

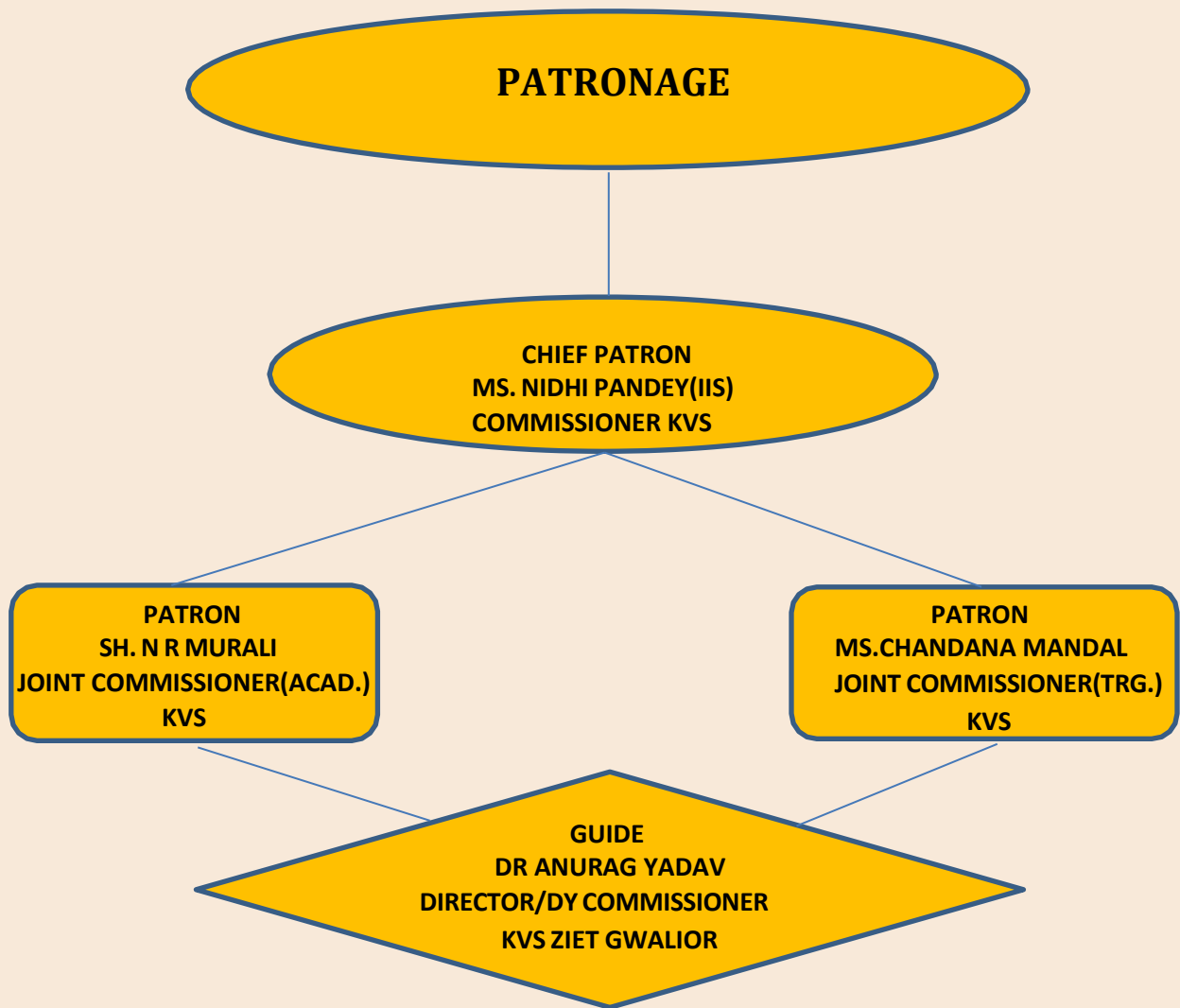


**INTERACTIVE STUDY MATERIAL**

**CLASS X**

**SUBJECT WISE • 2022-23**

**KVS ZIET GWALIOR**



**COMPILED BY: TEAM OF TRAINING ASSOCIATES, KVS ZIET GWALIOR**

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सत् त्वं पूषन् अपावृणु  
केन्द्रीय विद्यालय संगठन



आज़ादी का  
अमृत महोत्सव



INTERACTIVE STUDY MATERIAL

CLASS X SCIENCE 2022-23

**KENDRIYA VIDYALAYA SANGATHAN**  
**ZONAL INSTITUTE OF EDUCATION AND TRAINING**  
**GWALIOR**

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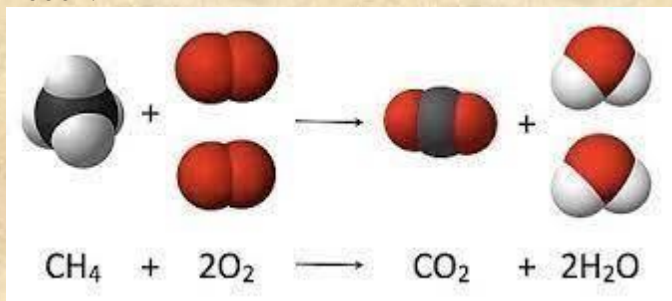


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## CHEMICAL REACTION AND EQUATIONS

### POINTS TO REMEMBER

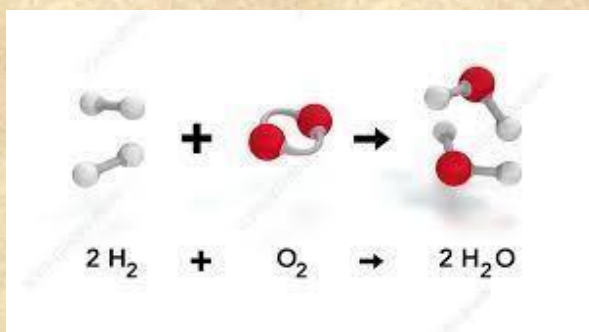
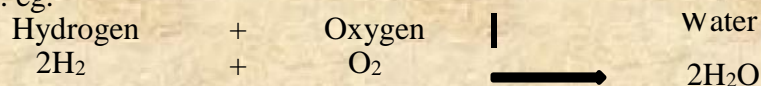
- **Chemical reactions**- The transformation of one chemical substance into another chemical substance with new properties is called a chemical reaction. eg. Burning of Mg ribbon.



- **Characteristics of chemical reactions**- (i) evolution of any gas (ii) change in colour (iii) change in state of substances (iv) change in temp. etc.



- **Chemical Equation**- Symbolic representation of a chemical reaction is called a chemical equation. eg.



- **Balanced chemical equation**- A balanced chemical equation is that equation which has same type of atoms in equal number on reactant side and product side both.

**Hints to Balancing Chemical Equations**

- Adjust the coefficients not the subscripts.
- Even/Odd – Multiply by 2 to make all even.
- Balance polyatomic ions as a whole.
- Check the balanced equation.

**Example:**

$\text{ZnS} + \text{O}_2 \Rightarrow \text{ZnO} + \text{SO}_2$  (O is even on the left and odd on the right)

$\text{ZnS} + \text{O}_2 \Rightarrow 2\text{ZnO} + \text{SO}_2$  (multiply by 2 to make O even)

$2\text{ZnS} + 3\text{O}_2 \Rightarrow 2\text{ZnO} + 2\text{SO}_2$  (balance the Zn, S and O)

**Example:**

$\text{Pb}(\text{NO}_3)_2 + \text{NaCl} \Rightarrow \text{NaNO}_3 + \text{PbCl}_2$  (balance  $\text{NO}_3$  as a whole)  
( $\text{NO}_3$  is even on the left and odd on the right)

$\text{Pb}(\text{NO}_3)_2 + \text{NaCl} \Rightarrow 2\text{NaNO}_3 + \text{PbCl}_2$  (multiply by 2 to make  $\text{NO}_3$  even)

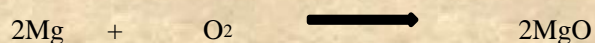
$\text{Pb}(\text{NO}_3)_2 + 2\text{NaCl} \Rightarrow 2\text{NaNO}_3 + \text{PbCl}_2$  (balance the Na)

- **Need to balance a chemical equation**- Because, only a balanced chemical equation obeys the law of conservation of mass.

## VISUAL EXPLANATION

- **Types of chemical reactions**-  
There are four main types of chemical reaction-

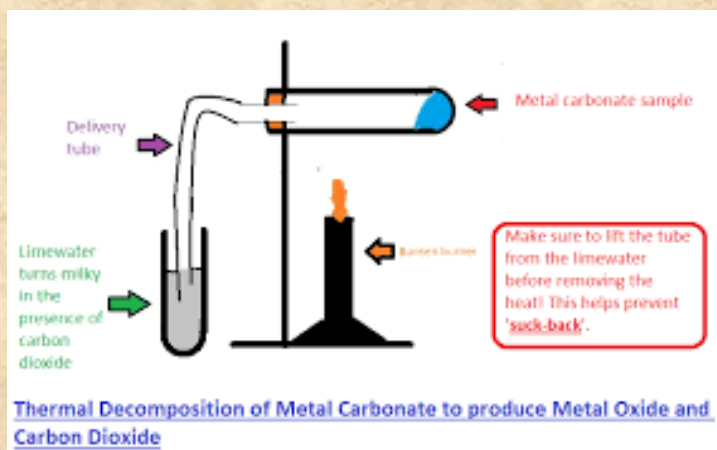
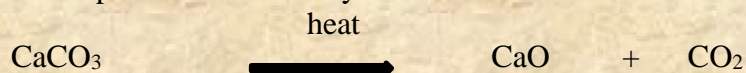
- (a) **Combination reaction**- When two or more reactants combine to form only one product it is called combination reaction.



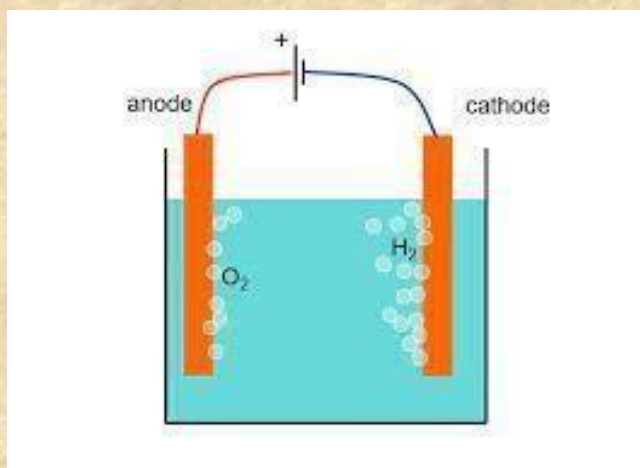
(b) Decomposition reaction- When a single reactant breaks down to form two or more products, it is called decomposition reaction.

Note-all decomposition reactions are endothermic because energy is supplied in the form of heat, sunlight or electricity

1. Thermolysis- when energy is supplied in the form of heat, it is called thermal decomposition or thermolysis.



2. Electrolysis- when energy is supplied in the form of electricity, it is called electrolysis.

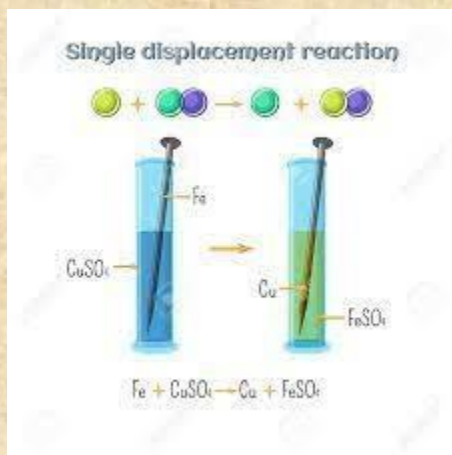
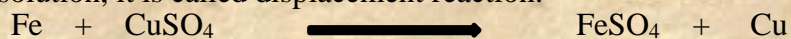




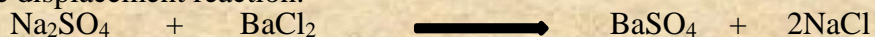
3. Photolysis-when energy is supplied in the form of sunlight, it is called photolysis.



(c) Displacement reaction- When a more reactive metal displaces a less reactive metal from its salt solution, it is called displacement reaction.



(d) Double displacement reaction- when in a reaction, ions exchange takes place, it is called double displacement reaction.



For detailed video on types of reactions, please

**VISUAL EXPLANATION**

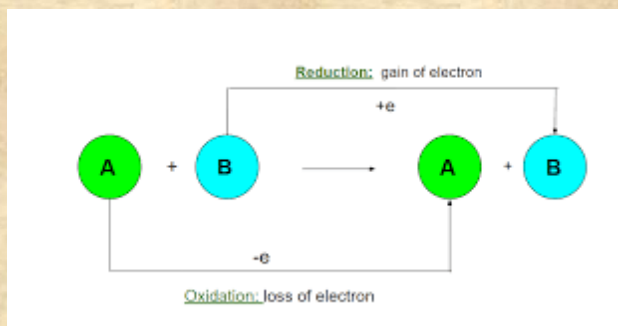
- **Oxidation**-Addition of oxygen or loss of hydrogen or Increase in oxidation number.



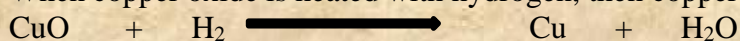
- **Reduction**- Removal of oxygen or addition of hydrogen or Decrease in oxidation number.



The reaction in which oxidation and reduction both take place simultaneously is called **Redox reaction**.



When copper oxide is heated with hydrogen, then copper metal and hydrogen are formed.



To watch a video on oxidation and reduction, please

## VISUAL EXPLANATION

- **Rancidity**-when oil and fat are oxidized, their smell and taste become foul and the food is said to be rancid. This process is called rancidity. To slow down the process of rancidity, antioxidants are added to food. For eg  $\text{N}_2$ , Butylated hydroxy anisole (BHA)



- **Corrosion**- when a metal is attacked by substances around it like acid base or moisture, it is said to be corroded and this process is called corrosion.eg. Rusting of iron.



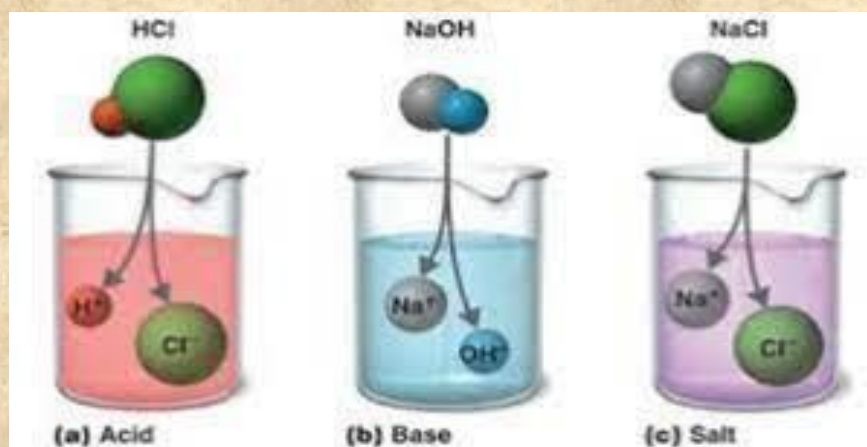
watch a video on corrosion and rancidity, please

## **VISUAL EXPLANATION**

## ACIDS BASES AND SALTS

### Topics in the Chapter

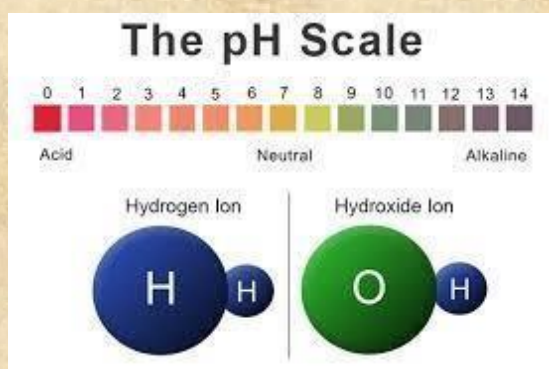
- Introduction
- Properties of Acids
- Properties of Bases
- Types of Indicators and its properties
- Reaction of Acids and Bases with Metals
- Reaction of Acids with Metal Carbonates
- Reaction of Acids and Bases with each other
- Reaction of Metallic Oxides with Acids
- Reaction of a Non-metallic Oxide with Base
- Similarities between all Acids and all Bases
- Acid or Base in Water Solution
- Strength of Acids and Base solutions



## **POINTS TO REMEMBER**

- Acid-base indicators are dyes or mixtures of dyes which are used to indicate the presence of acids and bases.
- Acidic nature of a substance is due to the formation of  $H^+$  (aq) ions in solution.
- Formation of  $OH^-$  (aq) ions in solution are responsible for the basic nature of a substance.
- When an acid reacts with a metal, hydrogen gas is evolved and a corresponding salt is formed.
- When a base reacts with a metal, along with the evolution of hydrogen gas a salt is formed which has a negative ion composed of the metal and oxygen.
- When an acid reacts with a metal carbonate or metal hydrogen carbonate, it gives the corresponding salt, carbon dioxide gas and water.
- Acidic and basic solutions in water conduct electricity because they produce hydrogen and hydroxide ions respectively.
- The strength of an acid or an alkali can be tested by using a scale called the pH scale (0-14) which gives the measure of hydrogen ion concentration in a solution.
- A neutral solution has a pH of exactly 7, while an acidic solution has a pH less than 7 and a basic solution a pH more than 7.
- Living beings carry out their metabolic activities within an optimal pH range.
- Mixing concentrated acids or bases with water is a highly exothermic process.
- Acids and bases neutralise each other to form corresponding salts and water.
- Water of crystallisation is the fixed number of water molecules present in one formula unit of a salt.
- Salts have various uses in everyday life and in industries.

## **VISUAL EXPLANATION**



## ACIDS :

- These are the substances which have sour taste.
- They turn blue litmus solution red.
- They give  $H^+$  ions in aqueous solution.
- The term 'acid' has been derived from the Latin word, acidus, which means sour.

**Strong Acids :**  $HCl$ ,  $H_2SO_4$ ,  $HNO_3$

**Weak Acids :**  $CH_3COOH$ , Oxalic acid, Lactic acid

**Concentrated Acid :** Having more amount of acid + less amount of water

**Dilute Acid :** Having more amount of water + less amount of acid

## BASES :

- These are the substances which are bitter in taste and soapy in touch.
- They turn red litmus solution blue.
- They give  $OH^-$  ions in aqueous solution.

**Strong Bases :**  $NaOH$ ,  $KOH$ ,  $Ca(OH)_2$

**Weak Bases :**  $NH_4OH$

**Alkalis :** These are bases which are soluble in water [ $NaOH$ ,  $KOH$ ,  $Ca(OH)_2$ ].

## SALTS :

These are the compounds formed from reaction of acid and base.

*Example :*  $KCl$ ,  $NaCl$ ,



## INDICATORS :

These are the substances which change their colour/smell in different types of substances.

in plants.  
**Natural indicators**

- Found in nature
- Litmus, red cabbage leaves extract, flowers of hydrangea plant, turmeric

## TYPES OF INDICATORS

substances.  
**Synthetic indicators**

- These are chemical
- Methyl orange, phenolphthalein

have different odour  
**Olfactory indicators**

- These substances in acid and bases.

	S. No.	Indicator	Smell/Colour in acidic solution	Smell/Colour in basic solution
<b>Indicator</b> <b>Natural</b>	1.	Litmus	Red	Blue
	2.	Red cabbage leaf extract	Red	Green
	3.	Flower of hydrangea plant	Blue	Pink
	4.	Turmeric	No change	Red
<b>Synthetic</b> <b>Indicator</b>	1.	Phenolphthalein	Colourless	Pink
	2.	Methyl orange	Red	Yellow
<b>Olfactory</b> <b>Indicator</b>	1.	Onion	Characteristic smell	No smell
	2.	Vanilla essence	Retains smell	No smell
	3.	Clove oil	Retains smell	Loses smell

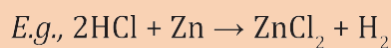
**VISUAL EXPLANATION**

## CHEMICAL PROPERTIES OF ACIDS AND BASES

### Reaction of Metals with

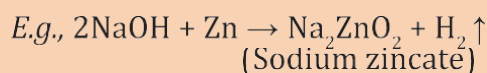
#### Acids

Acid + Metal  $\rightarrow$  Salt + Hydrogen gas



#### Bases

Base + Metal  $\rightarrow$  Salt + Hydrogen gas

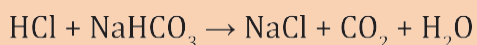
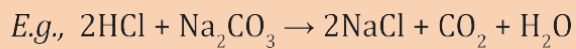


- \* Hydrogen gas released can be tested by bringing burning candle near gas bubbles, it burst with pop sound.

### Reaction of Metal Carbonates/Metal Hydrogen Carbonates with

#### Acids

Acid + Metal Carbonate/ Metal Hydrogen Carbonate  $\rightarrow$  Salt +  $\text{CO}_2$  +  $\text{H}_2\text{O}$



#### Bases

Base + Metal Carbonate/  
Metal Hydrogen Carbonate

$\rightarrow$  No Reaction

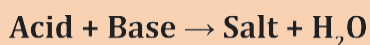
- \*  $\text{CO}_2$  can be tested by passing it through lime water.



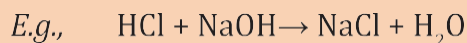
- \* When excess  $\text{CO}_2$  is passed,



### Reaction of Acids and Bases With Each Other



**Neutralisation Reaction** : Reaction of acid with base is called as neutralization reaction.



IF :

Strong Acid + Weak Base  $\rightarrow$  Acidic salt +  $\text{H}_2\text{O}$

Weak Acid + Strong Base  $\rightarrow$  Basic salt +  $\text{H}_2\text{O}$

Strong Acid + Strong Base  $\rightarrow$  Neutral salt +  $\text{H}_2\text{O}$

Weak Acid + Weak Base  $\rightarrow$  Neutral salt +  $\text{H}_2\text{O}$

**VISUAL EXPLANATION**



## Reaction of Metallic Oxides with Acids

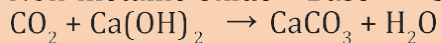
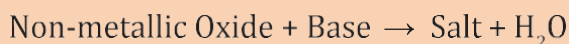
Metallic oxides are basic in nature.

*E.g.*, CaO, MgO are basic oxides.

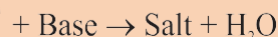
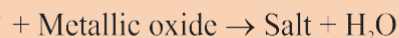
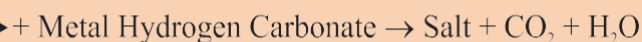


## Reaction of Non-metallic Oxides with Bases

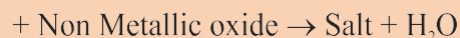
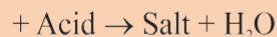
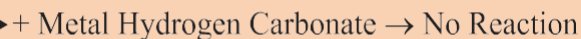
Non-metallic oxides are acidic in nature.



### Reaction Of Acid

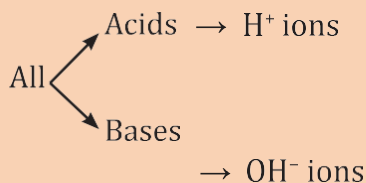


### Reaction Of Base



## What do all Acids and Bases have in common

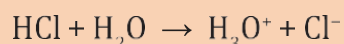
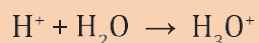
- All acids have  $\text{H}^+$  ions in common.
- Acids produce  $\text{H}^+$  ions in solution which are responsible for their acidic properties.
- All bases have  $\text{OH}^-$  (hydroxyl ions) in common.



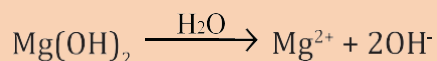
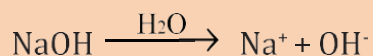
**VISUAL EXPLANATION**

### Acid or Base in Water Solution

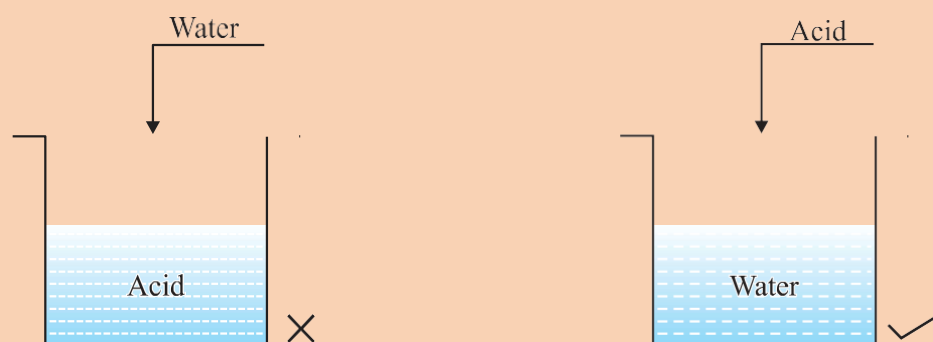
- Acids produce  $H^+$  ions in presence of water.
- $H^+$  ions cannot exist alone, they exist as  $H_3O^+$  (hydronium ions).



Bases when dissolved in water gives  $OH^-$  ions.



- Bases soluble in water are called alkali.
- While diluting acids, it is recommended that the acid should be added to water and not water to acid because the process of dissolving an acid or a base in water is highly exothermic.



If water is added to acid, the heat generated may cause the mixture to splash out and cause burns and the glass container may also break due to excessive local heating.

#### Adding water to acid may

Cause mixture to splash out

Break the glass container

Mixing an acid or a base with  $H_2O$  results in decrease of concentration of ions ( $H_3O^+/OH^-$ ) per unit volume. Such a process is called as dilution.

### Strength of Acid and Base

Strength of acid or base can be estimated using universal indicator.

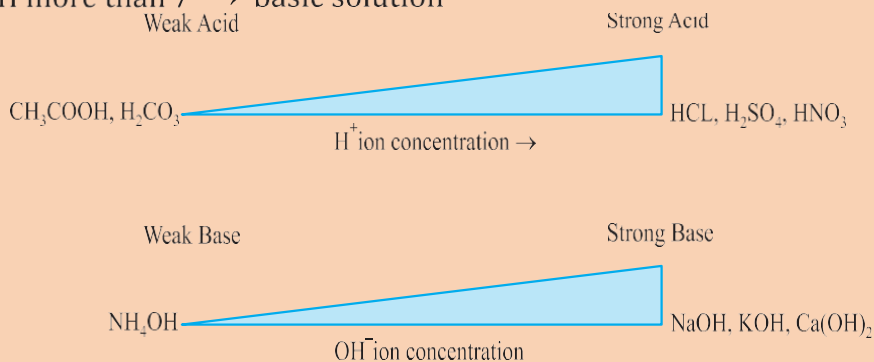
**Universal indicator :** is a mixture of several indicators. It shows different colours at different concentrations of  $H^+$  ions in the solution.

**pH Scale :** A scale for measuring  $H^+$  ion concentration in a solution p in pH stands for 'potenz' a German word which means power.

pH = 7  $\rightarrow$  neutral solution

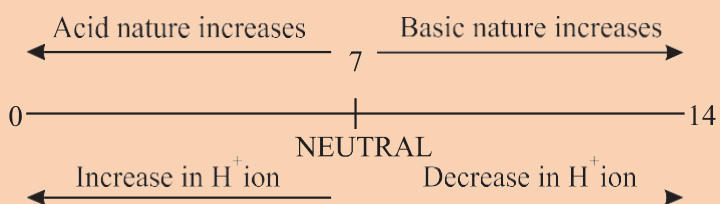
pH less than 7  $\rightarrow$  acidic solution

pH more than 7  $\rightarrow$  basic solution



On diluting an acid : pH increases  $\uparrow$

On diluting a base : pH decreases  $\downarrow$



[Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]

### Importance of pH in everyday life

1. Plants and animals are pH sensitive
  - Our body works within the pH range of 7-7.8.
  - When pH of rain water is less than 5.6, it is called acid rain.
2. pH of the soil
  - Plants require a specific pH range for their healthy growth.

**VISUAL EXPLANATION**

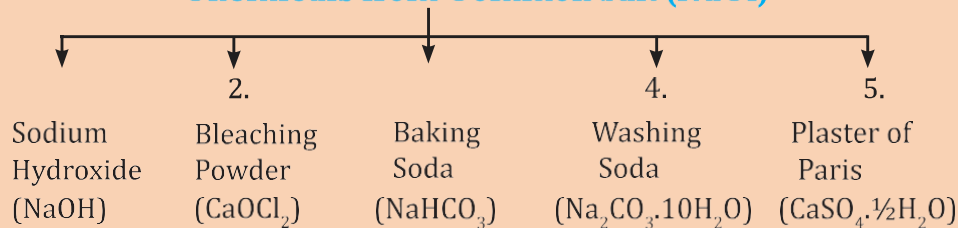
3. pH in our digestive system
- Our stomach produces HCl acid which helps in digestion.
  - During indigestion, stomach produces more acid and cause pain and irritation.
  - To get rid of this pain, people uses antacid (mild base) like milk of magnesia [ $\text{Mg}(\text{OH})_2$ ] to neutralize excess acid.
4. pH change as cause of tooth decay
- Tooth decay starts when pH of mouth is lower than 5.5.
  - Tooth enamel made up of calcium phosphate (hardest substance in body) does not dissolve in water but corrodes when pH is lower than 5.5 due to acids produced by degradation of food particles by bacteria.
  - Using toothpaste (generally basic) tooth decay can be prevented.
5. Self defence by animals and plants through chemical warfare
- (a) Bee sting leaves an acid which cause pain and irritation. Use of a mild base like baking soda on stung area gives relief.
- (b) Stinging hair of nettle leaves inject methanoic acid causing burning Sensation or pain. Rubbing with leaf of dock plant give relief.

### pH of Salts :

- (i) Strong Acid + Strong Base  $\rightarrow$  Neutral Salt : pH = 7
- (ii) Salt of strong acid + Weak base  $\rightarrow$  Acidic salt : pH < 7
- (iii) Salt of strong base + Weak acid  $\rightarrow$  Basic salt : pH > 7

**VISUAL EXPLANATION**

## Chemicals from Common Salt (NaCl)



**1. Sodium Hydroxide (NaOH) :** When electricity is passed through an aqueous solution of NaCl (brine), it decompose to form NaOH. (Chlor-alkali process)



At anode : Cl<sub>2</sub> gas

At cathode : H<sub>2</sub> gas

Near cathode : NaOH solution is formed.

### Uses :

H<sub>2</sub> : Fuels, margarine

Cl<sub>2</sub> : Water treatment, PVC, CFC's

HCl : Cleaning steels, medicines

NaOH : Degreasing metals, soaps and paper making

Cl<sub>2</sub> + NaOH → Bleach : Household bleaches, bleaching fabrics

**2. Bleaching Powder (CaOCl<sub>2</sub>):** It is produced by the action of chlorine on dry slaked lime.



### Uses :

(a) Bleaching cotton and linen in textile industry.

(b) Bleaching wood pulp in paper factories.

(c) Oxidizing agent in chemical industries.

(d) Disinfecting drinking water.

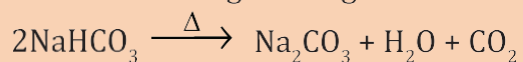
**3. Baking Soda (Sodium Hydrogen Carbonate) (NaHCO<sub>3</sub>) :**



Baking soda

**VISUAL EXPLANATION**

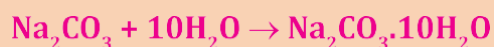
- It is mild non-corrosive base.
- When it is heated during cooking :



#### Uses :

- For making baking powder (mixture of baking soda and tartaric acid). When baking powder is heated or mixed with water,  $\text{CO}_2$  is produced which causes bread and cake to rise making them soft and spongy.
- An ingredient in antacid.
- Used in soda acids, fire extinguishers.

**4. Washing Soda ( $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ ) :** Recrystallization of sodium carbonate gives washing soda. It is a basic salt.



#### Uses :

- In glass, soap and paper industry.
- Manufacture of borax.
- Cleaning agent for domestic purposes.
- For removing permanent hardness of water.

**5. Plaster of Paris (Calcium sulphate hemihydrates) ( $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$ ) :**

On heating gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) at 373K, it loses water molecules and becomes Plaster of Paris (POP).

It is a white powder and on mixing with water it changes to gypsum.



#### Uses :

- Doctors use POP for supporting fractured bones.
- For making toys, material for decoration.
- For making surfaces smooth.

**Water of Crystallization :** It is a fixed number of water molecules present in one formula unit of a salt.

for eg 1.  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$     2.  $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$



**VISUAL EXPLANATION**

## **METALS AND NON-METALS**

- At present there are 118 known elements.
- There are similarities as well as differences in the properties of these elements.
- On the basis of their properties, elements can be divided into metals and non-metals.



### **Physical Properties of Metals**

#### Physical State

- All metals are solids at room temperature.
- Exceptions: Mercury and gallium are liquids at room temperature.

#### Lustre

- All metals in their pure state have a shine and can be polished to give a highly reflective surface.

#### Malleability

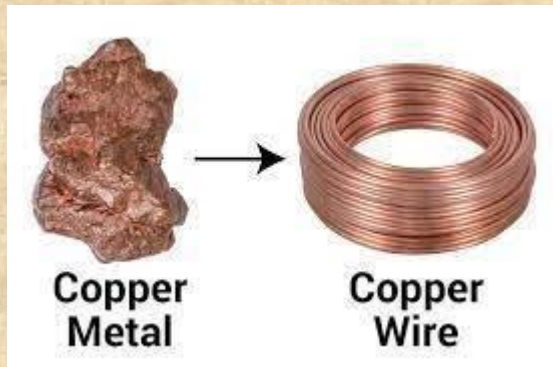
- Metals have the ability to withstand high tensile strength and can be made into thin sheets. This property of metals is called malleability.



## Ductility

- Metals can also be drawn into thin wires. The ability of metals to be drawn into wires is called ductility.

Example: Gold and silver are the most ductile metals.



## Conduction of Heat

- Metals are good conductors of heat and have high melting points. Example: Silver and copper are very good conductors of electricity.
- Exceptions: Lead and mercury are poor conductors of heat.





## Conduction of Electricity

- Metals are good conductors of electricity.
- All electric wires are made of copper.



## Hardness

- Metals are generally hard, and their hardness varies from metal to metal.
- Alkali metals such as sodium and potassium are soft metals and can be easily cut with a knife.



## Melting & Boiling Points

- Metals usually have high melting and boiling points.
- Tungsten has the highest melting point whereas sodium and potassium have low melting points.

### What is the trend in melting and boiling points?

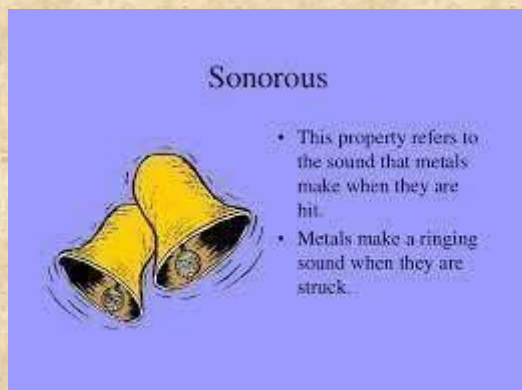
The melting points and boiling points of alkali metals decrease going down the group.

Element	Melting point (°C)	Boiling point (°C)
lithium	181	1342
sodium	98	883
potassium	64	760
rubidium	39	686
caesium	28	671

The melting and boiling points decrease going down group 1 because the atoms get larger. Melting points are lower than for typical, transition, metals, because alkali metals only have 1 electron in their outer shell. Not much heat energy is needed for this electron to be lost.

## Sonorous

- Metals which produce a sound on striking a hard surface are said to be sonorous.



## Physical Properties of Non-Metals

- Non-metals are either in the solid or gaseous state.  
Exception: Bromine is an exception which exists in the liquid state.
- Non-metals do not have lustre.  
Exception: Iodine crystals are lustrous.
- They do not possess the property of hardness.  
Exception: Carbon in the form of diamond is the hardest substance, which has a high melting and boiling point.
- Non-metals are poor conductors of heat and electricity.  
Exception: Graphite, an allotrope of carbon conducts electricity.

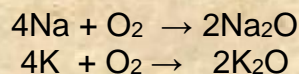


## Chemical Properties of Metals

### Reaction of Metals with Oxygen

Almost all metals react with oxygen to form metal oxides.

- Sodium and Potassium are the most reactive and react with oxygen present in the air at room temperature to form the oxides.



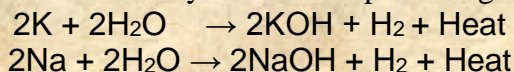
ii. Magnesium does not react with oxygen at room temperature, but on heating, it burns in the air with intense light and heat to form magnesium oxide.



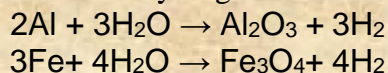
### Reaction of Metals with Water

Metals react with water to produce metal oxides with the release of hydrogen gas. But all metals do not react with water.

i. Metals such as sodium and potassium react vigorously with cold water to lead to evolution of hydrogen, which immediately catches fire producing a large quantity of heat.



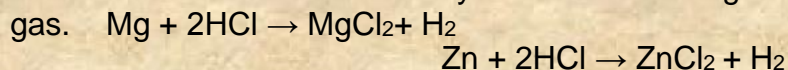
ii. Metals such as aluminium, zinc and iron do not react with cold or hot water, but they react with steam to form metal oxides and hydrogen.



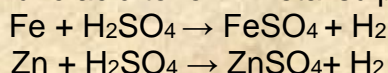
### Reactions of Metals with Acids

Metals react with acids to form salt and hydrogen gas.

i. Metals react with dilute hydrochloric acid to give metal chloride and hydrogen gas.

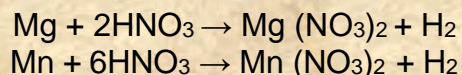


ii. Metals react with sulphuric acid to form metal sulphate and hydrogen gas.



iii. Metals react with nitric acid, but hydrogen gas is not evolved since nitric acid is a strong oxidising agent. So, it oxidises the hydrogen to water and itself gets reduced to a nitrogen oxide.

But magnesium and manganese react with dilute nitric acid to evolve hydrogen gas.

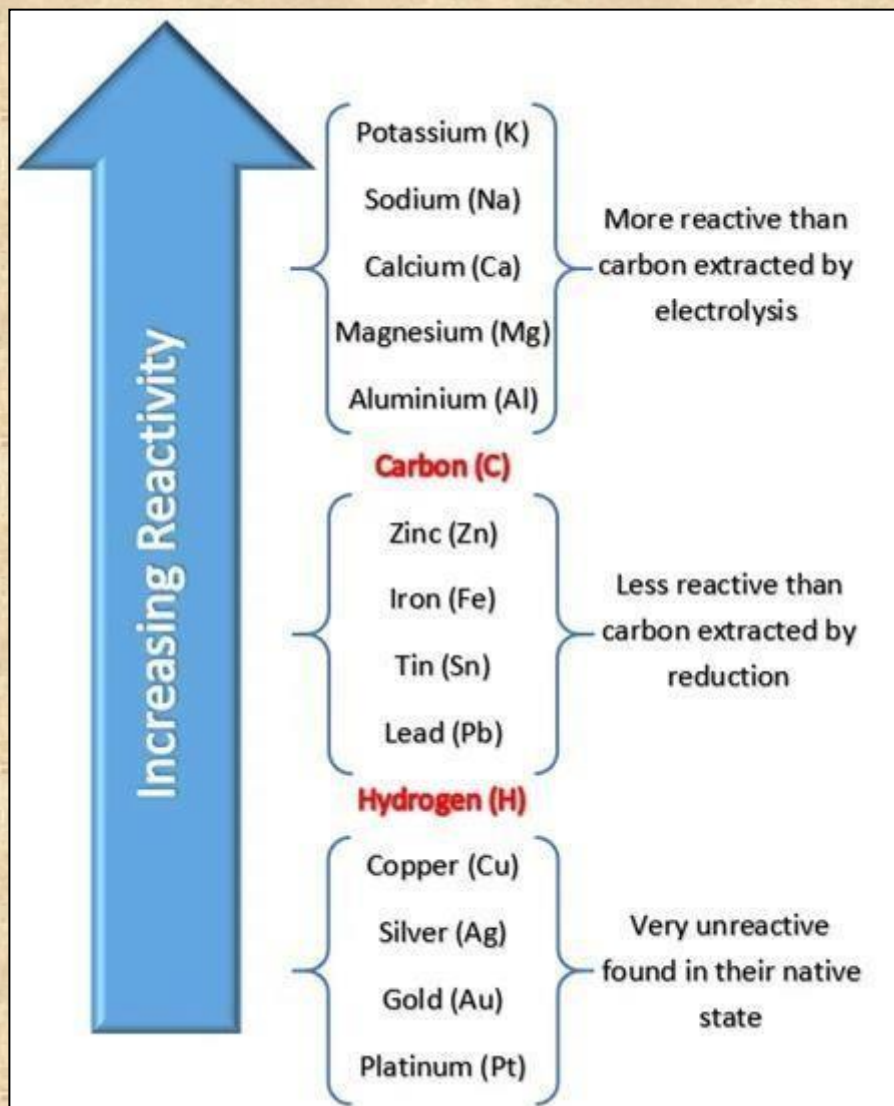


LINK IS GIVEN EXPLAINING THE TOPIC: -

**[VISUAL EXPLANATION](#)**

# Reactivity Series

The arrangement of metals in the order of decreasing reactivities is called the reactivity series of metals.

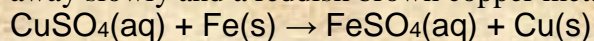


## Reactions of Metals with Solutions of Other Metal Salts

A more reactive metal displaces a less reactive metal from its salt solution.

For example:

When an iron nail is placed in a copper sulphate solution, the blue colour of  $\text{CuSO}_4$  fades away slowly and a reddish brown copper metal is formed.



HERE IS THE LINK REGARDING PRACTICAL WAY OF LEARNING THE PROPERTIES OF METALS AND NON METALS:-

[\*\*VISUAL EXPLANATION\*\*](#)

## Reaction of Metals with Chlorine

Metals react with chlorine to form metal chlorides. For example:

- i. Sodium readily reacts with chlorine to form ionic chloride called sodium chloride.  $2\text{Na(s)} + \text{Cl}_2\text{(g)} \rightarrow 2\text{NaCl(s)}$
- ii. Calcium reacts vigorously with chlorine to form calcium chloride.  
 $\text{Ca(s)} + \text{Cl}_2\text{(g)} \rightarrow 2\text{CaCl}_2\text{(s)}$

## Properties of Ionic Compounds

- Ionic compounds are hard solids, due to the strong force of attraction between the positive and negative ions.
- They are generally brittle and break into pieces when pressure is applied.
- Ionic compounds have high melting and boiling points, since a large amount of energy is required to break the strong intermolecular attractions.
- They are soluble in water, but insoluble in solvents such as kerosene, petrol, etc.
- They do not conduct electricity in a solid state, because electrostatic forces of attraction between ions in the solid state are very strong but conduct electricity in the fused (or in the aqueous state) because these forces weaken in the fused (or in solution) state so that their ions become mobile.

## Metallurgy

THIS VIDEO EXPLAINS METALLURGY:-

### VISUAL EXPLANATION

**Minerals:** The naturally occurring compounds of metals, along with other impurities are known as minerals.

**Ores:** The minerals from which metals are extracted profitably and conveniently are called ores.

**Gangue:** Earthly impurities including silica, mud, etc. associated with the ore are called gangue.

**Metallurgy:** The process used for the extraction of metals in their pure form from their ores is referred to as metallurgy.

## Extraction of Metals

- The reactivity of elements differs for different metals.
- Three major steps involved in the extraction of metals from their ores are:

## Enrichment of Ores

- The ores of metals are usually contaminated with a large amount of impurities such as sand, soil, etc. called gangue.
- Before extracting the metal from an ore, it is necessary to remove these impurities.
- The method used for removing gangue from the ore depends on the differences between the physical and chemical properties of the gangue and the ore.

## Conversion of Concentrated Ore into Metal

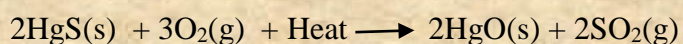
- The extraction of a metal from its concentrated ore is essentially a process of reduction of the metal compound present in the ore.
- The method of reduction to be used depends on the reactivity of the metal to be extracted.

- **Extraction of Less Reactive Metals**

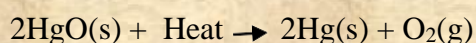
Metals at the bottom of the reactivity series are not very reactive and the oxides of these metals can be reduced by heating the ore itself.

### Extraction of Mercury

Cinnabar, an ore of mercury is first heated in the air and is converted into mercuric oxide.



Mercuric oxide is then reduced to mercury on further heating.



**Fig : Cinnabar**

**VISUAL EXPLANATION**

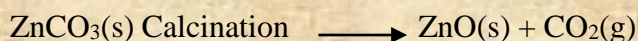
## • Extraction of Moderately Reactive Metals

- o The moderately reactive metals in the middle of the reactivity series are extracted by the reduction of their oxides with carbon, aluminium, sodium or calcium.
- o It is easier to obtain metals from their oxides (by reduction) than from carbonates or sulphides. So, before reduction can be done, the ore is converted into a metal oxide.
- o The concentrated ores can be converted into metal oxides by the process of calcination or roasting.

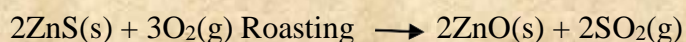
Calcination is the process in which a carbonate ore is heated strongly in the absence of air to convert it into a metal oxide.

For example:

When zinc carbonate is heated strongly in the absence of air, it decomposes to form zinc oxide and carbon dioxide.



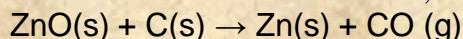
Roasting is the process in which a sulphide ore is strongly heated in the presence of air to convert it into a metal oxide.



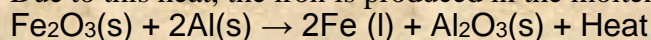
The metal oxides are converted to free metal by using reducing agents such as carbon, aluminium, sodium or calcium.

For example:

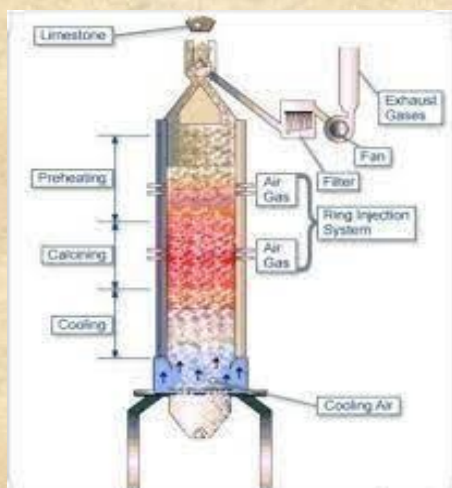
- o The metal zinc is extracted by the reduction of zinc oxide with carbon. Thus, when zinc oxide is heated with carbon, zinc is produced.



- o Aluminium reduces iron oxide to produce the metal iron with the evolution of heat. Due to this heat, the iron is produced in the molten state.



The reaction of iron (III) oxide with aluminium is used to join railway tracks or cracked machine parts. This reaction is known as the thermite reaction.



## Extraction of Highly Reactive Metals

Metals high up in the reactivity series are very reactive.

These metals have a strong affinity for oxygen. So, oxides of sodium, magnesium, calcium and aluminium cannot be reduced by carbon.

These metals are obtained by electrolytic reduction.

Sodium, magnesium and calcium are obtained by the electrolysis of their molten chlorides.

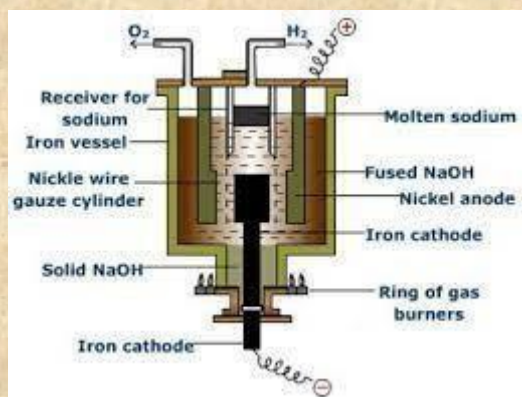
For example:

Sodium metal is extracted by the electrolytic reduction of molten sodium chloride.  $2\text{NaCl(l)}$

Electrolysis  $2\text{Na(s)} + \text{Cl}_2\text{(g)}$

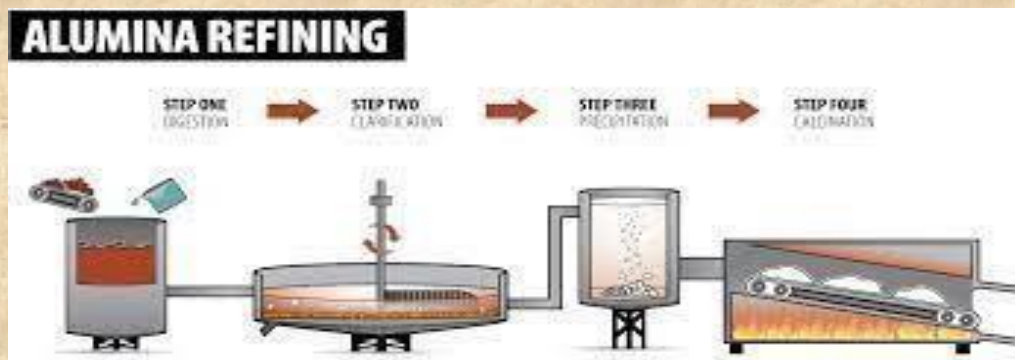
At Cathode:  $\text{Na}^+ + \text{e}^- \rightarrow \text{Na}$

At Anode:  $2\text{Cl}^- \rightarrow \text{Cl}_2 + 2\text{e}^-$



## Refining of Metals

- The most widely used method for refining impure metals is electrolytic refining.
- Electrolytic refining means refining by electrolysis. Metals such as copper, zinc, tin, lead, chromium, nickel, silver and gold are refined electrolytically.
- For refining an impure metal by electrolysis:
  - o A thick block of impure metal is made the anode.
  - o A thin strip of pure metal is taken as the cathode.
  - o A water soluble salt is taken as the electrolyte.
  - o On passing current through the electrolyte, the impure metal from the anode dissolves into the electrolyte.
  - o An equivalent amount of pure metal from the electrolyte is deposited on the cathode.
  - o The soluble impurities go into the solution, whereas the insoluble impurities settle down at the bottom of the anode and are known as the 'anode mud'.





## Corrosion

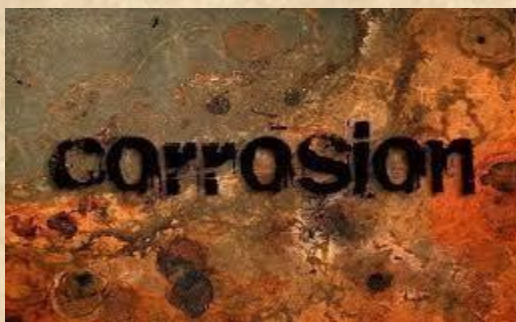
- When the surface of a metal is attacked by air, moisture or any other substance around it, the metal is said to corrode and the phenomenon is known as corrosion.
- Copper forms a green deposit on its surface when exposed to moist air. This green substance is nothing but copper carbonate.
- Iron reacts with moist air to acquire a coating of brown flaky substance called rust which is hydrated iron (III) oxide ( $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ ).
- Conditions necessary for rusting of iron
  - i. Presence of air (or oxygen)
  - ii. Presence of water (or moisture)

## Prevention of Corrosion

Corrosion of metals can be prevented if the contact between the metal and air is cut off. This can be done by the following methods:

- i. Galvanising: It is the process of giving coating a thin layer of zinc on iron or steel to protect them from corrosion. Example: shiny nails, pins. etc.
- ii. Tinning: It is a process of coating tin over other metals.
- iii. Electroplating: In this method, a metal is coated with another metal using electrolysis. Example: silver plated spoons, gold plated jewellery etc.
- iv. Alloying: An alloy is a homogeneous mixture of two or more metals or a metal and a non-metal in a definite proportion. The resultant metals, called alloys do not corrode easily. For example:
  - o Brass (copper and zinc)
  - o Bronze (copper and tin)
  - o Stainless steel (iron, nickel, chromium and carbon)

[CLICK HERE](#) FOR DETAILED EXPLANATION OF CORROSION AND ITS PREVENTION



### Introduction :

- The element carbon is non-metal. Its symbol is C.
- Carbon is a versatile element the percentage of carbon present in earth crust in form of mineral is 0.02% and in atmosphere as CO<sub>2</sub> is 0.03%.
- All the living things, plants and animals are made up of carbon based compounds.

### Carbon always form covalent bonds :

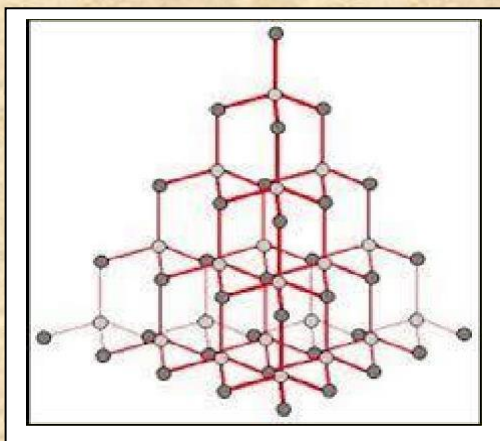
The atomic number of carbon is 6.

Electronic configuration :

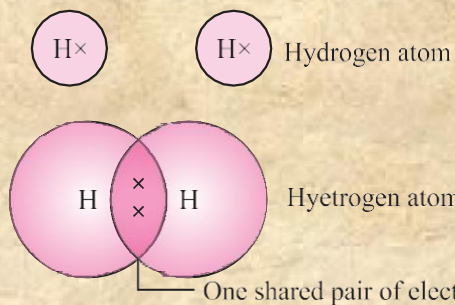
	K	L
C (6)	2	4

### How carbon attain noble gas configuration ?

- Carbon is tetravalent, it does not form ionic bond by either losing four electrons (C<sup>4+</sup>) or by gaining four electrons (C<sup>4-</sup>). It is difficult to hold four extra electron and would require large amount of energy to remove four electrons. So, carbon can form bond by sharing of its electrons with the electrons of other carbon atom or with other element and attain noble gas configuration.
- The atoms of other elements like hydrogen, oxygen and nitrogen, chlorine also form bonds by sharing of electrons.
- The bond formed by sharing of electrons between same or different atoms is covalent bond.

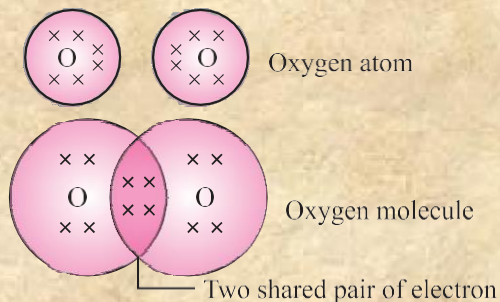


(i)  $H_2$



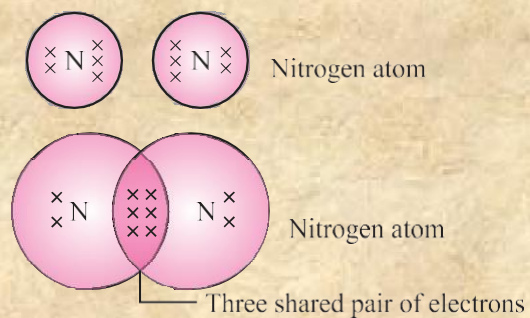
**H – H single bond between hydrogen atoms**

(ii)  $O_2$



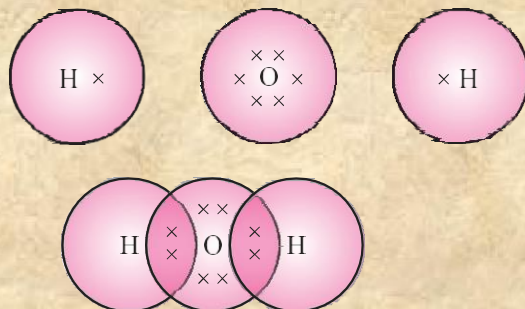
**O = O double bond between oxygen atoms**

(iii)  $N_2$



**N ≡ N triple bond between nitrogen atoms**

Molecule of water has single covalent bond between one oxygen and two hydrogen atoms.



**VISUAL EXPLANATION**

## Physical Properties of Covalent Compounds

- Covalent compounds have low melting and boiling points as they have weak intermolecular force.
- They are generally poor conductor of electricity as electrons are shared between atoms and no charged particles are formed.

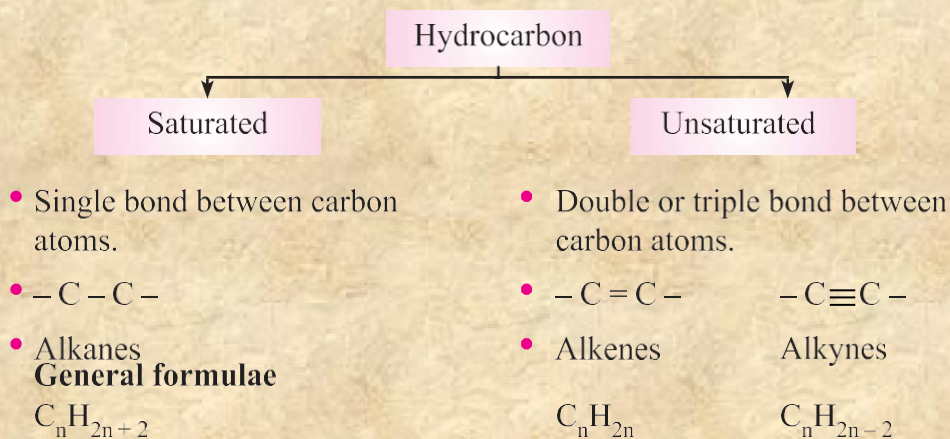
## Versatile Nature of Carbon

The two characteristic properties of carbon element which lead to the formation of large number of compounds :

- Catenation** : Carbon can link with carbon atoms by means of covalent bonds to form long chains, branched chains and closed ring compound. Carbon atoms may be linked by single, double or triple bonds.
- Tetravalency** : Carbon has 4 valence electrons. Carbon can bond with four carbon atoms, monovalent atoms, oxygen, nitrogen and sulphur.

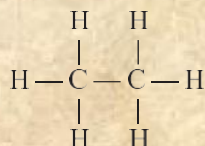
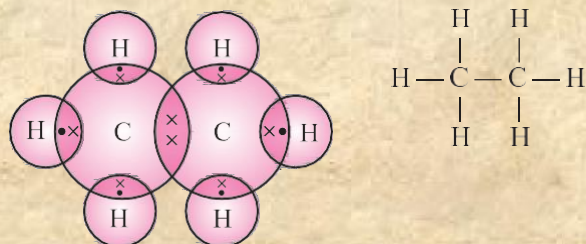
## Saturated and Unsaturated Carbon Compounds

Compounds made up of hydrogen and carbon are called hydrocarbon.



## Electron Dot Structure of Saturated Hydrocarbons

Ethane  $C_2H_6$



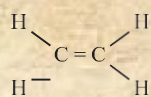
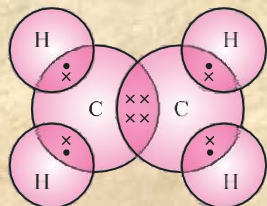
The names, molecular formulae and saturated formulae of saturated hydrocarbons (alkanes) are given below :

**VISUAL EXPLANATION**

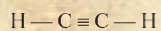
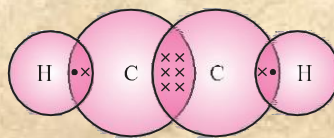
Name of Hydrocarbon	Molecular formula	Structural Formula
1. Methane	CH <sub>4</sub>	$\begin{array}{c} \text{H} \\   \\ \text{H}-\text{C}-\text{H} \\   \\ \text{H} \end{array}$
2. Ethane	C <sub>2</sub> H <sub>6</sub>	$\begin{array}{c} \text{H} \quad \text{H} \\   \quad   \\ \text{H}-\text{C}-\text{C}-\text{H} \\   \quad   \\ \text{H} \quad \text{H} \end{array}$
3. Propane	C <sub>3</sub> H <sub>8</sub>	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \\   \quad   \quad   \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\   \quad   \quad   \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$
4. Butane	C <sub>4</sub> H <sub>10</sub>	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\   \quad   \quad   \quad   \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\   \quad   \quad   \quad   \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \end{array}$
5. Pentane	C <sub>5</sub> H <sub>12</sub>	$\begin{array}{c} \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \\   \quad   \quad   \quad   \quad   \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{C}-\text{C}-\text{H} \\   \quad   \quad   \quad   \quad   \\ \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \quad \text{H} \end{array}$

### Electron Dot Structure of Unsaturated Hydrocarbons

Ethene C<sub>2</sub>H<sub>4</sub>



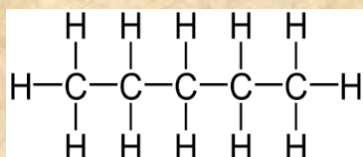
Ethyne C<sub>2</sub>H<sub>2</sub>



Name of Hydrocarbon	Molecular formula	Structural Formula
<b>Alkenes :</b>		
1. Ethene	$C_2H_4$	$  \begin{array}{c}  H \quad H \\    \quad   \\  H - C = C - H \\    \quad   \\  H \quad H  \end{array}  $
2. Propene	$C_3H_6$	$  \begin{array}{c}  \quad \quad H \quad H \\  \quad \quad   \quad   \\  H - C = C - C - H \\    \quad \quad   \\  H \quad \quad H  \end{array}  $
3. Butene	$C_4H_8$	$  \begin{array}{c}  \quad \quad \quad H \quad H \\  \quad \quad \quad   \quad   \\  H - C = C - C - C - H \\    \quad   \quad   \quad   \\  H \quad H \quad H \quad H  \end{array}  $
<b>Alkynes :</b>		
1. Ethyne	$C_2H_2$	$H - C \equiv C - H$
2. Propyne	$C_3H_4$	$  \begin{array}{c}  \quad \quad H \\  \quad \quad   \\  H - C \equiv C - C - H \\    \\  H  \end{array}  $
3. Butyne	$C_4H_6$	$  \begin{array}{c}  \quad \quad \quad H \quad H \\  \quad \quad \quad   \quad   \\  H - C \equiv C - C - C - H \\    \quad \quad   \\  H \quad \quad H  \end{array}  $

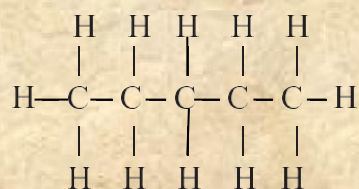
### Carbon Compounds on the Basis of Structure

(i) Straight (unbranched) chain

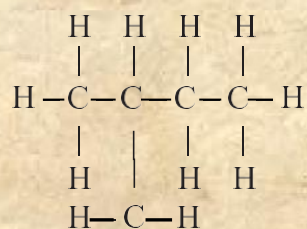


## (ii) Branched

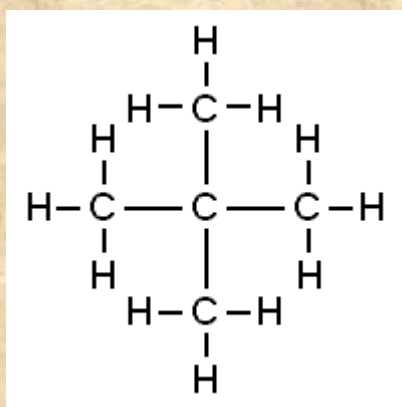
### Isomerism of $C_5H_{12}$ (Pentane)



n-pentane



iso-pentane

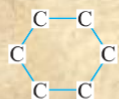


Neo-pentane

VISUAL EXPLANATION

These three above compounds has same molecular formula but different structures are called structural isomers and phenomenon is structural isomerism.

## (iii) Cyclic

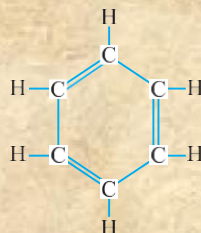
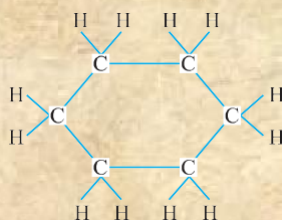


Cyclic Saturated

eg.  $C_6H_{12}$  (Hexane)



Cyclic unsaturated  
 $C_6H_6$  (Benzene)



## Functional Groups

- In hydrocarbon chain, one or more hydrogen atom is replaced by other atoms in accordance with their valencies. These are heteroatom.
- These heteroatom or group of atoms which make carbon compound reactive and decides its properties are called functional groups.

Hetero atom	Functional group	Formula of functional group
Cl/Br	Halo (Chloro/Bromo)	— Cl, — Br, — I
Oxygen	1. Alcohol	— OH
	2. Aldehyde	$\begin{array}{c} \text{H} \\ \diagup \\ \text{— C} \\ \diagdown \\ \text{= O} \end{array}$
	3. Ketone	$\begin{array}{c} \text{— C —} \\ \parallel \\ \text{O} \end{array}$
	4. Carboxylic acid	$\begin{array}{c} \text{O} \\ \parallel \\ \text{— C — OH} \end{array}$
Double bond	1. Alkene group	$> \text{C} = \text{C} <$
Triple bond	2. Alkyne group	$\text{— C} \equiv \text{C —}$

## Homologous Series

It is series of compounds in which the some functional group substitutes for the hydrogen in a carbon chain.

*E.g.*, Alcohols –  $\text{CH}_3\text{OH}$ ,  $\text{C}_2\text{H}_5\text{OH}$ ,  $\text{C}_3\text{H}_7\text{OH}$ ,  $\text{C}_4\text{H}_9\text{OH}$

- Have same general formula.
- Any two homologues differ by  $-\text{CH}_2$  group and difference in molecular mass is  $14\mu$ .
- Have same chemical properties but show gradual change in physical properties.

## VISUAL EXPLANATION

### Nomenclature of Carbon Compounds

- Identify the number of carbon atoms in compounds.
- Functional group is indicated by suffix or prefix.



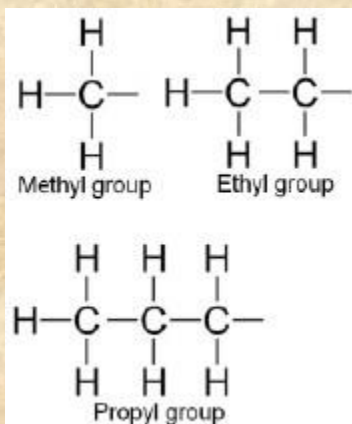
	<b>Functional Group</b>	<b>Prefix</b>	<b>Suffix</b>
1	Carboxylic Acid	carboxy-	-carboxylic acid -oic acid
2	Ester	(R)-oxycarbonyl	-oate
3	Acid Halide	halocarbonyl-	-oyl halide
4	Amide	carbonyl-	-carboxamide -amide
5	Nitrile	cyano-	-nitrile
6	Aldehyde	formyl-	-al -carbaldehde
7	Ketone	oxo-	-one
8	Alcohol	hydroxy-	-ol
9	Thiol	mercapto-	-thiol
10	Amine	amino-	-amine
11	Arene (cyclic arrays of C=C)	-	benzene
12	Alkene	alkenyl	-ene
13	Alkyne	alkynyl	-yne
14	Alkane	alkyl	-ane
15	Ether	alkoxy	-ane
16	Alkyl Halide	halo-	-ane
17	Nitro	nitro-	-ane

it is generally difficult to identify the dominant functional group in the spectrum because of the presence of multiple functional groups.

**Functional Group:** Single atom or group of atoms, that have similar chemical properties are called functional group. For example: Halogen group, Carboxyl group, Aldehyde group, etc.

Alkyl group:  $-R$  is known as alkyl group.

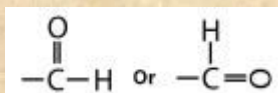
Examples:  $-CH_3$  (Methyl)  $-C_2H_5$  (Ethyl),  $-C_3H_7$  (Propyl)



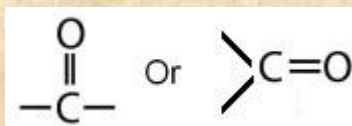
**Halogen group:** Halogen group is also known as halo group.  $-Cl$  (Chloro),  $-Br$  (Bromo),  $-I$  (Iodo) are halogen or halo group.

**Alcohol:**  $-OH$  is known as alcohol group.

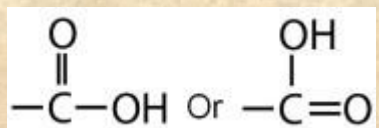
**Aldehyde:**  $-CHO$  is known as aldehyde group. Its structural formula is as follows:



**Ketone Group:**  $-CO-$  is known as ketone group. This is also known as carbonic group. Its structural formula is as follows:

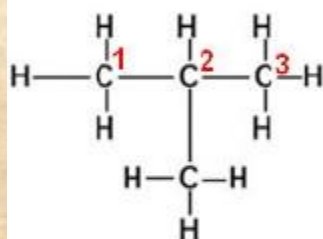
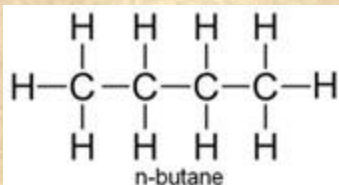


**Carboxylic Acid Group:**  $-COOH$  is known as carboxylic acid group; or simply as acid group. Its structural formula is as follows:

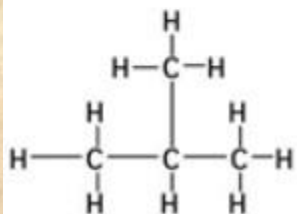


## Nomenclature of Alkane:

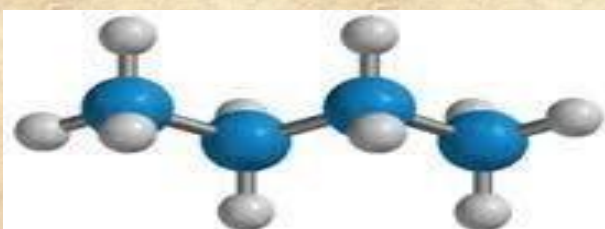
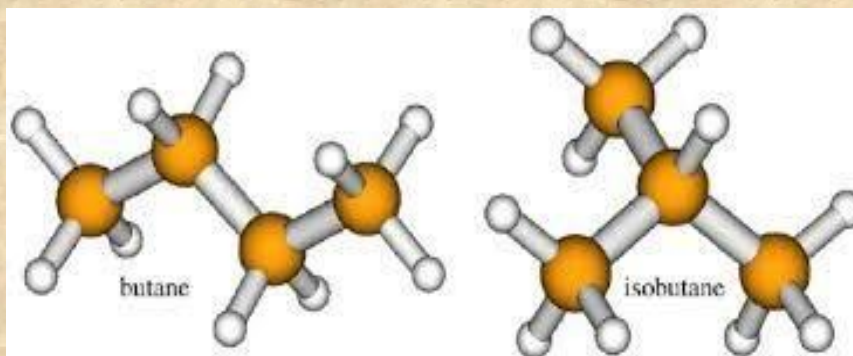
**Example:** In this structure, there are four carbon atoms but no functional group is attached. Hence, its name is butane



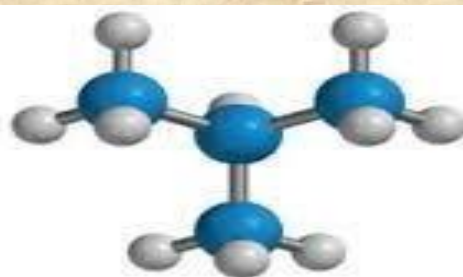
Iso-butane



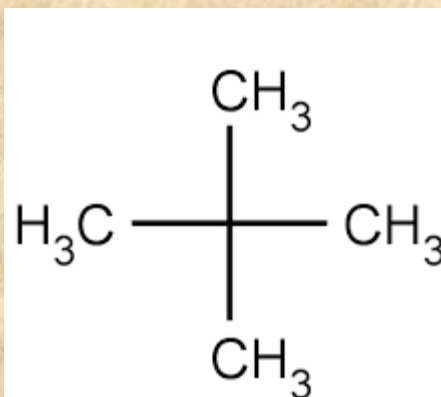
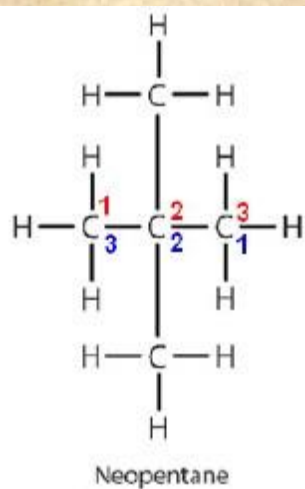
Iso-butane



butane



isobutane



### IUPAC Name:

There are three carbon atoms in longest chain.

Two methyl groups are present at second (2) carbon atom. (Di is used as prefix for two).

Therefore, IUPAC Name: Di-methyl propane.

### Ethanol and Ethanoic Acid

The two important carbon compounds are Ethanol and Ethanoic acid

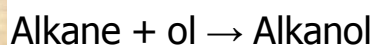
#### Alcohol:

Molecules in which hydroxyl group attached to alkyl groups are the alcohols.

The formula of alcohols can be written by replacing hydrogen ("H") from alkanes with hydroxy group ("OH").



Alcohols can be named by replacing "e" from alkanes with "ol".



Some of the important alcohols are:

Name of the alcohol	Chemical formula of alcohol
Methanol	CH <sub>3</sub> -OH
Ethanol	CH <sub>3</sub> -CH <sub>2</sub> -OH

### Preparation of Ethanol:

Ethanol can be manufactured through fermentation of molasses.

The process involves slow decomposition of a complex organic compound like molasses into simpler compounds including ethanol, by means of microorganisms like yeast.

### Physical Properties of ethyl alcohol:

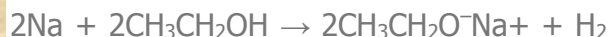
- It is a colourless inflammable and sweet smelling liquid
- Is miscible with water
- It is a good solvent that dissolves most known substances.
- Ethanol can cause drunkenness on consumption, even in small quantities of dilute ethanol.
- Extremely poisonous when consumed in pure form (absolute alcohol)

### Chemical properties of Ethanol:

It involves in different chemical reactions due to the presence of hydroxy group (-OH).

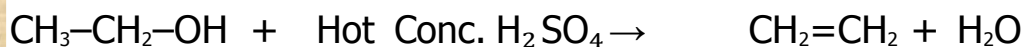
### Reaction of ethanol with sodium:

Ethanol readily reacts with sodium to form sodium ethoxide and hydrogen gas.



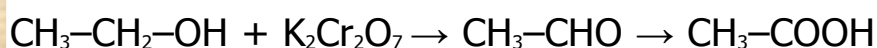
### Reaction with concentrated sulphuric acid:

Ethanol on heating to a temperature of 443 K with excess concentrated sulphuric acid, gives ethene.



### Oxidation:

Ethanol undergoes oxidation in presence of Potassium dichromate to form initially ethanal and finally forms further oxidised ethanoic acid.



### Esterification:

Reaction of ethanol with carboxylic acids is called esterification reaction. The product formed in this reaction is an ester along with water.

Esters are sweet smelling substances which are used in making perfumes and as flavoring agents.

### Example:



### Uses of Ethanol:

- Ethanol is used in pharmaceutical preparations like tincture of iodine, cough syrups, and tonics.
- Ethanol is used in the manufacture of organic compounds like acetaldehyde, acetic acid and chloroform.
- Ethanol is used as a preservative for biological specimen.

## Acetic acid / Ethanoic Acid :

The molecular formula of acetic acid is  $\text{CH}_3\text{COOH}$ .

5-8% solution of acetic acid in water is called vinegar.

## Preparation of Ethanoic acid:

Ethanoic acid is prepared by the oxidation of ethanol in the presence of oxidising agents like Alkaline  $\text{KMnO}_4$  or acidified  $\text{K}_2\text{Cr}_2\text{O}_7$ .

## Physical Properties of Ethanoic acid:

- Ethanoic acid is a colourless corrosive liquid with a pungent odour.
- The melting point of pure ethanoic acid is  $17^\circ$
- Ethanoic acid freezes during the winter and is known as glacial acetic acid.
- Miscible with water, ether and ethyl alcohol.

## Chemical Properties of Ethanoic acid:

### Reaction with sodium carbonate:

Ethanoic acid reacts with sodium carbonate to give sodium acetate ,carbon dioxide and water



### Reaction with sodium hydrogen carbonate:

Ethanoic acid reacts with sodium hydrogen carbonate to give sodium acetate ,carbon dioxide and water.

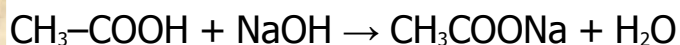


### Reaction with base:

Ethanoic acid reacts with bases to give salt and water.

### Example:

Reaction of ethanoic acid with sodium hydroxide to form sodium acetate and water.



Reaction with sodium hydrogen carbonate, sodium hydrogen carbonate and with bases are the acidic properties of ethanoic acid.

### Saponification:

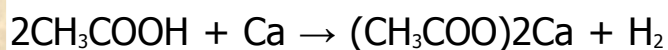
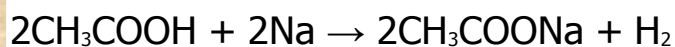
Esters react in the presence of an acid or a base to give back the alcohol and carboxylic acid. This is called saponification reaction. This is reverse reaction of esterification reaction.



### Reaction with active metals:

Ethanoic acid reacts with active metals to form metal ethanoate and hydrogen gas.

Example:





## Reduction:

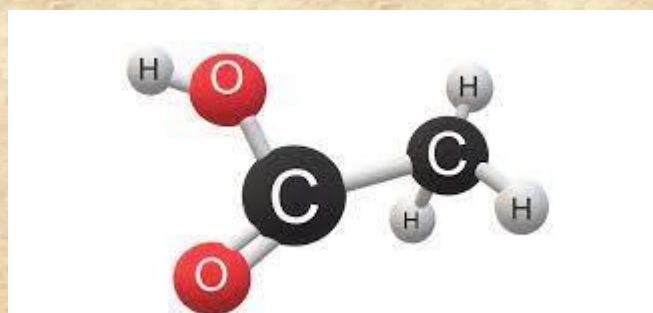
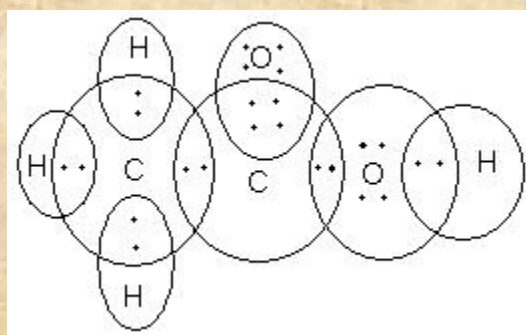
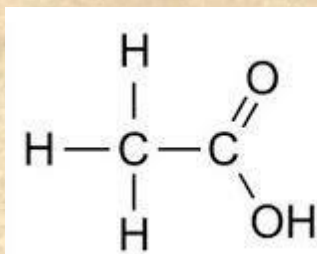
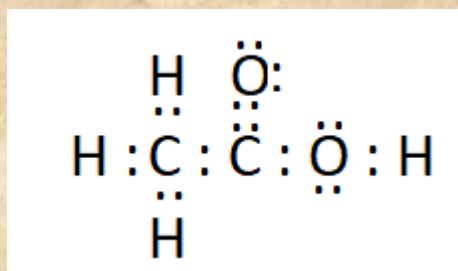
Ethanoic acid is reduced to ethanol in presence of reducing reagents like  $\text{LiAlH}_4$  (Lithium aluminum hydride),  $\text{NaBH}_4$  (Sodium borohydride).



## Uses of Ethanoic acid:

- Preserve food items
- Manufacture of artificial fibres
- Ethanoic acid is used for coagulating latex to prepare rubber from it.
- It is used as a reagent in the laboratory.
- It is used in the preparation of perfumes.

## VISUAL EXPLANATION



## Chemical Properties of Carbon Compounds

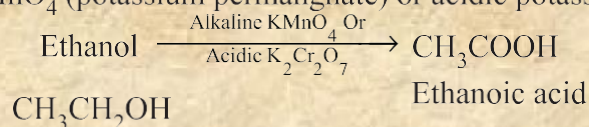
### (a) Combustion



- Carbon and its compounds are used as fuels because they burn in air releasing lot of heat energy.
- Saturated hydrocarbon generally burn in air with blue and non-sooty flame.
- Unsaturated hydrocarbon burns in air with yellow sooty flame because percentage of carbon is higher than saturated hydrocarbon which does not get completely oxidized in air.

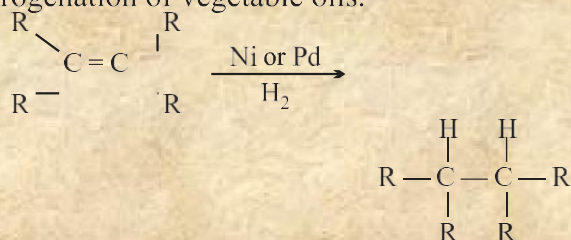
### (b) Oxidation

Alcohols can be converted to carboxylic acid in presence of oxidizing agent alkaline  $\text{KMnO}_4$  (potassium permanganate) or acidic potassium dichromate.

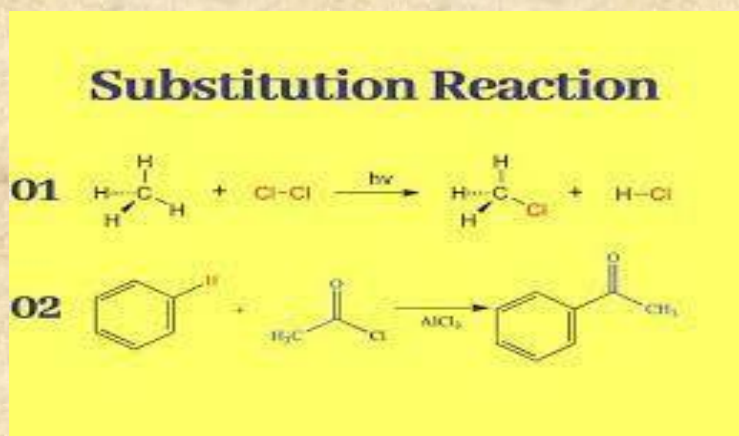


### (c) Addition Reaction :

Unsaturated hydrocarbon add hydrogen in the presence of catalyst palladium or nickel. Vegetable oils are converted into vegetable ghee using this process. It is also called hydrogenation of vegetable oils.



### (d) Substitution Reaction :



## Soaps and Detergents

- Soap is sodium or potassium salt of long chain carboxylic acid. *E.g.*,  $C_{17}H_{35}COO^-Na^+$
- Soaps are effective only in soft water.
- Detergents are ammonium or sulphonate salt of long chain of carboxylic acid.
- Detergents are effective in both hard and soft water.

**Soap molecule has :**

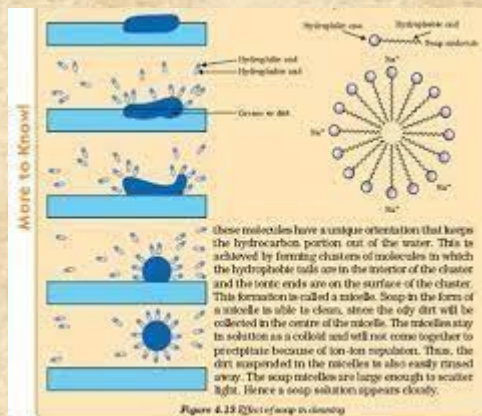
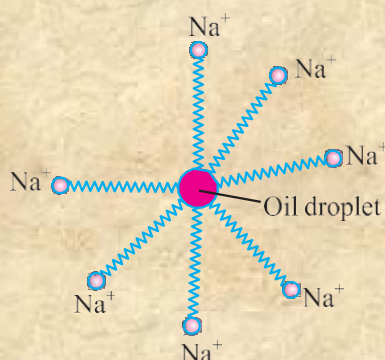
- (i) Ionic (hydrophilic) part
- (ii) Long hydrocarbon chain (hydrophobic) part



**Structure of soap molecule**

## Cleansing Action of Soap

- Most dirt is oily in nature and hydrophobic end attaches itself with dirt and the ionic end is surrounded with molecule of water. This results in formation of a radial structure called micelles.
- Soap micelles help to dissolve dirt and grease in water and cloth gets cleaned.



- The magnesium and calcium salt present in hard water react with soap molecule to form insoluble product called scum. This scum creates difficulty in cleansing action.
- By use of detergent, insoluble scum is not formed with hard water and cloths get cleaned effectively.

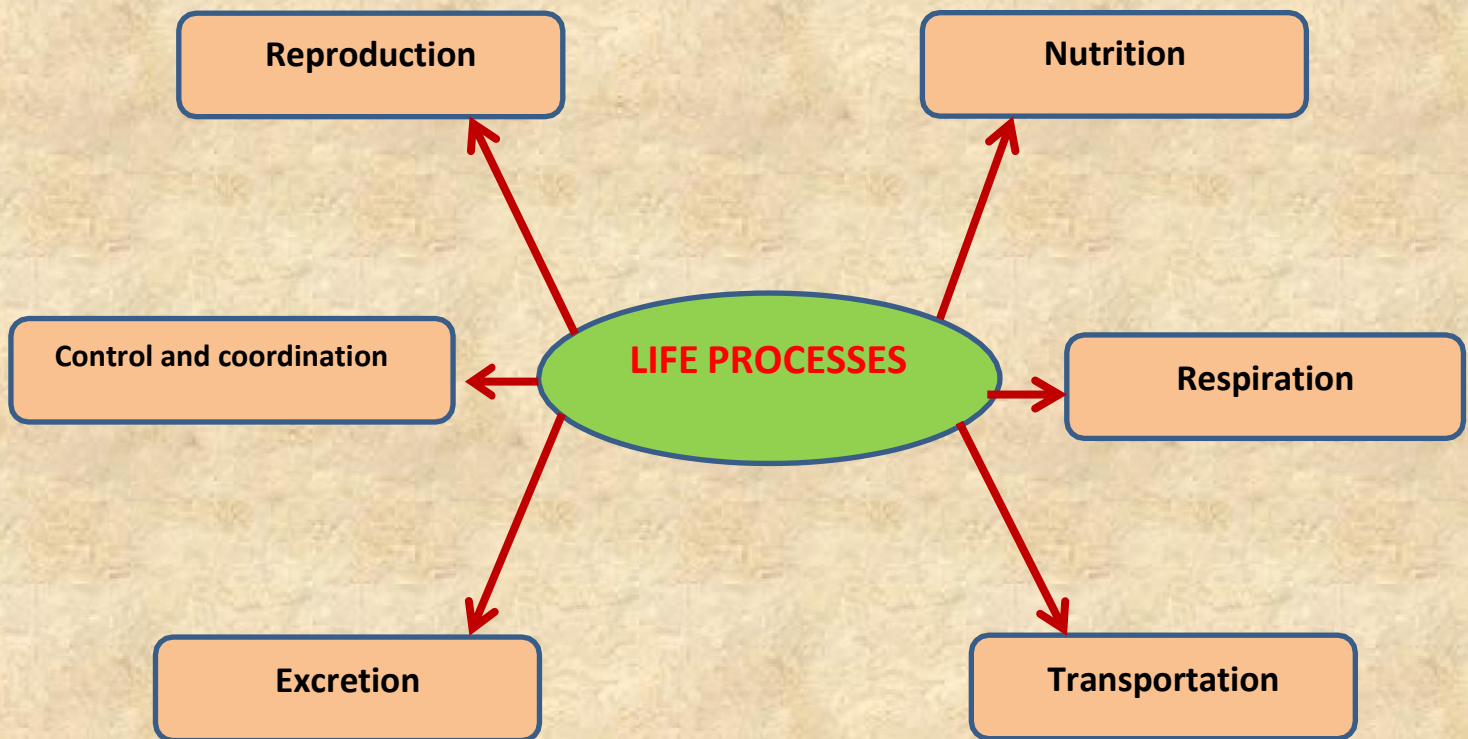
**VISUAL EXPLANATION**

# LIFE PROCESSES

[BACK TO INDEX](#)

There are certain basic vital processes essential for an organism to survive and maintain proper functioning of the body. These basic essential activities performed by an organism are called life Processes.

LifeProcesses



## Nutrition

- **Nutrition:** The process, by which an organism takes food and utilizes it, is called nutrition.
- **Need for Nutrition:** To provide energy for performing various activities.
- **Nutrients:** Materials which provide nutrition to organisms are called nutrients. Carbohydrates, proteins and fats are the main nutrients and are called macronutrients. Minerals and vitamins are required in small amounts and hence are called micronutrients.

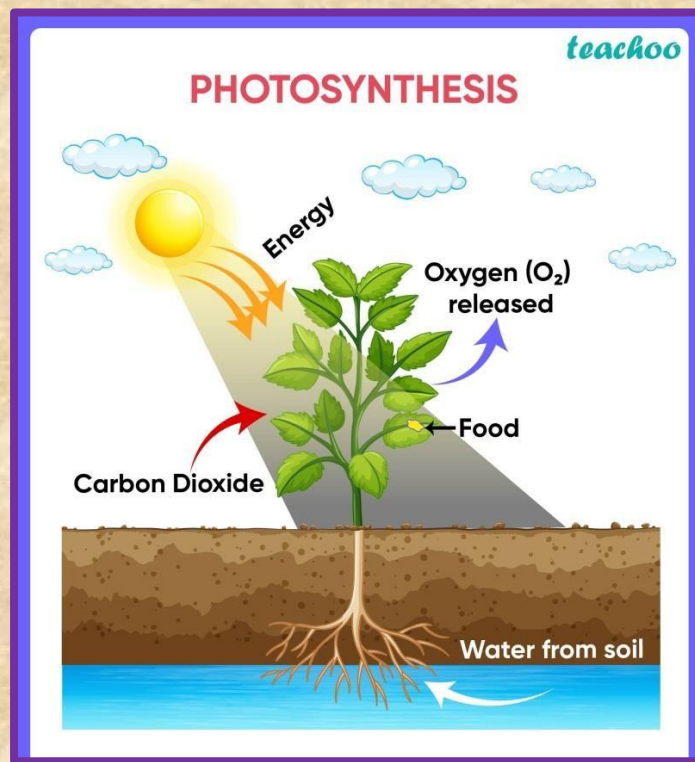
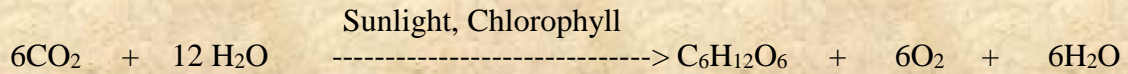
## Modes of Nutrition

- i) Autotrophic Nutrition.
- ii) Heterotrophic Nutrition.

The mode of nutrition in which an organism synthesises its own food is called autotrophic nutrition. Green plants and blue-green algae follow the autotrophic mode of nutrition.

**Nutrition in Plants:** Green plants prepare their own food. They make food in the presence of sunlight. Sunlight provides energy, carbon dioxide and water are the raw materials and chloroplast is the site where food is synthesised.

**Photosynthesis:** The process by which green plants synthesise food is called photosynthesis.



### Main Events of Photosynthesis:

- Absorption of light energy by chlorophyll.
- Conversion of light energy into chemical energy and splitting of water into hydrogen and oxygen.
- Reduction of CO<sub>2</sub> to carbohydrates.
- Sunlight activates chlorophyll, which leads to splitting of the water molecule.
- The hydrogen, released by the splitting of a water molecule is utilized for the reduction of carbon dioxide to produce carbohydrates.
- Oxygen is the by-product of photosynthesis.
- Carbohydrate is subsequently converted into starch and is stored in leaves and other storage parts.

**FOR VIDEO** [https://www.youtube.com/embed/xEF8shaU\\_34](https://www.youtube.com/embed/xEF8shaU_34)

### Opening and closing of stomatal pores:

- The opening and closing of stomatal pores are controlled by the turgidity of guard cells.
- When guard cells uptake water from surrounding cells, they swell to become a turgid body, which enlarges the pore in between (Stomatal Opening).
- While, when water is released, they become flaccid shrinking to close the pore (Stomatal Closing).

**FOR VIDEO** [CLICK HERE](#)

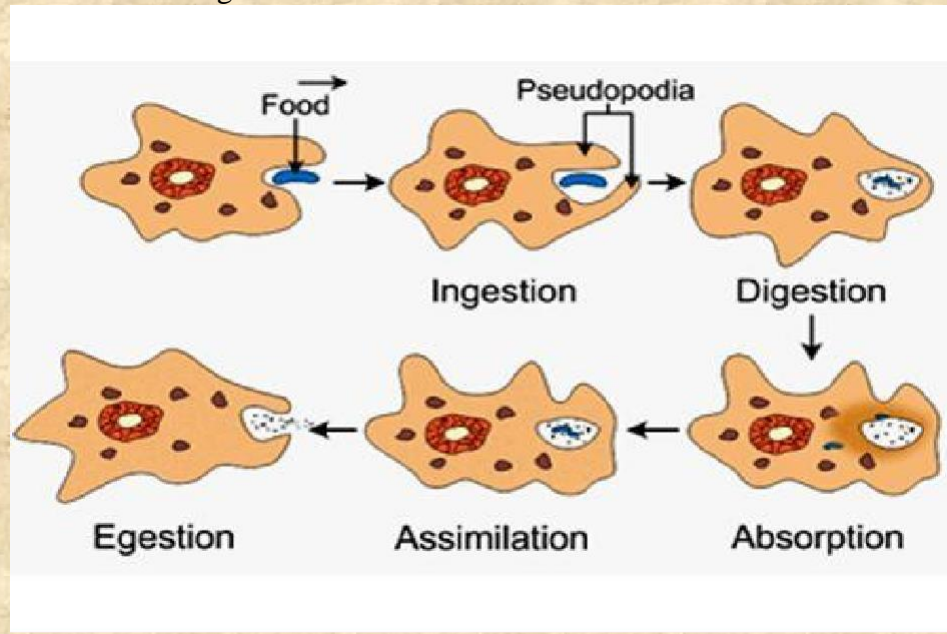
### Heterotrophic Nutrition

- The mode of nutrition in which an organism takes food from another organism is called heterotrophic
- **Saprophytic Nutrition**: In saprophytic nutrition, the organism secretes the digestive juices on the food. The food is digested while it is still to be ingested. The digested food is then ingested by the organism. All the decomposers follow saprophytic nutrition. Some insects, like houseflies, also follow this mode of nutrition.
- **Holozoic Nutrition**: In holozoic nutrition, the digestion happens inside the body of the organism. i.e., after the food is ingested. Most of the animals follow this mode of nutrition.
- **Parasitic Nutrition**: The organism which lives inside or outside another organism (host) and derives nutrition from it is known as parasites and this type of mode of nutrition is called parasitic nutrition. For example Cuscuta,

### Nutrition in Amoeba

- Amoeba is a unicellular animal which follows the holozoic mode of nutrition.
- In holozoic nutrition, the digestion of food follows after the ingestion of food. Thus, digestion takes place inside the body of the organism.

- Holozoic nutrition happens in five steps, viz. ingestion, digestion, absorption, assimilation and egestion.



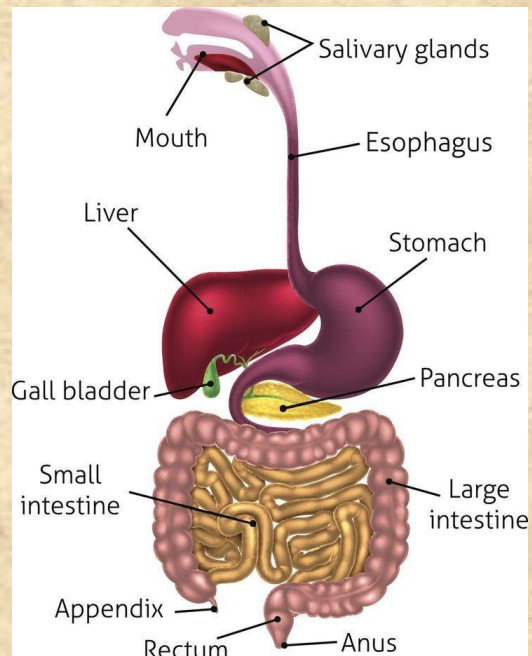
**FOR VIDEO**

<https://www.youtube.com/embed/rjth8YWqj6E>

## **Nutrition in Human Beings**

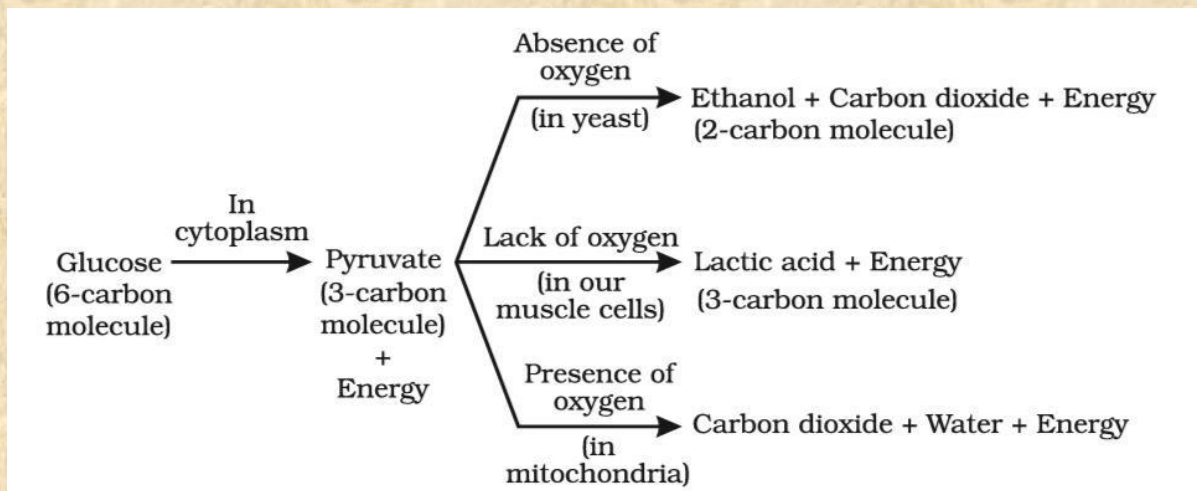
- Humans are heterotrophs and they cannot synthesise their own food.
- Food is crushed with teeth and acted on by saliva secreted by salivary amylase. The enzyme salivary amylase in saliva breaks down starch into sugar.
- Food is transferred to stomach through esophagus by rhythmic contractions called peristalsis.
- Gastric glands in stomach releases pepsin, hydrochloric acid and mucus. Pepsin digests protein, HCl provides acidic medium and removes the germs that might have entered along with food, mucus protects the inner lining of stomach from the effects of HCl.
- Liver releases bile juice that helps in fat digestion.
- Pancreas releases pancreatic juice that containing trypsin (protein digesting enzyme) and intestine releases intestinal juice.
- Food is completely digested in small intestine. Villi in intestine increases the surface area and for digestion and absorption.
- Large intestine reabsorbs water from the unabsorbed food.
- Waste materials removed from through the anus.

**FOR VIDEO** [CLICK HERE](#)

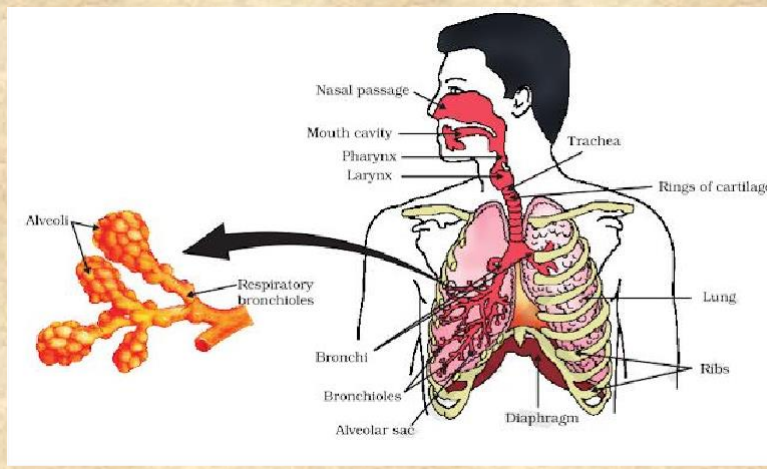


## Respiration

The process, by which a living being utilises the food to get energy, is called respiration. Respiration is an oxidation reaction in which carbohydrate is oxidized to produce energy. Mitochondria is the site of respiration and the energy released is stored in the form of ATP (Adenosine triphosphate).

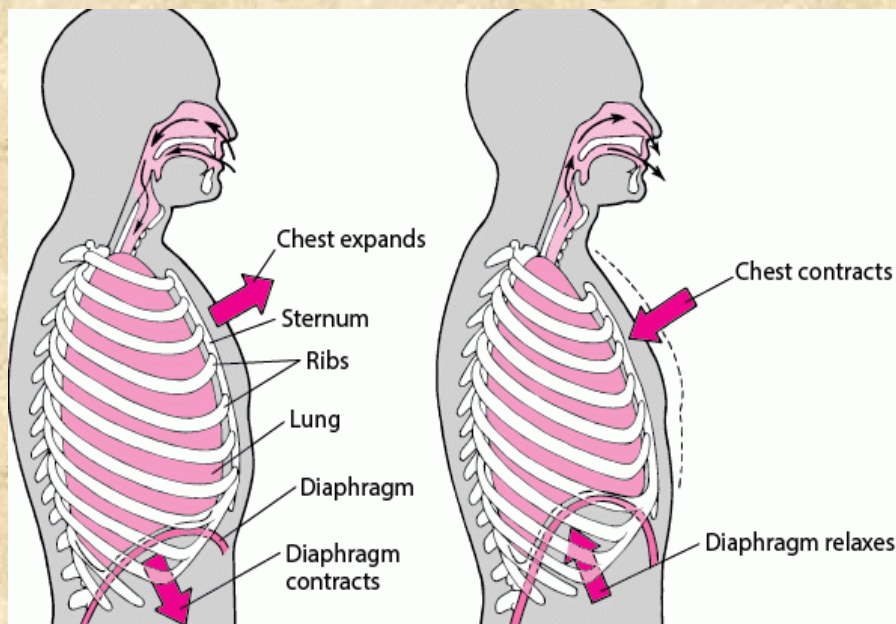






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### MECHANISM OF BREATHING



Inhalation

Exhalation

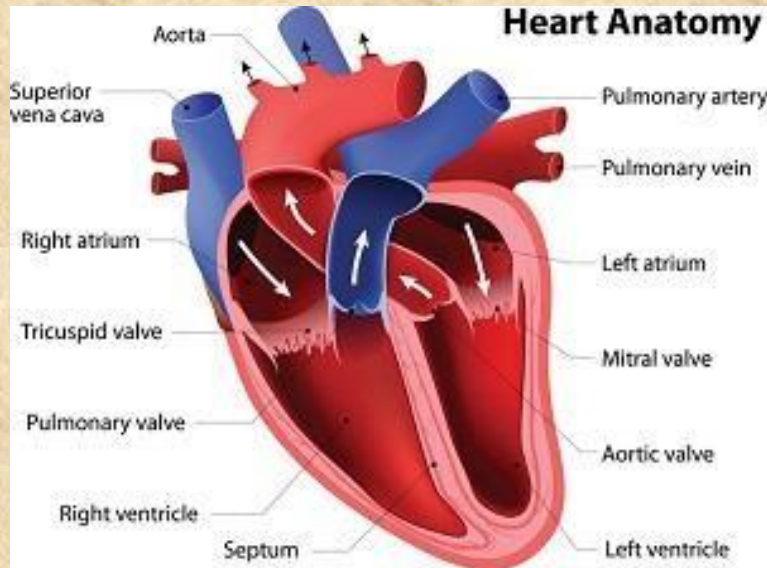
### Transportation:

- **Blood:** Blood is a connective tissue which plays the role of the carrier for various substances in the body. Blood is composed of 1. Plasma 2. Blood cells 3. Platelets.
- **Bloods cells:** There are two types of blood cells, viz. Red Blood Cells (RBCs) and White Blood Cells (WBCs).
- **Platelets:** Platelets are responsible for blood clotting. Blood clotting is a defence mechanism which prevents excess loss of blood, in case of an injury.
- **Lymph:** Lymph is similar to blood but RBCs are absent in lymph. Lymph is formed from the fluid which leaks from blood capillaries and goes to the intercellular space in the

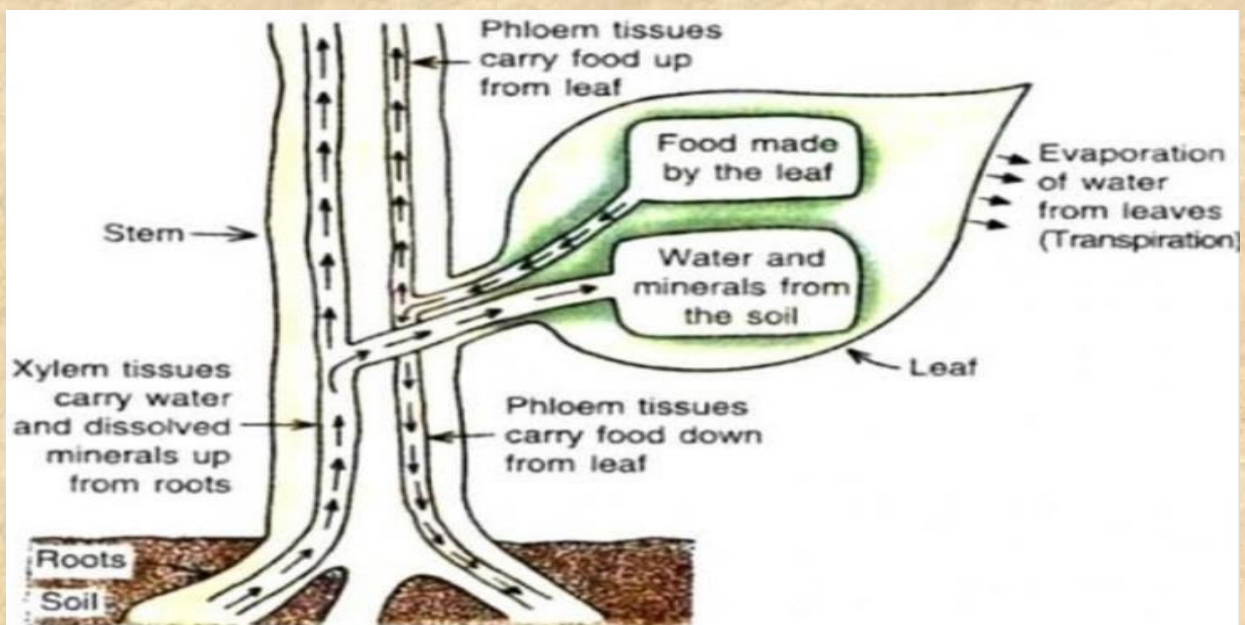
tissues. This fluid is collected through lymph vessels and finally return to the blood capillaries. Lymph also plays an important role in the immune system.

- **DOUBLE CIRCULATION** - In the human heart, blood passes through the heart twice in one cardiac cycle. This type of circulation is called double circulation. Double circulation ensures complete segregation of oxygenated and deoxygenated blood which is necessary for optimum energy production in warm-blooded animals.

[FOR VIDEO CLICK HERE](#)



### TRANSPORTATION IN PLANTS



## Excretion:

Excretion is a **biological process by which an organism gets rid of excess or toxic waste products of metabolism.** Excretion removes unwanted by-products of metabolism, toxic chemical substances, regulate the ionic concentration of body fluids, regulates water content of body and regulate pH of body fluids.

### **Excretion in human being:**

#### **Skin**

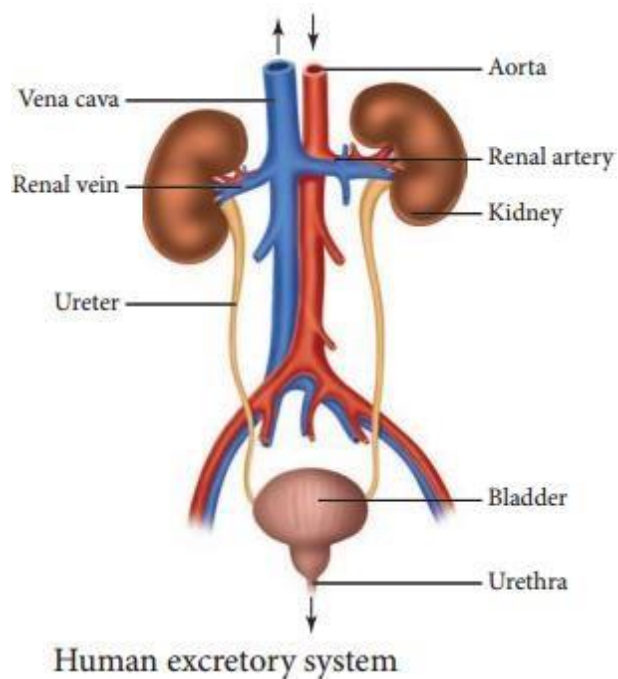
Skin acts as a minor excretory organ in humans. The waste product excreted by the skin is sweat. Sweat is produced by the sweat glands. It is composed of salts and urea. When the sweat comes out from the human body it helps in keeping the body cool in hot climates.

#### **Lungs**

Lungs help in removing excess carbon dioxide and some water vapour from our bodies that occurs when we breathe out.

#### **Human Excretory System**

The human excretory system is responsible for the elimination of waste in human beings. Humans have two kidneys, two ureters, a urinary bladder and a urethra as part of their excretory system.



## **Kidneys**

- Kidneys are the major excretory organs that remove waste from the human body.
- Kidneys are bean-shaped and are located on either side of the backbone below the rib cage.
- Our kidney has a number of subunits known as nephrons.
- Nephrons are referred to as the functional unit of kidneys.
- One human kidney can have 1 million nephrons.
- Nephrons carry out the process of secretion and the process of excretion.
- Nephrons consists of renal corpuscle (glomerulus with Bowman's capsule) and renal tubules.
- The product of the kidney is urine.

## **Ureter**

- The kidney is connected to the urinary bladder by a thin and muscular tube which is known as ureter
- The ureter functions between the kidneys and the urinary bladder

## **Urinary Bladder**

- It is a muscular sac-like structure that stores urine
- It is responsible for controlling the passage of urine
- It has the capacity to store urine of about 400 to 600 ml

## **Urethra**

- It helps to expel urine from the body
- It is also responsible for carrying sperm in males

## **Mechanism of excretion**

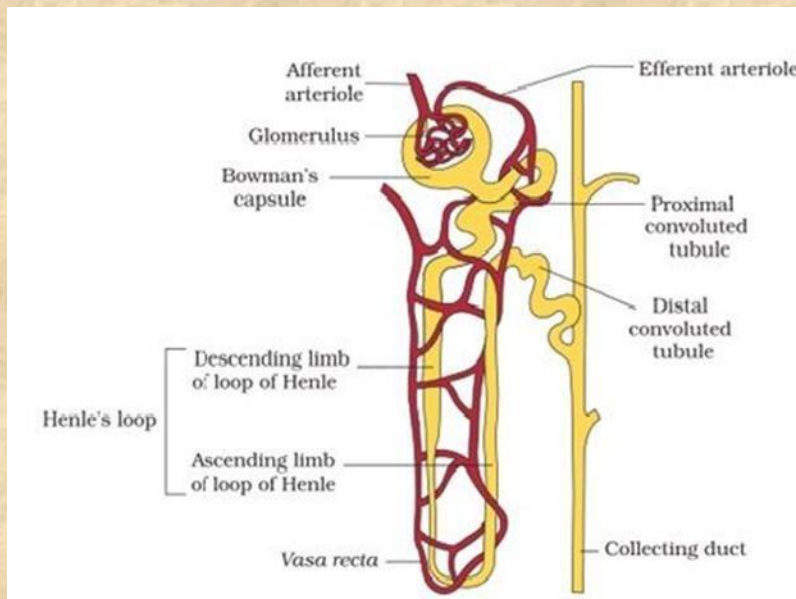
- Kidneys are positioned one on each side of the backbone, below the rib cage.
- Urine is transported from the kidneys to the urinary bladder, where it is retained until it is expelled through the urethra.
- Kidneys eliminate nitrogenous waste from the blood, such as urea or uric acid.
- The filtration units known as nephrons are found in enormous numbers in each kidney.
- The nephron is the minute or microscopic structural and functional unit of the kidney. It is **composed of a renal corpuscle and a renal tubule**. The renal corpuscle consists of a tuft of capillaries called a glomerulus and a cup-shaped structure called Bowman's capsule. The renal tubule extends from the capsule.
- The fundamental filtration unit in the nephrons of kidneys is a cluster of blood capillaries called glomerulus with very thin walls.

- Each kidney's urine eventually reaches the ureter, a lengthy tube that connects the kidneys to the urinary bladder.
- Urine is stored in the urinary bladder until it is pushed out via the urethra by the pressure of the inflated bladder.
- The bladder is a muscular organ that is controlled by the neurological system.

### Removal of nitrogenous waste :

FOR VIDEO [CLICK HERE](#)

### STRUCTURE OF NEPHRON:



### EXCRETION IN PLANTS

- Waste substances may be stored in leaves, bark etc. which fall off from the plant.
- Plants excrete some waste into the soil around them.
- Gums, resin → In old xylem
- Some metabolic wastes in the form of crystals of calcium oxalates in the leaves of colocasia and stem of Zamikand.



# CONTROL AND CO-ORDINATION

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## Control and Coordination in Animals:

It is brought about in all animals with the help of two main systems:

- i) Nervous System
- ii) Endocrine System

**Nervous System :** Consists of Brain, Spinal cord and a huge network of nerves.

### Functions:

- To receive the information from environment
- To receive the information from various body parts.
- To act accordingly through muscles and glands.

**Stimulus :** Any change in environment to which the organisms respond is called stimulus. E.g., touching a hot plate.

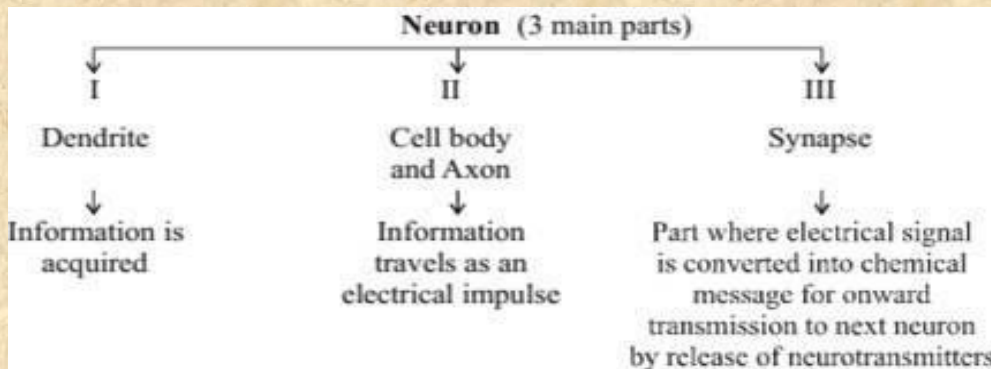
**Response :** The reaction of our body to a stimulus. E.g. withdrawal of our hand on touching hot plate.

**Coordination:** The working together of various organs of the body of an organism in a proper manner to produce appropriate reaction to a stimulus is called coordination.

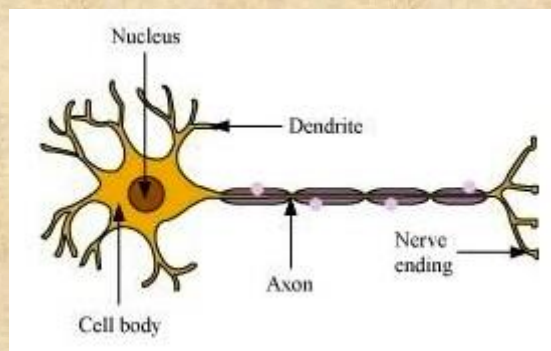
**Receptors :** Are specialized tips of some nerve cells that detect the information from the environment.

↓	↓	↓	↓	↓
Phonoreceptors (Inner Ear)	Photo receptors Eyes	Thermoreceptors (Skin)	Olfactory Receptor (Nose)	Gustatory Receptor (Tongue)
Hearing/ Balance of the body	Visual Stimulus	Pain Touch Heat	Smell Detection	Taste Detection

- **Neuron:** It is the structural and functional unit of nervous system.
- **Neurons** are electrically excitable cells in the nervous system that **functions** to process and transmit information. In vertebrate animals, **neurons** are the core components of the brain, spinal cord and peripheral nerves.
- The primary components of the **neuron** are the soma (cell body), the axon (along slender projection that conducts electrical impulses away from the cell body), dendrites (projections from the cell body, that **receive** messages from other **neurons**), and synapses (specialized junctions between **neurons**).

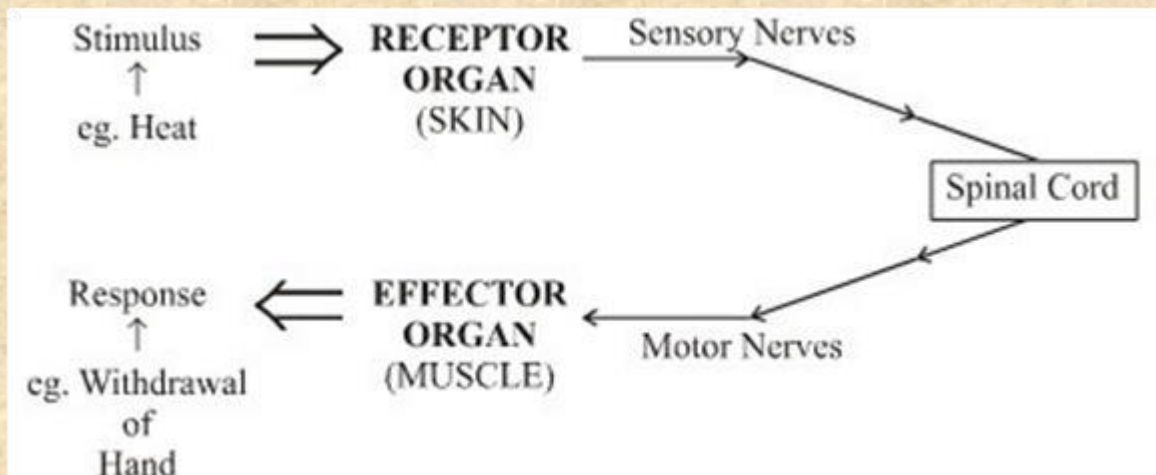


- The axon (**nerve** fibre) transmits electrical signals from the **cell** body. The dendrites are branching fibres that receive electrical signals from other neurons. The shape of a neuron is determined by the job it does.
- **Synapse:** The point of contact between the terminal branches of axon of one neuron with the dendrite of another neuron is called synapse.



## REFLEX ACTION

- Reflex action is an automatic response of the body to a stimulus at spinal cord level. e.g. withdrawal of hand on touching a hot plate, knee jerk etc.
- **Reflex arc:** The pathway taken by nerve impulses in a reflex action is called reflex arc.



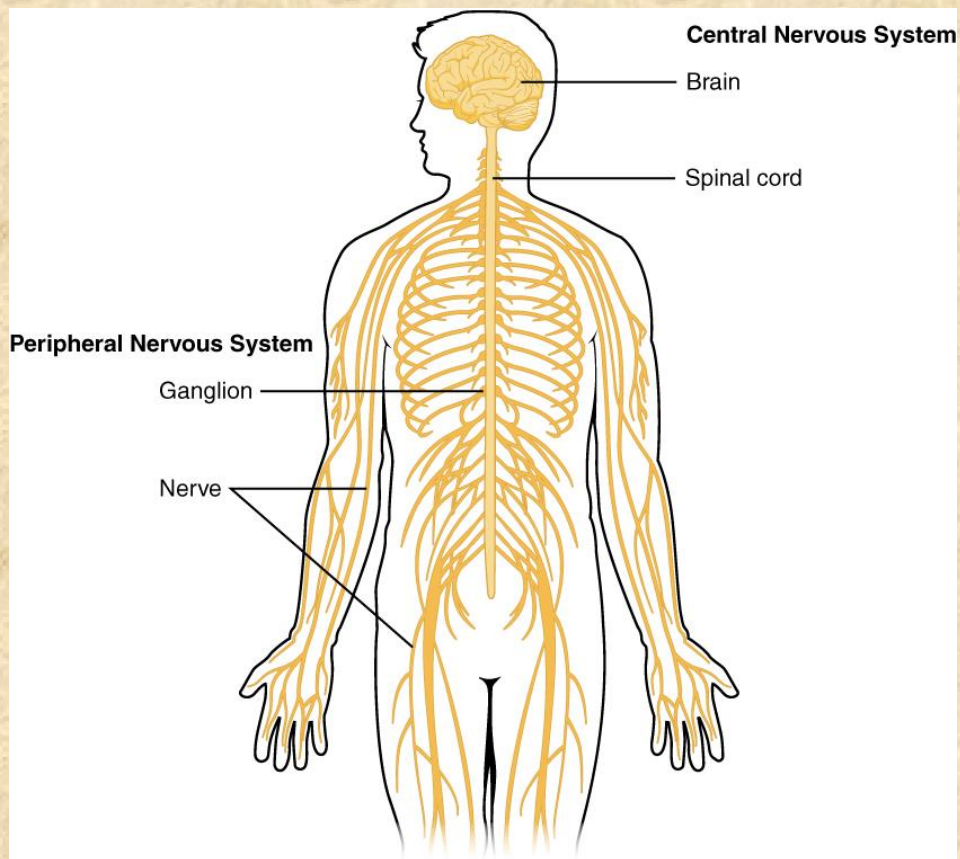
**Voluntary action** takes place under the control of a person (e.g. writing) whereas **Involuntary action** is not under the control of a person. (e.g. heartbeat)

- **Mechanism of Reflex action:** A reflex mechanism involves a receptor organ, an effector organ, and some type of communication network. When a sensory receptor is stimulated, signals pass from it along a sensory neuron to the spinal cord. The message travels out of the spinal cord along a motor neuron to the effector organ (e.g., a muscle or a gland), which shows the response. Such a pathway is called a reflex arc.
- **For video of REFLEX ARC**  
[https://www.youtube.com/embed/Qiv8dUp\\_I3c](https://www.youtube.com/embed/Qiv8dUp_I3c)

### **HUMAN NERVOUS SYSTEM:**

The **nervous system** of vertebrates (including **humans**) is divided into the central **nervous system** (CNS) and the peripheral **nervous system** (PNS). The (CNS) is the major division, and consists of the brain and the spinal cord. The spinal canal contains the spinal cord, while the cranial cavity contains the brain. The peripheral nervous system consists of the nerves that branch out from the brain and the spinal cord. These nerves form the communication network between the CNS and the body parts.





### **NERVOUS SYSTEM:**

**Human Brain :** It is enclosed in cranium (brain box) and is protected by cerebrospinal fluid which acts as a shock absorber. Human brain has three major parts or regions : (a) Fore-brain (b) Mid Brain (c) Hind Brain.

**Spinal Cord:** Spinal Cord is enclosed in Vertebral column.

### **Fore-brain (CEREBRUM):**

- Most complex specialized part of the brain is Cerebrum or the forebrain.

Functions

- Thinking part of the brain
- Control the voluntary actions.
- Store information (Memory)
- Centre associated with **HUNGER**
- Receives sensory impulses from various body parts and integrates it.

### Mid Brain:

- It connects the fore-brain with the hind-brain. It is the portion of the central nervous system associated with vision, hearing, motor control, sleep/wake, arousal (alertness), and temperature regulation.

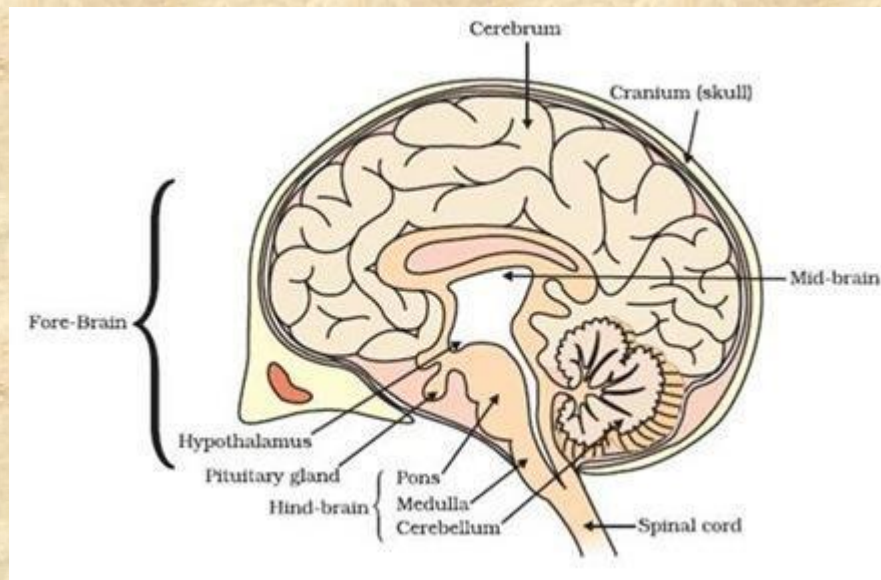
### Hind-Brain:

- Hind brain consists of three parts-

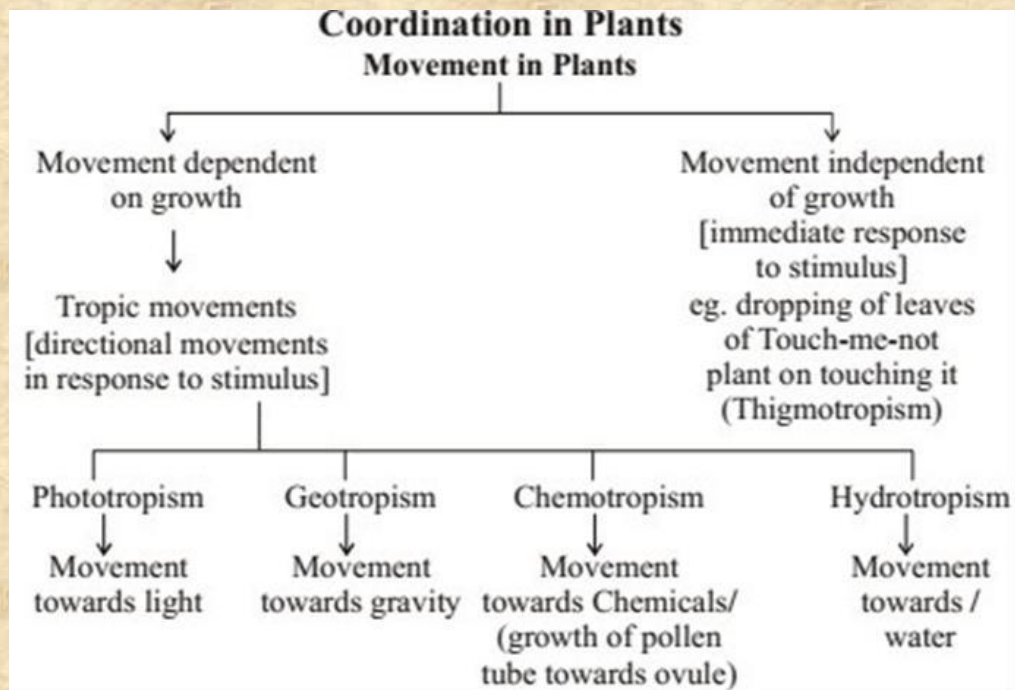
<b>CEREBELLUM</b>	i) Maintains posture and balance of the body. ii) Control body movement.
<b>MEDULLA</b>	Controls involuntary actions eg. blood pressure, salivation, vomiting
<b>PONS</b>	Involuntary action, regulation of respiration

### HUMAN BRAIN

<https://www.youtube.com/embed/DtkRGbTp1s8>



### COORDINATION IN PLANTS:



## TROPISM IN PLANTS

<https://www.youtube.com/embed/J9D8a7IHZSQ>

## HORMONES

- **These** are chemical compounds which help to coordinate growth, development and responses to the environment.

**Plant Hormones:** Main plant hormones are:

- **Auxin:** **Auxin** is a plant hormone produced in the stem tip and root tip that promotes cell elongation.
- **Gibberellin:** **Gibberellins (GAs)** are plant hormones that regulate growth and influence various developmental processes, including stem elongation, germination, flowering and leaf and fruit senescence (falling).
- **Cytokinins:** *Cytokinins (CK)* are a class of plant growth substances (phytohormones) that promote cell division, or cytokinesis, in plant roots and shoots. They are involved in cell growth and differentiation.
- **Abscisic acid:** Inhibits growth, cause wilting of leaves. (Stress hormone). It promotes the closing of stomata (during adverse rough condition) there by reducing the water loss.

## PLANT HORMONES

<https://www.youtube.com/embed/dV9QcGs58l0>

## Tropic Movements

- Directional plant growth movement in response to an external stimulus.
- Growth of a plant may be towards the stimulus (positive tropism) or away from it (negative tropism).
- Phototropism – movement in response to light.
- Chemotropism – in response to chemicals.
- Hydrotropism – in response to water.
- Geotropism – in response to gravity.

## Nastic Movements

- Non-directional movement of a plant part in response to an external stimulus.
- May or may not be a growth movement.
- All parts of the organ of a plant are affected equally irrespective of the direction of the stimulus.
- Thigmonasty – Nastic movement in response to touch of an object.
- Photonasty – Nastic movement in response to light.

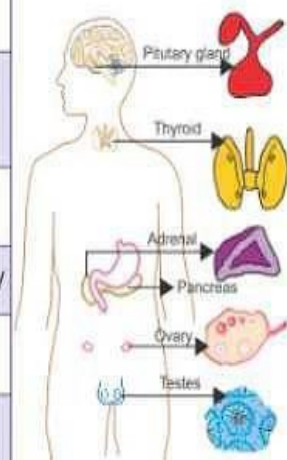
## HORMONES IN ANIMALS

- **Hormones** : Hormones are the chemical substances secreted by the endocrine glands and transmitted by the blood to the tissues on which it has a specific effect.

### (HORMONES IN ANIMALS)

[https://www.youtube.com/embed/ySkk7U\\_4PeY](https://www.youtube.com/embed/ySkk7U_4PeY)

Glands	Location	Hormones	Functions
Pituitary	Brain	Growth hormone	<ul style="list-style-type: none"> <li>• Regulates growth</li> <li>• Controls the functioning of endocrine glands</li> </ul>
Thyroid	Throat	Thyroxine	<ul style="list-style-type: none"> <li>• Controls the metabolism rate</li> <li>• It also brings about balanced growth</li> </ul>
Parathyroid	Near thyroid gland	Parathormone	<ul style="list-style-type: none"> <li>• Controls calcium balance of the body</li> </ul>
Adrenal	Attached to kidneys	Adrenaline	<ul style="list-style-type: none"> <li>• Prepares body for emergency</li> </ul>
Pancreas	Abdomen	Insulin	<ul style="list-style-type: none"> <li>• Controls glucose level of the blood</li> </ul>
Testes	Scrotum	Testosterone	<ul style="list-style-type: none"> <li>• Controls growth and development of male reproductive system</li> </ul>
Ovaries	Lower abdomen	Oestrogen, progesterone	<ul style="list-style-type: none"> <li>• Controls growth and development of female reproductive system</li> </ul>



## **Goitre**

Iodised salt is necessary because thyroid gland needs iodine to make thyroxine which helps in regulating the metabolism of carbohydrates, fats and proteins. Deficiency of iodine causes a disease called goitre.

## **Diabetes**

- **Cause:** It is due to deficiency of Insulin hormone secreted by Pancreas that is responsible to lower/control the blood sugar levels.
- **Treatment:** Common diabetes can be controlled by medicine but in severe cases injections of insulin hormone are given to the patients.

### **Feedback Mechanism:**

- The excess or deficiency of hormones has a harmful effect on our body. Feedback mechanism makes sure that hormones are secreted in precise quantities and at right time.

(FEEDBACK MECHANISM)

[https://www.youtube.com/embed/6lIFB\\_yr1WI](https://www.youtube.com/embed/6lIFB_yr1WI)

## **HOW DO ORGANISM REPRODUCE**

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- Reproduction is the process by which living organisms produce new individuals similar to themselves. It basically involves the making copies of the blueprints of the body design.
- Reproduction ensures continuity of life on earth.
- Chromosomes in the cell contain the information for inheritance of features which are passed from generation to generation in the form of DNAmolecules.
- So reproduction involves copying of DNA and other cell apparatuses. Thecopies will be similar to original and not identical.
- Variation is the basis and necessary for evolution of living beings.
- Variations help the species to withstand drastic environmental changes, thus save the species from becoming extinct and promotes its survival for a longer time.

### Asexual Reproduction

1. A single parent is involved
2. Gametes not formed
3. No fertilization occurs
4. Progeny is genetically similar to parent.

### Sexual Reproduction

1. Usually two Parents are involved
2. Gametes are formed
3. Fertilisation occurs
4. Progeny is not genetically similar to the parent. Genetic variations can be seen in the progeny.

- Asexual Reproduction is useful as a means of rapid multiplication. It is common in lower plants and animals.

### MODES OF ASEXUAL REPRODUCTION:

1. **FISSION:** The parent cell divides/splits into two daughter cell-Binary Fission; splits into many cells-multiple Fission.

## FISSION

### Binary Fission

The parent cell divides into two equal halves

Equal halves (daughter cells)

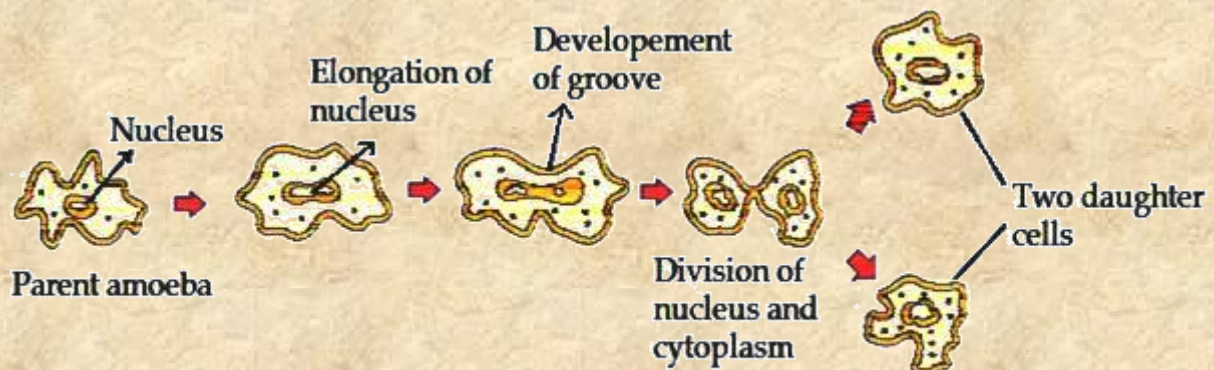
E.g. Amoeba follows transverse binary fission, i.e. fission in any plane.

-> Leishmania has a whip-like structure at one end and binary fission occurs in a definite orientation.

### Multiple Fission

The parent cell divides into many daughter cells simultaneously.

Eg. Plasmodium



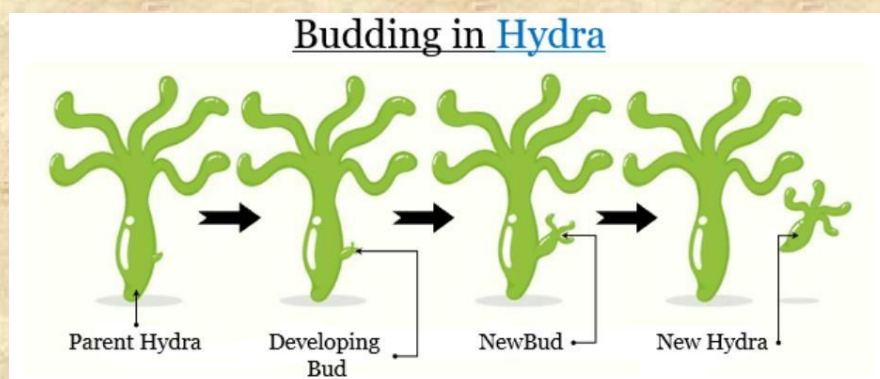
### Binary fission in Amoeba

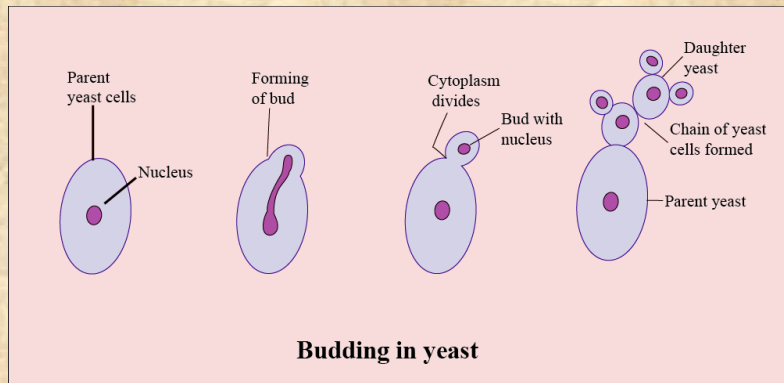
Binary fission in Amoeba: [Video](#)

<https://www.youtube.com/embed/fUxPL8cySwY>

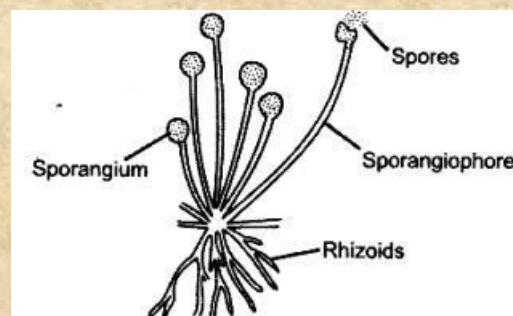
2. **BUDDING:** A bud develops as an outgrowth on parent body due to repeated cell division at a specific site. These buds detach from the parent body when they mature.

E.g. Hydra, yeast.





3. **SPORE FORMATION:** Spores which are present in sporangia are small, bulb like structure which are covered by thick walls that protect them until they come in contact with suitable condition. Under favourable conditions, they germinate and produce new Rhizopus.

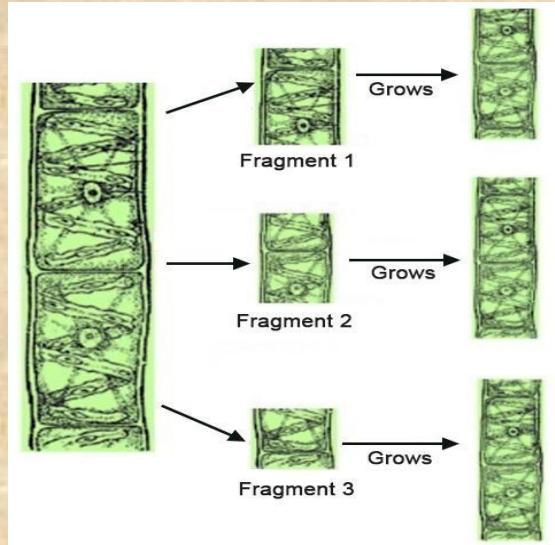


4. **FRAGMENTATION:** It takes place in multicellular organism with **simple body organisation**.

It is the process when the broken pieces of an organism (fragments) grow into a complete organism.

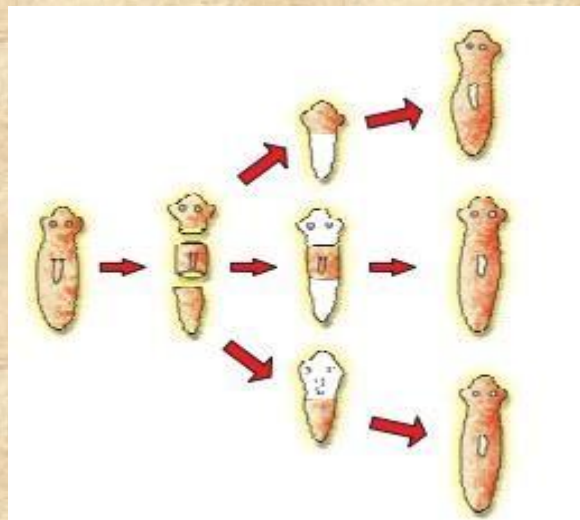


### Fragmentation in Spirogyra:



5. **REGENERATION:** When the simple animals like Hydra, Planaria develop a new individual from their broken part, it is known as regeneration. It is carried out by specialised cells which divide and differentiate to form the complete individual. These cells multiply and from this mass of cells other parts are generated.

### Regeneration in Planaria:



## **Vegetative Propagation:**

A mode of reproduction in which reproduction takes place from the vegetative parts like the stem, root and leaves.

### **Methods of Vegetative Propagation (Natural)**

1. **By Roots** : E.g. adventitious roots of Dahlias
2. **By Stems** : E.g. Potato (tuber), ginger (rhizome)
3. **By Leaves** : E.g. leaves of Bryophyllum. Buds are formed in the notches of leaf margin which develop into new plants.

### **Artificial**

1. **Grafting** : E.g. Mango.
2. **Cutting** : E.g. Rose
3. **Layering** : E.g. Jasmine
4. **Tissue culture**: E.g. Orchids, Ornamental Plants.

### **Benefits of Vegetative Propagation**

1. Plants can bear flowers, fruits earlier than those produced from seeds.
2. Growing plants like Banana, orange, rose, jasmine that have lost the capacity to produce seeds.
3. Genetically similarity is maintained in the plants.
4. Helps in growing seedless fruits.
5. Cheaper and easier method of growing plants.

## **Sexual Reproduction:**

When reproduction takes place as a result of fusion of two gametes, one from each parent, it is called sexual reproduction.

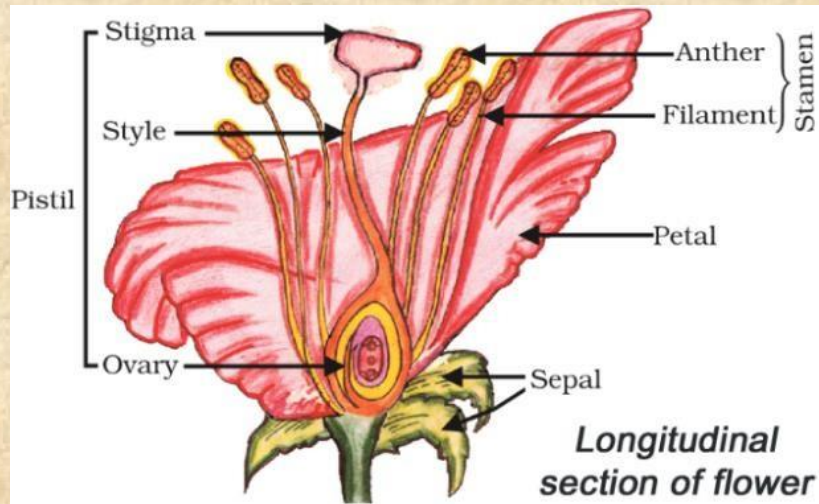
- The process of fusion of male and female gametes is called fertilization.
- The formation of gametes involves exchange of chromosomal (genetic) materials between homologous chromosomes causing genetic recombination which leads to variation.

## **Sexual Reproduction in Plants**

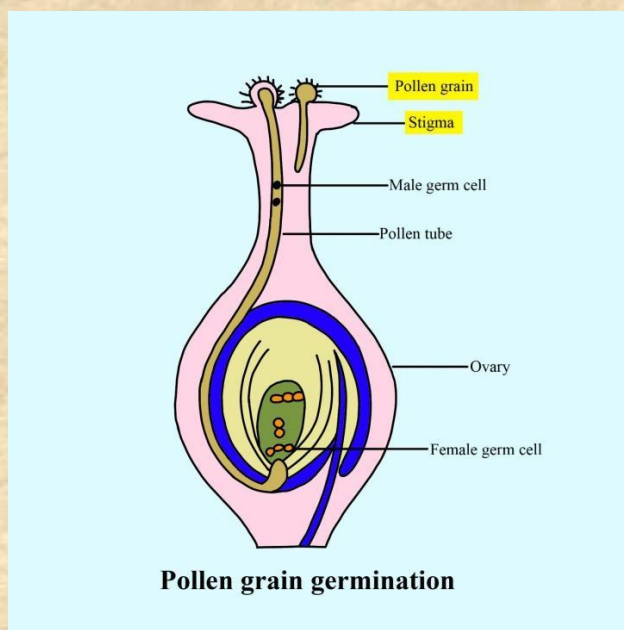
It occurs mostly in flowering plants. Flowers are the reproductive organs of plants.

### **Structure of Flower Video:**

[https://www.youtube.com/embed/jJ5K78\\_TIEY](https://www.youtube.com/embed/jJ5K78_TIEY)



- A typical flower consists of four main whorls namely calyx (sepals), Corolla (Petals), Androecium (Stamens) and Gynoecium (Carpels).
  - Pollen grains of a flower, transfer to the stigma of the carpel of the same flower (**Self- Pollination**) or to the stigma of carpel of the another flower (**Cross-Pollination**).
  - This transfer of pollen grains achieved by agents like wind, water or animals.
  - After Pollination, a pollen tube grows out of pollen grains, through which male germ cell reaches the ovary and fuses with the female germ cell.



## **Fertilization:**

- The fusion of male and female gamete is called fertilization. It occurs inside the ovary. Zygote is produced in this process.
- Zygote divides several times to form an embryo within the ovule. The ovule develops a tough coat and is converted into a seed.
- Ovary grows rapidly and ripens to form a fruit, while the seed contains the future plant or embryo which develops into a seedling under suitable condition. This process is known as Germination.
- Flowers can also be unisexual (contain either stamen or carpel) or bisexual (contains both stamen and carpel).

Unisexual flowers: Papaya, Water melon

Bisexual flowers: Hibiscus, Mustard.

## **Reproduction in Human Beings**

In humans sexual mode of reproduction takes place.

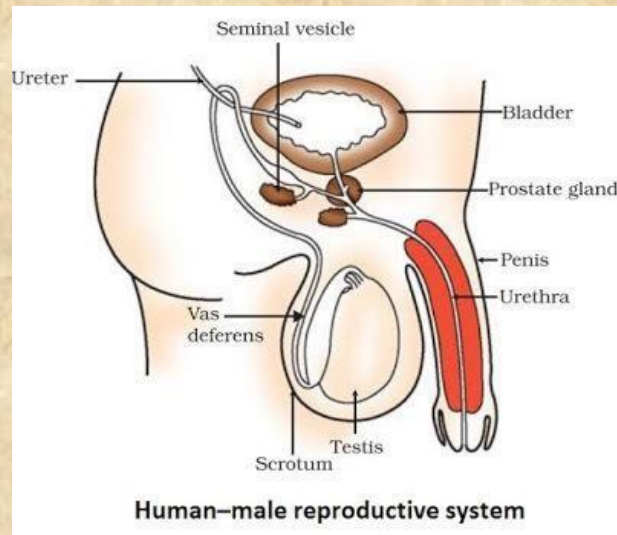
It needs sexual maturation which includes formation of the germ cells ie, egg (ova) in the female and sperm in the male partner & this period of sexual maturation is called Puberty.

### **Male Reproductive System:**

- The formation of male germ cells (sperms) takes place in the testes (male reproductive organ)
- A pair of testes is located inside scrotum which is present outside the abdominal cavity. Scrotum has a relatively low temperature needed for the production of sperms by testes.

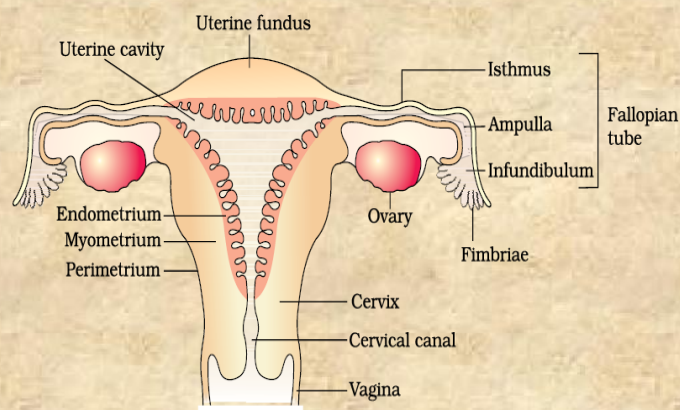
Testes release male sex hormone called **testosterone** and its function is to:

- Regulate the production of sperm
- Bring about changes in appearance seen in boys at the time of puberty.
- The sperms along with the secretion of prostate gland and seminal vesicle together constitute semen, which is released and made to enter into the female genital tract during **Copulation**.



### Female Reproductive System:

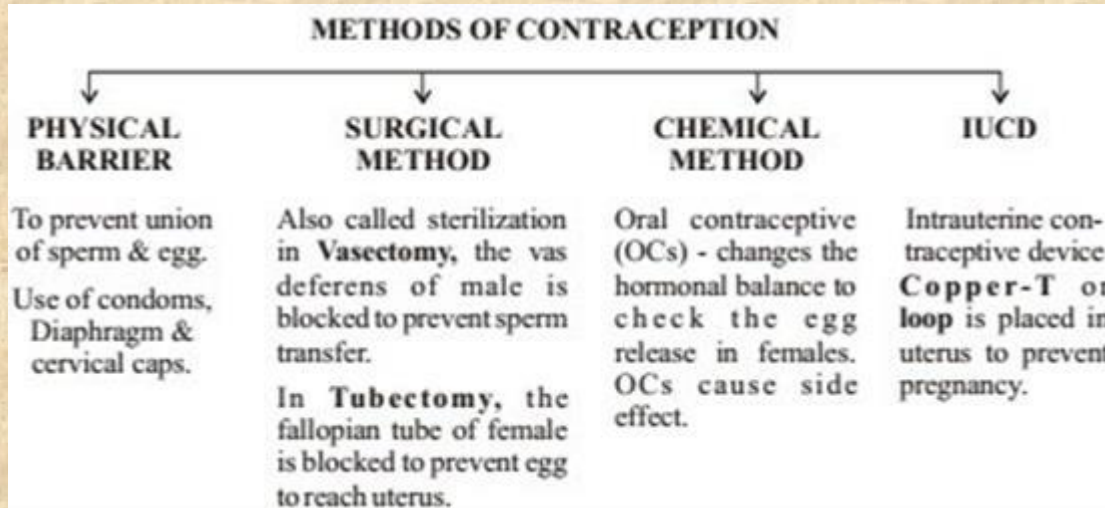
- The female germ cells or eggs are produced in the ovaries. (located in both sides of abdomen).
- When a girl is born, the ovaries already contain thousands of immature eggs.
- At puberty, some of these eggs start maturing. One egg is produced every month by one of the ovaries alternately.
- The Egg is carried from the ovary to the womb through fallopian tube. These two fallopian tubes unite into an elastic bag like structure known as uterus.
- The Uterus opens into the vagina through the cervix. Fertilization occurs in the fallopian tube of female genital tract.
- The fertilized egg called zygote (2n) gets implanted in the lining of the uterus, and start dividing. Uterus is richly supplied with blood to nourish the growing embryo. If zygote is not formed, the inner wall of uterus breaks which causes bleeding through vagina. This process is called **Menstruation**. It occurs at a regular interval of 28 days.
- The Embryo gets nutrition from the mother's blood with the help of a special tissue called **PLACENTA**. Similarly the wastes from developing embryo are removed to mother's blood through placenta.
- The time period from fertilization up to the birth of the baby is called **GestationPeriod**. In humans, it is about nine months (36 weeks).
- The sexual cycle (Menstruation) in a woman continues up to the age of 45-50 years. After that the ovaries do not release egg. This stage is called **Menopause**.
- Female sex hormones are estrogen and progesterone which are produced by ovary.



## Reproductive Health:

Reproductive Health means a total well-being in all aspects of reproductive phase, i.e., physical, emotional, social and behavioural.

**Contraception:** It is the avoidance of pregnancy.



Healthy society needs a balanced sex ratio that can be achieved by educating people to avoid malpractices like female foeticide & prenatal sex determination.



## HEREDITY AND EVOLUTION

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### Heredity:

Heredity is the mechanism by which characteristics are passed on from one generation to the next. Gene is the unit of heredity. Genetics is the study of heredity in biology. Gregor Mendel proposed the laws of inheritance.

### Variations:

Variation can be defined as any difference between the individuals in a species or groups of organisms of any species. The mutation is the ultimate source of genetic variation, but mechanisms such as sexual reproduction and gene flow contribute to it as well.

### Importance of variations

- Variation enables organisms to adjust and adapt better according to the changing conditions of the environment (survival advantage)
- Different kinds of variations in organisms lead to the development of new species.

## MENDEL'S LAW OF INHERITANCE

### Key Words

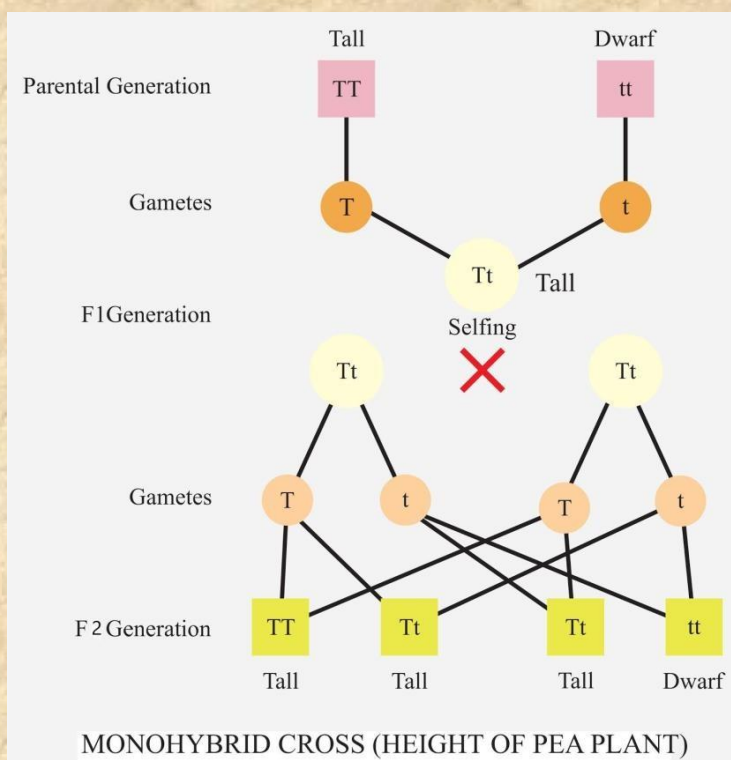
Chromosomes	Long thread-like structures present in the nucleus of a cell which contain hereditary information of the cell.
DNA	Deoxyribo nucleic acid - the genetic material.
Gene	Part of DNA, controls a specific biological function.
Contrasting characters	A pair of visible characters such as tall and dwarf, white and violet flowers, round and wrinkled seeds, green and yellow seeds etc.
Dominant trait	The trait which is expressed when both the alleles of a gene are dominant or one of the alleles is dominant and the other is recessive.
Recessive trait	Can't express itself in presence of dominant trait.
Homozygous	When alleles of similar types are present. E.g.- TT, tt.
Heterozygous	Two different alleles present together. E.g.- Tt
Genotype	It is genetic makeup of an individual. E.g.- TT, tt, Tt
Phenotype	It is observable feature. E.g.- tall, dwarf
Monohybrid cross	Cross to observe single character. E.g.- height of plant
Dihybrid cross	Cross to observe two characters at the same time. E.g. colour and shape of seed

### MENDEL'S LAWS OF INHERITANCE

- The Law of Dominance
- The Law of Segregation

- The Law of Independent Assortment.

**Law of Dominance:** When parents having pure contrasting characters are crossed then only one character expresses itself in the F1 generation. This character is the dominant character and the character/factor which cannot express itself is called the recessive character.



**Law of segregation:** The phenomenon of separation of the two alternating factors of one character during gamete formation so that one gamete receives only one factor of a character is called as Law of Segregation.

**Law of Independent Assortment:**

When two pairs of traits are combined in a hybrid, segregation of one pair of characters is independent of the other pair of characters. This phenomenon is called Law of Independent Assortment.

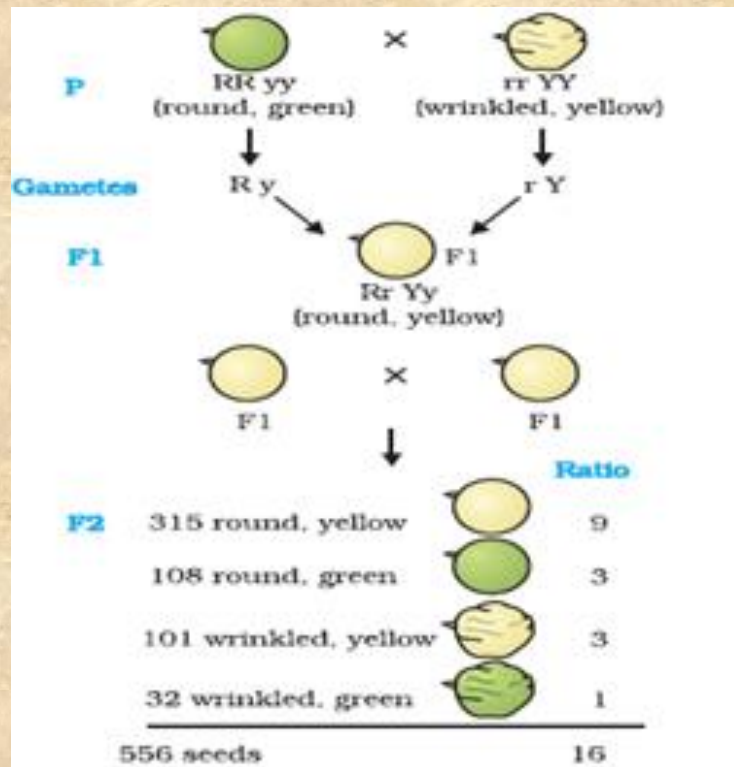
Dihybrid cross.

Gregor Mendel crossed pea plants bearing round green seeds (RRyy) with plants bearing wrinkled yellow seeds (rrYY) in his experiment.

In the F1 generation he obtained all round and yellow seeds. It means round and yellow traits of seeds are dominant features while wrinkled and green are recessive.

On selfing the plants of F1 Mendel found that in F2 generation four different types of seeds round yellow, round green, wrinkled yellow and wrinkled green in the ratio of 9 : 3 : 3 : 1 are present.





### HOW DO TRAITS GET EXPRESSED?

- DNA is regulating authority to make proteins in the cell.
- Gene provides information for one particular protein.
- E.g. the height of a plant depends upon the growth hormone which is in turn controlled by the gene.
- Both the parents contribute equally to the DNA of next generation during sexual reproduction.

### SEX DETERMINATION IN HUMAN

The process of determining the sex of an individual, based on the composition of the genetic makeup is called sex determination.

- Human has 23 pair of chromosomes.
- Autosome: 22 pairs (44)
- Sex chromosomes: 01 pair (02). They may be either- i) Homogametic – XX for female (44 +XX)

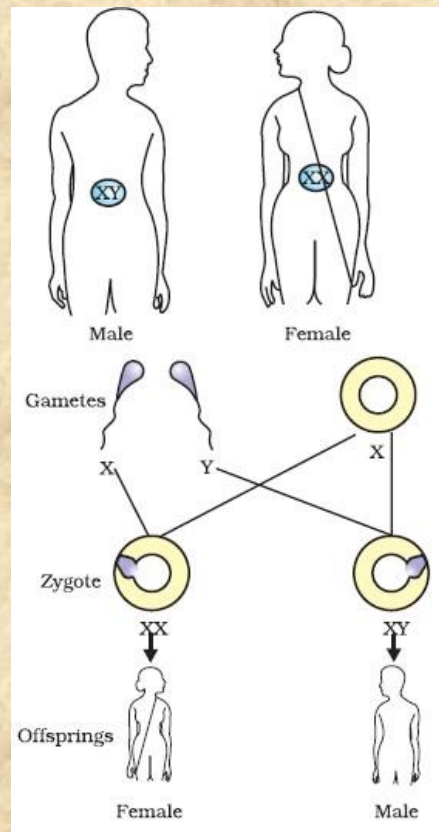
iii) Heterogametic XY for male (44 +XY)

In some organisms environment also plays crucial role in determination of sex-

- In some Reptiles: Temperature at which a fertilized egg is incubated governs the gender.
- Snails: A particular animal can change the gender within one's life time.

For more information click-

<https://www.youtube.com/embed/YVHDgyhS9pA>



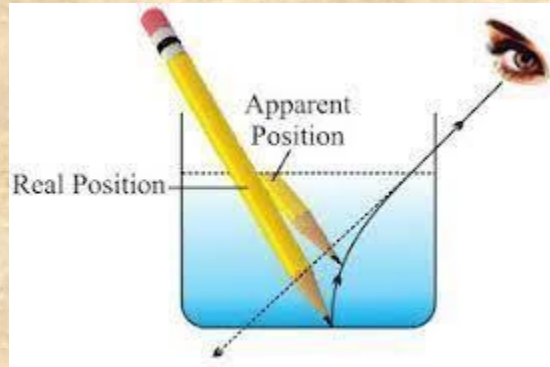
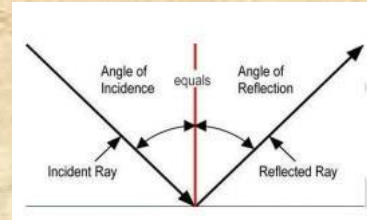
## LIGHT: REFLECTION AND REFRACTION

[BACK TO INDEX](#)

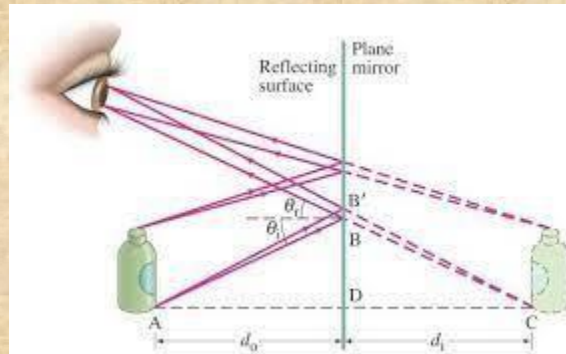
**LIGHT:-** When light falls on an object it is bounced back into the same medium. This is called reflection of light.

### LAWS OF REFLECTION OF LIGHT:-

- The angle of incidence is equal to the angle of reflection.
- The incident ray, the reflected ray and the normal to the mirror at the point of incidence all lie in the same plane.



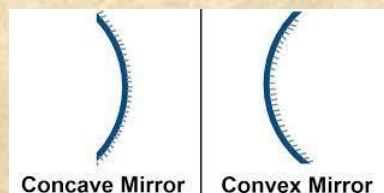
**IMAGE FORMATION BY A PLANE MIRROR :-** (i) virtual (ii) same size as the object. (iii) at the same distance from the mirror as the object. (iv) The image is laterally inverted.



**SPHERICAL MIRRORS:** Spherical mirror is the mirror which is a part of a hollow sphere. There are two types of spherical mirrors (a)concave mirror (b) convex mirror.

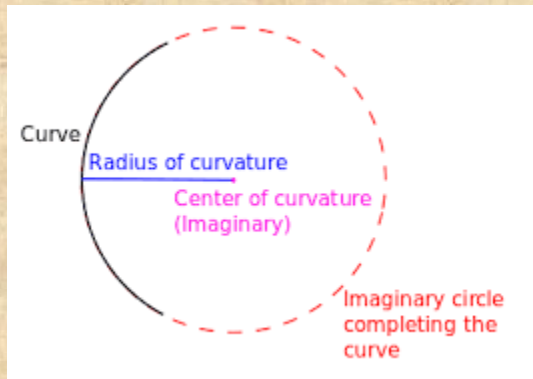
**a) Concave mirror (converging mirror):-** Concave mirror is a spherical mirror whose reflecting surface is curved inwards. • Rays of light parallel to the principal axis after reflection from a concave mirror meet at a point (converge) on the principal axis.

**b) Convex mirror (diverging mirror) :-** It is a spherical mirror whose reflecting surface is curved outwards. • Rays of light parallel to the principal axis after reflection from a convex mirror get diverged and appear to come from a point behind the mirror.



## IMP. TERMS RELATED TO SPHERICAL MIRRORS:

**i) Centre of curvature(C):** -It is the centre of the sphere of which the mirror is a part.



**ii) Radius of curvature(R):** - It is the radius of the sphere of which the mirror is a part (CP).

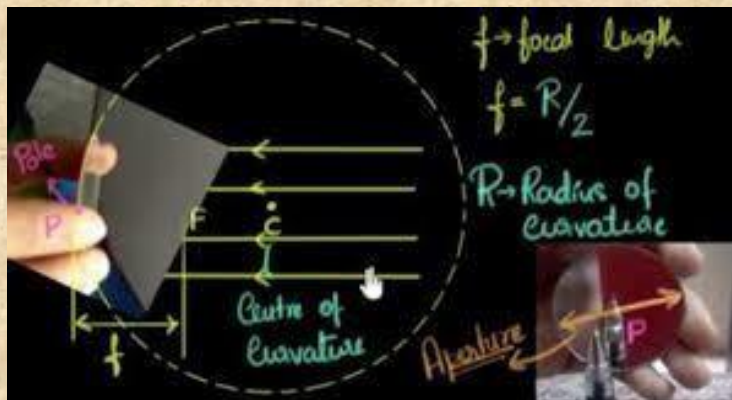
**iii) Pole:** -It is the centre of the spherical mirror (P).

**iv) Principal axis:** - It is the straight line passing through the centre of curvature and the pole.

**v) Principal focus:**- In a concave mirror, principal focus is the point on PA where the reflected light rays parallel to the principal axis converge and actually meet after reflection.

In a convex mirror, rays of light parallel to the principal axis get diverged after reflection and appear to come from a point on the principal axis behind the mirror called principal focus (F).

**vi) Focal length:** -focal length is the distance between the pole and principal focus (f) In a spherical mirror the radius of curvature is twice the focal length.  $R = 2f$

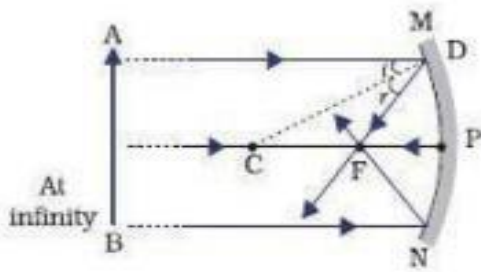


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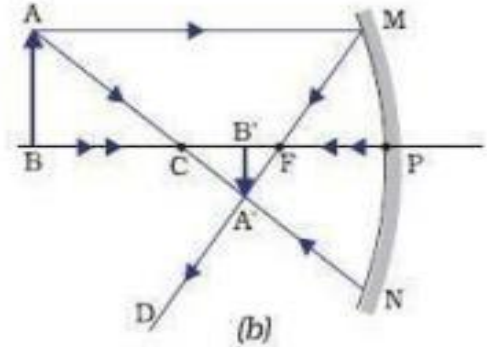
**IMAGE FORMATION BY CONCAVE MIRROR:-**

**Table 10.1** Image formation by a concave mirror for different positions of the object

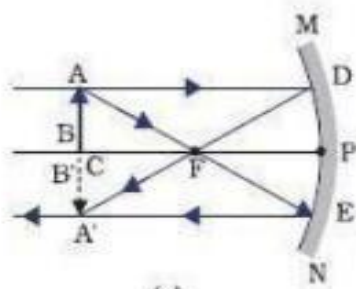
Position of the object	Position of the image	Size of the image	Nature of the image
At infinity	At the focus F	Highly diminished point-sized	Real and inverted
Beyond C	Between F and C	Diminished	Real and inverted
At C	At C	Same size	Real and inverted
Between C and F	Beyond C	Enlarged	Real and inverted
At F	At infinity	Highly enlarged	Real and inverted
Between P and F	Behind the mirror	Enlarged	Real and inverted



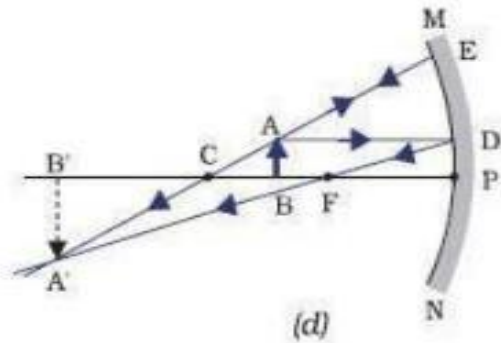
(a)



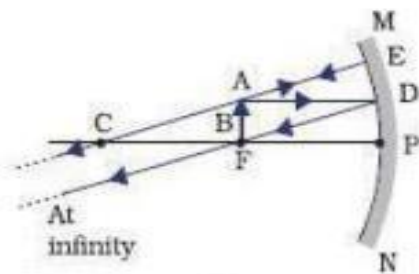
(b)



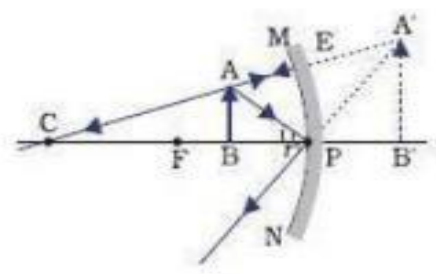
(c)



(d)

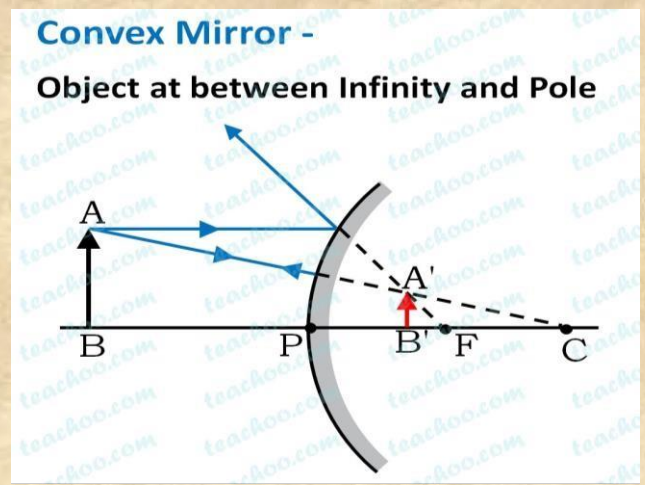
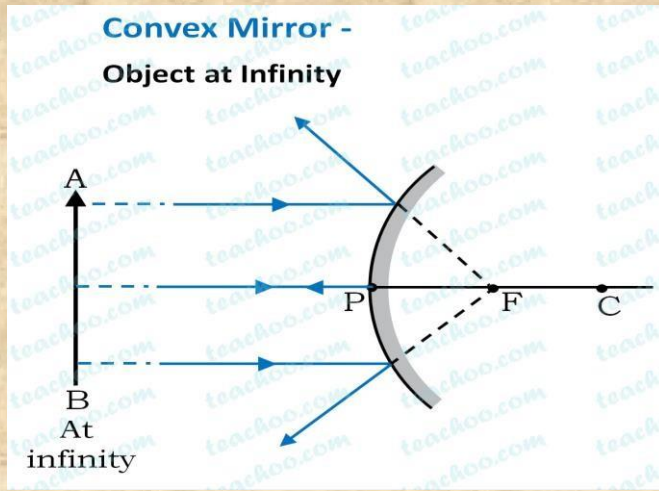


(e)



(f)

TO WATCH A VIDEO FOR RAY DIAGRAMS, PLEASE [CLICK HERE](#)



TO WATCH A VIDEO FOR RAY DIAGRAMS, PLEASE [CLICK HERE](#)

## THE HUMAN EYE AND THE COLOURFUL WORLD

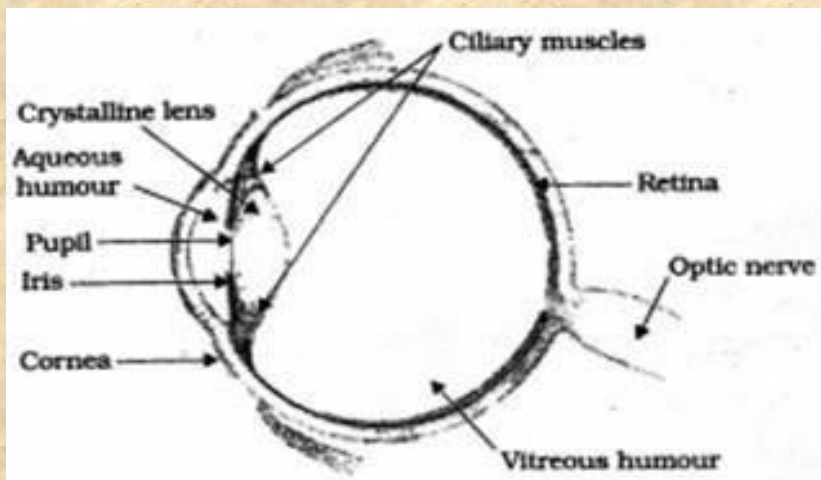
- Human eye is the natural optical instrument used which enables us to see.

We will study various natural optical phenomenon like Rainbow formation, twinkling of star, blue and red colour of sky etc.

### HUMAN EYE:

It acts like a camera, enable us to capture the colourful picture of the surroundings.

An inverted, real image on light sensitive is formed on the Retina



### The Various Parts of Eye and their Functions

1. **Cornea:** It is a thin membrane through which light enters. It forms the transparent bulge on the front of eyeball. Most of the refraction occurs at the outer surface of the cornea.
2. **Eyeball:** it is a convex lens, approximately spherical in shape, with a diameter of about 2.3cm. It can alter its curvature with help of ciliary muscles.
3. **Iris:** It is a dark muscular diaphragm that controls the size of pupil. It is behind the cornea. It helps in accommodation of light by changing the size of the pupil.
4. **Pupil:** It regulates and control the amount of light entering the eye. It is the black opening between aqueous humour & lens. Black in colour. Light entering cannot exit.

5. **Crystalline eye lens: Provides** the focused real & inverted image of the object on the retina. It is composed of a fibrous, jelly like material.

This is convex lens that converges light at retina.

6. **Ciliary muscles: It** helps to change the curvature of eye lens and hence changes its focal length so that we can see the object clearly placed at different positions.

7. **Retina:** Thin membrane with large no. of light sensitive cells.

There are two types of photoreceptors in the human retina, rods and cones.

Rods are responsible for vision at low light levels. They do not mediate colour vision.

Cones are active at higher light levels, are capable of colour vision.

When image is formed at retina, light sensitive cells get activated and generate electrical signal. These signals are sent to brain via optic nerve. Brain analyses these signals after which we perceive object as they are.

8. The *vitreous body* is the clear gel that fills the space between the lens and the retina of the eye ball of humans and other vertebrates.

9. The *aqueous humour* is a transparent, watery fluid similar to plasma, but containing low protein concentrations.

**VISUAL EXPLANATION** (parts of human eye)

### How Pupil Works?

**Example:** You would have observed that when you come out of the cinema hall after watching movie, in the bright sun light, your eyes get closed. And when you enter the hall from the bright light, you will not be able to see but after some time you would be able to see. Here the pupil of an eye provides a variable aperture, whose size is controlled by iris.

(a) **When the light is bright:** Iris contracts the pupil, so that less light enters the eye.

(b) **When the light is dim:** Iris expands the pupil, so that more light enters the eye. Pupil opens completely, when iris is relaxed.

**Persistence of Vision:** It is the time for which the sensation of an object continues in the eye. It is about 1/16th of a second.



## Power of Accommodation

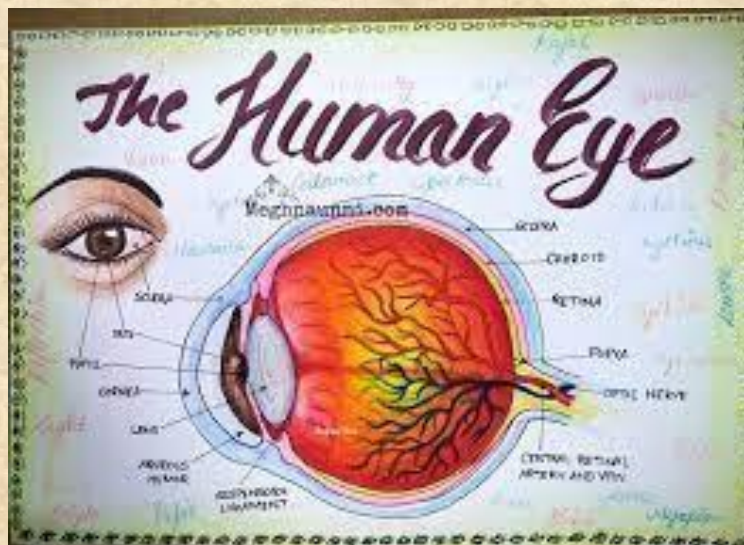
The ability of eye lens to adjust its focal length with the help of ciliary muscles is called accommodation.

### VISUAL EXPLANATION

(Accommodation and near point)

1. Eye lens becomes thin
2. Increases the focal length
3. Enable us to see distant object clearly

1. Eye lens becomes thick
2. Decreases the focal length
3. Enable us to see nearby object clearly

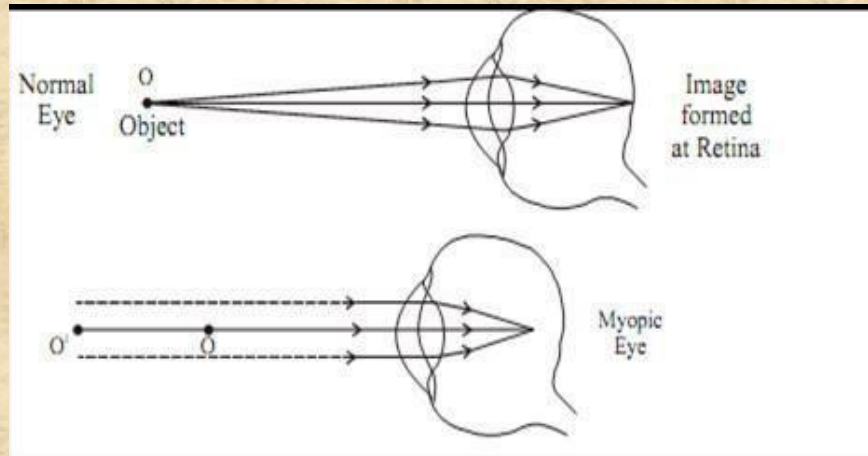


## Defects of Vision and their Correction

1. **Cataract:** The image cannot be seen distinctly because eye lens become milky and cloudy. This condition is known as cataract, it can cause complete or partial loss of vision. This can be corrected by surgical removal of extra growth (cataract surgery).

## 2. Myopia: (Near Sightedness)

A person can see nearby object clearly, but cannot see distant object distinctly.



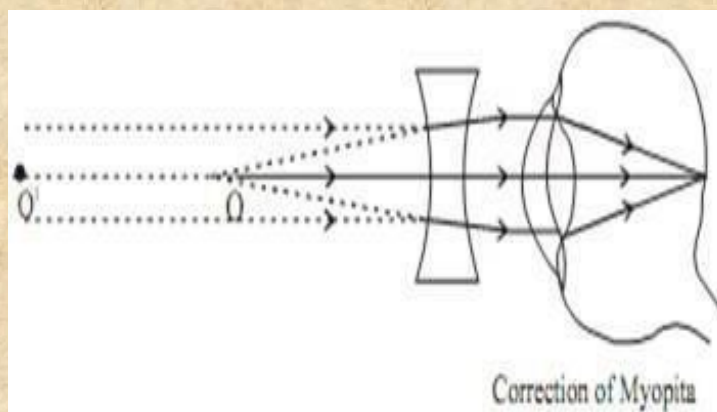
**Image formed in front of the retina.**

### The Reason of defect

1. Excessive curvature of eye lens means Eye lens becomes thick and its focal length decreases.
2. Elongation of the eye ball.

### Correction

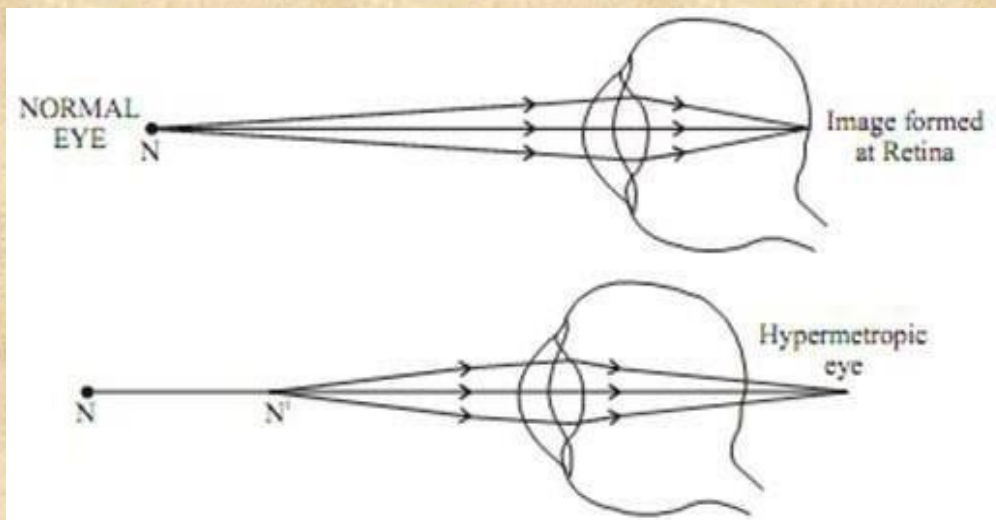
Corrected by using a Concave Lens of appropriate power.



## Hypermetropia (Far - Sightedness)

A person cannot see nearby object clearly, but can see distant object distinctly.

## Image formed at a point behind the retina



### The Reason of defect

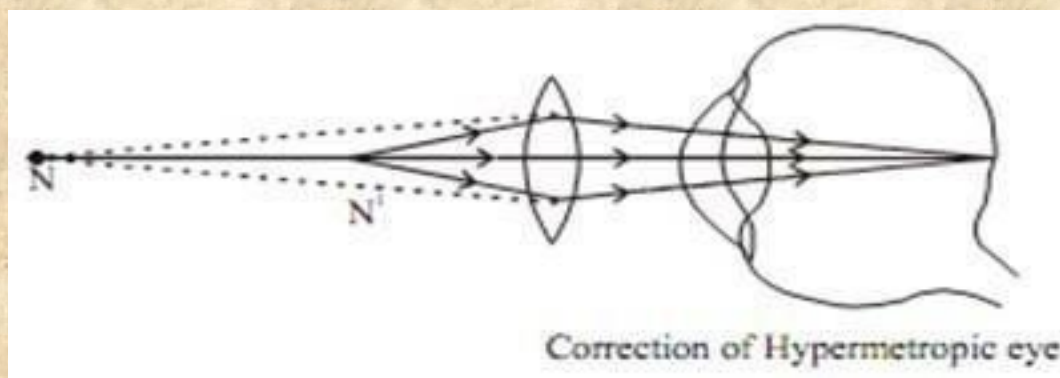
1. Increase in focal length of the eye lens (Thin eye lens)
2. Eye ball has become too small.

### Correction

Corrected by using a Convex Lens of appropriate power.

## VISUAL EXPLANATION

(myopia and hypermetropia )



## 4. Presbyopia

As we become old, the power of accommodation of the eye usually decreases; the near point gradually recedes away. This defect is called Presbyopia, a special kind of Hypermetropia.

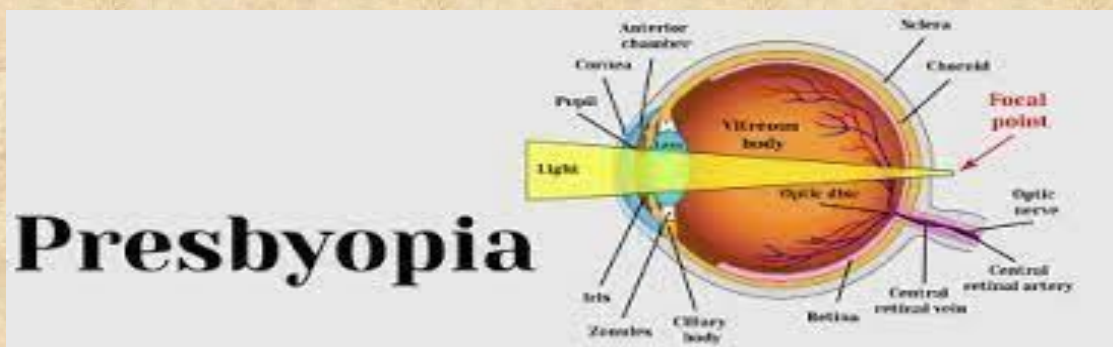
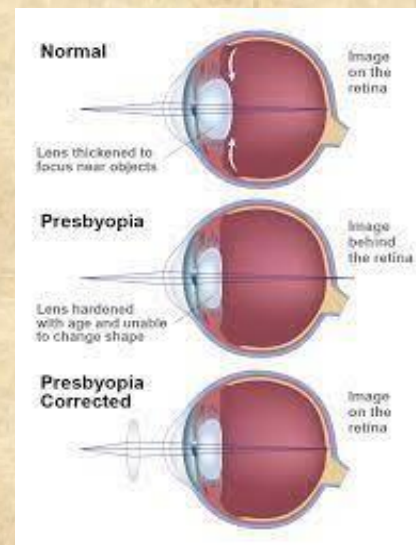
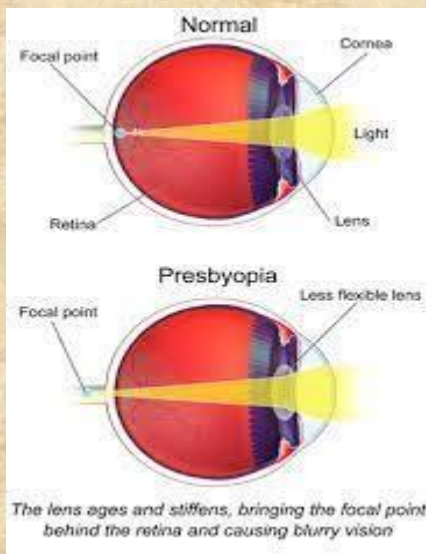
Person may suffer from both myopia and hypermetropia.

**Reason of defect:** Gradual weakening of ciliary muscles and decreasing the flexibility of the eye lens.

**Correction :** Using Bifocal lens with appropriate power. Bifocal lens consist of both concave and convex lens, upper position consist of concave lens and lower portion consist of convex lens action of Light through a Prism

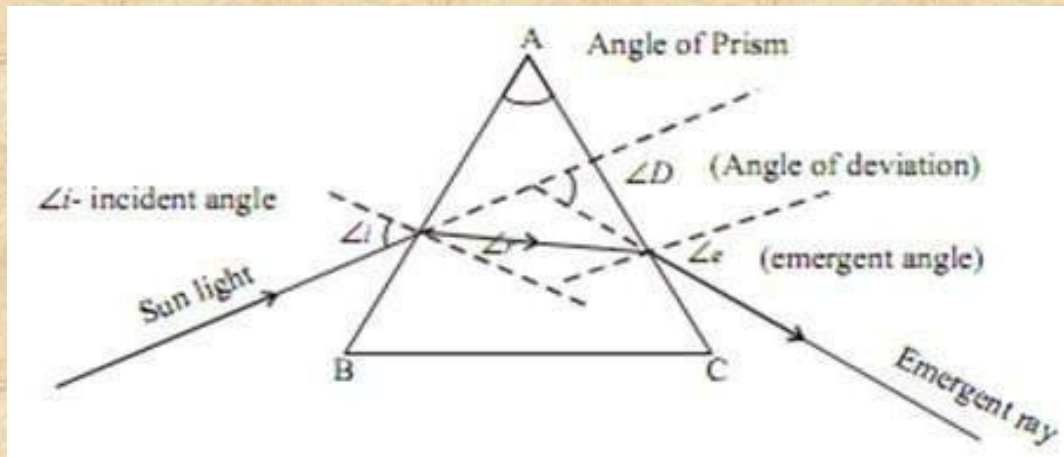
### VISUAL EXPLANATION

( presbyopia)



**Prism** : It has two triangular bases and three rectangular lateral surfaces.

These surfaces are inclined to each other. The angle between its two lateral faces is called



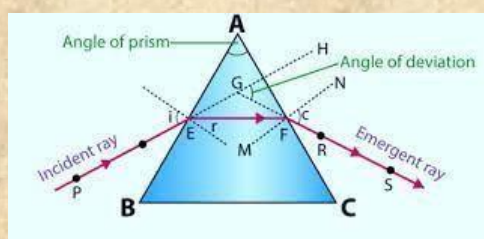
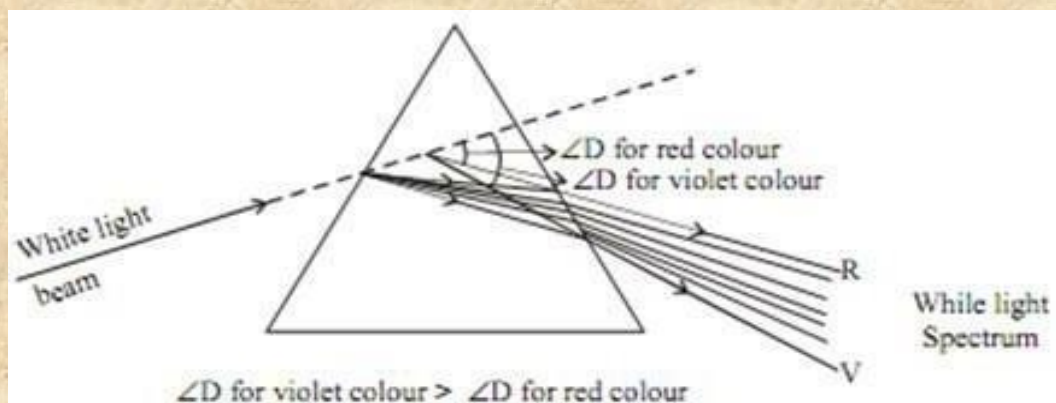
**Angle of Prism.**

**Angle of Deviation** ( $\angle D$ ) The angle between the incident ray and emergent ray.

Dispersion of white light by a Glass Prism

## VISUAL EXPLANATION

(Prism and Dispersion of light)



Inclined refracting surfaces of glass prism show exciting phenomenon.

## Splitting of White Light into Band of Colours

The band of the coloured components of light beam is called **Spectrum i.e. VIBGYOR**

The splitting of light into its component colours is called **Dispersion**.

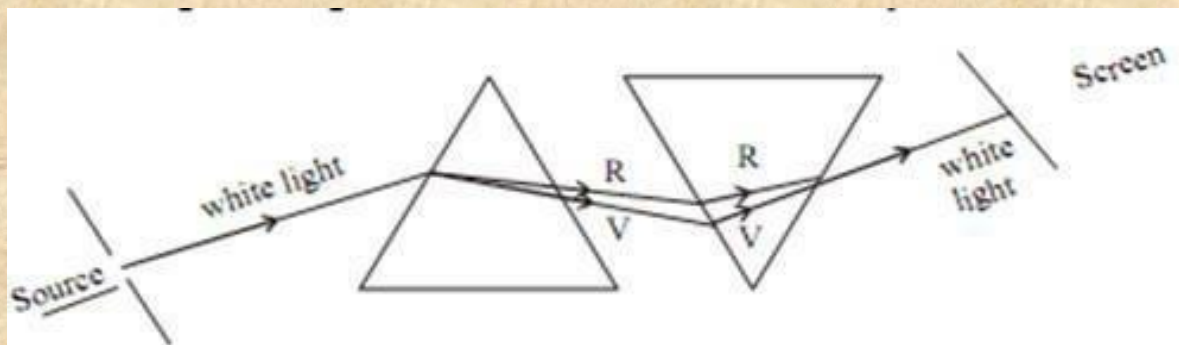
The different component colour of light bends at different angle with respect to incident angle, the red light bends the least while the violet bends most.

## ISSAC NEWTON

He was the first, who obtained spectrum of sunlight by using glass prism. He tried to split the spectrum of white light more by using another similar prism, but he could not get any more colours.

He repeated the experiment using second prism in an inverted position with respect to the first prism.

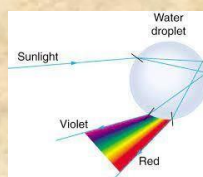
Allowed all the colours of spectrum to pass through second prism. He found white light emerges on the other side of second prism.



He concluded that sun is made up of seven visible colours 'VIBGYOR'

## RAINBOW

It is the spectrum of sunlight in nature It is formed due to the dispersion of sunlight by the tiny water droplet, present in atmosphere.



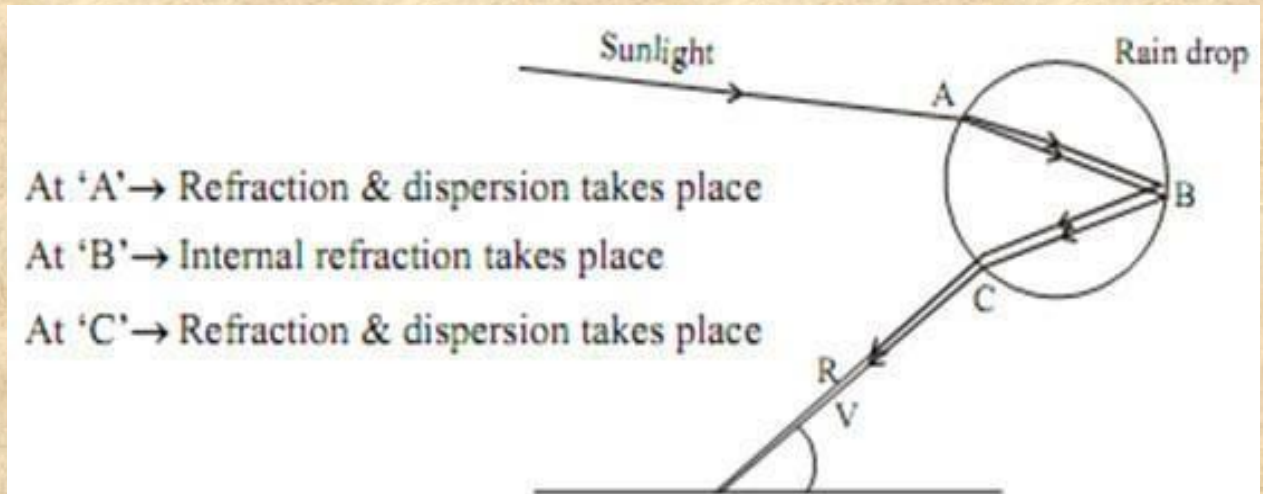
## Water Droplet Act like Prism

It refracts and disperses the incident sunlight, then reflects it internally (internal reflection) and finally refracts it again, when it emerges out of the water droplet.

A rainbow is always formed in a direction opposite to that of sun.

Due to dispersion and internal reflection of light, different colours reach the observer's eye.

Red colour appears on top & violet at the bottom of rainbow



## Atmospheric Refraction

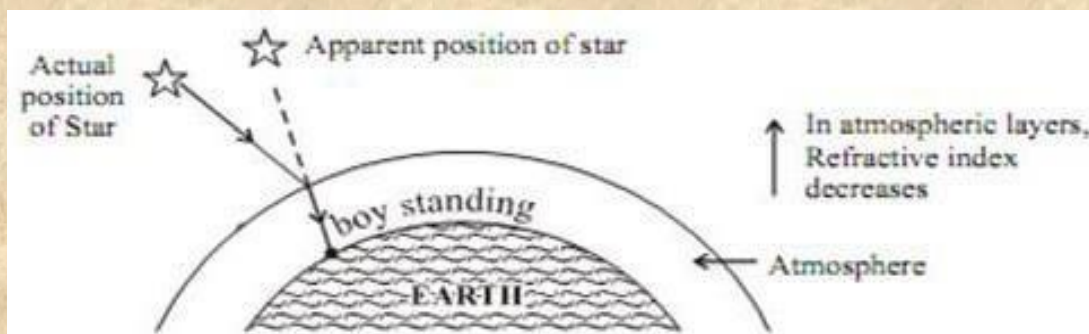
**1. Apparent Star Position:** It is due to atmospheric refraction of starlight.

The temperature and density of different layers of atmosphere keeps varying. Hence, we have different medium.

Distant star act as point source of light. When the starlight enters the earth's atmosphere it undergoes refraction continuously, due to changing refractive index i.e. from rarer to denser, it bends towards the normal.

Due to this the apparent position of the star is different from actual position.

The star appears higher than its actual position.



1. **Twinkling of Star:** It is also due to atmospheric refraction.

Distant star act like a point source of light. As the beam of starlight keeps deviating from its path, the apparent position of star keeps on changing because physical condition of earth's atmosphere is not stationary

Hence the amount of light enters our eyes fluctuate some time bright and sometime faint.

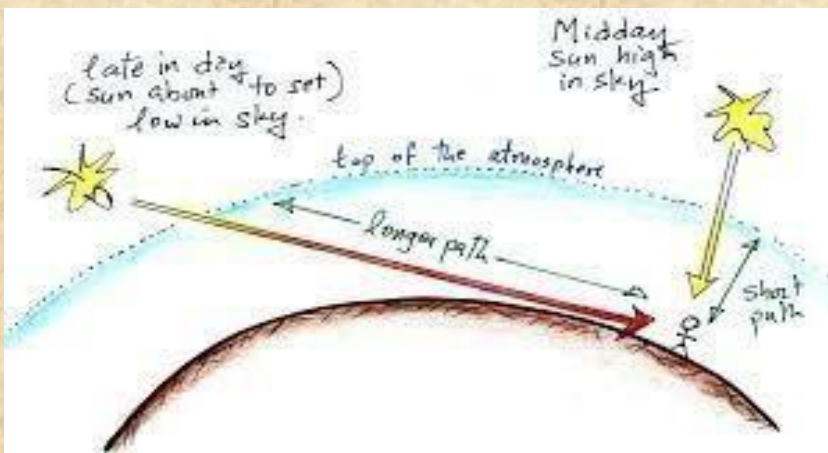
This is the “**Twinkling effect of star**”.

### **VISUAL EXPLANATION**

(Why do stars twinkle?)

### **Blue Sky**

The blue colour of the sky is caused by the scattering of sunlight on the molecules of the atmosphere. This scattering, called Rayleigh scattering, is more effective at short wavelengths (the blue end of the visible spectrum). Therefore, the light scattered down to the earth at a large angle with respect to the direction of the sun's light is predominantly in the blue end of the spectrum.



### **VISUAL EXPLANATION**

(Advanced sunrise and delayed sunset)

### **VISUAL EXPLANATION**

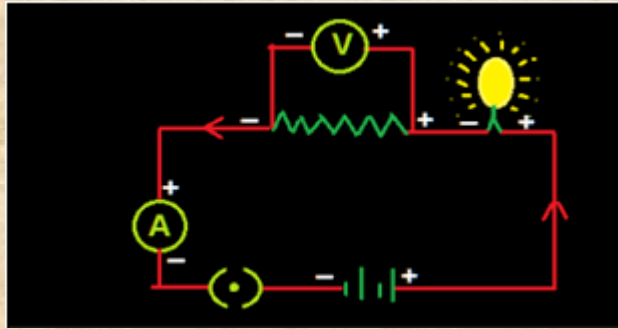
(why is the sky blue?)



## ELECTRICITY

### ➤ Electric Current :-

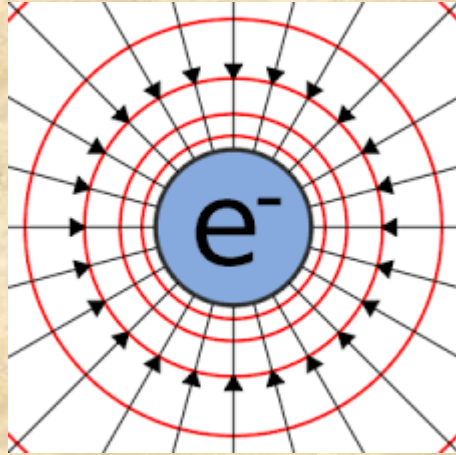
- Electric current is the flow of electrons through a conductor.
- The device which causes the flow of electrons through a conductor is called a cell.
- Electrons flow from the negative terminal to the positive terminal.
- Electric current flows from the positive terminal to the negative terminal.
- This is called conventional current.
- Electric current is expressed as: - The rate of flow of charges through a conductor or the quantity of charges flowing through a conductor in unit time.



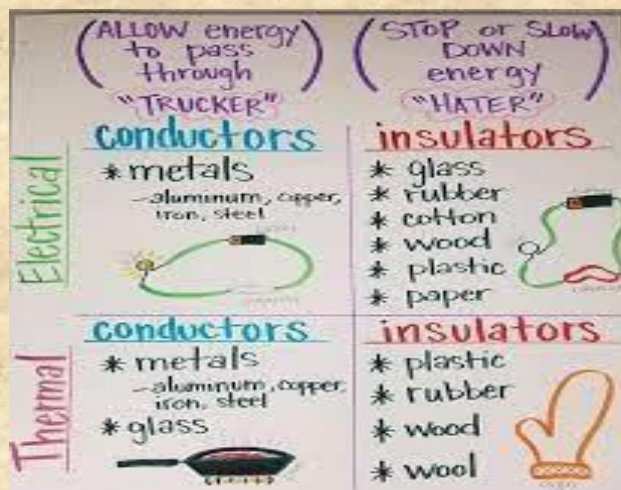
### ➤ Electric Charge:-

- The SI unit of electric charge is coulomb (C). It is the charge contained in  $6 \times 10^{18}$  electrons.
- The SI unit of current is called ampere (A).
- One ampere is the current flowing through a conductor if 1 coulomb of charge flow through it in 1 second.
  
- 1 Ampere = 1Coulomb/1Second
- Electric Current is measured by an ammeter. It is always connected in series in a circuit.

1. **Charge:** It is an inherent property of the body due to which the body feels attractive and repulsive forces. There are two types of electric charges:
- (i) Positive and (ii) Negative
  - (ii) Like charges are repelling each other.
  - (iii) Unlike charges attract each other.



2. **Conductors and insulators:** Those substances through which electricity can flow are called conductors. All the metals like silver, copper, aluminium etc. are conductors. Those substances through which electricity cannot flow are called insulators. Glass, ebonite, rubber, most plastics, paper, dry wood etc. are insulators.



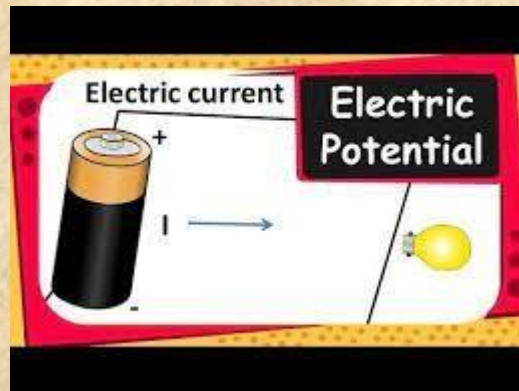
3. **Electrostatic potential:** The electrostatic potential at any point is defined as the work done in bringing a unit positive charge from infinity to that point. Potential is denoted by the symbol  $V$  and its unit is volt. A potential of one volt at a point means that 1 joule of work is done in bringing 1 unit positive charge from infinity to that point.

4. **Potential Difference:** The amount of work done in moving unit positive charge from one point to another in an electric field is known as potential difference. Potential difference = Work done/Quantity of charge transferred

If a  $W$  joule of work has to be done to transfer  $Q$  coulombs of charge from one point to another point, then the potential difference  $V$  between the two points is given by the formula:

Potential difference,  $V = W/Q$

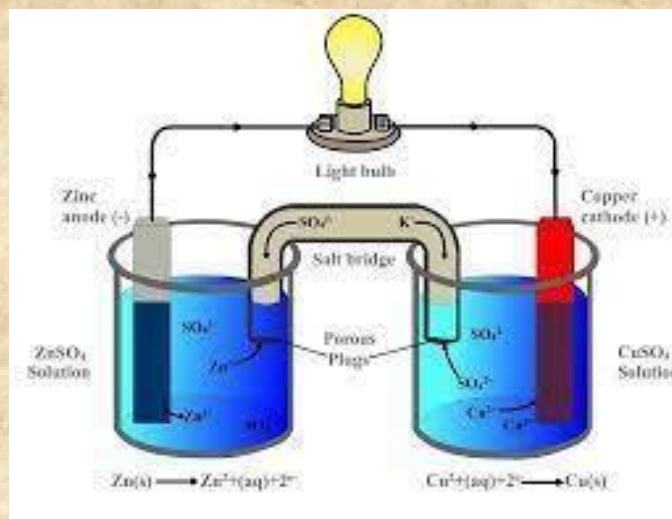
The SI unit of potential difference is volt (V).



5. **Voltmeter:** The potential difference is measured by means of an instrument called voltmeter. The voltmeter is connected in parallel across the points where the potential difference is measured. A voltmeter has high resistance.

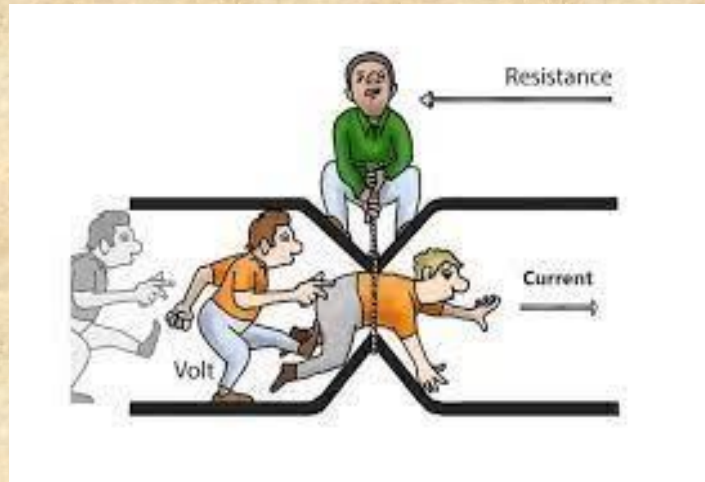


6. **Electric Current:** The electric current is the rate of flow of electric charges (called electrons) in a conductor.  
If a charge of  $Q$  coulombs flows through a conductor in time  $t$  seconds, then the magnitude  $I$  of the electric current flowing through it is given by  
Current,  $I = Q/t$ , The SI unit of electric current is ampere and it is denoted by the letter  $A$ . Electric current is a scalar quantity.
7. **Ammeter:** Current is measured by an instrument called ammeter. The ammeter is connected in series with the circuit in which the current is to be measured. An ammeter should have very low internal resistance.
8. **Voltaic Cell:** It is one of the earliest devices which are capable of providing a continuous flow of electric current. It is used for converting chemical energy into electrical energy. It was invented by Volta in the year 1800.



9. **Ohm's Law:** At constant temperature, the current flowing through a conductor is directly proportional to the potential difference across its ends. If  $I$  is the current flowing through a conductor and  $V$  is the potential difference across its ends. Then according to Ohm's law  
 $I \propto V$   
This can also be written as:  
 $V \propto I$   
 $V = IR$

Where R is a constant called 'resistance' of the conductor. The value of this constant depends on the nature, length, area of cross-section and temperature of the conductor.



**10. Resistance of a Conductor:** The property of a conductor due to which it opposes the flow of current through it is called resistance. The resistance of a conductor is numerically equal to ratio of potential difference across its ends to the current flowing through it. i.e.

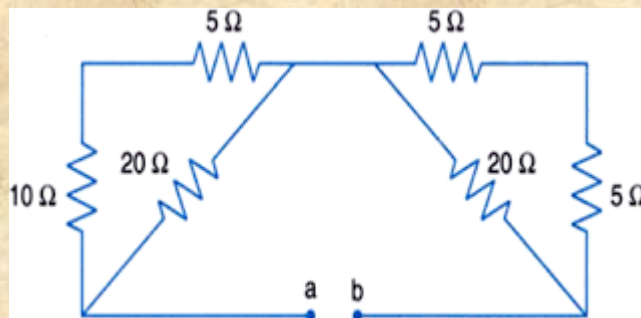
Resistance = Potential difference / Current

$$R = V/I$$

The SI unit of resistance is ohm, which is denoted by symbol  $\Omega$ . 1 ohm: If  $V = 1$  volt,  $I = 1$  ampere, then

$$R = 1 \text{ volt} / 1 \text{ ampere} = 1 \text{ ohm}$$

Thus, the resistance of a conductor is said to be 1 ohm if 1 ampere current flows through the conductor when a potential difference of 1 volt is applied across it.



**11. Factors affecting the Resistance of a Conductor:** The resistance of the conductor depends:

- (i) on its length,
- (ii) on its area of cross-section
- (iii) on the nature of its material.

**12. Resistivity:** It has been found by the experiments that:

- (i) The resistance of a given conductor is directly proportional to its length.
- (ii) The resistance of a given conductor is inversely proportional to its area of cross-section.

Thus, the resistivity of a conductor is the resistance of unit length and unit area of cross-section of the conductor. The SI unit of resistivity is ohm metre ( $\Omega\text{m}$ ).

Resistivity =  $\frac{\text{Resistance} \times \text{Area}}{\text{Length}}$

$\rho = \frac{R \times A}{L}$

**13. Combination of Resistance:** The resistance can be combined in two ways:

- (i) In series
- (ii) In parallel
- (i) Resistance in series:

**Series:**  $\begin{matrix} R_1 & R_2 & R_3 \\ \text{---}\text{---}\text{---} & \text{---}\text{---}\text{---} & \text{---}\text{---}\text{---} \end{matrix} = \begin{matrix} R_{eq} = R_1 + R_2 + R_3 \\ \text{---}\text{---}\text{---} \end{matrix}$

In series, the total Potential difference,

$$V = V_1 + V_2 + V_3 \dots\dots(i)$$

Applying Ohm's law to the entire circuit  $V = IR \dots\dots(ii)$

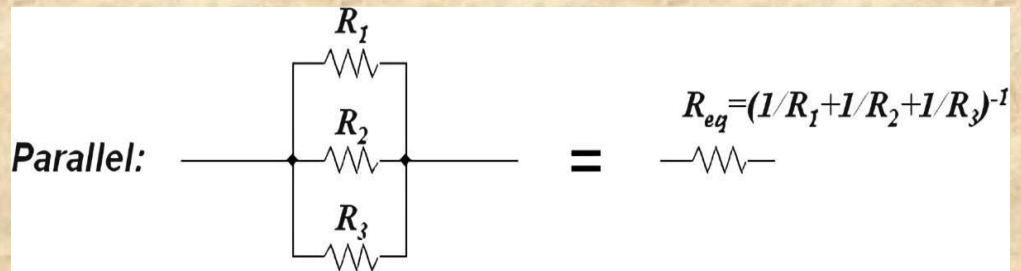
Applying Ohm's law to each resistance separately, we have  $V_1 = IR_1$ ;  $V_2 = IR_2$ ;  $V_3 = IR_3 \dots\dots(iii)$

From equations (i), (ii) and (iii), we have

$$IR = IR_1 + IR_2 + IR_3$$

$$R = R_1 + R_2 + R_3$$

(ii) Resistance in parallel:



In parallel, the total

current:  $I = I_1 + I_2 + I_3$

$\dots\dots(i)$

Applying Ohm's law to the entire circuit  $I = V/R$

$\dots\dots(ii)$

Applying Ohm's law to each resistance separately, we have  $I_1 = V/R_1$ ;  $I_2 = V/R_2$ ;

$I_3 = V/R_3 \dots\dots(iii)$

From equations (i), (ii) and (iii), we have

$$V/R = V/R_1 + V/R_2 + V/R_3$$

$$1/R = 1/R_1 + 1/R_2 + 1/R_3$$

**14. Electric Power:** The rate at which work is done by an electric current is known as electric power.

$$\text{Power} = \frac{\text{Workdone}}{\text{Time}} P$$

$$= \frac{W}{t} = \frac{(V \times Q)}{t} \dots\dots(i)$$

The work done by current  $I$  when it flows for time  $t$  under a potential difference  $V$  is given by:

$$W = V \times I \times t \text{ joules}$$

[Because  $W = VQ$  and  $Q = It$ ]

Putting the value of  $W$  in equation (i),

we have

$$P = \frac{(V \times I \times t)}{t} = VI$$

$$P = I^2R \text{ [Because } V = IR\text{]}$$

$$P = \frac{V^2}{R}$$

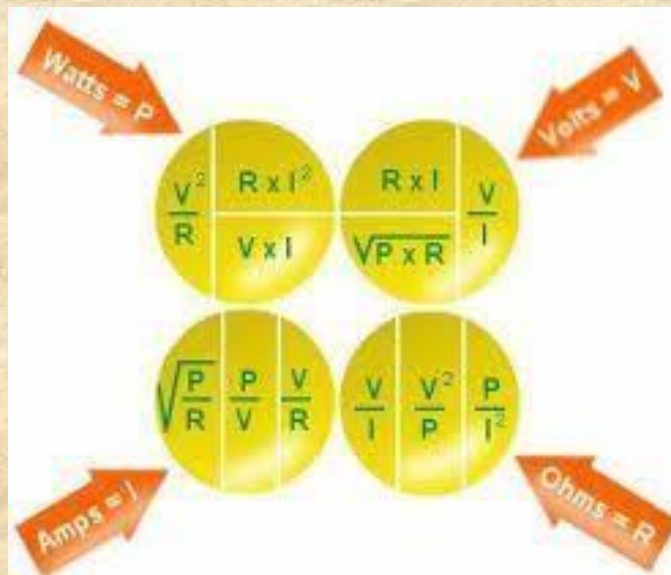
[Because  $I = \frac{V}{R}$ ] The

unit of electric power is

watt. Power =  $V \times I$

1 watt = 1 volt x 1 ampere

Thus, if a potential difference of 1 volt causes a current of 1 ampere to flow through a wire, the electrical power consumed is one watt.





## 15. Electrical Energy:

Electrical energy = Power x Time

$$E = P \times t$$

The electrical energy consumed by an electrical appliance depends upon

- (i) Power rating of the appliance
- (ii) Time for which it

(appliance) is used. The SI unit of electrical energy is joule.

1 joule is the amount of electrical energy consumed when an appliance of 1 watt is used for 1 second.



16. Commercial Unit of Electrical Energy: Kilowatt hour is the commercial unit of electrical energy. One kilowatt hour is the electrical energy consumed when an electrical appliance having 1kW power rating is used for 1 hour.

Energy used =

Power x Time

kWh = 1 kW x 1h

= 1000 w x 60 x 60s

= 1000 J s<sup>-1</sup> X 3600 s

= 3600000 J = 3.6 x 10<sup>6</sup> J

**7) Electrical energy and Electric power :-**

i) **Electrical energy** :- is the work done to maintain the flow of current in a conductor.  
 $W = Q \times V$      $I = Q/t$      $Q = I \times t$   
 $W = I \times t \times V$      $V = IR$   
 $W = I^2 R t$   
 The unit of electrical energy is joule (J).

ii) **Electric power** :- is the rate at which electric current is used.  
 $\text{Power} = \frac{\text{Work done}}{\text{Time}}$      $P = \frac{W}{t}$      $W = I^2 R t = I^2 R t$   
 $\text{Power} = I^2 R$      $R = \frac{V}{I} = I^2 \times V = I \times V$   
 or  $\text{Power} = I \times V$   
 The SI unit of power is watt (W).  
 One watt is the power when 1A of current flows across a potential difference of 1V.  
 1000 W = 1kW    1kWh = 1000 watt x 3600 seconds = 3.6 x 10<sup>6</sup> joules  
 The commercial unit of power is watt hour (Wh) or kilo watt hour (kWh).  
 One kWh is the power consumed when 1W of power is used for 1 hour.

**17. Heating Effect of Current:** When an electric current is passed through a high resistance wire, it becomes very hot and produces heat. This effect is called the heating effect of current.

When an electric charge  $Q$  moves against a potential difference  $V$ , the amount of work done is given by,

$$W = Q \times V \dots\dots(i)$$

But,

current,

$$I = \frac{Q}{t}$$

$$Q = I \times t$$

From Ohm's law:  $V = I \times R$

Now, putting all these values in equation (i),

we have Work done,  $W = I^2 \times R \times t$

This work done is converted into heat energy for maintaining the flow of current  $I$  through the conductor for  $t$  second.

Heat produced,  $H = I^2 \times R \times t$  joules.



### 18. Applications of Heating Effect of Current:

- (i) In electrical heating appliances: All electrical heating appliances are based on heating effect of current. For example, appliances such as electric iron, water heaters and geysers, room heaters, toaster, hot plates are fitted with heating coils made of high resistance wire such as nichrome wire.
- (ii) Electric filament bulb: The use of electric filament bulbs (ordinary electric bulbs) is also based on the heating effect of current. Inside the glass shell of electric bulb there is a filament. This filament is made from a very thin high bulb resistance tungsten wire. When current flows through this filament, it gets heated up. Soon, it becomes white hot and starts emitting light.



19. VIDEO LINK [CLICK HERE](#)

## Magnetic Effects of Electric Current

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**Magnet: Magnetic field and magnetic field lines, Magnetic field due to a current carrying conductor, Right hand thumb rule, Magnetic field due to current through a circular loop.**

**Magnetic field due to current in a solenoid.**

Magnet is an object that attracts objects made of iron, cobalt and nickel. Magnet comes to rest in North – South direction, when suspended freely.

**Use of Magnets:** Magnets are used

- in refrigerators.
- in radio and stereo speakers.
- in audio and video cassette players.
- in children's toys and;
- on hard discs and floppies of computers.

### Properties of Magnet

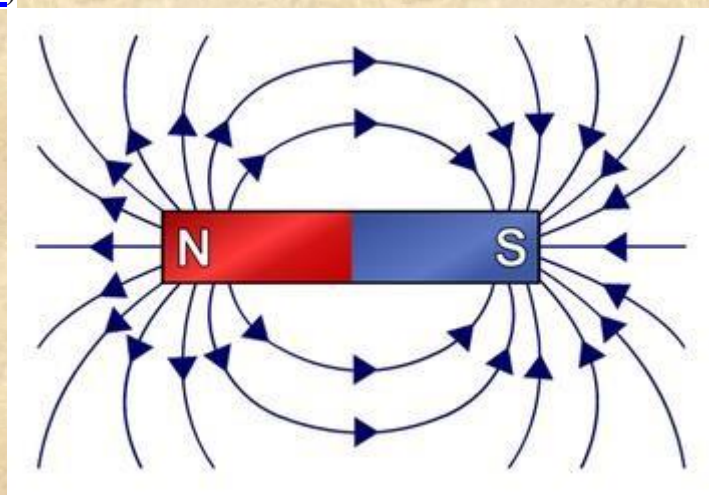
- A free suspended magnet always points towards the north and south direction.
- The pole of a magnet which points toward north direction is called north pole or north-seeking.
- The pole of a magnet which points toward south direction is called south pole or south seeking.
- Like poles of magnets repel each other while unlike poles of magnets attract each other.

**Magnetic field:** The area around a magnet where a magnetic force is experienced is called the magnetic field. It is a quantity that has both direction and magnitude, (i.e., Vector quantity).

**Magnetic field and field lines:** The influence of force surrounding a magnet is called magnetic field. In the magnetic field, the force exerted by a magnet can be detected using a compass or any other magnet.

The magnetic field is represented by magnetic field lines.

[\(Click here for video\)](#)



**Direction of field line:** Outside the magnet, the direction of magnetic field line is taken from North pole to South Pole. Inside the magnet, the direction of magnetic field line is taken from South pole to North pole

\*Note: Images are used for educational purpose only

**Strength of magnetic field:** The closeness of field lines shows the relative strength of magnetic field, i.e. closer lines show stronger magnetic field and vice – versa. Crowded field lines near the poles of magnet show more strength.

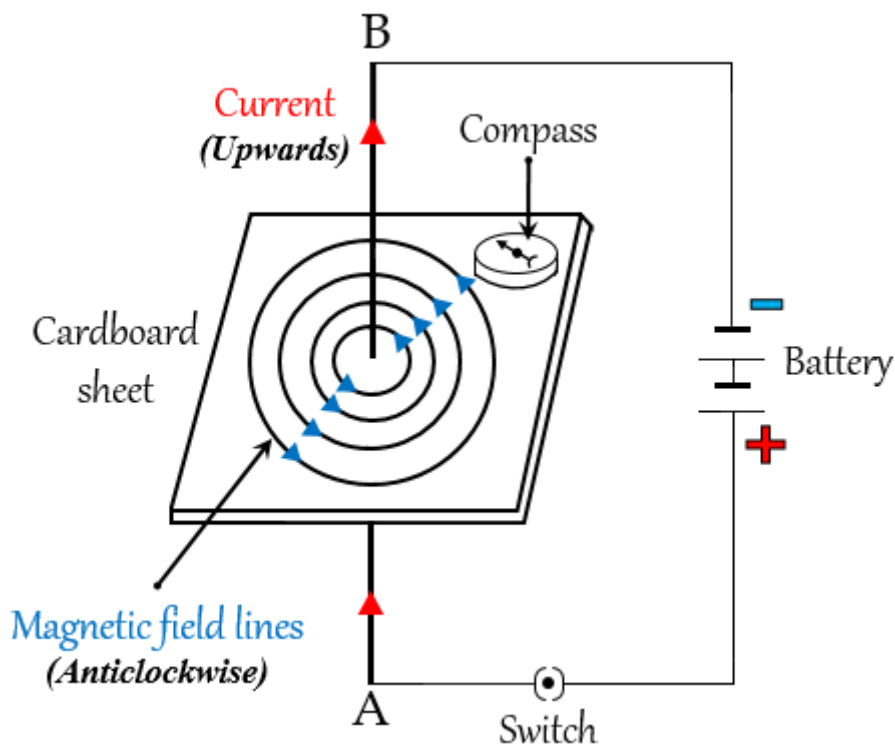
### Properties of magnetic field lines

(i) They do not intersect each other.

(ii) It is taken by convention that magnetic field lines emerge from North pole and merge at the South pole. Inside the magnet, their direction is from South pole to North pole. Therefore magnetic field lines are closed curves.

### Magnetic field lines due to current a current carrying straight conductor

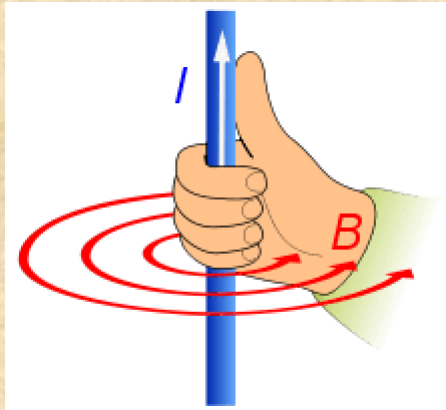
[Click here for video](#)



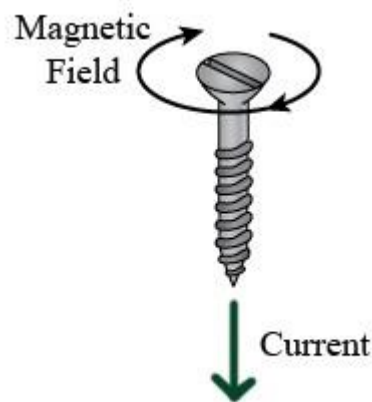
A current carrying straight conductor has magnetic field in the form of concentric circles, around it. Magnetic field of current carrying straight conductor can be shown by magnetic field lines. The direction of magnetic field through a current carrying conductor depends upon the direction of flow electric current.

**Right-Hand Thumb Rule:** If a current carrying conductor is held by right hand, keeping the thumb straight and if the direction of electric current is in the direction of thumb, then the direction of wrapping of other fingers will show the direction of magnetic field.

[Click here for video explanation](#)



**Maxwell's Corkscrew rule:** As per Maxwell's Corkscrew Rule, if the direction of forward movement of screw shows the direction of the current, then the direction of rotation of screw shows the direction of magnetic field.



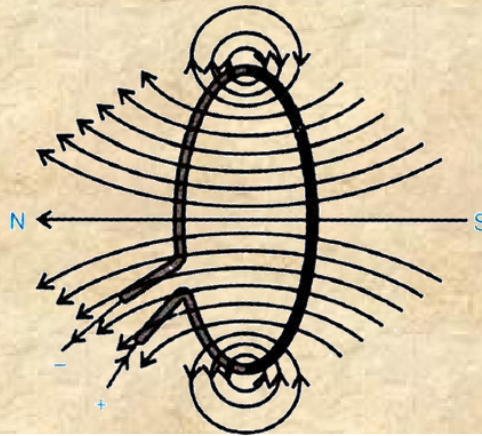
### Properties of magnetic field

- The magnitude of magnetic field increases with increase in electric current and decreases with decrease in electric current.
- The magnitude of magnetic field produced by electric current decreases with increase in distance and vice – versa. The size of concentric circles of magnetic field lines increases with distance from the conductor, which shows that magnetic field decreases with distance.
- Magnetic field lines are always parallel to each other.
- No two field lines cross each other.

### Magnetic field lines due to a current through a circular loop

( [Click here for video](#) )

In case of a circular current carrying conductor, the magnetic field is produced in the same manner as it is in case of a straight current carrying conductor.



**Clock Face Rule:** A current carrying loop works like a disc magnet. The polarity of this magnet can be easily understood with the help of Clock Face Rule. If the current is flowing in anti – clockwise direction, then the face of the loop shows north pole. On the other hand, if the current is flowing in clockwise direction, then the face of the loop shows south pole.

**Magnetic field and number of turns of coil:** Magnitude of magnetic field gets summed up with increase in the number of turns of coil. If there are ‘n’ turns of coil, magnitude of magnetic field will be ‘n’ times of magnetic field in case of a single turn of coil.

**The strength of the magnetic field at the centre of the loop(coil) depends on :**

**(i) The radius of the coil:** The strength of the magnetic field is inversely proportional to the radius of the coil. If the radius increases, the magnetic strength at the centre decreases

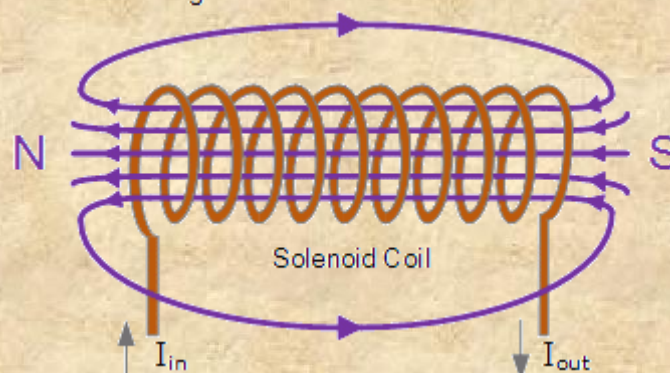
**(ii) The number of turns in the coil :** As the number of turns in the coil increase, the magnetic strength at the centre increases, because the current in each circular turn is having the same direction, thus, the field due to each turn adds up.

**(iii) The strength of the current flowing in the coil:** As the strength of the current increases, the strength of three magnetic fields also increases.

**Magnetic field due to a current in a Solenoid:** Solenoid is the coil with many circular turns of insulated copper wire wrapped closely in the shape of a cylinder. A current carrying solenoid produces similar pattern of magnetic field as a bar magnet. One end of solenoid behaves as the north pole and another end behaves as the south pole.

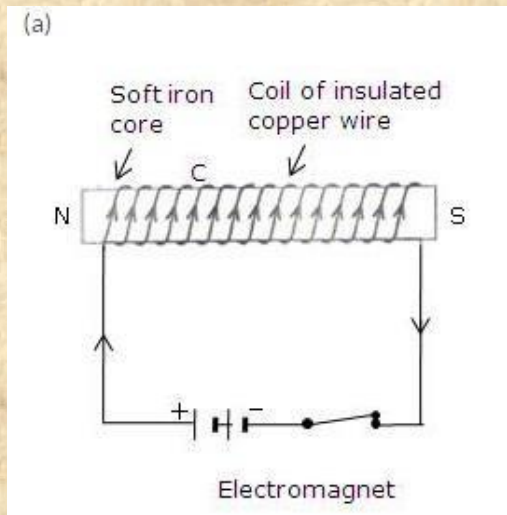
**A solenoid is a device comprised of a coil of wire, the housing and a moveable plunger (armature).** When an electrical current is introduced, a magnetic field forms around the coil which draws the plunger in. More simply, a solenoid converts electrical energy into mechanical work.

Electromagnetic field due to the flow of current



\*Note: Images are used for educational purpose only

**Electromagnet:** An electromagnet consists of a long coil of insulated copper wire wrapped on a soft iron. Magnet formed by producing magnetic field inside a solenoid is called electromagnet.

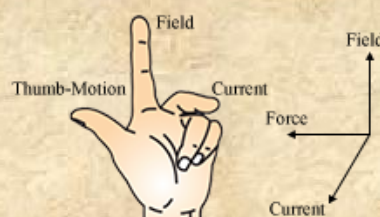


**Force on a current carrying conductor in a magnetic field:** A current carrying conductor exerts a force when a magnet is placed in its vicinity. Similarly, a magnet also exerts equal and opposite force on the current carrying conductor. This was suggested by Marie Ampere, a French Physicist and considered as founder of science of electromagnetism.

### Fleming's Left-Hand Rule:

[\(Click here for video\)](#)

If the direction of electric current is perpendicular to the magnetic field, the direction of force is also perpendicular to both of them. The Fleming's Left Hand Rule states that if the left hand is stretched in a way that the index finger, the middle finger and the thumb are in mutually perpendicular directions, then the index finger and middle finger of a stretched left hand show the direction of magnetic field and direction of electric current respectively and the thumb shows the direction of motion or force acting on the conductor. The directions of electric current, magnetic field and force are similar to three mutually perpendicular axes, i.e. x, y, and z-axis.



Many devices, such as electric motor, electric generator, loudspeaker, etc. work on Fleming's Left Hand Rule.

\*Note: Images are used for educational purpose only



## A.C and D.C Current

**A.C – Alternate Current:** Current in which direction is changed periodically is called Alternate Current. In India, most of the power stations generate alternate current. The direction of current changes after every  $1/100$  second in India, i.e. the frequency of A.C in

India is 50 Hz. A.C is transmitted upto a long distance without much loss of energy is advantage of A.C over D.C.

**D.C – Direct Current:** Current that flows in one direction only is called Direct current. Electrochemical cells produce direct current.

### Advantages of A.C over D.C

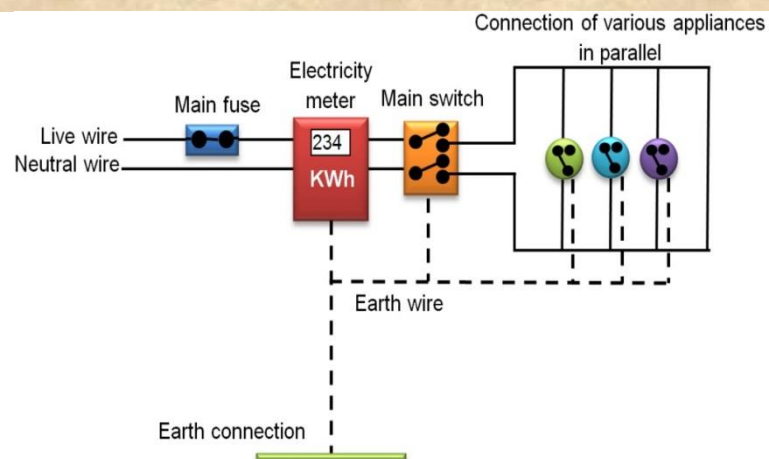
- Cost of generation of A.C is much less than that of D.C.
- A.C can be easily converted to D.C.
- A.C can be controlled by the use of choke which involves less loss of power whereas, D.C can be controlled using resistances which involves high energy loss.
- AC can be transmitted over long distances without much loss of energy.
- AC machines are stout and durable and do not need much maintenance.

### Disadvantages of AC

- AC cannot be used for the electrolysis process or showing electromagnetism as it reverses its polarity.
- AC is more dangerous than DC.

**Domestic Electric Circuits:** We receive electric supply through mains supported through the poles or cables. In our houses, we receive AC electric power of 220 V with a frequency of 50 Hz. The 3 wires are as follows

- Live wire – (Red insulated, Positive)
- Neutral wire – (Black insulated, Negative)
- Earth wire – (Green insulated) for safety measure to ensure that any leakage of current to a metallic body does not give any serious shock to a user.



**Short Circuit:** Short-circuiting is caused by the touching of live wires and neutral wire and sudden a large current flows.  
It happens due to

- damage of insulation in power lines.
- a fault in an electrical appliance.

**Overloading of an Electric Circuit:** The overheating of electrical wire in any circuit due to the flow of a large current through it is called overloading of the electrical circuit. A sudden large amount of current flows through the wire, which causes overheating of wire and may cause fire also.

**Electric Fuse:** It is a protective device used for protecting the circuit from short-circuiting and overloading. It is a piece of thin wire of material having a low melting point and high resistance.

- Fuse is always connected to live wire.
- Fuse is always connected in series to the electric circuit.
- Fuse is always connected to the beginning of an electric circuit.
- Fuse works on the heating effect.

[\*\*CLICK HERE FOR PPT\*\*](#)

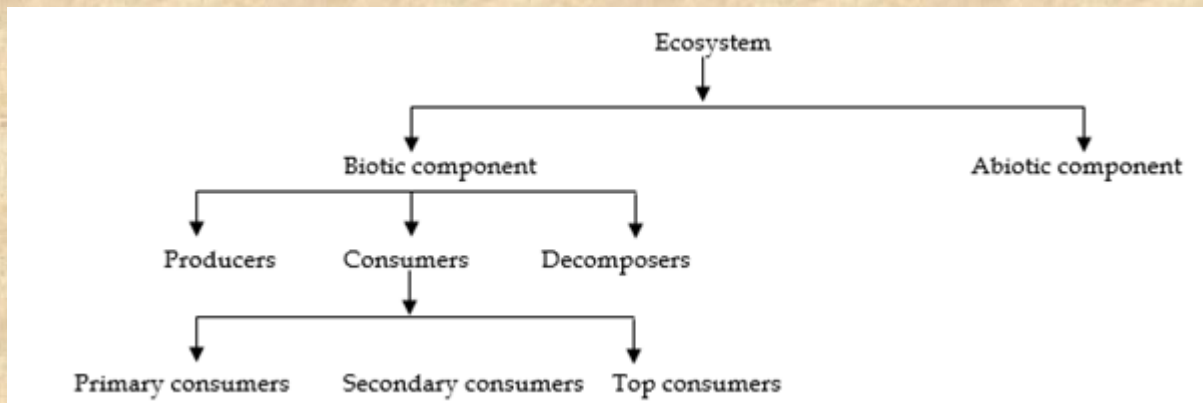
# Our Environment

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**Environment** refers to the surrounding of an organism where it thrives. It constitutes both living (biotic) and non-living (abiotic) factors.

## Ecosystem

The ecosystem comprises all the biotic and abiotic factors interacting with one another in a given area. Biotic components include all living organisms such as plants, animals, microorganisms and humans, etc. and abiotic components include sunlight, temperature, air, wind, rainfall, soil and minerals, etc. E.g. pond ecosystem, grassland ecosystem, etc.



[\(Click here for video\)](#)

## Types of Ecosystem

1. Natural Ecosystem (Forest , River , Ocean, Desert etc.)
2. Artificial Ecosystem (Aquarium , Zoo , Garden etc.)

## Trophic levels

It refers to the various levels in a food web as per the flow of energy. The different trophic levels are –

- Producers (T1)
- Primary consumers (herbivores-T2)
- Secondary consumers (primary carnivores -T2)
- Tertiary consumers(Sec carnivores -T3)
- Quaternary consumers (Ter. carnivores T4)
- Decomposers

## Pyramid of trophic levels

- Is a graphical representation.
- Can be the pyramid of numbers, the pyramid of biomass or the pyramid of energy.
- All the pyramids start with producers.

a) **Pyramid of numbers:** gives the number of organisms present at each trophic level. It can be upright or inverted.

b) **Pyramid of biomass:** gives the biomass of each trophic level and could be upright or inverted.

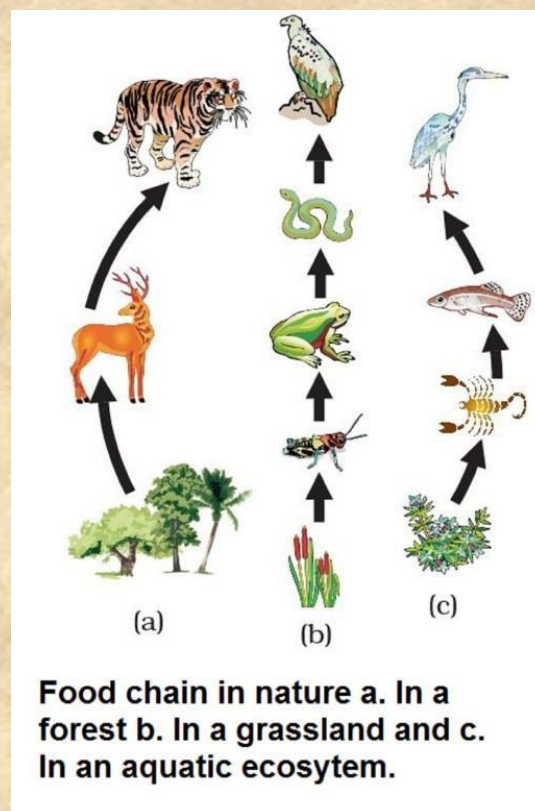
c) **Pyramid of energy:** is always upright as it shows the flow of energy from one trophic level to the next trophic level.

### Energy flow

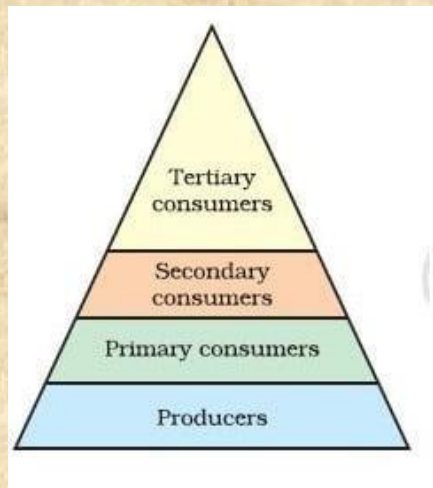
- Transfer of energy from one trophic level to another depicting its direction and amount.
- Can be represented by the pyramid of energy.
- In any food chain, only 10% of the energy is transferred from one trophic level to another.

### Food chain:

A food chain refers to the order of events in an ecosystem, where one living organism eats another organism, and later that organism is consumed by another larger organism. The flow of nutrients and energy from one organism to another at different trophic levels forms a food chain. In a food chain a series of organisms each dependent on the next as a source of food.



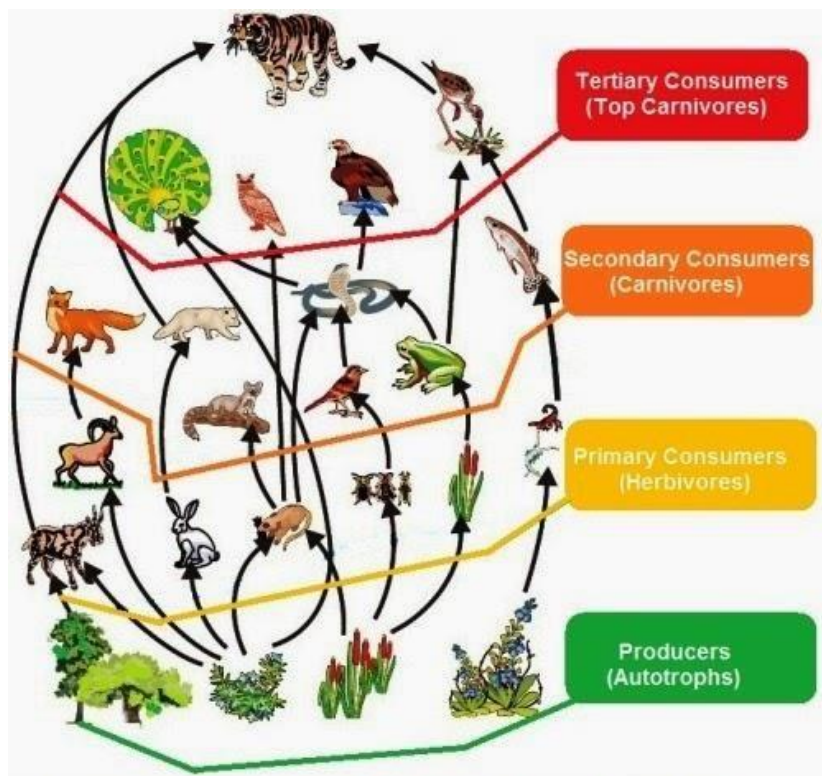
Trophic Levels:



## Food web:

A food web is a **network of food chains which are interconnected to each other**. In a food chain, each member is eaten by the other in a particular sequence. The producers, consumers and the decomposers of the various food chains are considered as the part of the food web.

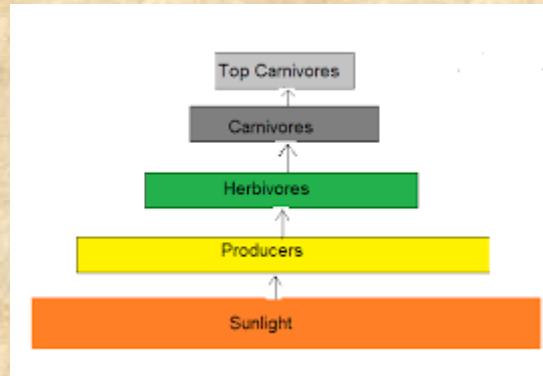
### Food Web consisting of many food chains



### Energy Flow and 10% Law ([Click here for video](#))

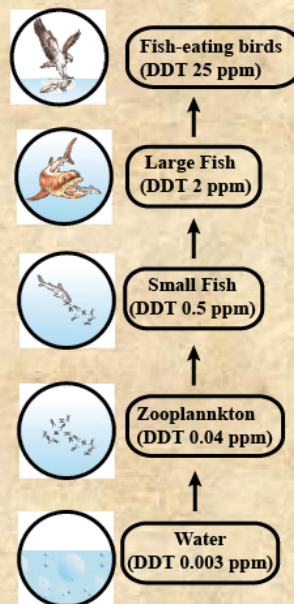
Ten per cent law is an enunciation given by Lindeman (1942) which states that only 10% of energy contained in a lower trophic level is trapped by next higher trophic level, the remaining 90% being lost in transfer and respiration of the latter.

## Flow chart showing flow of energy in an Ecosystem



### **Biomagnification:**

Biomagnification is the process by which a compound (such as a pollutant or pesticide) increases its concentration in the tissues of organisms in the higher levels of food chain. The increased concentration of insecticide DDT in fishes in the following diagrammatic representation is one instance of biomagnification.



**Biomagnification** ([Click Here for Video](#))

### **Ozone layer depletion:**

Ozone layer depletion is the thinning of the ozone layer present in the upper atmosphere. This happens when the chlorine and bromine atoms in the atmosphere come in contact with ozone and destroy the ozone molecules. It is destroyed more quickly than it is created.

### **Causes of Ozone Layer Depletion**

[Click here for video](#)

Ozone-Depleting Substances	Sources
Chlorofluorocarbons (CFCs)	Refrigerators, air-conditioners, solvents, dry-cleaning agents, etc.
Halons	Fire-extinguishers
Carbon tetrachloride	Fire extinguishers, solvents
Methyl chloroform	Adhesives, aerosols

**Solutions to Ozone Layer Depletion:**

- Avoid Using Ozone-Depleting Substances.
- Minimise the Use of Vehicles
- Use Eco-friendly Cleaning Products
- Use of Nitrous Oxide should be prohibited.

**Managing the Garbage we Produce**

Improvements in our life-style have resulted in greater amounts of waste material generation. Types of materials in garbage:

**Biodegradable wastes:**

Substances which can be decomposed by the action of microorganisms are called biodegradable waste.

Example: Fruit and vegetable peels, cotton, jute, dung, paper, etc.

**Non-biodegradable wastes:**

Substances which cannot be decomposed by the action of microorganisms are called non-biodegradable wastes.

Example: Plastic, polythenes, metals, synthetic fibres, radioactive wastes, pesticides etc.

Microorganisms release enzymes that decompose the materials. Enzymes cannot decompose all the materials because they are specific in their action.

**Waste management strategies:**

**Recycling**

- Recycling is the process of treating and converting waste into new products that can be used as raw materials by manufacturers. Plastics, glass, and paper are some examples of recyclable waste.
- Along with dumping and segregating waste, we must go a step further in reducing the amount of garbage we produce by applying the 3R's principle – reduce, reuse, and recycle.

**Composting**

Composting is the decomposition of organic waste into manure. Plant wastes are among the wastes that can be decomposed.

**Incineration**

- Incineration is the process of burning a substance at a high temperature. Incineration takes place in an incinerator.

**Landfills**

- The most common waste disposal strategy today is to dump waste in landfills. This strategy entails collecting biodegradable waste and burying it beneath the ground.

**Sewage treatment**

- The organic matter in sewage is digested in sewage treatment plant digesters to generate clean water and produce sewage gas (a type of biogas) and manure.

\*\*\*\*\*



# केंद्रीय विद्यालय संगठन आंचलिक शिक्षा एवं प्रशिक्षण संस्थान, ग्वालियर



अध्ययन सामग्री 2022-23

कक्षा 10

(हिंदी)

पाठ सं.	पाठ का नाम	पाठ का सार	पी.पी.टी.	वीडियो पाठ	विस्तृत उत्तरीय प्रश्न	बहुविकल्पीय प्रश्न
1	सूरदास (04 पद)	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
2	राम-लक्ष्मण परशुराम संवाद	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
4	आत्मकथ	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
5	उत्साह/अट नहीं रही है	<a href="#">पाठ का सार 1</a> <a href="#">पाठ का सार 2</a>	<a href="#">पी.पी.टी. 1</a> <a href="#">पी.पी.टी. 2</a>	<a href="#">वीडियो पाठ 1</a> <a href="#">वीडियो पाठ 2</a>	<a href="#">विस्तृत उत्तरीय प्रश्न 1</a> <a href="#">विस्तृत उत्तरीय प्रश्न 2</a>	<a href="#">बहुविकल्पीय प्रश्न 1</a> <a href="#">बहुविकल्पीय प्रश्न 2</a>
6	यह दन्तुरित मुस्कान / फसल	<a href="#">पाठ का सार 1</a> <a href="#">पाठ का सार 2</a>	<a href="#">पी.पी.टी. 1</a> <a href="#">पी.पी.टी. 2</a>	<a href="#">वीडियो पाठ 1</a> <a href="#">वीडियो पाठ 2</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a> <a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
9	संगतकार	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
10	नेता जी का चश्मा	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
11	बालगोबिन भगत	<a href="#">पाठ का सार</a>	<a href="#">पी.पी.टी.</a>	<a href="#">वीडियो पाठ</a>	<a href="#">विस्तृत उत्तरीय प्रश्न</a>	<a href="#">बहुविकल्पीय प्रश्न</a>
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केन्द्रीय विद्यालय संगठन, जीट ग्वालियर.

**KENDRIYA VIDYALAYA SANGATHAN,  
ZIET GWALIOR**

**Interactive Study Material**

**CLASS - X (2022-23)**

**SOCIAL SCIENCE**

आंचलिक शिक्षा एवं प्रशिक्षण संस्थान,  
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## **Chapter 1- RISE OF NATIONALISM IN EUROPE**

### **The French Revolution and the Idea of the Nation**

French Revolution of 1789 was the first clear expression of nationalism.

• Steps taken by French Revolutionaries to create a sense of collective identity amongst the French people:

- Ideas of La patrie and Le citoyen
- New French Flag
- Estates General was elected and renamed National Assembly
- New hymns composed and oaths taken
- Centralized administration system
- Internal customs duties and dues were abolished
- Uniform system of weights and measures were introduced
- French became the common language

### **Napolean**

- Ruled France from 1799 to 1815.
- Gained absolute powers in 1799 by becoming the First Consul.

### **Civil Code of 1804 / Napoleonic Code**

- Equality before the law was established
- Secured the right to property
- Simplified administrative measures
- Abolished feudal system
- Freed peasants from serfdom and manorial dues
- Guild restrictions were removed
- Transport and communication systems were improved.

Napoleon took away political freedom, increased taxes, imposed censorship and forced people to join French army.

### **The Making of Nationalism in Europe**

No Nation states were in Europe because of not common identity or culture.

- People residing in different areas spoke different languages.

→ Example: Hungary half of the population spoke Magyar other half spoke variety of dialects and in Galicia people spoke Polish.

### **The Aristocracy and the New Middle Class**

- Aristocracy

→ The land owning class.

→ Spoke French connected by ties of marriages.

→ Numerically a small group.

- Peasantry

→ Majority of population

- Middle class

→ New Social class emerged with the growth of towns and emergence of commercial classes.

→ Educated class where ideas of nationality gained popularity.

### **What did Liberal Nationalism Stand for?**

- Liberalism stood for freedom for the individual and equality for all before the law

→ The end of autocracy and clerical privileges

→ A constitution and representative government through parliament.

- In the economic sphere liberalism stood for the freedom of markets and the abolition of state-imposed restrictions on the movement of goods and capital.

- Zollverein abolished tariff barriers, reduced the number of currencies to two, and promoted a network of railways to stimulate mobility.

## **A New Conservatism after 1815**

- Believed that established institutions of state and society should be preserved, with the changes initiated by Napoleon.

## **Treaty of Vienna (1815)**

- Bourbon dynasty was restored to power in France
- A series of states created on the French boundary for preventing French expansion in future.
- German confederation was left untouched.
- Main intentions was to restore the monarchies that had been overthrown by Napoleon.

## **The Revolutionaries**

A commitment to oppose monarchical forms that had been established after the Vienna Congress, and to fight for liberty and freedom.

Giuseppe Mazzini

- Born in Genoa in 1807
- A member of the secret society of Carbonari
- Founded Young Italy in Marseillies, Young Europe in Berne.
- Believed in the unification of Italy into a republic.

## **The Age of Revolutions: 1830-1848**

- In July 1830, Bourbon kings of France were overthrown and a constitutional monarchy was established.
- Belgium broke away from the United Kingdoms of the Netherlands.
- Greece which had been a part of the Ottoman Empire since the fifteenth century, struggled for independence.  
→ Treaty of Constantinople of 1832 recognised Greece as an independent nation.

## **The Romantic Imagination and National Feeling**

- A cultural movement which sought to develop a particular form of nationalist sentiment, criticized the glorification of reason and science and focused instead on emotions, intuition and mystical feelings.
- German philosopher Johann Gottfried Herder tried to discover culture among common

people, through folk songs, folk poetry and folk dances.

### **Hunger, Hardship and Popular Revolt**

- In most countries there were more seekers of jobs than employment.
- Population from rural areas migrated to the cities to live in overcrowded slums.
- The rise of food prices or a year of bad harvest led to widespread pauperism in town and country.
- In 1848, the Population of Paris came out on the roads and Louis Philippe was forced to flee and National Assembly proclaimed a Republic.
- In 1845, weavers in Silesia led a revolt against contractors.

### **1848: The Revolution of the Liberals**

- The revolution was led by educated middle classes who combined their demands for constitutionalism with national unification.

#### Frankfurt Parliament

- On 18 May 1848, members of political association's elected 831 representatives who took their places in the Frankfurt Parliament convened in the Church of St. Paul and drafted a Constitution for the German nation.
- It was opposed by King of Prussia and also lost its social basis as no rights were given to workers and women.
- It forced the autocratic monarchs to introduce some changes – serfdom and bonded labour was abolished
- Hungarians were granted more autonomy.

### **The Making of Germany and Italy**

#### **Germany**

- Otto Van Bismarck with the help of Prussian army and bureaucracy took on the leadership of the movement for national unification.
- Three war over seven years ended in Prussian victory and completed the process of unification.
- Kaiser William I of Prussia headed the new German Empire.

#### **Italy**

- Italy was divided into seven states of which only Sardinia Piedmont was ruled by an Italian Princely state.

- Initially a unification programme was initiated by Giuseppe Mazzini, but it failed.
- Chief Minister Cavour led the movement, with the help of Giuseppe Garibaldi.
- In 1861, Victor Emmanuel II was proclaimed king of united Italy.

### **The Strange Case of Britain**

- In 1688, England established as a nation state.
- English parliament seized power from the monarchy.
- The Act of Union 1707 resulted in the formation of the ‘United Kingdom of Great Britain’.
- In 1801, Ireland was forcibly taken by the British after the failed revolution.
- A new ‘British Nation’ was founded through the propagation of a dominant English culture.

### **Visualising the Nation**

- Nations were portrayed as female figure (Allegory).
- The female form that was chosen to personify the nation did not stand for any particular woman in real life, rather it sought to give the abstract idea of the nation a concrete form.
- In France the allegory was christened as Marianne, in Germany – Germania became the allegory.

### **Nationalism and Imperialism**

- The Balkans comprised modern-day Romania, Bulgaria, Albania, Greece, Macedonia, Croatia, Bosnia-Herzegovina, Slovenia, Serbia and Montenegro.
- Balkans was a region of geographical and ethnic variation was under the control of the Ottoman Empire.
- The idea of Romantic nationalism made this region very explosive.
- The Balkan states were fiercely jealous of each other and each hoped to gain more territory at the expense of each other.
- European powers were also looking for the extend their control over the area.
- This led to a series of wars in the region and finally resulted in the First World War.

**LINK OF THIS CHAPTER:- [clickhere](#)**  
**2<sup>ND</sup> LINK (ANIMATED):- [CLICKHERE](#)**



## Chapter 2- **NATIONALISM IN INDIA**

### Introduction

Nationalism is an internal feeling to betterment of our country in every aspect.

- Modern nationalism was associated with the formation of nation-states.
- In India like many other colonies, the growth of modern nationalism is connected to the anti-colonial movement.

### The First World War, Khilafat and Non-Cooperation

- The First World War (1914-1918) created a new political and economic situation.
- India faced various problems during war period:
  - Increase in defence expenditure.
  - Prices increased through the war years.
  - Forced recruitment in rural areas.
- During 1918-19 and 1920-21, crops failure in many parts of India.
- Hardships did not end after the war was over.

### The Idea of Satyagraha

- Satyagraha is a novel way of fighting the colonial rule in India.
  - It is a non-aggressive, peaceful mass agitation against oppression and injustice.
- Satyagraha means insistence on truth.
- It is a moral force, not passive resistance.
- In January 1915, Mahatma Gandhi returned to India.
- Gandhiji organised Satyagraha Movements in Champaran, Bihar (1917), amongst cotton mill workers in Ahmedabad (1918) and Kheda district of Gujarat (1918) .

### The Rowlatt Act (1919)

- This act gave the government enormous powers to repress political activities and allowed detention of political prisoners without trial for two years.

### Jallianwala Bagh massacre

- On 13th April 1919, a huge crowd gathered in the enclosed ground of Jallianwala Bagh.
- Dyer entered the area, blocked the exit points, and opened fire on the crowd, killing hundreds.
- As the news spread, strikes, clashes with the police and attacks on government buildings started.

- The government responded with brutal repression.
- Gandhi called off the Rowlatt satyagraha as the violence spread.

### **Khilafat Movement**

- Khilafat Movement was led by two brothers Shaukat Ali and Muhammad Ali.
- Khilafat Committee was formed in Bombay in March 1919 to defend the Khalifa's temporal powers.
- Gandhiji convinced the Congress to join hands with the Khilafat Movement and start a Non-Cooperation Campaign for Swaraj.
- At the Congress session at Nagpur in December 1920, the Non-Cooperation programme was adopted.

#### Differing strands within the movement

- The Non-Cooperation-Khilafat Movement began in January 1921.

#### The Movement in the Towns

- It started with middle class participation in cities.
- Students, teachers, lawyers gave up studies, jobs, legal practices and joined movements.
- Council elections were boycotted.
- Foreign goods were boycotted.
- Liquor shops were picketed.

#### Movement in the countryside

- Peasants and tribals took over the struggle which turned violent gradually.

#### Peasant Movement in Awadh

- The peasants were led by Baba Ramchandra in Awadh against landlords and talukdars.
- In 1920, the Oudh Kisan Sabha was set up headed by Jawaharlal Nehru, Baba Ramchandra and a few others.

#### Movement of Tribals in Andhra Pradesh

- Alluri Sitaram Raju led the guerrilla warfare in the Gudem Hills of Andhra Pradesh.
- The rebels attacked police stations.

- Raju was captured and executed in 1924.

### **Swaraj in the Plantations**

- For the plantation workers, Swaraj means moving freely.
- They protested against the Inland Emigration Act (1859) which prevented them from leaving the plantation without permission.
- Each group interpreted the term swaraj in their own ways.

#### Towards Civil Disobedience

- In February 1922, Mahatma Gandhi decided to withdraw the Non-Cooperation Movement.
- Many leaders such as C. R. Das and Motilal Nehru formed the Swaraj Party within the Congress to argue for a return to council politics.
- Younger leaders like Jawaharlal Nehru and Subhas Chandra Bose pressed for more radical mass agitation and for full independence.

### **Factors that shaped Indian politics towards the late 1920s**

- The Worldwide Economic Depression  
→ Agricultural prices collapsed after 1930 as the demand for agricultural goods fell and exports declined.

- **Simon Commission**

- It was constituted by the Tory government of Britain to look into the demands of the nationalists and suggest changes in the constitutional structure of India.
- The Commission arrived in India in 1928.
- The Congress protested against this commission.

- In December, 1929, under the presidency of Jawaharlal Nehru, the Lahore session of Congress formalized the demand of –Purna Swarajl.

#### The Salt March and the Civil Disobedience Movement

- Gandhiji chose salt as the medium that could unite the nation as it is consumed by all the sections of the society.

#### Salt March

- Salt or Dandi March began on March 12, 1930.  
→ On 6th April 1930, Gandhiji reached Dandi, a village in Gujarat and broke the Salt Law by boiling water and manufacturing salt.

→ Thus, it began the Civil Disobedience Movement.

- It was different from Non-Cooperation Movement as people were now asked not only to refuse cooperation but also to break colonial laws.
- Boycott of foreign goods, non-payment of taxes, breaking forest laws were its main features.
- The British Government followed a policy of brutal repression.
- British government arrested all the leaders including Gandhiji and Nehru.
- Mahatma Gandhi called off the movement.

### **Gandhi-Irwin Pact (Delhi Pact)**

- On 5 March, 1931, Lord Irwin, the Viceroy, signed a pact with Gandhi.
- • In December, 1931, Gandhiji went to London for the Second Round Table Conference but returned disappointed.
- Gandhi relaunched the Civil Disobedience Movement but by 1934 it lost its momentum.

### How Participants saw the Movement

#### Rich peasants

- Rich peasant communities expected the revenue tax to be reduced, when the British refused to do so, they did join the movement.
- They did not rejoin the movement as the movement was called without revising the revenue rates.

#### Poor Peasants

- The poor peasants wanted rents of lands to be remitted.
- The Congress was unwilling to support the -no rentll campaigns due to the fear of upsetting the rich peasants and landlords.

#### Business Classes

- After the war, their huge profits were reduced, wanted protection against import of foreign goods.
- The spread of militant activities, worries of prolonged business disruptions, growing influences of socialism amongst the young Congress forced them not to join the movement.

#### Women

- Women also participated in protest marches, manufactured salt, and picketed foreign cloth and liquor shops.

→ Congress was reluctant to allow women to hold any position of authority within the organisation.

### Limits of Civil Disobedience

- The Dalits or the Untouchables did not actively participate in the movement, they demanded reservation of seats, separate electorates.
- Dr B.R. Ambedkar, the leader of the Dalits, formed an association in 1930, called the Depressed Classes Association.
- He clashed with Gandhiji.
- Poona Pact between the Gandhiji and B.R. Ambedkar (1932) gave reserved seats in Provincial and Central Councils but were voted by general electorate.
- The leader of the Muslim League M.A. Jinnah wanted reserved seats for Muslims in Central Assembly.  
→ Large sections of Muslims did not participate in the Civil disobedience movement.

### The Sense of Collective Belonging

- The sense of collective belonging came partly through the experience of united struggles.
- History and fiction, folklore and songs, popular prints and symbols, all played a part in the making of nationalism.  
. Nation came to be seen in image of **BHARAT MATA**. Bankim Chandra Chattopadhyay created the first image of Bharat Mata.  
.Bankim Chandra Chatterjee hymns to mother land .**Vande Mataram** to be sung widely in Nationalist movements.
- By 1921, Gandhiji had designed the Swaraj flag. It was again a tricolour (red, green and white) and had a spinning wheel in the centre.

VIDEO LINK OF THIS CHAPTER:- [CLICK HERE](#)

2<sup>ND</sup> LINK(ANIMATED):- [CLICKHERE](#)

## Chapter 3- **THE MAKING OF A GLOBAL WORLD**

### Introduction

- Globalisation is an economic system associated with the free movement of goods, technology, ideas and people across the globe.

### Section I: Pre Modern World

#### Silk Routes

- There are several silk routes, over land and by sea, knitting together vast regions of Asia, and linking Asia with Europe and northern Africa.  
→ Famous Chinese silk cargoes used to travel through these routes.

#### Food Travels: Spaghetti and Potato

- Noodles travelled west from China to become spaghetti.
- Common foods such as potatoes, soya, groundnuts, maize, tomatoes, chillies, sweet potatoes were only introduced in Europe and Asia after Christopher Columbus discovered Americas.

#### Conquest, Disease and Trade

- Precious metals from mines of Peru and Mexico enhanced European trade with Asia.
- The Spanish conquerors used the germs of smallpox in the conquest of America.
- Until well into the eighteenth century, China and India were among the world's richest countries.
- Until the nineteenth century, poverty and hunger were common in Europe.

### Section II: The Nineteenth Century (1815-1914)

- In the late eighteenth century, growth in the population increased the demand for food grains in Britain.
- The imported food into Britain more cheaply than it could be produced within the country.
- Industrial growth took place in Britain which led to higher incomes meaning more food imports.
- It was transported by railway and by ships.
- Food is only an example. Products such as cotton, rubber, coal also had same fate.

#### Role of Technology

- The railways, steamships, the telegraph were important inventions that transformed nineteenth-century world.
- After the introduction of new technology, namely, refrigerated ships animals were slaughtered for food at the starting point and then transported to Europe as frozen meat.

#### Late nineteenth-century Colonialism

- European conquests of Asia and Africa as colonies.
- Belgium and Germany became new colonial powers.
- The US became a colonial power in the late 1890s by taking over some colonies earlier held by Spain.

#### Rinderpest, or the Cattle Plague

- Rinderpest is a fast spreading cattle plague which hit Africa in the late 1880s.
- It was carried by infected cattle imported from British Asia and destroyed 90 percent of the livestock.
- The colonial governments now strengthen their power and to force Africans into the labour market.

#### Indentured Labour Migration from India

- Indentured Labour was a bonded labourer under contract to work for an employer.
- In the nineteenth century, thousands of Indian and Chinese labourers went to work on plantations, in mines, and in road and railway construction projects around the world.
- Recruitment was done by agents by providing false information about the work and location.
- On arrival at the plantations, labourers found living and working conditions harsh.
- It was abolished in 1921.

#### Indian Entrepreneurs Abroad

- Indian entrepreneurs, some bankers like Nattukottai and Chettiars financed export of agriculture to Central and South-East Asia.  
→ They even followed the Europeans to Africa.
- Industrial Revolution in England changed the balance of trade between England and India.
- Indian handicraft and agriculture were destroyed and Britain enjoyed a trade surplus with

India.

→ Their exports increased and imports decreased.

### Section III: The Inter-war Economy

- The First World war was the first modern industrial war.
- During the war, industries were restructured to produce war-related goods.
- The war transformed the US from being an international debtor to an international creditor.

#### Post-war Recovery

- After the war was over, the production reduced and unemployment increased.

#### Rise of Mass Production and Consumption

- In the US, war recovery was quicker.
- ‘\_Assembly line’ method introduced by Henry Ford soon spread to the US and were also widely copied in Europe in the 1920s.
- Mass production lowered the costs and prices of engineered goods.
- There was a housing and consumer boom in the 1920s, which ultimately led to the **Great Depression of 1929**.
- Markets crashed in 1929 and led to the failure of banks and the crisis affected other countries.  
→ By 1933, over 4000 banks closed and between 1929-32 about 110,000 companies collapsed.

### **India and the Great Depression**

- India was also affected by the Great Depression.
- Indian exports and imports declined extensively, prices fell.
- Bengal jute growers suffered the most.
- Large scale migration took place from villages to towns and cities.

### Section IV: Rebuilding a World Economy: The Post-war Era

- The Second World War broke out a mere two decades after the end of the First World War and once again, it led to destruction.
- After the USA and the USSR emerged as superpowers.



## **Post-war Settlement and the Bretton Woods Institutions**

- To ensure a stable economy a framework was agreed upon at the United Nations Monetary and Financial Conference held at Bretton Woods in New Hampshire, USA.
- It established the International Monetary Fund (IMF) and the World Bank.
- The International Monetary Fund (IMF) to deal with external surpluses and deficits of its member nations.
- The International Bank for Reconstruction and Development (popularly known as the World Bank) was set up to finance post-war reconstruction.
- The IMF and the World Bank commenced financial operations in 1947.
- Bretton Woods System was based on a fixed exchange rate.
- National currencies were pegged to the American dollar at a fixed rate.
- Decision-making in these institutions is controlled by the Western industrial powers largely by the US.

## **Decolonisation and Independence**

- Many countries in Asia and Africa became independent nations, supported by UNO and NAM.(Non –Aligned –Movement)
- Group of 77 or G-77 was organised by developing countries to demand **a new international economic order (NIEO)** which would give these countries real control over their national resources, raw materials, manufactured goods in their markets.
- MNCs or multinational companies were established in the 1950s and 1960s and operated in several countries.

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## Chapter 4- **THE AGE OF INDUSTRIALISATION**

### **Before the Industrial Revolution**

- Proto-industrialisation was a phase when there was large-scale industrial production for an international market which was not based on factories.
- Proto-industrial system was part of a network of commercial exchanges.

### **The Coming Up of the Factory**

- By the 1730s, the earliest factories in England came up.
- The first symbol of the new era was cotton.  
→ A series of inventions in the eighteenth century increased the efficacy of each step of the production process.
- Richard Arkwright created the cotton mill.

### **The Pace of Industrial Change**

#### **How rapid was the process of industrialisation?**

- The most dynamic industries in Britain were clearly cotton and metals.
- The new industries could not easily displace traditional industries.
- Technological changes occurred slowly because:  
→ The New technology was expensive.  
→ The machines often broke down and repair was costly.  
→ They were not as effective as their inventors and manufacturers claimed.

### **Hand Labour and Steam Power**

- In Victorian Britain, there was no shortage of human labour.
- Therefore, industrialists did not want to introduce machines which required large capital investment.
- Many seasonal industries were also there who usually preferred hand labour.
- Handmade goods came to symbolize refinement and class

## **Life of the Workers**

- Labours were available in abundance in the market which affected the lives of workers.
- After the busy season was over, workers became jobless.
- In the early nineteenth century, wages increased but the prices of goods also increased.

## **Industrialisation in the Colonies**

### **The Age of Indian Textiles**

- Before the age of machine industries, silk and cotton goods from India dominated the international market in textiles.
- A vibrant sea trade operated through the main pre-colonial ports.

### **What Happened to Weavers?**

- After the East India Company established political power, they tried to eliminate the existing traders and brokers and establish a more direct control over the weaver.
- It appointed a paid servant called the gomastha to supervise weavers, collect supplies, and examine the quality of cloth.
  - Loans were provided for purchasing raw material for production.
  - The produced cloth was to be handed over to the gomastha.
- In many weaving villages there were reports of clashes between weavers and gomasthas because:
  - The new gomasthas were outsiders, with no long-term social link with the village.
  - The price weavers received from the Company was miserably low.

### **Manchester Comes to India**

- As cotton industries developed in England, industrial groups pressurised the government to impose import duties on cotton textiles so that Manchester goods could sell in Britain without competition.
- Also, they persuaded the East India Company to sell British manufactures in Indian markets as well.
- Thus, cotton weavers in India faced two problems at the same time:
  - Their export market collapsed as market overloaded with Manchester imports.
  - Availability of lower cost cotton goods produced by machines.
- By the end of the nineteenth century, factories in India began production, flooding the market with machine-made goods which created a problem of weavers.

## **Factories Come Up**

- In 1854, the first cotton mill in Bombay came up.
- In 1855, first jute mill in Bengal came up.
- By 1862, four cotton mills came up.
- In 1862, another jute mill came up.
- In the 1860s, the Elgin mill was started in Kanpur
- In 1861, the first cotton mill of Ahmadabad was set up.
- In 1874, the first spinning and weaving mill of Madras began production.

## **The Early Entrepreneurs**

- In Bengal, Dwarkanath Tagore made his fortune in the China trade.
- In Bombay, Parsis like Dinshaw Petit and Jamsetjee Nusserwanjee Tata who built huge industrial empires in India.
- After colonial power came in power, Indian businessmen were barred from trading with Europe in manufactured goods.

## **Where Did the Workers Come From?**

- In most industrial regions workers came from the districts around.
- Industrialists usually employed a jobber to get new recruits.  
→ He got people from his village, ensured them jobs, helped them settle in the city.

### The Peculiarities of Industrial Growth

- European Managing Agencies established tea and coffee plantations, acquiring land at cheap rates from the colonial government.
- By the first decade of the twentieth century, the swadeshi movement promoted Indian industries.
- From 1906, moreover, the export of Indian yarn to China declined since produce from Chinese and Japanese mills flooded the Chinese market.
- During the First World War, British mills busy with war production to meet the needs of

the army, Manchester imports into India declined.

- After the war, Manchester could never recapture its old position in the Indian market.

### **Small-scale Industries Predominate**

- Large industries formed only a small segment of the economy and most of them were located in Bengal and Bombay.
- In the twentieth century, handicrafts production and handloom actually expanded.
- By the second decade of the 20th century, weavers used looms with a fly shuttle.

### **Market for Goods**

- New consumers are created is through advertisements.
- Advertisements appear in newspapers, magazines, hoardings, street walls, television screens.
- Advertisements became a vehicle of the nationalist message of Swadeshi.

**LINK OF THIS CHAPTER:-** [CLICKHERE](#)

## Chapter 5- **PRINT CULTURE AND MODERN WORLD**

### **The First Printed Books**

#### **Print in China**

- The earliest print technology was developed in China, Japan and Korea.
- By the seventeenth century, as urban culture bloomed in China, the uses of print diversified.
- In the late nineteenth century, western printing techniques and mechanical presses were imported as Western powers established their outposts in China.
- Shanghai became the hub of the new print culture.

#### **Print in Japan**

- Around AD 768-770, Buddhist missionaries from China introduced hand-printing technology into Japan.
- The Buddhist Diamond Sutra was the oldest Japanese book which was printed in AD 868.

### **Print Comes to Europe**

- In the 11th century, Chinese paper reached Europe via the silk route.
- In 1295, Marco Polo, a great explorer, returned to Italy from China and brought printing knowledge back with him.
- Italians began producing books with woodblocks, and soon the technology spread to other parts of Europe.
  - As the demand for books increased, booksellers all over Europe began exporting books to many different countries.
- But the production of handwritten manuscripts could not satisfy the ever-increasing demand for books because:
  - Copying was an expensive, laborious and time-consuming business.
  - Manuscripts were fragile, awkward to handle.
- In the 1430s, Johann Gutenberg invented new printing technology by developing first-known printing press at Strasbourg, Germany.

#### **Gutenberg and the Printing Press**

- Gutenberg learned the art of polishing stones, became a master goldsmith, and also acquired the expertise to create lead moulds used for making trinkets.
- Based on this knowledge, Gutenberg adapted existing technology to design his innovation.
- By 1448, Gutenberg perfected the system.
  - The first book he printed was the Bible.

- Between 1450 and 1550, printing presses were set up in most countries of Europe.

## **The Print Revolution and Its Impact**

### **A New Reading Public**

- Access to books created a new culture of reading.
- However, the rates of literacy in most European countries were very low till the twentieth century which was a major hurdle in spreading of this culture.
- So printers began publishing popular ballads and folk tales, and such books would be profusely illustrated with pictures.

### **Religious Debates and the Fear of Print**

- People believed can lead to the fear of the spread of rebellious and irreligious thoughts.
- In 1517, the religious reformer Martin Luther wrote ‘Ninety Five Theses’ criticising many of the practices and rituals of the Roman Catholic Church.  
→ This led to a division within the Church and to the beginning of the Protestant Reformation.

## **The Reading Mania**

- By the end of the eighteenth century, in some parts of Europe literacy rates were as high as 60 to 80 percent.
- In England, Penny chapbooks were carried by petty pedlars known as chapmen and sold for a penny.
- In France were the ‘Biliotheque Bleue’ - low priced small books printed on poor quality paper and bound in cheap blue covers.
- Newspapers and journals carried information about wars and trade, as well as news of developments in other places.

### **Print Culture and the French Revolution**

- Print culture created the conditions within which French Revolution occurred.
- Print popularized the ideas of the Enlightenment thinkers.
- Print created a new culture of dialogue and debate.
- By the 1780s, literature mocked the royalty and criticized their morality were large in number.

## **The Nineteenth Century**

### **Children, Women and Workers**

- In 1857, in France, a children's press, devoted to literature for children alone was set up.
- Women became important as readers as well as writers.
- Penny Magazines were especially meant for women, manuals teaching proper behaviors and housekeeping.
- In the nineteenth century, lending libraries in England became a medium for educating white-collar workers, artisans and lower-middle-class people.

### **Further Innovations**

- By mid-19th Century, Richard M. Hoe perfected the power driven cylindrical press.
- In the late 19th century, offset press was developed that can print up to six colours at a time.
- By the 20th century, electrically operated presses accelerated printing operations.

## **India and the World of Print**

### **Manuscripts Before the Age of Print**

- In India, manuscripts were copied on palm leaves or on handmade paper.

### **Print Comes to India**

- In the mid-sixteenth century, the printing press first came to Goa with Portuguese missionaries.
- By 1674: About 50 books had been printed in Konkani and in Karana languages.
- Cochin, 1579, Catholic priests printed the first Tamil book
- In 1713, Catholic priests printed the first Malayalam book
- By 1710, Dutch Protestant missionaries had printed 32 Tamil texts
- From 1780: James Augustus Hickey began editing the Bengal Gazette, a weekly magazine.

## **Religious Reform and Public Debates**

- From the early nineteenth century, there were intense debates around religious issues.
- Different groups offered a variety of new interpretations of the beliefs of different



religions.

- In 1821, Rammohun Roy published the Sambad Kaumudi.
- In 1810, the first printed edition of the Ramcharitmanas of Tulsidas, a 16th century text published in Calcutta.

### **New Forms of Publication**

- The novel, a literary form which had developed in Europe soon acquired distinctively Indian forms and styles.
- Other new literary forms such as lyrics, short stories, essays about social and political matters also entered the world of reading.
- Painters like Raja Ravi Varma produced visual images for mass circulation.

### **Women and Print**

- Liberal husbands and fathers began educating their womenfolk at home.
- Conservative Hindus believed that a literate girl would be widowed.
- Muslims feared that educated women would be corrupted by reading Urdu romances.

### **Print and the Poor People**

- In the 19th century, very cheap and small books were brought to markets.
- From the late nineteenth century, issues of caste discrimination began to be written about in many printed tracts and essays.

### **Print and Censorship**

- Before 1798, the colonial state under the East India Company was not much concerned about censorship.
- By 1820s, the Calcutta Supreme Court passed certain regulations to control press freedom.
- After the revolt of 1857, the attitude to freedom of the press changed.

In 1878, the Vernacular Press Act was passed which provided the government with extensive rights to censor reports and editorials in the vernacular press. Despite repressive measures, nationalist newspapers grew in numbers in all parts of India.

LINK OF THIS CHAPTER:- [CLICKHERE](#)

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Chapter 1- **RESOURCES AND DEVELOPMENT**

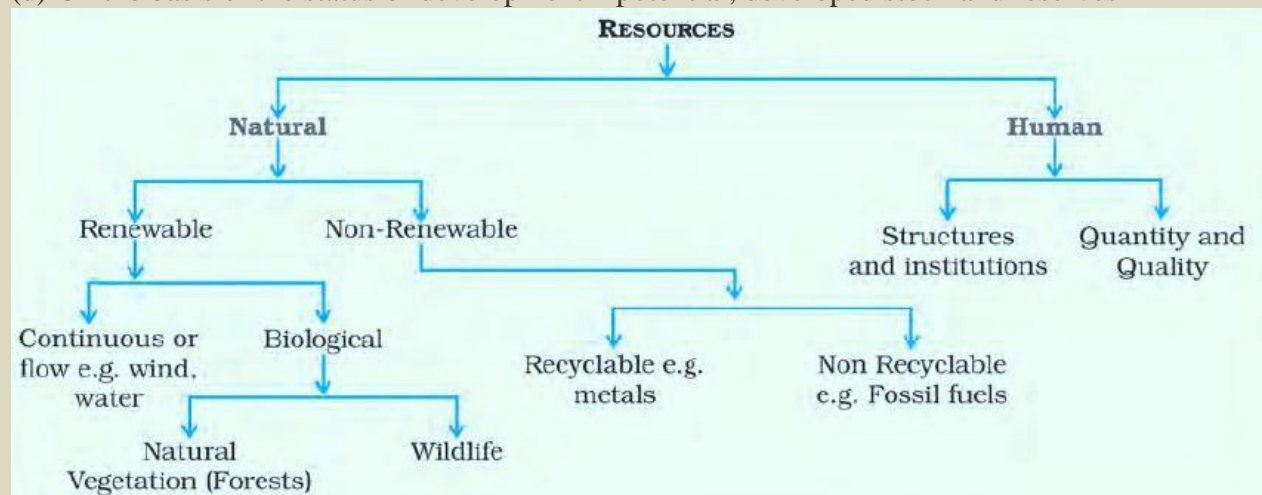
**Resources**

Everything in our environment which can be used to satisfy our needs and is technologically accessible, economically feasible and culturally acceptable is termed as ‘\_Resource’. Human beings themselves are essential components of resources. They transform material available in the environment into resources and use them.

**Classification of Resources**

Resources can be classified in the following ways:

- (a) On the basis of origin – biotic and abiotic
- (b) On the basis of exhaustibility – renewable and non-renewable
- (c) On the basis of ownership – individual, community, national and international
- (d) On the basis of the status of development – potential, developed stock and reserves



**On the Basis of Origin – Biotic and Abiotic**

Biotic Resources are obtained from the biosphere and have life.

Eg: Human beings, flora and fauna, fisheries, livestock etc.

Abiotic Resources: All those things which are composed of non-living things are called abiotic resources. Eg: rocks and metals.

(b) On the Basis of Exhaustibility – Renewable and Non-Renewable

The resources which can be renewed or reproduced by physical, chemical or mechanical processes are known as Renewable or Replenishable Resources.

The renewable resource may further be divided into continuous or flow.

Eg: Solar and wind energy, water, forests and wildlife, etc.

Non-Renewable Resources occur over a very long geological time. These resources take millions of years in their formation. Some of the resources like metals are recyclable and some like fossil fuels cannot be recycled and get exhausted with their use.

Eg: Minerals and fossil fuels.( Coal, petroleum etc)

(c) On the Basis of Ownership – Individual, Community, National and International  
Individual Resources are owned privately by individuals. In villages people own lands whereas in urban areas people own plots, houses and other properties.

Eg: Plantation, pasture lands, ponds, water in wells etc.

**Community Owned Resources** are accessible to all the members of the community. Eg: Grazing grounds, burial grounds, public parks, picnic spots, playgrounds etc.

**National Resources** are owned by a nation or country. All the minerals, water resources, forests, wildlife, land within the political boundaries and oceanic area up to 12 nautical miles (22.2 km) from the coast termed as territorial water and resources therein belong to the nation.

Eg: Roads, canals, railways etc.

**International Resources** are regulated by international institutions. The oceanic resources beyond 200 nautical miles of the *Exclusive Economic Zone* belong to open ocean and no individual country can utilise these without the concurrence of international institutions.

(d) On the Basis of the Status of Development – Potential, Developed Stock and Reserves.

Potential Resources are the resources which are found in a region but have not been utilised.

Eg: Rajasthan and Gujarat have enormous potential for the development of wind and solar energy, but so far these have not been developed properly.

**Developed Resources-** Resources, which are surveyed and their quality and quantity have been determined for utilisation. The development of resources depends on technology and level of their feasibility.

Stock. Materials in the environment which have the potential to satisfy human needs but human beings do not have the appropriate technology to access these, are called Stock.

Eg: Hydrogen can be used as a rich source of energy. But we do not have advanced technology to use it.

Reserves are the subset of the stock, which can be put into use with the help of existing technical ‘know-how’ but their use has not been started. These can be used for meeting future requirements.

Eg: Water in the dams, forests etc. is a reserve which can be used in the future.

### **Development of Resources**

Resources have been used by human beings indiscriminately and this has led to the following major problems.

Depletion of resources for satisfying the greed of a few individuals.

Accumulation of resources in a few hands, which, in turn, divided the society into two segments i.e rich and poor.

It has led to global ecological crises such as global warming, ozone layer depletion, environmental pollution and land degradation.

Resource planning is essential for the sustainable existence of all forms of life.

Sustainable Economic Development means —development should take place without

damaging the environment, and development in the present should not compromise with the needs of future generations.¶

### **Resource Planning**

In India, there are some regions which can be considered self-sufficient in terms of the availability of resources and there are some regions which have acute shortage of some vital resources. This calls for balanced resource planning at the national, state, regional and local levels.

#### Resource Planning in India

Resource planning is a complex process which involves:

(i) Identification and inventory of resources across the regions of the country. This involves surveying, mapping and qualitative and quantitative estimation and measurement of the resources.

(ii) Evolving a planning structure endowed with appropriate technology, skill and institutional set up for implementing resource development plans.

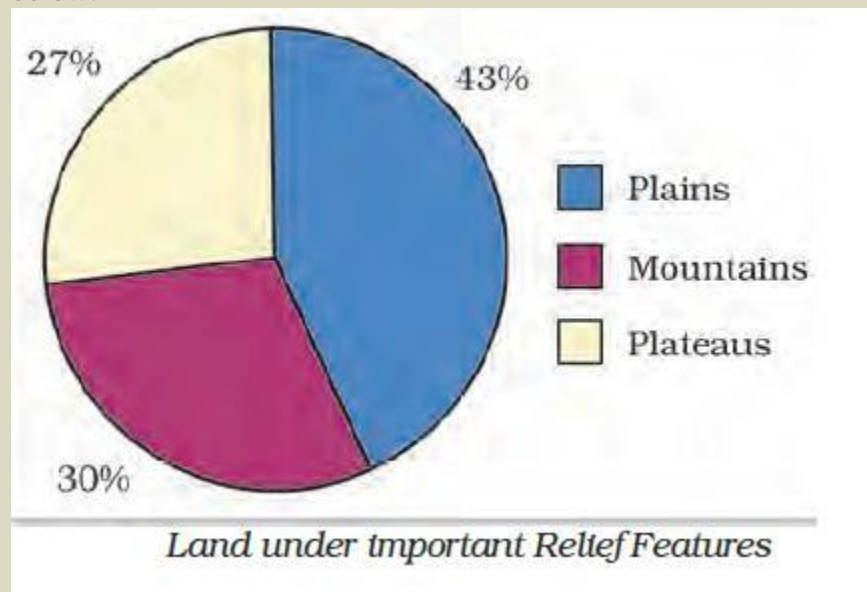
(iii) Matching the resource development plans with overall national development plans.

Resources can contribute to development only when they are accompanied by appropriate technological development and institutional changes. India has made concerted efforts towards achieving the goals of resource planning, right from the First Five Year Plan launched after Independence.

To overcome irrational consumption and over-utilisation of resources, resource conservation at various levels is important.

#### Land Resources

Land is a natural resource of utmost importance. It supports natural vegetation, wildlife, human life, economic activities, transport and communication systems. India has land under a variety of relief features, namely; mountains, plateaus, plains and islands as shown below:



### **Land Utilisation**

Land resources are used for the following purposes:

Forests

Land not available for cultivation

a) Barren and wasteland

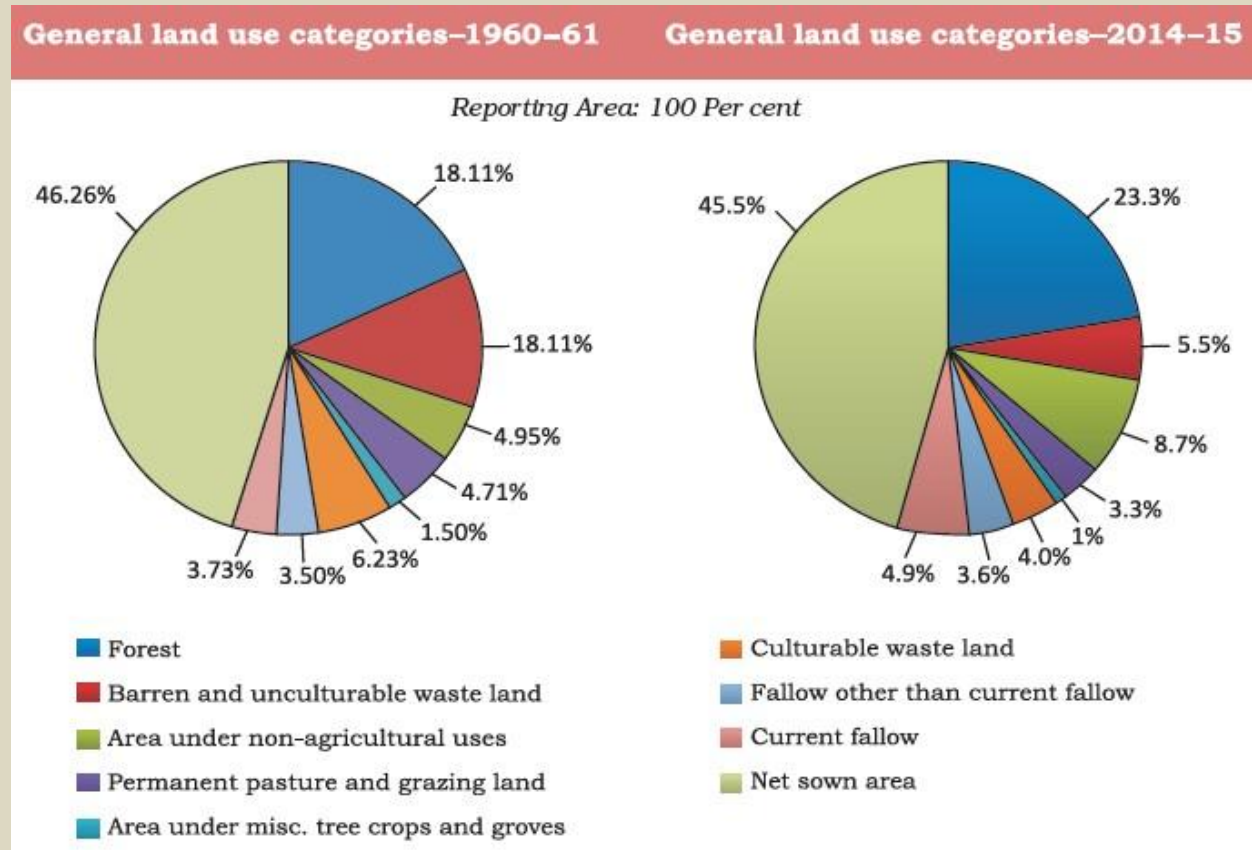
- b) Land put to non-agricultural uses
4. Fallow lands
  5. Other uncultivated lands (excluding fallow land)
  6. Net sown area

### Land Use Pattern in India

The use of land is determined

Physical factors: such as topography, climate, soil types

Human factors: such as population density, technological capability and culture and traditions etc.



The data below represents the land use pattern in India.

Waste land is the land put to other non-agricultural uses which include rocky, arid and desert areas, roads, railways, industry etc. Continuous use of land over a long period of time without taking appropriate measures to conserve and manage it, has resulted in land degradation.

### Land Degradation and Conservation Measures

Human activities such as deforestation, overgrazing, mining and quarrying have contributed significantly to land degradation. Mining sites leave deep scars and traces of over-burdening the land. In recent years, industrial effluents as waste have become a major source of land and water pollution in many parts of the country.

Some of the ways through which we can solve the problems of land degradation are:

Afforestation and proper management of grazing.

Planting of shelter belts of plants.

Stabilisation of sand dunes by growing thorny bushes.

Proper management of waste lands.

Control of mining activities.

Proper discharge and disposal of industrial effluents and wastes after treatment.

### **Soil as a Resource**

Soil is the most important renewable natural resource. It is the medium of plant growth and supports different types of living organisms on the earth.

It takes millions of years to form soil upto a few cms in depth. Various forces of nature such as change in temperature, actions of running water, wind and glaciers, activities of decomposers etc contribute to the formation of soil.

Parent rock or bedrock, climate, vegetation and other forms of life and time are important factors in the formation of soil.

Chemical and organic changes which take place in the soil play an important role.

Soil also consists of organic (humus) and inorganic materials.

### **Classification of Soils**

On the basis of the factors responsible for soil formation, colour, thickness, texture, age, chemical and physical properties, the soils of India are classified in different types as mentioned below.

#### **Alluvial Soils**

The entire northern plains are made of alluvial soil.

The Alluvial Soil is deposited by 3 important Himalayan river systems – the Indus, the Ganga and the Brahmaputra.

It is also found in Rajasthan, Gujarat and eastern coastal plains particularly in the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri rivers.

The alluvial soil consists of various proportions of sand, silt and clay. As we move inland towards the river valleys, soil particles appear to be bigger in size whereas in the upper side of the river valley, the soils are coarse.

**Based on age, Alluvial soils can be classified as:**

**Old Alluvial (Bangar):** The Bangar soil has a higher concentration of kanker nodules than the Khadar.

**New Alluvial (Khadar):** It has more fine particles and is more fertile than the Bangar. Alluvial soils are very fertile. These soils contain an adequate proportion of potash, phosphoric acid and lime, which are ideal for the growth of sugarcane, paddy, wheat and other cereal and pulse crops.



#### **Black Soil**

This soil is black in colour and is also known as regur soil. Climatic conditions along with the parent rock material are the important factors for the formation of black soil.

The soil is ideal for growing cotton and is also known as black cotton soil.

This type of soil is typical of the Deccan trap (Basalt) region spread over northwest Deccan plateau and is made up of lava flows.

The soil covers the plateaus of Maharashtra, Saurashtra, Malwa, Madhya Pradesh and Chhattisgarh and extends in the south-east direction along the Godavari and the Krishna valleys.

The black soils are made up of extremely fine i.e. clayey material and well-known for their

capacity to hold moisture.

Black soil is nutrients rich and contains calcium carbonate, magnesium, potash and lime.

The soil is sticky when wet and difficult to work on unless tilled immediately after the first shower or during the pre-monsoon period.



### Red and Yellow Soils

This type of soil develops on crystalline igneous rocks in areas of low rainfall in the eastern and southern parts of the Deccan plateau.

These soils develop a reddish colour due to diffusion of iron in crystalline and metamorphic rocks. It looks yellow when it occurs in a hydrated form.

Found in parts of Odisha, Chhattisgarh, southern parts of the middle Ganga plain and along the piedmont zone of the Western Ghats.



### Laterite Soil

The laterite soil develops under tropical and subtropical climate with the alternate wet and dry season.

This soil is the result of intense leaching due to heavy rain.

Lateritic soils are acidic ( $\text{pH} < 6.0$ ) in nature and generally deficient in plant nutrients. This type of soil is found mostly in Southern states, Western Ghats region of Maharashtra, Odisha, some parts of West Bengal and North-east regions.

The soil supports deciduous and evergreen forests but humus poor.

This soil is very useful for growing tea and coffee.

### Arid Soils

Arid soils range from red to brown in colour.

This soil is generally sandy in texture and saline in nature. In some areas, the salt content is very high and common salt is obtained by evaporating the water.

Arid soil lacks humus and moisture.

The lower horizons of the soil are occupied by Kankar because of the increasing calcium content downwards. The Kankar layer formations in the bottom horizons restrict the infiltration of water.



### Forest Soils

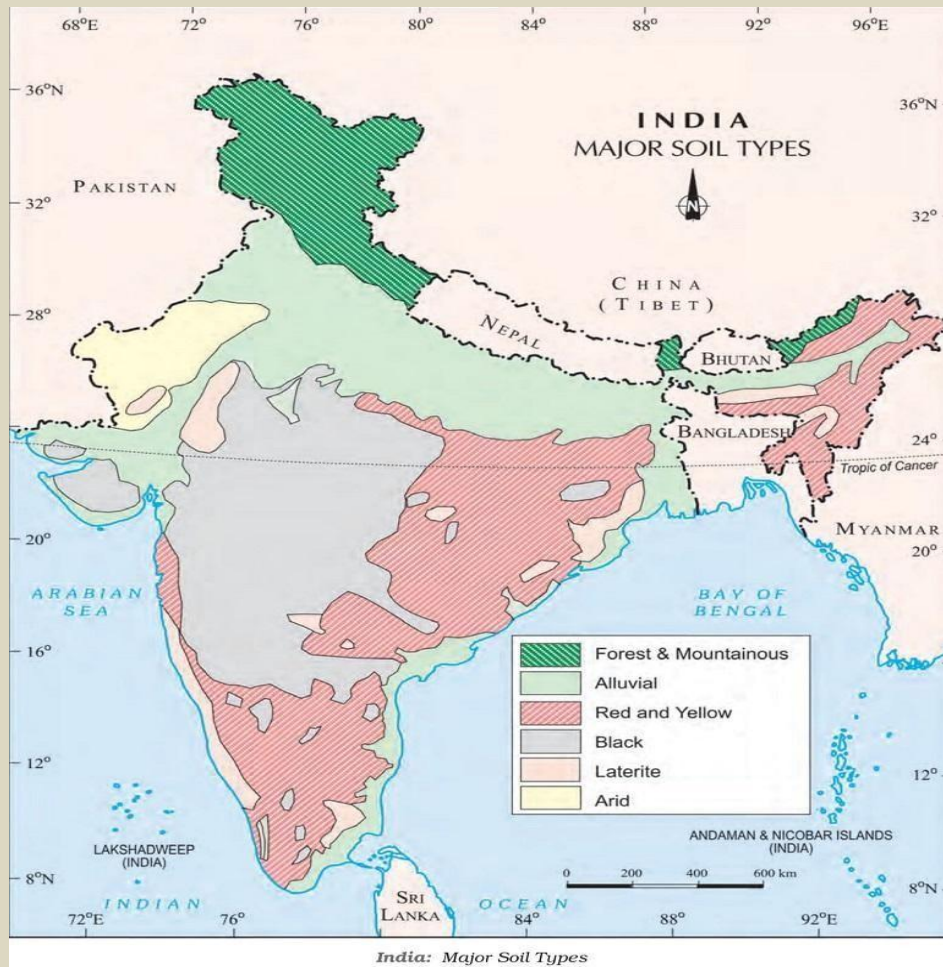
These soils are found in the hilly and mountainous areas.

The soil texture is loamy and silty in valley sides and coarse grained in the upper slopes.

In the snow covered areas of Himalayas, these soils experience denudation and are acidic with low humus content. The soil is fertile on the river terraces and alluvial fans.

The map below shows the different types of soils found in India.





### **Soil Erosion and Soil Conservation**

The denudation of the soil cover and subsequent washing down is described as soil erosion. The soil erosion is caused due to human activities like deforestation, over-grazing, construction and mining etc. Also, there are some natural forces like wind, glacier and water which lead to soil erosion. Soil erosion is also caused due to defective methods of farming.

The running water cuts through the clayey soils and makes deep channels as gullies. The land becomes unfit for cultivation and is known as bad land. When water flows as a sheet over large areas down a slope and the topsoil is washed away, it is known as sheet erosion. Wind blows loose soil off flat or sloping land known as wind erosion.

### **Different Ways for Soil Conservation.**

Ploughing along the contour lines decelerate the flow of water down the slopes. This is called Contour Ploughing.

Terrace cultivation restricts erosion. This type of agriculture practice is done in Western and Central Himalayas.

When a large field is divided into strips and strips of grass are left to grow between the crops. Then, this breaks up the force of the wind. This method is known as Strip Cropping. Planting lines of trees to create shelter helps in the stabilisation of sand dunes and in stabilising the desert in western India. Rows of such trees are called Shelter Belts.

[CLICK HERE](#)

## Chapter 2- FOREST AND WILDLIFE RESOURCES

### GIST OF THE LESSON / MIND MAP

**Biodiversity** is extremely diverse on earth and works interdependently. It is a system of closely knit networks that sustains the ecosystem. India has world's largest biodiversity thriving on its land and 10 per cent of the recorded wild flora and 20 per cent of its mammals are on the threatened list.

As the list generated by International Union for Conservation of Nature and Natural Resources (IUCN), the species can be classified as following

**Normal species:** They have population levels normal for survival. Example: pine, rodents, etc.

**Endangered Species:** They are in danger of extinction and would eventually decline if the present conditions continue. Example: crocodile, rhino, lion tailed macaque etc.

**Vulnerable species:** These species are vulnerable to fall into the endangered category in near future. Example: Asiatic elephant, dolphin, blue sheep etc

**Rare species:** They have a small population which can move to endangered or vulnerable category in near future if the present conditions for their survival sustain itself. Example: Asiatic buffalo, hornbill etc

**Endemic species:** These species are only found in limited geographical area. Example: Andaman teal, Nicobar pigeon, Andaman wild pig, mithun in Arunachal Pradesh.

**Extinct species:** These species are not found in the areas they were likely to be found. Example: Asiatic cheetah, pink head duck.

### CAUSES OF ENVIRONMENTAL DEGRADATION

Between 1951 and 1980, according to the Forest Survey of India, over 26,200 sq. km. of forest area was converted into agricultural land all over India and substantial parts of the tribal belts, especially in the northeastern and central India were deforested to practice shifting cultivation (Jhum), a type of "slash and burn agriculture. Around 5,000 sq km of forest lands have been cleared to progress river valley projects since 1951. For example About 40,000 hectares of forests were cleared for the Narmada Sagar Project in Madhya Pradesh.

### KEY WORDS OF THE LESSON

**Natural Resources:** These are the gifts produced by nature such as air, water, soil etc.

**Ecology:** The science which deals with the inter relation between various organisms and physical environment.

**Endangered species:** Plants and animals which are extinct or in the danger of getting extinct. 4. **Wild life sanctuary:** A reserved area for preserving natural beauty. e.g.

Ranthambhor wild life sanctuary.

4. **Biosphere:** Part of the earth which is covered by living organisms both plants and animals.

**Soil:** The upper layer of the ground containing weathered rock and humus.

**Coniferous forest:** Evergreen trees that bear needle like leaves. 8. **Deciduous forest:** Type of trees that lose their leaves every year.

7. **Ecosystem:** An integrated unit consisting of the community of living organisms and the physical environment.

8. **Flora:** Plants of a particular region or period are referred to as flora.

# Forest and Wildlife Resources



[CLICK HERE](#)

## Chapter 3- **WATER RESOURCES**

Three-fourth of the earth's surface is covered with water but only a small proportion of it accounts for freshwater, that can be put to use. Water is a renewable resource.

**Water Scarcity and the Need for Water Conservation and Management**

The availability of water resources varies over space and time.

Water scarcity is caused by over-exploitation, excessive use and unequal access to water among different social groups.

Water resources are being over-exploited to expand irrigated areas for dry-season agriculture.

In some areas, water is sufficiently available to meet the needs of the people. But, those areas still suffer from water scarcity due to bad quality of water.

The need of the hour is to conserve and manage our water resources:

To safeguard ourselves from health hazards.

To ensure food security, continuation of our livelihoods and productive activities.

To prevent degradation of our natural ecosystems.

### **Multi-Purpose River Projects and Integrated Water Resources Management**

In ancient times, we used to conserve water by constructing sophisticated hydraulic structures like dams built of stone rubble, reservoirs or lakes, embankments and canals for irrigation. We have continued this tradition in modern India by building dams in most of our river basins.

**Dams**

A dam is a barrier across flowing water that obstructs, directs or retards the flow, often creating a reservoir, lake or impoundment. –Dam|| refers to the reservoir rather than the structure.

**Uses of Dam:**

Dams are built:

To impound rivers and rainwater that can be used later to irrigate agricultural fields.

For electricity generation.

Water supply for domestic and industrial uses.

Flood control.

Recreation, inland navigation and fish breeding.

**Side effects of Creating Dams**

Regulating and damming of rivers affect their natural flow.

Poorer the habitats for the rivers' aquatic life.

Fragment rivers make it difficult for aquatic fauna to migrate.

Dams created on the floodplains submerge the existing vegetation and soil leading to its decomposition over a period of time.

Creating of large dams has been the cause of many new environmental movements like the \_Narmada Bachao Andolan' and the \_Tehri Dam Andolan' etc.

Many times local people had to give up their land, livelihood and their control over resources for the construction of the dam.

Most of the objections to the projects arose due to their failure to achieve the purposes for which they were built. Most of the dams were constructed to control floods but, these dams have triggered floods. Dams have also caused extensive soil erosion. Excessive use of water has resulted in earthquakes, caused water-borne diseases and pests and pollution.

ave a look at the India Major Rivers and Dams in the map below:



### Rain Water Harvesting

Rainwater harvesting is a simple method by which rainfall is collected for future usage. The collected rainwater may be stored, utilised in different ways or directly used for recharge purposes.

Different methods have been adopted in different areas for Rain Water Harvesting. In hill and mountainous regions, people have built diversion channels like the guls or kuls of the Western Himalayas for agriculture.

**-Rooftop rainwater harvesting** is commonly practised to store drinking water, particularly in Rajasthan.

In the flood plains of Bengal, people developed inundation channels to irrigate their fields. In arid and semi-arid regions, agricultural fields were converted into rain-fed storage

structures that allowed the water to stand and moisten the soil such as khadins in Jaisalmer and Johads in other parts of Rajasthan.

The **tankas** are part of the well-developed rooftop rainwater harvesting system and are built inside the main house or the courtyard. This is mainly practised in Rajasthan, particularly in Bikaner, Phalodi and Barmer areas for saving the rainwater. Many houses have constructed underground rooms adjoining the tanka to beat the summer heat as it would keep the room cool.

Tamil Nadu is the first state in India which has made rooftop rainwater harvesting structure compulsory to all the houses across the state. There are legal provisions to punish the defaulters.

[CLICKHERE](#)



Video Water Resource.mp4

## Chapter 4- **AGRICULTURE**

### **Types of Farming**

The cultivation methods depend upon the characteristics of the physical environment, technological know-how and socio-cultural practices. Farming varies from subsistence to commercial type. In different parts of India, the following farming systems are practised.

#### **Primitive Subsistence Farming**

It is a 'slash and burn' agriculture. Farmers clear a patch of land and produce cereals and other food crops. When the soil fertility decreases, the farmers shift and clear a fresh patch of land for cultivation. It is known by different names in different parts of the country. It is known as jhumming in north-eastern states.

Land productivity is low in this type of agriculture.

This type of farming depends on monsoon.

This farming is practised in a few parts of India.

#### **Intensive Subsistence Farming**

This type of farming is practised in areas of high population pressure on land.

It is labour-intensive farming, where high doses of biochemical inputs and irrigation are used for higher production.

#### **Commercial Farming**

This type of farming uses higher doses of modern inputs such as high yielding variety (HYV) seeds, chemical fertilisers, insecticides and pesticides to obtain higher productivity.

Plantation is a type of commercial farming in which a single crop is grown on a large area.

Plantations cover large tracts of land, using capital intensive inputs, with the help of migrant labourers. All the produce is used as a raw material in industries.

Eg: Tea, Coffee, Rubber, Sugarcane, Banana.

For More Information On Agriculture, Watch The Below Video:

5,645

#### **Cropping Pattern**

India has three cropping seasons:

Rabi

Kharif

Zaid

	<b>Rabi</b>	<b>Kharif</b>	<b>Zaid</b>
Sowing Season	Winter from October to December	Beginning of the rainy season between April and May	In between the Rabi and the Kharif seasons, there is a short season during the summer months known as the Zaid season (in the months of March to July)
Harvesting Season	Summer from April to June	September-October	

Important Crops	Wheat, Barley, Peas, Gram and Mustard.	Paddy, Maize, Jowar, Bajra, Tur (Arhar), Moong, Urad, Cotton, Jute, Groundnut and Soyabean.	Watermelon, Muskmelon, Cucumber, Vegetables and Fodder crops
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To Know About Types Of Agriculture, Watch The Video Below:

14,057

### **Major Crops in India**

A variety of food and non-food crops are grown in different parts of India, depending upon the variations in soil, climate and cultivation practices. Major crops grown in India are:

Rice

Wheat

Millets

Pulses

Tea

Coffee

Sugarcane

oil seeds

Cotton

Jute

We will discuss all of these one by one, in detail.

Rice

It is a kharif crop.

It requires high temperature and high humidity with annual rainfall above 100 cm.

India is the second largest producer of rice in the world after China.

It is grown in the plains of north and north-eastern India, coastal areas and the deltaic regions.

Wheat

This is a rabi crop.

It requires a cool growing season and bright sunshine at the time of ripening.

It requires 50 to 75 cm of annual rainfall evenly distributed over the growing season.

The Ganga-Satluj plains in the north-west and black soil region of the Deccan are two main wheat-growing zones in India.

It is the second most important cereal crop and main food crop, in the north and north-western part of India.

Millets

Jowar, Bajra and Ragi are the important millets grown in India.

These are known as coarse grains and have very high nutritional value.

Jowar	Bajra	Ragi
3rd most important food crop with respect to area and production.	Grows well on sandy soils and shallow black soil.	It is a crop of dry regions.



It is a rain-fed crop mostly grown in the moist areas.		Grows well on red, black, sandy, loamy and shallow black soils.
Mainly produced in Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh.	Major producing states are Rajasthan, Uttar Pradesh, Maharashtra, Gujarat and Haryana.	Major producing states are Karnataka, Tamil Nadu, Himachal Pradesh, Uttarakhand, Sikkim, Jharkhand and Arunachal Pradesh.

#### Maize

It is a Kharif crop.

It requires temperature between 21°C to 27°C and grows well in old alluvial soil.

It is used both as food and fodder.

Major maize-producing states are Karnataka, Madhya Pradesh, Uttar Pradesh, Bihar, Andhra Pradesh and Telangana.

#### Pulses

India is the largest producer and consumer of pulses in the world.

Pulses are the major source of protein in a vegetarian diet.

Major pulses grown in India are Tur (Arhar), Urad, Moong, Masur, Peas and Gram.

Pulses are mostly grown in rotation with other crops so that the soil restores fertility.

Major pulse producing states are Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh and Karnataka.

#### Food Crops other than Grains

##### Sugarcane

It is a tropical as well as a subtropical crop.

It grows well in hot and humid climates with a temperature of 21°C to 27°C and annual rainfall between 75cm to 100cm.

It can be grown on a variety of soils.

Needs manual labour from sowing to harvesting.

India is the second largest producer of sugarcane only after Brazil.

Sugarcane is the main source of Sugar, Gur (Jaggery), Khansari and molasses.

The major sugarcane-producing states are Uttar Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Bihar, Punjab and Haryana.

##### Oil Seeds

Different oil seeds are grown covering approximately 12% of the total cropped area of India. Main oil-seeds produced in India are:

*Groundnut*: is a Kharif crop and accounts for half of the major oilseeds produced in India.

Gujarat is the largest producer of groundnuts.

*Mustard*: is a rabi crop.

*Sesamum (til)*: is a Kharif crop in the north and rabi crop in south India.

*Castor seeds*: It is grown as both Rabi and Kharif crop.

*Linseed*: is a rabi crop.

##### Coconut

##### Soyabean

##### Cotton seeds

##### Sunflower

##### Tea

It is also an important beverage crop introduced by the British in India.

The tea plant grows well in tropical and sub-tropical climates with deep and fertile well-drained soil, rich in humus and organic matter.

Tea bushes require warm and moist frost-free climate all through the year.

Tea is a labour-intensive industry.

Major tea producing states are Assam, hills of Darjeeling and Jalpaiguri districts, West Bengal, Tamil Nadu and Kerala.

Rubber	Fibre	Cotton	Jute
It is an equatorial crop.	Cotton, Jute, Hemp and Natural Silk are the four major fibre crops.	It is a Kharif crop.	It is known as the golden fibre.
It requires a moist and humid climate with rainfall of more than 200cm and temperature above 25°C.	Cotton, Jute and Hemp are grown in the soil.	It requires high temperature, light rainfall, 210 frost-free days and bright sunshine for its growth.	It grows well on well-drained fertile soils in the flood plains. High temperature is required for its growth.
It is an important industrial raw material	Natural Silk is obtained from cocoons of the silkworms fed on green leaves	Cotton grows well in black cotton soil of the Deccan plateau.	It is used in making gunny bags, mats, ropes, yarn, carpets and other artefacts.
Mainly grown in Kerala, Tamil Nadu, Karnataka and Andaman and Nicobar islands and Garo hills of Meghalaya.	Rearing of silkworms for the production of silk fibre is known as Sericulture.	Major cotton-producing states are Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Punjab, Haryana and Uttar Pradesh.	Major jute producing states are West Bengal, Bihar, Assam, Odisha and Meghalaya.

#### Coffee

Yemen coffee is produced in India and this variety of coffee is in great demand all over the world. Its cultivation was introduced on the Baba Budan Hills and is confined to the Nilgiri in Karnataka, Kerala and Tamil Nadu.

#### Horticulture Crops

India is a producer of tropical as well as temperate fruits. Major crops produced are pea, cauliflower, onion, cabbage, tomato, brinjal and potato. Some of the famous horticulture crops grown in India are:

Mangoes of Maharashtra, Andhra Pradesh, Telangana, Uttar Pradesh and West

Bengal Oranges of Nagpur and Cherrapunjee (Meghalaya), bananas of Kerala, Mizoram, Maharashtra and Tamil Nadu.

Lichi and Guava of Uttar Pradesh and Bihar

Pineapples of Meghalaya

Grapes of Andhra Pradesh, Telangana and Maharashtra

Apples, pears, apricots and walnuts of Jammu and Kashmir and Himachal Pradesh.

**Non-Food Crops:** The 3 important Non-food crops of India are Rubber, Jute, and Cotton.

#### **Technological and Institutional Reforms**

Agriculture provides a livelihood for more than 60% of its population, so this sector needs some serious technical and institutional reforms. The Green Revolution and the White Revolution were some of the reforms initiated by people to improve agriculture.

Some Initiatives taken by the Government are:

Schemes introduced by Government such as Kissan Credit Card (KCC), Personal Accident Insurance Scheme (PAIS).

Special weather bulletins and agricultural programmes for farmers on the radio and television were introduced.

The government also announces minimum support price, remunerative and procurement prices for important crops to check the exploitation of farmers by speculators and middlemen.

#### **Contribution of Agriculture to the National Economy, Employment and Output**

In 2010-11 about 52% of the total workforce was employed by the farm sector.

The share of agriculture in the GDP is declining.

Indian Council of Agricultural Research (ICAR), agricultural universities, veterinary services and animal breeding centres, horticulture development, research and development in the field of meteorology and weather forecast, etc. are a few of the initiatives introduced by the government to improve Indian agriculture.

[CLICKHERE](#)

## Chapter 5- MINERALS AND ENERGY RESOURCES

### KEY WORDS

#### What is Mineral

Mineral is defined as a –homogenous, naturally occurring substance with a definable internal structure. Minerals are found in varied forms in nature, ranging from the hardest diamond to the softest talc. Rocks are combinations of homogeneous substances called minerals.

#### Mode of Occurrence of Minerals

Minerals are usually found in —ores. The term ore is used to describe an accumulation of any mineral mixed with other elements. Minerals generally occur in the following forms: In igneous and metamorphic rocks, minerals may occur in the cracks, crevices, faults or joints.

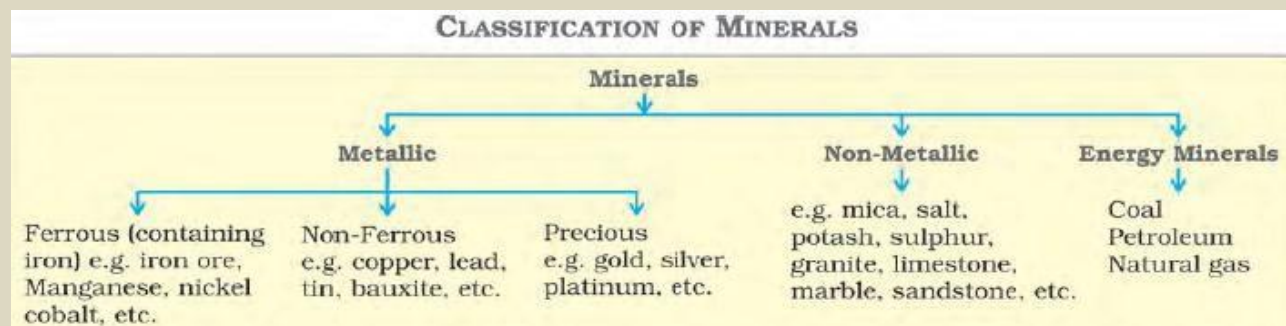
In sedimentary rocks, a number of minerals occur in beds or layers.

The decomposition of surface rocks and the removal of soluble constituents also forms the minerals.

Minerals also occur as alluvial deposits in sands of valley floors and the base of hills.

The ocean waters contain vast quantities of minerals.

#### Classification of Minerals



#### Ferrous Minerals

Ferrous minerals account for about three-fourths of the total value of the production of metallic minerals.

#### Iron Ore

India is endowed with fairly abundant resources of iron ore.

**Magnetite** is the finest iron ore with a very high content of iron, up to 70%. It has excellent magnetic qualities.

**Hematite** ore is the most important industrial iron ore. It contains 50 to 60% iron.

The major iron ore belts in India are:

Odisha-Jharkhand belt

Durg-Bastar-Chandrapur belt

Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt

Maharashtra-Goa belt

#### Manganese

It is mainly used in the manufacturing of **steel and ferro-manganese** alloy.

Nearly 10 kg of manganese is required to manufacture 1 tonne of steel.

It is also used in manufacturing bleaching powder, insecticides and paints.

#### Non-Ferrous Minerals

Non-ferrous minerals include copper, bauxite, lead, zinc and gold. These minerals play a vital role in a number of metallurgical, engineering and electrical industries.

## **Copper**

Malleable, ductile and good conductor of heat and electricity.

Mainly used in electrical cables, electronics and chemical industries.

The Balaghat mines in Madhya Pradesh, Khetri mines in Rajasthan and Singhbhum district of Jharkhand are leading producers of copper.

## **Bauxite**

Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates.

Aluminium is obtained from bauxite. Aluminium has good conductivity and great malleability.

Deposits are mainly found in the Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katni.

## **Non-Metallic Minerals**

**Mica** is a mineral made up of a series of plates or leaves. It can be clear, black, green, red, yellow or brown.

Mica is the most indispensable minerals used in electric and electronic industries.

It has excellent di-electric strength, low power loss factor, insulating properties and resistance to high voltage.

Mica deposits are found in the northern edge of the Chota Nagpur plateau.

## **Rock Minerals**

Limestone is found in rocks composed of calcium carbonates or calcium and magnesium carbonates.

It is the basic raw material for the cement industry and essential for smelting iron ore in the blast furnace.

## **Conservation of Minerals**

Minerals are a non-renewable resource. It takes thousands of years for the formation and concentration of minerals. Continued extraction of ores leads to the depletion of minerals. So, it's important to take the necessary steps so that mineral resources can be used in a planned and sustainable manner.

## **Energy Resources**

Energy resources can be classified as

**Conventional Sources:** It includes firewood, cattle dung cake, coal, petroleum, natural gas and electricity.

**Non-Conventional Sources:** It includes solar, wind, tidal, geothermal, biogas and atomic energy

Let us discuss each of them in detail.

## **Conventional Sources of Energy**

### **Coal:**

It is the most abundantly available fossil fuel. It is used for power generation, to supply energy to the industry as well as for domestic needs.

**Lignite** is a low grade brown coal, which is soft with high moisture content.

Coal that has been buried deep and subjected to increased temperatures is **bituminous coal**.

**Anthracite** is the highest quality of hard coal.

Jharia, Raniganj, Bokaro are important coalfields.

### **Petroleum**

It provides fuel for heat and lighting, lubricants for machinery and raw materials for a number of manufacturing industries.

Petroleum refineries act as a nodal industry for synthetic textile, fertiliser and numerous chemical industries.

Mumbai High, Gujarat and Assam are major petroleum production areas in India.

### **Natural Gas**

Natural gas is an important clean energy resource. It is considered an environment-friendly fuel. The power and fertilizer industries are the key users of natural gas.

Compressed Natural Gas (CNG) is used in vehicles to replace liquid fuels.

Large reserves of natural gas have been discovered in the Krishna-Godavari basin

### **Electricity**

Electricity is generated mainly in 2 ways:

By running water which drives hydro turbines to generate **Hydro Electricity**. It is a renewable resource of energy. India has a number of multi-purpose projects like the Bhakra Nangal, Damodar Valley Corporation, the Kopili Hydel Project.

By burning other fuels such as coal, petroleum and natural gas to drive turbines to produce **Thermal Power**. It uses non-renewable fossil fuels for generating electricity.

### **Non-Conventional Sources of Energy**

The renewable energy sources like solar energy, wind, tide, biomass and energy from waste material are called **Non-Conventional Energy Sources**. Let's discuss them one by one.

#### **Nuclear or Atomic Energy**

Nuclear Energy is obtained by altering the structure of atoms. Uranium and Thorium are used for generating atomic or nuclear power.

#### **Solar Energy**

Solar energy is produced by the Sun's light. Photovoltaic technology converts sunlight directly into electricity.

#### **Wind Power**

Wind Energy or Power is the use of wind to generate electricity. Wind turbines are used for this purpose. The largest wind farm cluster is located in Tamil Nadu from Nagarcoil to Madurai.

#### **Biogas**

Biogas is a type of biofuel that is naturally produced from the decomposition of organic waste. Biogas is the most efficient use of cattle dung. It improves the quality of manure.

#### **Tidal Energy**

Tidal energy is the form of hydropower that converts the energy obtained from tides into useful forms of power, mainly electricity. In India, the Gulf of Khambhat, the Gulf of Kachchh in Gujarat on the western coast and Gangetic delta in Sunderban regions of West Bengal provide ideal conditions for utilising tidal energy.

#### **Geo-Thermal Energy**

When heat and electricity are produced by using the heat from the interior of the earth, it is known as Geo-Thermal Energy. In India, geothermal energy is harnessed from Parvati valley near Manikarn in Himachal Pradesh and from Puga Valley, Ladakh.

### **Conservation of Energy Resources**

Every sector of the national economy – agriculture, industry, transport, commercial and domestic – needs inputs of energy. There is an urgent need to develop a sustainable path for energy development. Here are some ways that each one of us can contribute to save energy resources:

Using public transport systems instead of individual vehicles. Switching off electricity when not in use. Using power-saving devices.

Using non-conventional sources of energy.

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## Chapter 6- MANUFACTURING INDUSTRIES

Production of goods in large quantities after processing from raw materials is called manufacturing. Workers employed in steel factories, car, breweries, textile industries, bakeries etc. fall into secondary activities.

Importance of Manufacturing.

The manufacturing sector is considered the backbone of development due to the following reasons:

Manufacturing industries help in modernising agriculture as it provides jobs in secondary and tertiary sectors.

It helps in the eradication of unemployment and poverty.

Export of manufactured goods expands trade and commerce, and brings in much needed foreign exchange.

It helps in prospering the country by giving a boost to the economy.

Contribution of Industry to National Economy

The trend of growth rate in manufacturing over the last decade has been around 7 per cent per annum.

### Industrial Location

Industrial locations are influenced by the availability of:

Raw material

Labour

Capital

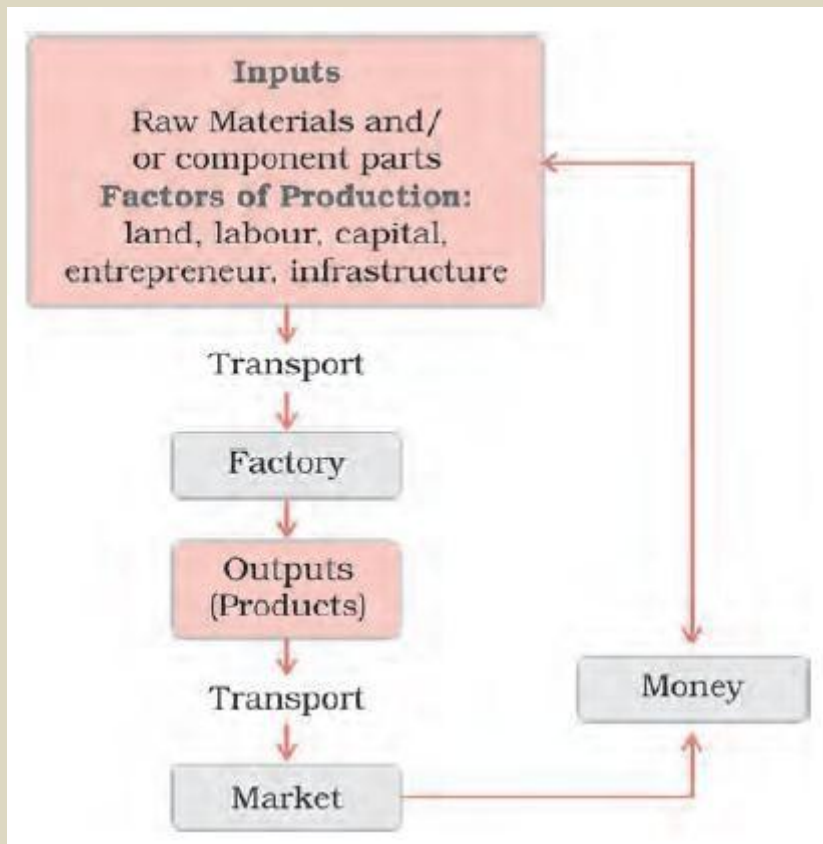
Power

Transport

Market

Government policies

Manufacturing activity tends to locate at the most appropriate place where all the factors of industrial location are either available or can be arranged at a lower cost. The figure below shows the industry market linkage.



### Agro-based Industries

Cotton, jute, silk, woollen textiles, sugar and edible oil, etc. industries are based on agricultural raw materials. Let's know about each of them, one by one.

#### Textile Industry

It is the only industry in India, which is self-reliant and complete in the value chain i.e., from raw material to the highest value added products. It contributes to industrial production, employment generation and foreign exchange earnings.

#### Cotton Textiles

This industry has close links with agriculture and provides a living to farmers, cotton boll pluckers and workers engaged in ginning, spinning, weaving, dyeing, designing, packaging, tailoring and sewing. It supports many other industries, such as, chemicals and dyes, packaging materials and engineering works.

#### Jute Textiles

India is the largest producer of raw jute and jute goods. Most of the mills are located in West Bengal, mainly along the banks of the Hugli river.

#### Sugar Industry

India stands second as a world producer of sugar but occupies the first place in the production of Gur and Khandsari. This industry is seasonal in nature.

### Mineral-based Industries

Industries that use minerals and metals as raw materials are called **mineral-based industries**. Let's discuss some industries that fall under this category.

#### Iron and Steel Industry

Iron and steel is the basic industry as all the other industries – heavy, medium and light, depend on it for their machinery. It is considered as a *heavy industry* because all the raw



materials, as well as finished goods, are heavy and bulky entailing heavy transportation costs.

India is an important iron and steel producing country in the world yet, we are not able to perform to our full potential largely due to:

High costs and limited availability of coking coal

Lower productivity of labour

Irregular supply of energy

Poor infrastructure.

### **Aluminium Smelting**

Aluminium Smelting is the second most important metallurgical industry in India. It is used to manufacture aircraft, utensils and wires. Bauxite is the raw material used in the smelters. Aluminium Smelting has gained popularity as a substitute for steel, copper, zinc and lead in a number of industries. It exhibits the following properties:

Light in weight

Resistant to corrosion

A good conductor of heat

Malleable

Becomes strong when it is mixed with other metals

### **Chemical Industries**

The Chemical industry comprises both large and small scale manufacturing units. Rapid growth has been recorded in both inorganic and organic sectors.

*Inorganic chemicals* include sulphuric acid nitric acid, alkalies, soda ash and caustic soda.

*Organic chemicals* include petrochemicals, which are used for manufacturing synthetic fibers, synthetic rubber, plastics, dye-stuffs, drugs and pharmaceuticals.

### **Fertilizer Industry**

The fertilizer industries are centred around the production of nitrogenous fertilizers (mainly urea), phosphatic fertilizers and ammonium phosphate (DAP) and complex fertilizers which have a combination of nitrogen (N), phosphate (P), and potash (K). Gujarat, Tamil Nadu, Uttar Pradesh, Punjab and Kerala contribute towards half of the fertilizer production.

### **Cement Industry**

Cement is essential for construction activity such as building houses, factories, bridges, roads, airports, dams and for other commercial establishments. This industry requires bulky and heavy raw materials like limestone, silica and gypsum.

### **Automobile Industry**

This industry deals with the manufacturing of trucks, buses, cars, motorcycles, scooters, three-wheelers and multi-utility vehicles. These industries are located around Delhi, Gurugram, Mumbai, Pune, Chennai, Kolkata, Lucknow, Indore, Hyderabad, Jamshedpur and Bengaluru.

### **Information Technology and Electronics Industry**

The electronics industry covers a wide range of products from transistor sets to television, telephones, cellular telecom, telephone exchange, radars, computers and many other equipment required by the telecommunication industry. This industry has generated employment in India. Bengaluru is known as the electronic capital of India.

## **Industrial Pollution and Environmental Degradation**

Industries are responsible for 4 types of pollution:

Air

Water

Land

Noise

**Air pollution** is caused by the presence of a high proportion of undesirable gases, such as sulphur dioxide and carbon monoxide. Smoke is emitted by chemical and paper factories, brick kilns, refineries and smelting plants, and burning of fossil fuels leads to air pollution. It adversely affects human health, animals, plants, buildings and the atmosphere as a whole.

**Water pollution** is caused by organic and inorganic industrial wastes and effluents discharged into rivers. The industries which are mainly responsible for water pollution are paper, pulp, chemical, textile and dyeing, petroleum refineries, tanneries and electroplating industries.

**Thermal pollution** of water occurs when hot water from factories and thermal plants is drained into rivers and ponds before cooling.

**Noise pollution** is the propagation of noise with harmful impact on the activity of human or animal life. It results in irritation, anger, cause hearing impairment, increased heart rate and blood pressure.

### **Control of Environmental Degradation**

Here are some ways through which industrial pollution can be reduced:

Minimising the use of water by reusing and recycling it.

Harvesting rainwater to meet water requirements.

Treating hot water and effluents before releasing them in rivers and ponds.

Particulate matter in the air can be reduced by fitting smoke stacks to factories with electrostatic precipitators, fabric filters, scrubbers and inertial separators.

Smoke can be reduced by using oil or gas instead of coal in factories.

Machinery can be redesigned to increase energy efficiency and reduce noise.

[CLICKHERE](#)

## Chapter 7- **LIFE LINES OF NATIONAL ECONOMY**

### **Transport**

Movement of goods and services can be over three important domains of our earth i.e. land, water and air. Based on these, transport can also be classified into the land, water and air transport. Let's discuss them in detail:

#### **Roadways**

India has one of the largest road networks in the world, aggregating to about 54.7 lakh km.

The growing importance of road transport over rail transport is mentioned below:

1. The construction cost of roads is much lower than that of railway lines.
2. Roads can cover more geographically harder locations that cannot be done by the railways.
3. Roads can negotiate higher gradients of slopes and can be easily built-in traverse mountains such as the Himalayas.
4. Road transport is economical.
5. It also provides door-to-door service
6. Road transport provides links between railway stations, air and seaports.

In India, roads are classified in the following six classes according to their capacity.

#### **Golden Quadrilateral Super Highways**

Golden Quadrilateral is a network of Highways connecting India's four top metropolitan cities, namely Delhi, Kolkata, Chennai, Mumbai. These highway projects are being implemented by the National Highway Authority of India (NHAI).

#### **National Highways**

The National highways are a network of trunk roads that are laid and maintained by the Central Public Works Department (CPWD). The historical Sher-Shah Suri Marg is called **National Highway No.1**, between Delhi and Amritsar.

#### **State Highways**

Roads linking a state capital with different district headquarters are known as State Highways. These roads are constructed and maintained by the State Public Works Department (PWD).

### **District Roads**

These roads connect the district headquarters with other places of the district. These roads are maintained by the Zila Parishad.

### **Other Roads**

Rural roads, which link rural areas and villages with towns, are classified under this category.

These roads received special impetus under the Pradhan Mantri Grameen Sadak Yojana.

### **Border Roads**

Border Roads Organisation constructs and maintains roads in the bordering areas of the country. This organisation was established in 1960 for the development of the roads of strategic importance in the northern and north-eastern border areas.

Roads can also be classified on the basis of the type of material used for their construction such as:

- Metalled roads may be made of cement, concrete or even bitumen of coal. These are all-weather roads.
- Unmetalled roads go out of use in the rainy season.

### **Railways**

Railways are the principal mode of transportation for carrying huge loads and bulky goods for long and short distances in India. Railways have become more important in India's economy.

There are three types of railway gauges are there,

They are :-

1. Broad gauge,
2. Meter gauge and

3. Narrow gauges.

However, rail transport suffers from certain problems as well, which are mentioned below:

1. Construction of bridges is required across rivers' wide beds for lying down the railway lines.
2. In the hilly terrains of the peninsular region, railway tracks are laid through low hills, gaps or tunnels.
3. The Himalayan mountainous regions are also un-favourable for the construction of railway lines due to the highest elevation points in the surface, sparse population and lack of economic opportunities.
4. It is difficult to lay railway lines on sandy plains.

### **Pipelines**

Pipeline network uses pipes, usually underground, to transport and distribute fluids. These are used to transport water, crude oil, petroleum products and natural gas, fertilizer factories and big thermal power plants. Solids can also be transported through a pipeline when converted into slurry.

There are 3 important networks of pipeline transportation in the country.

1. From oil field in upper Assam to Kanpur (Uttar Pradesh)
2. From Salaya in Gujarat to Jalandhar in Punjab
3. From Hazira in Gujarat to Jagdishpur in Uttar Pradesh

### **Waterways**

Waterways are the cheapest means of transport. They are most suitable for carrying heavy and bulky goods. It is a fuel-efficient and environment-friendly mode of transport.

The National Waterways in India are:

- N.W. No.1 – The Ganga river between Allahabad and Haldia (1620 km).
- N.W. No.2 – The Brahmaputra river between Sadiya and Dhubri (891 km).

- N.W. No.3 – The West-Coast Canal in Kerala (Kottapurma-Kollam, Udyogamandal and Champakkara canals-205 km).
- N.W. No.4 – Specified stretches of Godavari and Krishna rivers along with Kakinada Puducherry stretch of canals (1078 km).
- N.W. No.5 – Specified stretches of river Brahmani along with Matai river, delta channels of Mahanadi and Brahmani rivers and East Coast Canal (588 km).

Inland waterways in India are Mandavi, Zuari and Cumberjua, Sunderbans, Barak and backwaters of Kerala through which transportation takes place.

### **Major Sea Ports**

India's trade with foreign countries is carried from the ports. There are 2 major and 200 notified non-majors (minor/intermediate) ports in India.

Here is the list of major ports in India:

1. Kandla in Kachchh was the first port to be developed after independence. It is also known as the Deendayal Port.
2. Mumbai is the biggest port with a spacious natural and well-sheltered harbour.
3. Marmagao port (Goa) is the premier iron ore exporting port of India.
4. Mangalore port, located in Karnataka caters to the export of iron ore.
5. Kochchi is the extreme south-western port, located at the entrance of a lagoon.
6. Tuticorin port is situated at the extreme south-east.
7. Chennai is one of the oldest artificial ports of India.
8. Visakhapatnam is the deepest landlocked and well-protected port
9. Paradeep port located in Odisha, specialises in the export of iron ore.
10. Kolkata is an inland riverine port.
11. Haldia port was developed as a subsidiary port, in order to relieve growing pressure on the Kolkata port.
12. Ennore port recently commissioned in order to reduce the pressure of Chennai port.

## **Airways**

The airway is the fastest, most comfortable and prestigious mode of transport. Air travel has

made access easier to the terrain areas like high mountains, dreary deserts, dense forests and long oceans. The air transport was nationalised in 1953. Air India provides domestic and international air services.

**Pawanhans Helicopters Ltd.** provides helicopter services to Oil and Natural Gas Corporation

in its off-shore operations, to inaccessible areas and difficult terrains. But, air travel is not within the reach of the common people.

## **Communication**

The major means of communication in India are television, radio, press, films, etc.

The Indian postal network is the largest in the world. It handles parcels as well as personal written communications.

- First-class mail is airlifted between stations covering both land and air.
- Second-class mail includes book packets, registered newspapers and periodicals.

They are carried by surface mail, covering land and water transport.

India has one of the largest telecom networks in Asia. The Subscriber Trunk Dialling (STD)

facilities all over India have been made possible by integrating the development in space technology with communication technology.

- Mass communication provides entertainment and creates awareness among people about various national programmes and policies. It includes radio, television, newspapers, magazines, books and films.
- India Radio Channel (Akashwani) broadcasts a variety of programmes in national, regional and local languages.

Doordarshan, the national television channel is one of the largest terrestrial networks in the world.

India publishes a large number of newspapers in about 100 languages and dialects.

### International Trade

The exchange of goods among people, states and countries is referred to as trade. Trade between two countries is called international trade. It is considered as the economic barometer for a country. Export and import are the components of trade. The balance of trade of a country is the difference between its export and import.

When the value of export exceeds the value of imports, it is called a favourable balance of trade.

If the value of imports exceeds the value of exports, it is termed as an unfavourable balance of trade.

The commodities exported from India to other countries include gems and jewellery, chemicals and related products, agriculture and allied products, etc.

The commodities imported to India include petroleum crude and products, gems and jewellery, chemicals and related products, base metals, electronic items, machinery, agriculture and allied products.

### **Tourism as a Trade**

More than 15 million people are directly engaged in the tourism industry. Tourism in India:

Promotes national integration

Provides support to local handicrafts and cultural pursuits

Helps in the development of international understanding about Indian culture and heritage. Foreign tourists visit India for heritage tourism, eco- tourism, adventure tourism, cultural tourism, medical tourism and business tourism.

[CLICKHERE](#)



## Chapter 1- **POWER SHARING**

### • **NEED TO READ:**

- Story of Belgium
- Story of Sri Lanka
- Majoritarianism in Sri Lanka
- Accommodation in Belgium
- Why power sharing is desirable?
- Forms of power-sharing

### **STORY OF BELGIUM**

- Belgium is a small country in Europe which has a population of a little over one crore.
- The ethnic composition of this small country is very complex.
- Out of the total population of the country, 59 percent lives in the Flemish region and speaks Dutch Language. Another 40 percent people live in the Wallonia region and speak French. Remaining one percent of the Belgians speak German.
- In Belgium's capital, Brussels, 80 percent people speak French while 20 percent are Dutch speaking.
- The minority French-speaking community was relatively rich and powerful.  
→ This made Dutch-speaking community angry as they the benefit of economic development and education much later.
- During the 1950s and 1960s, tensions between the Dutch-speaking and French-speaking communities created due to these differences.

### **STORY OF SRI LANKA**

- Sri Lanka is an island nation, south of India having diverse population of about two crore people.
- The major social groups are the Sinhala-speakers (74 percent) and the Tamil-speakers (18 percent).
- Tamils are divided into two groups:  
→ Sri Lankan Tamils (13 percent) - Tamil natives of the country  
→ Indian Tamils (5 percent) - came from India during colonial period as plantation workers.
- Most of the Sinhala-speaking people are Buddhists, while most of the Tamils are Hindus or Muslims.
- There are about 7 percent Christians, who are both Tamil and Sinhala.

### **MAJORITARIANISM IN SRI LANKA**

- The democratically elected government adopted a series of Majoritarian policy measures to establish Sinhala supremacy. These are:  
→ Sinhala as the only official language.  
→ The governments followed preferential policies that favoured Sinhala applicants for university positions and government jobs.
- These decisions gradually increased the feeling of alienation among the Sri Lankan Tamils.
- The Sri Lankan Tamils launched parties and struggles for the recognition of Tamil as an

official language, for regional autonomy and equality of opportunity in securing education and jobs.

- By 1980s several political organisations were formed demanding an independent Tamil Eelam (state) in northern and eastern parts of Sri Lanka.

- It soon turned into Civil War.

### Accommodation in Belgium

- Between 1970 and 1993, Belgian's constitution amended four times to work out an arrangement that would make everyone to live together.

- **The Elements of the Belgian model:**

- Constitution prescribes that the number of Dutch and French-speaking ministers shall be equal in the central government.

- Many powers of the central government have been given to state governments of the two regions of the country.

- Brussels has a separate government in which both the communities have equal representation.

- There is also provision of 'community government' elected by people belonging to one language community which has the power regarding cultural, educational and language-related issues.

### Why power sharing is desirable?

- Power sharing is good because it helps to reduce the possibility of conflict between social groups.

- Power sharing is the very spirit of democracy.

- A democratic rule involves sharing power with those affected by its exercise, and who have to live with its effects.

### Forms of power-sharing

- In modern democracies, power sharing arrangements can take many forms.

- Horizontal distribution of power: Power is shared among different organs of government, such as the legislature, executive and judiciary. Example: India.

- Federal Government (Vertical distribution of power): Power can be shared among governments at different levels – a general government for the entire country and governments at the provincial or regional level. Example: USA.

- Power may also be shared among different social groups such as the religious and linguistic groups. Example: 'Community government' in Belgium.

- Power sharing arrangements can also be seen in the way political parties, pressure groups and movements control or influence those in power.

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## **Chapter 2- FEDERALISM**

### **What is Federalism?**

Federalism is a system of government in which the power is divided between a central authority and various constituent units of the country.

### **Features of Federalism**

- There are two or more levels of government.
- Different tiers of government govern the same citizens, but each government have power independent of the other.
- The fundamental provisions of the constitution cannot be changed by one level of government.
- The judiciary prevents conflict between centre and regional government in the exercise of their powers.
- Sources of revenue for each level of government are clearly specified to ensure its financial autonomy.

### **Kinds of Federations**

- **\_Coming together\_ Federations:** The independent States coming together on their own to form a bigger unit.
- **\_Holding together\_ Federations:** A large country decides to divide its power between the constituent States and the national government.

### **What makes India a federal country?**

- The Constitution originally provided for a two-tier system of government - Central Government, representing the Union of India and the State governments.
- Later, the third tier of federalism was added in the form of Panchayats and Municipalities.

The Constitution divides powers between the Union Government and the State Governments within three lists:

- Union List includes subjects of national importance.
- State List contains subjects of State and local importance.
- Concurrent List includes subjects of common interest to both the Union Government as well as the State Governments, such as education, forest, trade unions, marriage, adoption

and succession.

- Residuary subjects: Those subjects which are not mentioned in any of the three lists or any other matter that arise with passage of time.

### **Features of Indian Federation**

- All states of India do not have equal powers.
- The Parliament cannot on its own change power sharing. These changes need the approval of both the Houses of Parliament with at least two-thirds majority.
- The judiciary oversee the implementation of constitutional provisions and procedures.

### **How is federalism practised?**

#### **Linguistic states**

In 1947, the boundaries of several old States of India were changed in order to create new States:

- On the basis of language.
- On the basis of culture.

#### **Language policy**

- Our Constitution has not made any language the national language of India.
- Hindi was identified as the official language.
- Besides Hindi, there are 21 other languages recognised as Scheduled Languages by the Constitution.
- States too have their own official languages.
- English along with Hindi used for official purposes.

#### **Centre-State relations**

- The sharing of powers between Centre and States by the constitution has also strengthened federalism in India.
- After 1990, many regional political parties rise in many States of the country which started an era of 'coalition governments' at the Centre which make it difficult for the Central Government to dismiss state governments in non-democratic manner.

### **Decentralisation in India**

- When power is taken away from Central and State governments and given to local government, it is called decentralisation.

- Before 1992, the local bodies were directly under the state governments.
  - Regular elections were not held.
  - The local bodies did not have any resources or powers of their own.
  
- After 1992, the Constitution was amended to make the third-tier of democracy more powerful and effective. The steps taken are:
  - Mandatory to hold regular elections to local government bodies.
  - Seats are reserved for the Scheduled Castes, Scheduled Tribes and Other Backward Classes.
  - At least one-third of all positions are reserved for women.
  - An independent institution called the State Election Commission has been created in each State.
  - The State governments are required to share some powers and revenue with local government bodies.

### **Rural Local Government**

- Popularly known by the name panchayati raj.
  - Gram Panchayat: It is the decision-making body for the entire village.
  - Panchayat Samiti: A few gram panchayats are grouped together to form what is usually called a panchayat samiti or block or mandal.
  - Zilla Parishad: All the panchayat samitis or mandals in a district together form the zilla parishad.

### **Urban Local Government**

- In larger urban areas, there are corporations and in smaller urban areas, there are municipal corporations

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## **Chapter 3- GENDER, RELIGION AND CASTE**

### Gender Division

- Sexual Division of Labour: A system in which all work inside the home is either done by the women of the family while men are expected to work outside to earn money.
- This belief is not based on biology but on social and expectations and stereotypes.

### Feminist movements

- Social movements that aim at establishing equality between men and women are called feminist movements.

### Women's Oppression in various ways

- Literacy Rate: The literacy rate among women is only 65.46% compared with 82.14% among men.
- Jobs: There is very low percentage of women in the high paid and high value jobs as just a few girls are encouraged to take up higher education.
- Wages: Despite the Equal Wages Act, women in all areas are paid lesser than men, be it sports, cinema, agriculture or construction works.
- Sex Ratio: Most parents prefer boy children to girl children. Female infanticide and feticide are common in our country. This has resulted in unfavourable sex ratio.
- Social Evil: Society in general and urban centres in particular, is not safe for women. Dowry harassment, physical abuse, sexual harassment are routine tales.

### **Women's political representation**

- Political representation of women in India is very low. It has never crossed 5% in any of the Vidhana Sabhas and never crossed 12% in Loka Sabha.

### Religion, Communalism and Politics

#### Religion Differences in Politics

- Human rights activists allege that people from minority religious community suffer a lot whenever there is communal violence.

#### Communalism

- Extreme and partisan attachment to one's own religion is called Communalism.

### What is Communal Politics?

- Problem in the society begins when one religion is pitted against the others.
- The problem becomes serious when demands of one religious groups is formed in opposition to other religions.
- The problem becomes very acute when the Government uses its power to fulfil the demands of only one religious group.
- This kind of using religion is politics is called Communal Politics.

### The Theory of Communal Politics

- Religion is the main basis of formation of the society.
- The followers of a religion must form one community.
- Their fundamental interests are the same.

### Why is theory of Communal Politics wrong?

- People of the same religion do not have same interest and aspirations in every context.
- Everyone has different identities in different contexts.

### Steps taken to combat communalism

- India is a secular state. There is no official religion or state religion in India.
- Everyone is free to practice, profess and property any religion.

- The constitution prohibits discrimination on grounds of religion.

### Caste and Politics

#### Caste Inequalities

- Members of the same caste group formed the social community that practiced the same or similar occupation, married within the caste group, and did not eat with members from other caste groups.

#### Why does caste system still persist?

- Most people prefer to marry within their own caste or tribe.
- Untouchability has not ended a completely.
- The caste groups that had access to education have continue to do well.

#### How Caste Influences Politics

- When parties choose candidates in elections, they keep in mind the caste the composition of the constituency.
- Political parties and candidates appealing to the caste sentiment of the people.

#### Caste alone cannot determine Indian Elections

- No parliamentary constituency in the country has a clear majority of one single caste.
- No party wins the votes of all the voters of a caste our community.
- If that caste group has many to choose from, the other caste groups have none, if they were to vote only on the basis of caste.
- The voter's attachment to his party and the party ideology can be stronger than his attachment to his caste group.

#### The Outcome of Political Expression of Caste

- It has provided space and opportunity for the disadvantaged groups to demand their share in power.
- It also has helped them to fight for social justice.
- Caste based politics is certainly not healthy in democracy.
- It can divert attention from other important issues like poverty, development and corruption.
- It can also lead to tensions, conflicts and violence.

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## Chapter 4- **POLITICAL PARTIES**

### **Why do we need Political Parties?**

#### **Meaning of Political Party**

- A political party is a group of people who come together to contest elections and hold power in the government.

#### **Functions of a Political Party**

- Parties contest elections.
- Parties put forward different policies and programmes and the voters choose from them. A party reduces a vast number of opinions into a few basic positions which it supports.
- Parties play a decisive role in making laws for a country.
- Parties form and run governments.
- Those parties that lose in the elections play the role of opposition to the parties in power.

#### **How many Parties should we have?**

- There are three types of party system a country can have.

#### **One Party System**

- Only one party is allowed to control and run the government.

#### **Two Party System**

- Power usually changes between two main parties.

#### **Multi-Party System**

- Several parties compete for power, and more than two parties have a reasonable chance of coming to power either on their own strength or in alliance with others.

#### **Election Commission**

- Every party in India has to register with the Election Commission.
- The Commission treats every party as equal to the others, but it offers special facilities to large and established parties.
- They are given a unique symbol and are called, -recognised political parties.

#### **State Parties**

- A party that secures at least six percent of the total votes in an election to the Legislative Assembly of a State and wins at least two seats is recognised as a State party.

#### **National Parties**

- A party that secures at least six percent of the total votes in Lok Sabha elections or Assembly elections in four States and wins at least four seats in the Lok Sabha is recognised as a national party.

#### **Indian National Congress (INC)**

- Popularly known as the Congress Party.
- Founded in 1885.
- Played a dominated role in Indian politics, at the national and state level for several decades after India's Independence.

#### **Bharatiya Janata Party (BJP)**



- Founded in 1980 by reviving the erstwhile Bharatiya Jana Sangh.
- Cultural nationalism (or ‘Hindutva’) is an important element in its origination of Indian nationhood and politics.
- Wants full territorial and political integration of Jammu and Kashmir with India.

### **Bahujan Samaj Party (BSP)**

- Formed in 1984 under the leadership of Kanshi Ram.
- Seeks to represent and secure power for the bahujan samaj which includes the dalits, adivasis, OBCs and religious minorities.

### **Communist Party of India - Marxist (CPI-M)**

- Founded in 1964.
- Believes in Marxism- Leninism.
- Supports socialism, secularism and democracy and opposes imperialism and communalism.

### **Communist Party of India (CPI)**

- Formed in 1925.
- Believes in Marxism-Leninism, secularism and democracy.

### **Nationalist Congress Party (NCP)**

- Formed in 1999 following a split in the Congress party.
- Accepted democracy, Gandhian secularism, equity, social justice and federalism.

### **State Parties**

- Other than these six parties, most of the major parties of the country are classified by the Election Commission as ‘State parties’.

### **Challenges to Political Parties**

- Lack of Internal Democracy
- Challenge of Dynastic Succession
- Growing Role of Money and Muscle Power
- Meaningful choice

## **How can Parties be reformed?**

### **Recent efforts and suggestions in India**

- The Constitution was amended to prevent elected MLAs and MPs from changing parties.
- New law states that if any MLA or MP changes parties, he or she will lose the seat in the legislature.
- The Supreme Court passed an order to reduce the influence of money and criminals.
- The Election Commission passed an order making it necessary for political parties to hold their organisational elections and file their income tax returns.

### **Some suggestions to reform political parties**

- A law should be made to regulate the internal affairs of political parties.
- To give a minimum number of tickets, about one-third, to women candidates
- There should be state funding of elections.
- There are two other ways in which political parties can be reformed.

VIDEO LINK(ANIMATED) :-

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## Chapter 5- OUTCOMES OF DEMOCRACY

### How do we assess democracy's outcomes?

- Democracy is a better form of government because:
  - It promotes equality among citizens.
  - It enhances the dignity of the individual.
  - It improves the quality of decision-making.
  - It provides a method to resolve conflicts.
  - It allows room to correct mistakes.

### Is the democratic government efficient?

- Non-democratic rulers do not have to bother about deliberation in assemblies or worry about majorities and public opinion.
- A democratic government will take more time to follow procedures before arriving at a decision.
  - Because it has followed procedures, its decisions may be both more acceptable to the people and more effective.

### Accountable

- A citizen who wants to know if a decision was taken through the correct procedures can find this out. This is known as transparency.

### Legitimate Government

- In democracy, governments are elected through a regular, free and fair elections.
- Laws are made following proper procedures, after much discussion with the representatives of the people.
- If people feel that government has done something which goes against the Constitution, people can challenge it in the Judiciary.

### Economic growth and development

- Between 1950 and 2000, dictatorships have slightly higher rate of economic growth.
- Economic growth depends on various factors:
  - Size of the population of a country
  - Global situation
  - Co-operation from other countries
  - Economic policies adopted by the country
- However, the difference in the rates of economic development between less developed countries with dictatorships and democracies is negligible.

### Reduction of inequality and poverty

- Democracies are based on political equality, but we find growing economic inequalities.

### Accommodation of social diversity

- Democracy helps its citizens to lead a peaceful and harmonious life by accommodating various social divisions.

### Dignity and freedom of the citizens

- Democracy promotes dignity and freedom of the individual.

### Democracy - its examination never gets over

- A democracy is always striving towards a better goal.
- People constantly demand more benefits in a democracy.

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Chapter 1- **DEVELOPMENT**



Economic development, in general, means a long term increase in the real per capita income or per capita GDP of a country. Along with per capita income, there are certain other criteria also like the education, health, social security, self-confidence, gender equality, dignity of the individual etc.

**Economic development means long-term and sustainable improvement in Real Per Capita GDP and standard of living of the people. Economic development is concerned with the improvement of quality of life of the people and their capabilities, nourishment, literacy, education, gender equality, health care facilities, housing facilities etc.**

Development or progress has many aspects. Different people have different goals to achieve. There may be some common goals for all of us. Development for one may not be development for others. People desire more income.

Only income is not sufficient to make life happy.

Security, respect, equal treatment and freedom are equally important.

People do not have a single goal. There are many goals in life.

National development is the concern of all citizens.

Different persons could have different as well as conflicting notions of a country's development.

Per capita income is the main criterion for comparison of development of nations.

Total income cannot be considered a useful measure for comparison between countries.

We use average income/per capita income or per capita GDP for comparison.

Average income (per capita income) of a nation can be obtained by dividing the total income of the nation by its population.

$$\text{PCI} = \frac{\text{National Income}}{\text{Population}}$$

Per capita GDP means Gross Domestic Product divided by population.

### DIFFERENT PEOPLE, DIFFERENT GOALS

SL. NO.	CATEGORY OF PERSONS	DEVELOPMENTAL GOALS
1	Landless Rural Labourers	More days of work, better wages , quality education, social equality etc.
2	Prosperous farmers from Punjab	High support price for their crops, Cheap labourers, enough water for crops, sending children abroad.
3	Farmers who depend on rain	Sufficient and timely rainfall, artificial irrigation.
4	A rural woman from a land owning family	Better opportunities of education and employment.
5	Urban unemployed youth	Government job and highly paid employment opportunities.
6	A boy from a rich urban family	Opportunities to study and work abroad.
7	A girl from a rich urban family	Equal freedom as brother, and decision making power. Study abroad.
8	An adivasi from Narmada valley	Survival at native places, rights to forest-products.

**Development means not only high income and more consumption but other goals or factors also. These are:**

- (i) Equal treatment in society,
- (i) Freedom
- (ii) Social Security
- (iii) Respect of others
- (iv) Working atmosphere
- (v) Opportunity to learn

Different persons could have different as well as conflicting notions of a country's development.

### **How to Compare Different Countries or States?**

While –averages are useful for comparison, they also hide disparities. It does not tell how the income is distributed among the people. Rise in average income may be due to rise in prices. There may not be real growth in output.

Average income hides disparities in the distribution of income.

As per the World Development Report (WB) 2017, countries with PCI of US\$ 12,056 and above are called –rich countries, and those with PCI of US\$955 or less are called low income countries.

India's PCI was US\$ 1820 in 2017. (Low middle income countries).

### **Other Goals:**

Besides average income, we can use other goals such as security, respect for others, equal treatment, freedom etc, to compare different regions or nations.

**TABLE 1.3- STATE P.C.I. OF SELECTED STATES**

<b>State</b>	<b>PCI for 2015-16 (in Rs.)</b>
<b>Haryana</b>	<b>1,62,034</b>
<b>Kerala</b>	<b>1,40,190</b>
<b>Bihar</b>	<b>31,454</b>

**TABLE 1.4 DEMOGRAPHIC COMPARATIVE DATA ON HARYANA, KERALA AND BIHAR**

State	Infant Mortality Rate, per Live Births (2016)	Literacy Rate in % , age 7 years and above (2011)	NAR (Per 100 persons- age 14 and 15), 2013-14
Haryana	33	82	61
Kerala	10	94	83
Bihar	38	62	43

As per Table 1.3, since PCI of Haryana is more than that of Kerala, Haryana is more developed than Kerala.

However, as per Table 1.4, Kerala has lower IMR. Higher literacy rate and higher Net Attendance Ratio compared to Haryana. Therefore, Kerala is more developed than Haryana.

Infant mortality rate is the number of children that die before the age of one year as a proportion of 1,000 live children born in that particular year.

Literacy rate means literate population of a country in the 7 and above age group.

Net attendance ratio is the total number of children of age group 6-10 attending school as a percentage of total number of children in the same age group.

#### **Public Facilities:**

Income is not a completely adequate indicator of goods and services that citizens are able to use. People require pollution-free environment, unadulterated medicines, protection from infectious diseases, security, public education etc. All these can be provided by the Government for collective use in the form of public facilities.

Kerala has low IMR because it has adequate provision of basic health and educational facilities.

Health and nutritional status of the people of those states will be high where PDS is functioning well.

$$\text{Body Mass Index} = \frac{\text{Weight (in Kg.)}}{(\text{Height in Meter})^2}$$

## **COMPARISON OF COUNTRIES BASED ON HUMAN DEVELOPMENT INDEX**

Human Development Report, **published by UNDP**, compares countries based on:-

- (i) The educational levels of the people (Gross Enrolment Ratio and Mean Years Schooling),
- (ii) Their health status (Life Expectancy, counted at birth- LE) and,
- (iii) Per capita income (PCI).

### **HUMAN DEVELOPMENT DATA OF INDIA AND ITS NEIGHBOURS (Out of 189 Countries)**

<b>Country</b>	<b>PC GNI (in PPP of US \$)- 2011</b>	<b>LE at Birth (in years)- 2017</b>	<b>MYS(People aged 25 and above)- 2017</b>	<b>HDI Rank (2018)</b>	<b>HDI Value</b>
<b>Norway</b>	<b>68,012</b>	<b>82.3</b>	<b>12.6</b>	<b>01</b>	<b>0.953</b>
<b>US</b>	<b>54,941</b>	<b>79.5</b>	<b>13.4</b>	<b>12</b>	<b>0.924</b>
<b>Sri Lanka</b>	<b>11,326</b>	<b>75.5</b>	<b>10.9</b>	<b>76</b>	<b>0.77</b>
<b>China</b>	<b>15,270</b>	<b>76.4</b>	<b>7.8</b>	<b>86</b>	<b>0.752</b>
<b>India</b>	<b>6,353</b>	<b>68.3</b>	<b>6.4</b>	<b>130</b>	<b>0.64</b>

## **SUSTAINABILITY OF DEVELOPMENT**

**“Sustainable development means the development strategy that meets the needs of the present generation without compromising the needs of the future generations.”**

**Development must be sustainable. Even though groundwater is renewable, still nearly one-third of the country is overusing it.**

Non-renewable resources are those which will get exhausted after years of use.

Its alternative and new resources are to be discovered and used.



Consequences of environmental degradation do not respect national or state boundaries. Scientists, economists, philosophers and other social scientists are working together on sustainable development.

**E-MATERIAL**

1. Video Lesson- Part 1 [CLICKHERE](#)

2. Video Lesson- Part 2 [CLICKHERE](#)

## Chapter 2- **SECTORS OF INDIAN ECONOMY**



### **Classification of Sectors based on Economic Activities :**

**1. Primary Sector : Primary activities are those activities which are producing goods by exploiting the natural resources..** It is also known as agriculture and related sector.

There are many activities that are undertaken by directly using natural resources. For example, the cultivation of rice. It takes place within a crop season.

When we produce a good by exploiting the natural resources, it is an activity of primary sector.

This is because it forms the base for all other products that we subsequently make.

Since most of the natural products we get are from agriculture, dairy, fishing, forestry, mining and quarrying.

**2. Secondary Sector : Primary sector's products are changed into others forms through ways of manufacturing. Also known as Industrial sector.**

The secondary sector covers activities in which natural products are changed into other forms through ways of manufacturing that we associate with industrial activity. For example, natural rubber is the product of the primary sector, and it is converted into tyre, slippers, door mats etc. by the industrial sector.

Secondary sector gradually becomes associated with the different kinds of industries that came up, it is called as industrial sector.

**3. Tertiary Sector : The tertiary sector produces services. Also known as service sector. Eg. Banking, trade and commerce, transport and communication, education, health services, civil administration and defence etc.**

After primary and secondary, there is a third category of activities that fall under tertiary sector and is different from the above two. These are activities that help in the development of the primary and the secondary sector.

## **GROSS DOMESTIC PRODUCT(GDP) :**

**GDP is the sum total of the money value of all final goods and services produced in the primary , secondary and tertiary sectors of an economy during a financial year.**

## **COMPARING THE THREE SECTORS:**

### **Importance of Sectoral Classification in GDP and Employment**

1. Employment is an important factor because it supports a person financially.
2. GDP depicts the contribution of different sectors in National Income
3. High economic growth is not possible with the prevailing unemployment, low per capita income and low GDP.

Therefore, the importance of Sectoral classification is high in GDP and Employment.

### **In 2019-20, the sectoral contribution to GDP is as follows:**

**Primary sector- 13%**

**Secondary Sector- 30%**

**Tertiary Sector- 57%**

The sum of production in the three sectors gives what is called Gross Domestic Product (GDP) of the country.

It is the value of all final goods and services produced within a country during a particular year.

### **Rising importance of the Tertiary Sector :**

(i) First, in any country several services such as hospitals, educational institutions, post and telegraph services etc. are required. These can be considered as basic services. In a developing country, the government has to take responsibility for the provision of these services.

(ii) Second, the development of agriculture and industry leads to the development of services such as transport, trade, storage and the like, as we have already seen.

(iii) Third, as income levels rise, certain sections of people start demanding many more services like eating out, tourism, shopping, private hospital, private school.

(iv) Fourth, over the past decade or so, certain new services such as those based on information and communication technology have become important and essential.

## **CONTRIBUTION OF PRIMARY, SECONDARY AND TERTIARY SECTORS IN PRODUCTION AND EMPLOYMENT IN INDIA:**

A remarkable fact about India is that while there has been a change in the share of the three sectors in GDP, a similar shift has not taken place in employment.

. The primary sector continues to be the largest employer even now.

More than half of the workers in the country are working in the primary sector, mainly in agriculture, producing only a quarter of the GDP.

The secondary and tertiary sectors produce three-fourth of the produce whereas they employ less than half the people.

It means that there are more people in agriculture than is necessary. So, even if you move a few people out, production will not be affected. In other words, workers in the agricultural sector are under-employed.

. The underemployment is hidden in contrast to someone who does not have a job and is clearly visible as unemployed. Hence, it is also called disguised unemployment.

. We see other people of the service sector on the street pushing a cart or selling something where they may spend the whole day but earn very little.

They are doing this work because they do not have better opportunities.

Employment- A situation in which all those who are able and willing to work at the existing wage rate, get work.

- Unemployment- A situation in which people are able and willing to work at the existing wage rate, but do not get work.
- Disguised Unemployment- A situation in which more people than the required number are employed. The contribution of the redundant labourers to output is almost zero.

### **How to Create More Employment?**

One way by which we can tackle this problem is to identify, promote and locate industries and a large number of people may be employed.

A study conducted by the Planning Commission estimates that nearly 20 lakh jobs can be created in the education sector alone.

Every state or region has the potential for increasing the income and employment for people in that area. The same study by the Planning Commission says that if tourism as a sector is improved, every year we can give additional employment to more than 5 lakh people.

We must realize that some of the suggestions discussed above would take a long time to implement.

Recognizing this, the central government in India made a law implementing the Right to Work.

### **Mahatma Gandhi National Rural Employment Guarantee Act 2005 (MGNREGA 2005).**

Under MGNREGA 2005, all those who are able to, and are in need of, work are guaranteed 100 days of employment in a year by the government.

If the government fails in its duty to provide employment, it will give unemployment allowances to the people.

#### **Sectoral Share in Employment (2019-20):**

Primary Sector- 49%

Secondary Sector- 24%

Tertiary Sector- 27%

#### **Comparative Study of Contribution to GDP and Employment Share by Three Sectors (2019-20)**

<b>Sectors↓</b>	<b>Contribution to GDP (in %)</b>	<b>Share in Employment (%)</b>
<b>Primary</b>	<b>13</b>	<b>49</b>
<b>Secondary</b>	<b>30</b>	<b>24</b>
<b>Tertiary</b>	<b>57</b>	<b>27</b>
<b>TOTAL</b>	<b>100</b>	<b>100</b>

**DIVISION OF SECTORS AS ORGANISED AND UNORGANISED:**

<b>SL.NO.</b>	<b>ORGANISED SECTOR</b>	<b>UNORGANISED SECTOR</b>
<b>1</b>	<b>Regular Employment</b>	<b>Irregular employment</b>
<b>2</b>	<b>High wages</b>	<b>Low wages</b>
<b>3</b>	<b>Good working conditions</b>	<b>Poor working conditions</b>
<b>4</b>	<b>Job security</b>	<b>No job security</b>
<b>5</b>	<b>Fixed working hours</b>	<b>Long working hours</b>
<b>6</b>	<b>Different Leave facility</b>	<b>No leave facility</b>
<b>7</b>	<b>Medical and Educational reimbursement</b>	<b>No reimbursement</b>
<b>8.</b>	<b>PF, Paid leave, LTC, safe working hours etc are available</b>	<b>No such facilities available</b>

The organized sector covers those enterprises or places of work where the terms of employment are regular and therefore, people have assured work. It is called organized because it has some formal processes and procedures. The unorganized sector is characterized by small and scattered units which are largely outside the control of the government. Jobs here are low-paid and often not regular. Employment is not secure. This sector includes a large number of people who are employed on their own doing small jobs such as selling on the street or doing repair work.

### **Organised Sector :**

- Terms of employment are regular
- Registered by government
- Follows various rules and regulations
- It has some formal processes and procedures.

### **Unorganised Sector :**

- Small and scattered units which are largely outside the control of the government.
- There are rules and regulations but these are not followed.
- Employment is not secure.

### **How to Protect Workers in the Unorganized Sector?**

The organized sector offers jobs that are the most sought-after.

It is also common to find many organized sector enterprises in the unorganized sector. Since the 1990s, it is also common to see a large number of workers losing their jobs in the organized sector.

In the rural areas, the unorganized sector mostly comprises of landless agriculture labourers, small and marginal farmers, sharecroppers and artisans.

Nearly 80% of rural households in India are in small and marginal farmer category.

In the urban areas, unorganized sector comprises mainly of workers in the small-scale industry, casual workers in the construction, trade and transport etc., and those who work as street vendors, head load workers, garment makers, rag pickers etc.

### **SECTORS IN TERMS OF OWNERSHIP: PUBLIC AND PRIVATE SECTORS:**

- **In the public sector, the Govt. owns most of the assets and provides all the services. Eg. Indian Railways. The objective here is social welfare.**
- **In the private sector, ownership of assets and delivery of services is in the hands of private individuals or companies. Activities in the private sector are guided by the motive to earn profits.**

The purpose of the public sector is not just to earn profits.

Governments raise money through taxes and other ways to meet expenses on the services rendered by it. There are several things needed by the society as a whole but which the private sector will not provide at a reasonable cost.

Collecting the money from thousands of people who use these facilities is not easy.

Even if they provide these things they would charge a high rate for their.

Thus, governments have to undertake such heavy spending and ensure that these facilities are available for everyone.

There are some of the activities, which the government has to support.

The private sector may not continue their production or business unless government ensures it.

The government has to bear part of the cost. There are a large number of activities which are the primary responsibility of the government. The government must spend on these.

Providing health and education facilities for all is one example.

The government also needs to pay attention to aspects of human development. It is also the

duty of the government to take care of the poorest and most ignored regions of the country through increased spending in such areas.

### **E-MATERIAL**

1. Video Lesson (Part 1): [CLICKHERE](#)
2. Video Lesson (Part 2): [CLICKHERE](#)
3. Video Lesson (Complete Chapter): [CLICKHERE](#)



## Chapter 3- **MONEY AND CREDIT**

**“Money is anything which is generally accepted as medium of exchange and at the same time acts as a measure and store of value”.**

**Barter system is the direct exchange of goods or services, without using money.**

Barter is a system of mutual exchange, where goods are exchanged for goods directly, without the use of money as a medium. There is the absence of Double coincidence of wants. There is the lack of a common method to store value, lack of standard for deferred payments, lack of a common unit of value and lack of transfer of value.

### **Functions of Money:**

1. Medium of Exchange
2. Measure of value.
3. Store of value.
4. Standard of deferred payments.
5. Transfer of value

A person holding money can exchange it for any commodity or service that he or she might want. Thus everyone prefers to receive payments in money and then exchange the money for things that they want. Both parties have to agree to sell and buy each other commodities. This is known as a Double coincidence of wants.

### **MODERN FORMS OF MONEY:**

#### **Currency:**

Modern forms of money include currency – paper notes and coins, and demand deposits with the banks..

Money is accepted as a medium of exchange because the currency is authorized by the government of the country.

In India, the Reserve Bank of India (which is India’s central bank) issues currency notes (Rs.2 and above) on behalf of the central government. One Rupee note and coins are issued by the Ministry of Finance, Govt. of India.

#### **Deposits with Bank:**

The other form in which people hold money is as deposits with the bank. People deposit money with the banks by the opening a bank account in their name. Banks accept the deposits and also pay an amount as interest on the deposits. People also have the provision to withdraw the money as and when they require. Since the deposits in the accounts can be withdrawn on demand, these deposits are called **demand deposits**.

It is this facility which lends it the essential characteristics of money.

For payment by cheque, the buyer who has an account with the bank, make out a cheque for a specific amount. **A cheque is a document instructing the bank to pay a specific amount from the person’s account to the person in whose name the cheque has been issued.**

The facility of cheque against demand deposits makes it possible to directly settle payments without the use of cash. Since demand deposits are accepted widely as a means of payment, along with currency, they constitute money in the modern economy.

But for the banks, there would be no demand and no payments by cheques against these deposits. The modern forms of money – currency and deposits – are closely linked to the working of the modern banking system.

### **LOAN ACTIVITIES OF BANKS:**

**A bank is an institution which accepts deposits from the public and lends loans to borrowers. Loan interest will be more than the deposit interest.**

Banks keep only a small proportion of their deposits as cash with themselves. This is kept as a provision to pay the depositors who might come to withdraw money from the bank on any given day. Since, on any particular day, only some of its many depositors come to withdraw cash, the bank is able to manage with this cash. Banks use the major portion of the deposits to extend loans.

There is a huge demand for loans for various economic activities. Banks make use of the deposits to meet the loan requirements of the people.

In this way, banks mediate between those who have surplus funds and those who are in need of these funds. Banks charge a higher interest rate on loans than what they offer on deposits. The difference between what is charged from borrowers and what is paid to depositors is their main source of income.

**Bank credit means the amount of money a person or business can borrow from a banking institution in the form of a loan.**

**Credit or Loan refers to an agreement in which the lender supplies the borrower with money, in return for the promise of future payment.**

### **TERMS OF CREDIT:**

- 1. Collateral (Security or Guarantee)**
- 2. Documentation**
- 3. Tenure**
- 4. Mode of Repayment**
- 5. Rate of Interest**

Every loan agreement specifies an interest rate which the borrower must pay to the lender along with the repayment of the principal. In addition, lenders may demand collateral against the loan. Collateral is an asset that the borrower owns and uses this as a guarantee to a lender until the loan is repaid. The interest rate, collateral and documentation requirement, and the mode of repayment together comprise what is called the terms of credit.

## **FORMAL SECTOR CREDIT IN INDIA:**

**Banks and cooperative banks constitute the formal sector sources of credit in India.**

**The informal lenders include moneylenders, traders, employers, relatives and friends, etc.**

The Reserve Bank of India supervises the functioning of formal sources of loans. For instance, we have seen that the banks maintain a minimum cash balance out of the deposits they receive. The RBI monitors the banks in actually maintaining a cash balance. Periodically, banks have to submit information to the RBI on how much they are lending, to whom, at what interest rate, etc.

There is no organization that supervises the credit activities of lenders in the informal sector. They can lend at whatever interest rate they choose. Compared to the formal lenders, most of the informal lenders charge a much higher interest on loans. Thus, the cost to the borrower of informal loans is much higher. The Higher cost of borrowing means a large part of the earnings of the borrowers is used to repay the loans. Cheap and affordable credit is crucial for the country's development.

### **Formal and Informal Credit: Who gets what?**

Banks and cooperative banks constitute the formal sector sources of credit in India.

The informal lenders include moneylenders, traders, employers, relatives and friends, etc. 85% of the loans taken by poor households in the urban areas are from informal sources. Urban households take only 10% of their loans are from informal sources, while 90% are from formal sources. The rich households are availing cheap credit from informal lender whereas the poor households have to pay a large amount of borrowing. The formal sector still meets only about half of the total credit needs of the rural people.

The remaining credit needs are met from informal sources. Thus, it is necessary that banks and cooperatives increase their lending particularly in the rural areas so that the dependence on informal sources of credit reduces. While formal sector loans need to expand, it is also necessary that everyone receives these loans. It is important that the formal credit is distributed more equality so that the poor can benefit from the cheaper loans.

### **SELF-HELP GROUPS(SHG)s**

**SHG is a holistic programme , covering all aspects of self-employment of the rural poor, and their capacity building, planning of activity clusters based on resource availability , infrastructure build up, technology, credit, and marketing. Eg. Kudumbashree in Kerala.**

#### **Features:**

- 1. 15 to 20 members
- 2. Grants small loans to members
- 3. Does not require collateral
- 4. closely monitored by all members

### **Objectives of Self Help Groups:**

- 1. To inculcate saving habits in the community.
- 2. To create sensitive forum for addressing needs of people.
- 3. To enhance capabilities of women
- 4. To access resources
- 5. To generate sense of collective action.

### **E-MATERIAL**

1. Video Lesson (Part 1): [CLICKHERE](#)

2. Video Lesson (Part 2): [CLICKHERE](#)

## **Chapter 4- GLOBALISATION AND INDIAN ECONOMY**

### **WHAT IS GLOBALISATION?**

**Globalisation means integration of our economy with the world economy.**

**It is the process of interaction and integration among people, companies, and governments at international level.**

The process of Globalisation started in India in 1991, as part of economic reforms or LPG (Liberalisation, Privatisation and Globalisation). International movement of goods, capital, and people, are the three aspects of globalisation.

### **Multi National Corporations (MNCs):**

**An MNC is a company that owns or controls production in more than one nation. Eg.** Microsoft Corporation-(USA), IBM(International Business Machines)-(USA), Sony-(Japan), Samsung-(South Korea) , Siemens-(Germany). Designing the product, production, and sale will be in different countries.

MNCs set up offices and factories for production in regions where they can get cheap labour and other resources. MNCs are not only selling its finished products globally but more important, the goods and services are produced globally. As a result, production is organized in increasingly complex ways.

### **INTERLINKING PRODUCTION ACROSS COUNTRIES:**

Different Considerations for Setting up production Units by MNCs:

1. Availability of labour at low cost,
2. Availability of other factors of production,
3. Market availability,
4. Favorable Government Policies (eg. SEZs)

In general, MNCs set up production where it is close to the markets; where there is skilled and unskilled labour available at low costs; and where the availability of other factories of production is assured. The money that is spent to buy assets such as land, building, machines and other equipment is called investment. The investment made by the MNCs is called foreign investment. The benefit to the local company of such joint production is two-fold.

(i) MNCs can provide money for additional investments, like buying new machines for faster production.

(ii) MNCs might bring with them the latest technology for production.

But the most common route for MNC investments is to buy up local companies and then to expand production.

Many of the top MNCs have wealth exceeding the entire budget of the developing country government.

We see that there are a variety of ways in which the MNCs are spreading their production and interacting with local producers in various countries across the globe.

MNCs are exerting a strong influence on production at these distant locations.

As a result, production in these widely dispersed locations is getting interlinked.

### Ways by which MNCs Set up Production in other Countries:

- 1. By Foreign Investment.
- 2. By setting up production units in collaboration with local companies.
- 3. By buying up local companies.
- 4. By placing orders for production with small producers.

### **FOREIGN TRADE AND INTEGRATION OF MARKETS:**

Foreign trade creates an opportunity for the producers to reach beyond the domestic markets i.e., markets of their own countries.. For the buyers, import of goods produced in another country is one way of expanding the choice of goods beyond what is domestically produced.

In general, with the opening of trade, goods travel from one market to another.

Foreign trade thus results in connecting the markets or integration of markets in different countries.

**Foreign investment (FDI) is the investment in one country by a company, based in another country. It is different from Foreign Portfolio Investment(FPI).**

### **FACTORIS THAT HAVE ENABLED GLOBALISATION:**

Rapid improvement in technology has been on a major factor that has stimulated the globalization process. For instances, the past 50 years have seen several improvements in transportation technology. Even more remarkable have been the development of information and communication technology.

Technologies in the areas of telecommunications, computers, and internet have been changing rapidly.

### Ways in which Countries can be Integrated:

- **1. International movement of goods and services.**
- **2. International movement of investment and technology.**
- **3. International movement of people for jobs and education.**

### **Liberalization of foreign trade and foreign investment policy:**

1. Tax on imports is an example of trade barrier. It is called a barrier because some restriction has been set up.
2. The government can use trade barriers to increase or decrease foreign trade and to decide what kind of goods and how much of each, should come into the country.
3. The Indian government, after Independence, had put barriers to foreign investment.
4. This was considered necessary to protect the producers within the country from foreign competition.
5. Barriers to foreign trade and foreign investment were removed to a large extent.
6. This meant that goods could be imported and exported easily and also foreign companies could set up factories and offices here.
7. Removing barriers or restriction set by the government is what is known as liberalization.
8. The government imposes much less restriction than before and is therefore said to be more liberal.

### **WORLD TRADE ORGANISATION:**

World Trade Organisation (1995), sets the rules of trade between member countries (164).

- To liberalise international trade.
- To reduce tariffs.
- To monitor the implementation of rules.
- HQ- Geneva

We have seen that the liberalization of foreign trade and investment in India was supported by some very powerful international organization.

These organizations say that all barriers to foreign trade and investment that are harmful. There should be no barriers.

World Trade Organization (WTO) is one such organization whose aim is to liberalize international trade.

Though WTO is supposed to allow a free trade for all, in practice, it is seen that the developed countries have unfairly retained trade barriers. On the other hand, WTO rules have forced the developing countries to remove the trade barriers.

### **Special Economic Zones (SEZs):**

**SEZs are industrial areas with world class facilities of electricity, transport, storage and educational facilities. Companies in SEZs have no need to pay taxes for five years.**

## **IMPACT OF GLOBALISATION IN INDIA:**

### **POSITIVE EFFECTS OF GLOBALISATION**

- 1. Greater choice of products before consumers.
- 2. Investment by MNCs increased in India, which resulted in growth of employment and market for raw materials .
- 3. Several of top Indian companies got benefitted, by improving their technology and production standards.

In the last twenty years, globalization of the Indian economy has come a long way. Globalization and greater competition among producers – both local and foreign producers – has been of advantage to consumers, particularly the well-off sections in the urban areas. As a result, these people today, enjoy much higher standards of living than was possible earlier. MNCs have increased their investments in India over the past 20 years, which means investing in India has been beneficial for them..

Moreover, globalization has enabled some large Indian companies to emerge as multinationals themselves!

Globalization has also created new opportunities for companies providing services, particularly those involving IT.

### **NEGATIVE EFFECTS OF GLOBALISATION**

1. Small producers have been hit hard due to international competition. Eg., toys, tyres, dairy products etc.
2. Unemployment increased among unskilled and semi-skilled labourers.
3. Job-insecurity among the employees, and long working hours, due to –flexiblel employment.
4. Economic disparities among nations and people widened.
5. Due to globalisation, the service sector got benefitted, whereas the agriculture and industrial sectors have been adversely affected.

## **How to Ensure a Fair Globalisation?**

- A fair globalisation creates opportunities for all and ensures that the benefits of globalisation are shared among all.

### **Role of Government :**

- 1. The government has to ensure that the labour laws are properly implemented and the workers are getting their rights.
- 2. The Government can support small producers to improve their performance.



- 3. The government can use trade barriers and investment barriers to protect domestic producers.
- 4. The government, by aligning with other developing countries, can negotiate at the WTO for –fairer rules
- The people also can play an important role in the struggle for fair globalisation, by massive campaigns and representations.

### **E-MATERIAL**

1. Video Lesson (Part 1): [CLICKHERE](#)

2. Video Lesson (Part 2): [CLICKHERE](#)

3. Video Lesson (Part 3): [CLICKHERE](#)

## Chapter 5- CONSUMER RIGHTS (Only for Project Work)

### The Consumer in the Marketplace:

- Rules and regulations are required for the protection of the consumers in the marketplace.
- Exploitation in the marketplace happens often.
- Markets do not work in a fair manner when producers are few and powerful whereas consumers purchase in small amounts and are scattered. This happens especially when large companies are producing these goods. These companies with huge wealth, power and reach can manipulate the market. At times, false information is passed on through the media, and other sources to attract consumers.

### Consumer Movement:

- In India, the consumer movement as a ‘social force’ originated with the necessity of protecting and promoting the interests of consumers against unethical and unfair trade practices.
- Rampant food shortages, hoarding, black marketing, adulteration of food and edible oil gave birth to the consumer movement in an organised form in the 1960s.
- Till the 1970s, consumer organisations were largely engaged in writing articles and holding exhibitions. They formed consumer groups to look into the malpractices in ration shops and overcrowding in the road passenger transport.
- More recently, India witnessed an upsurge in the number of consumer groups.

### Rights of Consumers :

Rights which are provided by law : -

- **Right to safety:** Consumers have the right to be protected against the marketing of goods and delivery of services that are hazardous to life and property. Producers need to strictly follow the required safety rules and regulations. There are many goods and services that we purchase that require special attention to safety.
- **Right to be informed:** Consumers have the right to be informed about the particulars of goods and services that they purchase. Consumers can then complain and ask for compensation or replacement if the product proves to be defective in any manner. Similarly, one can protest and complain if someone sells a good at more than the printed price on the packet. This is indicated by ‘MRP’ — maximum retail price.
- **Right to choose:** Any consumer who receives a service in whatever capacity, regardless of age, gender and nature of service, has the right to choose whether to continue to receive the service.
- **Right to be heard:** Consumers have the right to be heard in case of a grievance.

- **Right to seek redressal:** Consumers have the right to seek redressal against unfair trade practices and exploitation. If any damage is done to a consumer, he or she has the right to get compensation depending on the degree of damage.
- **Right to represent in consumer courts:** The consumer movement in India has led to the formation of various organisations locally known as consumer forums or consumer protection councils. They guide consumers on how to file cases in the consumer court. On many occasions, they also represent individual consumers in the consumer courts. These voluntary organisations also receive financial support from the government for creating awareness among people.

#### **Factors causing exploitation of Consumers :**

- Limited information
- Limited supplies
- Limited competition
- Low literacy

#### **Duties of Consumers :**

- To purchase quality marked products such as ISI, AGMARK etc.
- To ask for cash memo for the items purchased whenever possible.
- To complain for genuine grievances, consumers must know their rights and must exercise them.

#### **Demerits of Consumer Redressal Process :**

- The Consumer Redressal Process is becoming cumbersome, expensive and time consuming.
- Many a time, consumers are required to engage lawyers. These cases require time for filling and attending the court proceedings etc.
- In most purchases, cash memos are not issued hence evidence is absent.
- Most purchases in the market are small retail sales.
- The enforcement of laws that protect workers, especially in the unorganised sectors is weak.
- Rules and regulations for working of markets are often not followed.

#### **Consumer Protection Act - 1986 (COPRA)**

- To protect and promote the interest of consumers.
- Under COPRA, a three-tier quasi-judicial machinery at the district, state and national levels is set up for redressal of consumer disputes.
- The district level court deals with the cases involving claims upto Rs. 20 lakhs; The State level courts between Rs. 20 lakhs and Rs. 1 crore and the national level court deals with cases involving claims exceeding Rs. 1 crore.
- If a case is dismissed in district level court, the consumer can also appeal in state and then in national level courts. Thus, the Act has enabled us as consumers to have the right to represent in the consumer courts.

India has been observing 24 December as the National Consumers' Day. It was on this day that the Indian Parliament enacted the Consumer Protection Act in 1986. India is one of the countries that have exclusive courts for consumer redressal.

There are today more than 700 consumer groups in the country of which only about 20-25 are well organised and recognized for their work.

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Gwalior

केन्द्रीय विद्यालय संगठन  
आंचलिक शिक्षा एवं प्रशिक्षण संस्थान ग्वालियर (म.प्र.)

**Kendriya Vidyalaya Sangathan**  
**Zonal Institute of Education & Training, Gwalior (M.P.)**



**Interactive Resource Material for Class X English**

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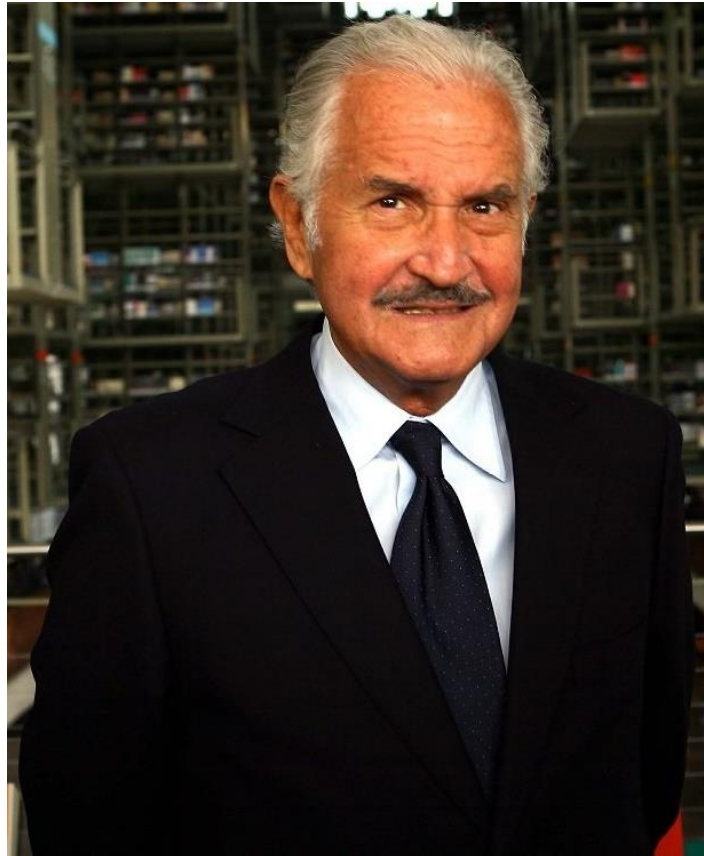
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First  
Flight  
Prose



# 1. A Letter To God

- *G L Fuentes*

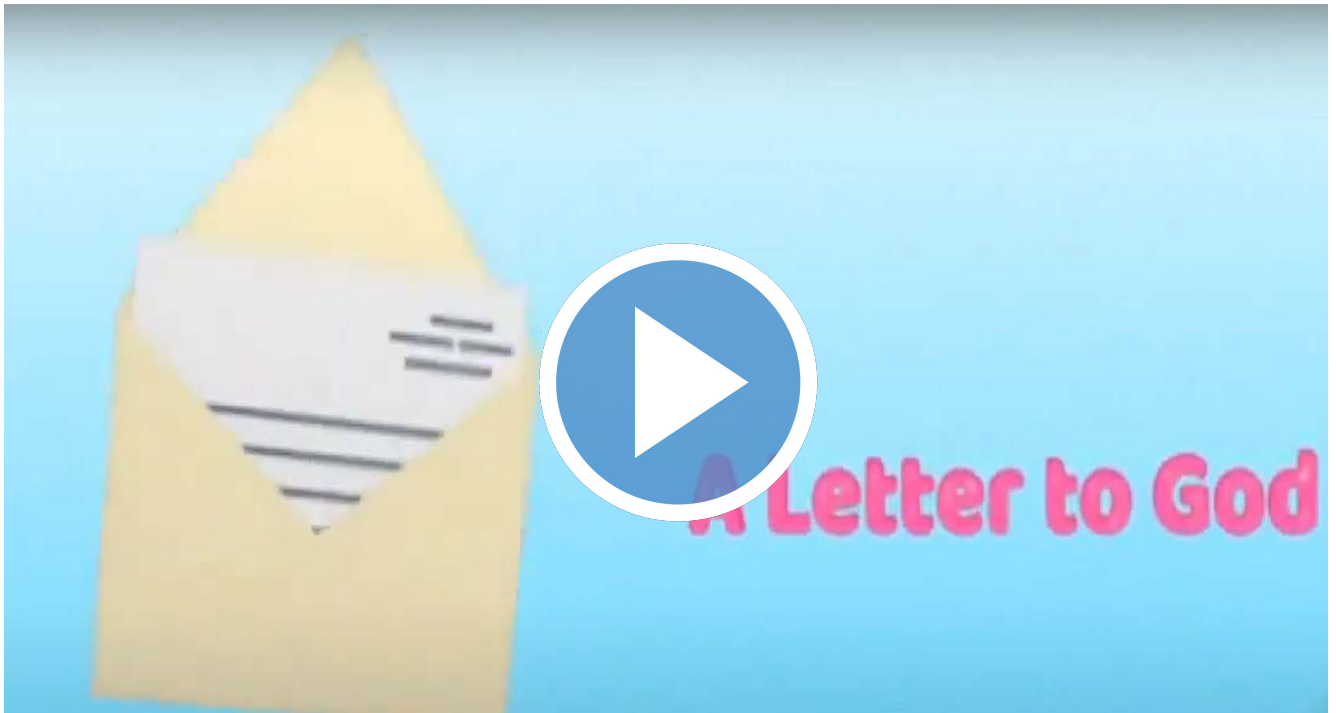


**Gregorio Lopez Fuentes (1897-2002)**

Gregorio Lopez Fuentes was born on July 11, 1897, was a Mexican novelist, poet, and journalist. He was one of the leading chroniclers of the Mexican Revolution. He came in contact with the Indians, farmers, and labourers of the region, whose lives he later described in his works. His stories were seen as exciting, humorous and symbolic of Mexico. He was awarded the National Prize of Arts and Sciences in 1935.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map



## Synopsis of the Lesson

A Letter to God is a story written by G L Fuentes talks about the poor farmer, Lencho's unshakable faith in God. He was a hardworking farmer who was expecting a good harvest. But unfortunately, his entire crop yield has been destroyed by a devastating hailstorm. He was sad, heartbroken and depressed but had a very strong faith in God. He was certain that God would help him. Though he spent his time in the farm, he knows how to write. He writes a letter to God seeking help from the Almighty. He requested God to send him one hundred pesos to harvest his field again and save his family from starvation. At the post office, he placed a stamp on the letter and dropped it into the mailbox.

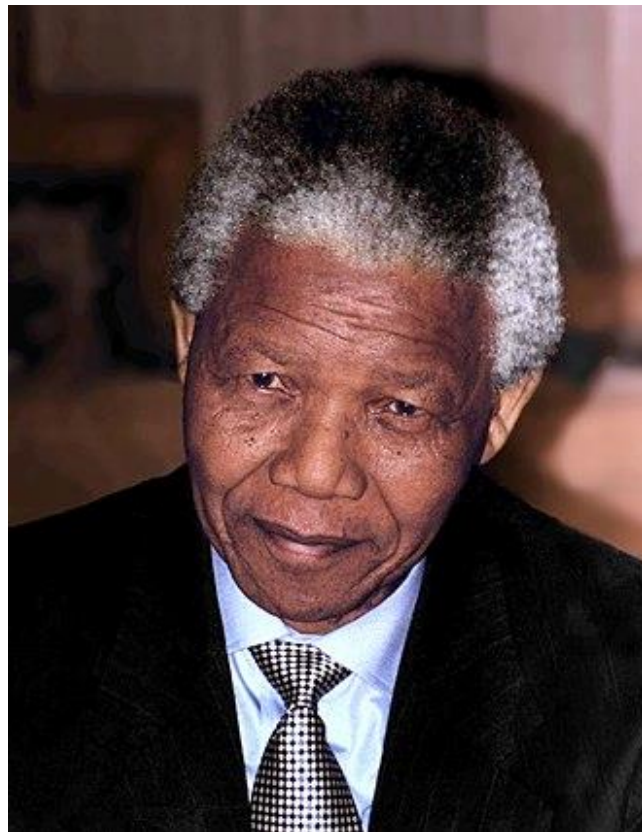
One of the employees, a postman took the letter from mailbox, went to the postmaster laughing heartily and showed him the letter to God. The postmaster, a fat, amiable fellow also broke out laughing, but almost immediately he turned serious and commented, *what faith! I wish I had the faith of the man who wrote this letter. Starting up a correspondence with God!* The postmaster moved by the faith and decided to help. He requested the employees to donate for charity and he also gave part of his salary. The money collected was little less than what Lencho asked. The entire amount was placed in an envelope and addressed to the poor farmer, as the postmaster thought the faith should not be broken.

Lencho returned to the post office the following Sunday, to check if there was a letter for him. The letter was taken out by the postmaster and handed to him politely. Lencho was not surprised at all to see the letter with money inside the envelope. He opened the envelope and counted the money. He became angry when he found only seventy pesos. He was sure that God could never make such a blunder. He immediately went to the window to ask for the paper and ink and wrote to God and dropped it into the mailbox.

The postmaster and the employees read the letter after Lencho had left. Lencho had complained to God to send him the remaining money as he had requested for but he also asked him not to send it through mail. He had mentioned that the *post office employees were a bunch of crooks*. Although Lencho's wishes get fulfilled partially, he remains ungrateful in the end.

## **2. Nelson Mandela: Long Walk to Freedom**

- *Nelson Rolihlahla Mandela*



**Nelson Rolihlahla Mandela (1918- 2013)**

Nelson Mandela was a South African anti-apartheid activist who served as the first President of South Africa from 1994 to 1999. He was the country's first black head of state and the first elected in a fully representative democratic election. His government focused on dismantling the legacy of apartheid by fostering racial reconciliation. He was born into the Thembu royal family in Mvezo, Union of South Africa, fondly refers him by his Thembu clan name, Madiba and described as the Father of the Nation.

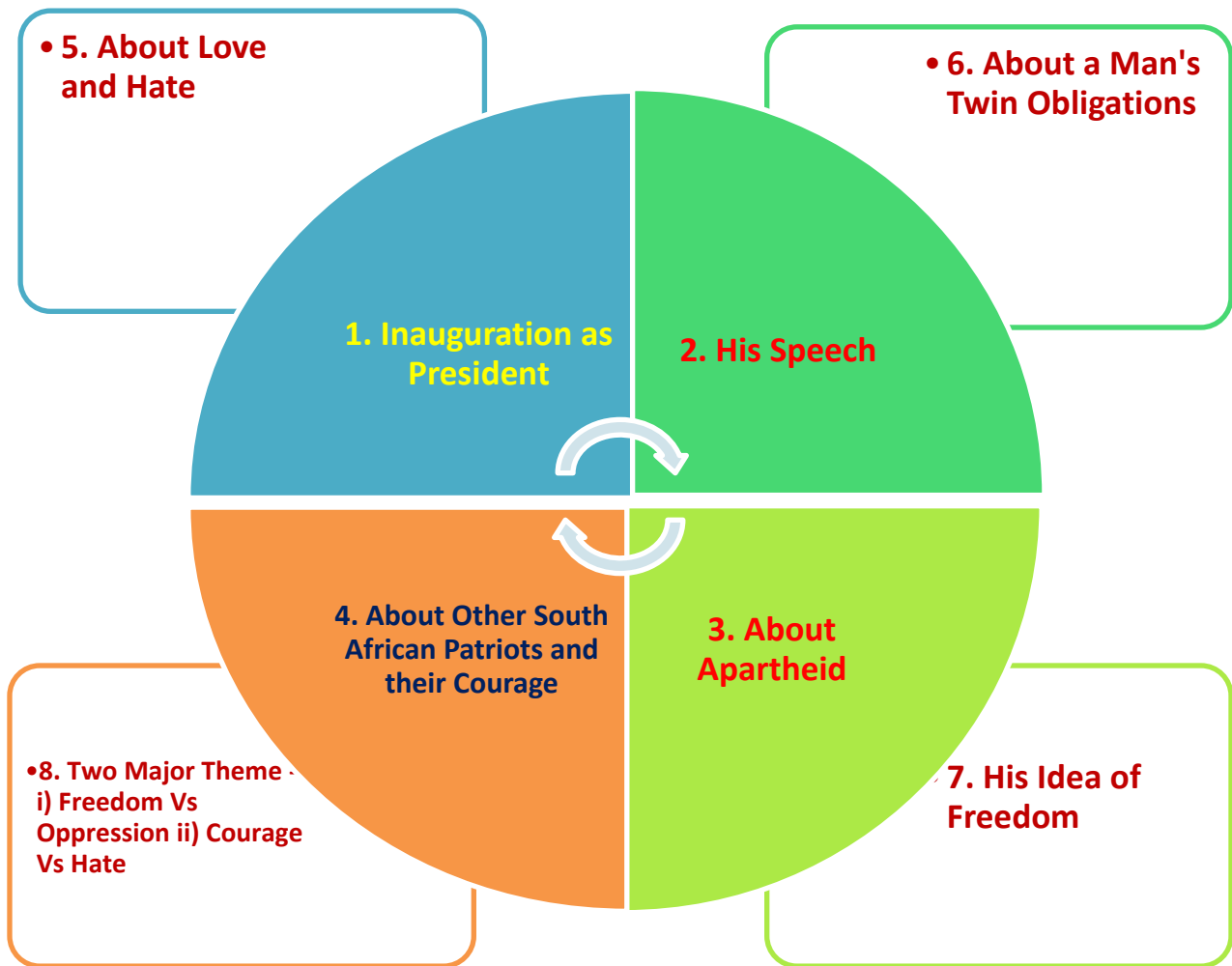
Mandela was given over 250 awards, accolades, prizes, honorary degrees and citizenships in recognition of his political achievements. Among his awards were, the Nobel Peace Prize, India's the Bharat Ratna, the US Presidential Medal of Freedom etc.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



# Mind Map



## Points in Detail (1 to 7)

- It took place on 10<sup>th</sup> May, 1994 in the Union Building in Pretoria
- It was attended by dignitaries from around the world.
- Mandela was accompanied by his daughter.

- It marked the triumph of humanity, liberty and peace over oppression.
- He brought out the irony - who was regarded as a criminal, now hosting dignitaries from all over the world.
- He pledged to fight against poverty and discrimination.
- He pledged never to let his nation be ruled by tyranny again.

- Inauguration marked the end of oppressive systems in human history – apartheid
- It is a system of racial discrimination – white-sinned dominated over the dark-skinned people of their land.
- Apartheid had caused immeasurable suffering for his people.

- Apartheid also produced courageous men and women – risked their lives to fight oppression.
- It is through their sacrifice; Mandela understood the idea of courage.
- “...courage was not the absence of fear, but the triumph over it.”
- He paid tribute to those who paved way for Africa’s freedom by calling himself the ‘sum of all African Patriots.’

- Mandela believed that no one is born hating other human beings rather they are taught to hate.
- He believed in mankind’s boundless capacity for goodness and love.

- Two obligations – one to family and one to country
- In an unequal society, a man cannot fulfill both. Every man must be free to be able to do so.
- Mandela had to put his people’s needs above those of his family’s.

- He realised that his freedom was an illusion only on reaching adulthood.
- He further realised that other members of his community too were not free.
- One cannot enjoy true freedom if one’s fellow beings are in chains.
- This realization led him to give up his own and fight for his people’s freedom.
- His idea of freedom is all inclusive.
- He believed everyone must be free, not just the oppressed, but also the oppressor who is imprisoned by hate.



## Synopsis of the Lesson

Nelson Mandela, a South African freedom fighter, unfortunately a political prisoner for thirty years for the sake of eradicating the apartheid system from the country. The African National Congress struggled and finally democratic elections were held in South Africa in 1994 and Mandela became the first black president of a new nation. *A Long Walk to Freedom*, Mandela speaks about a historic occasion, *the inauguration*.

Mandela took his oath as the president in the Union Buildings Amphitheatre in Pretoria in the presence of several prominent political personalities and world leaders across the globe. He commenced his speech by addressing all the dignitaries and assured the citizens, *never, never again will this beautiful land experience the oppression of one by another* and the government would treat people with due respect and equality.

The people of South Africa, on this historic inauguration, sang two National Anthems. The White people sang *Nkosi Sikelel –iAfrika* and the blacks, *Die Stem*, the old anthem of the Republic, which was a stark reminder of the exploitation of the blacks in South Africa. Deeply pained by the racist history, Mandela said that *the structure the created formed the basis of one of the harshest, most inhumane, societies the world has ever known*. He emphasized that people are *not born hating another person because of the colour of his skin, or his background, or his religion. People must learn to hate, and if they can learn to hate, they can be taught to love, for love comes more naturally to the human heart than its opposite*.

In life, every man has twin obligations – one to his family, to his parents, to his wife and children; and the other to his people, his community, and his country. In a civil and humane society, as per their own interests and inclinations, each man is able to fulfil these obligations. But in a country like South Africa, it was almost impossible because if they attempted to live as a human being, they were punished and isolated. When Mandela became an adult then he understood that his freedom was only an illusion. In fact, he was the slave of exploitation. He also understood that not only he was a slave but his other family members were also.

Mandela further believed that *the oppressor must be liberated just as surely as the oppressed. A man who takes away another man's freedom is a prisoner of hatred; he is locked behind the bars of prejudice and narrow-mindedness*. The profound idea is that the oppressor must be liberated just like the oppressed. According to him, Freedom is also mandatory for them who were suppressing others in the past. They also have the right to have it because snatcher of other's freedom is a prisoner of the same. Thus, the oppressor is as much a prisoner as the oppressed. The oppressor too is not free. The brave man is not the one who does not feel afraid, but he is the one who conquers that fear.

### 3. TWO STORIES ABOUT FLYING

#### (I) His First Flight

- *Liam O' Flaherty*

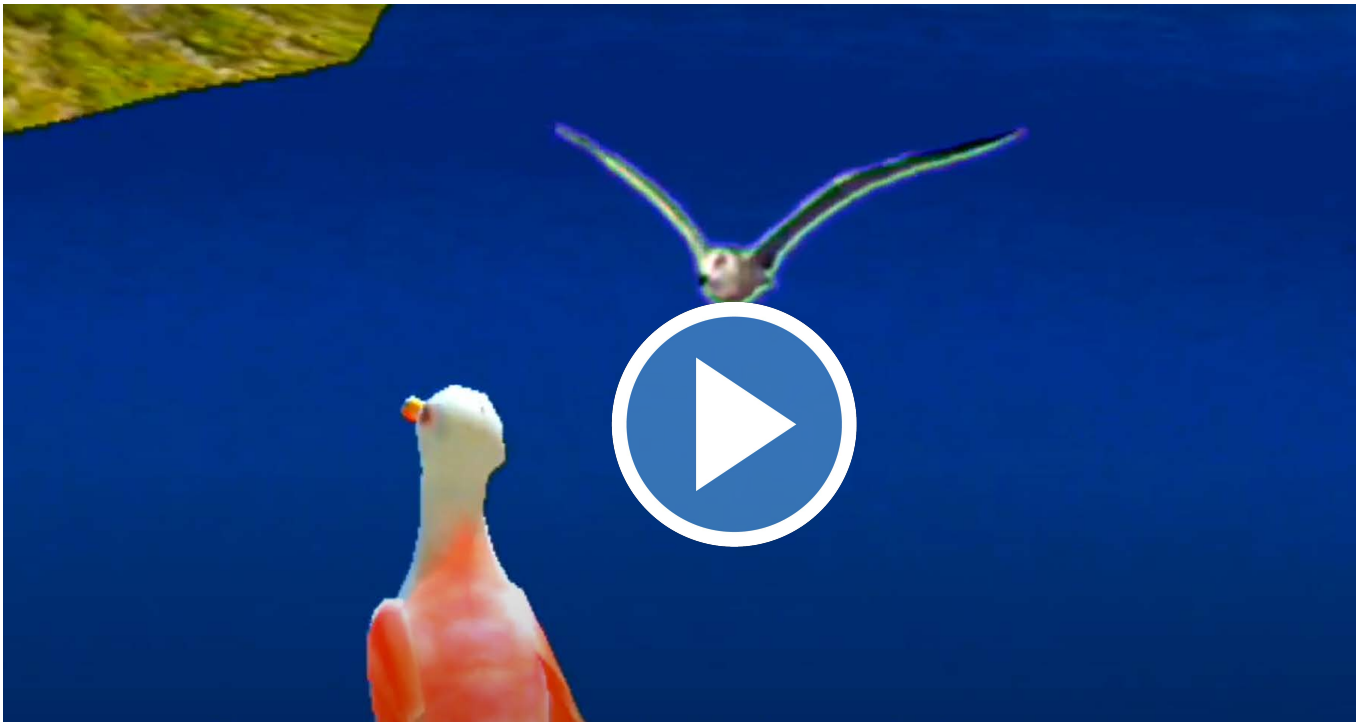


**Liam O' Flaherty (1896-1984)**

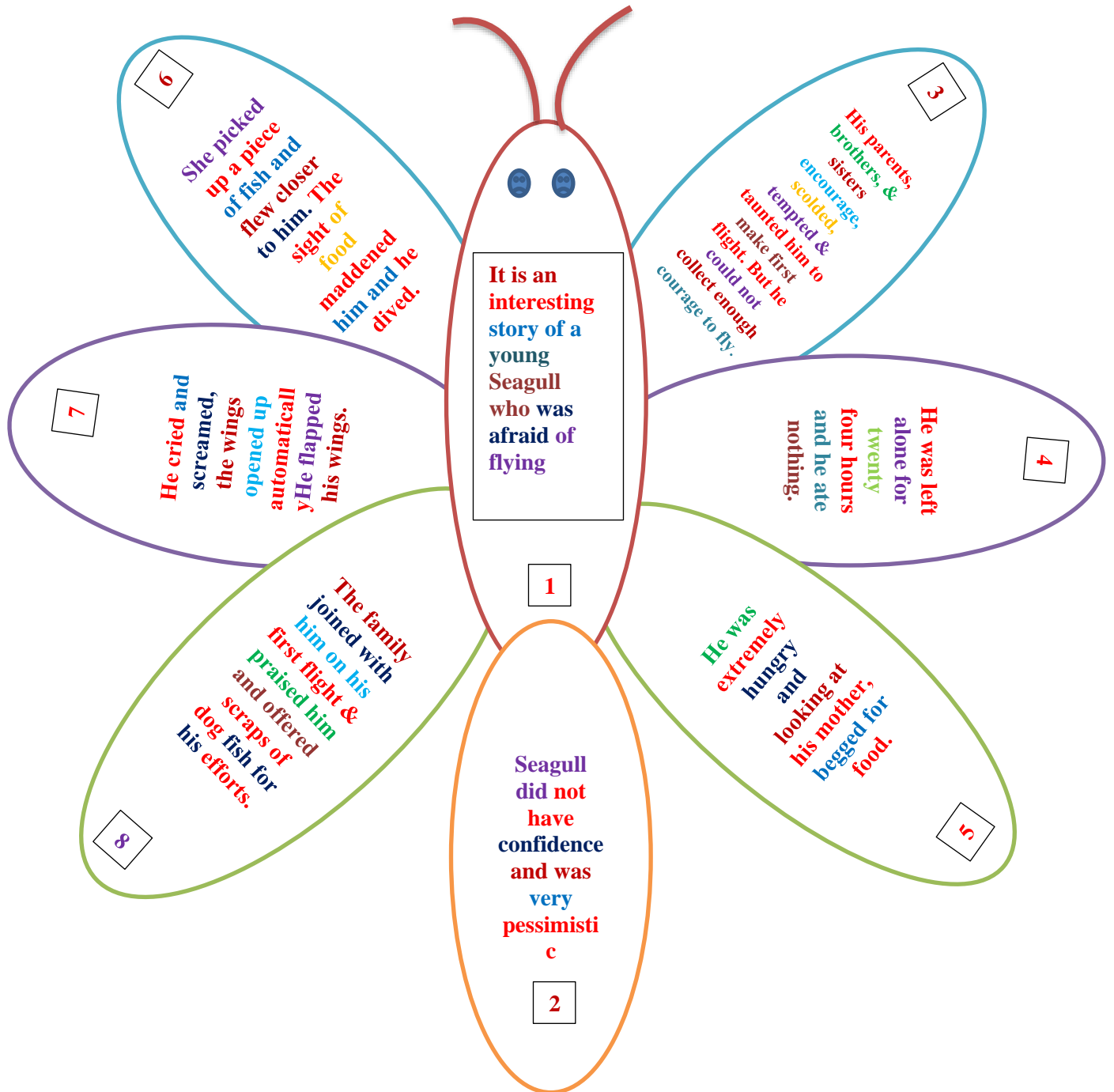
Liam O' Flaherty was an Irish novelist and short-story writer whose works combine brutal naturalism, psychological analysis, poetry, and biting satire with an abiding respect for the courage and persistence of the Irish people. He was considered to be a leading figure of the Irish Renaissance.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



# Mind Map



## Synopsis of the Lesson

This story is about the young Seagull who is afraid to fly for the first time as it did not have trust on its wings. The siblings, two brothers and sister had already learned to fly. But this young seagull did not have courage and fearful about the depth of the long stretch of the sea. The parents persuaded, scolded and even threatened him that if he did not fly, he would die of hunger but the seagull remained stable at one place and did not move.

One day, it was getting hot as the sun was rising up in the sky and he was feeling too hungry. His mother tried to tempt him with pieces of fish realizing his madness for food. She flew across to get nearer to him but the food was within the reach of his beak but could not get it. He was so hungry that he dived at the fish and felt that his wings had spread outwards and the wind rushed against his breast feather. He felt that his wings were cutting through the air. Beneath him he saw a vast green sea. He tried to stand on the sea on which his parents and siblings had already landed. Just his feet sank into the green sea but he did not sink any further. His family praised him for his first flight.

The writer gives a beautiful narration about how the bird overcomes his fear. This story tells us that the inner strength of the person is always helpful in overcoming difficult situations, through Seagull who overcame his fear.

## TWO STORIES ABOUT FLYING

### (II) **Black Aeroplane**

- *Frederick Forsyth*



### **Frederick Forsyth (1938)**

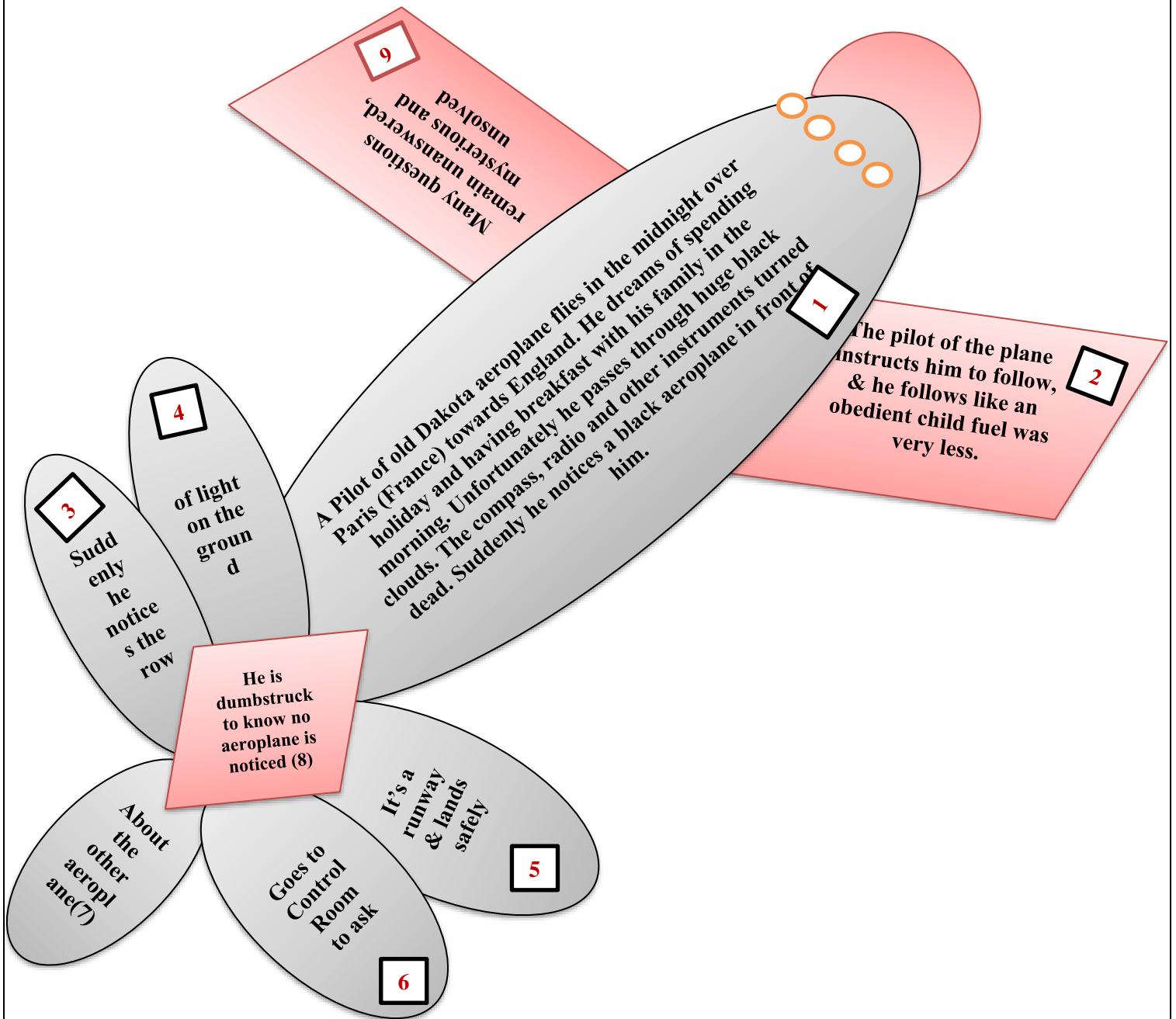
**Frederick Forsyth** is a British author of best-selling thriller novels noted for their journalistic style and their fast-paced plots based on international political affairs and personalities. The realism of his works raised speculation that he had worked for the British Intelligence agency M16. In 2015, shortly before the release of his autobiography, *The Outsider: My Life in Intrigue*, Forsyth confirmed the rumours. He claimed his association with M16 began during the Biafran war and continued for more than two decades. In 1997 he was appointed Commander of the Order of the British Empire (CBE).

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



# Mind Map





## Synopsis of the Lesson

It is an interesting account of the narrator's encounter with the pilot of a black aeroplane who comes to his rescue in distress, written by Fredrick Forsyth. It is a mystery built around the black aeroplane and its pilot. The pilot was flying an old Dakota aeroplane desires to be with his family in London next morning's breakfast, for a long vacation. The pilot was extremely happy.

The stars were shining and the sky was clear. The plane was flying over France and going back to England. Around 1:30 a.m. he called Paris Control Room. The Control Room instructed him to turn twelve degrees west. The pilot checked the map and the compass, switched over to his second and last fuel tank and turned the plane twelve degrees west towards England.

When Paris was 150 km behind, he saw the black storm clouds approaching the plane. He could not fly over them and he did not have enough fuel to fly around them south or north. First he thought of going back to Paris but his strong urge to meet his family members led him straight into the storm. It was absolutely dark inside the clouds. The plane was jumping and twisting in the air. All the instruments had stopped working. The pilot lost his contact with the ground staff.

Suddenly he saw another aeroplane quite near him. That strange black aeroplane had no lights on its wings. The pilot of the black aeroplane asked him to follow him. The pilot flew in the clouds for half an hour. He had only fuel left to fly another fifteen minutes. The pilot was frightened. Suddenly the black aeroplane descended and the pilot followed him. Finally, the black aeroplane guided him to an airport for landing. The pilot was thrilled to see the runway but when he turned his head to thank the pilot of the black aeroplane he couldn't see him anywhere.

After landing, the pilot immediately rushed to the Control Centre and enquired about the black aeroplane which guided him all the way to the airport. The woman on duty at the Control Centre told him that no other plane was seen flying that night. She had seen only his plane on the radar. The pilot was surprised to hear all this and kept on wondering who had helped him to arrive and land safely without a compass or a radio and without any more fuel left in his tank. He kept thinking about that strange black aeroplane and its mysterious pilot.

## 4. From The Diary Of Anne Frank

- *Anne Frank*



### **Anne Frank (1929-1945)**

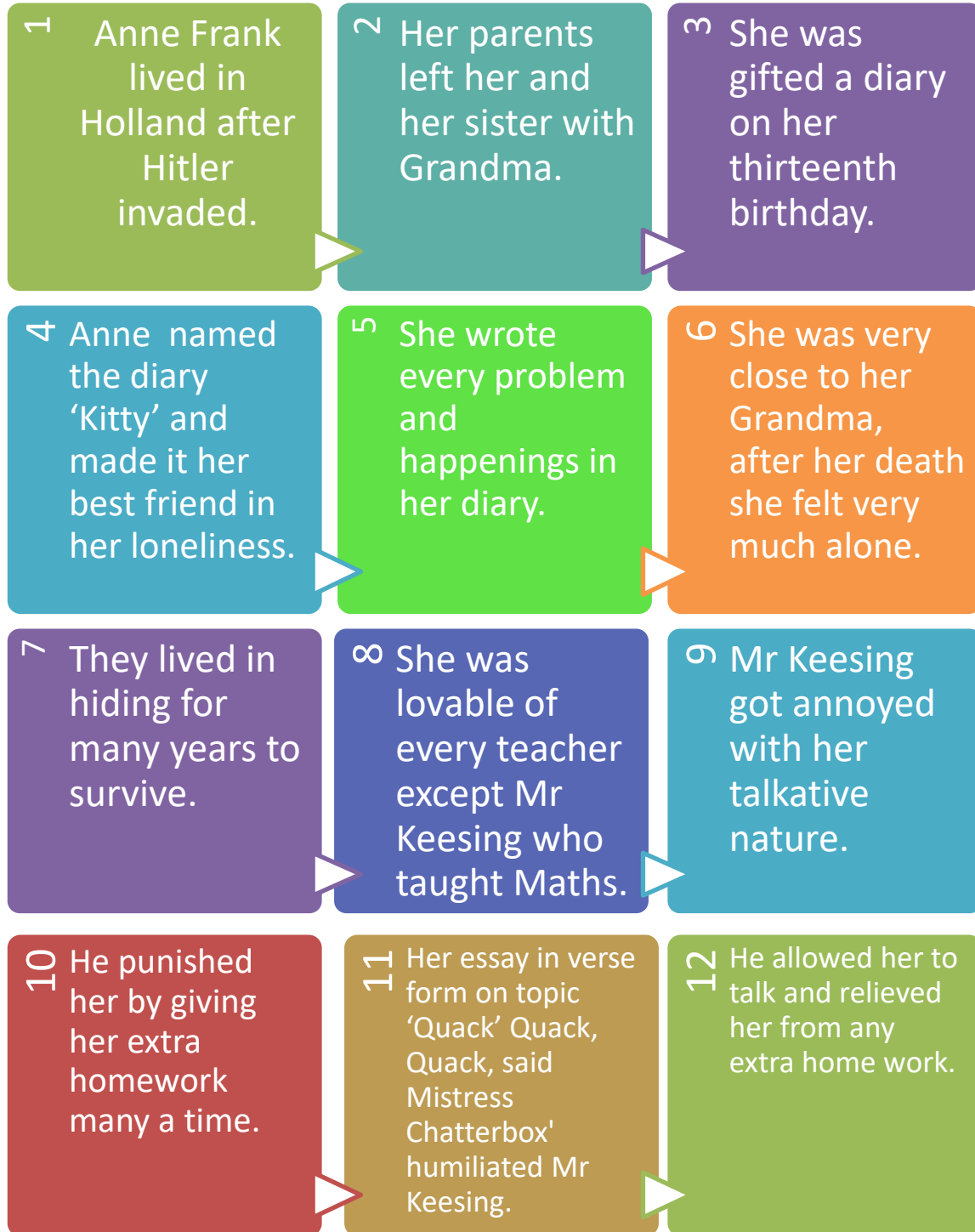
Anne Frank was a Jewish girl. The twelve-year-old Jewish girl wrote ‘The Diary of Anne Frank’ while in hiding with her family in Amsterdam, Netherlands during the Nazis’ occupation of the Netherlands in World War II. After two years in hiding, the group was arrested by the Gestapo on 4<sup>th</sup> August 1944 and transported to a concentration camp in Bergen where Anne and her elder sister Margot died of typhus in 1945. Her father, Otto, the only survivor of the group found her diary and got it published in English under the name *The Diary of a Young Girl*.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map



## Synopsis of the Lesson

The author, Anneliese Marie 'Anne' Frank was a German born Jewish girl who wrote while hiding with her family and four friends in Amsterdam during the German occupation of the Netherlands in World War II. The author feels that it is strange and unusual for her to write a diary. She also thought that in the future no one will read about a young girl's past experiences. But then she decides, '*it doesn't matter. I feel like writing, and I have an even greater need to get all kinds of things off my chest*'. *Paper has more patience than people*, she thought.

She was feeling little depressed and lonely and felt strongly that *paper does have more patience* and started the diary. She wanted the diary to be her friend, so named it *Kitty*, her friend. She had good time with friends but cannot share everything with them as they are not true friends. So *Kitty* became her very close friend. She refers to her father as the most lovable person who presents her the Diary on her 13<sup>th</sup> birthday. She missed her Grandma who she loved dearly.

The entire class was nervous about their results but she and her friend was unsure only about mathematics. She was doing fairly well in all the other subjects. According to Anne about the quarter of the class should not pass as they do not participate in any activities. Anne recalls Mr Keesing who teaches maths, was annoyed with her for her talkativeness. He punished her by giving extra home work on the topic *A Chatterbox* and next time *An Incurable Chatterbox* and the last one was *Quack, Quack, Quack, Said Mistress Chatterbox*.

She decides to present her argument in writing in support of talking. Mr Keesing enjoyed it but the last one made her feel that he was trying to play joke on her with this ridiculous subject. So, she made sure that the joke was on him. His purpose was to make her quite in the class but he failed even after giving extra home work. But her third homework, satire in a poetic form made him to stop giving punishment and allowed her to talk uninterrupted. Thus, Anne needs to talk to give vent to her emotions and to remain mentally fit.

## 5. Glimpses of India

### (i) A Baker From Goa

- *Lucio Rodrigues*



### **Lucio Rodrigues (1916-1973)**

Lucio Rodrigues (1916-73) was a great Konkani essayist. He wrote several articles in English and Konkani to various periodicals and magazines. He served as the visiting professor of Folklore at many universities and also as a professor of English in Mumbai and Goa. His essays were posthumously published under the title *Of Soil and Soul* and *Konkani Folk Tales*. Subtle humour and informal narration are the essential features of his writings.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map

- 1 • The Portuguese in Goa were lovers of bread.
- 2 • Those eaters of bread have now gone but its makers still exist.
- 3 • During the childhood days of the narrator, a baker used to be their friend, companion and guide.
- 4 • The baker came twice a day- once in the morning and again while returning home after finishing his selling.
- 5 • The jingling thud of the baker's bamboo woke up the sleeping children.
- 6 • The loaves were delivered to the servants of the house.
- 7 • The children would peep into the baker's basket for the bread-bangles.
- 8 • The children would eat bread with hot tea.
- 9 • The marriages were incomplete without the popular *bol* bread.
- 10 • *Bolinhas* was a must during Christmas and all other festivals.
- 11 • The bakers wore a particular knee length frock known as *kabai*.
- 12 • Baking was a profitable profession. Bakers had a plump physique testifying to this.
- 13 • The bakers collected their bills at the end of the month.



## Synopsis of the Lesson

*A Baker from Goa* is a historical story linked to the time when Portuguese ruled Goa. It focuses on the relevance and the importance of a baker in Goa. Even though Portuguese have left the country, the importance of bakers is still upheld. They are referred to *Pader* who make a jingle sound with the bamboo when they come to sell loaves of bread in the streets. This jingling sound would wake the author and his friends during their early days. They used to run towards him without even washing their mouths. *The loaves were bought by some Paskine or Bastine, the maid-servant of the house.* The children chose bread-bangles and sometimes sweet bread of special make, named *Bol*.

The narrator talked about baker's dress style kabai, an exceptional frock of knee-length. The sweet bread named *Bol* was a part of marriages, and the lady prepares sandwiches on the engagement of her daughter in earlier years. Cakes, sandwiches, and several other items were made with the loaves of bread during that time. Since that time, the bakery has continued to be a money-making profession and the baker and his family never go hungry.

## **(ii) Coorg**

- *Lokesh Abrols*



### **Lokesh Abrol**

Lokesh Abrol or Dr. Lokesh Abrol is a doctor, traveller and social entrepreneur who loves India and likes writing about different places he visited in India. He is an optimist for whom a challenge brings in a new possibility. A doctor by profession, an India travel and Heritage author by hobby, having published for NCERT, Discover India, Incredible India, Outlook Traveler, Swagat, Srishti, Tashi Delek and he even did an honorary stint as a weekly heritage talk show host for Hindi Khabar TV.

‘This has been so true so often that I look forward to what’s going to pop up next’, says Lokesh Abrol. He likes to humbly describe himself as a doctor, educationist and social worker, by destiny rather than design. ‘I was and am an incorrigible outdoors person, a wannabe soldier, forester, farmer, traveler, photographer, in other words a dreamer lucky to have lived all my dreams’ says he.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map

Coorg is a story about the Coorg or Kodagu district of Karnataka.

The author describes Coorg as a heavenly place located between Mangalore and Mysore.

It is undeniably God's abode, with evergreen forests, spices, and coffee plantations.

The weather is pleasant here from September to March, so many tourists visit. The coffee aroma pervades the air here.

Coorg people may be seen wearing Kuppia, a long black coat similar to the kuffia worn by Arabs.

Coorg people are well-known for their bravery.

One of the most important regiments in the Indian Army is the Coorg Regiment.

General Cariappa, our first army chief, is also from Coorg.

The Coorg forests and hills are a major source of water for the Cauvery River.

Buddhist monks also live in Bylakuppe on the Nisargadhama Island near Coorg.

## Synopsis of the Lesson

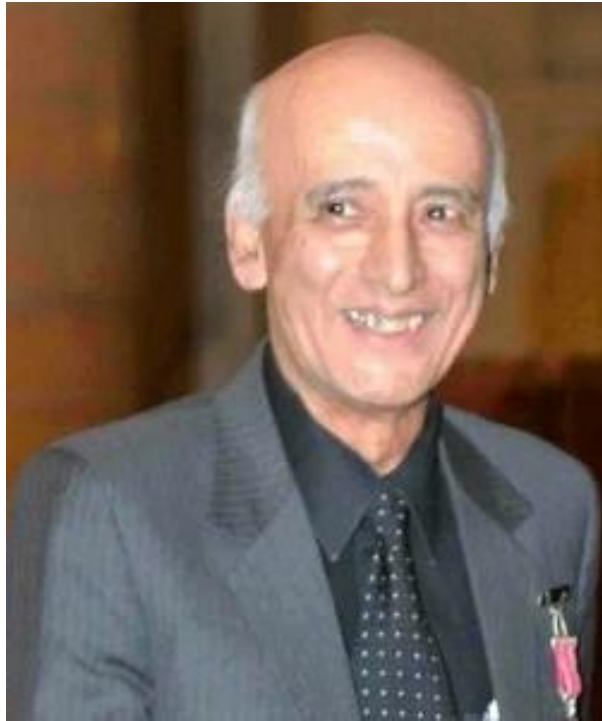
The smallest district of Karnataka, midway between Mysore and the coastal town of Mangalore, sits a piece of heaven that must have drifted from the kingdom of god is Coorg or Kodagu, is home to evergreen rainforests, spices and coffee plantations. The weather is pleasant from September to March. Many tourists visit this place during this time. The air in the whole area carries the aroma of coffee. The people of Coorg, Kodavus wear the long, black coat with an embroidered waist-belt known as *kuppia*. It resembles the *kuffia* worn by the Arabs and the Kurds.

This Coorg land of rolling hills is inhabited by a proud race of martial men, beautiful women and wild creatures. They are independent, brave and known for hospitality. One of the most decorated regiment in the Indian Army is the Coorg Regiment. The first Chief of the Indian Army, General Cariappa, was a Coorgi. The Kodavus are the only people in India permitted to carry firearms without a licence. The origin of river Kaveri is in Coorg. Mahaseer, a large freshwater fish, abound in these waters. The place abounds in diversity of flora and fauna. People who seek for high-energy adventure enjoy river rafting, canoeing, rappelling, mountain hiking and rock climbing here.

Birds, bees, butterflies, Macaques, Malabar squirrels, langurs, slender loris etc. draws everyone's attention. The climb to the Brahmagiri hills brings a panoramic view of the entire landscape of Coorg. A walk across the rope bridge will take you to the sixty four acre island of Nisargadhama and to the largest Tibetan settlement at nearby Bylakuppe. The visitors searching for the heart and soul of India, find right here in Coorg.

### **(iii) Tea From Assam**

- *Arup Kumar Dutta*



### **Arup Kumar Dutta (1946 - )**

Arup Kumar Dutta was born on 2 July 1946 to Girish and Indira Dutta. He is an Indian writer and Journalist from Guwahati, Assam. He has written 18 books for adults and 17 adventure novels for young people. In 2014 he was awarded the Life Time Achievement Honour by Association of Writers and Illustrators for Children, New Delhi, and the Indian chapter of the International Board of Books for Young People. He has also won numerous awards including the Shankar's Award in 1979, conferred to mark The International Year of the Child. He has been awarded the civilian award Padma Shri by Government of India in 2018.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map

The story of Assam Tea begins with two friends, Rajvir and Pranjol, traveling to Assam. They stop to buy tea from a roadside vendor on their way.

While sipping his tea, Rajvir informs Pranjol that over 800,000,000 cups of tea are consumed worldwide each day.

While Rajvir is looking at the beautiful and serene scenery, Pranjol is busy reading detective books.

There were tea bushes all over as far as one could see. They also saw a building which was a tea garden.

Assam has the greatest tea plantation. According to legend, a few tea branches fell into the boiling hot water by accident.

The Emperor enjoyed the delectable flavour. This is how it came about. According to legend, Buddhist Monk Bodhidharma cut off his eyelids to avoid falling asleep during meditation.

They both disembarked at Mariani Junction and proceeded to Dhekiabari Tea Estate. They saw women picking tea leaves there.

Pranjol's father had come to meet them there, claiming to be an expert on tea plantations. Rajvir expresses a desire to learn from him.



## Synopsis of the Lesson

This lesson talks about Assam, a North-Eastern State in India, famous for tea plantation. Pranjol, Rajvir's classmate at school in Delhi had invited Rajvir, to visit his home during summer vacation. They both were travelling to Assam by train. Pranjol's father is a manager of a tea-garden in Upper Assam. Rajvir says everyday throughout the world eighty crore cups of tea are drunk.

The train passes through green hills; Rajvir was excited and enjoying the beautiful, magnificent greenery, paddy fields, tea bushes stretched as far as eye could see but Pranjol who was brought up at plantation had no excitement and was reading detective book. Rajvir then tells him about the various legends, Indian and Chinese, behind tea. He tells how a Chinese emperor accidentally discovered tea back in 2700 B.C. He also tells another story about how ten tea plants grew out of eyelids of Bodhidharma, an ancient Buddhist ascetic. The words, chai and chini are from Chinese. Tea came to Europe only in the sixteenth century and was drunk more as medicine than as beverage.

The train reached Mariani junction, Pranjol's parents were waiting for them and they all drove towards Dhekiabari, the tea-garden managed by Pranjol's father. The tea bushes, all neatly pruned to the same height on both sides of the road, they walked. The tea-pluckers with bamboo baskets, wearing plastic aprons, were plucking the newly sprouted leaves. Pranjol's father told Rajvir that he would tell them many more interesting things about tea plantation.

## 6. Mijbil The Otter

- *Gavin Maxwell*



**Gavin Maxwell (1914 - 1969)**

Gavin Maxwell was a British naturalist and author, best known for his non-fiction writing and his work with otters. He wrote the book, *Ring of Bright Water* (1960) about how he brought an otter back from Iraq and raised it in Scotland. The otter was of a previously unknown sub-species which was subsequently named after Maxwell. *Ring of Bright Water* sold more than a million copies and was made into a film starring Bill Travers and Virginia McKenna in 1969.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map

After his dog died, Maxwell decided to keep an Otter as his pet.

**On the suggestion of a friend, he got an offer from the Tigris Marsh.**

Maxwell felt that the arrival of the Otter opened a new stage in his life.

**The Otter first appeared as a little dragon. He was covered with mud. Maxwell spent a lot of time and energy removing the dust.**

Otters like to play in the water and cannot stand in front of the water.

**He also likes to play with rubber balls. Marble toys are his favourite.**

**A few days later, Maxwell had to return to London.**

Transport to Mijbil to London became a problem because British Airways did not allow animals on its flights.

**Another airline agreed to pack the animal in a box.**

Maxwell made a small box for the Otter. On the plane, the Otter escaped, passengers yelled & stood on their seats.

**Finally, the Otter came back, lying on Maxwell's knees.**

On reaching London, the Otter was unfamiliar animals, people made random assumptions. Mijbil learned to play ping-pong & developed certain habits.

## Synopsis of the Lesson

The author, Gavin Maxwell, tells us how his life altered after he decided to keep an Otter. He is taking us through his journey and its experiences with Mijbil, the Otter. The journey begins from Iraq to London by flight.

Gavin Maxwell was travelling to Southern Iraq when he decided to get an otter for a pet. He felt that his native Camusfearna would be an ideal location to raise an otter as it was close to water. His friend advised him to get an otter from the Tigris Marshes as they were abundant and they had been tamed by the Arabs. They were travelling to the Consulate-General in Basra to collect their mail but his mail had not arrived.

After a few days, he found two Arabs at the Consulate having an otter and also a note from his friend. The otter looked like a small dragon and was covered with pointed scales, velvet fur and mud. It belonged to a previously unknown species and later named by the zoologists *Lutrogale perspicillata maxwelli* or Maxwell's otter. This was the beginning for Maxwell for a lifelong affection for otter.

Mijbil was aloof and indifferent in the beginning but one night it crawled into bed and slept on Maxwell's knees. Maxwell fondly remembered Mijbil's enjoyment in water splashing happily. Two days later he found Mijbil in the bathroom turning on the water tap by himself. It became his favourite pastime. He would spend hours playing with a rubber ball or rolling marbles down his belly while lying flat on his back.

Though they both spent their time peacefully in Basra, Maxwell was worried about transporting Mijbil back to England. As per aeroplane guidelines, Mijbil has to be carried in an eighteen inch square box. Maxwell put Mijbil in the box to get accustomed to the small space and left for meal. When he returned, there was an appalling scene, Mij was exhausted, and blood had trickled and dried. It had tried to escape and got hurt on the lining of the box. Maxwell almost missed his flight as he had to remove all the sharp edges from the box and rushed to the airport.

Maxwell boarded the flight and had a word with the airhostess about Mijbil. She was kind enough to allow Maxwell to keep Mij along with him. He was grateful for her kindness and opened the box. In a flash, Mij jumped out of the box and sped down the aircraft creating havoc. All started

screaming and at last the airhostess asked the narrator to take his seat and Mij came on its own to him.

They stayed in London for a month. There Mij invented its own game with ping-pong ball. The narrator also took him for a walk. During this walk Mij developed a compulsive habit of tugging the narrator to a wall and jumping on it. Some Londoners guessed Mij to be a baby seal or a squirrel, or a walrus or a hippo, a beaver or a bear cub. Maxwell went to the labourer but he too could not guess what Mij was and demanded what it was supposed to be.

## **7. Madam Rides The Bus**

- *Vallikannan*



### **Vallikannan (1920 - 2006)**

Vallikannan is the pseudonym of R S Krishnasamy. He was born in Rajavallipuram near Tirunelveli. He started writing at a very young age and had published twenty five books by the time he was thirty. He wrote a total of 75 books in his life – novels, novellas, poetry collections, plays and essay anthologies. In 1978, he was awarded the Sahitya Akademi Award for Tamil for his critical work on modern Tamil poetry.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**





## Mind Map

Valli was an eight year old girl. The most fascinating thing for her was the bus that travelled between her village and the nearest town.

**She wanted to ride the bus.**

**She made elaborate planning & saved 60 paise both ways fare of the bus.**

**The bus conductor stretched out his hand to help her up but Valli could get on by herself.**

**The conductor was fond of joking and called her 'madam'.**

**The bus started with a roar & Valli was constantly looking outside.**

**The conductor asked her to sit down as she paid for her seat. She took her seat & an elderly woman sat beside her.**

**The old woman was very repulsive & the smell of the betel she was chewing offended**

**The old woman asked why Valli was travelling alone. Valli asked her not to bother**

**Suddenly, a young cow came running very fast in the middle of the road.**

**The driver sounded his horn loudly but the more he honked, it became more frightened**

**Valli laughed at the scene until tears came in her eyes**

**Her destination had come and the driver asked Valli to get off the bus.**

**Valli handed thirty paise coins to the driver & told him that she was going back on the same bus.**

**The conductor was surprised, offered free drink but Valli firmly refused.**

**On her return journey, she saw the same cow lying dead by the side of the road. The memory haunted her and she no longer was looking outside.**

**She reached back at 3.40 pm & hoped to see the driver again. Her mother woke up & talking with her aunt**

**Valli interfered in their talk & agreed that many things were happening outside without their knowledge**

## Synopsis of the Lesson

This is a sensitive story of an eight year old girl's first bus journey into the world outside her village. She witnesses an incident during her journey, makes her understand the mystery of life and death.

The girl named Valliammai who was called Valli in short, curious to know the outside world. Her favourite pastime was standing in the front doorway of her house, watching what was happening in the street outside. She had no friends to play with.

The most fascinating thing of all was the bus that travelled between her village and the nearest town. She collected information about the bus timings, how far the other village and how much fare for one side journey. She planned to travel without the knowledge of her mother and decided to go and come back in the afternoon while she was having her nap.

The bus came on the day Valli had decided to go. She stopped the bus, when the conductor extended his help for climbing, she refused. The conductor was jovial and treated her as madam showing her the seat. The bus was new; seats were luxurious, comfortable, and painted in green and white colour stripes.

She took ticket paying thirty paise and enjoyed the journey watching green fields, mountains, palm trees, grassland from the window. She also saw a young cow that came in front of the bus while crossing the road. The driver blew the whistle and the cow crossed the road safely. All this was fascinating and it was like a dream come true for her.

In the same bus without getting down she took ticket for her return journey and travelled back to her village. Though the conductor asked her to get down to visit the town, she replied that she came for bus ride. In her return journey she saw the same cow dead by the roadside. This made her heart cry and she was sad and upset. This incident made her understand the meaning of life and death in her own terms. She reached home but did not utter a single word about the bus ride.

## **8. The Sermon At Benares**

- *Betty Renshaw*



### **Betty Renshaw (1927 - 2013)**

Betty Louise Renshaw Barber was born in Shannon, Mississippi on September 3, 1927. She was herself an active missionary worker and was always there to visit and support them in every possible way. Betty was dedicated to “serving God and loving others and often prayed that God would use her gifts for His glory”. She constantly reminded people around her about the Almighty’s infinite grace and kindness. Betty was just as active in showing God’s love as she was in talking about it. An embodiment of encouragement, support and kindness, her conversations and letters ended with the oft quoted line, “God loves you, and so do I.” Betty married Joseph Henry Barber, Jr. on December 23, 1950 and together they went on several missionary trips around the world. Married for 61 years, this pious and beautiful soul left for the Divine Abode on her eighty – sixth birthday, i.e. a year and after her husband’s demise.

**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**



## Mind Map



This lesson tells us about the life of Gautama Buddha, who was born in a royal family as Siddhartha.

- Once he saw a funeral procession, and monk begging for the alms.



**These sights moved him a lot and he decided to become a monk and started moving in search of enlightenment.**

- **He started meditation under a peepal tree .**



**After seven days he got enlightenment and became known as the Buddha (the Awakened or the Enlightened).**

- **He preached his first sermon at Benares.**



Once a woman came to him requesting to bring her dead son to life.

- He asked the lady to bring handful of mustard seeds from the house where there had been no death.



The lady moved from one house to another.

- But she could not find a single house where no one has lost a child, husband, parents or friend.



Sorrow and grief increases our pain, when we are unable to accept the truth.

- Then she came to know that death is common to all, it is inevitable and is the ultimate truth.

## Synopsis of the Lesson

*The Sermon at Benares* is written by Betty Renshaw. This lesson is a part of her book named, *Values and Voices*. Here she depicts how a royal prince left his family back in the palace to find the truth behind all the sufferings in the world. It describes Lord Buddha's revelations during his journey. He met people who helped him understand the real truth and achieve enlightenment, the spiritual awakening, finally under the peepal tree at Bodhgaya.

Gautama Buddha (563 B.C. – 483 B.C.) was a prince named Siddhartha Gautama, in northern India. At the age of twelve he was sent for schooling in the sacred Hindu scriptures. He returned after four years and married a princess. He lived for ten years in the palace as befitted royalty and had a son. He was shielded from the sufferings of the world till the age of twenty five.

One day when he went out for hunting chanced upon a sick man, then an aged man, then a funeral procession and finally a monk begging for alms. These sights moved him and at once he went out into the world to seek enlightenment concerning sorrows. He wandered for seven years and finally sat under a peepal tree. He was enlightened after seven days. He renamed the tree the Bodhi Tree, the Tree of Wisdom and began to teach his new understandings. At this point he came to be known as Buddha.

He preached his first sermon at the city of Benares. This sermon reflects his wisdom about *inscrutable kind of suffering*. It is conveyed in the form of a story about Kisa Gotami whose only son had died and went to people asking medicine for him. At last she reaches Buddha, the Sakyamuni. Buddha told her that he would cure her son if she brought handful of mustard seeds from a house where no death had taken place. Kisa went from house to house but was unable to find one where no death had been seen.

She finally realized that death was common to all and no one could escape it. People weep over their dead ones. It is only the wise who do not grieve as they have accepted the truth. If a person weeps, his sufferings only become greater. Those who do not grieve have peace of mind and will overcome sorrow and be blessed.

## 9. The Proposal

- *Anton Chekov*



### **Anton Chekov (1860-1904)**

Anton Chekhov, in full, Anton Pavlovich Chekhov, Russian playwright and master of the modern short story, was a literary artist of laconic precision who probed below the surface of life, laying bare the secret motives of his characters. Chekhov's best plays and short stories lack complex plots and neat solutions. Concentrating on apparent trivialities, they create a special kind of atmosphere, sometimes termed haunting or lyrical. Chekhov described the Russian life of his time using a deceptively simple technique devoid of obtrusive literary devices, and he is regarded as the outstanding representative of the late 19<sup>th</sup> century Russian realist school.

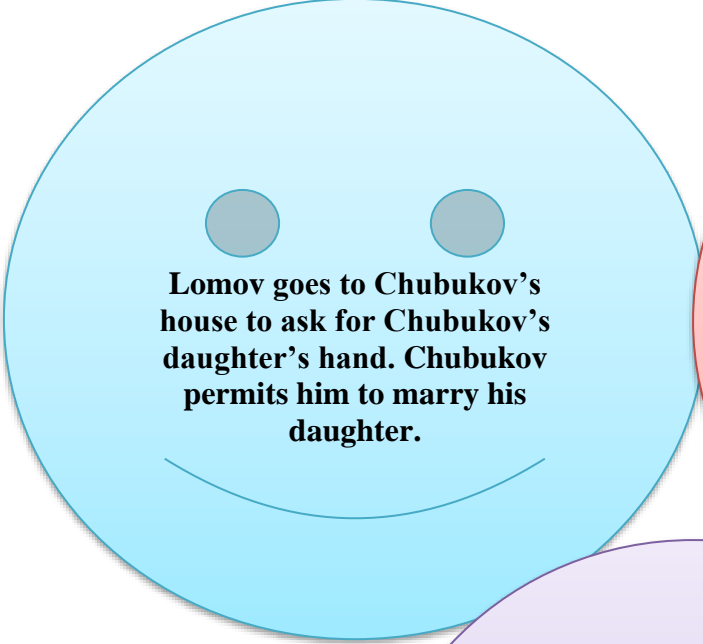
**TEXT BOOK LESSON LINK**

**AUDIO LESSON LINK**

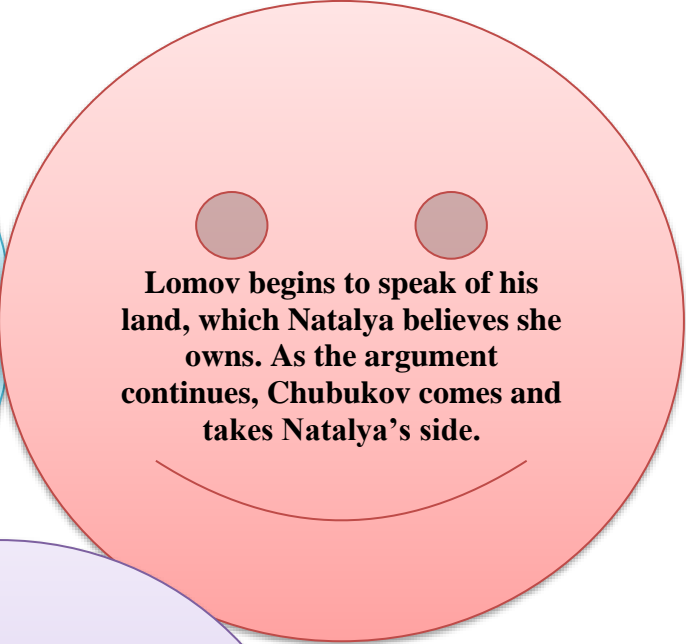




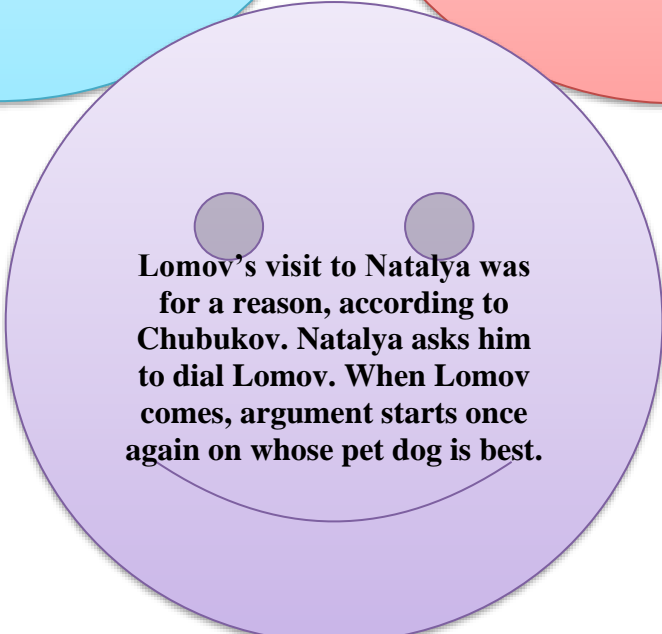
## Mind Map



**Lomov goes to Chubukov's house to ask for Chubukov's daughter's hand. Chubukov permits him to marry his daughter.**



**Lomov begins to speak of his land, which Natalya believes she owns. As the argument continues, Chubukov comes and takes Natalya's side.**



**Lomov's visit to Natalya was for a reason, according to Chubukov. Natalya asks him to dial Lomov. When Lomov comes, argument starts once again on whose pet dog is best.**



**Lomov loses consciousness. Chubukov gives Lomov his daughter's hand.**

## Synopsis of the Lesson

The Proposal, originally titled A Marriage Proposal, is a one-act play, a farce, by the Russian short story writer and dramatist Anton Chekhov, written in 1888-89. The play is about the tendency of wealthy families, to increase their estates by encouraging marriages that make good economic sense. Ivan Lomov, a long time wealthy neighbour of Stepan Chubukov, also wealthy, comes to seek the hand of Chubukov's twenty-five-year-old daughter, Natalya. All three are quarrelsome people, and they quarrel over petty issues. The proposal is in danger of being forgotten amidst all this quarrelling. But economic good sense ensures that the proposal is made, after all – although the quarrelling perhaps continues.

The curtain rises with Lomov entering his neighbour Chubukov's house to ask his daughter's hand. Chubukov seeing Lomov dressed up well assumes that he must have come to ask for money which he does not want to return. After knowing the real purpose, Chubukov leaves to call Natalya. Lomov is a thirty five years old gentleman who suffers from palpitations and gets upset very easily. He thinks it is the right age for him to marry and is happy that he is choosing Natalya. He believes Natalya is average looking and an honest caretaker.

Natalya arrives and Lomov initiates the conversation. During the conversation, he mentions Oxen Meadows which earlier was a disputed property but is now his. Both enter into a heated argument on this issue and later Chubukov also joins. Chubukov accidentally reveals that Lomov had come for wedding proposal. Natalya was surprised and regrets for sending him out. She asks her father to bring him back and Chubukov blames himself for being the father of a young daughter.

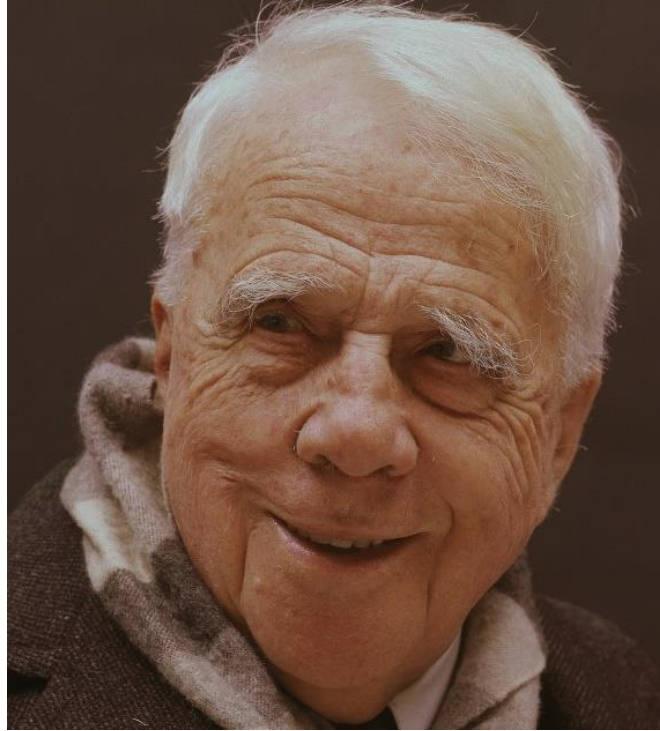
When Lomov comes they both enter into debating on dogs. They continue arguing and Chubukov enters the scene only to worsen it. Everyone gets hyper and Lomov finally falls due to palpitation. Still the argument continues and suddenly Natalya notices that he is unconscious. As he did not drink water they declare him dead but later he moves a bit and drinks water. Chubukov forcefully hands over Natalya's hands to Lomov, gives his blessings and asks them to kiss. Lomov expresses his excitement and kisses Natalya's hands. Natalya again keeps convincing about her point on dog but Lomov being adamant refuses to accept this and the quarrelling continues.



**First Flight  
Poetry**

# 1. Dust Of Snow

- Robert Frost



## Robert Frost (1874 - 1963)

Robert Frost is a highly acclaimed American poet of the twentieth century. He wrote about characters, people and landscapes. His poems are concerned with human tragedies and fears, his reaction to the complexities of life and his ultimate acceptance of his burdens. *Stopping by the Woods on a Snowy Evening*, *Birches*, *Mending Wall* are a few of his well-known poems. He was honoured frequently during his lifetime. He is the only poet to receive four Pulitzer Prize for poetry. He became one of America's rare *public literary figures*, almost an artistic institution. He was later styled as the Poet Laureate of Vermont.

[POEM TEXT LINK](#)

[AUDIO POEM LINK](#)

## Critical Appreciation

The poem, *Dust of Snow* by Robert Frost, is written in a simple and lucid style. The poem is set in a snowy landscape with a tree and a bird perched on it. It conveys message using the indirect imagery that the little things in life can make a great change in future. It also expresses that if one can take the hard times of life lightly, eventually something will happen to change the situation into a joyous one.

The poem is about the human experience with the nature - snow, crow and a hemlock tree - where one has no control over. But always nature enlightens or elevates or rejuvenates one's mood and energizes to a positive outlook or into a happier state of mind.

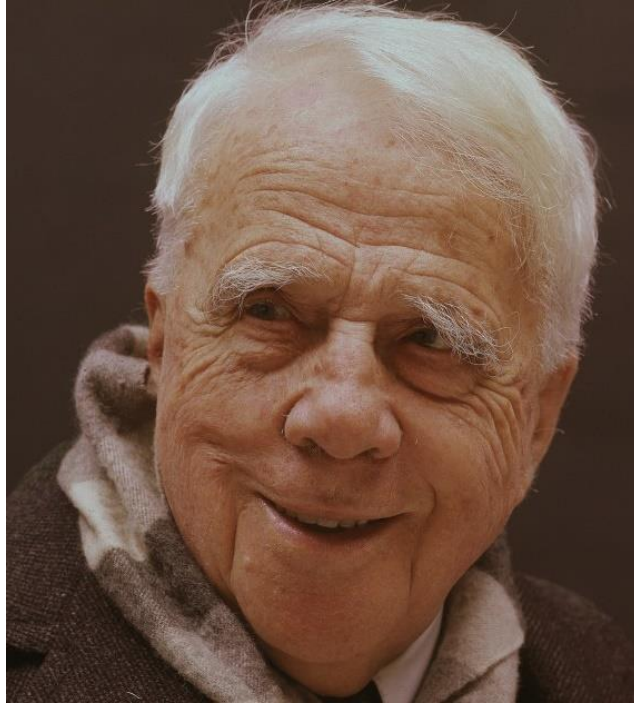
The poem is written in *abab* rhyme scheme. The 'snow' and 'crow' interacting with the poet has given 'heart a change of mood'. Further it 'saved some part of a day' that had apparently been lacking beforehand. The simple occurrence could shake and liberate the poet from *rueing*. The *tree* symbolizes the firm rootedness and the *snow* for purity and the *crow* contrasts the snow indicates the natural elements of earth lifts his low mood with its beauty and simplicity.

Robert Frost uses simple imagery like crow scattering snow from hemlock tree and dust of snow falling on him expresses the positive effect of nature. The use of alliteration in *Has given my heart* and *And saved some part* adds beauty to the poem. The poet makes a covert comparison in the third line of the first stanza, the mass of snowflakes atop the hemlock tree with dust. The poem is written without the use of any punctuation, expresses a string of thought.

The poem presents a moment that seems simple, but has a larger significance.

## 2. Fire And Ice

- Robert Frost



### Robert Frost (1874 - 1963)

Robert Frost is a highly acclaimed American poet of the twentieth century. He wrote about characters, people and landscapes. His poems are concerned with human tragedies and fears, his reaction to the complexities of life and his ultimate acceptance of his burdens. *Stopping by the Woods on a Snowy Evening*, *Birches*, *Mending Wall* are a few of his well-known poems. He was honoured frequently during his lifetime. He is the only poet to receive four Pulitzer Prize for poetry. He became one of America's rare *public literary figures, almost an artistic institution*. He was later styled as the Poet Laureate of Vermont.

[POEM TEXT LINK](#)

[AUDIO POEM LINK](#)

## Critical Appreciation

The poem, *Fire and Ice* by Robert Frost, is symbolic of emotions of desire and hatred. The poet says there are two possible ways how the world could end either by fire or by ice. It may happen that the core of the earth will get so heated up and wipe out civilisation with fire or the temperatures would go so low to the freezing point that life will not be possible to live on the planet.

The poet compares fire and ice with one's desire and hatred respectively. The poet says that human beings let their emotions rule them and he would support the ones who are in favour of fire because of what he knows about "fiery desires". Then he says that if the world had to end twice, ice would be equally competent. He brings out a contrast between *ice* and *hatred*. Humans' insensitivity and hatred has the capacity of inner destruction. Though slow and steady it has the same effect that desire has on us.

If given to choose between fire and ice, ice would be as competent as fire to destroy the world. If fire would lead to rapid destruction, ice would be silent damage. The poem tells us that our emotions control us and if we don't stop it, it will lead to utter chaos.

The poet has used many poetic devices to convey his ideas very clearly and beautifully. The poet compares *fire* with *desire* and *ice* with *hatred* as well as contrasts *fire* and *ice*. He symbolises and personifies *fire* and *ice*, and brings out visual imagery like *some say* and *tasted desire*. The rhyme scheme of the poem is *abaa* in the first stanza and *ababa* in the second stanza.

The poem presents the alternative human passions, desire and hatred. The poet gives the balanced position of both elements to give his final decision. The main idea of the poem is about the end of the world and the importance of emotions in this connection.

### 3. A Tiger in the Zoo

- *Leslie Norris*



#### **Leslie Norris (1921 - 2006)**

George Leslie Norris was a prize-winning Welsh poet and short story writer. He taught at academic institutions in Britain and the United States, including Brigham Young University. Norris is considered one of the most important Welsh writers of the post-war period, and his literary publications have won many prizes.

His works have won numerous awards, including the Cholmondeley Poetry Prize, the David Higham Memorial Prize, the Katherine Mansfield Memorial Award, the AML Award for Poetry (1996), and the Welsh Arts Council Senior Fiction Award. He is also an honorary Doctor of the University of Glamorgan, and honorary Doctor of Humane Letters of BYU. Leslie is a Fellow of the Royal Society of Literature and of the Welsh Academy.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**



## Critical Appreciation

The poem, *A Tiger in the Zoo* is written by Leslie Norris, contrasts a tiger in the zoo with the tiger in its natural habitat. The poem moves from the zoo to the jungle, and back again to the zoo. It gives a strong message that the wild animals should remain in their natural habitat and not caged in zoos and cells. The natural freedom should not be snatched from the wild animals. Captivity is the worst kind of punishment given to animals living in their natural habitat and environment. The poem effectively brings out the idea how valuable the necessity of *freedom* is.

The poet uses two different rhyme scheme *abcb* and *abcd* in the poem. The metaphor, *velvet* compared with paws of tiger, repetition of the word *brilliant*, and the imagery used in describing the tiger and its movement, *vivid stripes, lurking in shadow, sliding through long grass, snarling around houses, terrorising the village, stalking the length of his cage, ignoring visitors', stars with his brilliant eyes, at the brilliant stars*, adds beauty and a visual treat to the poem.

The poet symbolises *cage* to the captivity of the tiger by humans and *sky* to the freedom that the tiger longs for. By symbolising *cage* and *sky* the poet shows the helplessness of the tiger. The use of alliteration, *should be lurking in shadow, should be snarling, plump deer pass, in a concrete cell*, highlights soft sounds like 's', 'p' and 'c', the poet draws the attention of the readers towards tiger's condition. The metaphor, *pads of velvet*, compares the paws of the tiger to the quality of softness of velvet and the repetition of the words, *stalk, quiet* and *brilliant* emphasizes the strength of the tiger and its yearning for freedom.

## 4. How to Tell Wild Animals

- *Carolyn Wells*



### **Carolyn Wells (1862 - 1942)**

Carolyn Wells, a prolific American writer remembered largely for her popular mysteries, children's books, and humorous verse. Wells supplemented her formal education with an early-formed habit of voracious reading. After completing her schooling she worked as a librarian for the Rahway Library Association for some years.

From 1900 Wells gave herself entirely to literary work, and over the next four decades she produced a flood of books, some 170 titles that fell into several genres: children's stories, mystery and detective stories, anthologies, and humorous and nonsense writings.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

The poem, *How to Tell Wild Animals* by Carolyn Wells narrates the poem in a humorous tone suggesting some dangerous ways to identify or tell wild animals. The poet tells the readers, if we ever get a chance to go to the jungle of East and come across an animal with yellowish-brown skin and whose roar is loud enough to scare us to death, we must recognise the animal as an Asian lion.

In the second stanza, the poet talks about an animal that is of a royal chain. While roaming if one come across an animal in yellowish skin with black stripes and just in case he kills and eats up, one must recognise the wild animal as a Bengal tiger. The poet employs dark humour because after one is already eaten up an animal, it is of no use to recognise its type.

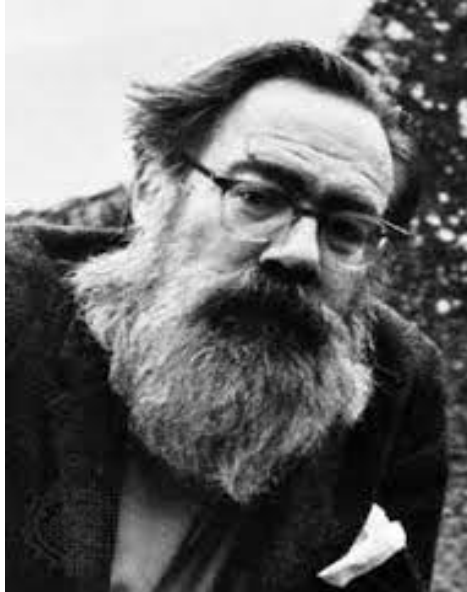
In the next stanza the poet says if one comes across an animal's skin with spots and who runs fast and jumps upon us at once, is leopard. Its of no use crying out in pain as the leopard will only keep on jumping. The poet next says if one walks on the yard and spots an animal which hugs tightly, then that is bear. If one wants to make sure of its identity, the easiest way is that the animal will just keep hugging and touching very gently which will confirm its identity as a bear.

In the fifth and sixth stanza the poet talks how it will be a puzzle to a newcomer in the job, identifying the animals and gives tips. Hyenas will be smiling while crocodiles will be teary-eyed and both are dangerous. About Chameleon, the poet says looks like a lizard without any ears and wings and changes its colour based on the surface it sits on.

The use of descriptive language, imagery, helps the readers to visualise the image of Bengal tiger, especially in the lines A noble wild beast greets you, With black stripes on a yellow ground. The alliteration, roaming round, very, very hard and novice might nonplus are examples of the same sound repeated in the beginning of the closely placed words. These words, lep and very are repeated to emphasis the action. The poet is ironical when she talks about A noble wild beast greets you and He'll give you just one more caress. The poet uses ababcc rhyme scheme having a regular and strong rhythm.

## 5. The Ball Poem

- *John Berryman*



### **John Berryman (1914 - 1972)**

John Berryman, U.S. poet whose importance was assured by the publication in 1956 of the long poem *Homage to Mistress Bradstreet*. He was brought up a strict Roman Catholic in the small Oklahoma town of Anadarko, moving at 10 with his family to Tampa, Fla. When the boy was 12, his father killed himself. Berryman attended a private school in Connecticut and graduated from Columbia University, where he was influenced by his teacher, the poet Mark Van Doren. After study at the University of Cambridge in 1938, he returned to the U.S. to teach at Wayne State University, Detroit, beginning a career that included posts at Harvard, Princeton, and the University of Minnesota.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

The poem, *The Ball Poem*, written by John Berryman, talks about a boy, who loses a ball while playing and is very upset. He is upset, not because it costs high or difficult to get another but his memories and feelings from his younger days were attached to the ball. The poet says that the boy must now learn to take responsibilities.

The poet wants the boy to grow up and give up his love for materialistic things. Money cannot buy everything in life, Happiness or the feelings of belongingness cannot be bought by money moreover a lot of our belongings will be lost during the course of life.

The poem tries to convey that there will definitely a day will come when we will have to grow up and take our responsibilities in life. A day will come, we will lose our loved ones and that is the harsh reality of life.

The poem is written in free verse. The word *ball* is symbolic of the boy's childhood, loss of his innocence as well as symbolises overcoming the loss and becoming a man. The poet compares the boy's childhood with the lost ball through the metaphor, *All his young days into the harbour where His ball went*. The alliteration, *what, what* and *buys a ball back* enhances the beauty of the poem. The ball, What and how to stand up is repeated in the poem. The imagery, *merrily bouncing down the street* gives the visual description and the transferred epithet *desperate eyes* highlights the emotion of sadness experienced by the boy is reflected in his eyes.

The poet expresses how the boy has to accept the miseries of life and stand up again to move on with the life.

## 6. Amanda

- Robin Klein



**Robin Klein (1936 - )**

Robin McMaugh Klein is an Australian author of books for children. She was born in Kempsey, New South Wales, Australia, and now resides near Melbourne. Robin Klein is one of nine children. She had her first short story published at the age of 16. She worked in number of jobs before becoming an established writer, including tea lady at a warehouse, bookshop assistant, nurse, copper enamellist, and program aide at a school for disadvantaged children. In 1981, she was awarded a Literature Board grant for writing, and since then, she has had more than 20 books published. She is the poet of the poem *Amanda*.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

The poem, *Amanda* is written by Robin Klein presents two contrasting perspectives and scenarios. The poet speaks about a young girl and her dreams and fantasies of freedom on one hand and the reality in the form of her mother's restrictions, instructions and dictates on what to do and what not to do on the other hand. The poem beautifully paints a picturesque portrayal of the world of fantasies of a girl, Amanda and the constant real strikes on the girl from her mother demanding corrections in her behaviour. The poem ultimately attaches us with the girl emotionally whereas the mother seems to be on the wrong path of not understanding her daughter and dictating her behavioural rules.

The young girl here symbolises all the young girls who are growing up with their world of fantasies and freedom but are constantly nagged by their mothers on their behaviours and ways of living a routine life.

The poem keeps alternating between the voices of the controlling adult and the daydreaming of freedom seeking Amanda. This technique further highlights the conflicting themes of control and freedom in the poem. The rhyme scheme of the poem is aaba, ccc, aaba. The repetitions like Don't, Stop, Did emphasises the restrictions imposed by the adult speaker brings out the theme of control. Amanda refers to mermaid and Rapunzel, alludes to these figures brings her desire to escape from her parents and live a life of freedom.

The alliteration used in the poem, stop that slouching and sit up straight and stop that sulking, enhances the rhyme of the poem. The poet has used metaphors to compare the silence with gold and freedom with sweet, silence is golden and freedom is sweet. The nagging and controlling nature of the adult speaker repeating, Don't bite, Don't hunch, Did you tidy makes Amanda silent, hushed, bare feet, transferred epithet, would make dust patterns with her feet as a street orphan.

The poet, Robin Klein brings out beautifully, how difficult it is for children to compromise their freedom and behave according to the societal norms as this is not only restrains them but also is responsible for making a child lose his/her individuality, and controlling them so much would simply take away their uniqueness and originality.

## 7. The Trees

- Adrienne Rich



### **Adrienne Rich (1929 - 2012)**

Adrienne Rich (1929 - 2012) was born in Baltimore, Maryland, USA. She is widely known for her involvement to contemporary women's movement as a poet and theorist. She has published nineteen volumes of poetry, three collections of essays and other writings. A strong resistance to racism and militarism echoes through her work. She was called 'one of the most widely read and influential poets of the second half of the 20<sup>th</sup> century', and was credited with bringing 'the oppression of women and lesbians to the forefront of poetic discourse'. Her first collection of poetry, *A Change of World*, was selected by renowned poet W H Auden for the Yale Series of Younger Poets Award.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**



## Critical Appreciation

The poem, *The Trees*, by Adrienne Rich, is a short symbolic poem focusing on the movement of trees that are initially indoors but seeking to escape to freedom in the forest. The trees represent nature but also the nature of being, womanhood in particular. The poem is a free verse poem of four stanzas. There is no set rhyme scheme and no regular metric beat pattern, each line is different rhythmically and the lines vary in length. The varying line length, unusual syntax and powerful imagery need careful understanding of the poem.

The first two stanzas, the poet objectively describes the escape of the trees, actions of the trees, to their new environment. The last two stanzas, the poet, I, seems to want to ignore this profound shifting of the trees but paradoxically by mentioning her own aloofness brings the whole situation into sharper focus.

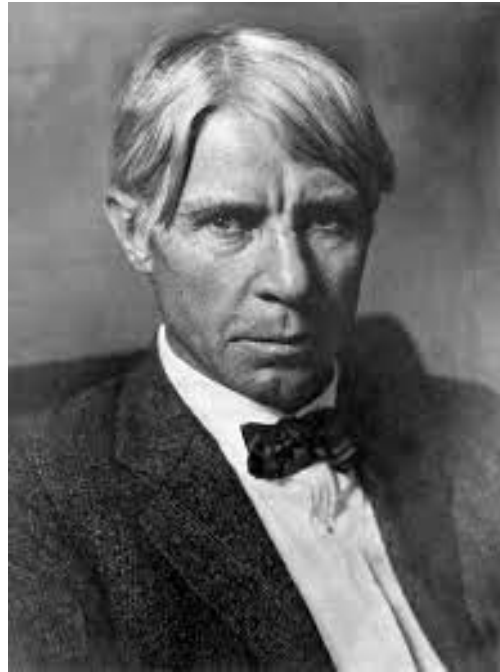
The use of simile is clear as the branches of the trees are seen like newly discharged patients heading for the clinic door. The portrayal of the trees with people in need of medical help brings out patients half-dazed moving with great struggle for fulfilling their true purpose, renewing the empty forest. In the third and the final stanza also the poet compares both human and domestic elements, like a voice and like a mirror.

The repetition in the first stanza, the forest that was empty, where no birds, no insect, no sun, reinforces the idea that previously there was no life outside. The poet personifies the trees, sun, twigs and bugs in the first, second and the fourth stanzas, no sun bury its feet in shadow, twigs stiff with exertion, long-cramped boughs shuffling, The trees are stumbling forward.

The poet uses 'the trees' to connote the significance of forests and raise the issue of 'deforestation'. People keep plants and trees in their homes and have the false impression that it can replace the lost forests. The poet uses the trees as symbolic to say that the issue of deforestation can be tackled only by planting trees. Also the poet uses trees metaphorically to represent helplessness of women in the patriarchal society.

## 8. Fog

- *Carl Sandburg*



### **Carl Sandburg (1878 - 1967)**

Carl August Sandburg was an American poet, biographer, journalist, and editor. He won three Pulitzer Prize, two for his poetry and one for his biography of Abraham Lincoln. During his lifetime, Sandburg was widely regarded as ‘a major figure in contemporary literature’, especially for volumes of his collected verse, including *Chicago Poems* (1916), *Comhuskers* (1918), and *Smoke and Steel* (1920). He enjoyed ‘unrivaled appeal as a poet in his day, perhaps because the breadth of his experiences connected him with so many strands of American life’. When he died in 1967, President Lyndon B. Johnson observed that ‘Carl Sandburg was more than the voice of America, more than the poet of its strength and genius. He was America’.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

Carl Sandburg's *Fog* is a short poem written in a free verse having no regular rhyme. Carl Sandburg was inspired by Japanese haiku, and developed what is essentially a haiku into something more. The poem is an extended metaphor, the poet seeing the fog as a cat that comes on tiny, silent feet when they are stalking. Only a cat can move in such a way, almost imperceptibly, and in complete silence.

The poet has chosen cat as it is an independent animal, follows no rules, slips and slides in and out of our lives as it pleases just like fog which knows no boundaries. Cats are stealthy and moves in slow motion. They can fix themselves onto an object or creature, seemingly in a trance, yet they appear to be moving in a most mysterious fashion.

The poet by using this dual imagery of fog and cat, fog turning into a cat, cat morphing back into the fog, introduces the idea that the fog is alive and is an entity. The short lines of the poem, reflects the fog rolling in slowly and the use of feet instead of paws makes it life-like.

The poet has given a very lively picture of the fog and compares it with cat which comes silently and spreads all over the city and the harbour. It is everywhere as if sitting on its haunches, silently. Then suddenly it gets up and moves to some other place. It's all about the beauties of nature, which we fail to enjoy in our busy life. The poem showcases Carl Sandburg's rich imagination and creativity by using a common weather like fog to comment on different aspects of nature.

## 9. The Tale of Custard the Dragon

- *Ogden Nash*



### **Ogden Nash (1902-1971)**

Frederic Ogden Nash was an American poet well-known for his light verse, of which he wrote over 500 pieces. With his unconventional rhyme schemes, he was declared by The New York Times the country's best known producer of humorous poetry. Nash was best known for surprising, pun-like rhymes, sometimes with words deliberately misspelled for comic effect.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

The poem, *The Tale of Custard the Dragon* by Ogden Nash, is a humorous poem about a cowardly dragon named, Custard. Belinda had many pets, a black kitten named Ink, a grey mouse named Blink, yellow dog named Mustard and a dragon named Custard. All the pets except Custard were described as brave and compared with tiger and lion. But the dragon is very timid and always demands a safe place. The other animals make fun of him.

One night, a pirate breaks into the house, frightening all of them. Everyone started running hither and thither seeking a hideout but to everyone's surprise Custard bravely moves forward and savours the man. The poet has tried to put forward the idea that sometimes a timid person comes out to be the actual hero in the toughest situations of life.

The poem revolves around the theme that one should not judge a book by its cover. The one who had seemed to be the biggest coward is the one who saves everyone at the end. The pirate who entered very bravely was gobbled up. Thus, neither Custard nor the pirate, and the other pets are not what they seem to be. The poet employs irony as well as humour. When the situation demands, they are bound to show their true colours which may surprise us.

The poet uses simile, *sharp as Mustard, mouth like a fireplace, as brave as a barrel full of bears, brave as a tiger in a cage, snorting like an engine, clashed his tail like iron in a dungeon*, to create humour and irony in the poem. Many places the poet has used repetition, *little*, as well as used poetic licence *realio, trulio, winda* for the sake of rhyming and evoke humour. *Belinda is as brave as a barrel full of bears*, here the poet uses simile, compares Belinda with barrel full of bears and alliteration is also used.

## 10. For Anne Gregory

- William Butler Yeats



### William Butler Yeats (1865 - 1939)

William Butler Yeats was an Irish poet, dramatist, writer and one of the foremost figures of twentieth century literature. He was a driving force behind the Irish Literary Revival and became a pillar of the Irish literary establishment who helped to found the Abbey Theatre. In his later years, he served two terms as a Senator of the Irish Free State. Yeats was awarded the Nobel Prize in Literature in 1923. His major later works include 1928's *The Tower* and *Words for Music perhaps* and *Other Poems*, published in 1932.

**[POEM TEXT LINK](#)**

**[AUDIO POEM LINK](#)**

## Critical Appreciation

The poem, *For Anne Gregory*, by William Butler Yeats comprises three stanzas, a conversation between a young man and a young woman. The poem opens with a young man looking at Anne Gregory's beautiful honey-coloured hair expresses any man fall in love with her. This love is not for Anne but for her beautiful features and gorgeous hair compared to walls, *honey-coloured ramparts*, symbolising outer beauty that prevents anyone from looking inside her soul. The young man believes that no man can love Anne for what she is but for her beauty. The poet uses *ab cb db* rhyme scheme and *your yellow hair* an alliteration to add beauty to the poem.

In the second stanza, Anne replies to the young man that what is visible from the outside is very superficial and unimportant. She gives an example of changing her beautiful hair and dye it in black, brown or carrot. Just like the colour of her hair is changeable, outer beauty of any kind is changeable. So, anyone falling in love with her must see the actual person behind the beauty. Anne feels that young man, who falls in love with her, must love her for what she is and not for her yellow hair or outward appearance.

In the final stanza of the poem, the speaker mentions an old religious man, who announced that he had found a text in which it is written that only God is capable of looking beyond external beauty. He means that humans do not have the depth and understanding to look inside the soul of a person. He concludes that only God can love Anne only for herself and not her beauty. The poet has used repetition, *yellow hair* and *despair* to reinforce the notion of external beauty.



**Footprints  
without Feet**  
Supplementary Reader



## 1. A Triumph of Surgery

- *James Herriot*



**James Herriot (1940–1992)**

James Alfred Wight, better known by his pen name James Herriot, was a British veterinary surgeon and author. He is best known for writing a series of eight books set in the 1930s–1950s Yorkshire Dales about veterinary practice, animals, and their owners, which began with *If Only They Could Talk*, first published in 1970. Over the decades, the series of books has sold some 60 million copies.

Mr. Pumphrey was a rich and emotional lady who has a cut dog Tricky. She loved him so much that she always overfed him. Therefore, Tricky had put on a lot of weight and hence became lethargic. When Doctor Herriot saw the fat, he was shocked. Then he made a plan and told Mrs. Pumphrey that Tricky must undergo treatment for the ailment, in the hospital. The story signifies that the parents should not be indulgent which may harm their children.

**TEXT BOOK LESSON LINK**

**AUDIO BOOK LINK**

## **Gist of the Lesson**

This story is about a dog named Tricky reared by Mrs. Pumphrey and how his illness is cured by Mr. Herriot. Mrs. Pumphrey being emotional, caring, affluent, pampered the dog by providing various coats for various seasons, cushions, toys, beds, bowls and especially by overfeeding him. This overindulgence leads to Tricky becoming lazy which in turn causes the illness. He had become fat like a bloated sausage with a leg at each corner, his eyes, bloodshot and rheumy, stared straight ahead and his tongue lolled from his jaws. Dr. Herriot is called for the rescue and keeps Tricky for a fortnight under observation in the hospital. He knew from the beginning that lack of exercise is the only reason for it and what was required to make him recover.

At the surgery, for two days the doctor kept an eye and fed nothing but water. By the end of the second day, he began to show interest in the surrounding. In the feeding time every dog was liable to have some competition for the last part of his meal. Initially Tricky was casually licking but soon got adapted to the prevailing circumstances where he had to race and fight for the food, he even started hunting rats at night. His health soon progressed and he required no medical treatment. The anxious Mrs. Pumphrey finally got her dog back after a fortnight and was relieved to know he became alright. She finally thanks the doctor and calls it a triumph of surgery.

This story represents the current state of most parents who pamper their children and spoil them. Being tough when required in the upbringing of children must be done to set them on the right path. Here the dog did not require a surgery since he was at a stage where exercise could cure him. Similarly the earlier children are corrected the easier it is.

## 2. The Thief's Story

- *Ruskin Bond*



### **Ruskin Bond (1951)**

Ruskin Bond is an Anglo-Indian author born in 19 May 1934 to Edith Clarke and Aubrey Alexander Bond, in Kasauli, Punjab States Agency, British India. His first novel, *The Room on the Roof*, was published in 1956, and it received the John Llewellyn Rhys Prize in 1957. Bond has authored more than 500 short stories, essays, and novels, including 64 books for children. He was awarded the Sahitya Akademi Award in 1992 for *Our Trees Still Grow in Dehra*. He was awarded the Padma Shri in 1999 and Padma Bhushan in 2014.

The story focuses on basic human values and relationships. It is easier for a thief to burgle a greedy man. It is difficult even for a thief to burgle a careless and honest person. A young boy becomes friendly with Anil. Anil trusts him totally and employs him. Does the boy deceive his trust? The story is about a fifteen-years-old thief.

**[TEXT BOOK LESSON LINK](#)**

**[AUDIO BOOK LINK](#)**

## **Gist of the Lesson**

This story is about a young thief and Anil, a Magazine writer. The young boy aged 15 who is a thief by profession and fairly successful at that had no luck of late and decides to introduce himself as Hari Singh to Anil during a wrestling match. He tries to flatter Anil to become his friend and gain his trust. Hari asks Anil for a work but Anil denies as he has no money to give, he later asks if Anil can feed him and Anil agrees to take him if he can cook. Hari had lied that he knows to cook which became evident after the dinner he had made as it had to be given to stray dog. During the course of stay for a month Hari prepares tea, buys supplies and makes a few rupees profit out of it. Anil teaches Hari to read and write, also trusted him with the house key.

One day Anil's article gets published in the magazine and makes 600 rupees out of it. He happily shares the news with Hari and sleeps keeping the money under the pillow. Hari had not robbed for quite a while now and this was a wonderful opportunity for him but he had never stolen from a person who trusts him. He knew what it was like to steel from a greedy man, rich man and poor man but this was different. Nevertheless, he decides to steel and depart on the 10:30 train to Lucknow but as he nears the train, he does not feel like boarding it. He starts to think of the things he will miss and the friendship he'll lose. After spending a few hours, introspecting on the maidan bench in the rain, he decides to keep the dampened money below the pillow and sleeps at his usual place, the balcony. The next day Anil wakes him up with the tea and hands him over the wet fifty rupees saying that he shall be paid regularly from now on. It is implied that Anil knows what Hari had tried to do but he never utters a word or shows it to him.

This story shows the value of relationships over money. There are many ways to accumulate money but to gain respect and relationships requires honesty.

### 3. The Midnight Visitor

- *Robert Arthur*



#### **Robert Arthur (1909-1969)**

Robert Arthur Jr. born on November 10, 1909 in Fort Mills, Corregidor Island in the Philippines. He was a writer and editor of crime fiction and speculative fiction known for his work with *The Mysterious Traveler* radio series. He was honored twice by the Mystery Writers of America with an Edgar Award for Best Radio Drama. After graduating, he worked as an editor and later returned to the University of Michigan where he completed his M.A. in Journalism in 1932.

The Midnight Visitor is a story about how a detective named Ausable got rid of his rival Max by applying his brain in a grave situation. Ausable was in search of some sensitive papers in the hotel room. Suddenly, he was attacked by his rival named Max. Max put him at the gunpoint and claimed the sensitive papers. However, Ausable got rid of the situation by applying extraordinary intelligence.

**[TEXT BOOK LESSON LINK](#)**

**[AUDIO BOOK LINK](#)**

## **Gist of the Lesson**

This story is about a secret Agent Ausable along with a writer named Fowler and his adversary Max. Fowler is a young and romantic writer who meets Ausable in relation to his next story but he does not fit into any of the description of a secret agent. Ausable is very fat and though he spoke French and German passably he still had not lost the Boston accent. The hotel where he stayed and the prosaic telephonic call to make the appointment had made the writer disillusioned but Ausable asked him to cheer up as he had the paper that will affect the course of history. Once Ausable closed the door behind and switched on the light there was Max holding a gun pointing to him. Fowler had his first authentic thrill but Ausable was calm and sat down. Max threatened Ausable and asked him to handover the papers regarding the missiles. Ausable instead asks how Max had entered the room and told him there was a balcony through which intruders had come in the last time. The room used to be bigger and the hotel management is yet to close the entry through balcony. Max admitted his entry through a passkey and that a balcony would have saved him some trouble.

During the conversation, there was a sudden knocking at the door which made Fowler startle but Ausable smiled and told Max that it must be the Police as he had earlier called for extra protection. Soon the knocking increases making Max angry and go towards the window to jump on the balcony with the gun pointed towards him. The door opens and there stood the waiter with the drink and two glasses but alas Max makes the jump only to realize there was no balcony.

This story shows how the secret agent had beautifully evaded a life-threatening situation using his wit. He had the calmness and intelligence to execute it and managed to successfully safeguard the paper as well.

## 4. A Question of Trust

- *Victor Canning*



### **Victor Canning (1911-1986)**

Victor Canning was born in Plymouth, Devon, the eldest child of a coach builder, Fred Canning. He was a prolific writer throughout his career, which began young: he had sold several short stories by the age of nineteen and his first novel, *Mr Finchley Discovers His England* (1934) was published when he was twenty-three. Canning also wrote for children: his trilogy *The Runaways* was adapted for US children's television. Canning's later thrillers were darker and more complex than his earlier work and received great critical acclaim. *The Rainbird Pattern* was awarded the CWA Silver Dagger in 1973 and nominated for an Edgar award in 1974.

It is a story about a locksmith named Horace Danby. He was a very successful businessman. He had two assistants to help him. Being good and respectable, but he was not totally honest. He was fond of rare and expensive books. He purchased them at any cost. For this, he robbed safe only once in a year.

**TEXT BOOK LESSON LINK**

**AUDIO BOOK LINK**

## **Gist of the Lesson**

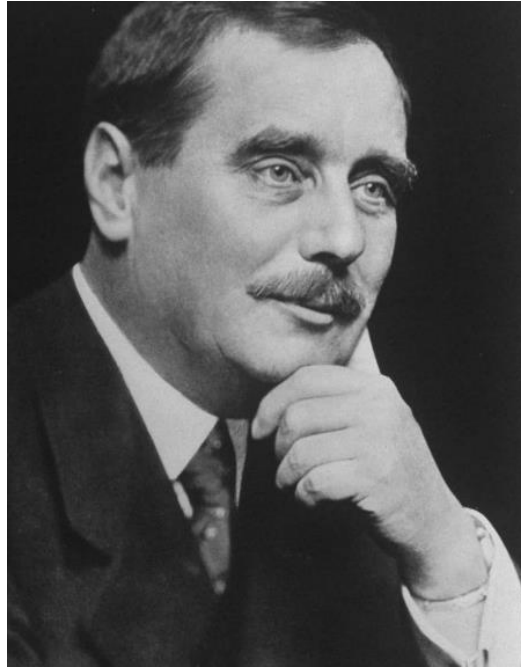
Horace Danby was a good and respectable citizen in the society. He was fifty and unmarried, lived with the housekeeper and was usually very well except for occasional hay fever. He was successful enough in business to have two helpers. He had one issue though; he was not completely honest. He stole every year to buy expensive rare books. This year he planned to steal from the house at Shotover Grange. He had been studying the house for two weeks with the plan and all details obtained from a magazine. The family was in London and the two servants had gone out for a movie. Danby enters the house and locates the safe to open with gloves, he even knows the technique to shush the dog by calling its name. While opening the safe the bowl of flowers on the table kept making him sneeze due to his hay fever. After the loud sneeze a voice from the doorway asked him whether it was cold or hay fever and before he could think he answered hay fever.

A young pretty lady dressed in red meets Horace and she seemed quite amused to meet him. Horace felt if he treated her right, she would perhaps leave him. She also seemed quite reasonable and since Horace was in a desperate situation, he agreed to her demands if she would let him go and forget that she ever met him. Before the family left for London, she had promised her husband she would keep it in the bank instead she kept them in the safe. She had come for taking the jewels from the safe but had forgotten the number and that if Horace opened it, she would let him go without informing the Police. She would mend the safe before her husband returned. Horace accepted and did as she told, opening it in an hour. Post three days he was caught by the Police as he opened the safe without gloves and his fingerprints matched. Sitting in prison library he wonders about the charming, clever lady and gets angry when anyone talks about 'honour among thieves'. This story illustrates that you must set a thief to catch a thief.



## 5. Footprints without Feet

- *H. G. Wells*



### **H. G. Wells (1866-1946)**

Herbert George Wells was an English writer. Prolific in many genres, he wrote more than fifty novels and dozens of short stories. His non-fiction output included works of social commentary, politics, history, popular science, satire, biography and autobiography. Wells is now best remembered for his science fiction novels and has been called the "father of science fiction". He was born at Atlas House, 162 High Street in Bromley, Kent. Wells was nominated for the Nobel Prize in Literature four times.

It is a story about a scientist named Griffin, who was searching for different ways that could make a man invisible. He got success when he developed a formula through which he became invisible. *Footprints without feet*, is all about the invisible man who cannot be seen but can feel physically by touching.

**[TEXT BOOK LESSON LINK](#)**

**[AUDIO BOOK LINK](#)**

## **Gist of the Lesson**

This story is about a scientist named Griffin who after consuming certain rare drugs becomes invisible. He is a lawless person and misuses this discovery. The landlord disliked Griffin and tried to eject him, in revenge he sets his landlord's house on fire. Thus, it was that he became a homeless wanderer, without clothes and without money. After stepping in some mud two boys find mud footprints and they appear from nowhere; they keep following it but later disappear. Griffin escapes from them and decides to slip into the big London store for warmth to getaway from the bitterly cold. He wraps every cloth to keep him warm and sleeps with the quilt. The next morning, he awakes after the assistants start to come and he panics and runs, removing his clothes to become invisible. He then steals from a theatrical company wearing bandages round his forehead, dark glasses, false nose, big bushy side-whiskers, and a large hat. To escape without being seen, he callously attacks the shopkeeper from behind, after which he robs him of all the money he could find.

He leaves the crowded London and takes a train to the village of Iping. He stays at the local inn where he had booked two rooms. Satisfied that her guest was an eccentric scientist, and in view of the fact that he had paid her in advance, Mrs Hall was prepared to excuse his strange habits and irritable temper. But the stolen money did not last long, and presently Griffin had to admit that he had no more ready cash. Shortly afterwards a curious episode occurred wherein the housekeeping money of the Clergyman was stolen and the scientist who had no money was able to return it. This raised suspicion and the constable eventually catches hold of him only to see him become invisible and escape. In the meantime Mrs Hall encounters an event where she is attacked by the chair and thinks it has become possessed by witchcraft done by Griffin.

## 6. The Making of a Scientist

- *Robert W. Peterson*



### **Robert W. Peterson (1925 - 2006)**

Robert W. Peterson, born on 1925 in Warren, Pennsylvania was an American newspaper writer who later became a freelance author of magazine articles and books, especially on the topics of Sports and Scouting.

*The Making of a Scientist* is a fascinating story of a young student who did marvelous work in the field of science. Richard Ebright, a solitary child, had a great fascination for catching butterflies in his childhood. Encouraged by his mother, he kept on enriching his treasures of rocks, fossils, coins and butterflies. He was able to collect all twenty-five varieties of butterflies and thus started losing interest in collecting and tagging the butterflies. But with the guidance of Dr. Urquhart he started doing more complex experiments on the butterflies. This enthused him to open newer vistas of science and encouraged him.

**TEXT BOOK LESSON LINK**

**AUDIO BOOK LINK**

## **Gist of the Lesson**

This story follows the life of Richard H. Ebright and how his curiosity in butterflies led him to the discovery about the form and function of a cell. From childhood his mother was very supportive by engaging him in mind stimulating activities. From kindergarten he had been collecting rocks, fossils, coins and butterflies. By the time he had reached second grade he had collected 25 species found around his hometown. Once he had gotten bored with it, at that time his mother gave him a book called *The Travels of Monarch X* by Dr Urquhart, which told how monarch butterflies migrate to Central America.

At the end of the book, readers were invited to help study butterfly migrations by tagging them. Since by chasing one can't catch many, he raised them in his basement. He continued this work for years and eventually lost interest due to lack of feedback. In the Seventh-grade science fair, he got a hint of what real science was. It was not just about presentations but to experiment. So, he wrote to Dr Urquhart for ideas, and back came a stack of suggestions for experiments. He started doing various experiments answering questions like what causes the viral disease that kills the monarch caterpillars, whether viceroy butterflies copy monarchs, purpose of the twelve tiny gold spots on a monarch pupa and won a lot of awards and accolades in the field of Zoology including the International Science and Engineering Fair.

After his freshman year at Harvard University his further research in the golden spots on Monarch led to the important question on the form and function of cell and DNA, opening up the possibility for further research and possible answers to preventing cancer and other diseases. This story shows how the curiosity and enthusiasm made Richard H. Ebright to ask questions and his further experiences made him into a research scientist. His perception of science was changed altogether at a science fair by getting inspired from other projects.

## 7. The Necklace

- *Guy De Maupassant*



### **Guy De Maupassant (1850-1893)**

Henri René Albert Guy de Maupassant, born on 5 August 1850, was a 19<sup>th</sup> century French author, remembered as a master of the short story form, as well as a representative of the Naturalist school, who depicted human lives, destinies and social forces in disillusioned and often pessimistic terms. He wrote 300 short stories, six novels, three travel books, and one volume of verse. His first published story, "Boule de Suif" ("The Dumpling", 1880), is often considered his most famous work.

The story of *The Necklace* is a satire that gives a strong message on human values. The very first thing that this lesson teaches us is that everyone should be content in life with whatever little that he has. One should live within one's means or else he invites unnecessary problems, anxieties, and confusion in life. The most important message of the story is that we should be what we are.

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## **Gist of the Lesson**

This story is about Mme Loisel and her necklace. Mme Loisel was very pretty and dreamed of living the high life but ended up marrying a petty clerk. She suffered incessantly, feeling herself born for all delicacies and luxuries. Her husband was a simple person, content with his life and tried to make her happy by taking her to a party at the Minister's residence. Instead of feeling happy she was upset as she had no beautiful clothes to wear. M Loisel decides to spend his 400 francs that he had saved for buying a gun for hunting at the wife's request of a suitable costume. Still, he found her upset over not possessing a jewel for the event for which he suggests to loan from her friend Mme Forestier. The next day Mme Loisel visits her friend, narrates her ordeal, chooses a diamond necklace and returns in joy. She becomes a huge success at the ball and they return in a carriage to home. After returning, she removes the wrap, views the mirror and to her shock the necklace was missing. She gives a loud cry and her husband in dismay searches in the folds of the cloak.

He decides to walk along the path to find but returns unsuccessfully, later they file a police complaint and nothing turns up. To buy time they tell Mme Frostier that the clasp of the chain is broken and will return after fixing it. After no positive news they decide to buy a similar looking diamond necklace using their life savings. M. Loisel takes loan from many lenders for the remaining eighteen thousand francs. Their life becomes very difficult for the next ten years. They sent away the maid and stayed in attic rooms. She washed clothes, utensils, threw garbage, went to grocer's, butcher's and fruiterer's. Her husband worked in the evenings, putting the books of some merchants in order, and nights he often did copying at five sous a page. One Sunday while taking a walk she sees Mme Forestier with her child and now that she had paid, she would tell her all. She narrates the whole story only to find out that the necklace Mme Forestier had lent was a look alike and were not worth over five hundred francs.

## 8. Bholi

- *K.A. Abbas*



**K.A. Abbas (1935-1987)**

Khwaja Ahmad Abbas (7 June 1914 – 1 June 1987) was an Indian film director, screenwriter, novelist, and journalist in Urdu, Hindi and English. He won four National Film Awards in India. Abbas wrote 73 books in English, Hindi and Urdu and was considered a leading light of the Urdu short story. His best-known fictional work remains *Inquilab*, which made him a household name in Indian literature. Like *Inquilab*, many of his works were translated into many Indian, and foreign languages, like Russian, German, Italian, French and Arabic.

This is the story of Bholi, a simple girl and the fourth daughter of Numberdar Ramlal. How she transformed and who encouraged her, is the story.

**[TEXT BOOK LESSON LINK](#)**

**[AUDIO BOOK LINK](#)**

## **Gist of the Lesson**

This story is about a girl named Sulekha, fourth daughter of revenue official Ramlal. She had fallen of the cot on her head when she was ten months old and perhaps it had damaged her brain hence she remained a backward child and came to be known as Bholi, the simpleton. Bholi used to look fair and pretty but when she was two years old she had an attack of small pox leaving her entire body permanently disfigured by deep pock marks. Ramlal was worried about getting her married as she was neither good looking nor intelligent. When Bholi was seven years old a primary school was opened and the village Tehsildar inaugurated it. He said to Ramlal that as a representative of the government he must set an example by sending his daughters to school. Ramlal and his wife were very worried because if he sent his girls to school then no one would marry them. After a discussion, as per his wife's suggestion he decides to take admission for Bholi since there was already a very less chance of her getting married. Bholi was initially terrified but after she was made to put on clean clothes, bathed and oil rubbed onto her hair she felt she was being taken to a place better than her home. She feels happy seeing girls of her age and wishes to make friends but they make fun of her stammering. The teacher in the class was the only person who was considerate to her and spoke in a soft and soothing way touching Bholi's heart.

Not only did the teacher encourage her to speak without fear, she even gave her a book with images and description of animals which fascinated Bholi. The teacher gave her the confidence that she can read much bigger books. Thus, years passed, the village became a small town and the little primary school became a high school. Bholi received a wedding proposal from Bishamber Nath who was nearing his fifties and limped. Since he was an outsider, he didn't know about Bholi's appearance or intelligence and her parents thought this was a good proposal. On the day of the wedding Bishamber saw Bholi's face and demanded five thousand rupees dowry from Ramlal. Tears streaming down his face, Ramlal counted the notes and placed the bundle at the bridegroom's feet. Seeing all this Bholi's hand struck out and flung the garland into the fire. Bholi said in a loud and clear voice that she will not marry this man who is a mean, greedy and contemptible coward. After putting an end to the wedding, she explains to her concerned father that she will serve them in their old age and teach in the same school where she had learnt so much. All thanks to her teacher who was present in the wedding the whole time.



## 9. The Book That Saved the Earth

- *Claire Boiko*



### **Claire Boiko (1925-2019)**

Claire was born on May 17, 1925 in Wellesley, Massachusetts, the daughter of Harvard student Clarence Parker Taylor and his wife, Vivian Adams Taylor. She gave life to her passion for literature in her career as a children’s playwright. She penned more than 70 plays for Plays Magazine. Her works have been performed locally at Duzine and Lenape schools and as far away as Bangladesh. She received hundreds of letters from children thanking her for her plays.

*The Book That Saved The Earth*, written by Claire Boiko, is a fictional, comic drama about a nursery book called *Mother Goose*. The play's plot is set in the twentieth century, and it depicts an attempt by a Martian named Think-Tank and his crew to attack Earth.

**[TEXT BOOK LESSON LINK](#)**

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## Gist of the Lesson

*The Book That Saved the Earth* story revolves around a book of nursery rhymes titled, *The Mother Goose* which saves the earth from the attack of aliens from the Mars. The story begins with the historian sitting in a museum telling the audience how one day in the twentieth century the Martians had planned to attack the Earth. To validate the point, he asks the audience to look into the historiscope which displays historical events. A character that has a balloon brain, Think Tank, is the Master and the other character Noodle, his assistant, both talking about how they are going to invade Earth.

They wanted to establish their rule on the planet Earth which they believe it to be ridiculous. The Master, Think Tank sends one of the crew to inspect Earth. The crew lands in the library and appears perplexed as they know nothing of its content. So, they consult their Master, Think Tank, who they believe to be very intelligent. Think Tank asks them to show the item and decodes it as sandwiches which are a staple diet of the earthlings. He orders his crew to eat it which they discard as a tasteless one.

Thin Tank's assistant Noodle informs him that they are not sandwiches but may be earthling's communication devices of ears and later he say may be through eyes. All the crew members start opening the sandwiches and reads the book. It was a rhymes book named, Mother Goose. But they were unable to understand anything from the book.

So, they all consume a vitamin from Mars' chemical department which will give them the extra intelligence to decode. The crew after eating the vitamins read the book of rhyme. As Oop started reading the book of nursery rhymes they take the literal meaning of rhymes and feel troubled. Then, Think Tank calls his crew and informs that they have gathered some information about earthlings, and they should be postponing the idea of invasion. The Oop read the rhyme Humpty dumpty, and they all saw the picture of Humpty who looked like Think Tank. The Master drew an inference that the earthlings have identified him and will kill him soon. So, he asked his crew to run immediately from Earth and thus a dusted book of rhymes saved the Earth from invasion from Mars.



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<https://ciet.nic.in/pages.php?id=interactions&ln=en>

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