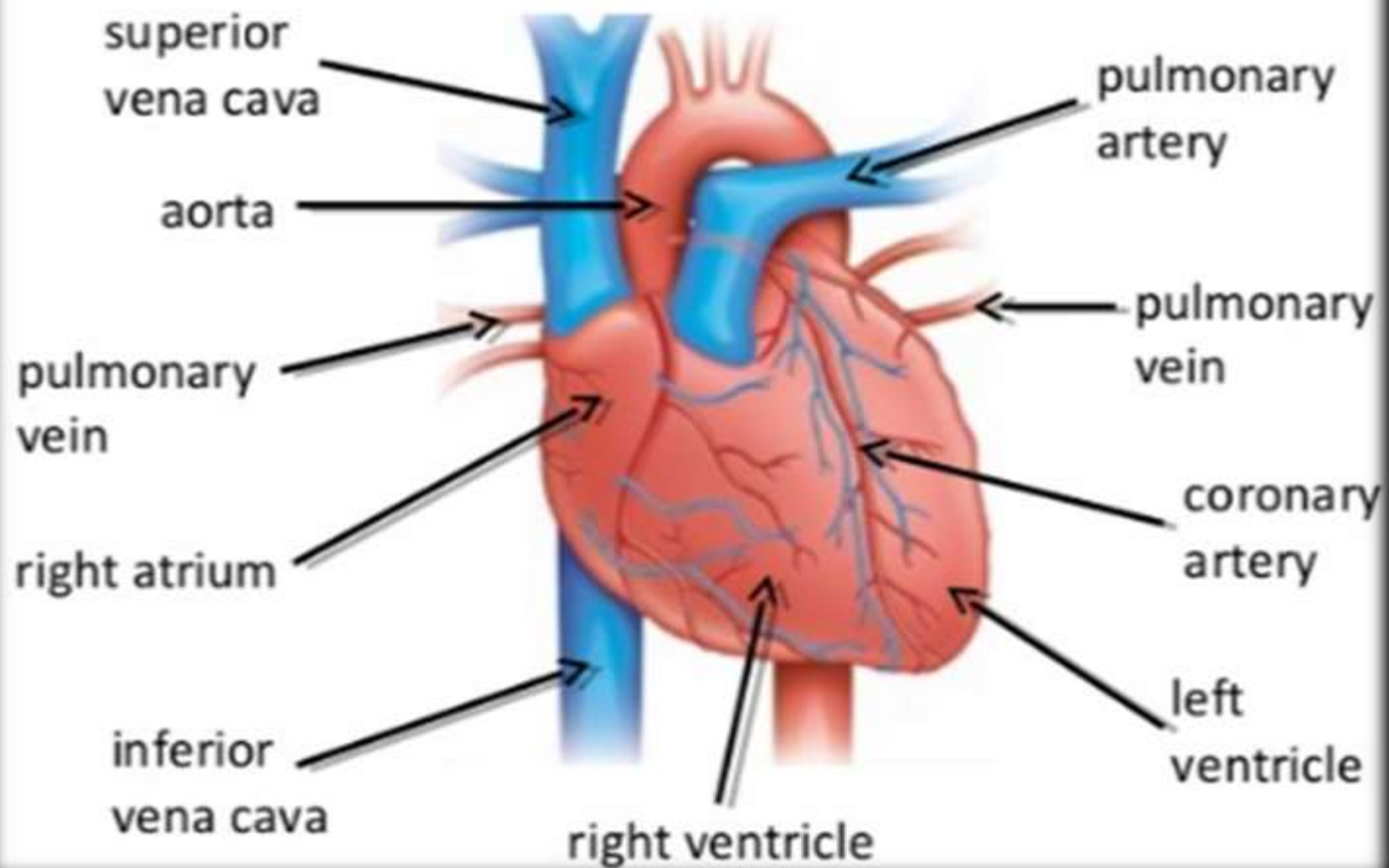
Chromosome



Blood film

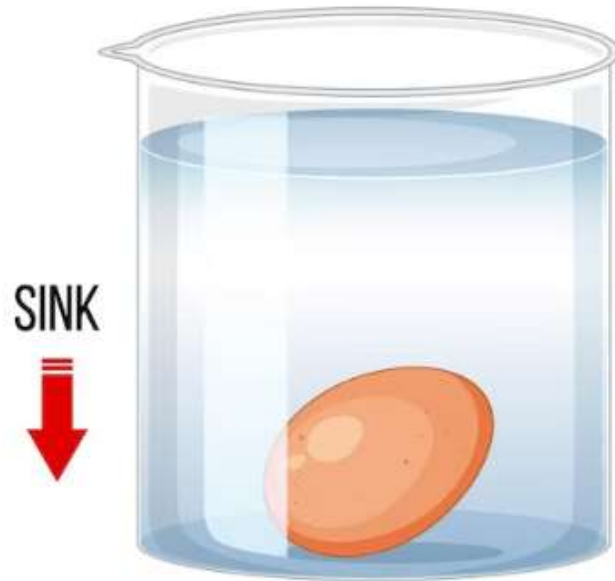
Blood cells



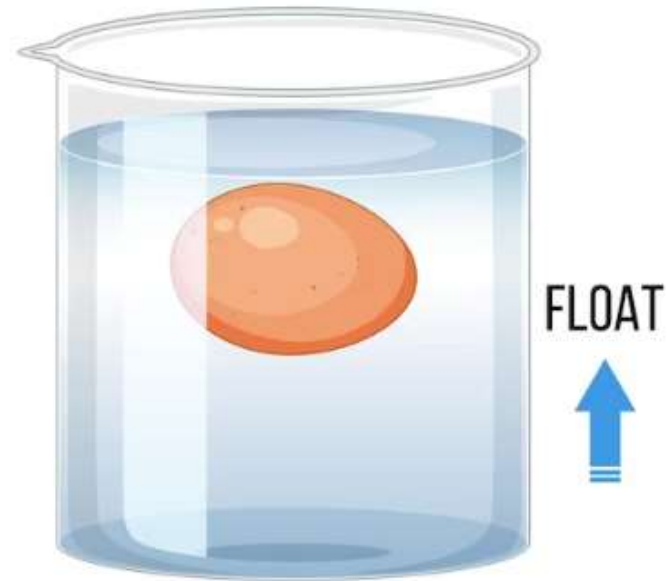


External structure of heart

Law of floatation

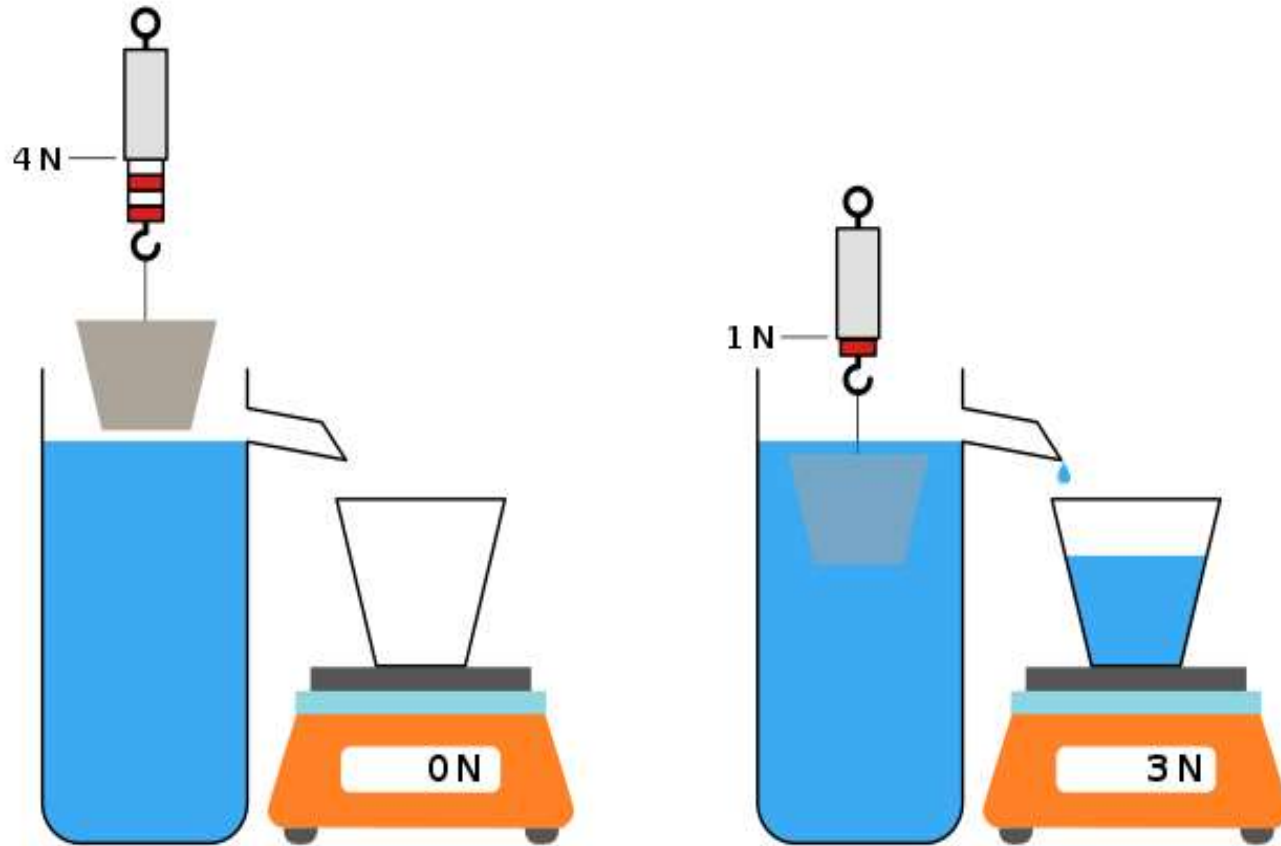


FRESH WATER

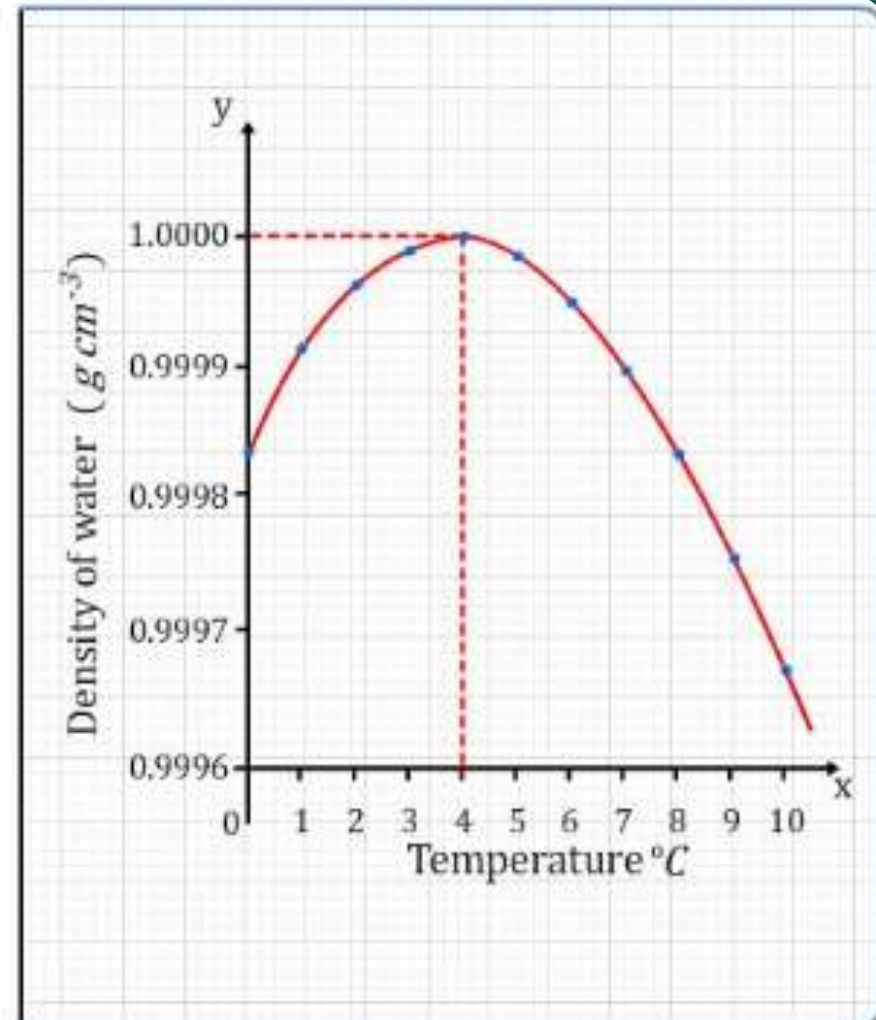
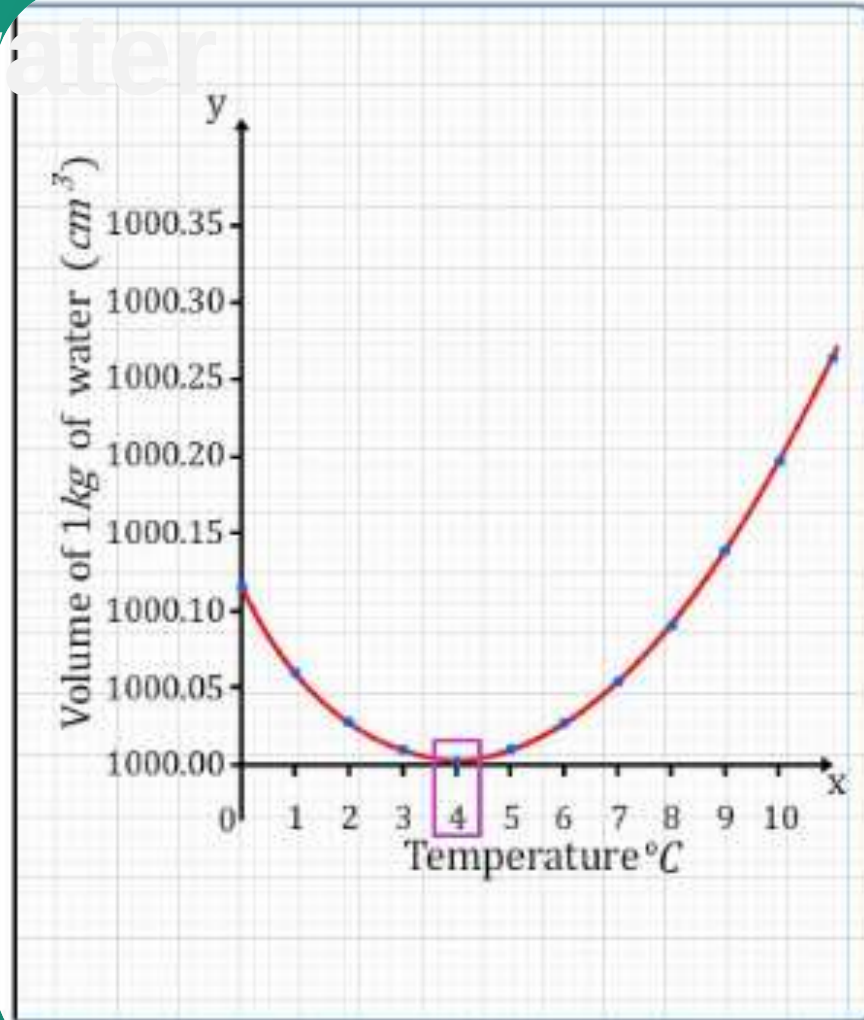


SALT WATER

Archimede s' Principle

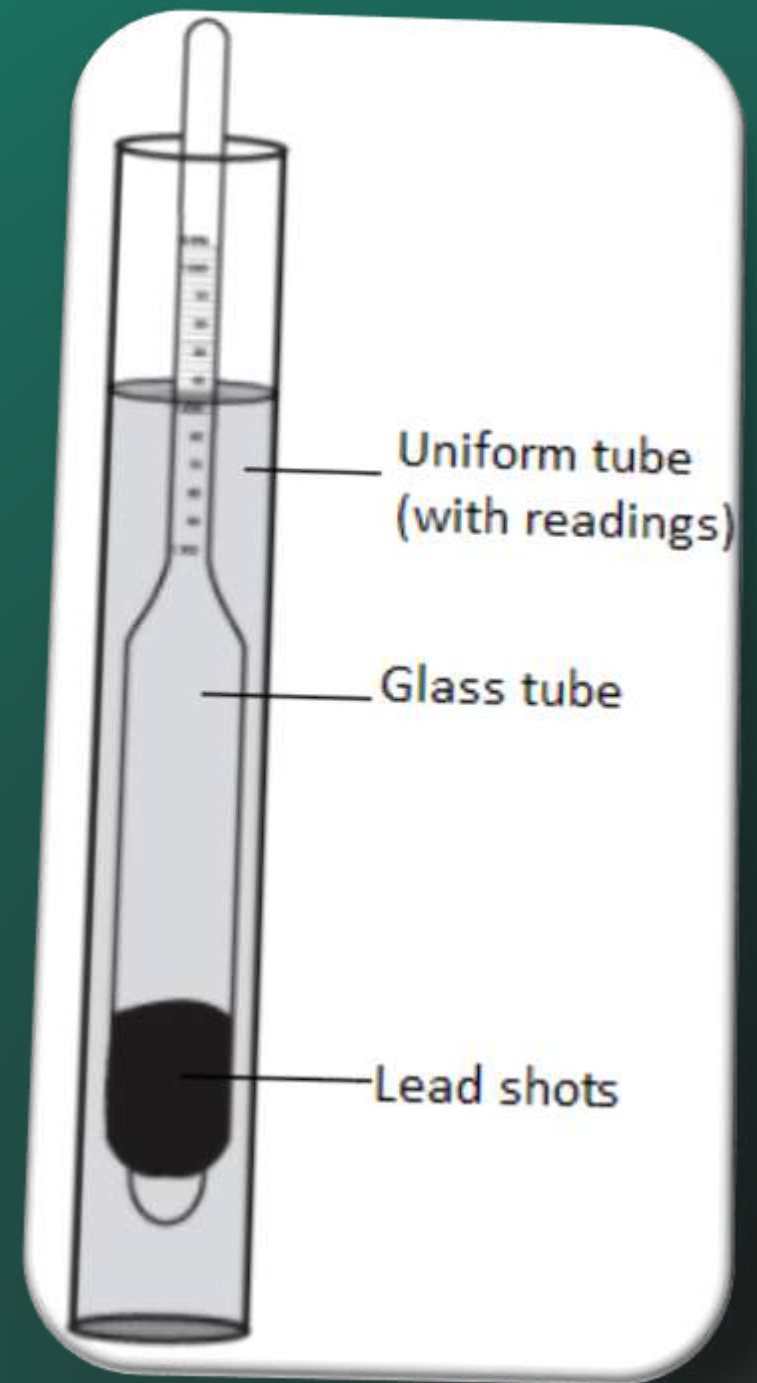


Graph of anomalous expansion of water

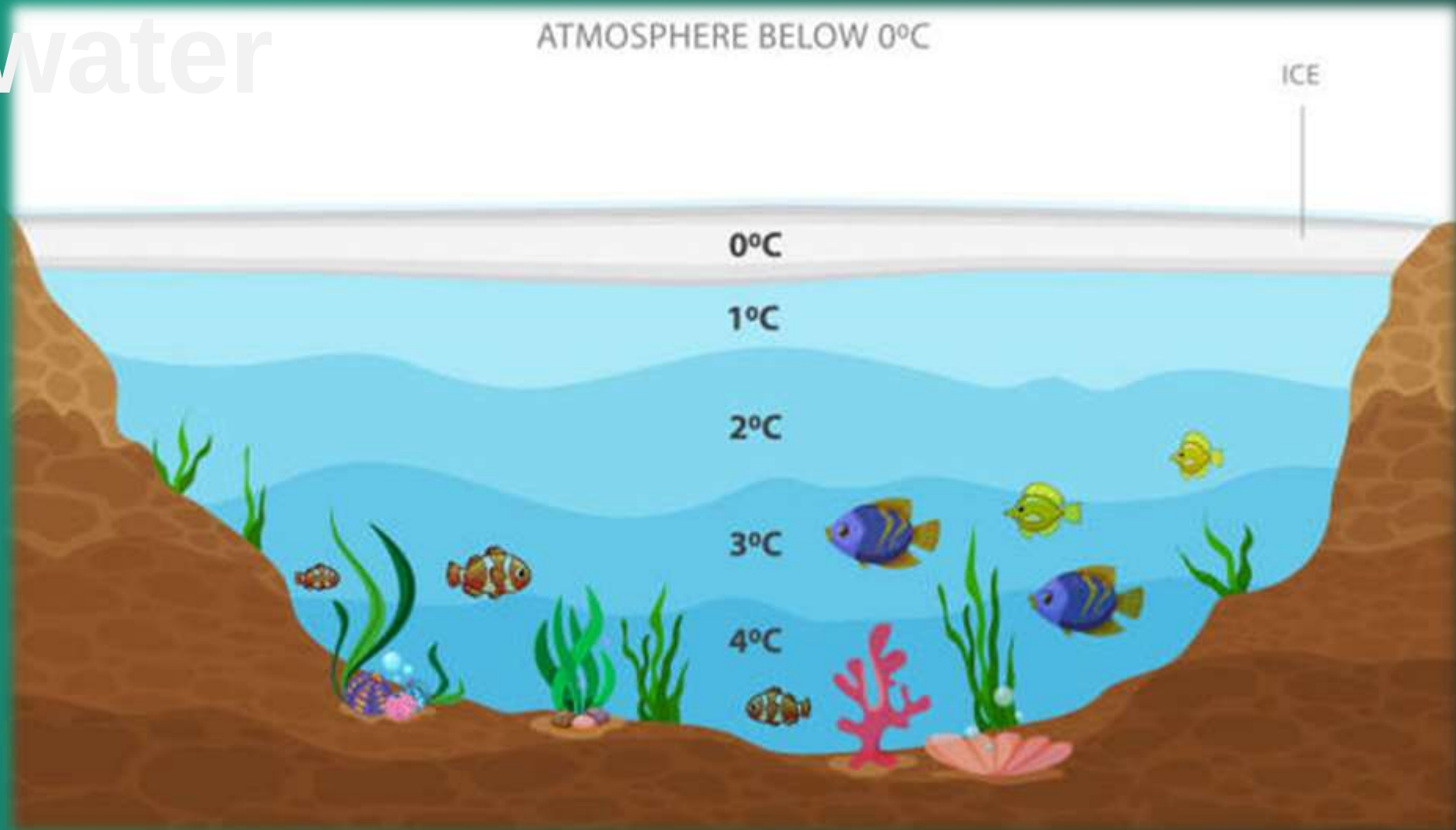


Hydromete

r



Anomalous expansion of water



Sea breeze and land breeze



DC motor

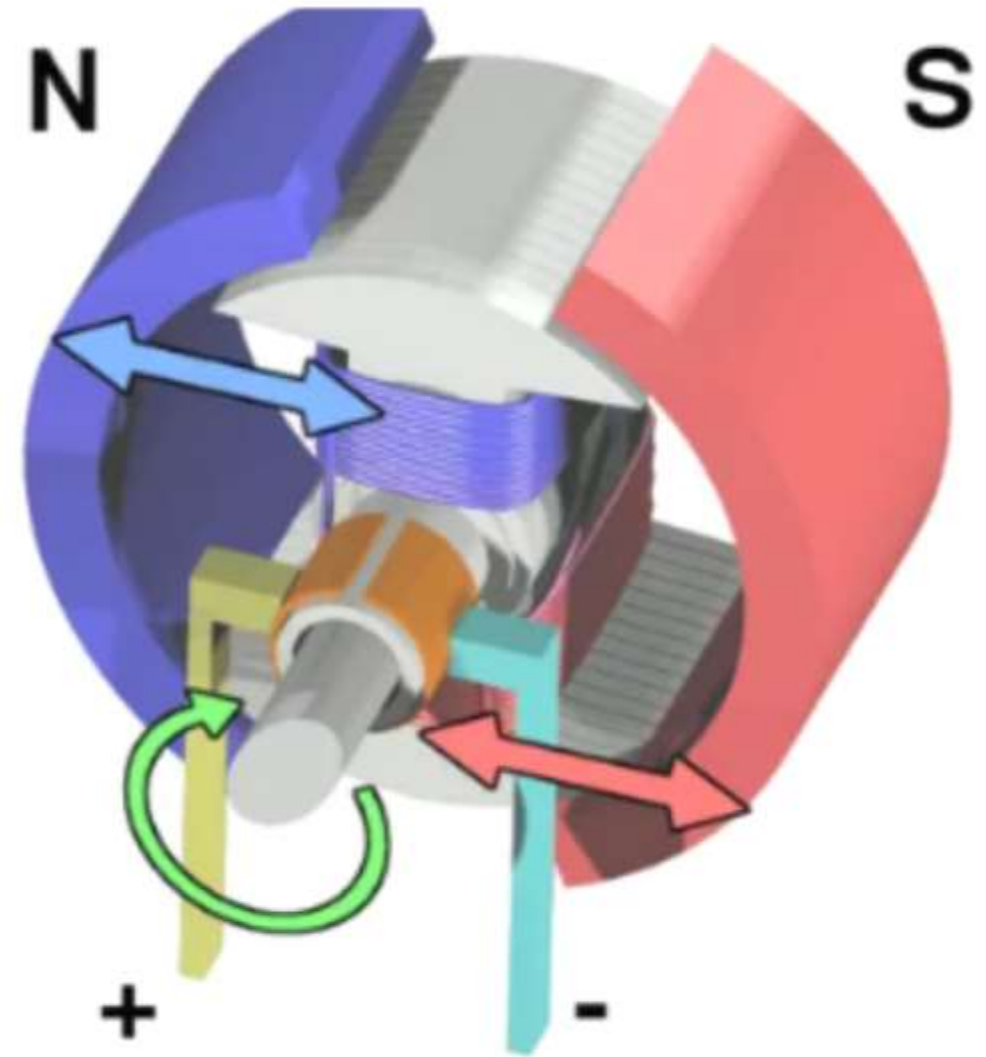
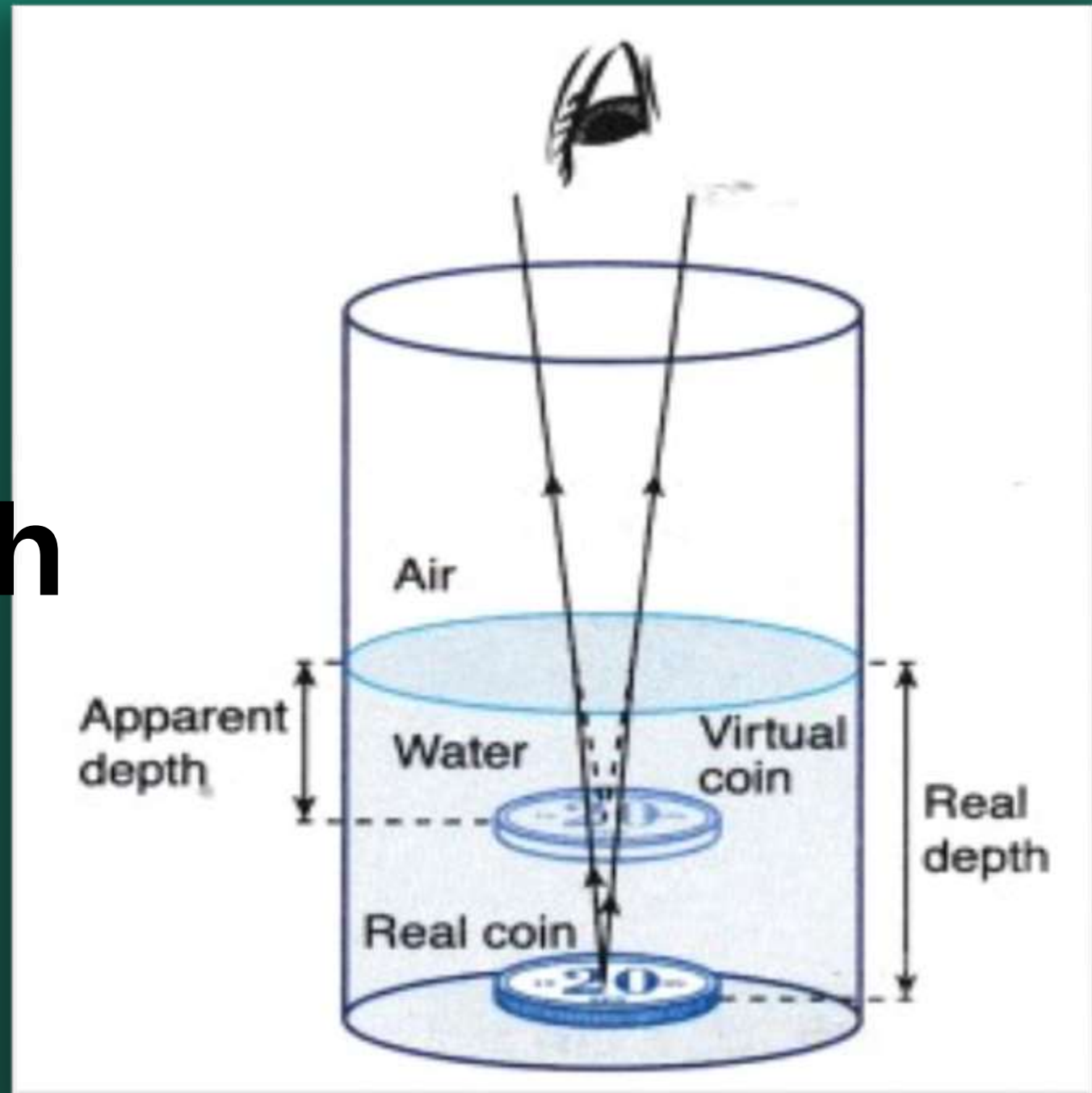


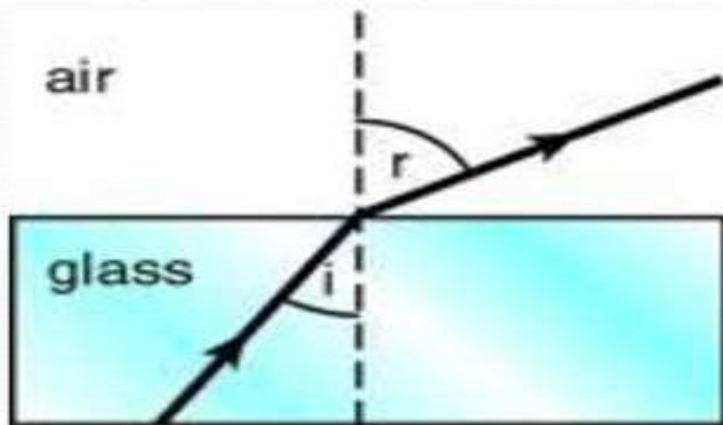
Figure 1 - Inside the DC Motor

Apparent depth

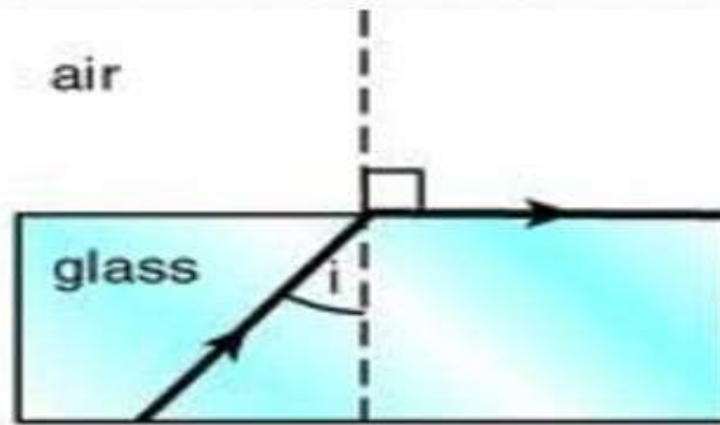


Total internal reflection of light

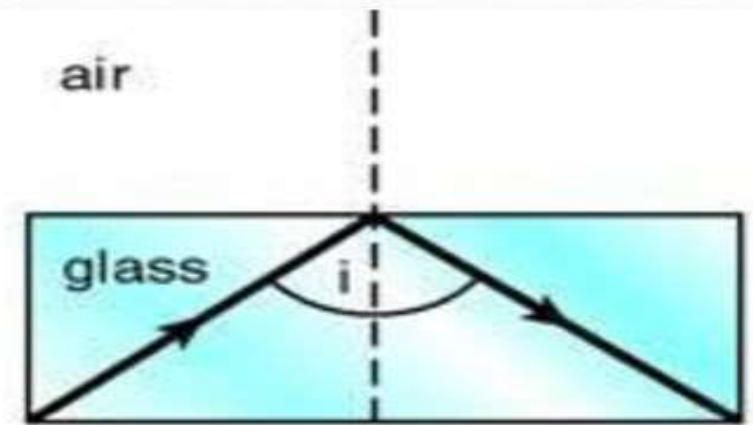
Total internal reflection occurs when the incident ray is greater than the critical angle



if the angle of incidence is less than the critical angle, the light refracts away from the normal

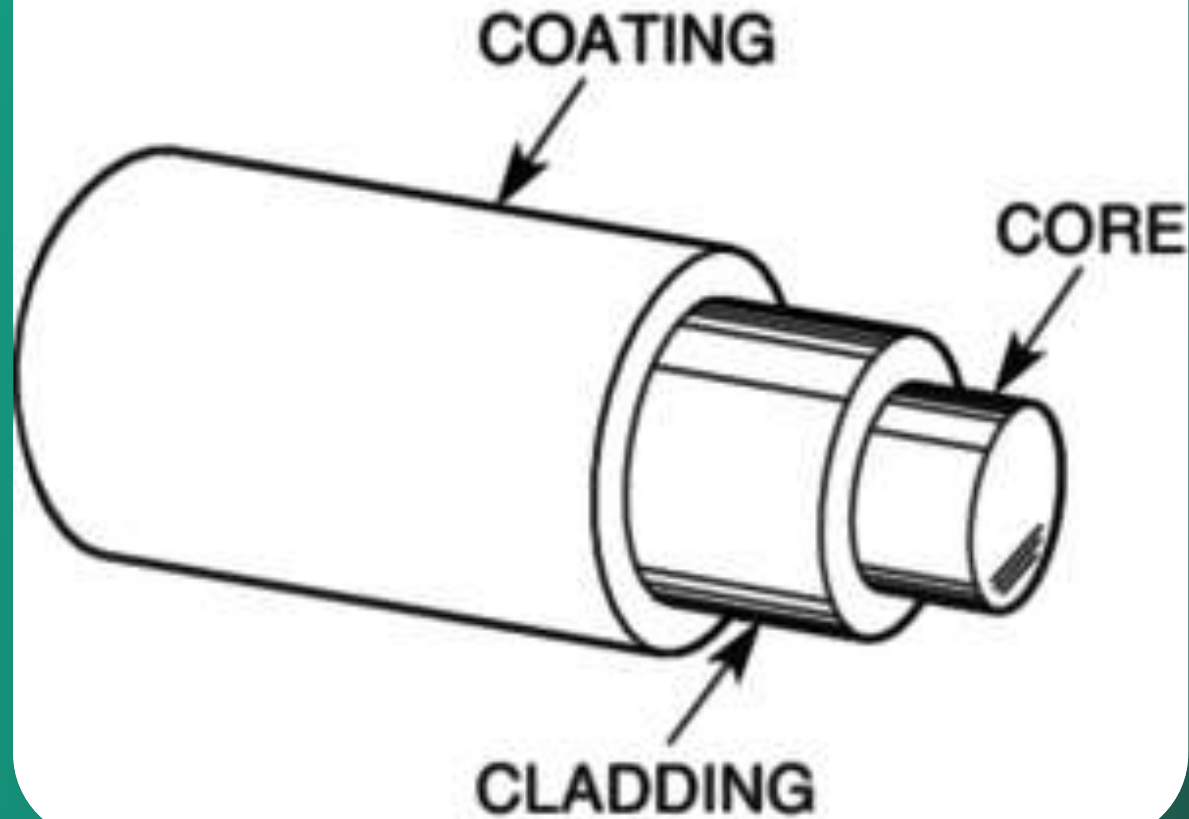


if the angle of incidence is equal to the critical angle, the light refracts at 90° to the normal



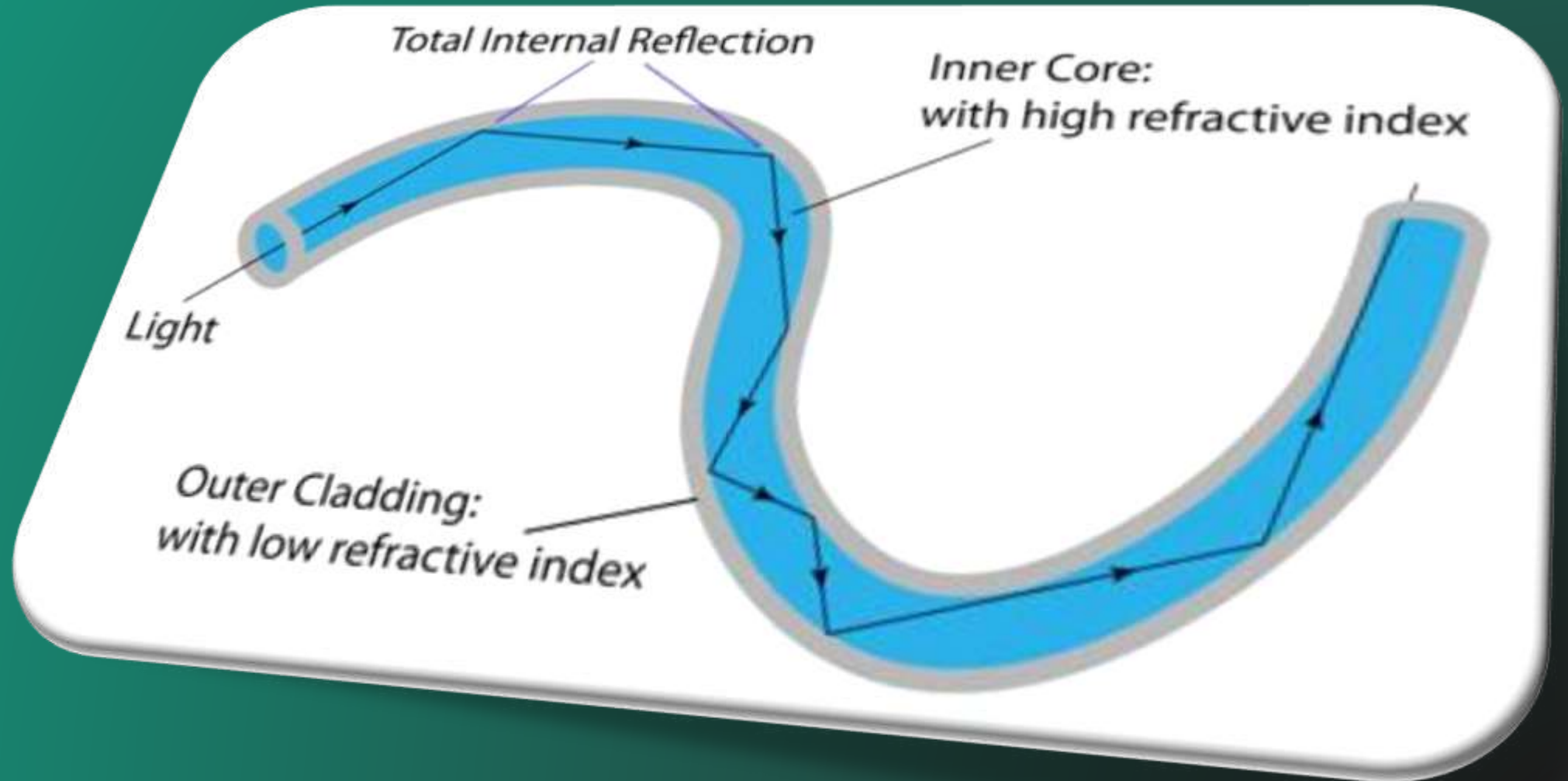
if the angle of incidence is greater than the critical angle, total internal reflection occurs

OPTICAL FIBER



**Optical
fibre
structure**

Light pipe



Types of concave and convex lenses

CONVEX LENS



biconvex



planoconvex



concavoconvex

CONCAVE LENS



biconcave

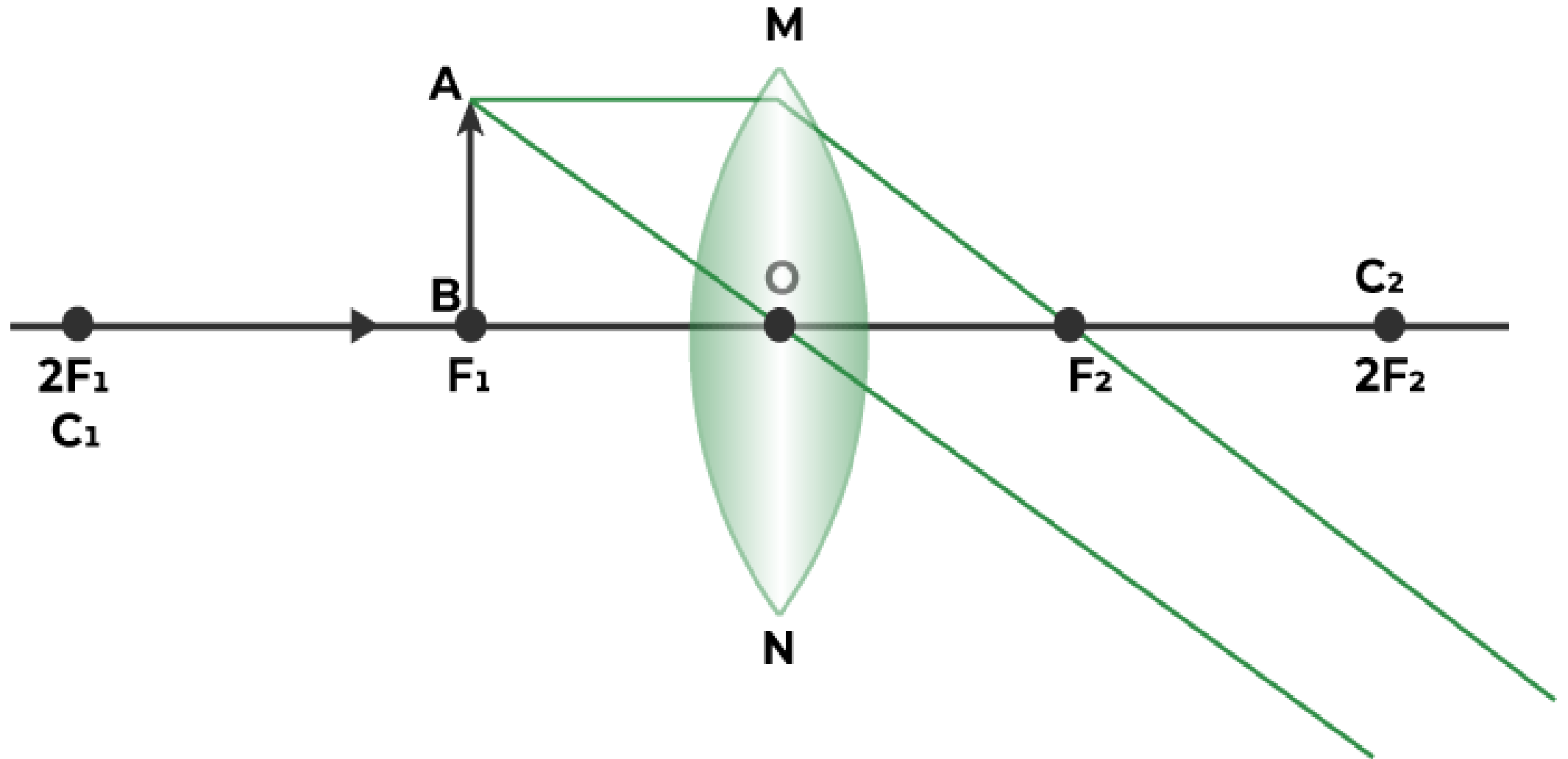


planoconcave

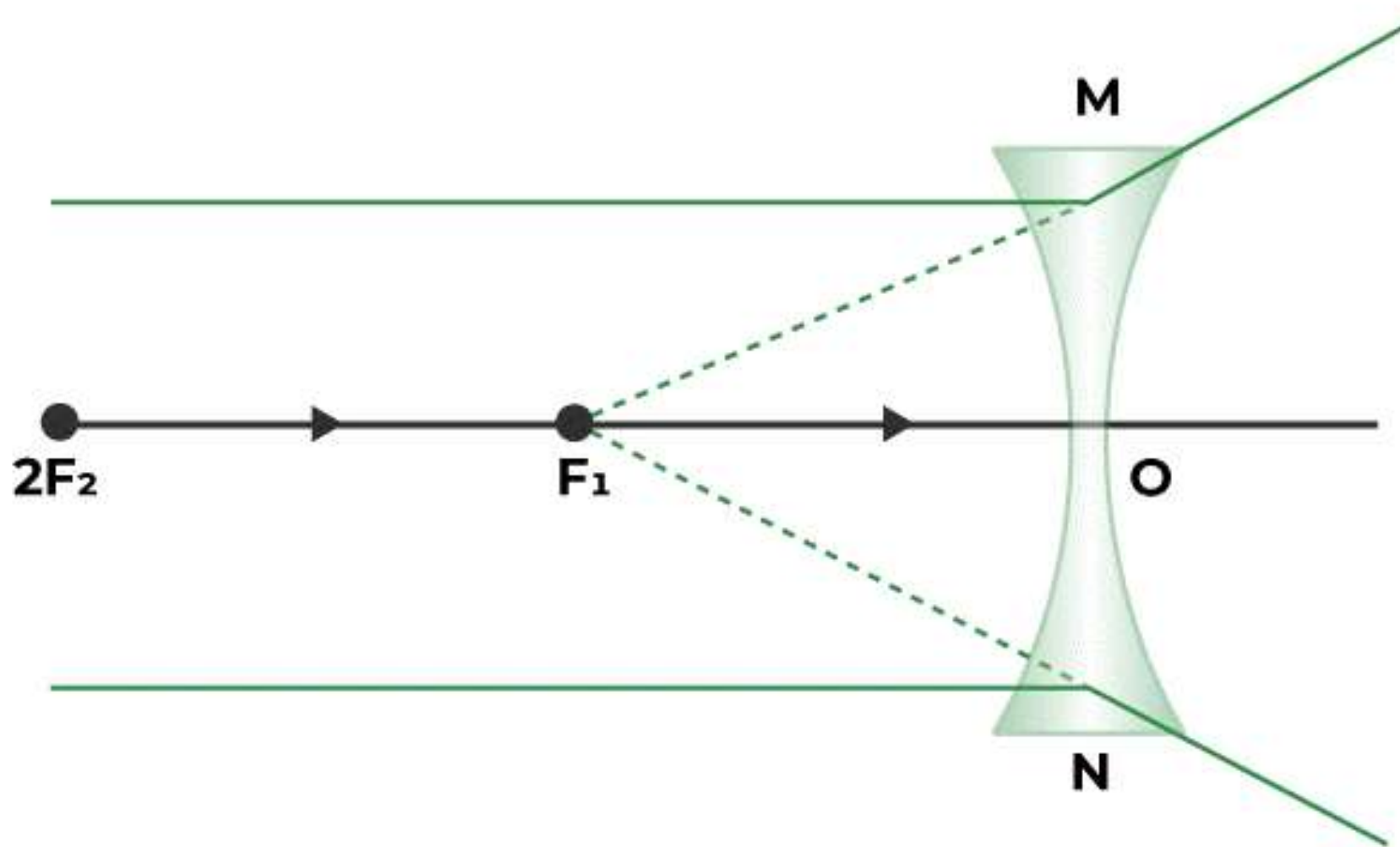


convexoconcave

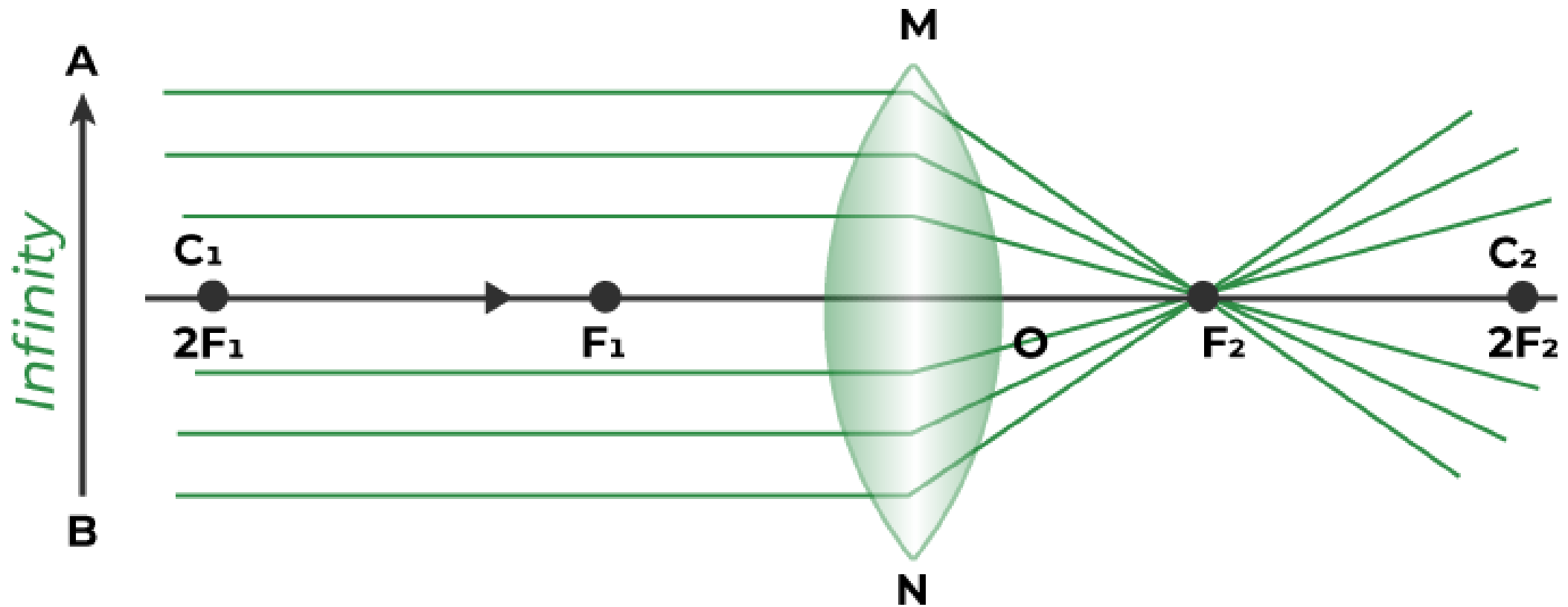
When an object is at focus before the convex lens.

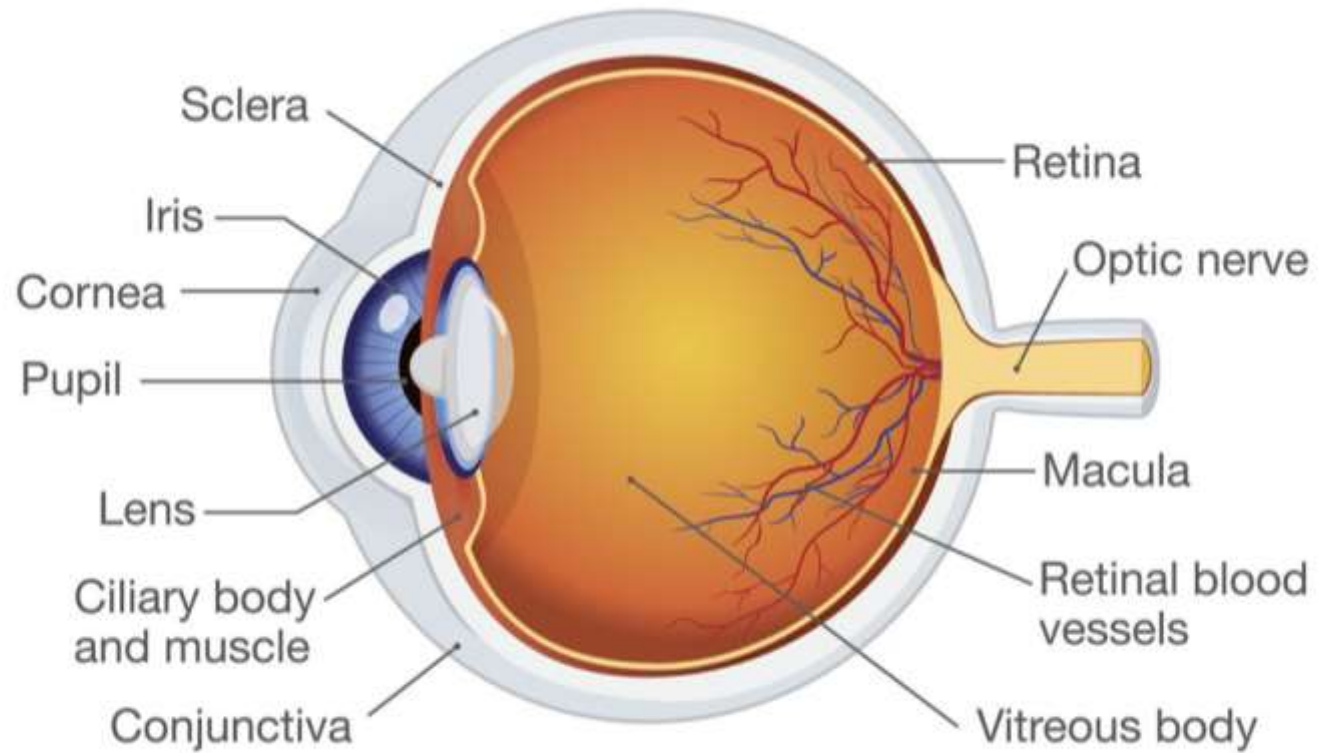


When object is at infinity before a concave lens



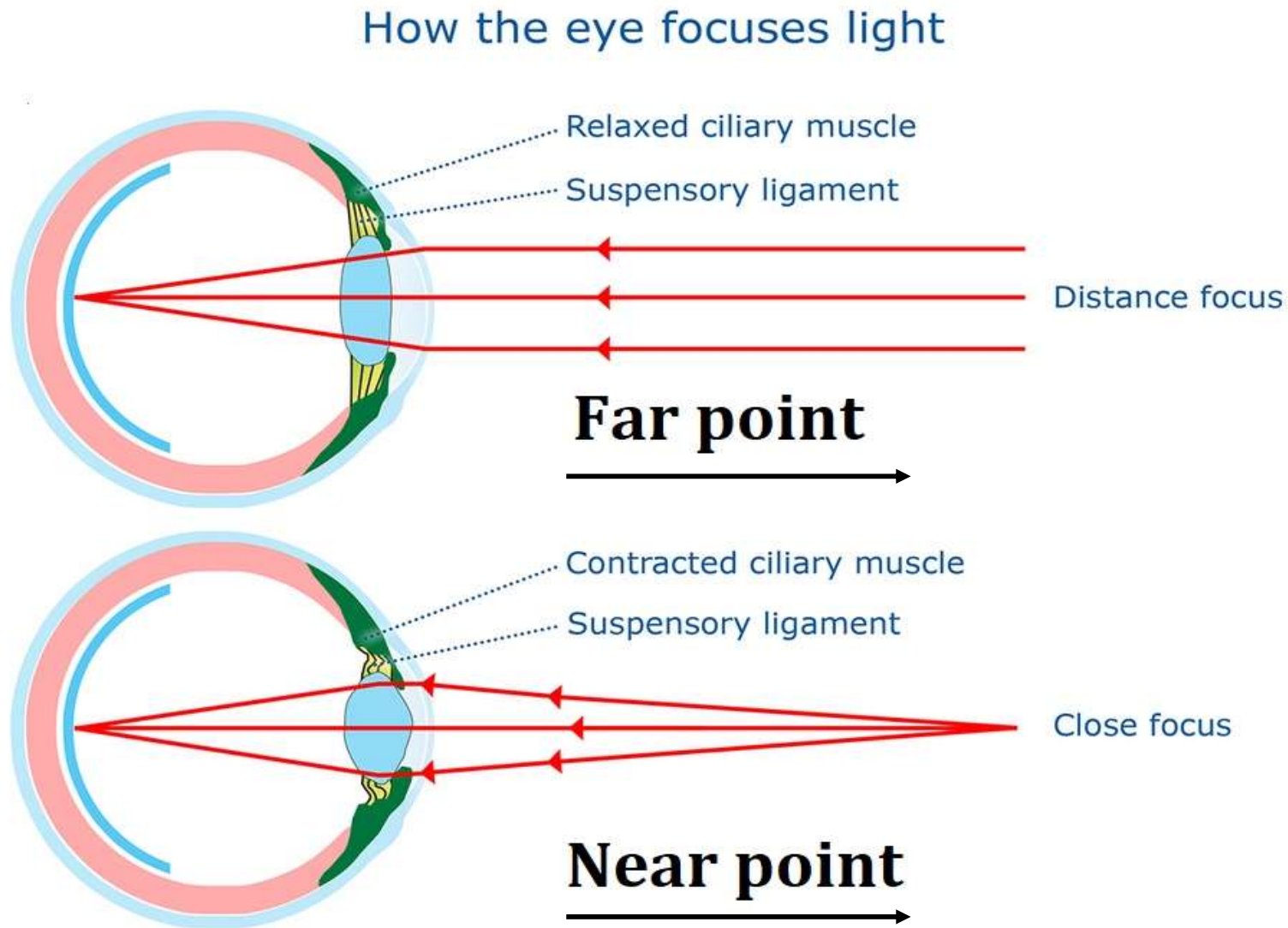
When object is at infinity before a convex lens





Human Eye Anatomy

Eye accommodation, near point and far



MODERN

PERIODIC TABLE OF THE ELEMENTS

GROUP

1 1A

2 2A

3 3A

4 4A

5 5A

6 6A

7 7A

8 8A

9 9A

10 10A

11 11A

12 12A

13 13A

14 14A

15 15A

16 16A

17 17A

18 18A

1 1.008

2 4.0026

3 6.94

4 9.0122

11 22.990

12 24.305

19 39.098

20 40.078

37 85.468

38 87.62

55 132.91

56 137.33

87 (223)

88 (226)

GROUP IUPAC

GROUP CAS

ATOMIC NUMBER

SYMBOL

ELEMENT NAME

Metal

Semimetal

Nonmetal

Alkali metal

Alkaline earth metal

Transition metals

Lanthanide

Actinide

Chalcogens element

Halogens element

Noble gas

STANDARD STATE (25 °C; 101 kPa)

Ne - gas

Hg - liquid

Fe - solid

Tc - synthetic

13 10.81

14 12.011

15 14.007

16 15.999

17 18.998

18 20.180

21 44.956

22 47.867

23 50.942

24 51.996

25 54.938

26 55.845

27 58.933

28 58.693

29 63.546

30 65.38

31 69.723

32 72.64

33 74.922

34 78.971

35 79.904

36 83.798

39 88.906

40 91.224

41 92.906

42 95.95

43 (98)

44 101.07

45 102.91

46 106.42

47 107.87

48 112.41

51 121.76

52 127.60

53 126.90

54 131.29

57-71

72 178.49

73 180.95

74 183.84

75 186.21

76 190.23

77 192.22

78 195.08

79 196.97

80 200.59

81 204.38

82 207.2

83 208.98

84 (209)

85 (210)

86 (222)

89-103

104 (267)

105 (268)

106 (271)

107 (272)

108 (277)

109 (276)

110 (281)

111 (280)

112 (285)

113 (285)

114 (287)

115 (289)

116 (291)

117 (294)

118 (294)

PERIOD

1

2

3

4

5

6

7

1 H HYDROGEN

2 Li LITHIUM

3 Na SODIUM

4 K POTASSIUM

5 Rb RUBIDIUM

6 Cs CAESIUM

7 Fr FRANCIUM

10 Be BERYLLIUM

12 Mg MAGNESIUM

20 Ca CALCIUM

38 Sr STRONTIUM

56 Ba BARIUM

88 Ra RADIUM

21 Sc SCANDIUM

39 Y YTTRIUM

57-71 La-Lu Lanthanide

89-103 Ac-Lr Actinide

22 Ti TITANIUM

40 Zr ZIRCONIUM

72 Hf HAFNIUM

104 Rf RUTHERFORDIUM

23 V VANADIUM

41 Nb NIOBIUM

73 Ta TANTALUM

105 Db DUBNIUM

24 Cr CHROMIUM

42 Mo MOLYBDENUM

74 W TUNGSTEN

106 Sg SEABORGIUM

25 Mn MANGANESE

43 Tc TECHNETIUM

75 Re RHENIUM

107 Bh BOHRNIUM

26 Fe IRON

44 Ru RUTHENIUM

76 Os OSMIUM

108 Hs HASSIUM

27 Co COBALT

45 Rh RHODIUM

77 Ir IRIIDIUM

109 Mt MEITNERIUM

28 Ni NICKEL

46 Pd PALLADIUM

78 Pt PLATINUM

110 Ds DARISTADIUM

29 Cu COPPER

47 Ag SILVER

79 Au GOLD

111 Rg ROENTGENIUM

30 Zn ZINC

48 Cd CADMIUM

80 Hg MERCURY

112 Cn COPERNICIUM

31 Al ALUMINUM

49 In INDIUM

81 Tl THALLIUM

113 Nh NIHOINIUM

32 Si SILICON

50 Sn TIN

82 Pb LEAD

114 Fl FLEROVIUM

33 P PHOSPHORUS

51 Sb ANTIMONY

83 Bi BISMUTH

115 Mc MOSCOVIUM

34 S SULPHUR

52 Te TELLURUM

84 Po POLONIUM

116 Lv LIVERMORIUM

35 Cl CHLORINE

53 I IODINE

85 At ASTATINE

117 Ts TENNESSINE

36 Ar ARGON

54 Xe XENON

86 Rn RADON

118 Og OGANESSON

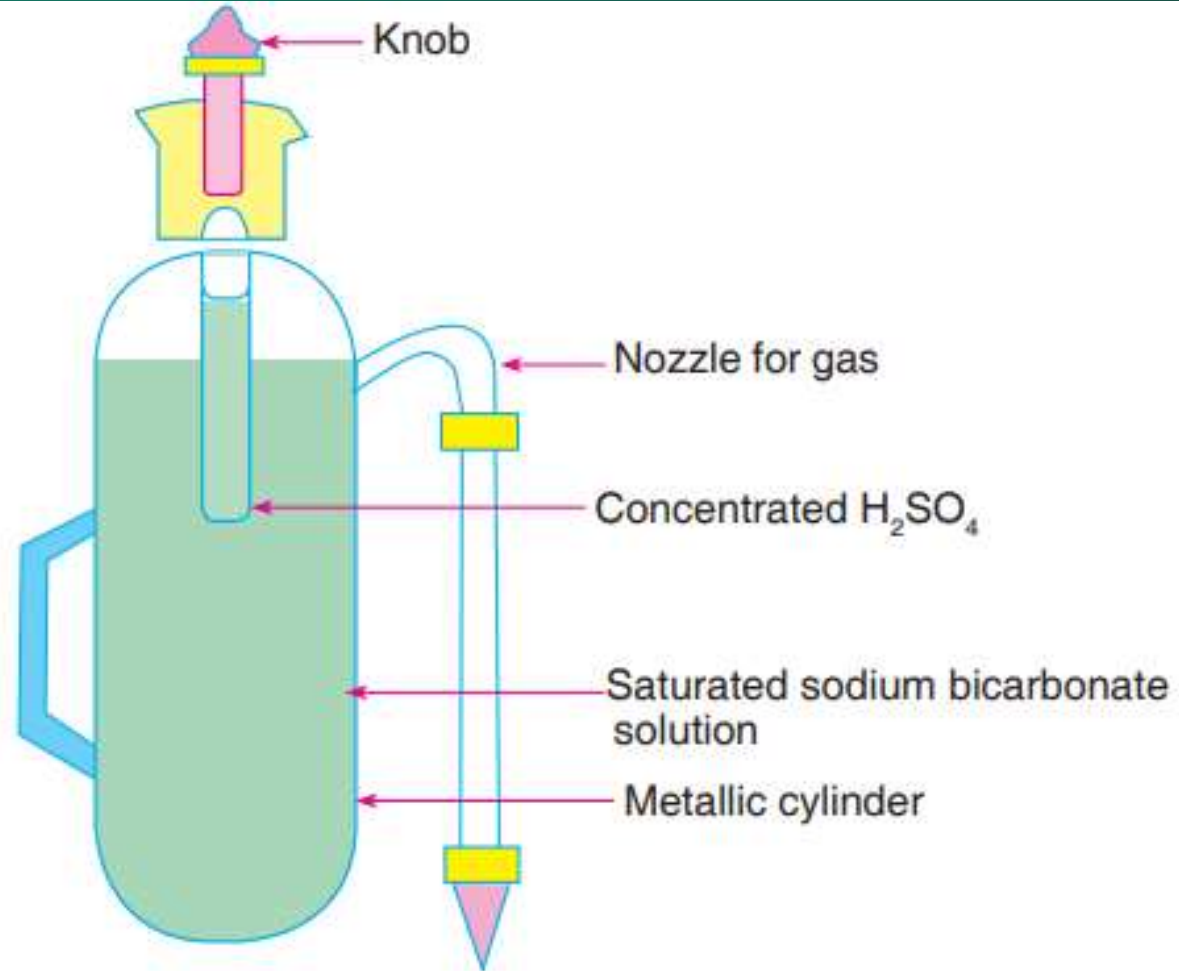
LANTHANIDE

57 138.91	58 140.12	59 140.91	60 144.24	61 (145)	62 150.36	63 151.96	64 157.25	65 158.93	66 162.50	67 164.93	68 167.26	69 168.93	70 173.05	71 174.97
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
LANTHANUM	CERIU	PRASEODYMIUM	NEODYMIUM	PROMETHIUM	SAMARIUM	EUROPIUM	GADOLINIUM	TERBIUM	DYSPROSIUM	HOLMIUM	ERBIUM	THULIUM	YTTTERBIUM	LUTETIUM

ACTINIDE

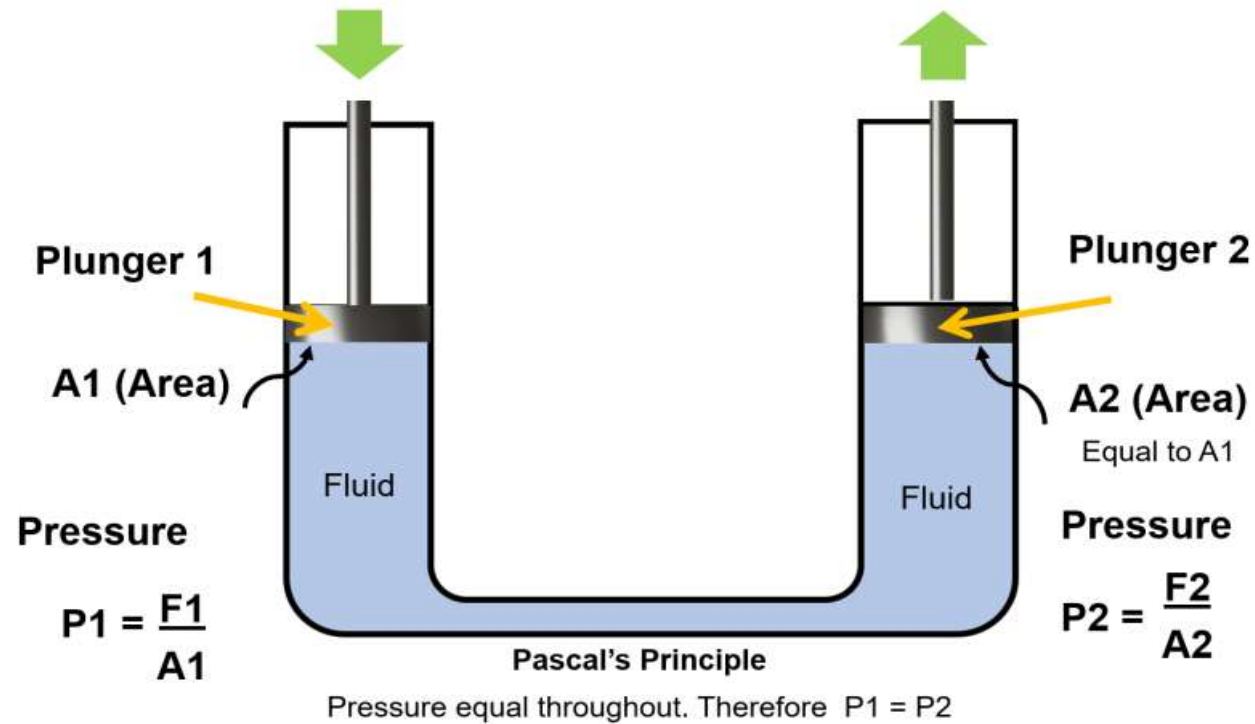
89 (227)	90 232.04	91 231.04	92 238.03	93 (237)	94 (244)	95 (243)	96 (247)	97 (247)	98 (251)	99 (252)	100 (257)	101 (258)	102 (259)	103 (262)
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
ACTINIUM	THORIUM	PROTACTINIUM	URANIUM	NEPTUNIUM	PLUTONIUM	AMERICIUM	CURIUM	BERKELIUM	CALIFORNIUM	ENSTEINIUM	FERMIUM	MENDELEVIUM	NOBELIUM	LAWRENCIUM

Fire Hydrant

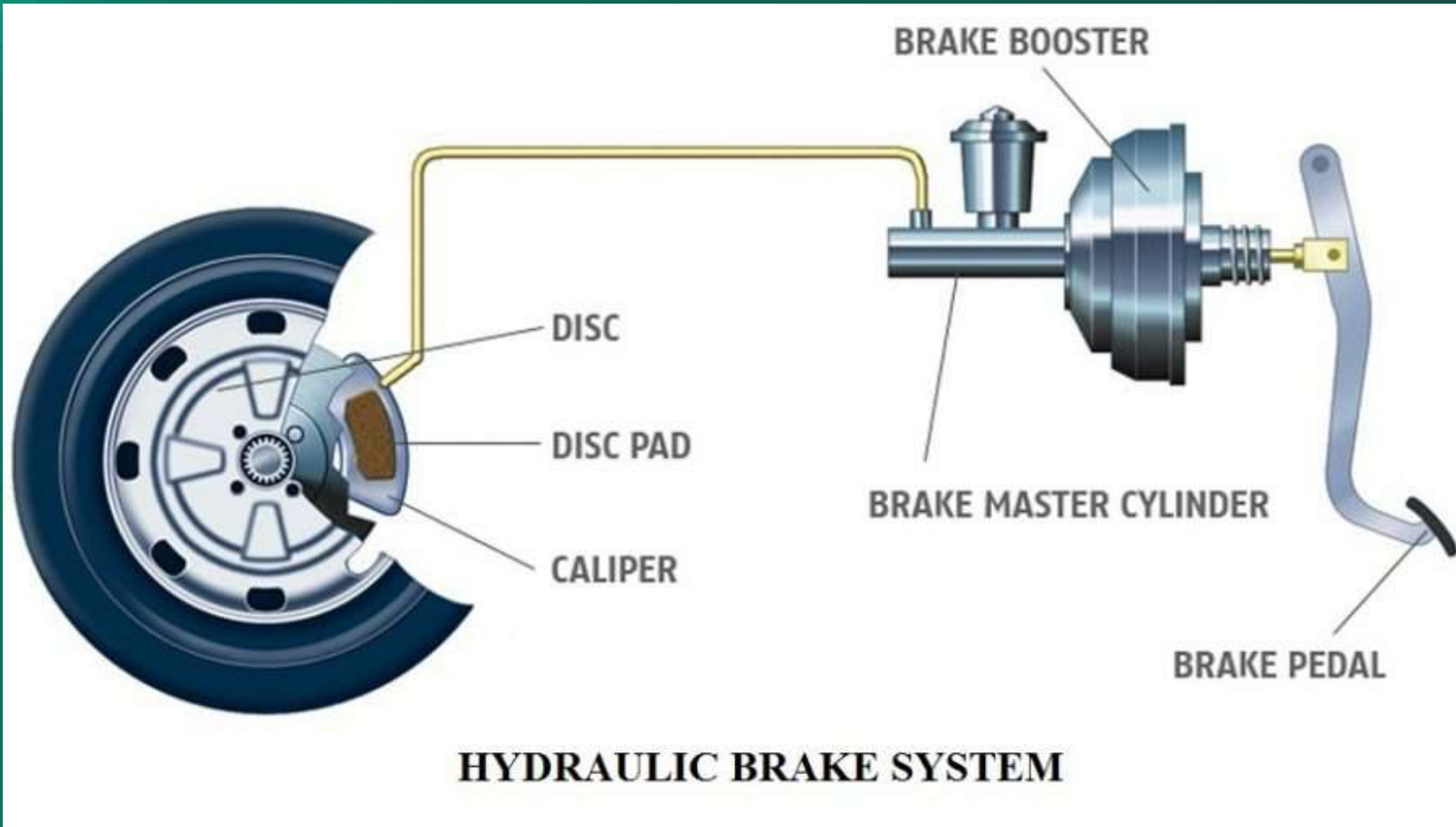


Original Force $F_1 = P_1 \times A_1$

Output Force $F_2 = P_2 \times A_2$
Same as original force

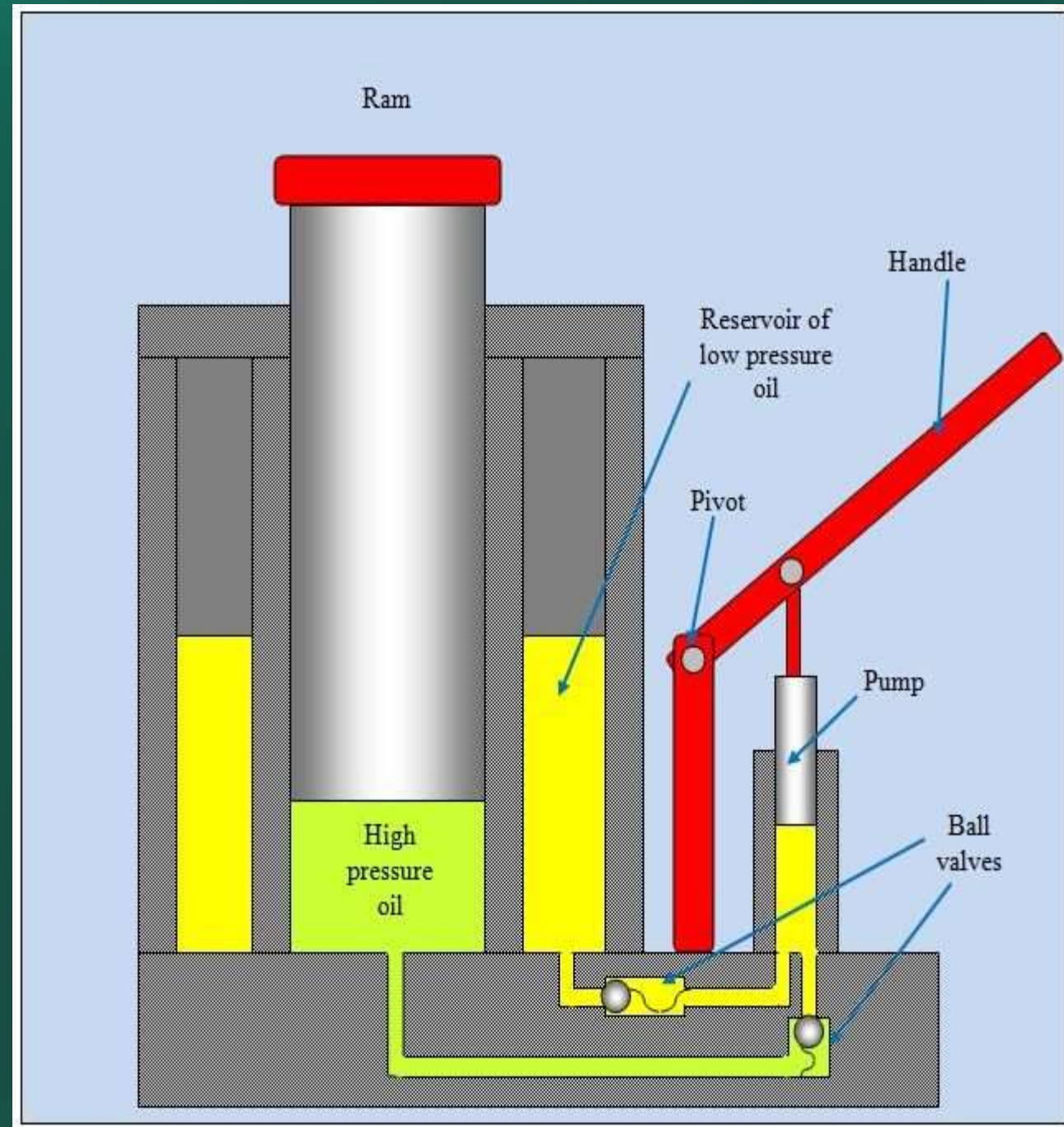


Pascal's

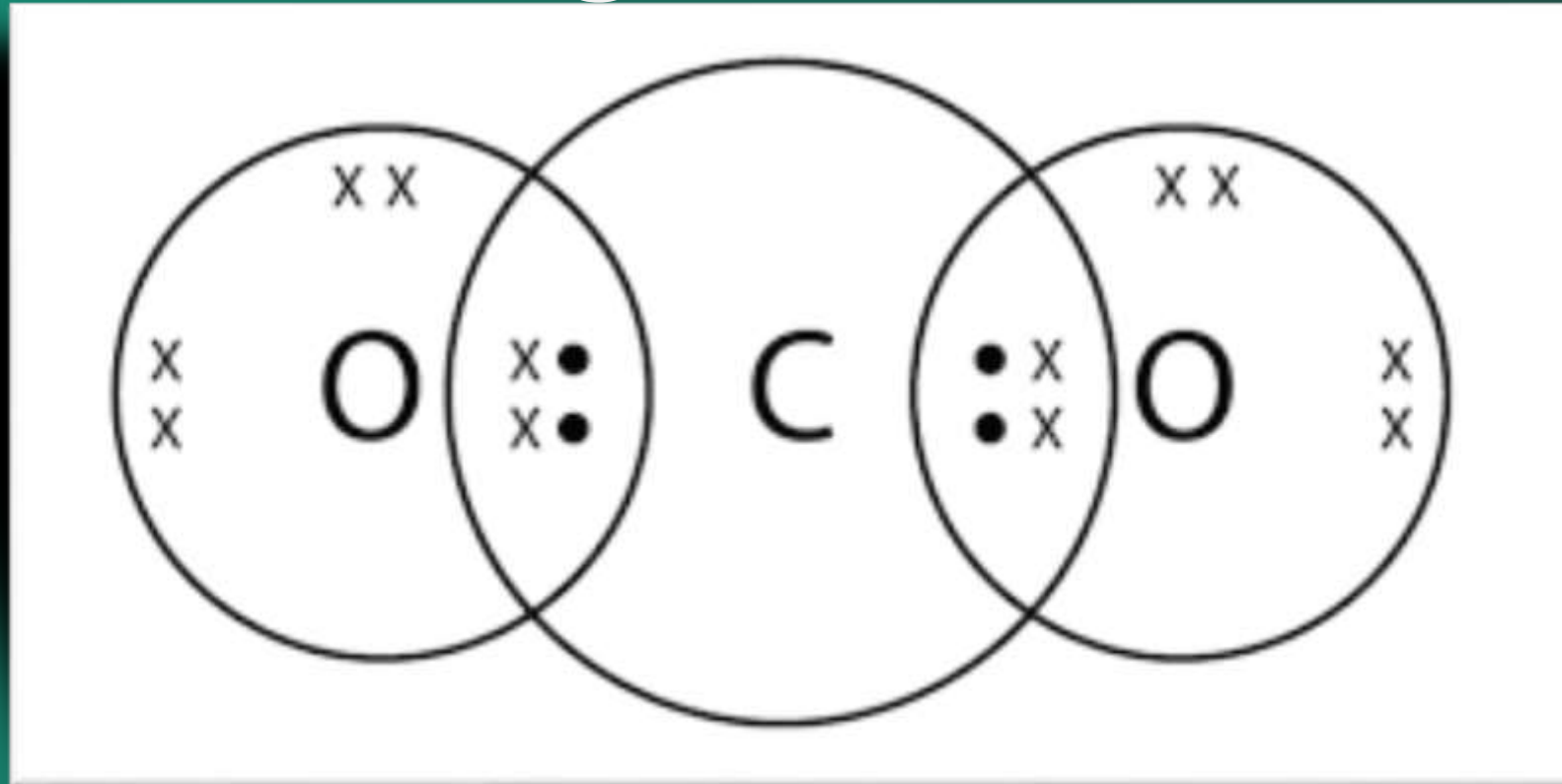


Hydraulic Brake

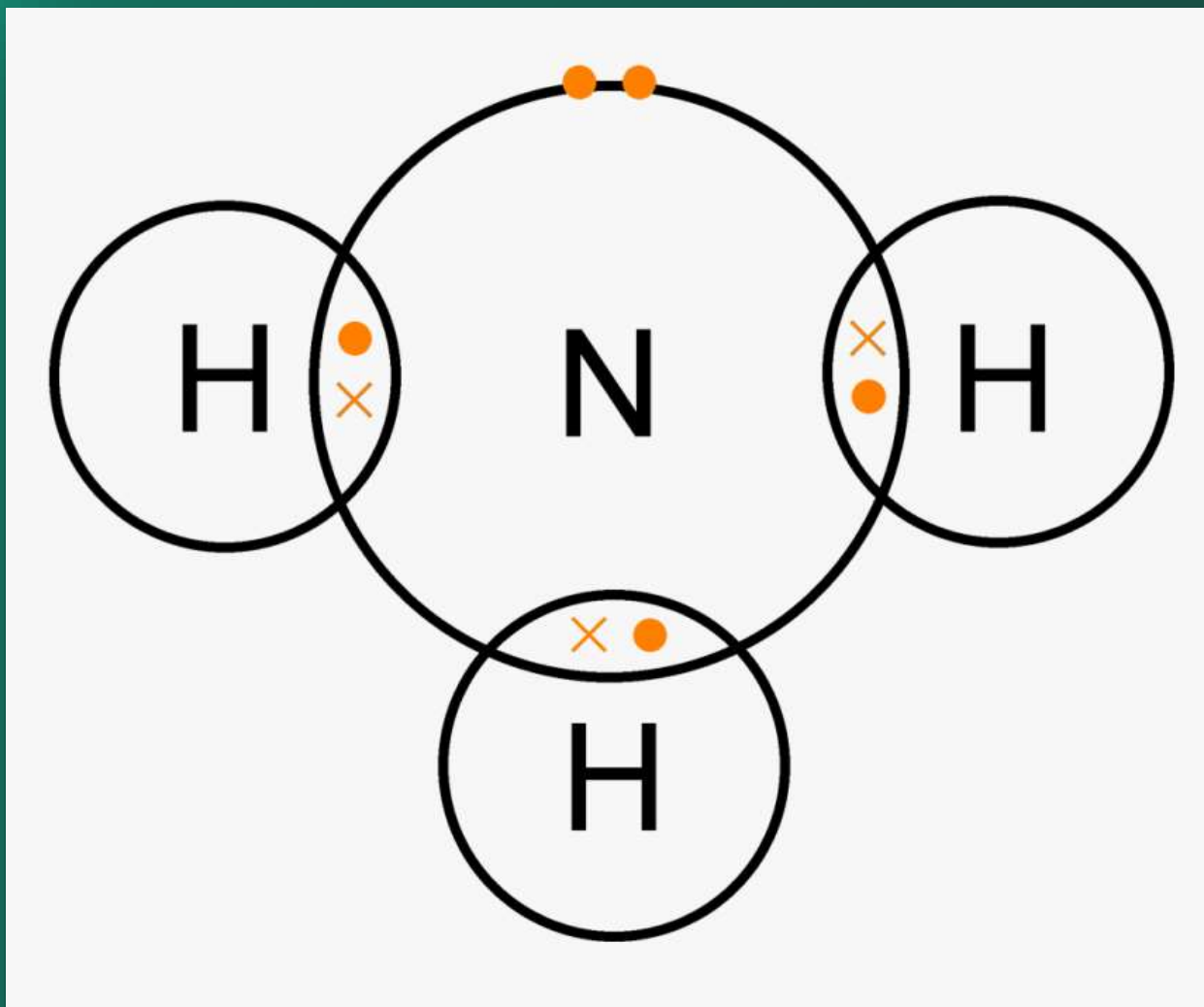
Hydraulic Jack



Electron dot diagram of carbon dioxide



Lewis dot diagram of Ammonia gas



Important Derivations

1. Derive the equation $F = \frac{Gm_1m_2}{d^2}$.

Where,

F = gravitational force

G = gravitational constant

m_1 = mass of the first object

m_2 = mass of the second object

2. Derive the equation $g = \frac{GM}{R^2}$

Where,

g = acceleration due to gravity

G = gravitational constant

M = mass of the planet

R = radius of the planet

3. Derive the relation $Q = msdt$

Where,

- i. 'Q' means the amount of heat lost or gained
- ii. 'm' means the mass of the object that's losing gaining heat
- iii. 'dt' means the temperature change.

4. Derive the relation $F_2 = F_1 \left(\frac{A_2}{A_1} \right)$

Where

- i. F_2 is the weight carried in the second piston and A_2 is the area of the second piston of the hydraulic machine.
- ii. F_1 is the force used in the first piston and A_1 is the area of the first piston of a hydraulic machine.

Important Chemical Formulas And Chemical Equations

1. Principle of laboratory preparation of ammonia gas

Word equation :

Ammonium chloride + Calcium hydroxide $\rightarrow$ Calcium chloride + Water + Ammonia

Balanced equation :



2. Principle of laboratory preparation of carbon dioxide gas

Word equation:

Calcium carbonate + Hydrochloric acid $\rightarrow$ Calcium chloride +
Water + Carbon dioxide

Balanced equation:



3. Acid base reaction

Word equation :

Hydrochloric acid + Sodium hydroxide $\rightarrow$ Sodium chloride + Water

Formula equation : $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

Balanced equation : $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$

4. Double displacement reaction

Word equation :

Sodium chloride + Silver nitrate $\rightarrow$ Silver chloride + Sodium nitrate

Formula equation : $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$

Balanced equation : $\text{NaCl} + \text{AgNO}_3 \rightarrow \text{AgCl} + \text{NaNO}_3$

5. Single displacement reaction

Word equation :

Copper + Silver nitrate $\rightarrow$ Silver + Copper nitrate

Formula equation : $\text{Cu} + \text{AgNO}_3 \rightarrow \text{Ag} + \text{Cu}(\text{NO}_3)_2$

Balanced equation : $\text{Cu} + 2\text{AgNO}_3 \rightarrow 2\text{Ag} + \text{Cu}(\text{NO}_3)_2$

6. Combination reaction

Word equation : Sodium + Chlorine $\rightarrow$ Sodium chloride

Formula equation : $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$

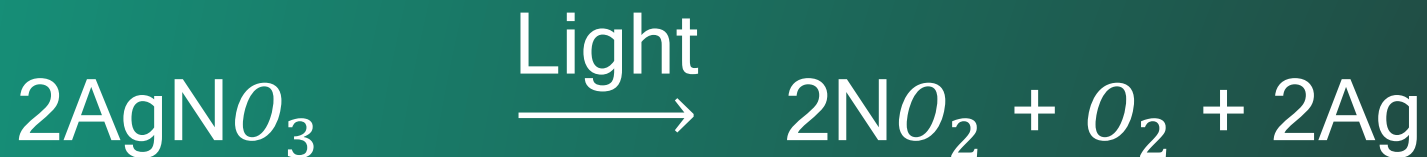
Balanced equation: $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$

7. Decomposition reaction

1. Word equation : Potassium chlorate $\xrightarrow{\Delta}$ Potassium chloride + Oxygen



2. Silver nitrate $\xrightarrow{\text{Light}}$ Nitrogen dioxide + Oxygen + Silver



8. Formation of carbon dioxide inside a fire extinguisher

Word equation :

Sodium bicarbonate + Sulphuric acid $\rightarrow$ Sodium sulphate + Water + Carbon dioxide

Balanced equation :



9. Formation of urea

Word equation : Ammonia + Carbon dioxide $\rightarrow$ Urea + Water

Balanced equation :
$$\text{NH}_3 (\text{g}) + \text{CO}_2 (\text{g}) \xrightarrow[\text{pressure}]{1500^\circ\text{C}} \text{NH}_2\text{-CO-NH}_2$$

10. When a glass rod dipped in hydrochloric acid is introduced in a gas jar that contains ammonia

Word equation : Ammonia + Hydrochloric acid $\rightarrow$ Ammonium chloride

Balanced equation :
$$\text{NH}_3 (\text{g}) + \text{HCl} (\text{aq}) \rightarrow \text{NH}_4\text{Cl} (\text{aq})$$

11. Reaction that occurs inside the fountain experiment to produce liquor ammonia

Word equation : Ammonia + Water $\rightarrow$ Ammonium hydroxide

Balanced equation : $\text{NH}_3 + \text{H}_2\text{O} \rightarrow \text{NH}_4\text{OH}$

12. Formation of acid rain

Word equation : Carbon dioxide + Water $\rightarrow$ Carbonic acid

Balanced equation : $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{CO}_3$

13. Formation of glucose

Word equation : Carbon dioxide + Water $\rightarrow$ Glucose + Oxygen

Balanced equation : $\text{CO}_2 + \text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

14. Erosion of the marble of the castle by acid rain

Word equation :

Calcium carbonate + Sulphuric acid $\rightarrow$ Calcium sulphate + Carbon dioxide + Water

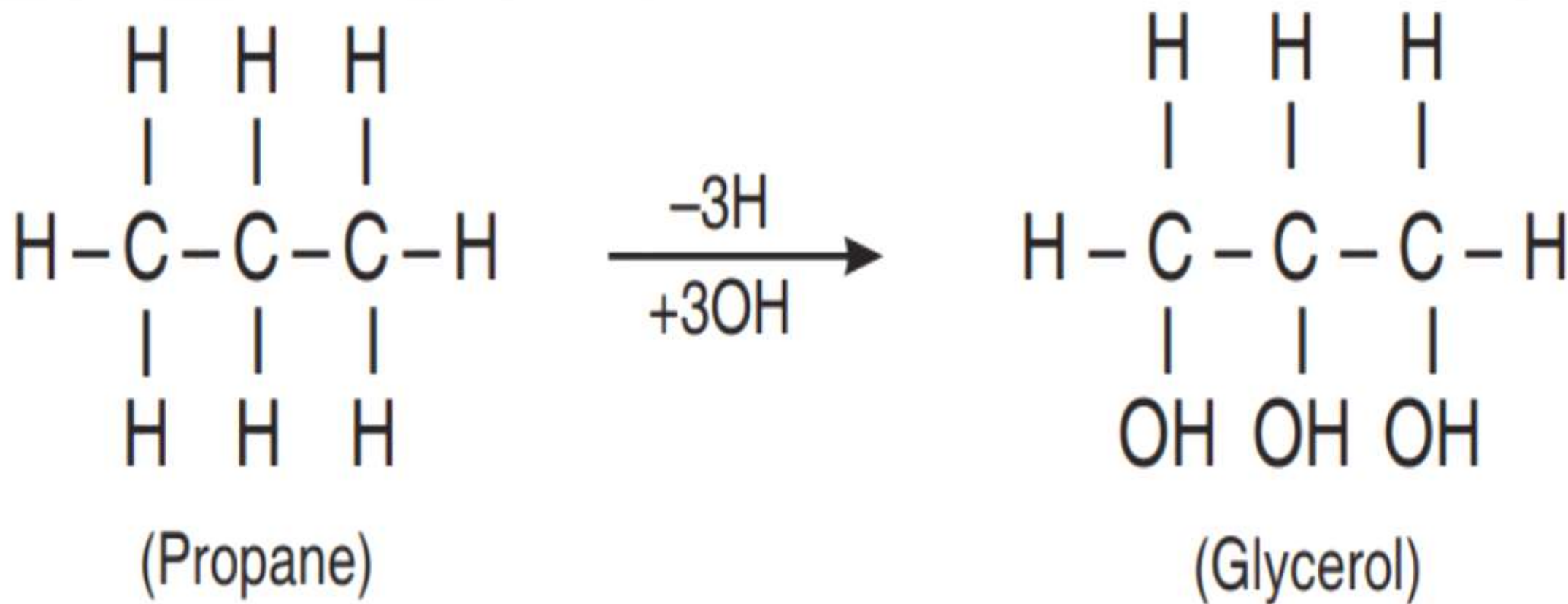
Balanced equation: $\text{CaCO}_3(\text{s}) + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{CaSO}_4(\text{s}) + \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{l})$

15. When alkene receives plenty of hydrogen

Word equation : Alkene + Hydrogen $\rightarrow$ Alkane

Balanced equation : $\text{H}_2\text{C}=\text{H}_2\text{C} + \text{H}_2 \rightarrow \text{C}_2\text{H}_6$

15. When propane loses one hydrogen from each carbon and produces glycerol.



Unit 2 : Classification of Living Things

❖ **Trophophyll**

❖ **Sporophyll**



Unit 3 : Honey bee

Moulting

Histogenesis

Parthenogenesis

Complete metamorphosis

Sex pheromone

Honey production

Spermathecae

Composition of honey

Histolysis

Composition of royal jelly

Apiculture or melittology or apiology

Unit 4 : Heredity

Mitosis

Nucleoside

Meiosis

Nucleotide

Crossing over

Bonds between pair of nitrogen
bases

Cytokinesis

Types of RNA

Karyokinesis

Heterosome

Unit 5 : Blood circulatory system

→ Serum and its use

→ Carboxyhaemoglobin

→ Oxyhaemoglobin

→ Polycythaemia

→ Thrombocytosis

→ Blood group

→ Bradycardia

→ Tachycardia

→ Stethoscope

→ the function of purine:
formation of RNA and DNA

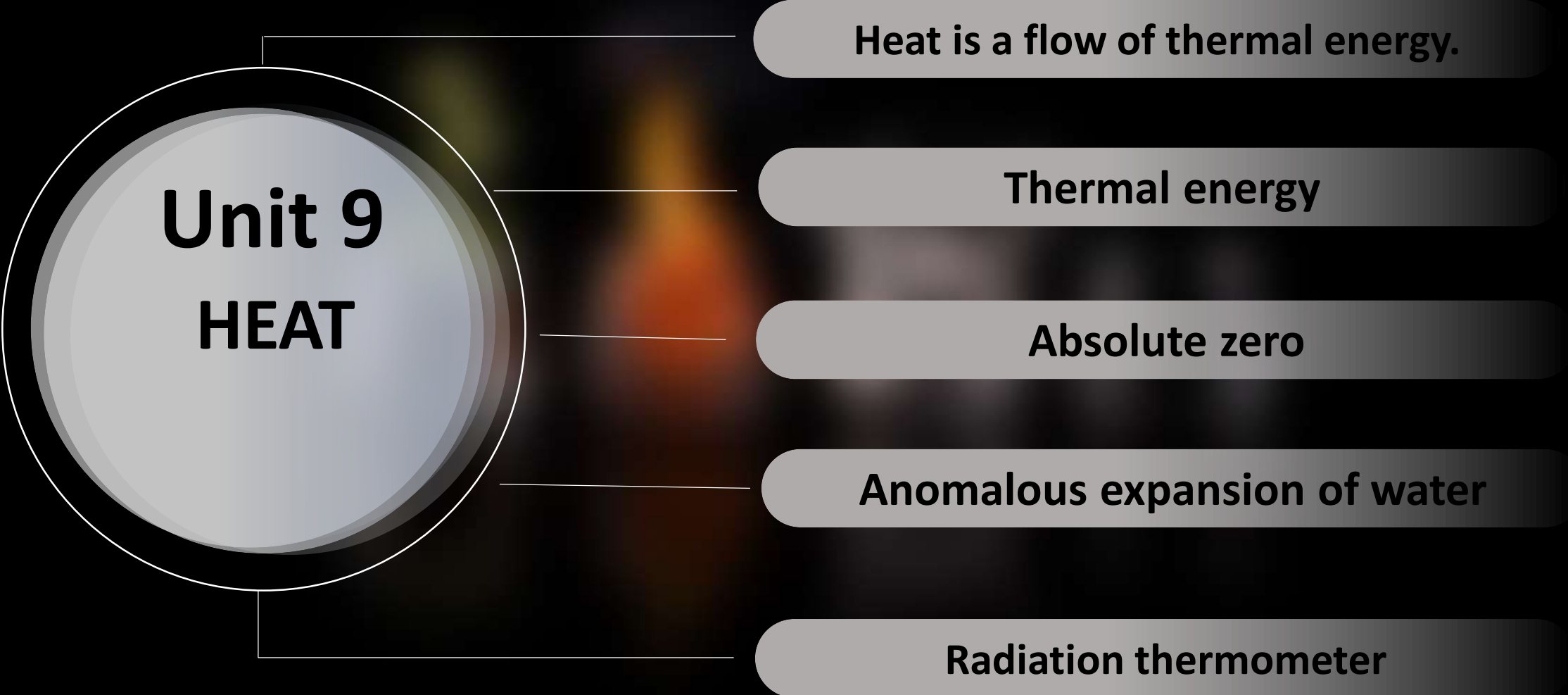
→ Site of formation of urine: liver
and intestine

→ Plaque

→ Types of white blood cells: granular (neutrophil, eosinophil and basophil)
and non-granular (lymphocyte and monocyte)

Unit 5 : Pressure

- → **Transmission of pressure**
- → **Role of intermolecular distance in transmission of pressure**
- → **excavator and hydraulic jack**
- → **hydrometer, lactometer**
- → **Floatation in the atmosphere: hot air balloon,**



Unit 9

HEAT

Heat is a flow of thermal energy.

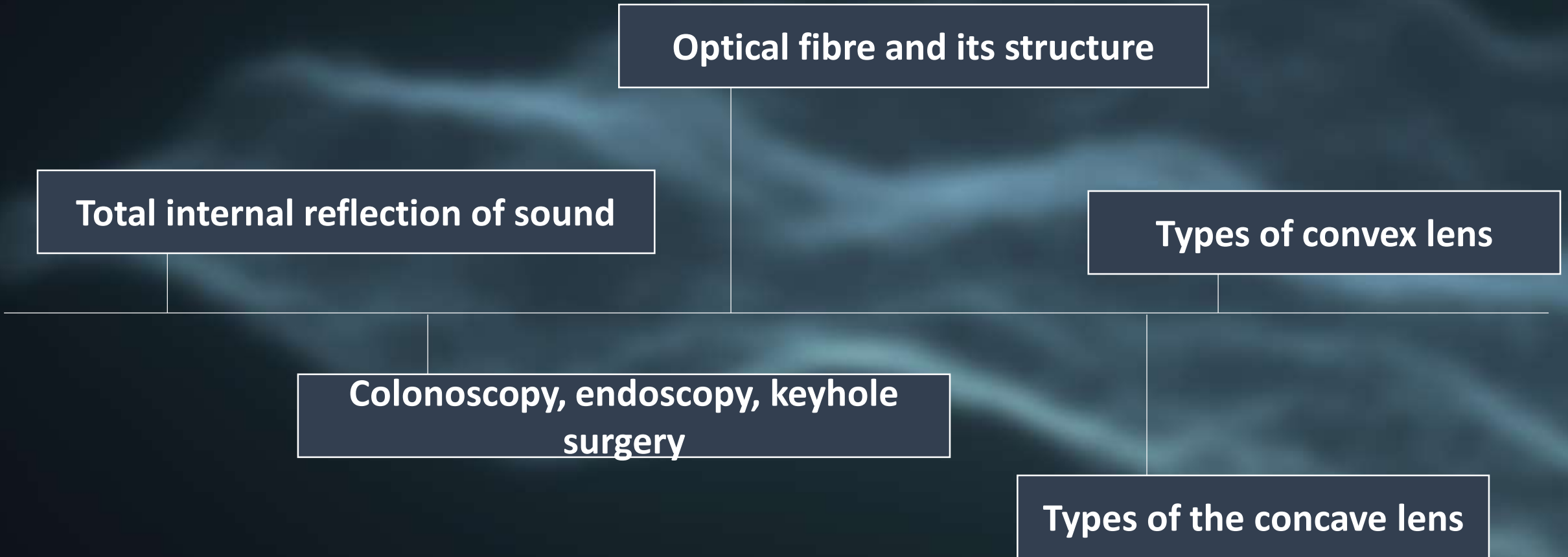
Thermal energy

Absolute zero

Anomalous expansion of water

Radiation thermometer

Unit 10 : WAVE



Unit 10 : Electricity and magnetism

Magnetic field around a solenoid



Current time graph

Maxwell's right-hand grip rule



Voltage and frequency of the current supplied in Nepal

Maxwell's right-hand thumb rule



Rectifier

Unit 14

Classification of elements

1. Metalloid
2. Sub-electronic configuration of valance orbit
3. Electropositivity and electronegativity

Unit 15

Chemical reaction

1. Example of negative catalyst: phosphoric acid (H_3PO_4)

Unit 16 : Some gases

1. Electron dot figure of carbon dioxide
2. Carbogen
3. Acid rain: pH value of monsoon rain = 6
pH value of acid rain 3 to 5

Unit 17: Metals and non-metals



Minerals: characteristics of minerals



Percentage of metal in each chief ore of the metals

Unit 18 : Hydrocarbon

1. IUPAC name of glycerol (propane-1,2,3-triol) and glycol (ethane-1,2-diol)



Thank you