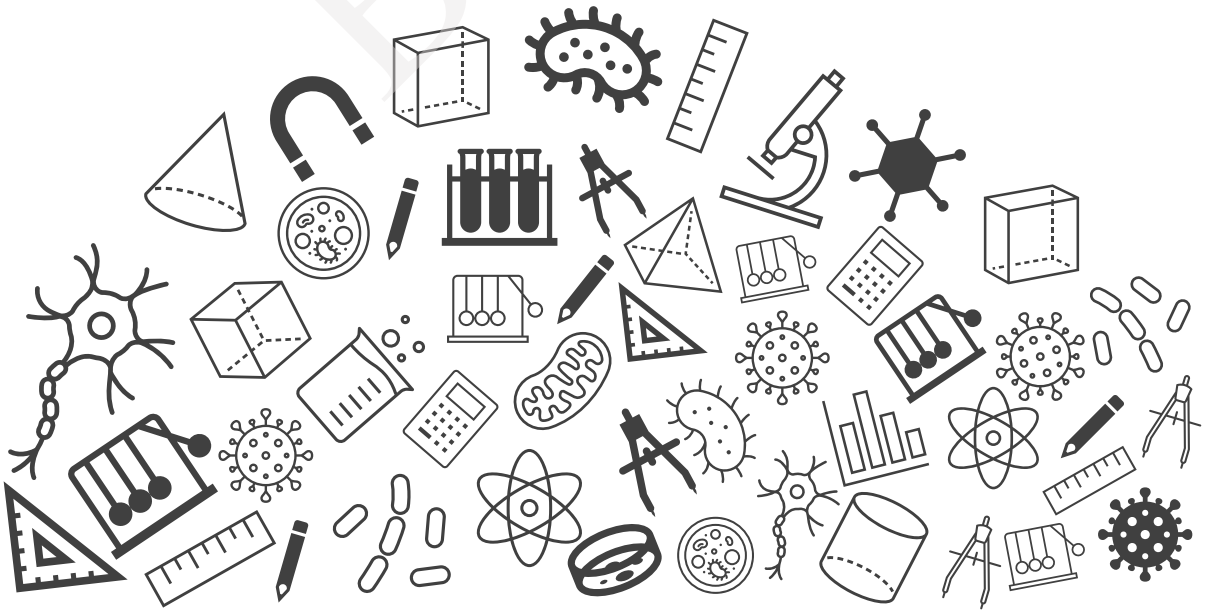
# Grade 08
## Chapter Notes



BIOLOGY

BYJU'S

CHAPTER NOTES

# Crop Production and Management

## Grade 8

# Topics to be covered

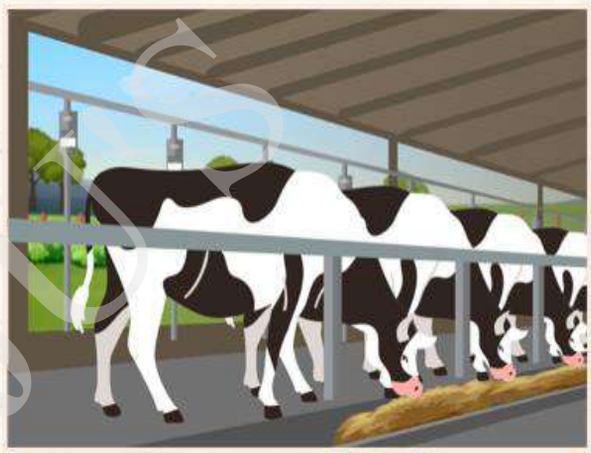
1. Agriculture
2. Types of Crop
3. Agricultural Practices
   - 3.1 Preparation of soil
   - 3.2 Sowing
   - 3.3 Adding manure and fertilisers
   - 3.4 Irrigation
   - 3.5 Protection from weeds
   - 3.6 Harvesting
   - 3.7 Storage
4. Animal Husbandry

# 1. Agriculture

## Definition

- The practice of **cultivating crops** and **rearing livestock** on a **large scale** for the purpose of **food production.**

Cultivation of crops



Rearing of livestock

# 2. Types of Crop

## Types

In India, crops can be broadly **categorised** into **two types** based on seasons – **Rabi** and **Kharif** crops.

## Rabi

- The crops which are **sown** in the **winter season.**
- Examples – wheat, mustard, gram, and pea.




## Kharif

- The crops which are **sown** in the **rainy season.**
- Examples – maize, paddy, soyabean and groundnut.

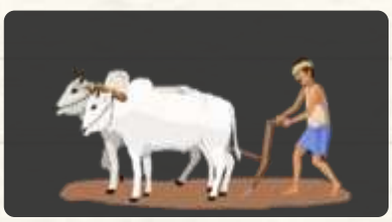



# 3. Agricultural Practices

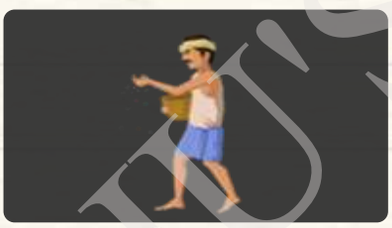
## Definition

The **steps** involved in **agriculture** are collectively termed as **agricultural practices.**

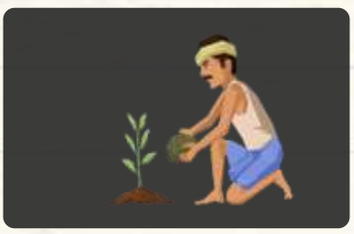
## Agricultural Practices



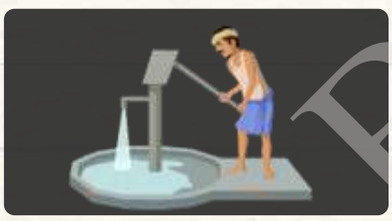
a. Preparation of soil



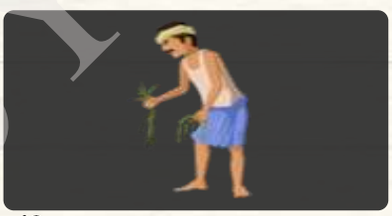
b. Sowing



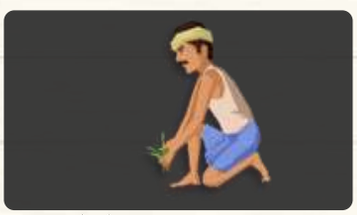
c. Addition of nutrients



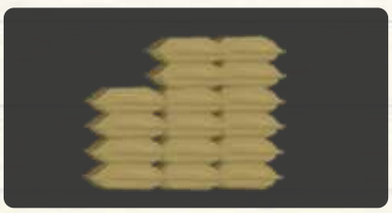
d. Irrigation



e. Removal of weeds



f. Harvesting



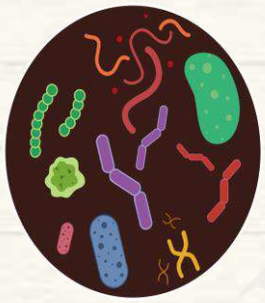
g. Storage

# 3. Agricultural Practices

## 3.1 Preparation of Soil

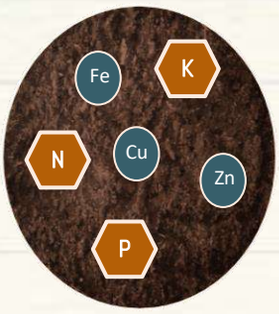
The process of **loosening** and **turning** the soil is called tilling or ploughing. The soil is **ploughed** before sowing the seeds because following are the advantages of soil preparation:

Loosens the **soil**



Helps in **growth** of **microbes**

Allows **root** to **breathe** easily




Mixes the **soil** **nutrients** uniformly

## Tools required for Tilling/ Ploughing

Traditional

### Plough

This is being used since ancient times for **tilling** the soil, **adding fertilisers** to the crop, **removing** the **weeds**, and **turning** the soil.

### Hoe

It is a simple tool that is used for **removing weeds** and for **loosening** the soil.

Modern

### Cultivator

**Ploughing** is done by a tractor-driven cultivator. The use of a cultivator saves labour and time.

# 3. Agricultural Practices

## 3.2 Sowing

The process of **planting seeds** in the soil. Sowing requires a proper selection of seeds and tools.

## Desirable Qualities of Seeds

Seeds should be **disease resistant.**

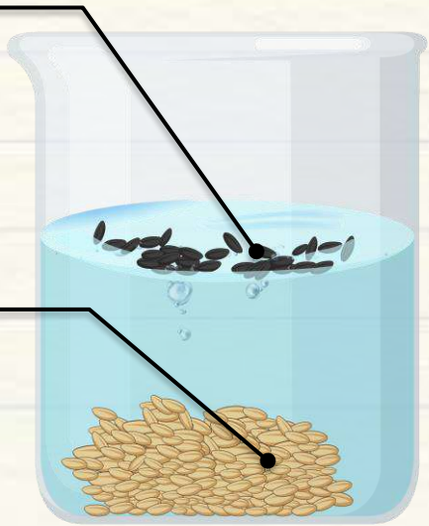
Seeds should be of **high yield variety.**

Seeds should have **wider adaptability.**

## Seed Test

**Damaged seeds** float on the **surface**

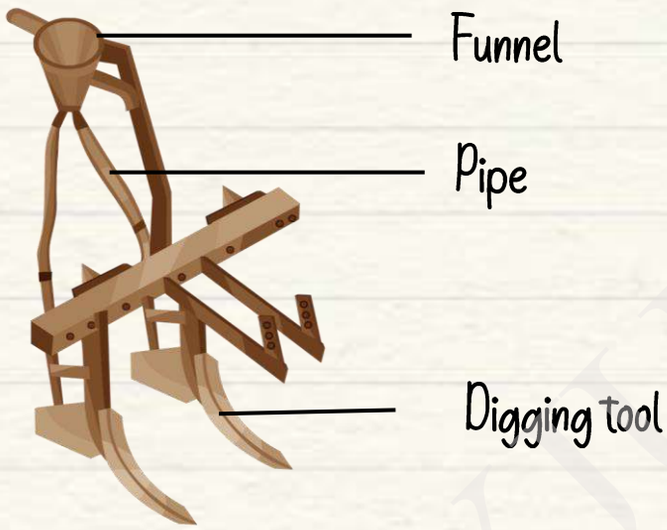
**Healthy seeds** sink to the **bottom**



# 3. Agricultural Practices

## Tools Used for Sowing

### Traditional: Funnel Sowing




- Funnel sowing is a **traditional method** of sowing.
- It has three parts: funnel, pipe-like structure, and a digging tool.
- Cattle is also used in this method of sowing.

### Modern: Seed Drill

- Seeds are **sown uniformly.**
- Seeds are sown at **proper depth.**
- Seeds are **protected** from **birds.**

# 3. Agricultural Practices

## 3.3 Addition of Manure and Fertilisers

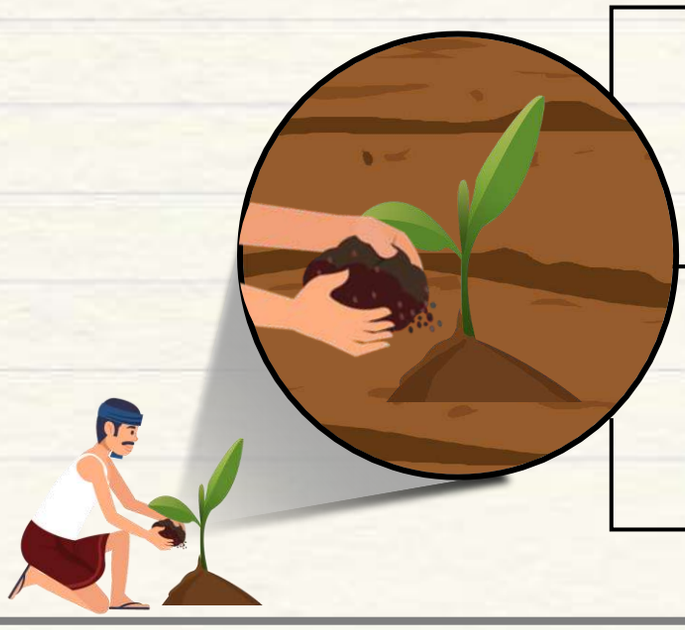
**Composting** is the process of **decomposition** of kitchen wastes, animal wastes, and agricultural wastes. **Manure** is an organic substance obtained from the **decomposition** of **plant or animal wastes.** Farmers dump plant and animal waste in pits in open places and allow it to decompose. The decomposition is caused by some microorganisms. The decomposed matter is used as organic manure.

Animal waste

Kitchen waste

Agricultural waste

## Advantages of Manure



- Enhances **water retention** and **improves soil texture**
- Facilitates **exchange of gases**
- Increases **friendly microbes** and adds **humus** to the soil

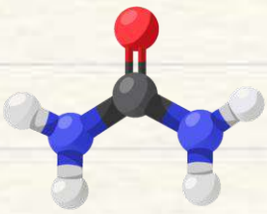
# 3. Agricultural Practices

## Limitations of Manure

- Manure has limited soil nutrients.
- It has a deficit in essential nutrients like nitrogen (N), phosphorus (P), and potassium (K).

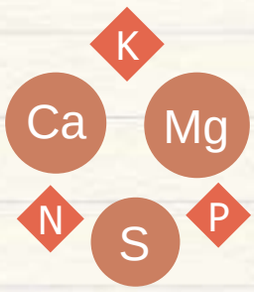
## Fertilisers

- These are **inorganic salts** rich in **nutrients.**
- Examples of fertilisers are urea, potash, NPK, superphosphate, and ammonium sulfate.



Inorganic Salts

Made in factories




Rich in nutrients

# 3. Agricultural Practices

## Advantages of Fertilisers

- Rich in **specific nutrients** (N, P, K)
- Enhances **growth** and **yield** of crops

## Disadvantages of Fertilisers

- Reduces **soil fertility**
- Kills **beneficial organisms** in the soil
- Causes **water pollution**

## Differences between Manure and Fertiliser

### Manure

- **Organic substance** obtained by decomposition of animal and plant waste.
- Prepared in **fields.**
- **Rich** in **nutrients** like **nitrogen, phosphorus** and **potassium.**
- Provides **humus** to the soil.

### Fertiliser

- **Inorganic salt** made from synthetic substances.
- Prepared in **factories.**
- Relatively **less rich** in **nutrients.**
- Does **not provide** any **humus** to the soil.

# 3. Agricultural Practices

## Eutrophication

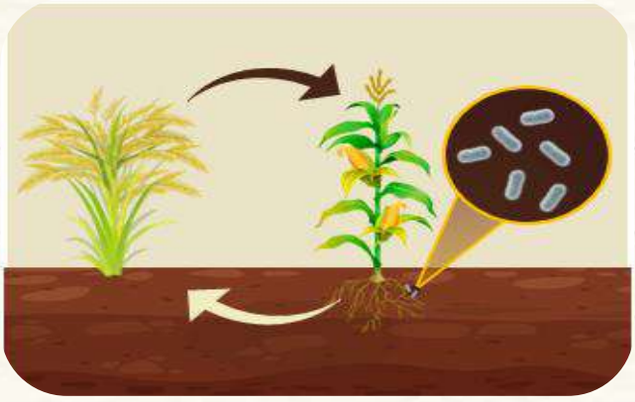
- The **excess fertilisers** wash away from the crop fields into the water bodies.
- Since fertilisers are rich in nutrients, they **promote high algal growth** over the **water surface.**
- The algal growth **takes up** most of the **dissolved oxygen** in water thus leading to the **death** of **aquatic plants** and **fishes.**

## Alternate Methods of Soil Replenishment

### Land Fallowing

- Land is **left barren** for one or more seasons.
- Helps in restoring the lost nutrients in the soil.

### Crop Rotation



- Different crops are **grown alternately.**
- For example, leguminous crops are grown after growing wheat.
- *Rhizobium* in root nodules of leguminous crops fix atmospheric nitrogen.

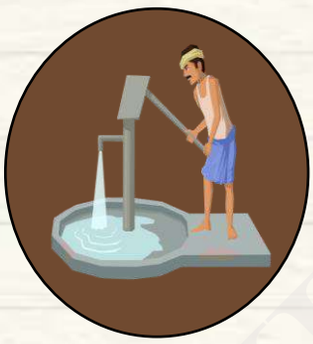
# 3. Agricultural Practices

## 3.4 Irrigation

Supply of **water** to crops at **regular intervals** is called irrigation.

### Sources of Irrigation

River



Tube Well

Well

Dam

## Traditional Methods of Irrigation

### Chain Pump

The farmer **rotates** a **wheel** that **allows the buckets** attached to a chain to **collect water.**

### Moat

A **bucket** is **attached** to a **pulley** that is **drawn by cattle.**

# 3. Agricultural Practices

## Traditional Methods of Irrigation

### Dhekli

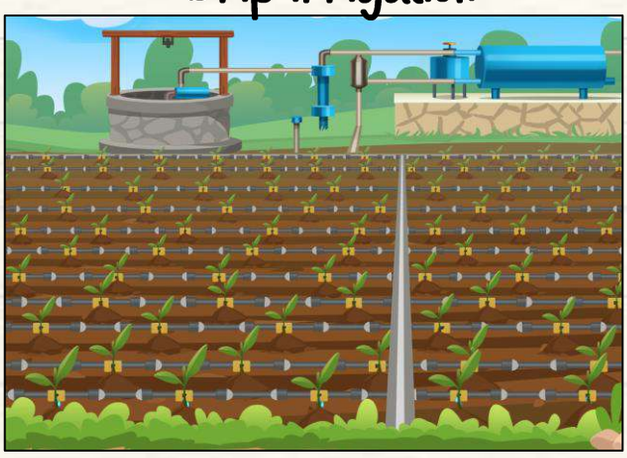
The farmer **immerses** an **empty bucket** into the water. The water-filled bucket is **pulled up** due to the **weight of the rock** on the other end.

### Rahat

**Cattle** is **connected** to a **wheel**. When the cattle move, they **rotate the wheel** that has buckets attached to it. This helps in drawing water from the well.

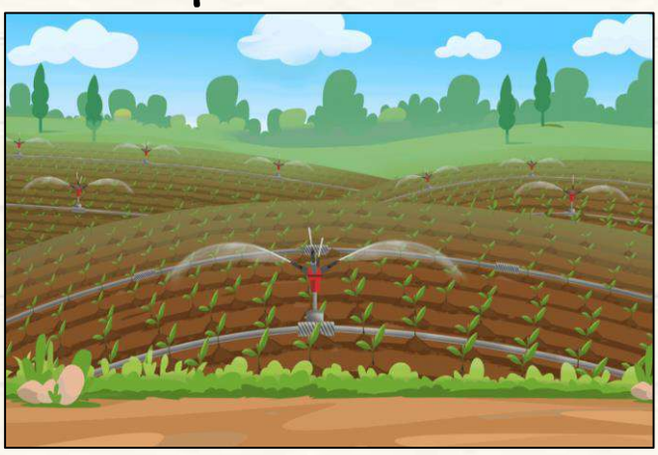
## Modern Methods of Irrigation

### Drip irrigation



In this system, water is supplied to crops **drop by drop** near the roots. So it is called drip system.

### Sprinkler method



This system **simulates rainfall** and is useful on uneven land surfaces.

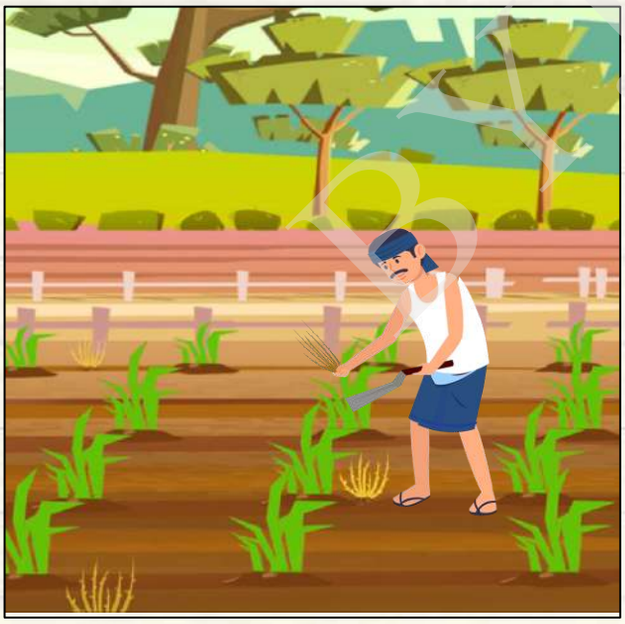
# 3. Agricultural Practices

## 3.5 Protection from Weeds

- In a field, many other **undesirable plants** may grow naturally along with the crop. These undesirable plants are called weeds. The removal of weeds is called weeding.

## Methods of Weeding

### Manual Method



Removal of weeds can be done by:

1. **Tilling** which helps in uprooting and killing weeds.
2. Manually using a **khurpi.**

### Chemical Method

Removal of weeds can be done by:

1. 1. Spraying **weedicides** like 2,4-D kills weeds.
2. 2. Weedicides do not affect crops.

# 3. Agricultural Practices

## 3.6 Harvesting

- Harvesting is **cutting down crops** once they are **matured.**

## Tools of Harvesting

**Traditional Method:**
**Sickle**

**Modern Method:**
**Combine**

Harvesting is done manually with the help of a **sickle** which is a traditional tool.

**Combine** is a modern tool which is a combination of harvester and thresher

# 3. Agricultural Practices

## Post Harvesting: Threshing

- The process of **separating the grains** from the **straw** to which it is attached.

## Post Harvesting: Winnowing

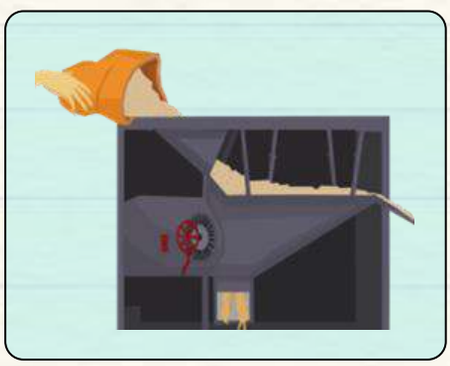
- The process of **separating the grains** from the chaff.

## Tools Used for Winnowing

### Traditional Method

Farmers **manually** separate grains from chaff with the help of **wind.**

### Modern Method



**Winnowing machine** can easily separate grains from the chaff.

# 3. Agricultural Practices

## 3.7 Storage

- Storage of agricultural produce is an important task. If the **harvested grains** are to be kept for **longer time**, they should be **safe** from **moisture, insects, rats and microorganisms.**

## Storage Challenges

Rats, microorganisms, insects, and moisture are the major storage challenges faced by farmers.

## Types of Storage

### Small scale storage

Jute bags

Metal bins

### Large scale storage

Granaries

Silos

# 1. Animal Husbandry

## Definition

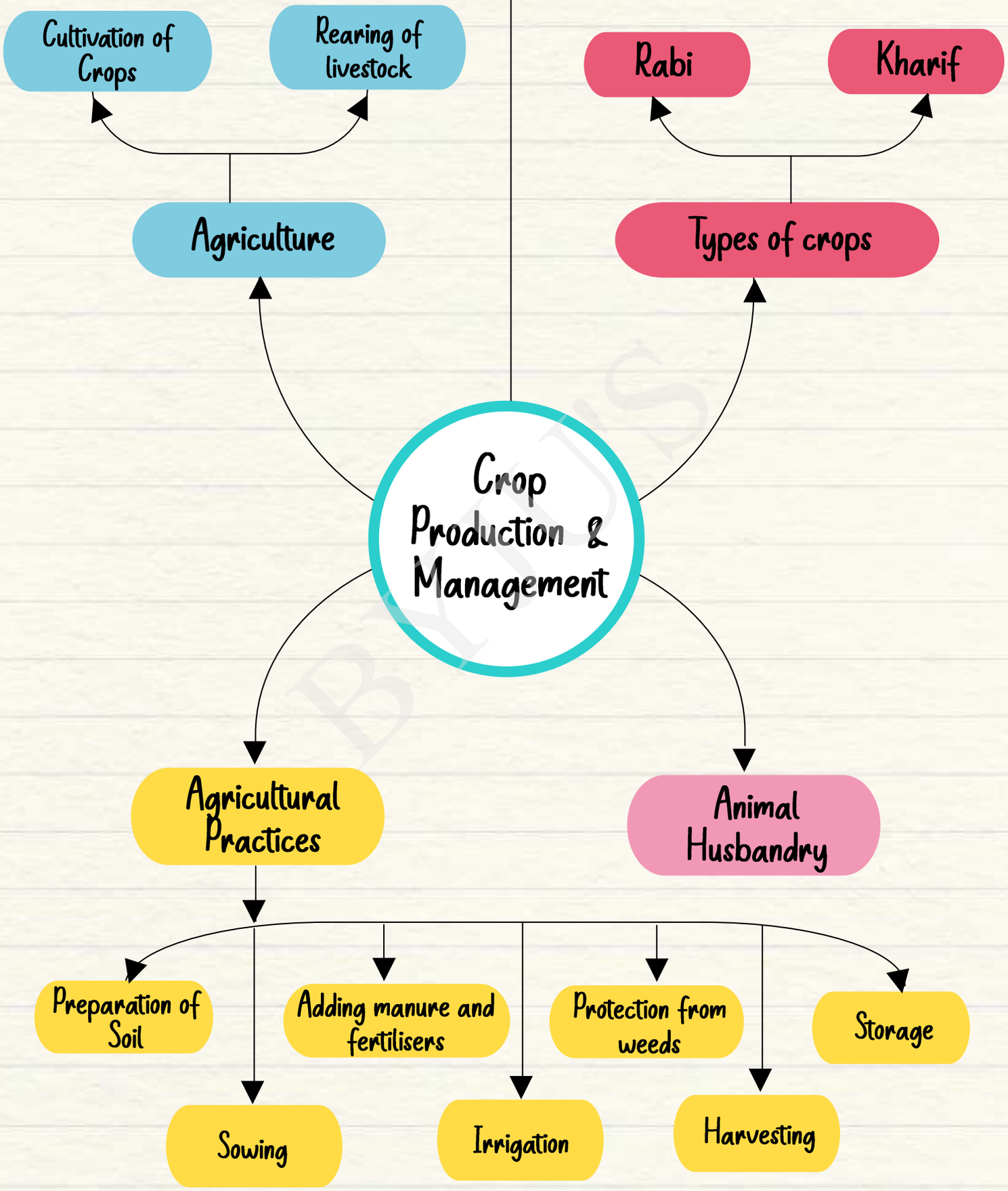
- It is the **practice** of **rearing** and **taking care of animals** on a **large scale** to obtain **food products** from them.

Cattle provide milk

Poultry provides eggs and meat

Fishery provides various nutrients

# Mind Map



BIOLOGY

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CHAPTER NOTES

# Microorganisms: Friend and Foe

# Topics to be covered

1. Microorganisms
   - 1.1 Types of Microorganisms
   - 1.2 Where do Microorganisms Live?
2. Beneficial Microorganisms
   - 2.1 In the Food Industry
   - 2.2 In the Environment
   - 2.3 In the Medical Industry
3. Harmful Organisms
   - 3.1 Diseases in Humans
   - 3.2 Diseases in Plants
   - 3.3 Diseases in Animals
4. Food Preservation
   - 4.1 Need for Preservation
   - 4.2 Methods of Preservation

# 1. Microorganims

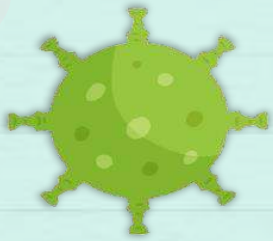
## Definition

- A group of tiny organisms that are visible only under a microscope.
- Microorganisms are of different types such as virus, bacteria, fungi, protozoa, and some algae.

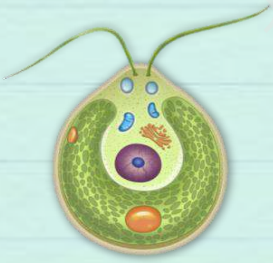
## 1.1 Types of microorganism

### Bacteria

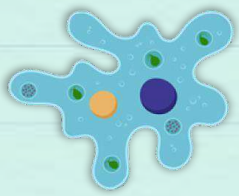
### Virus



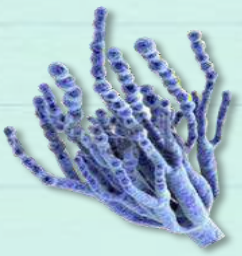
### Algae



### Protozoa



### Fungi



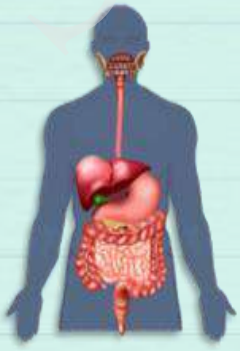
# 1. Microorganisms

## 1.2 Where do microorganism live ?

They live in all types of environments, ranging from ice-cold climates to hot springs; and deserts to water bodies. They are also found inside the bodies of animals including humans.

### Water bodies

### Human digestive system



### Extreme conditions

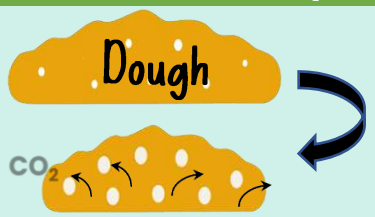
# 2. Beneficial Microorganism

## 2.1 In the Food Industry

### Fermentation

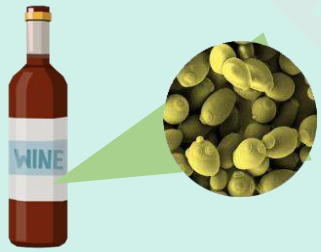
Process of conversion of sugar into alcohol along with release of carbon dioxide by yeast in the absence of oxygen

### Bread making



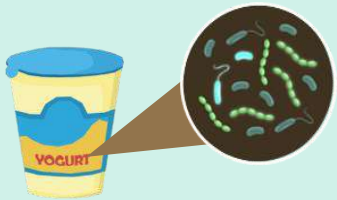

- Yeast is needed in the bread making. It feeds on the sugar present in the dough to release alcohol and carbon dioxide
- The presence of carbon dioxide in the dough gives the bread its fluffy texture.

### Wine making




- Yeast is also needed for the fermentation of grapes to prepare wine.
- The sugar is broken down to form alcohol and carbon dioxide. This alcohol is processed to produce wine.

### Curd making




- *Lactobacillus* helps in the preparation of curd by fermenting milk.
- The sugar molecules of milk is broken down into lactic acid. The lactic acid in the milk leads to the formation of curd.

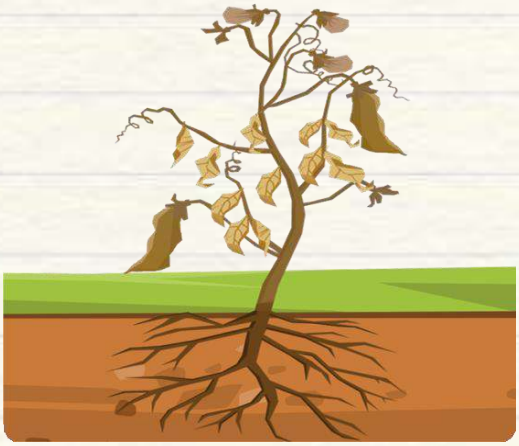
# 2. Useful microorganims

## 2.2 In the Environment

### Nutrient Replenishment in soil

Some bacteria are able to fix nitrogen from the atmosphere in the soil. This enriches the soil with nitrogen and increase its fertility. These microbes are commonly called biological nitrogen fixers

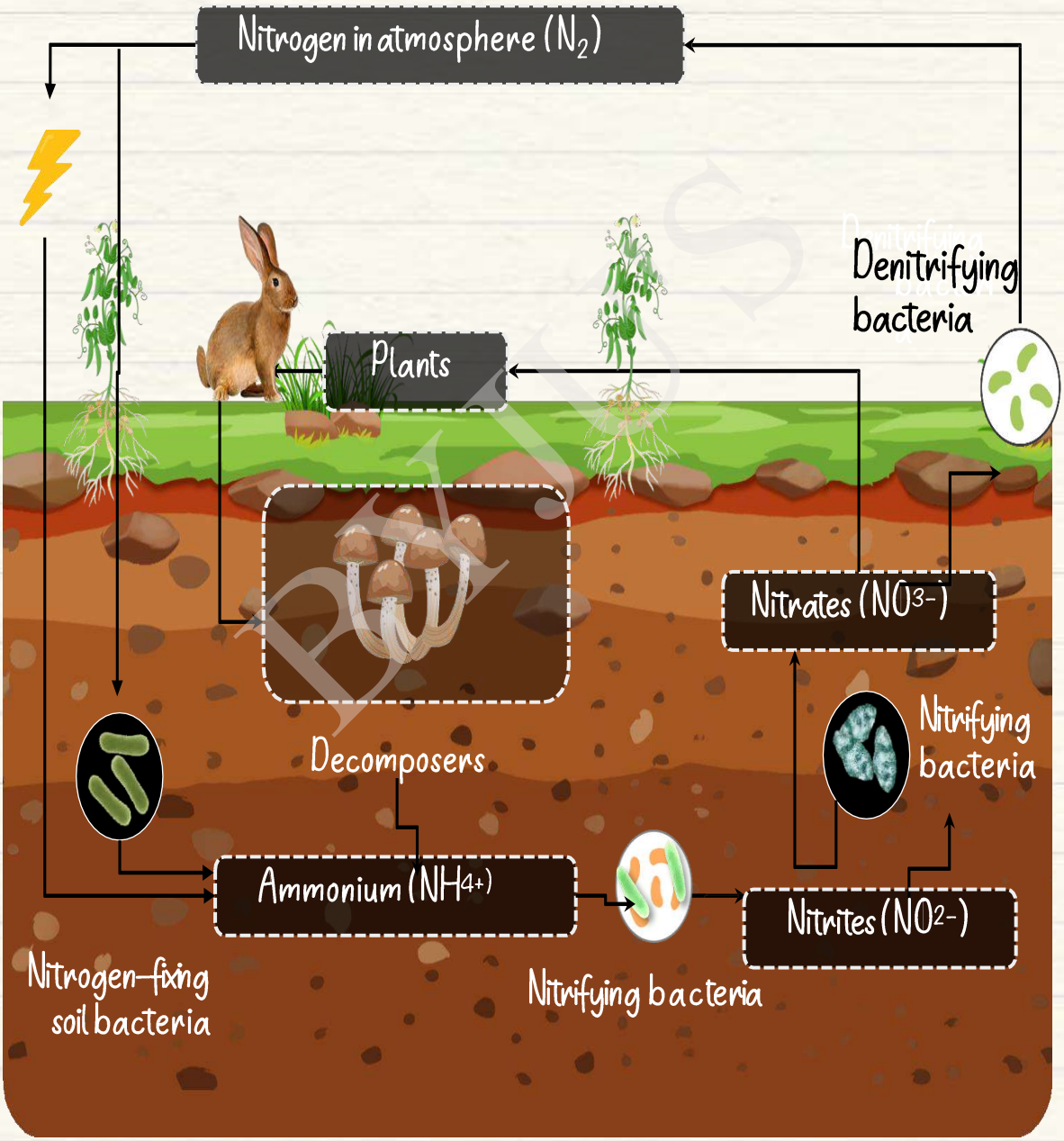
### Decomposition



The microorganisms decompose dead organic waste of plants and animals converting them into simple substances. Thus, it helps in keeping the environment clean.

# 2. Useful microorganisms

## Nitrogen cycle



# 2. Useful microorganims

## 2.3 In the Medical Industry

### Vaccines

- Made up of dead or weakened microbes
- Provides immunity to our body
- Can be injected or given through drops
- Edward Jenner first discovered the vaccine in 1798 for smallpox.
- He used the cowpox virus for the vaccine


Edward Jenner

### Antibiotics

- Chemical substances produced by microbes to kill other microbes
- Streptomycin, tetracycline, and erythromycin are some examples of antibiotics.

# 3. Harmful Microorganism

## Pathogens

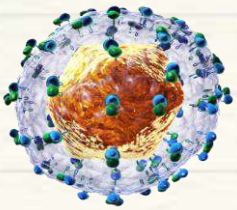
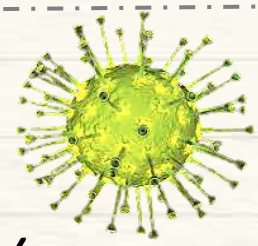
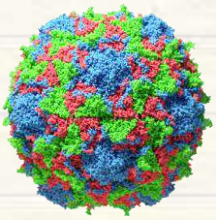
Some of the microorganisms cause diseases in human beings, plants and animals. Such disease-causing microorganisms are called pathogens.

## 3.1 Bacterial Diseases in Humans

| Disease | Mode of transmission | Pathogens |
|---|---|---|
| Tuberculosis | Contaminated air droplets |  Mycobacterium tuberculosis |
| Typhoid | Contaminated water or food |  Salmonella typhi |
| Cholera | Contaminated water or food |  Vibrio cholerae |

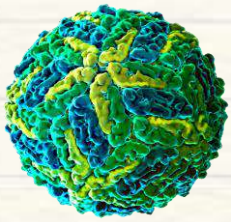
# 3. Harmful Microorganism

## 3.2 Viral Diseases in Humans

| Disease | Mode of transmission | Pathogens |
|---|---|---|
| Hepatitis A | Contaminated water or food |  Hepatitis A virus |
| Chickenpox | Contaminated air or direct contact |  Varicella-zoster virus |
| Polio | Contaminated air or water |  Poliovirus |

# 3. Harmful Microorganism

## 3.3 Vector-borne Diseases in Humans

| Disease | Mode of transmission | Pathogens |
| --- | --- | --- |
| Malaria |  Female *Anopheles* |  *Plasmodium* |
| Dengue |  Female *Aedes* |  *Dengue virus* |

# 3. Harmful Microorganism

## 3.4 Diseases in Animals

| Disease | Causal Agent and Symptoms |
| --- | --- |
| Foot and Mouth Disease (FMD)<br>  | • Transmitted through direct contact and contaminated air droplets<br>• Caused by *Aphthovirus*<br>• Symptoms include:<br>i. Lesions<br>ii. Painful blisters<br>iii. Excessive salivation |
| Anthrax<br>  | • Transmitted through contaminated soil, food, and water<br>• Caused by *Bacillus anthracis*<br>• Symptoms include:<br>i. Difficulty in breathing<br>ii. Convulsions<br>iii. Fever |

# 3. Harmful Microorganism

## 3.5 Diseases causing microbes in Plants

| Disease | Mode of transmission | Pathogens |
|---|---|---|
|  Citrus canker | Air | Bacteria<br>*Xanthomonas axonopodis* |
|  Wheat rust | Air, seeds | Fungi<br>*Puccinia rust fungus* |
|  Yellow vein mosaic | Insects | Virus<br>*Yellow vein mosaic virus* |

# 4. Food Preservation

## 4.1 Need for Preservation

- Microorganisms spoil food by releasing toxic substances. Consuming such food leads to food poisoning.
- For example: *E.coli* enters the body through vegetables and fruits contaminated by sewage water.
- Spoiled food emits bad smell and has a bad taste and changed colour.

## Symptoms of Food Poisoning

Abdominal cramps

Nausea

Fever

Vomiting

Diarrhoea

# 4. Food Preservation

## 4.2 Methods of Preservation

### Vacuum Packing

- Foods are stored in packets from which air is removed.
- The removal of air prevents the growth of microorganism.

### Pasteurisation

- Milk is heated to a certain temperature to kill microbes.
- It is then quickly cooled at a low temperature to prevent further growth of microbes.

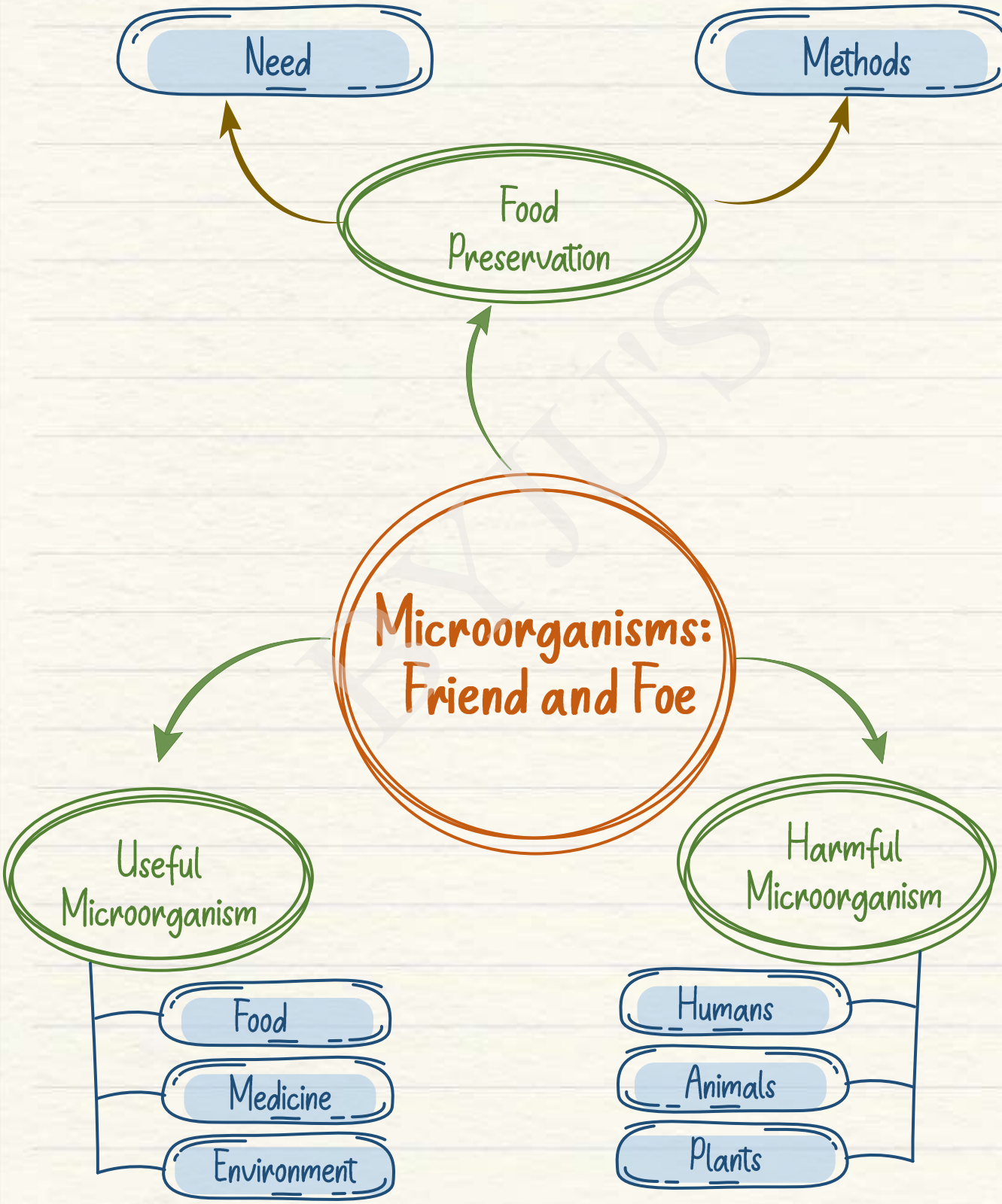
### Addition of Chemical Preservatives

- Sodium benzoate and sodium metabisulphite are commonly used chemical preservatives.

### Salt and Sugar


- Meat and fish are preserved by curing them with salt.
- Jam and jellies are preserved by sugar.
- Both inhibit the growth of microorganisms.

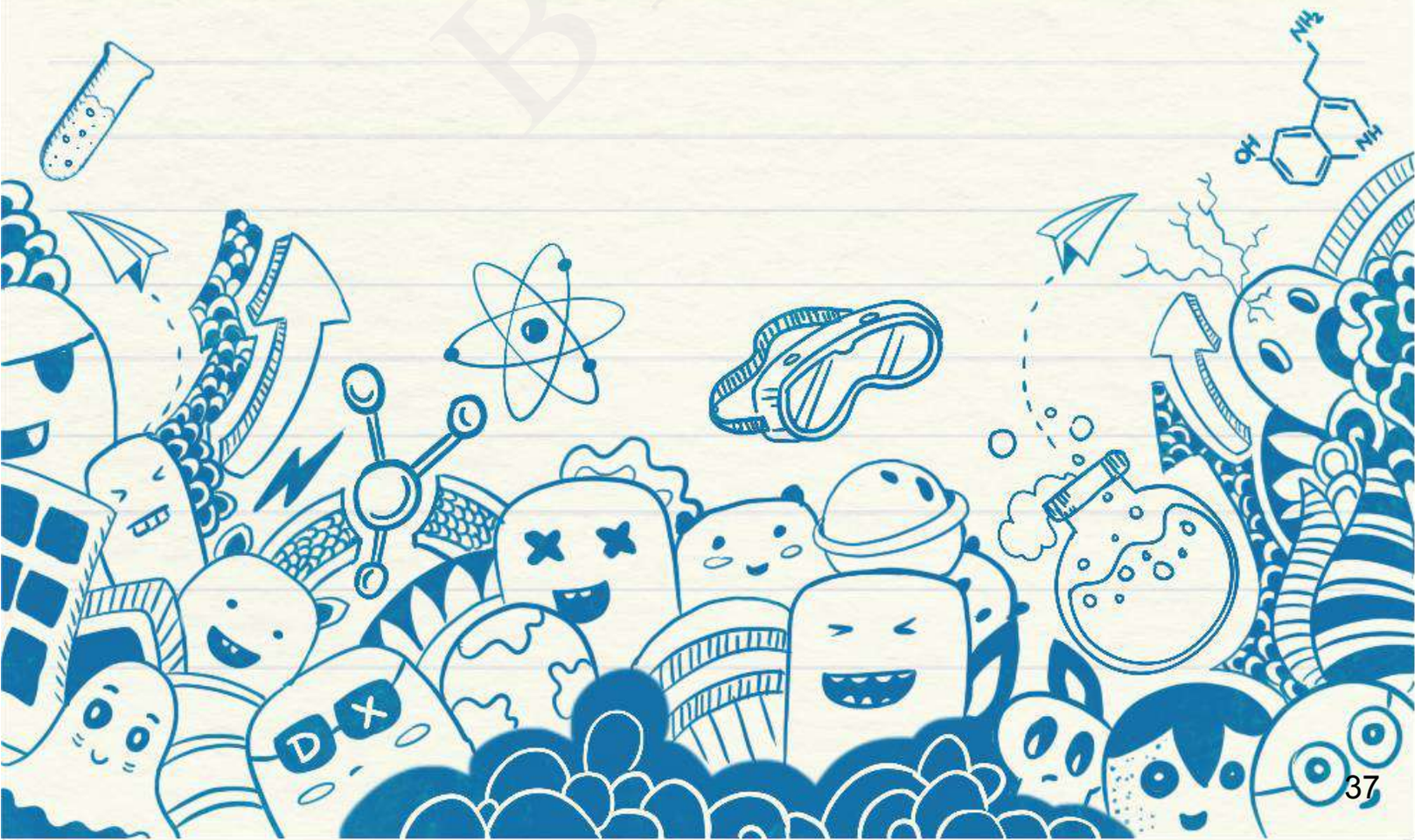
# Mind Map


Need
Methods
Food Preservation
Microorganisms: Friend and Foe
Useful Microorganism
Food
Medicine
Environment
Harmful Microorganism
Humans
Animals
Plants

BYJU'S

CHAPTER NOTES

# Coal and Petroleum



# Topics to be Covered

1. Natural Resources
   - 1.1 Exhaustible Natural Resources
   - 1.2 Inexhaustible Natural Resources
   - 1.3 Fossil Fuels
2. Coal
   - 2.1 Carbonisation
   - 2.2 Uses of coal
   - 2.3 Derivatives of coal
3. Petroleum
   - 3.1 Formation of petroleum
   - 3.2 Extraction of petroleum
   - 3.3 Refining of petroleum
4. Natural gas
   - 4.1 Forms of natural gas
   - 4.2 Uses of natural gas
5. Conservation of Fossil Fuels

# 1. Natural Resources

Materials obtained from nature that are required for our basic needs are known as natural resources.

Sun

Forest


Fuel

## Types of Natural Resources

### 1.1 Exhaustible Natural Resources

- Natural resources that are likely to be exhausted by human activities are called exhaustible natural resources.
- Examples: Fossil fuels, forests, minerals, etc.

### 1.2 Inexhaustible Natural Resources

- Natural resources that are not likely to be exhausted by human activities are known as inexhaustible natural resources.
- Examples: Sunlight, air, etc.

# 1.3: Fossil fuels: Exhaustible Natural Resources

- These are fuels that are found in Earth"s crust and are formed from the dead remains of the living organisms.
- These fuels are used as a source of energy.

## Examples of fossil fuels

Coal


Petroleum

Natural Gas

# 2. Coal

- Coal is a hard black solid fossil fuel found on the Earth.

## 2.1 Carbonisation

- Over millions of years, natural processes led to burying of vegetation under the soil.

⇩

- The dead vegetation got compressed as more soil was deposited over it.

⇩

- Under high pressure and temperature and over a long period of time, these dead remains converted to coal.

## 2.2 Uses of Coal

Power plants

Steam engines

Industries

Cooking

# 2.3 Derivatives of Coal

## Coke

- Tough, porous and black substance
- Purest form of carbon
- Uses:

Steel production

Metal industry

## Coal Gas

- Obtained during processing of coal
- Uses:

Fuel in industries

## Coal Tar

- Thick black liquid with an unpleasant smell
- Mixture of carbonaceous substances
- Uses:

Paints

Explosives

Roads

# 3. Petroleum
# (petra-rock; oleum-oil)


- It is a dark oily liquid with an unpleasant odour

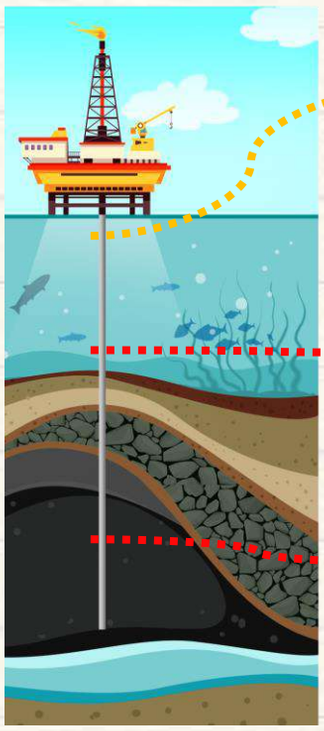
## 3.1 Formation of Petroleum

- Formed from the remains of organisms that got buried under seabed millions of years ago

⇩

- Formed due to the enormous pressure and temperature in the absence of oxygen

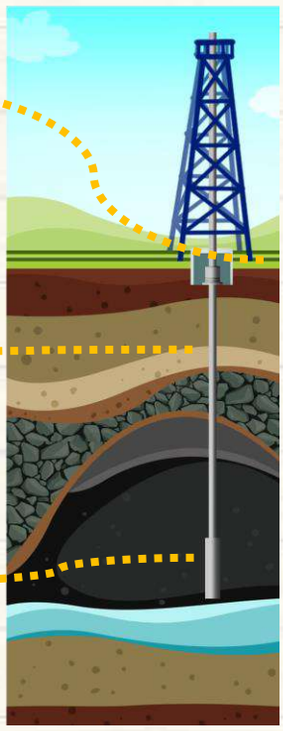
## 3.2 Extraction of Petroleum



Driller and pipeline lowered into the Earth

Drilling pipe is lowered it drills in further

Drilling pipe reaches the deposit and pumps out the oil



- Petroleum wells can be found on both land and seas/oceans

# 3.3 Refining of petroleum

- The process of separating the various constituents of petroleum is called refining.

| Constituents of petroleum | Uses |
|---|---|
| Petrol | Motor fuel, aviation fuel |
| Kerosene | Fuel for stoves, lamps, jets |
| Diesel | Fuel for heavy motor vehicles |
| Lubricating oil | Lubrication |
| Paraffin wax | Ointments, candles, vaseline |
| Bitumen | Paints, road surfacing |
| Petroleum Gas in Liquid form (LPG) | Fuel for home and industry |

Petrochemicals:
These are the chemicals obtained during refining of petroleum.

# 4. Natural gas

- It is formed from the remains of organisms that got buried under seabed millions of years ago.
- Generally found trapped between impervious rocks along with petroleum.

## 4.1 Forms of natural gas

- Natural gas is converted in two forms for usage.

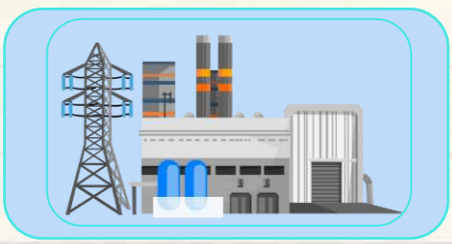
### Compressed natural gas (CNG)

- It has low cost of production.
- It can be transported through pipelines, trucks, and ships.
- It is used as fuel in light vehicles.

### Liquefied natural gas (LNG)

- It has more cost of production.
- It can be transported through trucks and ships.
- It is used as fuel in heavy vehicles.

## 4.2 Other uses of natural gas



Electricity generation

Cooking fuel

# 5. Conservation of fossil fuels

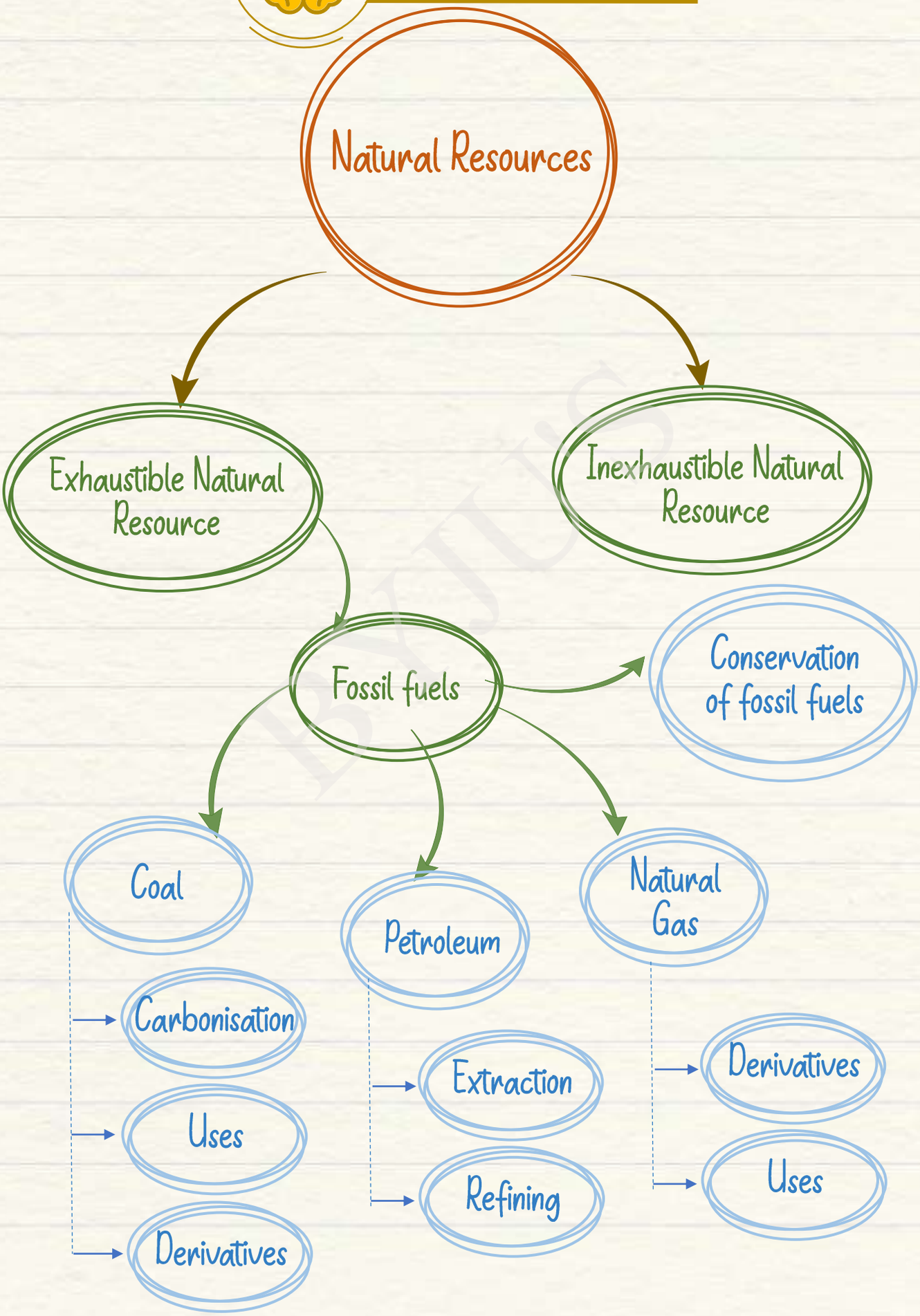
Switching off engines at traffic signals

Regular maintenance of vehicles

Using alternative energy sources

Use of public transport

# Mind Map

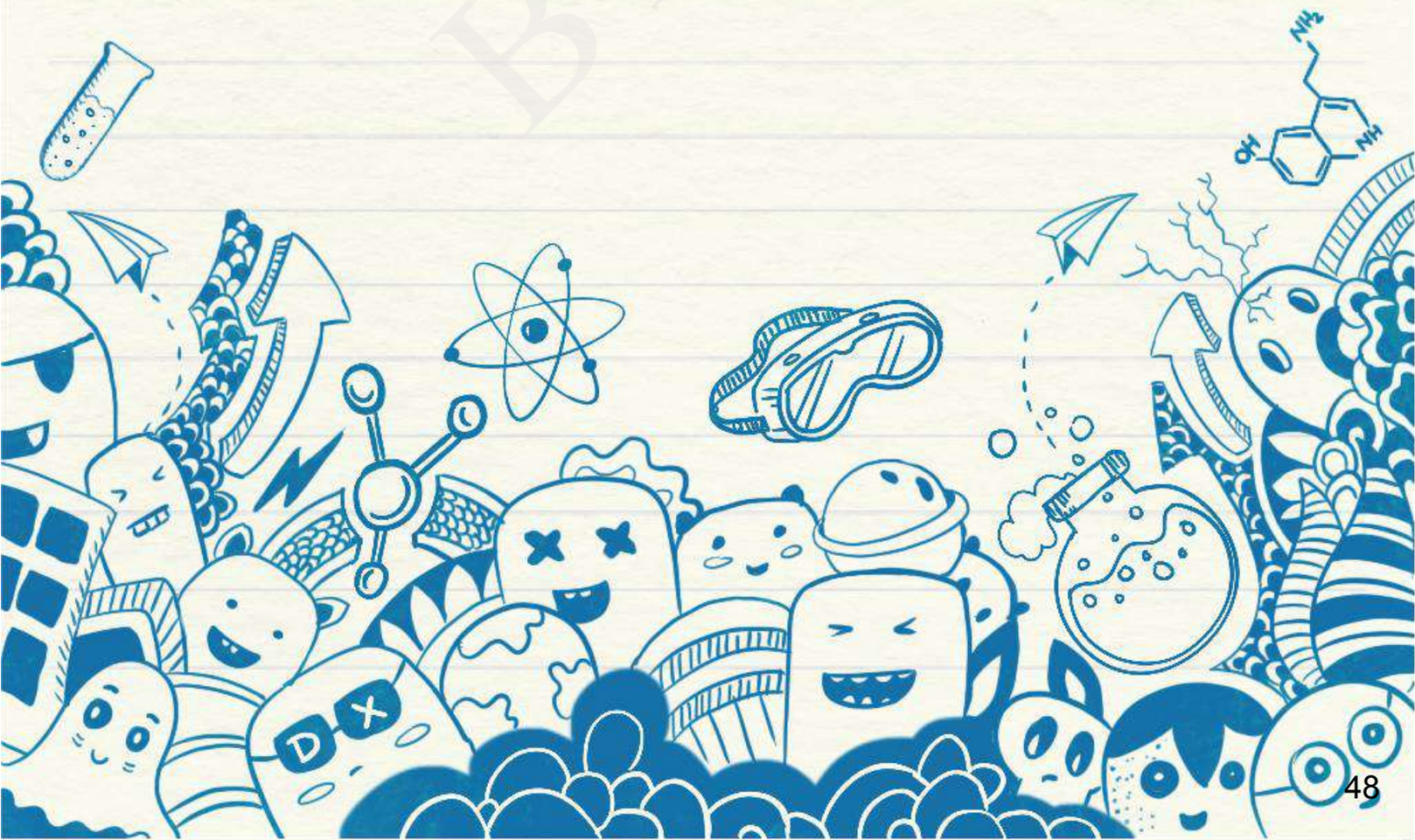


CHEMISTRY

BYJU'S

CHAPTER NOTES

# Combustion and Flame



# Topics to be Covered

1. Introduction to combustion
2. Types of substances
3. Ignition temperature
4. Types of combustion
5. Structure of flame
6. Fuels
7. Calorific value
8. Harmful effects of burning fuel
9. Fire triangle
10. Fire extinguisher

# 1. Introduction to Combustion

Burning of a substance in the presence of air (oxygen) to release energy is called as combustion. It can be represented as:

Substance + Oxygen ⟶ Energy

## 2. Classification of Substances

(Based on combustibility)

### 2.1. Combustible substances

- The substances that undergo combustion easily
- Examples: Matchstick, petrol, coal and paper

### 2.2. Non-combustible substances

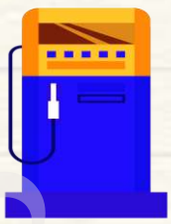
- The substances that do not undergo combustion
- Examples: Bricks, sand, iron nails and glass

# 3. Ignition Temperature

- Ignition temperature is the lowest temperature at which a substance catches fire.

Ignition temperature of certain substances

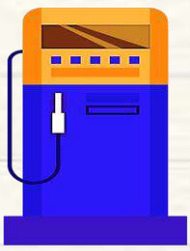
Wood: 260°C



Petrol: 220°C

## Inflammable substances

Inflammable substances are the substances that catch fire quickly due to their low ignition temperature.



Petrol

LPG


Hydrogen

The terms flammable and inflammable mean exactly the same thing. They are used for substances that can burn very easily. The term non-flammable is used for substances that cannot burn at all or are very difficult to burn.

# 4. Types of Combustion

## 4.1 Based on the Supply of Oxygen

### Combustion

### Complete

- Sufficient supply of oxygen results in complete combustion.
- Production of clean blue flame.
- Production of carbon dioxide and water vapour.

### Incomplete

- Limited supply of oxygen results in incomplete combustion.
- Production of yellow flame.
- Production of carbon monoxide and soot (residue).

A process similar to combustion occurs inside our body as well. It is respiration.

# 4. Types of Combustion

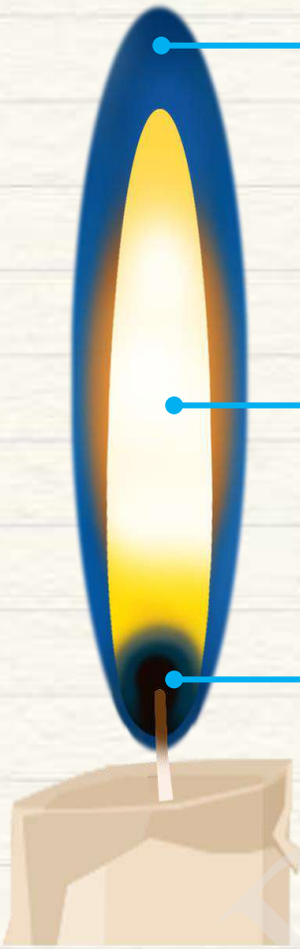
## 4.2 Based on the requirement of External heat

**Combustion**

- **No external heat source is required**
  - **Spontaneous**
    - The substance suddenly bursts into flames, without any external ignition source
    - 
    - Combustion of Phosphorous
- **External heat source is required**
  - **Rapid**
    - The substance burns rapidly to produce heat and light.
    - 
    - Combustion of a matchstick
  - **Explosion**
    - The substance undergoes sudden reaction on ignition to produce heat, light and sound.
    - 
    - Combustion of firecrackers

Spontaneous combustion of coal dust has resulted in many disastrous fires in coal mines.

# 5. Structure of Flame



**Outermost zone (Non- luminous zone)**
- Hottest zone
- Temperature = 1400°C.
- Blue in colour.
- Complete combustion occurs.

**Middle zone (Luminous zone)**
- Moderately hot
- Temperature = 1200°C.
- Yellow in colour.
- Incomplete combustion occurs.

**Innermost zone (Dark zone)**
- Least hot zone
- Temperature = 600°C.
- Black in colour.
- Contains unburnt wax vapours.

The substances that do not vaporize while burning do not produce flames.

Charcoal burning without flames

The substances which vaporize while burning produce flames.

Kerosene oil burning with flames in lamp

# 6. Fuel

- Fuels are the combustible substances that produce significant amount of heat upon combustion.

- Solid fuels: Wood and coal
- Liquid fuels: Petrol and kerosene
- Gaseous fuels: LPG and CNG

All combustible substances are not fuels as some combustible substances like paper and do not produce significant amount of heat upon combustion.

## 6.1 Ideal Fuel

- An ideal fuel should have the following characteristics:


Easy availability


Releases large amount of heat


Economical

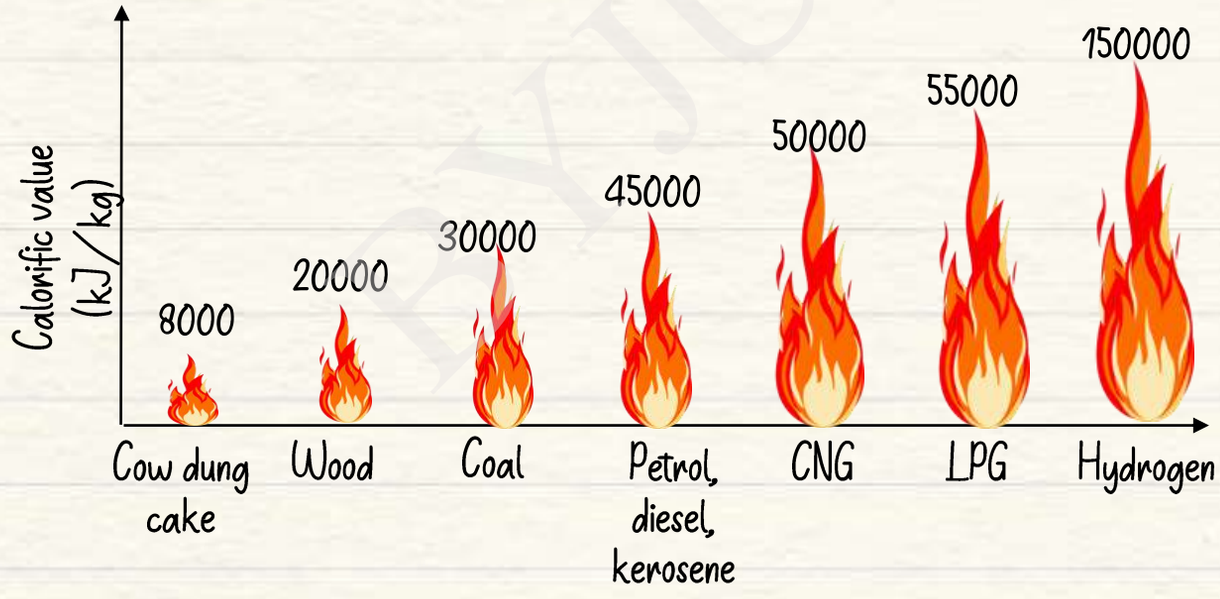

No undesirable residue

# 1. Calorific value

- Calorific value is the heat energy (in kJ) produced on complete combustion of 1 kg of fuel.

$$\text{Calorific value} = \frac{\text{Amount of heat produced (kJ)}}{\text{Mass of fuel (kg)}}$$

## Calorific value of various fuels




Calorific value is used the express the efficiency of a fuel.

# 5. Conservation of fossil fuels

## Air pollution

Due to unburnt carbon particles and harmful gases

## Respiratory problems (Asthma)

Due to unburnt carbon particles

## Carbon monoxide poisoning

Due to incomplete combustion of fuels

## Acid rain

Due to oxides of nitrogen, sulphur and carbon

## Global warming

Due to carbon dioxide and other gases

### Melting of Glaciers

Rise in sea level

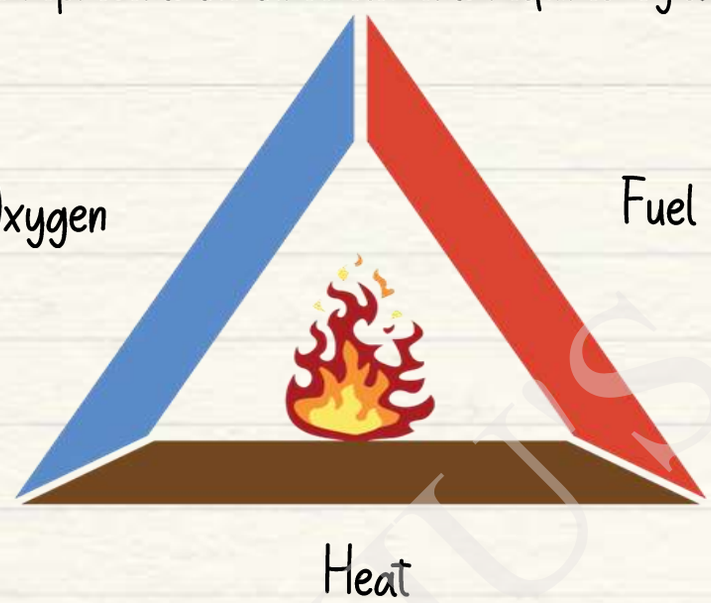
### Floods

Submerging of low-lying coastal areas

Fuels like CNG (Compressed Natural Gas) and LPG (Liquefied Petroleum Gas) are called cleaner fuels as they produce the harmful products in very small amounts.

# 9. Fire triangle

A fire triangle represents the three elements required by a fire needs to ignite.




- A fire can be extinguished by removing one or more of the elements in the fire triangle:
- Cut off the supply of air (oxygen)
- Cut off fuel
- Reduce heat to bring down the temperature of the fuel below the ignition temperature

In most of the cases, the fuel cannot be eliminated for extinguishing fire.

# 10. Fire Extinguisher

## Water

A fire triangle represents the three elements required by a fire needs to ignite

## Blanket

Cuts off the supply of oxygen

## Sand


Cuts off the supply of oxygen

## Carbon dioxide


Reduces the temperature of fuel and cuts off the supply of oxygen

Water is not suitable for extinguishing fires involving:

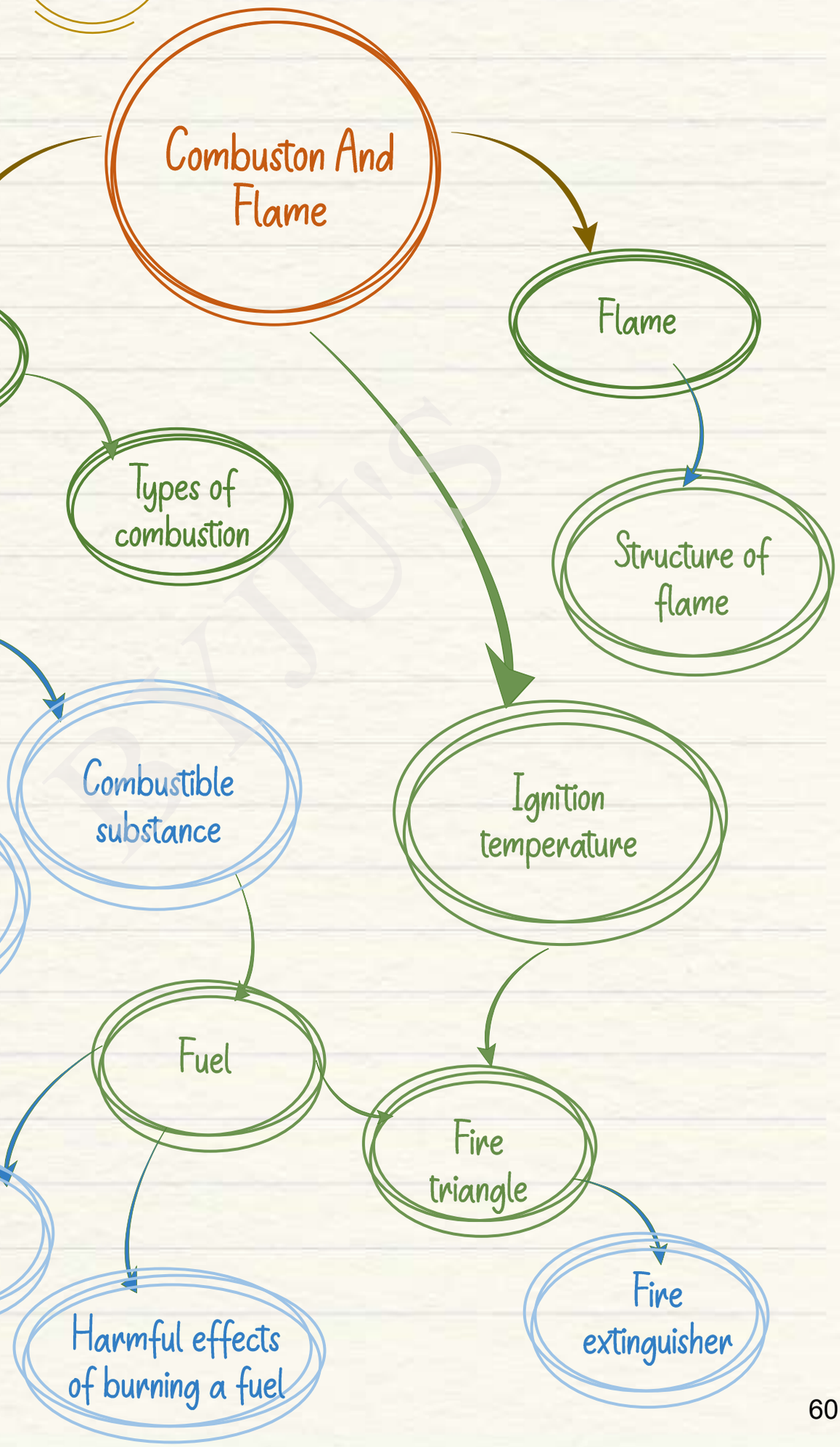
### Oil

Water being heavier sinks below the oil, and oil keeps burning on the top.

### Electrical equipment

Water may conduct electricity and electrocute the person trying to douse the fire.

# Mind Map


Combuston And Flame
Combustion
Types of combustion
Types of substances
Combustible substance
Non-combustible substance
Flame
Structure of flame
Ignition temperature
Fuel
Calorific value
Harmful effects of burning a fuel
Fire triangle
Fire extinguisher

BYJU'S
CHAPTER NOTES

# Conservation of Plants and Animals

## Grade 8

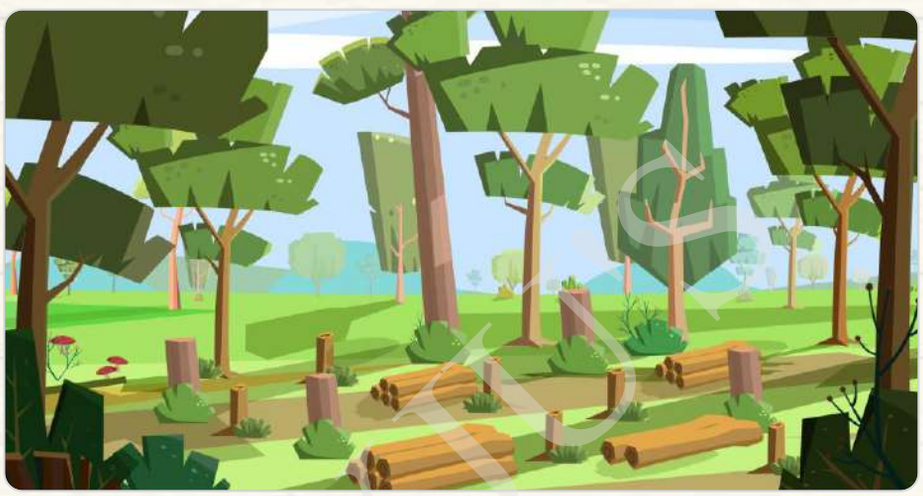
# Topics to be covered

1. Deforestation
   - 1.1 Causes of deforestation
   - 1.2 Consequences of deforestation
2. Conservation of plants and animals
   - 2.1 Endangered species
   - 2.2 Extinct species
   - 2.3 Biosphere reserve
   - 2.4 Wildlife sanctuary
   - 2.5 National park
   - 2.6 Project Tiger
   - 2.7 Zoo
   - 2.8 Endemic species
3. Red Data Book
4. Migration

# 1. Deforestation

## Definition

- Deforestation means clearing forests and using that land for other purposes.



Deforestation

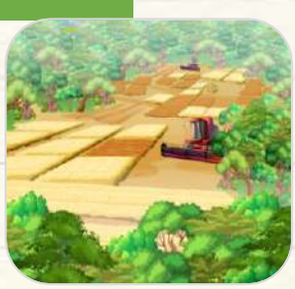
## 1.1 Causes of deforestation

Drought

Forest fire

Hurricane

Natural causes of deforestation



Agricultural field

Industrialisation

Urbanisation

Illegal logging

Man-made causes of deforestation

# 1. Deforestation

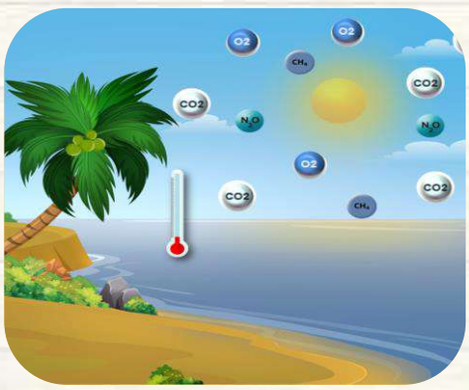
## 1.2 Consequences of deforestation

Soil erosion

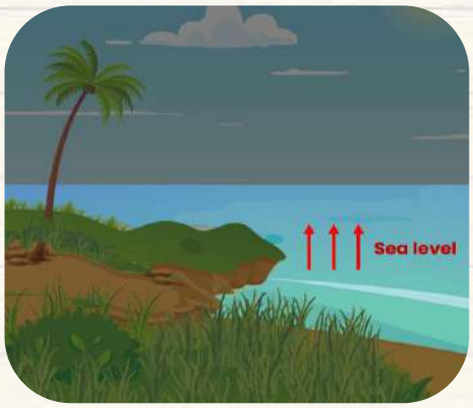
Decreased rainfall

Drought

Desertification




Global warming

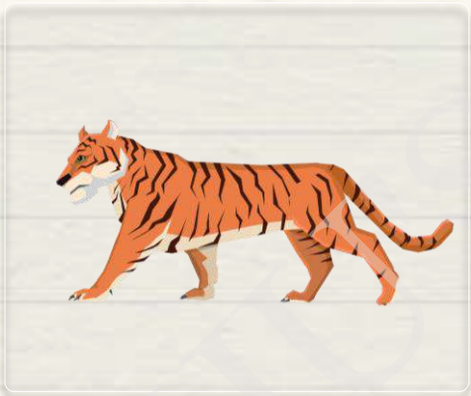



Increase in sea level

# 2. Conservation of plants and animals

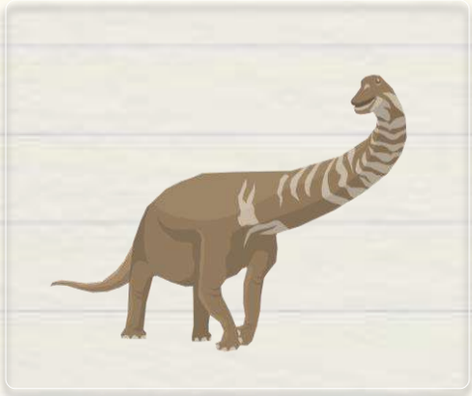
## 2.1 Endangered species

- Species of plants and animals that are on the verge of extinction are known as endangered species.
- Example: Tiger



## 2.2 Extinct species

- The species of plants and animals which are completely wiped out from the Earth are called extinct species.
- Example: Dinosaur



# 2. Conservation of plants and animals

## 2.3 Biosphere reserve

- Biosphere reserves are large areas of protected land for the conservation of wildlife resources and the traditional life of the tribals living in the area.


## 2.4 Wildlife sanctuary

- Wildlife sanctuaries are the protected areas where animals are protected from any disturbance to them and their habitat.

# 2. Conservation of plants and animals

## 2.5 National park

- National parks are areas reserved for wildlife where they can freely use their habitats and natural resources.
- Along with flora, fauna, and landscape it also protects the historic objects of the area.


## 2.6 Project Tiger

- Project Tiger was launched by the Government of India for the conservation of tiger.

# 2. Conservation of plants and animals

## 2.7 Zoo

- Zoo provides artificial habitat to animals and birds.
- It is created for visitors to watch animals and birds as a part of tourism.


## 2.8 Endemic species

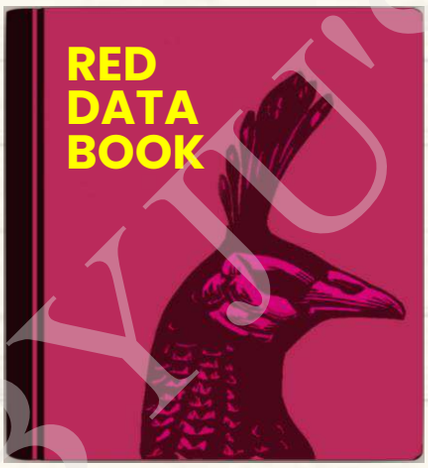
- Species that are found exclusively in a particular area is known as endemic species.
- Flying squirrel is the endemic fauna and the Sal tree is the endemic flora of the Pachmarhi biosphere reserve.

Flying squirrel

Sal tree

# 3. Red Data Book

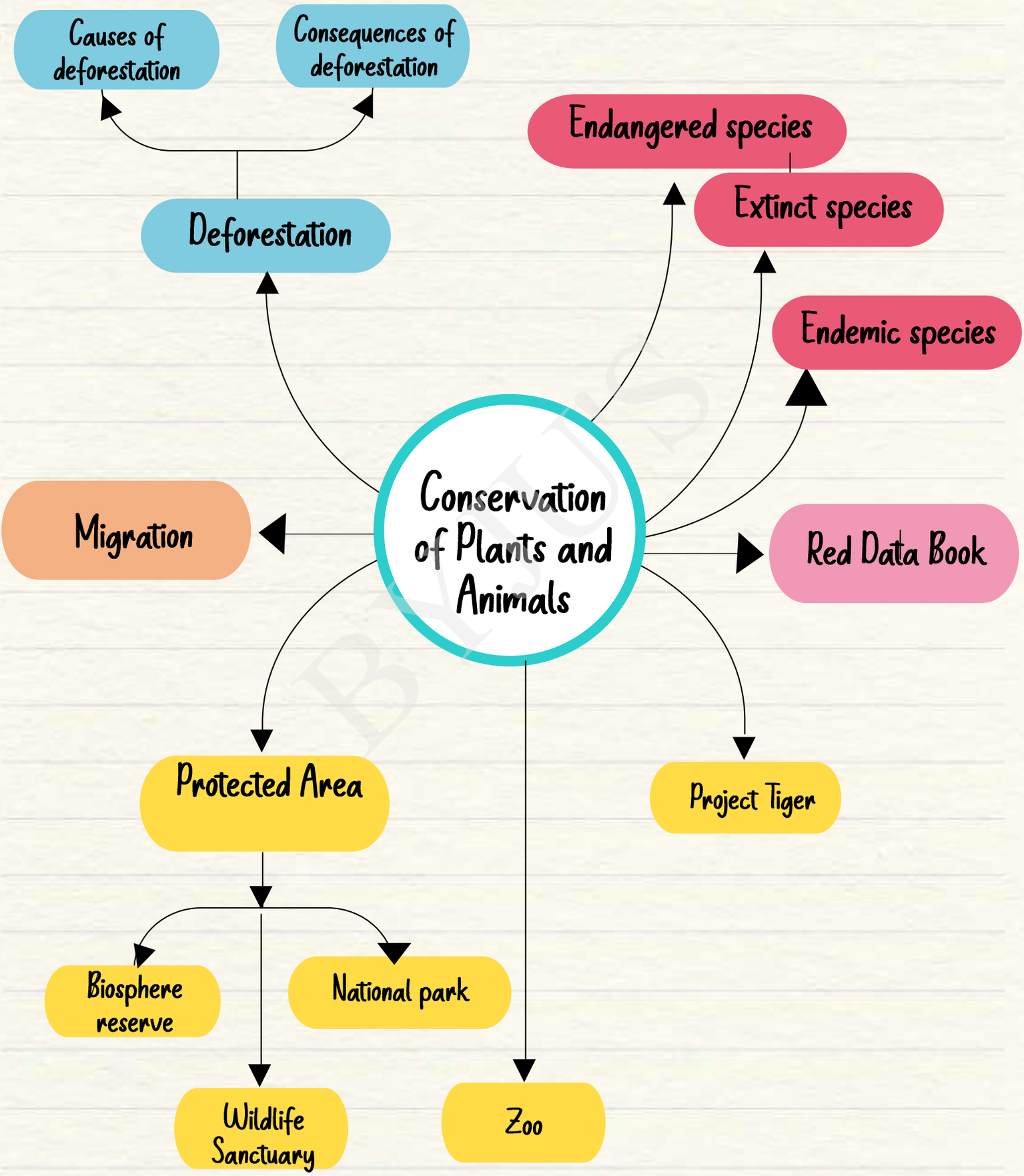
- Red Data Book is a sourcebook that keeps a record of all the endangered plants and animals.
- It is maintained by IUCN- International Union for Conservation of Nature.



# 1. Migration

- Migratory birds fly to faraway areas every year during a particular time because of climatic changes.
- They fly to lay eggs as the weather in their natural habitat becomes cold and inhospitable.
- Birds who cover long distances to reach another land are known as migratory birds.

# Mind Map


Causes of deforestation
Consequences of deforestation
Deforestation
Endangered species
Extinct species
Endemic species
Migration
Conservation of Plants and Animals
Red Data Book
Protected Area
Project Tiger
Biosphere reserve
National park
Wildlife Sanctuary
Zoo

BYJU'S Classes

# Class Notes

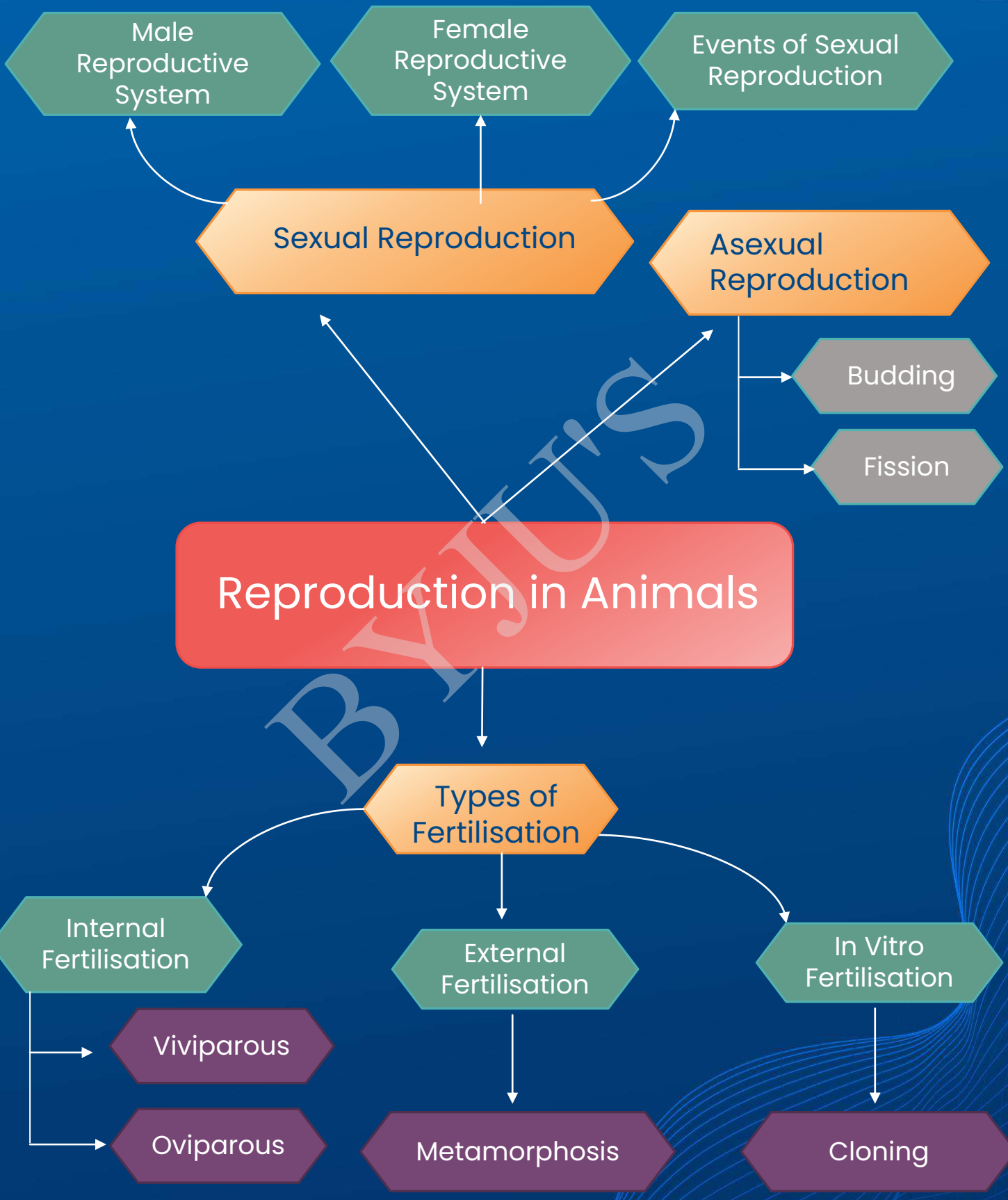
# Reproduction in Animals

## Grade 8

# Topics to be Covered

1. Reproduction
   - 1.1 Asexual reproduction
   - 1.2 Sexual reproduction
2. Asexual Reproduction
   - 2.1 Fission
   - 2.2 Budding
3. Sexual Reproduction
   - 3.1 Male Reproductive System
   - 3.2 Female Reproductive System
   - 3.3 Events in Sexual Reproduction
4. Types of Fertilisation
   - 4.1 Internal Fertilisation
   - 4.2 External Fertilisation
   - 4.3 In Vitro Fertilisation

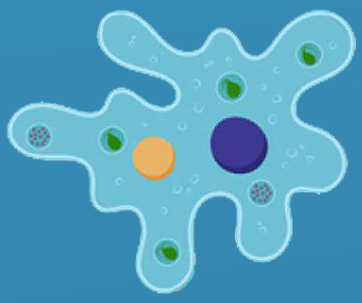
# Mind Map



# 1. Reproduction

- The process in which organisms produce young ones of their own kind is known as reproduction.
- Reproduction ensures continuation of species.

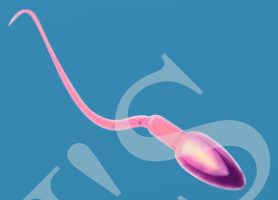
## Asexual Reproduction



*Amoeba*

*Hydra*

## Sexual Reproduction



Sperm

Ovum



## 1.1 Asexual Reproduction

- Involves only one parent.
- Gametes are not formed.
- Fertilisation doesn't occur.

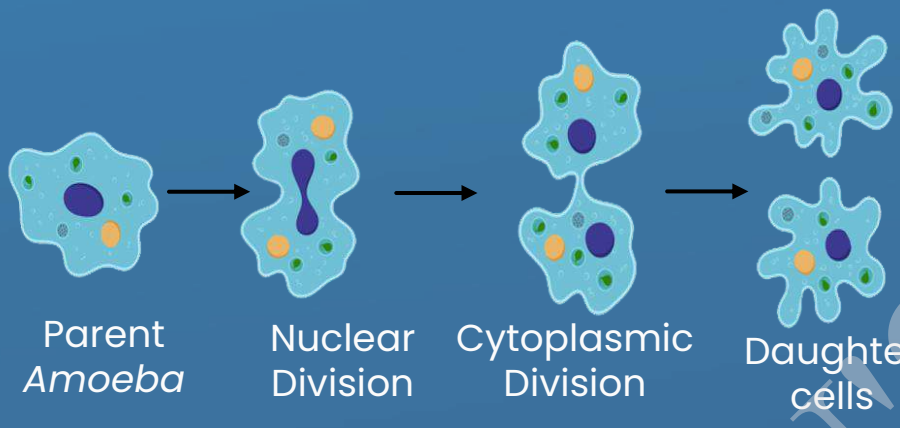
## 1.2 Sexual Reproduction

- Involves both the parents.
- Gametes are formed.
- Fertilisation occurs.

# 2. Asexual Reproduction

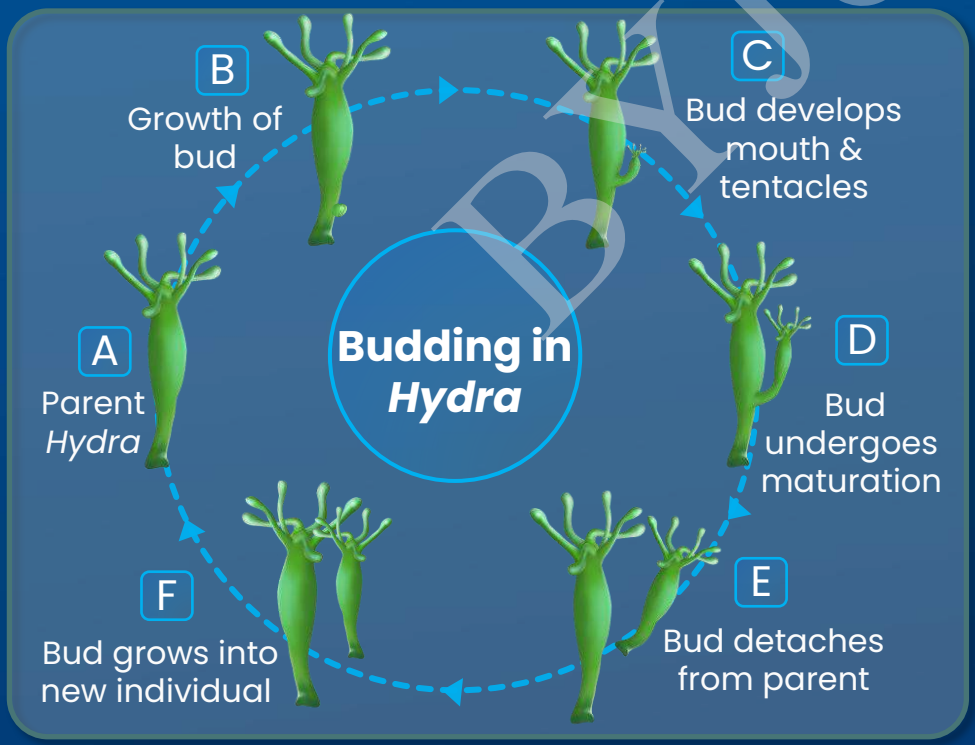
The two types of asexual reproduction that we have studied is fission in *Amoeba* and budding in *Hydra*.

## 2.1 Fission




*Amoeba* reproduces by dividing itself into two daughter cells.

## 2.2 Budding

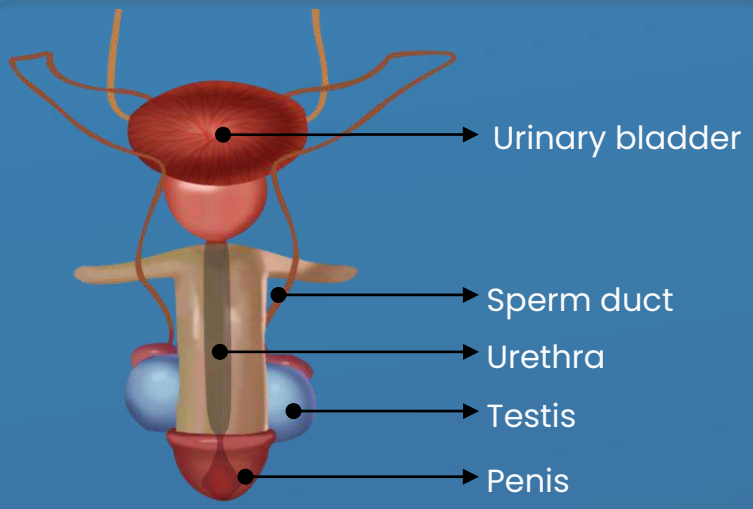



In *Hydra*, new individuals develop from buds.

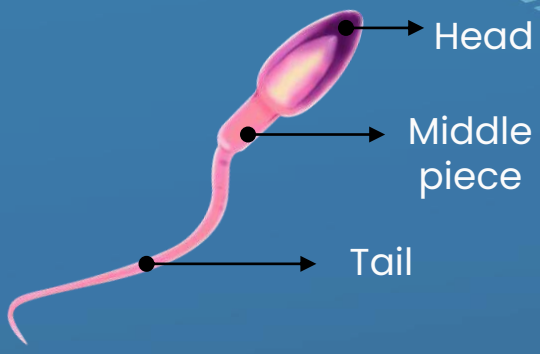
# 3. Sexual Reproduction

Reproduction resulting from the fusion of male and female gametes is called sexual reproduction.

## 3.1 Male Reproductive System



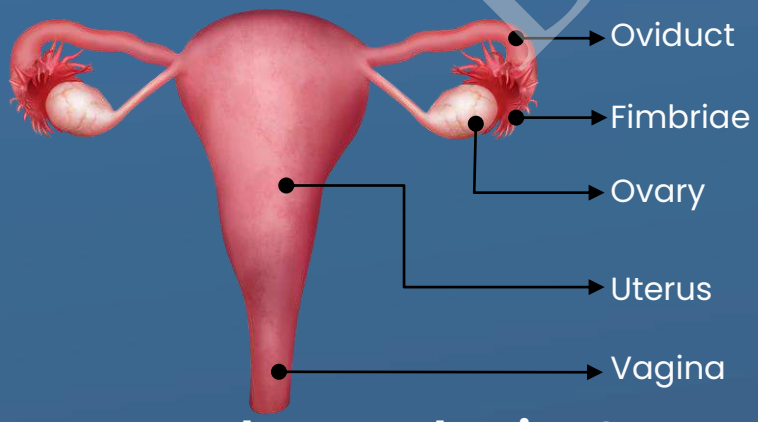

**Male Reproductive System**




**Structure of Sperm**

- The male reproductive system includes a pair of testes, sperm ducts and a penis. The male reproductive system is responsible for producing sperms.
- Sperm contains head, middle piece and tail. Genetic material is present in the head, mitochondria in the middle piece provides energy and the tail helps in movement.

## 3.2 Female Reproductive System




**Female Reproductive System**

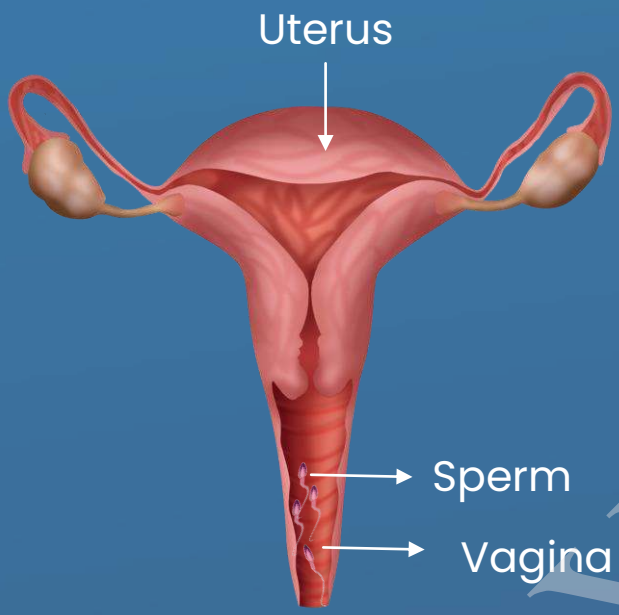
**Ovary**

- The female reproductive system includes a pair of ovaries, oviducts and a uterus. It is responsible for producing ova/eggs.
- Ova are produced in the ovaries and released alternately every month. Uterus provides site for the embryo development.

# 4. Events in Sexual Reproduction

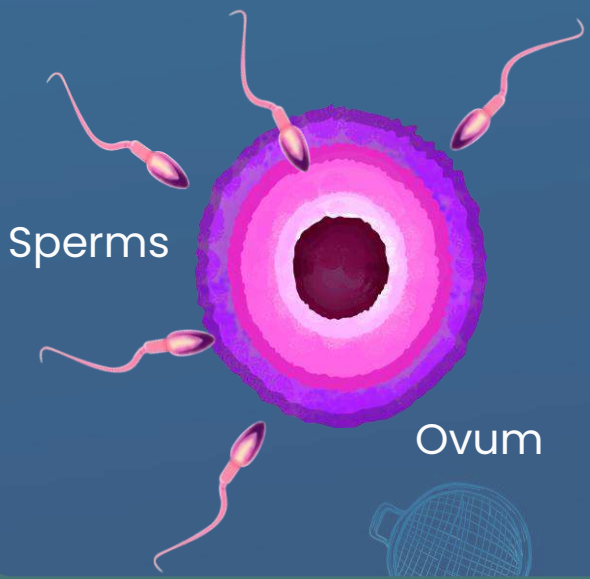
Events of sexual reproduction includes insemination, fertilisation, embryo formation and implantation.

## Insemination




Insemination is the deposition of sperms in the vagina.

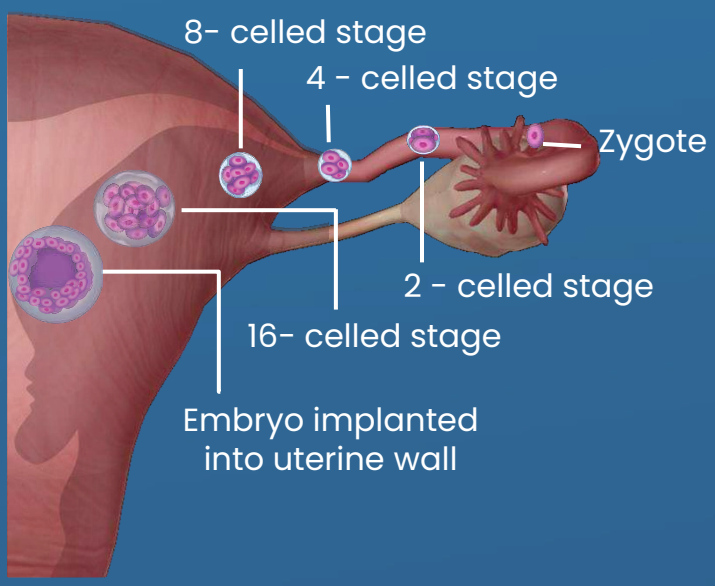
## Fertilisation




- The fusion of ovum and sperm is called fertilisation. The fertilised egg is called a zygote.
- Zygote develops into an embryo, which grows into a young one.

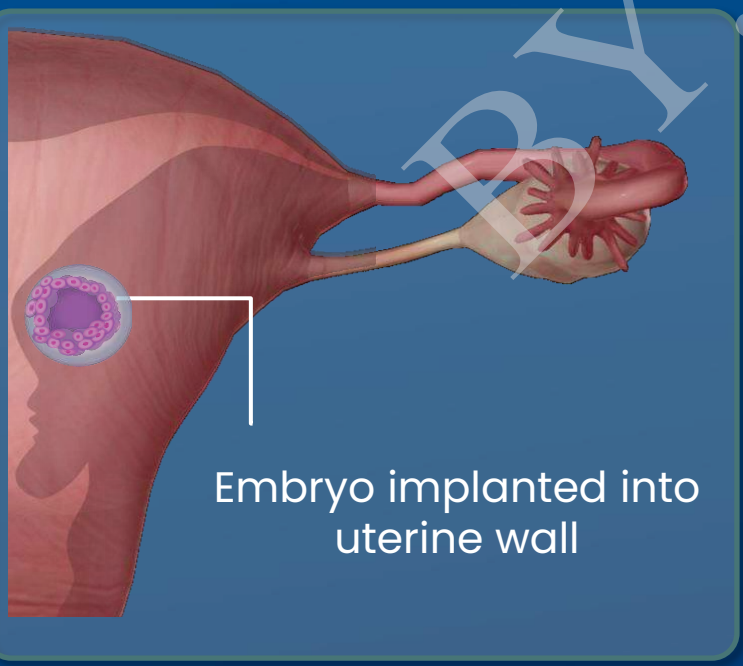
# 4. Events in Sexual Reproduction

## Embryo formation




Zygote undergoes divisions to form two cells which further undergoes multiple divisions to form sixteen cells and finally to thirty two - celled stage called blastocyst.

## Implantation




The blastocyst gets embedded in the wall of the uterus by the process called implantation.

The cells continue to grows and the internal organs also start developing. The stage of the embryo in which all the body parts are identifiable is called foetus.

# 4. Types of Fertilisation

Fertilisation is of two types: External fertilisation and Internal fertilisation.

## 4.1 Internal Fertilisation

Fertilisation that takes place inside the female body is called internal fertilisation. Example: Human beings, hens, cows etc.

**Viviparous**

**Oviparous**

### Viviparous Animals

- They give birth to their young ones.
- Internal fertilisation occurs.
- Growth and development of zygote occurs inside the female body.

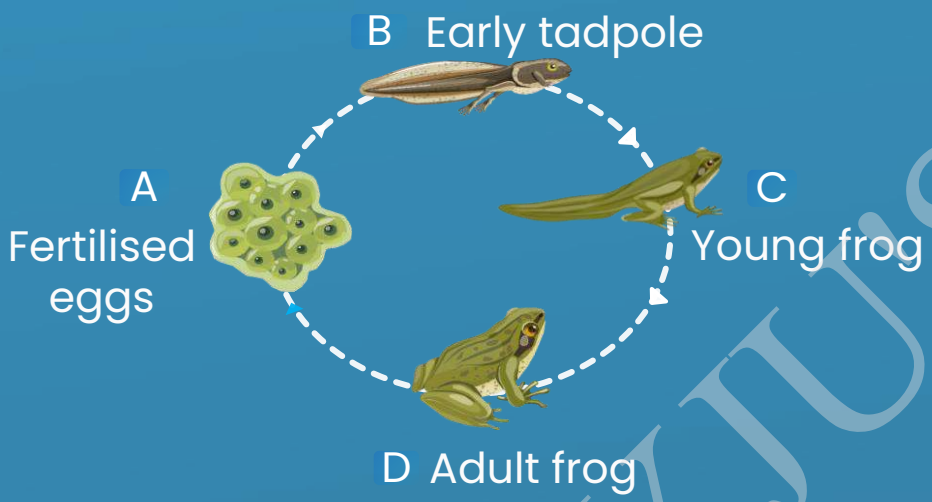
### Oviparous Animals

- Animals that lay eggs are called oviparous animals.
- Internal fertilisation occurs.
- Provides sufficient warmth to the developing embryo.

## 4.2 External Fertilisation

Fertilisation that takes place outside the female body is called external fertilisation. Example: frog, fish, starfish.

## Metamorphosis

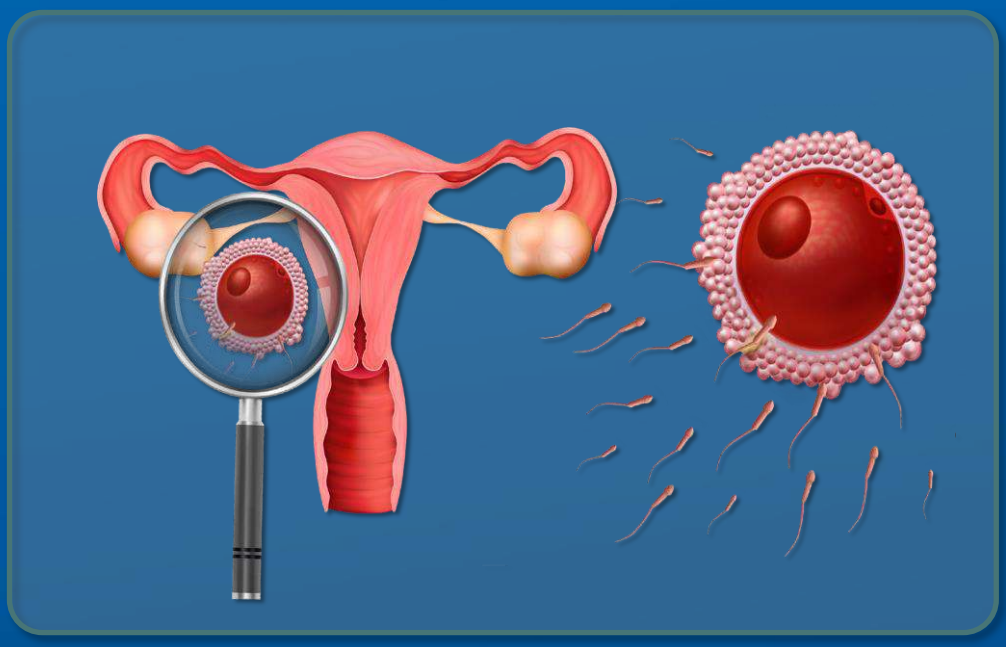



Transformation of a larva into an adult through a series of continuous changes is called metamorphosis.

- Fertilisation is external in frogs. The fertilised eggs hatch into tadpoles which are almost fish-like.

- The tadpoles eventually transform into young frogs which still have tails attached to them. The tail disappears eventually and the young frog now transforms into an adult frog.

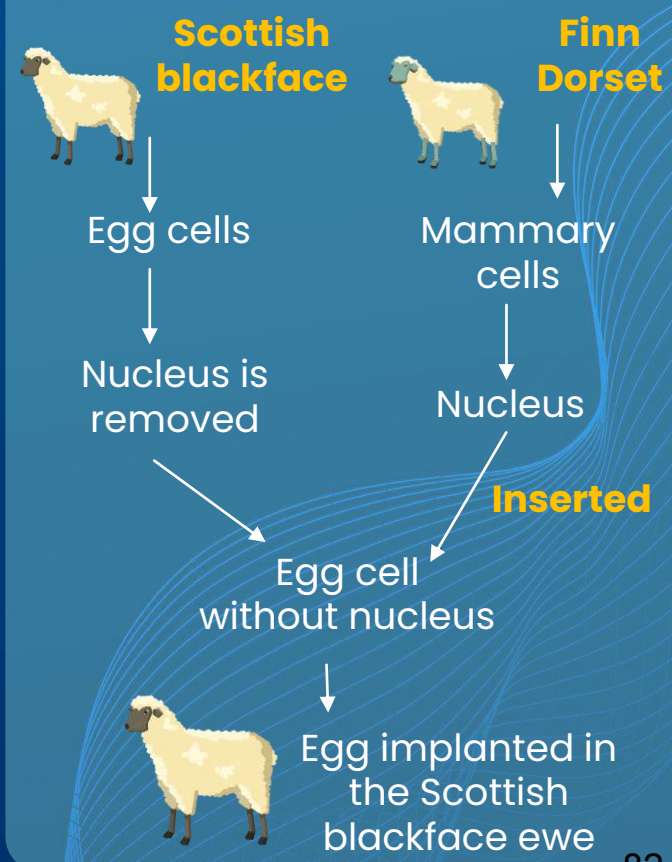
## 4.3 In Vitro Fertilisation



Artificial method of fertilisation of egg and sperm cells outside the body. Babies born through this technique are called test tube babies.

## Cloning

- Production of an exact copy of a cell, any other living part, or a complete organism. First performed by Ian Wilmut.
- First mammal to be cloned was a sheep named Dolly. Dolly was born on 5th July 1996. Dolly was cloned using the process of nuclear transfer



BYJU'S Classes

# Class Notes

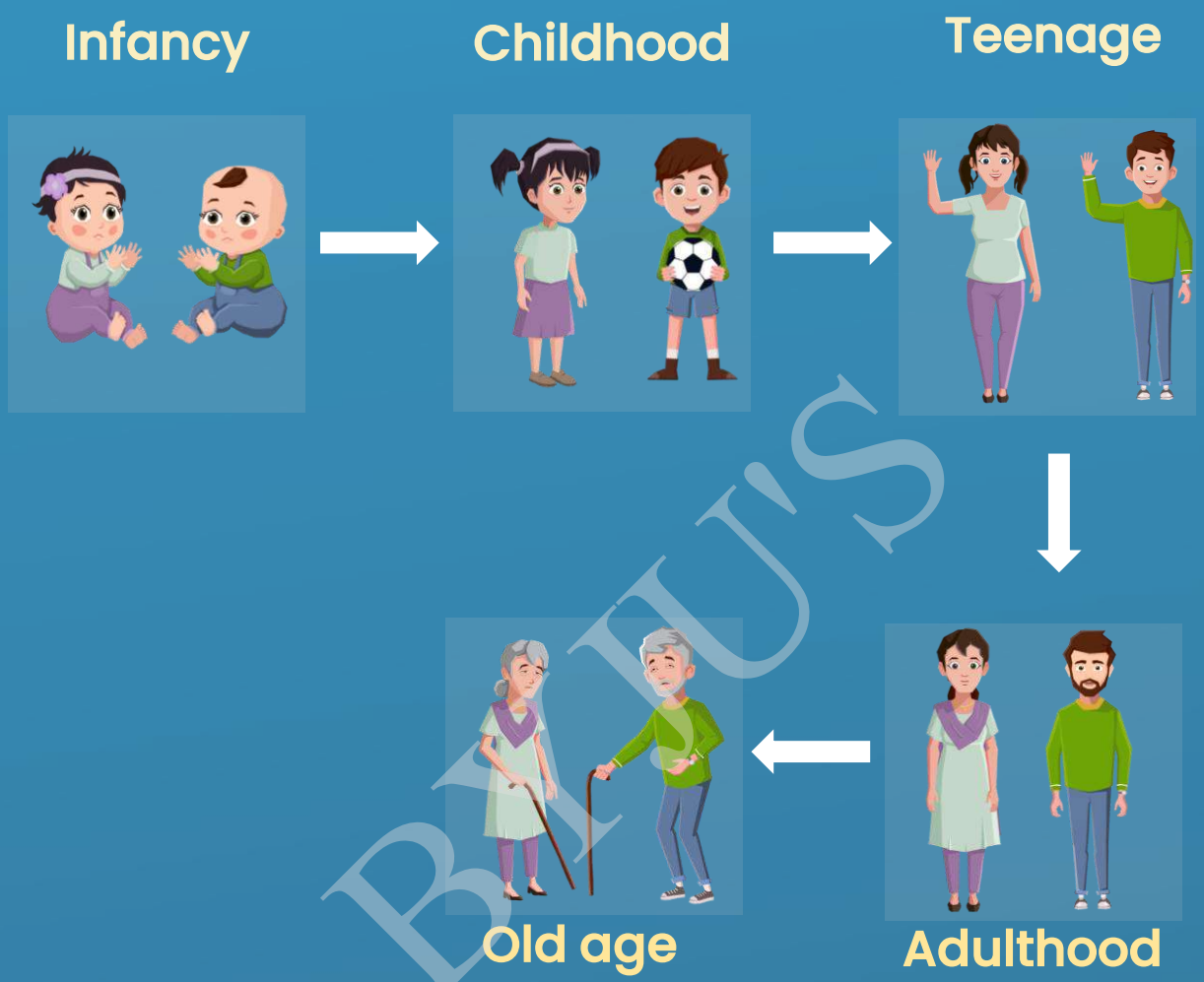
# Reaching the Age of Adolescence

## Grade 8

# Reaching the Age of Adolescence

# 1. Different Phases in Human Life

## 1.1 Phases in Human Life






## 1.2 Adolescence

- Adolescence is the transitional stage from childhood to adulthood and it occurs between the ages of 11 and 19.
- Since this period covers the 'teens' (13 to 18 or 19 years of age), adolescents are also called teenagers.

## 2. Puberty

During adolescence, there is a series of physical and emotional changes as it marks the onset of **puberty.**

## 3. Changes During Puberty

**1. Physical changes**
Changes that happen in the body

**2. Emotional changes**
Affects emotions

**3. Secondary sexual changes**
Bodily signs of sexual maturity

# 3.1 Physical changes

## Increase in Height

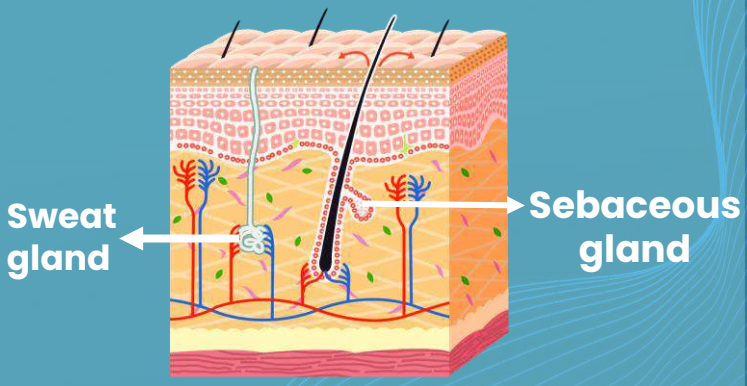
- During puberty, bones of arm and legs elongate which makes a person tall.

## Change in shape

- Boys: Broader shoulders, wider chests
- Girls: Widening of waist

## Appearance of acne

- Increased activities of sweat glands and sebaceous glands cause pimples.



# 3.1 Physical changes

## Change in voice

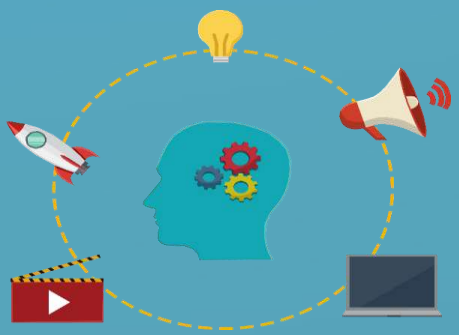
- Boys: Deep voice due to development of Adam's apple
- Girls: High-pitched voice

**Adam's apple** is partial growth of voice box which is seen as the protruding part of the throat.

# 3.2 Emotional changes

## Positive Emotions

- Increased brain activity
- Desire to learn new things



## Negative Emotions

- Mood swings
- Aggression

# 3.3 Secondary Sexual changes

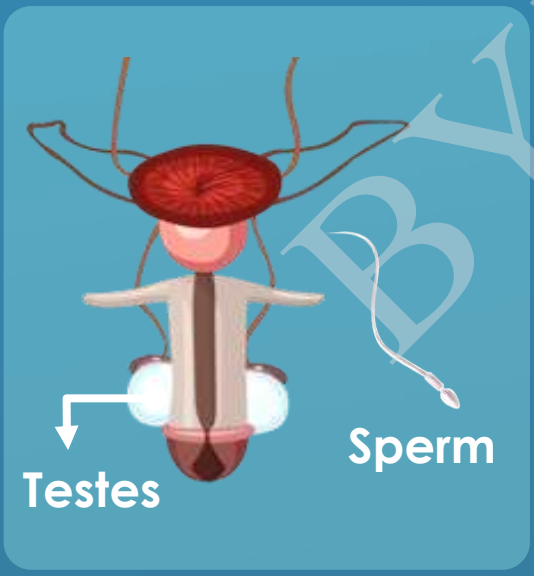
## 3.3.1 Definition

- The features that help to distinguish the male from the female are called secondary sexual characters.

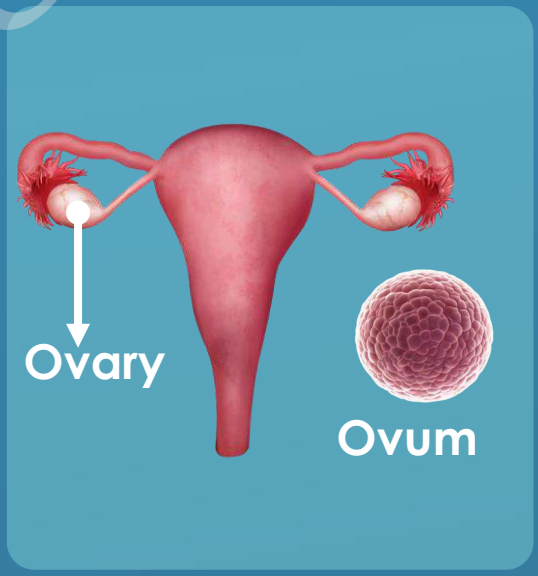
## 3.3.2 Development of sex organs

- Secondary sexual changes involve the development of sex organs.

**Male Reproductive System**




**Female Reproductive System**




- Testes produces sperms
- Secretes testosterone

- Ovary produces ovum
- Secretes progesterone and estrogen

# 3.3 Secondary Sexual changes

## 3.3.3 Development of secondary sexual characters

**Males**

**Testosterone**

**Stimulate secondary sexual changes**

**Females**

**Estrogen and progesterone**

**Hair on armpits**

**Hair on genital regions**

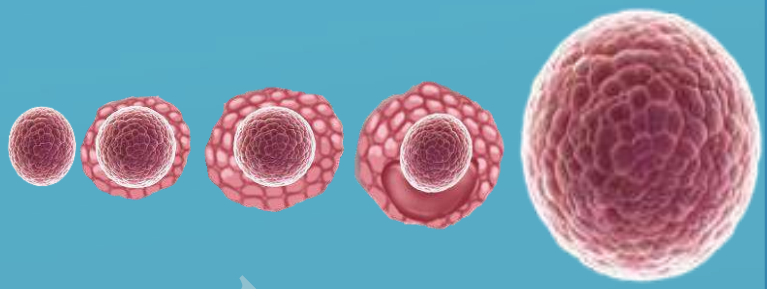
**Growth of facial hair and chest hair**

**Breast enlargement and widening of hips**

# 4. Reproductive Phase in Females

## 4.1 Ovulation

- Release of an egg from the ovary
- One ovum develops alternately in each ovary



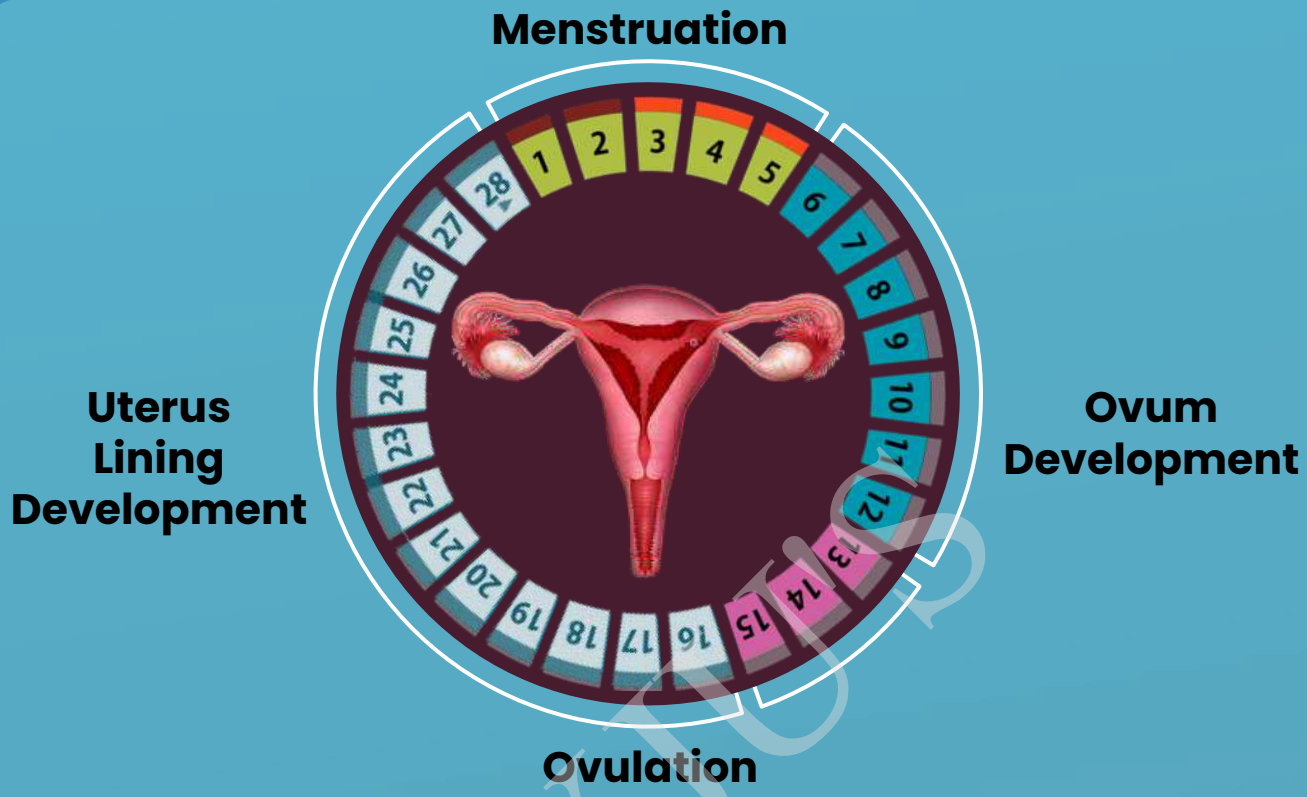
## 4.2 Fertilisation

- Fusion of male sperm and female egg
- Leads to zygote formation

- In females, the reproductive phase of life begins at puberty from 10 to 12 years of age.
- It generally lasts till the age of approximately 45 to 50 years.

# 4. Reproductive Phase in Females

## 4.3 Menstruation

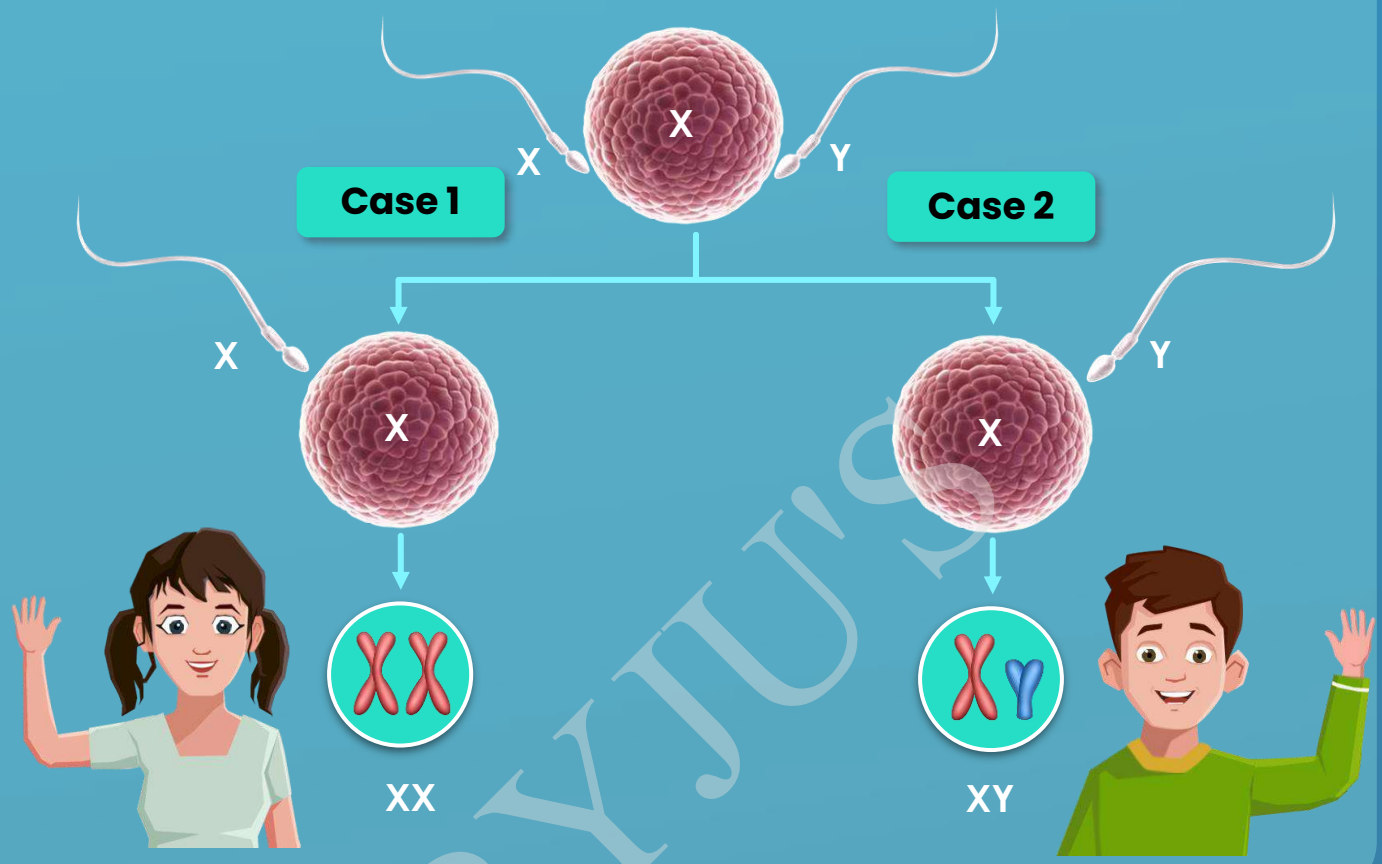



- Discharge of blood, mucus and unfertilised egg from the vagina is known as menstruation.
- A menstrual cycle lasts on an average is 28 days long.
- The phases of menstrual cycle are:
  - Menstruation - Days 1 to 5
  - Ovum development: Days 6 to 12
  - Ovulation: Days 13 to 15
  - Uterus lining development: Days 16 to 28

- **Menarche** is the beginning of the first cycle of menstruation.
- **Menopause** is the complete stoppage of menstruation.

# 5. Sex Determination

## 5.1 Boy or Girl?



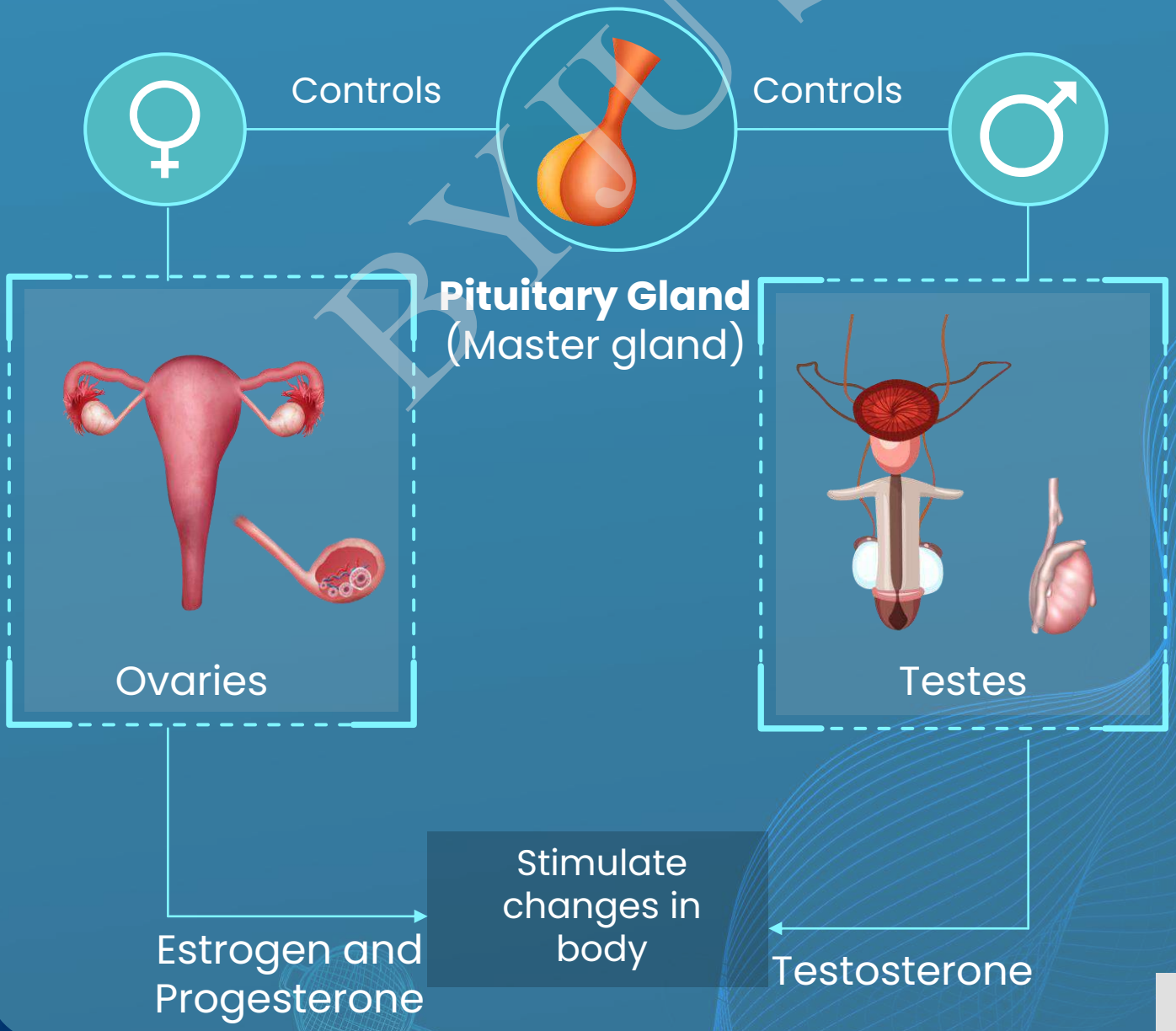

- Nucleus contains chromosomes which are thread-like structures that carry the genetic information.
- Humans have 23 pairs of chromosomes, i.e 46 chromosomes in total.
- Of the 23 pairs of chromosomes, one pair of chromosomes are known as sex chromosomes.
- An ovum has 22 + X chromosomes, while a sperm has 22 + X or Y chromosomes.

# 6. Glands and Hormones

## 6.1 Definition

- Glands are groups of specialised cells that release certain substances.
- Hormones are the chemicals that are responsible for certain changes in the body.
- These hormones are produced in the gland and are then released into the bloodstream whereby the circulatory system carries it to the target site.

## 6.2 Hormones released during puberty



# 7. Endocrine Glands

## Pituitary Gland

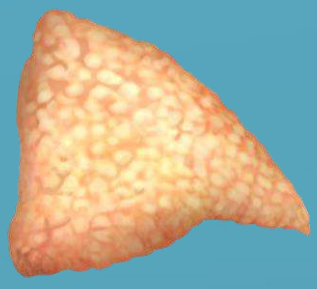
- The pituitary secretes many hormones that stimulates other endocrine glands to release its secretion.

## Thyroid Gland

- Thyroid gland is a butterfly shaped gland located in the throat region.
- Secretes thyroxine hormone.

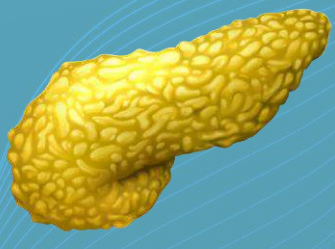
## Adrenal Gland

- The adrenal gland is located on top of kidneys.
- Secretes adrenaline hormone when pituitary gland sends signal to it.



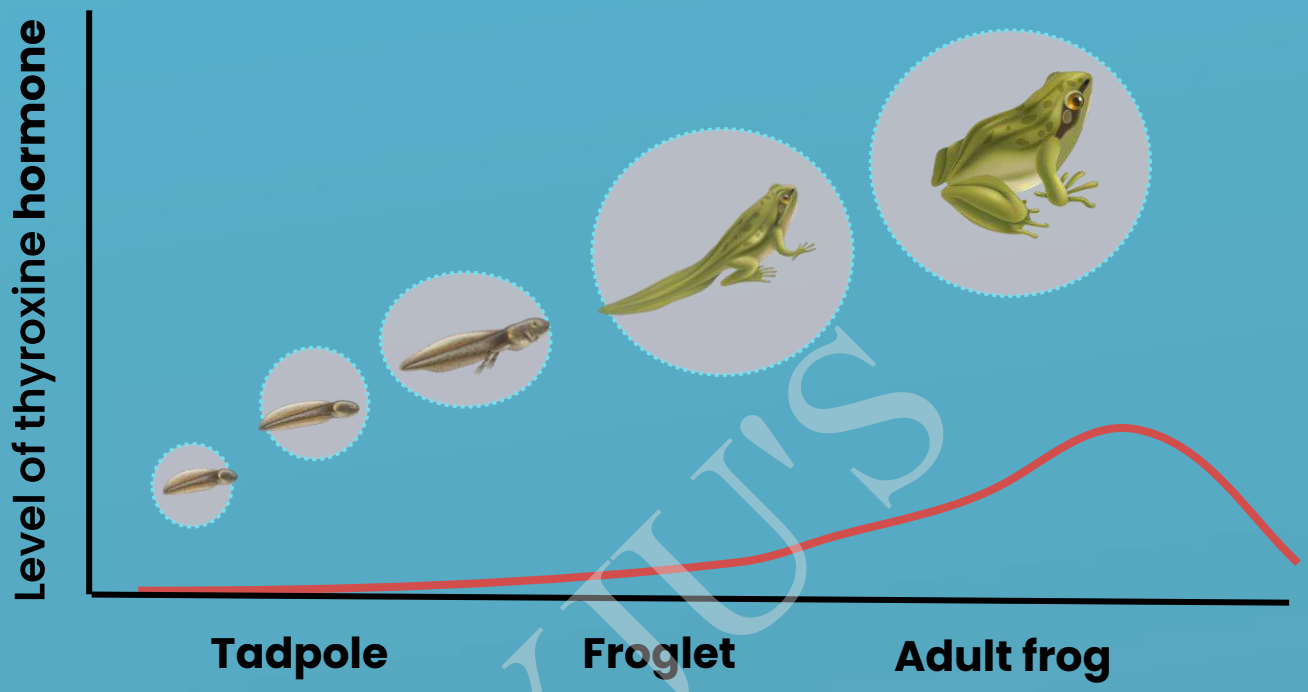
## Pancreas

- Regulates blood sugar level in the body.
- Insulin helps the cells to take up glucose from the blood, this decreases blood glucose level



# 8. Metamorphosis

## 8.1 Role of Hormones in Metamorphosis






- Transformation of a larva into an adult frog through a series of continuous changes is called metamorphosis.
- In frogs, this transformation is controlled by thyroxine which is released from thyroid gland.
- In the case of tadpoles, the thyroxine level is lowest while it is highest when the froglet becomes an adult frog.

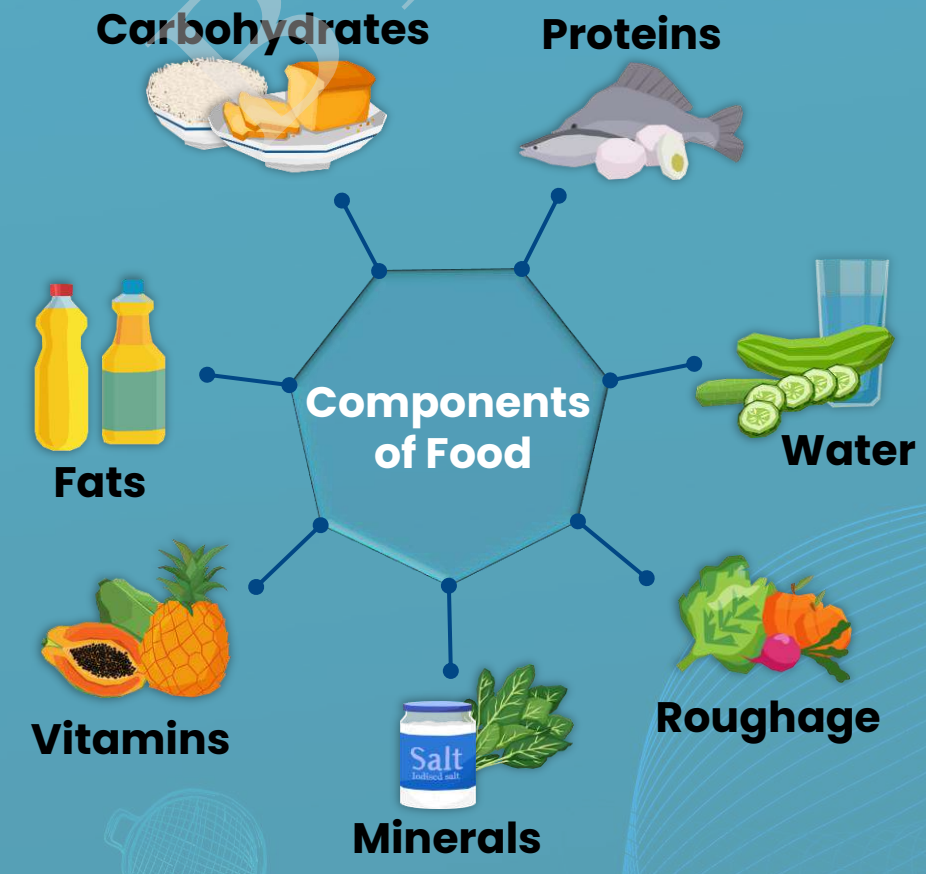
# 9. Reproductive Health

## 9.1 Introduction to Health

- The physical and mental well being of an individual is regarded as an individual's health.
- To keep the body healthy, every human being, at any age, needs to have a balanced diet. The person must also observe personal hygiene and undertake adequate physical exercise.

## 9.2 Balanced diet

- A balanced diet means that the meals include proteins, carbohydrates, fats and vitamins in requisite proportions.
- Adolescents need right proportion of nutrients for proper growth and development.



# 9. Reproductive Health

## 9.3 Personal Hygiene

- Every teenage should maintain cleanliness.
- If cleanliness is not maintained there are chances of catching bacterial infection.

**Brush teeth**

**Wash hands**

**Regular shower**

**Wear clean clothes**

**Change sanitary pad**



## 9.4 Physical exercise

- Walking and playing in fresh air keeps the body fit and healthy. All young boys and girls should take walks, exercise and play outdoor games.

**Exercise regularly**


**Good sleep**

**Positive mindset**

# 9. Reproductive Health

## 9.5 Drug awareness

- Drugs are addictive. If you take them once, you feel like taking them again and again.
- They harm the body in the long run. They ruin health and happiness.

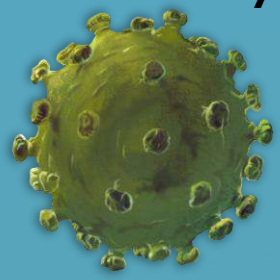
Say no to drugs

Say no to cigarette

Say no to alcohol

## 9.6 AIDS

**Pathogen- Human Immunodeficiency Virus**

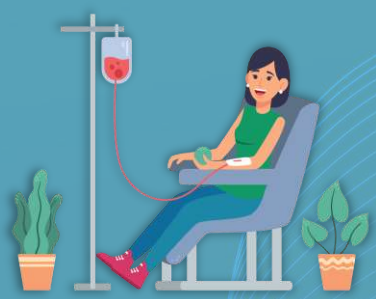


**Organ affected- Immune system**

**Modes Of Transmission**

Sexual Contact

Pregnancy



Blood Transfusion

Sharing of needles

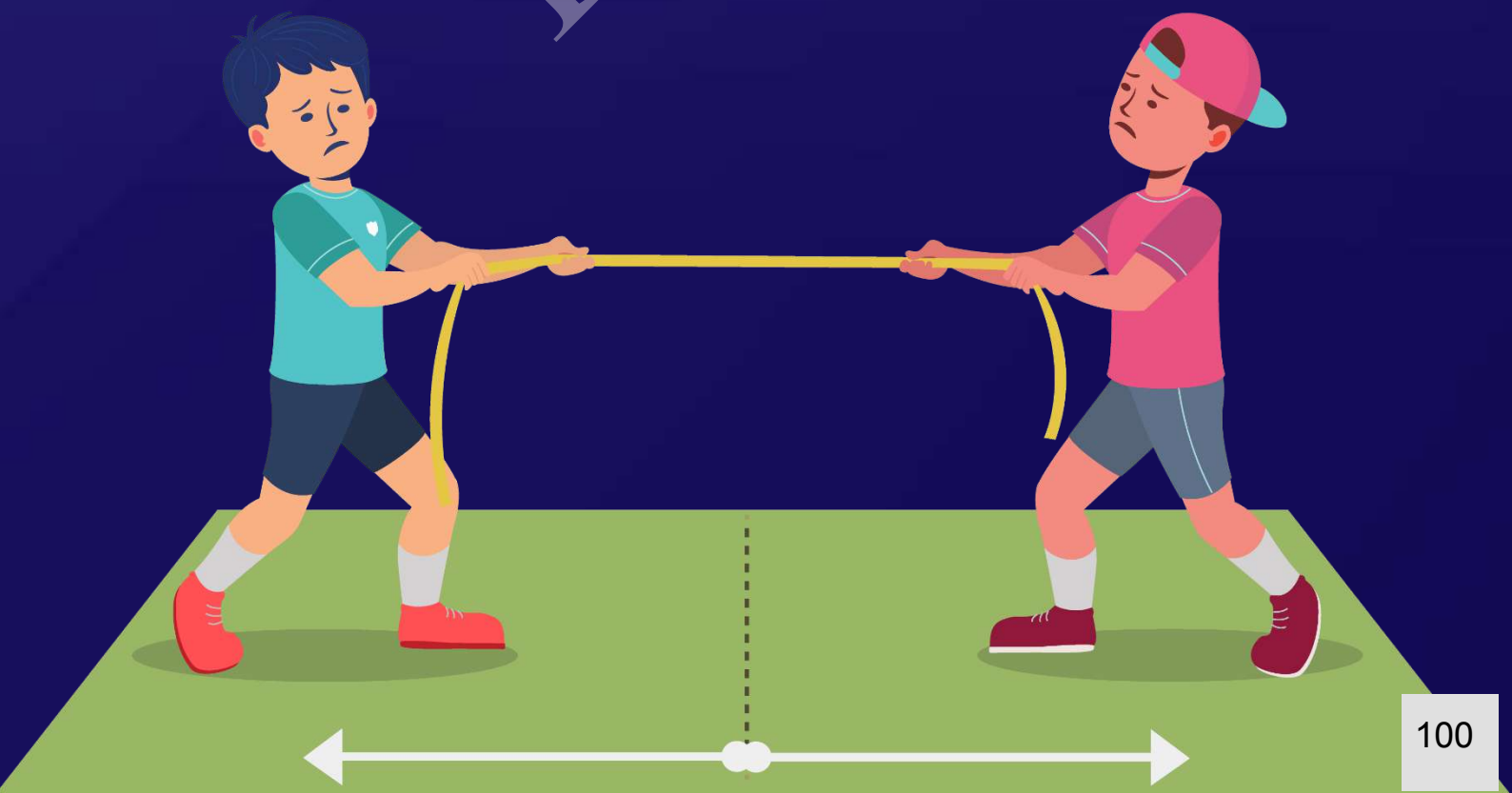
BYJU'S Classes

# Class Notes

## Force and Pressure

Grade 08

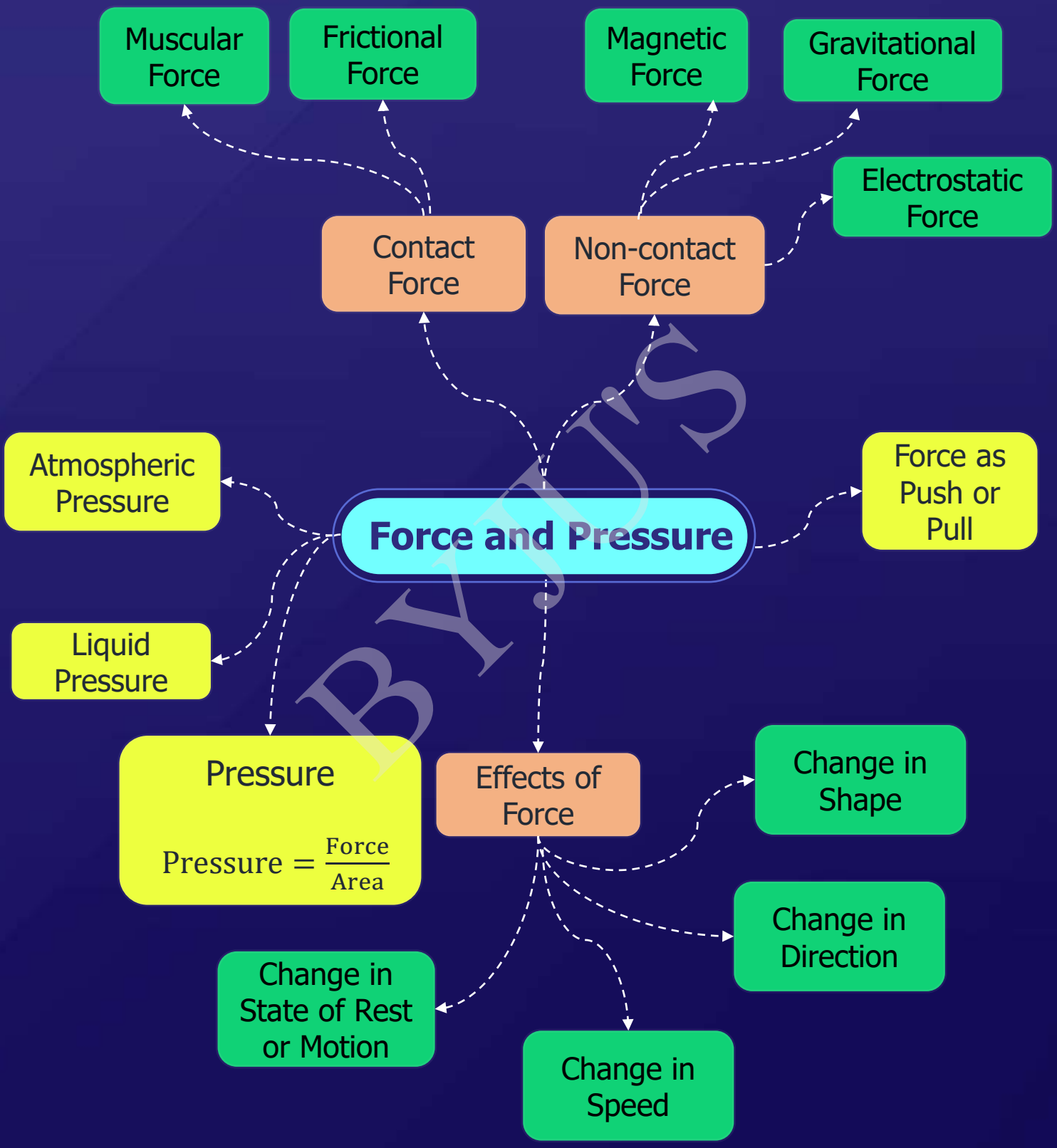




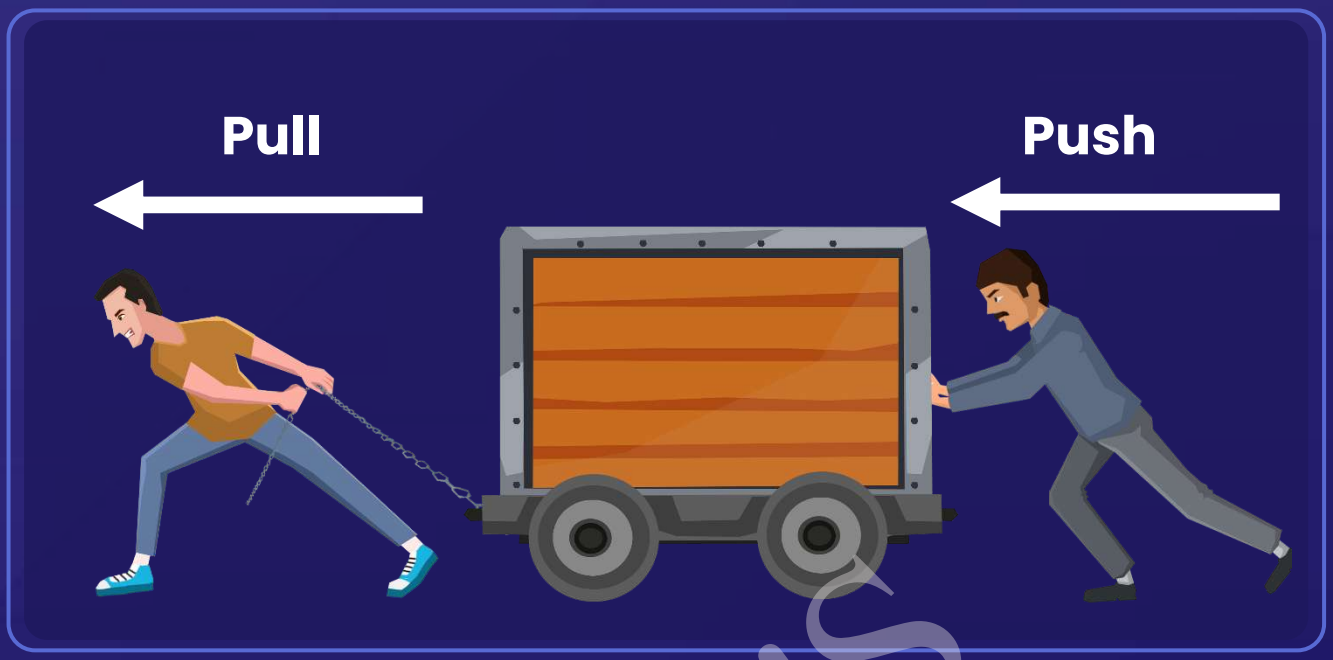
# Topics to be Covered

1. **Understanding Force**
   - 1.1 Push and Pull
   - 1.2 Force as an Interaction between Bodies
2. **Types of Force**
   - 2.1 Contact Force
   - 2.2 Non-contact Force
3. **Effects of Force**
4. **Net Force**
   - 4.1 Finding Net Force
   - 4.2 Balanced and Unbalanced Forces
5. **Pressure**
   - 5.1 Pressure
   - 5.2 Liquid Pressure
   - 5.3 Gaseous and Atmospheric Pressure

# Mind Map



# Force




**A force is a push or pull acting on an object.**

Examples of pushing force:
- Pushing a trolley
- Force on keys while typing
- Inserting a plug in a socket

Examples of pulling force:
- Opening curtains
- Drawing water from a well
- Opening a drawer

- The SI unit of force is newton (N).

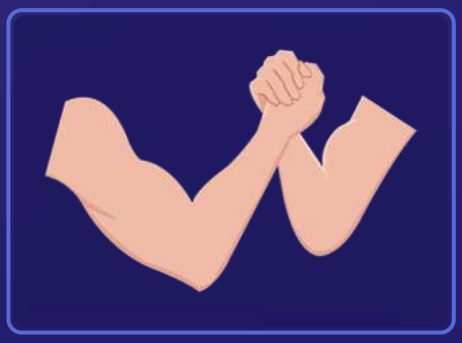
- At least two objects must interact for a force to come into play. For example, to push a trolley, a person has to interact with the trolley.

# Types of Force

Forces are broadly classified into two types: Contact forces and Non-contact forces.

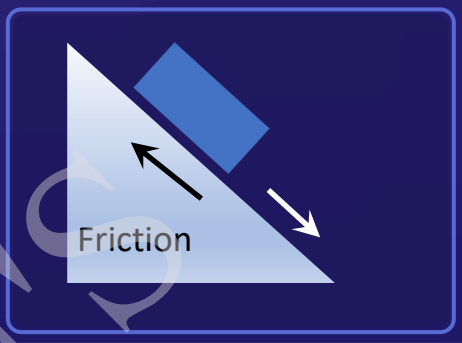
## Contact Forces

A force which requires physical contact between bodies and cannot act from a distance is called a contact force.



### Muscular Force

**Muscular force is the force exerted by** the action of muscles.

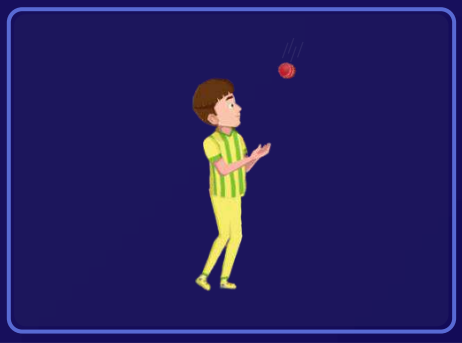



### Frictional Force

**Friction** a force that opposes slipping or relative motion between surfaces in contact.

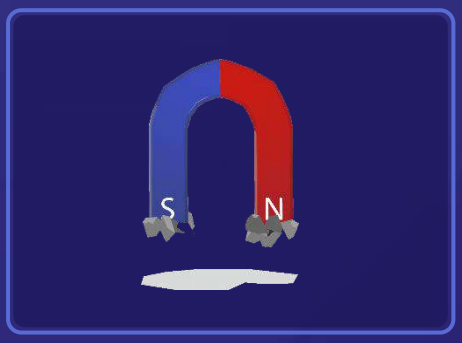
## Non-contact Forces

A force which can be exerted from a distance without any physical contact is called a non-contact force.

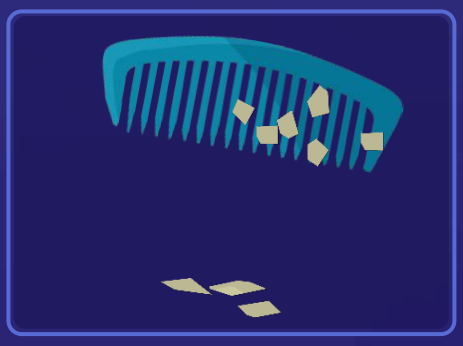


### Gravitational Force

**Gravitational force** is an attractive force that exists between any two bodies having mass.




Magnetic Force



Electrostatic Force

**Magnetic force** is the force exerted by a magnet on another magnet or magnetic material.

It can be attractive or repulsive in nature.

**Electrostatic force** is a force due to electric charge particles at rest.

It can be attractive or repulsive in nature.



## Effects of Force

- Change in state of rest or motion
- Change in speed
- Change in direction
- Change in shape

**Examples -**

Change in state of rest or motion – A fielder catching a ball
Change in speed – A car slowing down on application of brakes
Change in direction – A car taking a U turn
Change in shape – Kneading dough

# Net Force

Net force: Sum of the two applied forces

Net force: Difference between the two applied forces



| Balanced Forces | Unbalanced Forces |
| --- | --- |
| Net force = 0 | Net force ≠ 0 |

# Pressure

- Pressure is defined as perpendicular force acting on a unit area.

- SI Unit → pascal (Pa)
- 1 Pa = 1 N/m$^2$

**Formula**

$$Pressure = \frac{Force}{Area}$$

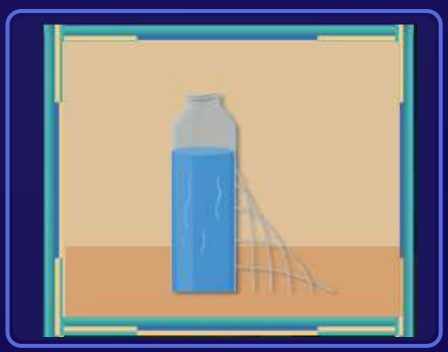


# Liquid Pressure

Just like solids, liquids also exert pressure. Following are the properties of liquid pressure:

Acts on the walls of the container

Equal at the same depth



Increases with depth

# Gaseous Pressure

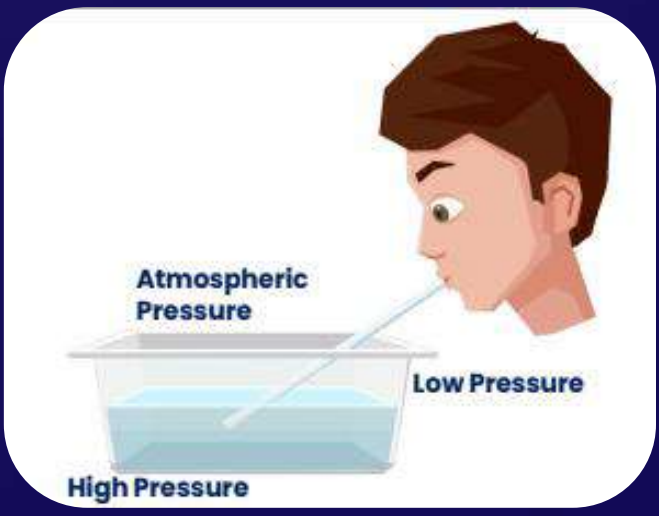
Gases also exert pressure. For example: a balloon bursts when we blow excess air into it.

# Atmospheric Pressure

- The gaseous envelope which surrounds the earth is known as the **atmosphere**.
- The weight of the air column over a unit area of Earth's surface is known as **atmospheric pressure**.
- Atmospheric pressure **decreases** with altitude.
- Generally, atmospheric pressure is measured in atm.

$$1 \text{ atm} = 10^5 \text{ Pa}$$

A straw uses atmospheric pressure for its working. One end of the straw is dipped in the liquid. When we suck at the other end of the straw, air pressure inside the straw reduces. But the pressure on the free surface of the liquid is equal to the atmospheric pressure. This difference in pressure pushes the liquid up the straw.



BYJU'S Classes

# Class Notes

## Friction

Grade 08



# Topics to be Covered

1. Introduction to Friction
2. Causes of Friction
   - 2.1 Interlocking of Irregularities
   - 2.2 Bond Formation
3. Factors affecting Friction
   - 3.1 Nature of Surfaces
   - 3.2 Pressing Force
4. Types of Friction
   - 4.1 Static Friction
   - 4.2 Sliding Friction
   - 4.3 Rolling Friction
   - 4.4 Comparison of Types of Friction

# Topics to be Covered

5 **Friction: A Necessary Evil**

5.1 As a Friend
5.2 As a Foe

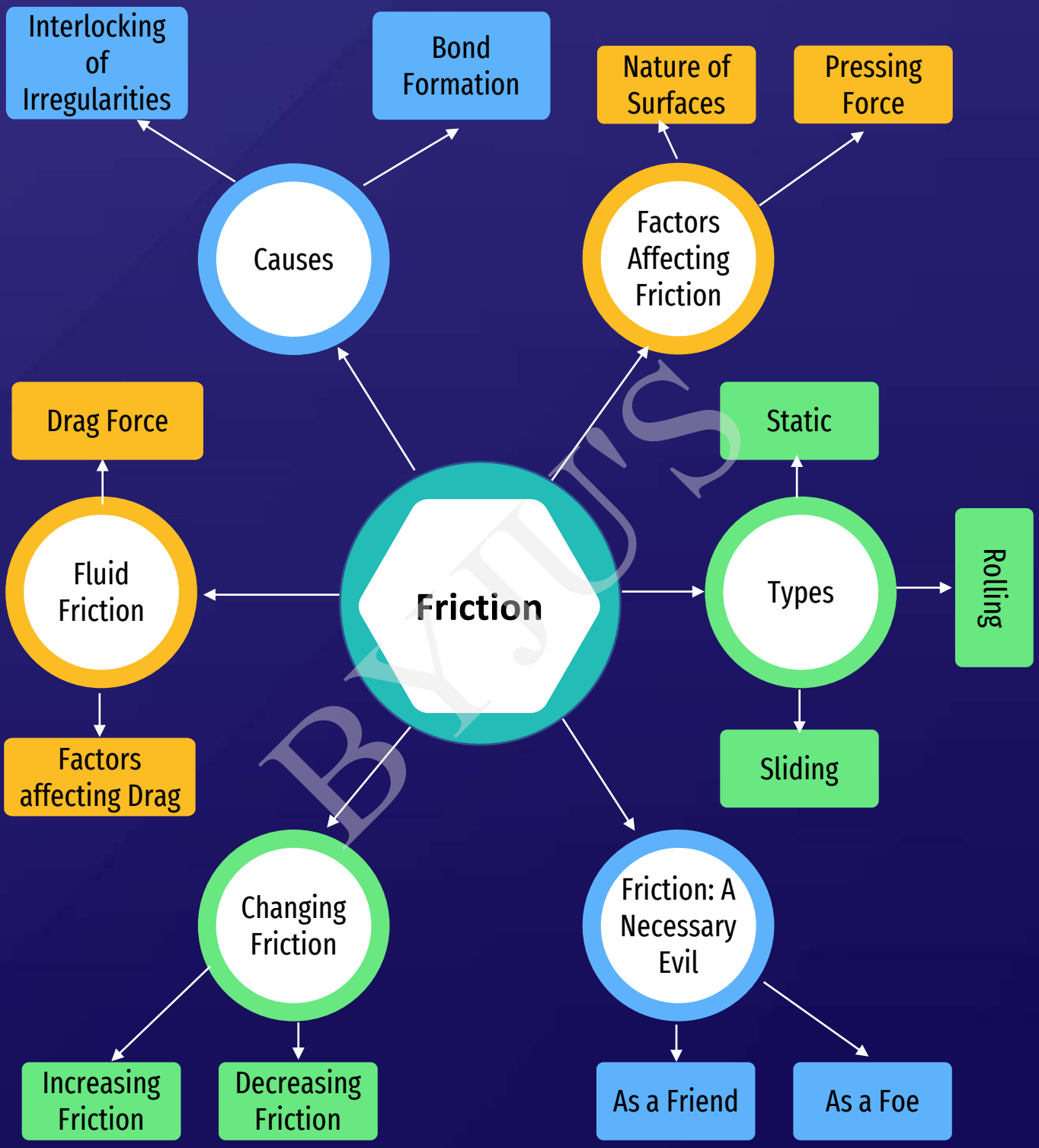
6 **Changing Friction**

6.1 Increasing Friction
6.2 Decreasing Friction

7 **Fluid Friction**

7.1 Introduction
7.2 Factors affecting Fluid Friction

# Mind Map

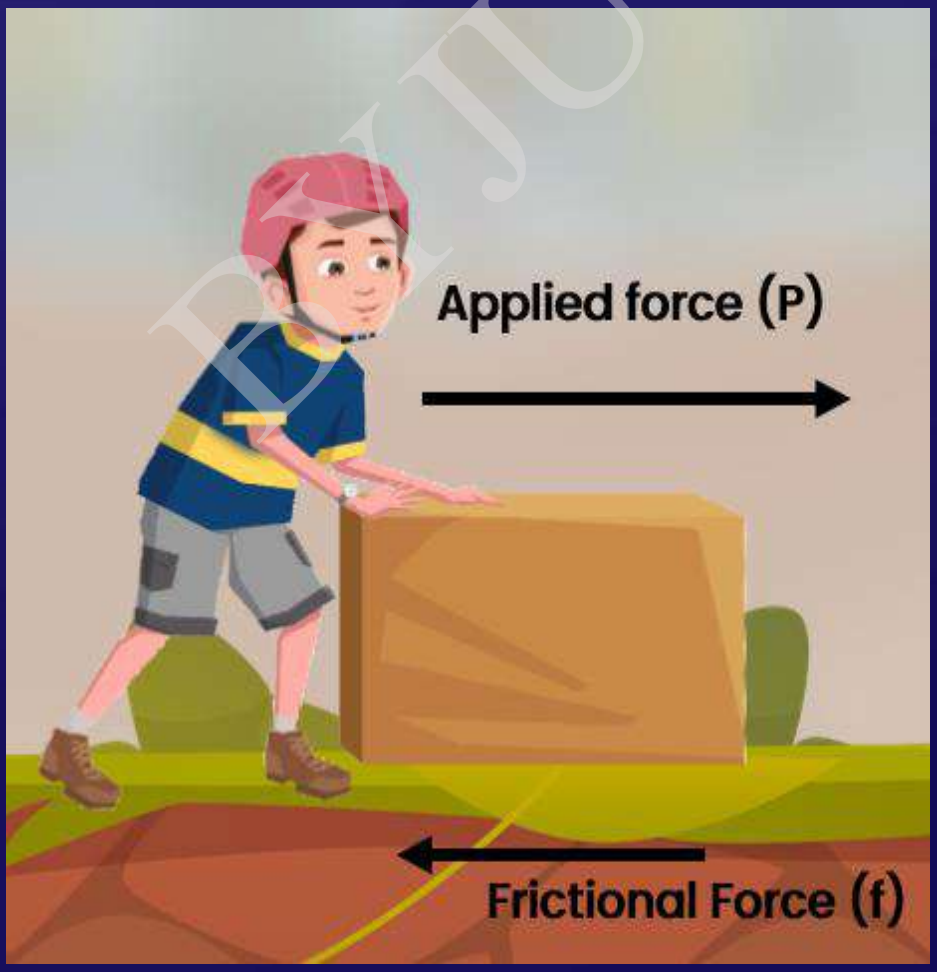


# 1. Introduction to Friction

Friction is a force which opposes relative motion between two surfaces in contact.

It is a type of contact force.

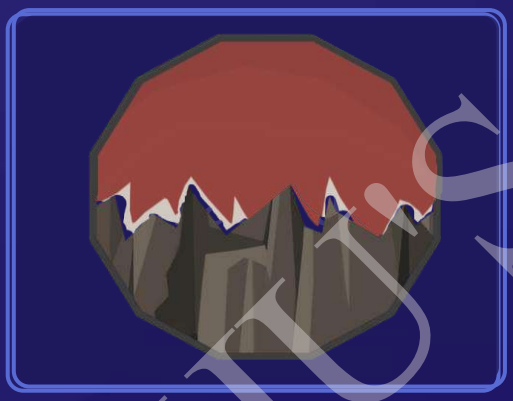
For example, when we try to push a heavy block kept on ground by applying some force, it does not move because friction acts on the block in the opposite direction.



# 2. Causes of Friction

## 2.1 Interlocking of Irregularities

When we look under a microscope, even smooth looking surfaces have irregularities present on them. These irregularities get interlocked and offer resistance when the surfaces try to move relative to each other.

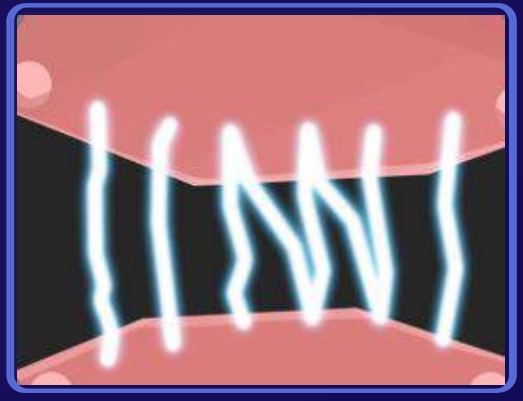


Interlocking of Irregularities



## 2.2 Bond Formation

When two surfaces are close to each other, weak bonds are formed between them. This also offers friction between the surfaces.



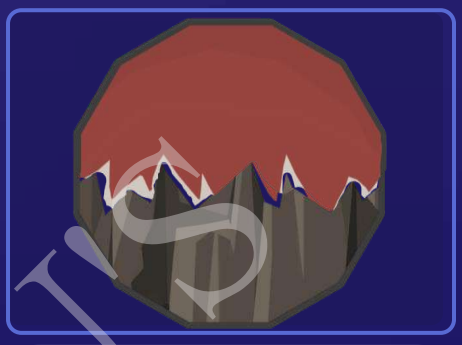
Bond Formation

# 3. Factors affecting Friction

## 3.1 Nature of Surfaces in Contact

Friction depends on the nature of surfaces in contact. Smooth surfaces have fewer irregularities and interlock less strongly compared to rough surfaces. Hence, friction is generally less if surfaces are smooth.

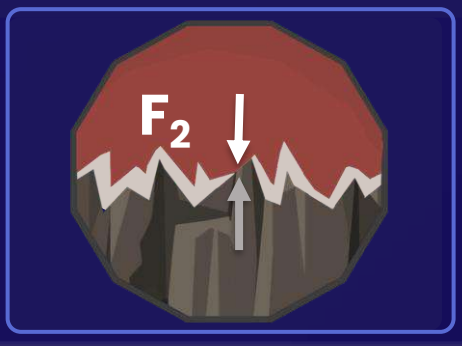
Smooth Surfaces
- Less Friction



Rough Surfaces
- More Friction

## 3.2 Pressing Force

If surfaces are pressed harder against each other, friction is more. This is because the irregularities get interlocked more strongly when the pressing force is more.




Less Pressing Force
- Less Friction


More Pressing Force
- More Friction

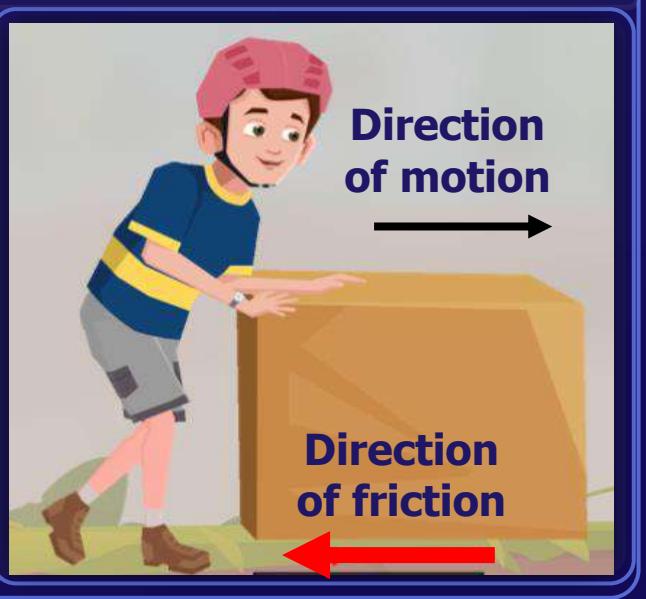
# 4. Types of Friction

## 4.1 Static Friction

Static friction is a force that keeps an object at rest when we try to move it by applying an external force. With an increase in applied force, static friction increases to a limit, beyond which slipping starts.


## 4.2 Sliding Friction

When a body begins to slide on the surface, the force exerted by the surface on the object is called sliding friction or kinetic friction.



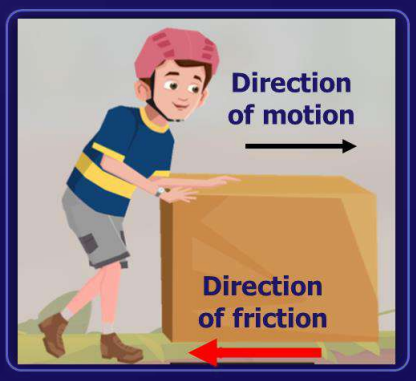
# 4. Types of Friction

## 4.3 Rolling Friction

Rolling friction acts when an object rolls over a surface. In rolling, the surfaces in contact don't rub against each other as they do while sliding.

## 4.4 Comparison of Types of Friction

In general, static friction is greater than sliding friction which in turn is greater than rolling friction between two surfaces.

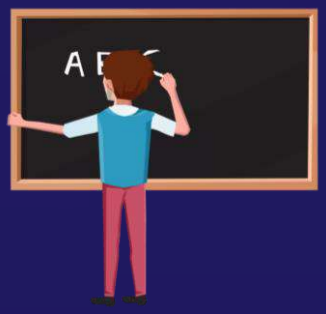

Static Friction > Sliding Friction > Rolling Friction

# 5. Friction: A Necessary Evil

Friction can both act as a friend and a foe.

## 5.1 As a friend

In some situations, friction is desirable. For example, it enables us to hold objects, write using a chalk or light a matchstick.



## 5.2 As a foe

In other scenarios, friction is undesirable. For example, it causes wear and tear of shoes and tyres, reduces efficiency of machines because of heat loss, etc.

# 6. Changing Friction

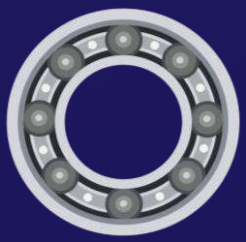
In some situations, friction is desirable whereas in others, it is undesirable. Accordingly, we need to increase or decrease friction.

## 6.1 Increasing Friction

Friction is favorable for getting better grip on roads, hence tyres are provided with treads. Similarly, bats have grips on the handle to increase friction.

## 6.2 Decreasing Friction

To reduce friction between sliding parts, we use ball bearings. Similarly, the use of lubricants between machine parts reduces friction.



# 7. Fluid Friction

## 7.1 Introduction

- Fluids (liquids and gases) also offer friction when there is relative motion of an object through the fluid.
- The frictional force exerted by the fluids is called fluid friction or drag.
- For example, an aircraft experiences drag while flying, a deep-sea diver experiences water drag, etc.



Air Drag

Water Drag

# 7. Fluid Friction

## 7.2 Factors affecting Fluid Friction

Fluid friction is affected by the following factors:

### Relative Speed of Object with respect to Medium

Fluid friction on an object moving through a fluid depends on its relative speed with respect to the fluid. More the relative speed, more is the drag. For example, rockets might catch fire while re-entering the atmosphere with high speeds whereas passenger planes don't catch fire because of their lower speeds



More Speed - More Drag

Less Speed - Less Drag

# 7. Fluid Friction

## Nature of the Medium

Fluid friction also depends upon nature of the fluid. Denser the fluid, more is the drag. For example, drag offered by honey is more than that offered by water.

Thin Fluid – Less Drag

Thick Fluid – More Drag



## Shape of the Object

Fluid friction depends on shape of the object as well. Streamlined bodies experience less drag as compared to non-streamlined bodies.


BYJU'S Classes

# Class Notes

## Sound

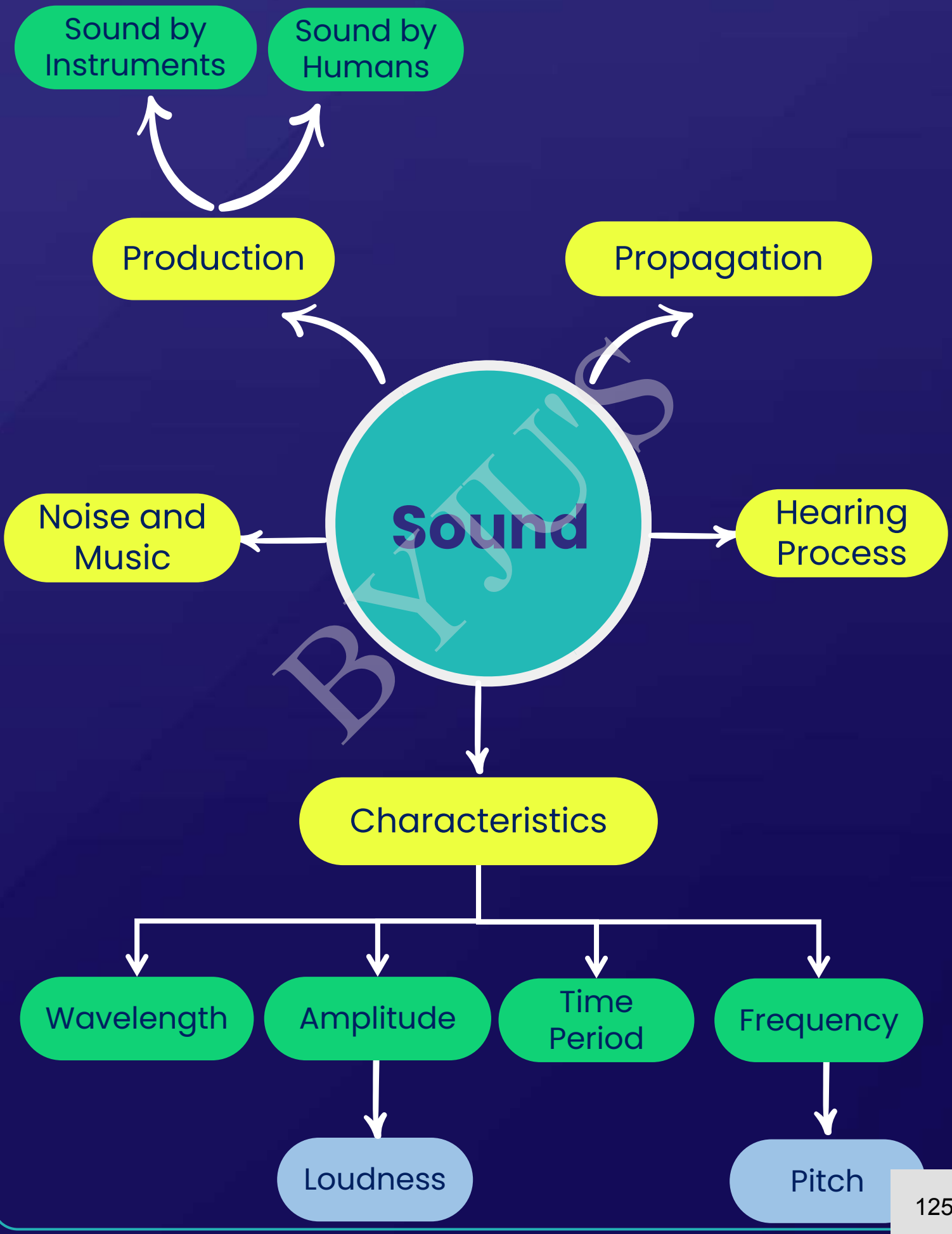
Grade 08



# Topics to be Covered

1. **Production of Sound**
   - 1.1 Sound Production in Different Instruments
   - 1.2 Sound Production in Humans
2. **Propagation of Sound**
3. **Hearing Process**
4. **Characteristics of Sound**
   - 4.1 Wavelength
   - 4.2 Amplitude
   - 4.3 Time Period
   - 4.4 Frequency
5. **Audible and Inaudible Sounds**
6. **Noise and Music**
   - 6.1 Noise Pollution

# Mind Map



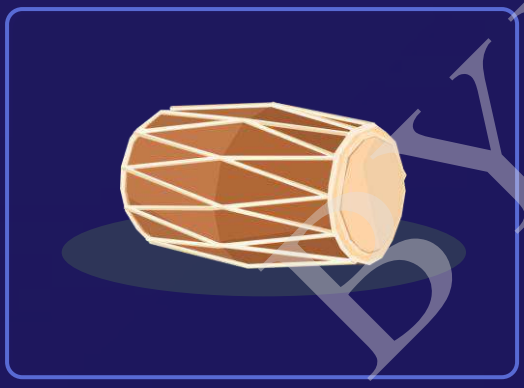
# 1. Production of Sound

Sound is a form of energy which is produced by vibrating objects.

## 1.1 Sound Production in Different Instruments

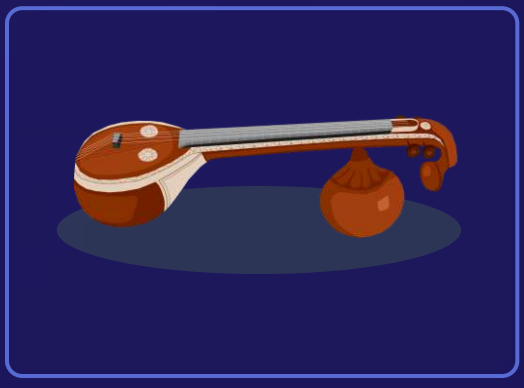
**Guitar**:

Due to vibration of strings



**Dholak**:

Due to vibration of membranes



Sitar:

Due to vibration of strings

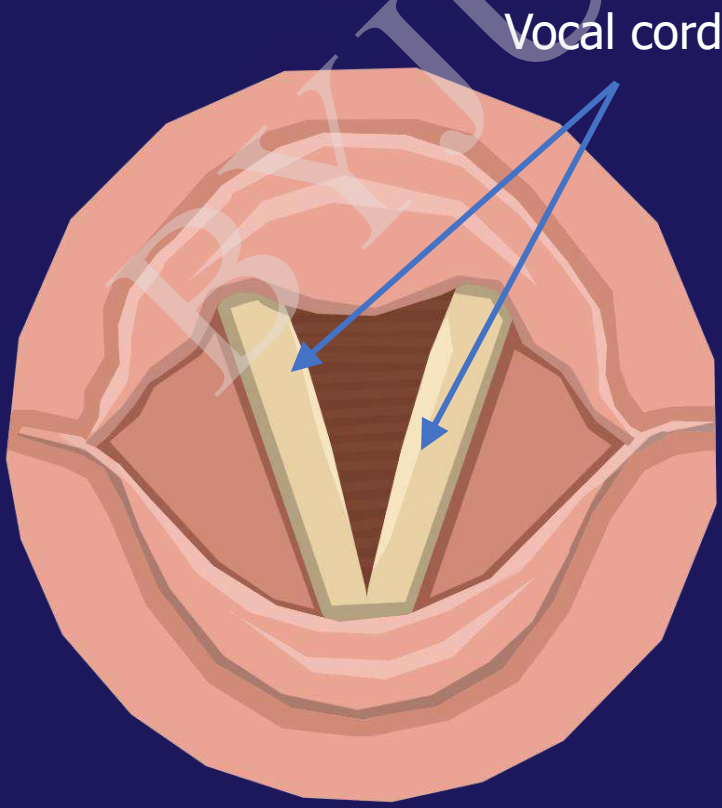
Flute:

Due to vibration of air column

# 1. Production of Sound

## 1.2 Sound Production in Humans

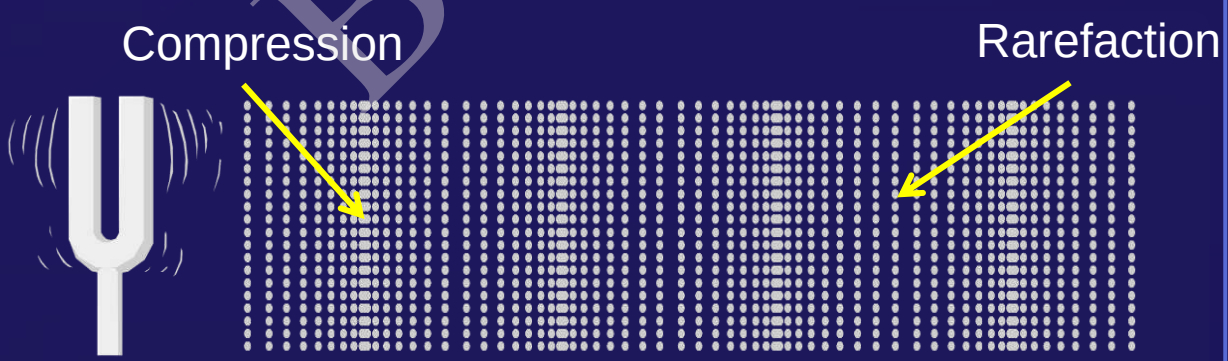
- In humans, sound is produced by the voice box or the larynx.
- It is at the upper end of the windpipe. Two vocal cords are stretched across the voice box or larynx in such a way that it leaves a narrow slit between them for the passage of air.
- When the lungs force air through the slit, the vocal cords vibrate, thus producing sound.



# 2. Propagation of Sound

Sound propagates in air as a series of compressions and rarefactions.

- Let's take the example of a vibrating tuning fork. When it moves forward, it pushes and compresses the air in front of it, creating a region of high pressure. This region is called compression.
- When the vibrating body moves backward, it creates a region of low pressure called rarefaction.
- As the object moves back and forth rapidly, a series of compressions and rarefactions are created in air. This is how sound propagates.



# 2. Propagation of Sound

- Sound requires a medium for propagation. It cannot travel through a vacuum because the vacuum has no medium which can carry the sound energy.
- Sound can travel through solids, liquids and gases. Its speed is maximum in solids, followed by liquids and then gases.

In Solids:

Speed is maximum.

In Liquids:

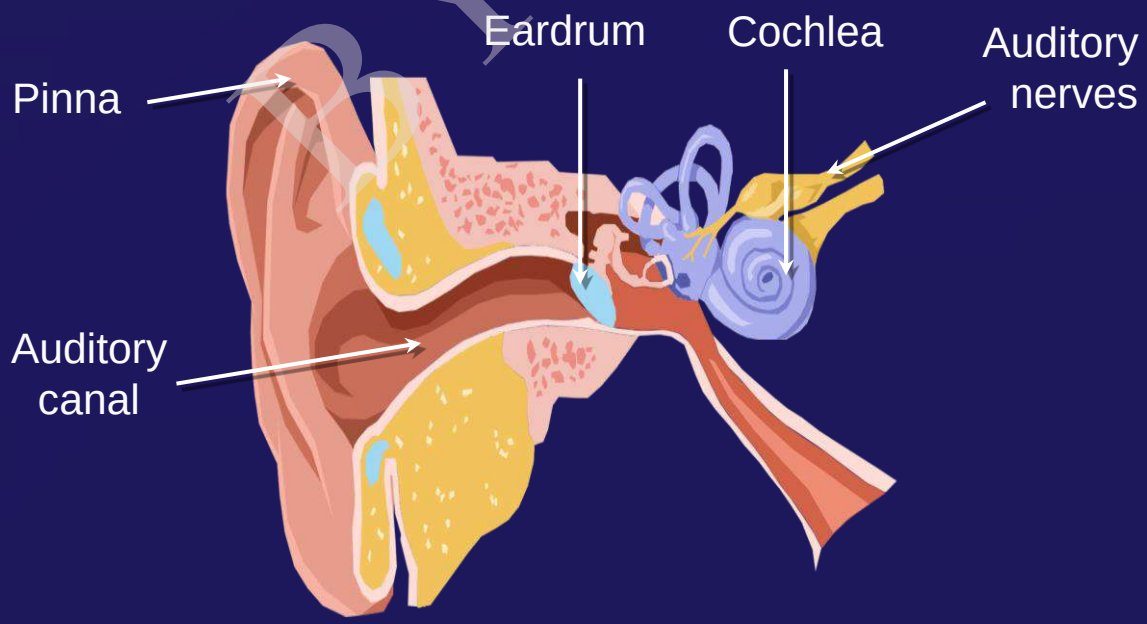
Speed is more than gases but less than solids.

In Gases:

Speed is minimum.

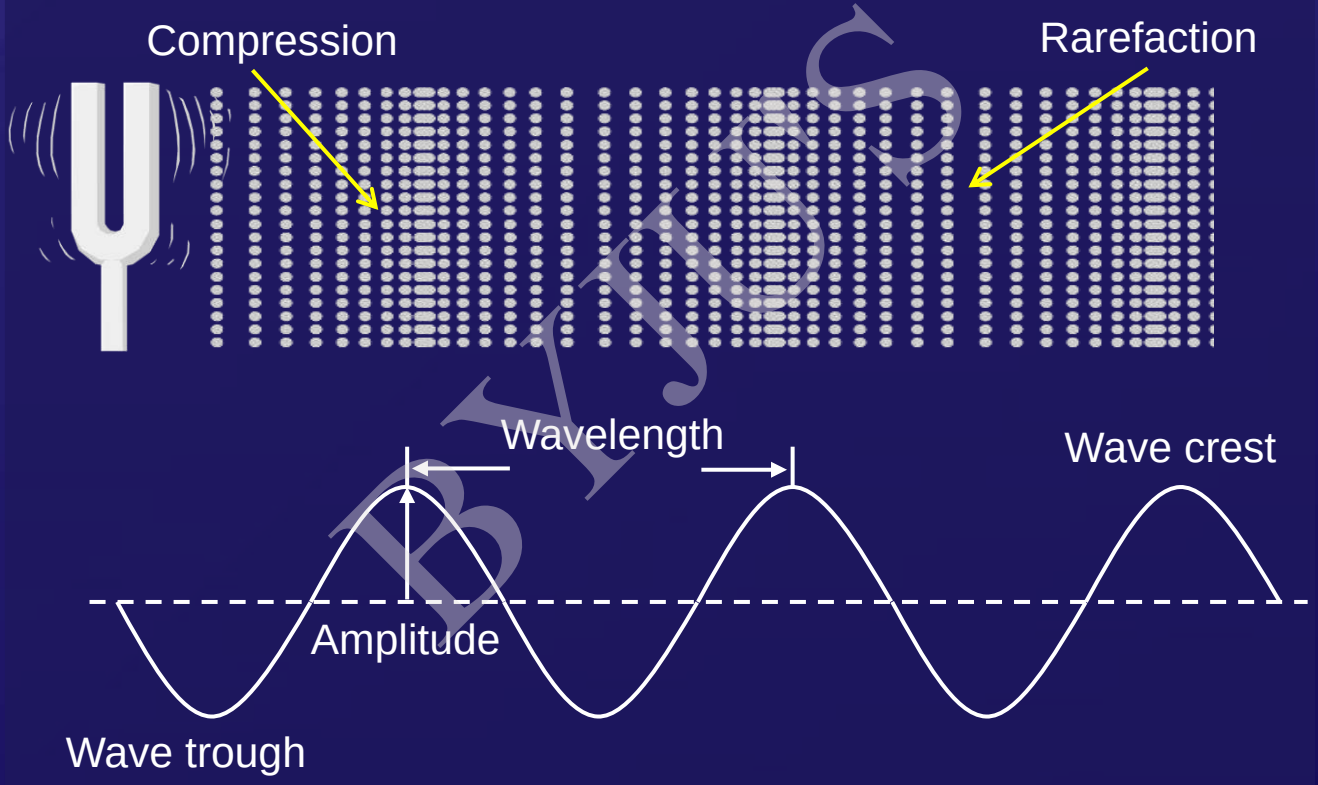
# 3. Hearing Process

- The outer part of the ear called pinna helps in collecting the sound and funnels it into the eardrum through the ear canal.
- Eardrum starts vibrating in a response to the incoming sound.
- Three little bones present in the middle ear increase the strength of the sound and pass the vibrations to the cochlea, where these vibrations are converted into electrical impulses. These impulses are then sent to the brain by the auditory nerves.
- Finally, the brain senses these impulses as sound.



# 4. Characteristics of Sound

- The propagation of sound can be represented in the form of a wave.
- The region of higher pressure or compression is represented as crest and the region of lower pressure or rarefaction is represented as trough.






## 4.1 Wavelength

- Wavelength is the distance between any two consecutive crests or troughs.
- The S.I. unit of wavelength is metre (m).

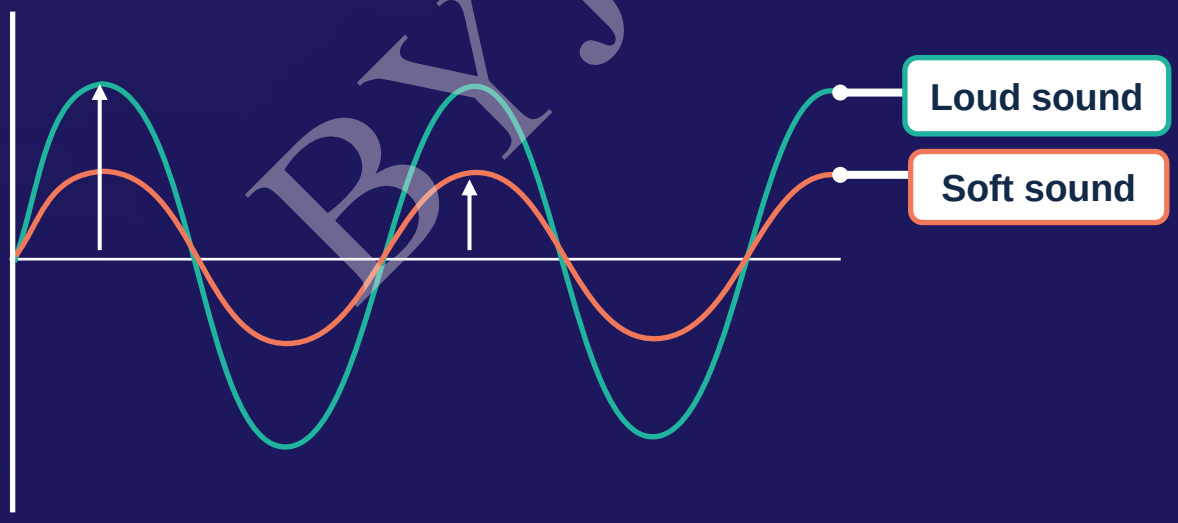
# 4. Characteristics of Sound

## 4.2 Amplitude

- The maximum displacement (or distance) of a crest or a trough from the mean position is called amplitude.
- Its SI unit is metre (m).

**Loudness:**

- Loudness is the characteristic by which a loud sound can be distinguished from a feeble sound.
- It depends on the amplitude of the sound wave. More the amplitude, louder is the sound.
- It is measured in decibel (dB).






## 4.3 Time Period

- Time period is the time required to produce one complete wave or oscillation.
- Its SI unit is second (s).

# 4. Characteristics of Sound

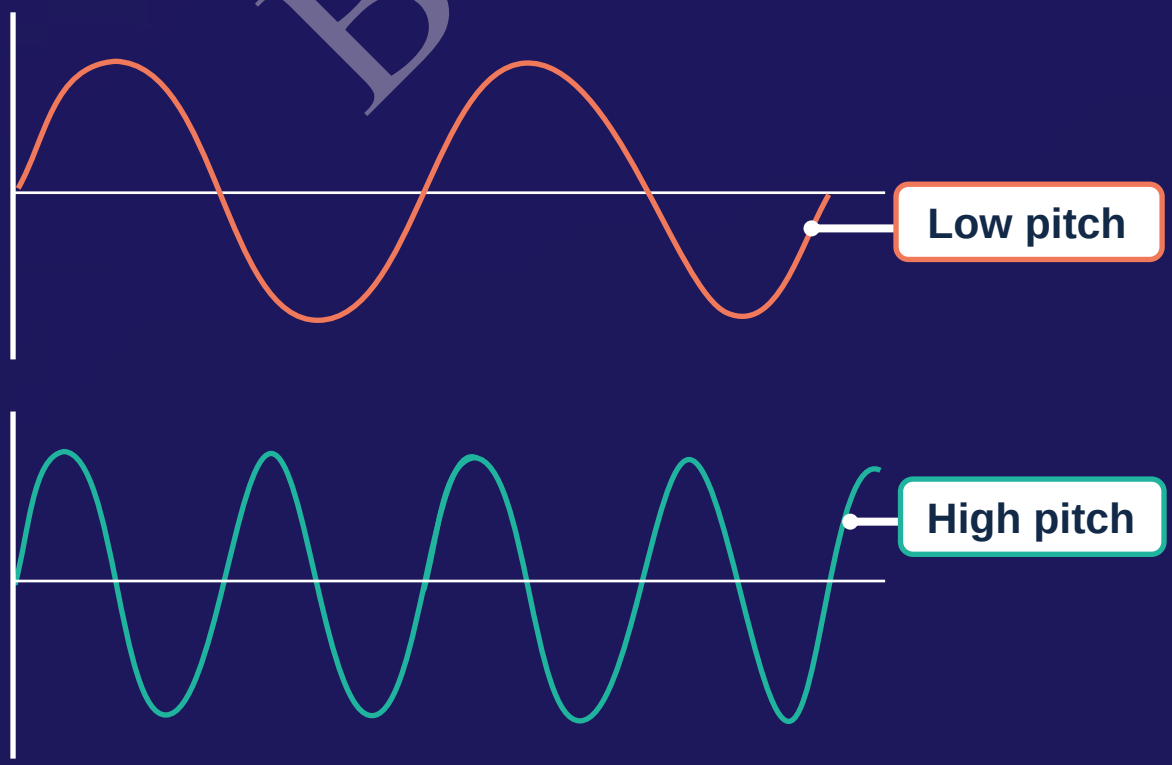
## 4.4 Frequency

- Frequency is the number of waves or oscillations produced in one second.
- The SI unit of frequency is hertz (Hz).

$$\text{Frequency} = \frac{1}{\text{Time period}}$$

**Pitch:**

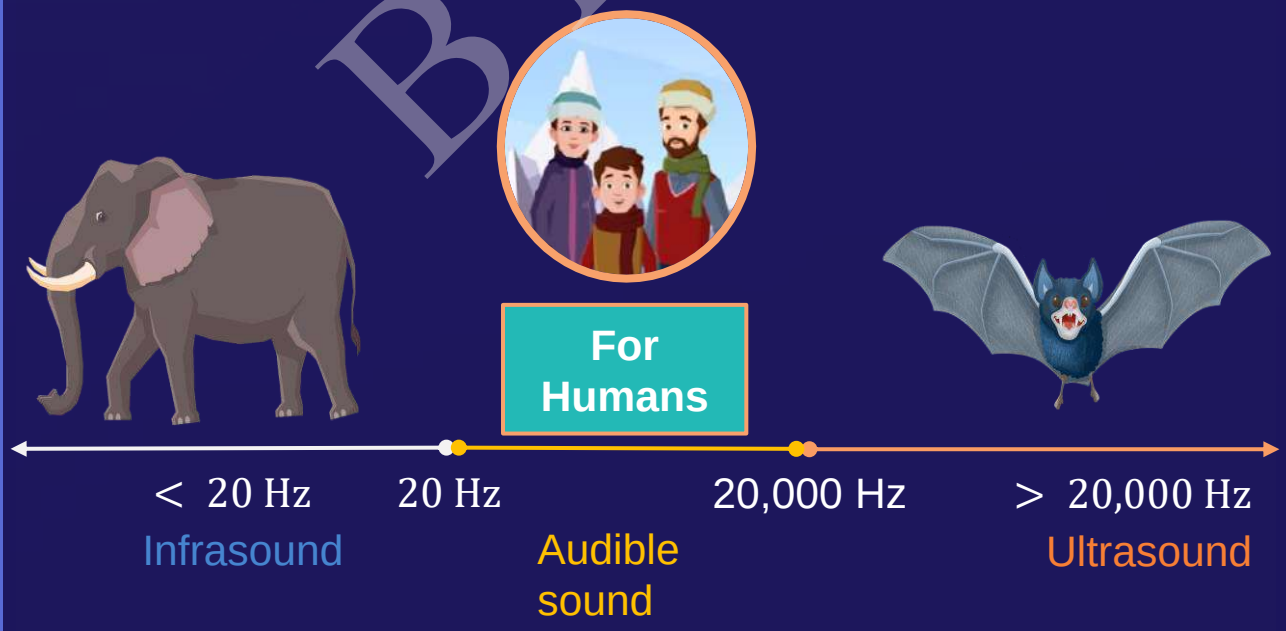
- Pitch is the characteristic by which a shrill sound can be distinguished from a flat sound.
- It depends on the frequency of the sound wave.
- Low frequency implies low pitched sound and high frequency implies high pitched sound.



# 5. Audible and Inaudible Sounds

- Our ears can hear sound in a particular range only.
- Sound having frequency roughly ranging from 20 Hz to 20,000 Hz lies in the audible range. In this range we can hear the sound.
- Sound having a frequency of less than 20 Hz is called **infrasound** and sound having a frequency of more than 20,000 Hz is called **ultrasound**. These frequencies are inaudible to us.
- Unlike humans, animals have different audible range of hearing. For example: elephants can hear sound of frequency less than 20 Hz and bats can hear sound of frequency even more than 20 kHz.





# 6. Noise and Music

- Noise is any unwanted or unpleasant sound while music is a sound that produces a pleasing sensation.

## 6.1 Noise Pollution

- The presence of excessive or unwanted sounds in the environment is called noise pollution.
- In cities, unnecessary honking and noise coming from vehicles are the major sources of noise pollution.

Honking of vehicles

- Apart from that, music speakers operating at high volumes, noisy machinery, etc. also contribute to noise pollution.

Speaker on high volume

# 6. Noise and Music

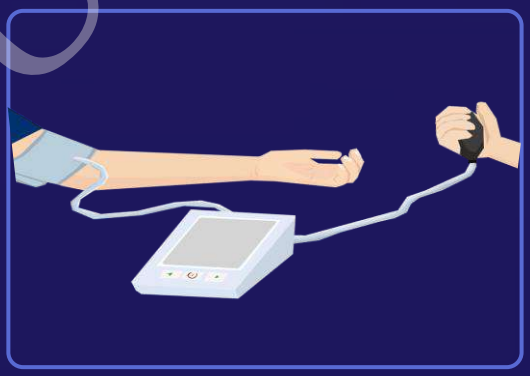
## 6.1 Noise Pollution

### Hazards of Noise Pollution:

Headache

Sleeplessness

Hearing loss



Hypertension

### Methods to reduce Noise Pollution:

Planting trees

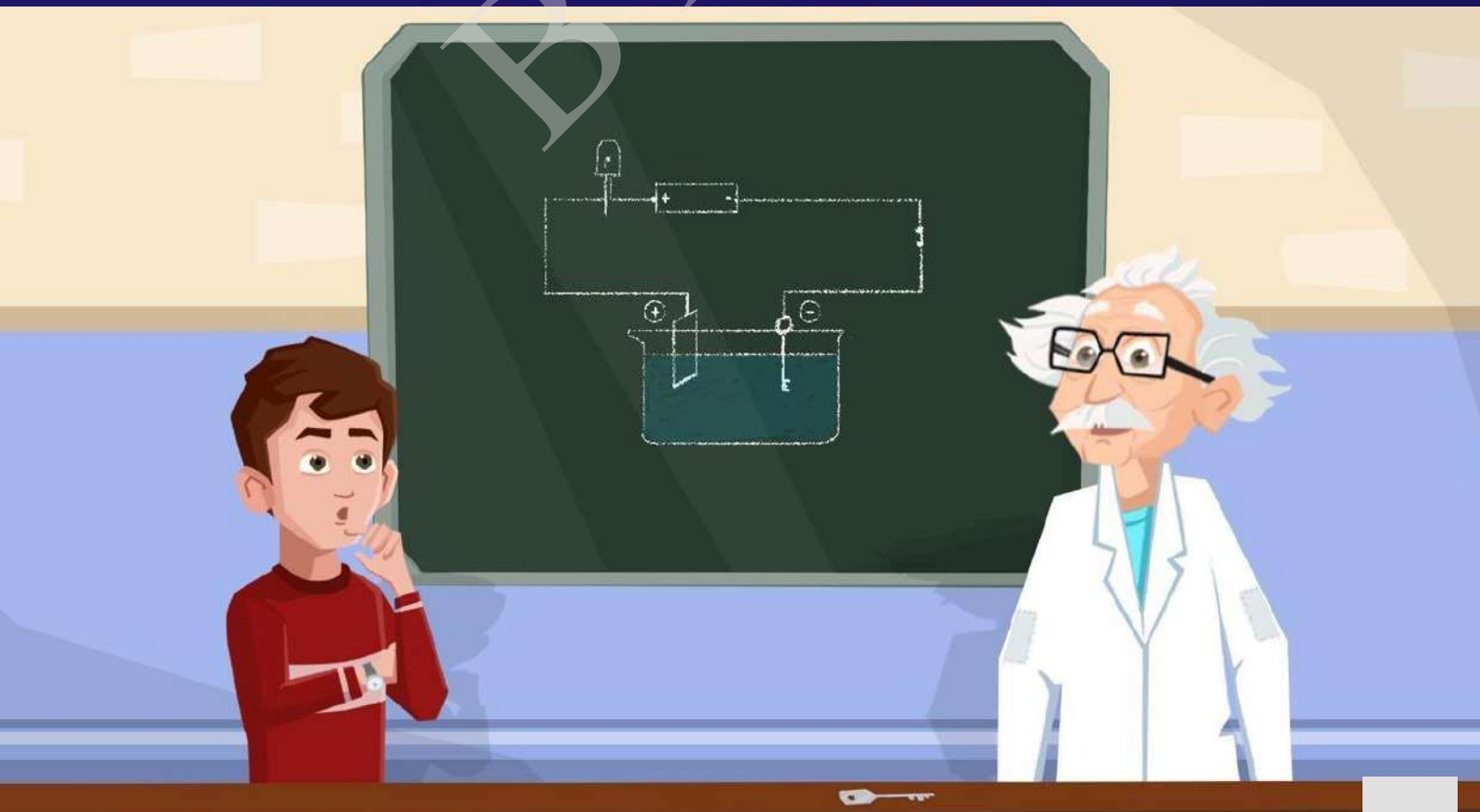

Lubricating machines

BYJU'S Classes

# Class Notes

## Chemical Effects of Electric Current

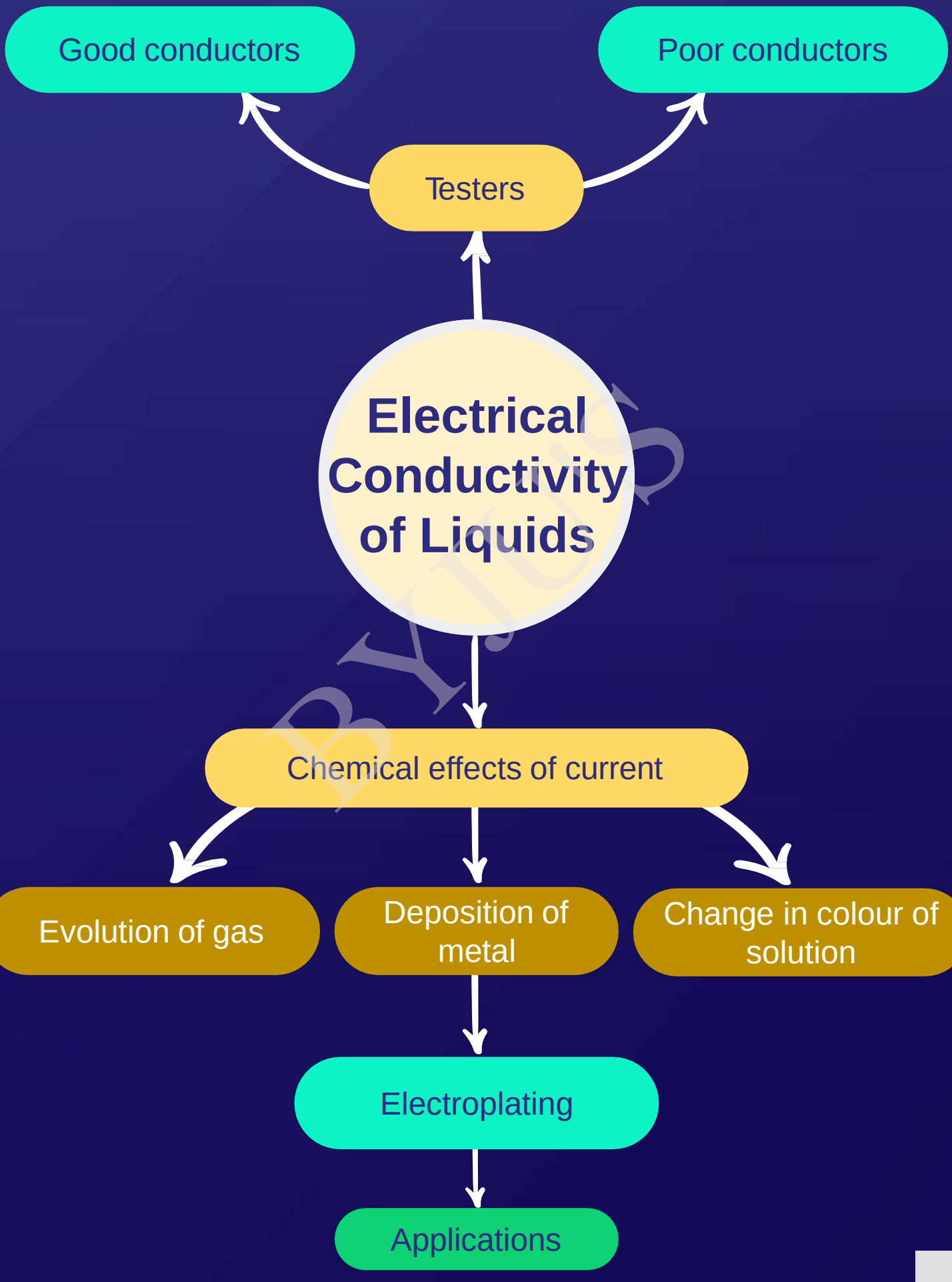
Grade 08



# Topics to be Covered

1. **Electrical Conductivity**
   1. Testers
   2. Good conductors
   3. Poor conductors
2. **Electrical Conductivity of Liquids**
3. **Chemical Effects of Electric Current**
   1. Electrodes and electrolytes
   2. Chemical effects
4. **Electroplating**
   1. Applications of electroplating
   2. Purification of copper

# Mind Map



# 1. Electrical Conductivity

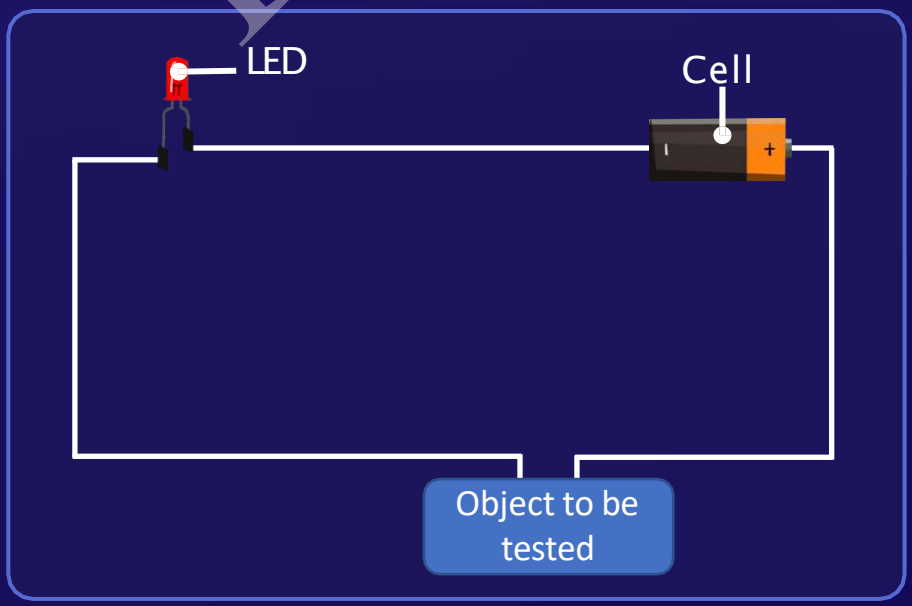
Electrical conductivity is the ability of a material to conduct electric current.

Based on electrical conductivity, materials are classified as: good conductors and poor conductors.

To check whether a material is a good conductor or a poor conductor of electricity, we use a tester circuit.

## 1.1 Testers

- A tester is an electrical equipment that is used to check the presence of electric current in a circuit using an indicator.
- The indicator can be a bulb, an LED, a buzzer, or a magnetic compass.



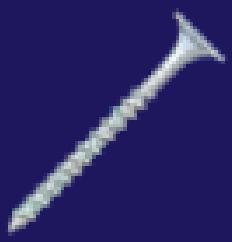

- Using an LED is preferred over a bulb as the LED glows even when for weak current in the circuit.

# 1. Electrical Conductivity

## 1.2 Good conductors

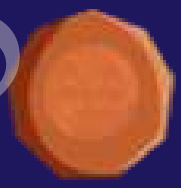
- These materials allow electric current to pass through them easily.
- They have high electrical conductivity.

Examples:



Iron

Steel



Copper

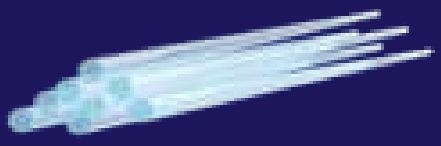
## 1.3 Poor conductors

- These materials do not allow electric current to pass through them easily.
- They have low electrical conductivity.

Examples:

Wood

Paper



Glass

# 2. Electrical conductivity of Liquids

- Just like solids, some liquids are good conductors while others are poor conductors of electricity.
- Water from sources such as taps, hand pumps, wells, etc. and rainwater are good conductors as they contain dissolved mineral salts. Lemon juice, milk and vinegar are also good conductors as these contain acids.
- Liquids such as sugar solution, kerosene and cooking oil are poor conductors. Distilled water is also a poor conductor as it is devoid of any mineral salts.



**Good conductors**

Tap water

Lemon juice

Vinegar

**Poor conductors**

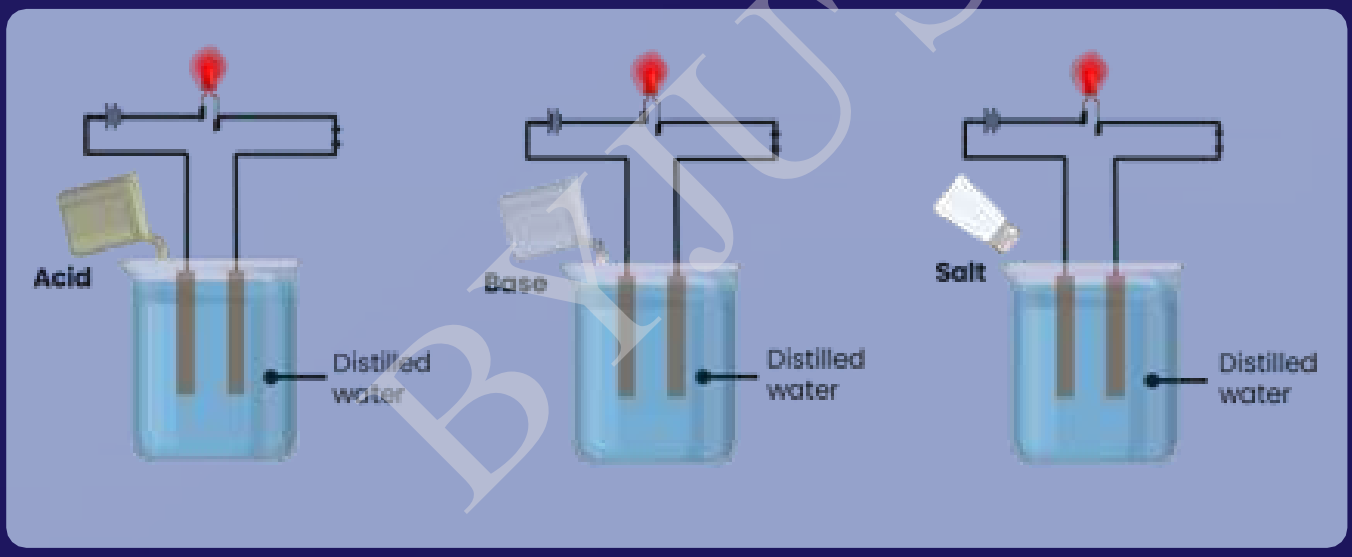
Kerosene

Distilled water

Oil

# 2. Electrical conductivity of Liquids

- Most liquids that conduct electricity are solutions of acids, bases or salts.
- Water in its pure(distilled) form is a poor conductor of electricity. Adding acids, bases, or salts in distilled water allows the passage of electric current and turns the solution into a good conductor of electricity.



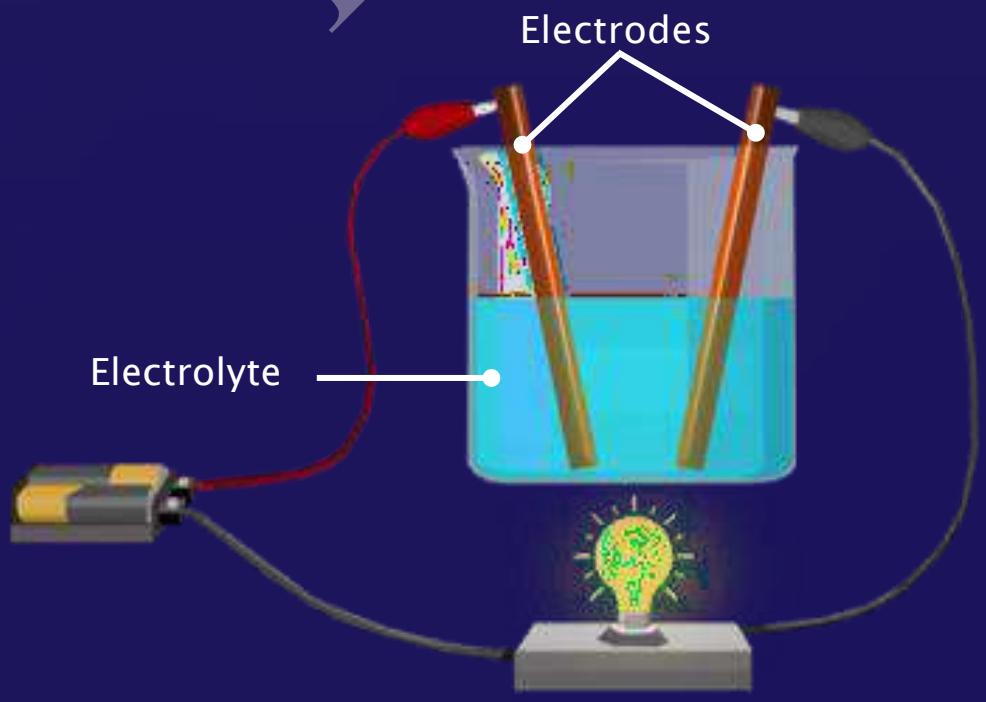

- Generally, liquids have a lower conductivity as compared to solids. To test conductivity of liquids, a tester with an LED is preferred. Moreover, instead of using a cell, a battery which is a combination of cells is preferred.

# 3. Chemical Effects of Electric Current

## 3.1 Electrodes and electrolytes

- An electrode is a conductor that is used to make electrical contact with non-metallic parts (in our case liquids) of the circuit. A carbon rod or an iron nail can be used as an electrode.
- The electrode connected to the positive terminal of the battery is called anode while the electrode connected to the negative terminal is called cathode.
- An electrolyte is a conducting solution in which the electrodes are placed. It can be a solution of an acid, base or salt.





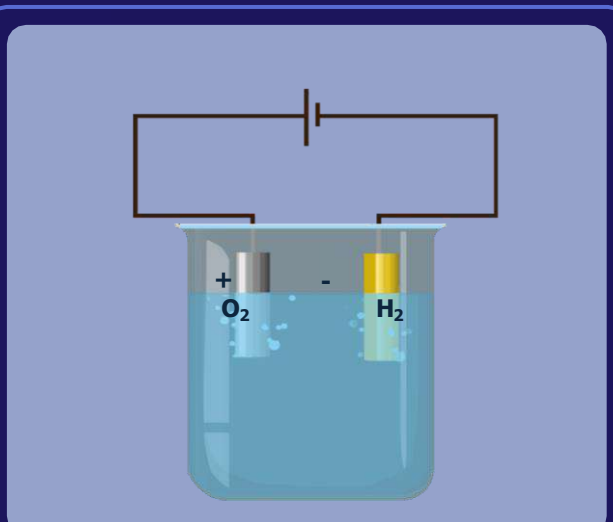
# 3. Chemical Effects of Electric Current

## 3.2 Chemical effects

- The passage of an electric current through a conducting solution causes chemical reactions. As a result, the following chemical effects can be observed:

✓ Formation of gas bubbles at electrodes
✓ Change in colour of the electrolyte
✓ Deposition of metals at electrodes

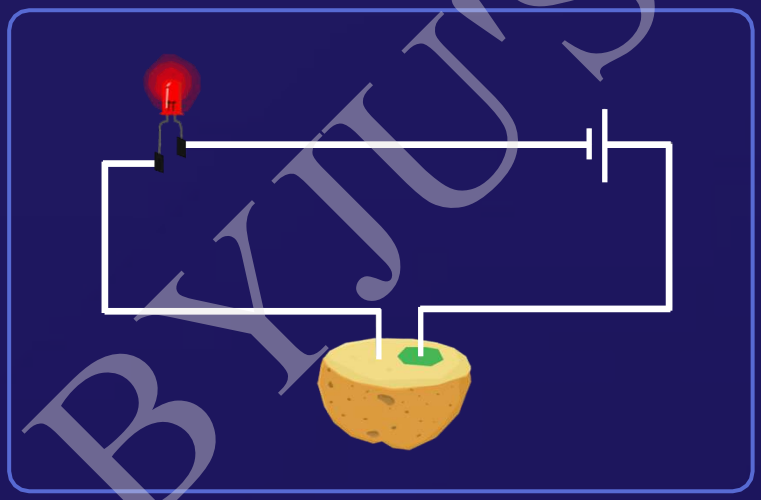
- When electricity is passed through water, bubbles of oxygen and hydrogen are produced. Oxygen bubbles are formed at the electrode connected to the positive terminal of the battery while hydrogen bubbles are formed at the electrode connected to the negative terminal. This process of breaking of water into oxygen and hydrogen is called **electrolysis of water.**



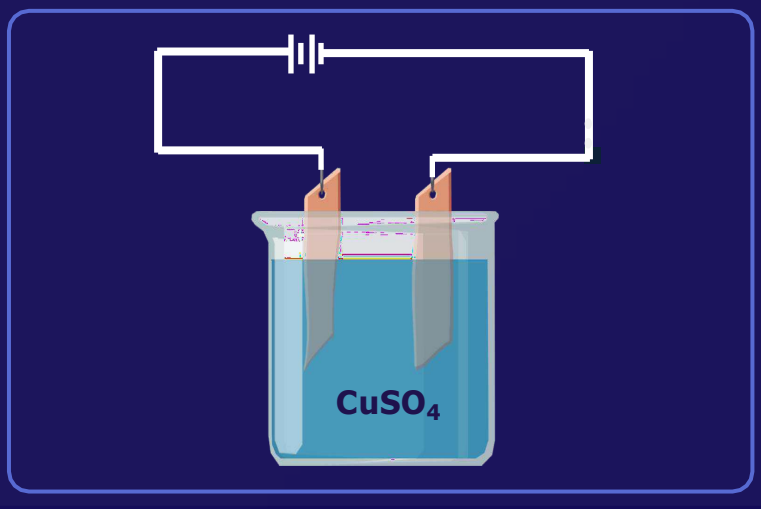
# 3. Chemical Effects of Electric Current

## 3.2 Chemical effects

- When an electric current is passed through a potato, a greenish-blue spot is formed around the wire connected to the positive terminal of the battery. This can be used to identify the positive terminal of a cell or battery concealed in a box.



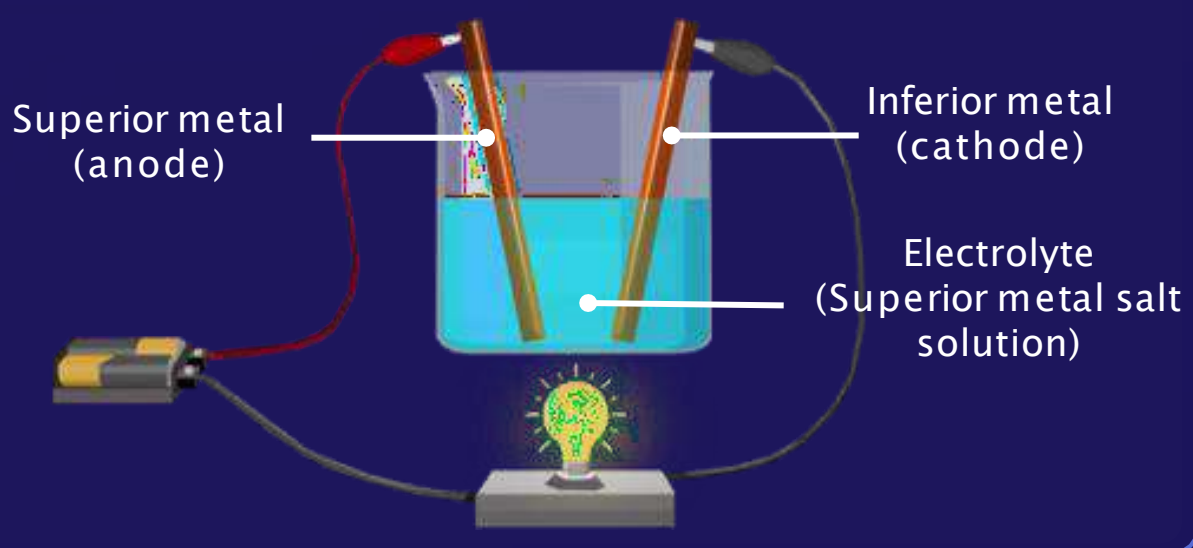
- When electricity is passed through copper sulphate solution using copper electrodes, a deposition of copper is seen on the negative electrode.



# 4. Electroplating

It is the process of depositing a layer of a desired metal on another material by means of electricity.

- In electroplating, an inferior metal (which can be affected by atmospheric humidity, $CO_2$, etc.) is coated with a superior metal (which is generally less reactive).
- The superior metal is connected to the positive terminal of the battery while the inferior metal is connected to the negative terminal. The electrolyte must be a salt solution of the metal that is to be deposited.
- If we want to electroplate zinc on iron, zinc is used as anode while iron as cathode. Zinc sulphate solution can be taken as electrolyte. On passing current through the electrolyte, free zinc in the electrolyte gets drawn to the cathode and gets deposited on it. From the other electrode, an equal amount of zinc gets dissolved in the solution and the process continues.

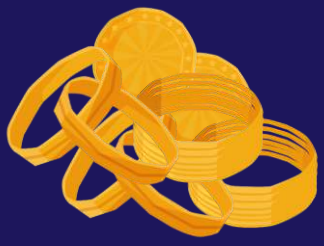


# 4. Electroplating

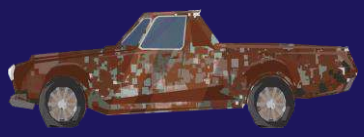
## 4.1 Applications of electroplating

- Chromium plating is done on objects such as car parts, taps, gas burners, wheel rims, etc. Chromium has a shiny appearance and does not corrode.
- Gold and silver are electroplated on less expensive metals. This is used to make ornaments, medals, etc.
- For storing food, iron cans are electroplated with tin. Tin is less reactive and prevents the food from coming in direct contact with iron.
- A coating of zinc is added on iron (in automobiles and bridges) to protect it from corrosion and formation of rust.
- Electroplating is also used for purification of metals such as copper. Presence of impurities can decrease the electrical conductivity of copper and is not desirable.

Prevents scratches



Makes objects shiny



Prevents corrosion

## 4.2 Purification of copper

- To purify copper, an aqueous solution of copper sulphate is taken as the electrolyte. This contains copper and sulphate ions.
- The anode(positive electrode) is made from impure copper and the cathode(negative electrode) is made from pure copper.
- When electric current passes through the electrolyte, free copper gets drawn to the cathode and gets deposited on it. From the other electrode, an equal amount of copper gets dissolved in the solution. Through this process, pure copper is obtained at the cathode.