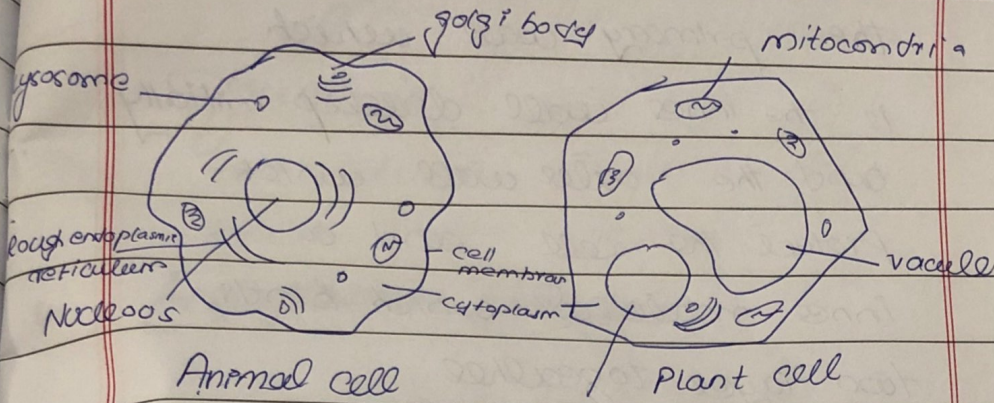


# Cell



# Cell

Cell is discussed by Robert Hooke and nucleus is discovered by the Robert Brown. Cell is surrounded by the number of the organelles

## ↳ Cell wall

Cell wall is the outermost layer of the plant cell. It provides support to the cell. It provides strength to the cell. It is composed of cellulose, hemicellulose, and lignin.

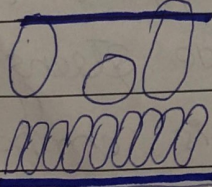
lignin provide strength to the wall

The cell wall is of two types the primary wall which is the inner wall develops initially and the outer wall which protect the cell and a inner material which binds two layers together

## 2- Cell membrane

Cell membrane is the outer most layer of the animal cell. It provides support to the cell. It provide strength to the cell. It is a passage from where transport of material occur.

It is a semipermeable membrane. Lipids bilayered in the the lipid bilayer



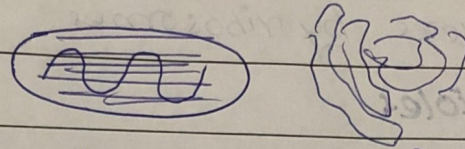
Fluid mosaic model

## Cytoplasm

Cytoplasm is the inner part of the cell.

Most of the organelles found in it and most of the cellular activities takes place in the cytoplasm.

## 4 Endoplasmic Reticulum



Endoplasmic reticulum is of two types

### Rough endoplasmic Reticulum RER

RER is rough in the shape ribosomes are attached with them and they read the information from the protein.

### Smooth Endoplasmic Reticulum

It helps into the synthesis of the starch.

## 5 Ribosomes

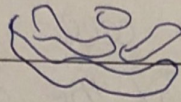
They are attached with the rough endoplasmic reticulum.

Day: \_\_\_\_\_

Date: \_\_\_\_\_

they help in protein synthesis.

## Golgi bodies



Golgi bodies are found in the cytoplasm of the cell they further synthesize the protein which is sent to the Golgi complex by ribosomes.

## Centrioles

They are found in the animal cells help in the cell division.

## Plastids

Plastids are the material found in the plants.

### Plastids are

**Chloroplast** : It is a green coloured material help in photosynthesis.

**Chromoplast** : It is a coloured material.

**Leucoplast** : It is found in the roots of the plant.

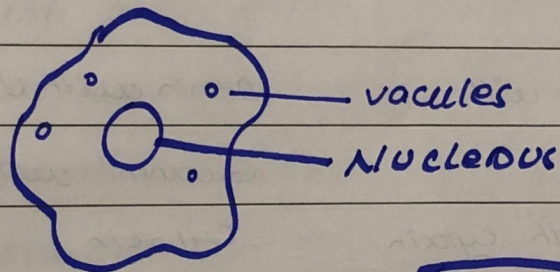
## Nucleus

Nucleus is found in the center of the animal.

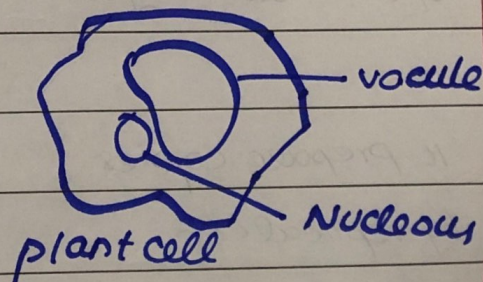
cell and side of the plant cell it helps in the synthesis of nucleic material/genetic material

## Vacuoles

Vacuoles store water they are found in both animal and plant cells. In plant there is one vacuole found in the center while in animal cell vacuoles are small and many.



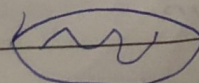
Animal cell



plant cell

## Mitochondria

Mitochondria is the power house of the cell. ATP are generated into it.



# DNA

# RNA

①	DNA is Deoxyribo nucleic acid	It is Ribonucleic acid
②	It is made up of deoxyribose sugar	It is made of ribosome sugar
③	DNA is double strand structure	It is single stranded structure
④	It contains four nitrogenous base	It has four nitrogenous bases
⑤	Adinin pairs with Thaimin and Guanine with cytoxin	Adinin with Uracil Guanin with cytoxin
⑥	It prepares copies by replication	It prepares copies by transmission
⑦	It is present inside the nucleus	cytoplasm and nucleus
⑧	It is found in animal cells of eukaryotes	present in viruses

# Immune System

Immune system is a system in our body which helps the body to fight against the pathogen.

## Immune System

(is divided into two)

### Innate Immunity

It is the first line of defence in the body skin, mucus membrane, neutrophils and macrophages stops the pathogen but it is not a long term (immunity).

### Adoptive Immunity

When a pathogen enters in a body body releases antibodies and T cells they fight against it and have a memory system so that next time they kill the pathogen in time.

## Lymphatic System

In lymphatic system immune cells travel

to the whole body, spleen, bonemarrow and lymphatic nodes are the major components of it. In lymphatic nodes these pathogen are stopped and killed.

## **Antibodies**

Antibodies are released by the B-cells in response to pathogen they kill it by themselves or target it to other cell to kill the pathogen.

## **Vaccinization**

Vaccinization is also the process from which antibodies are produced to fight against the bacteria. Vaccines are of different types

• Weakened (Attenuate): Microorganism is live e.g. measles

Inactivated: killed viruses or bacteria of the vaccine

Toxoid: Toxin produced by microorganism is used e.g. tetanus

Conjugate: Part of bacteria combined with proteins e.g. influenza



# Disease

## Polymyelitis

Polio is a viral disease that attack on the nervous system and cause a complete paralysis

### According to WHO

One of 200 people suffering from polio are completely paralyzed.

### Transmission of disease

Polio is transmitted through the feces, oral or contaminated water.

### How to cure polio

Polio has no cure.

It can be prevented by the vaccines that consist of active vaccine or inactivated vaccine.

### According to WHO

99% of the polio is controlled since 1988

Polio Eradication strategy 20-26 to fully remove it.

# Dengue

Dengue is a viral disease  
It is transmitted through  
the mosquito *Aedes Aegypti*:

## According to WHO

The world is at risk  
of dengue around 100-400  
million people suffer from  
dengue every year.

## Symptoms

Headache, fever, body  
pain. Symptoms remain  
from 1-2 weeks. Severe  
dengue leads to death.

## Transmission

It is transmitted through  
the female mosquito *Aedes Aegypti*.

**Cure**: There is no cure for it  
however paracetamol is used to  
control pain. Dengvaxia is a  
first vaccine for it.

**Prevention**: mosquito net, feel  
screen clothes etc.

# Hepatitis

Hepatitis is a viral disease  
it causes infection in the liver  
and ultimately leads to the  
liver cancer.

**Hepatitis can be of 5 types  
caused by viruses**

**Hepatitis A:** It is found in the  
jeases and can transmitted  
through the contaminated water.  
It causes mild infection  
people can easily recover.

People usually in developing  
countries suffered from it.  
Vaccine is available for  
it.

**Hepatitis B:** It is spread  
through the blood. It  
causes severe infection  
when combined with D.  
Vaccine is available  
for this.

## Hepatitis C

It is transmitted through the blood or contaminated needles.

Symptoms are mild. No vaccine is available for hepatitis C. Antivirals are available.

## Hepatitis D

It is caused when the patient has hepatitis B. Together they cause ~~the~~ severe damages to the body.

It can be cured with vaccine of hepatitis B.

## Hepatitis E

It is transmitted to the contaminated water and food. Symptoms are mild. ~~can be cured.~~ ~~NO~~

Vaccine is available for the hepatitis E.

According to WHO: 4.5 million

premature deaths can be prevented by 2023 through vaccination.

# Diarrhoea

**Diarrhoea** is the intestinal disease caused by bacteria i.e. E-coli, viruses and microorganism transmitted through the contaminated food.

**Symptoms** 3-5 times watery stools, sunken eyes, lethargy

**Treatment** ORS or simple salt, sugar and water solution.

## Three types of Diarrhoea

**Watery:** Last from hours to days

**Including** cholera

**Bloody:** It is called dysentery

**Persistent:** Last for weeks upto 14 days

**According to WHO** It is the second leading cause of deaths of children under 5.

~ 525000 deaths every year due to the diarrhoea (child)

# Kingdoms

All living organisms are divided into five kingdoms

- ① Plants
- ② Animalia
- ③ Protista
- ④ Monera
- ⑤ Fungi

## Monera

Kingdom Monera is the kingdom which contains the single celled organisms like Bacteria they sometimes can make food.

## Protista

In kingdom protista these can be single or multicellular organism they have chlorophyll in them they can prepare their own food they usually live in the water e.g algae

## Fungi

Fungi are the multicellular organism they can not prepare their own food therefore dependent on the other e.g yeast

## Plants

All plants weather big or small grow in it. Plants have chlorophyll in them they can prepare their own food

**Plants are divided into**

**Vascular**

**Non Vascular**

Vascular plants have proper vascular system in them xylem that transport water and phloem that transport

The usually have small plants they do not have proper vascular system

Food : mango, Banana

e.g mosses

**Vascular are further divided**

**Seed forming plants**

**Non seed forming plants**

They have seeds and produce flowers e.g rose

The do not have spores or flowers

**Angiosperms**

**Gymnosperms**

Their seed are enclosed in fruits

Their seed is not enclosed

They do not have cones

They have cones

Found in hilly areas pine

They produce  
grains

They do not produce  
grains

They can be found  
everywhere

e.g mango - guava

### Angiosperms

#### MonoCot

#### Dicot

Their seed  
has two cotyledons

Their seed has  
one cotyledon

e.g guava,  
rose, mango

e.g. Sugarcane,  
Bamboo

### Kingdom Animalia

#### Vertibrates

#### Invertebrates

- Fish - Shark
- Amphibians - Frog
- Reptiles - Lizard
- Mammals - Lion
- Birds - Duck

- Sponges :
- Coelms : Tapeworm
- Mollus : Snail
- Insects : Ant
- Echinoderm, starfish

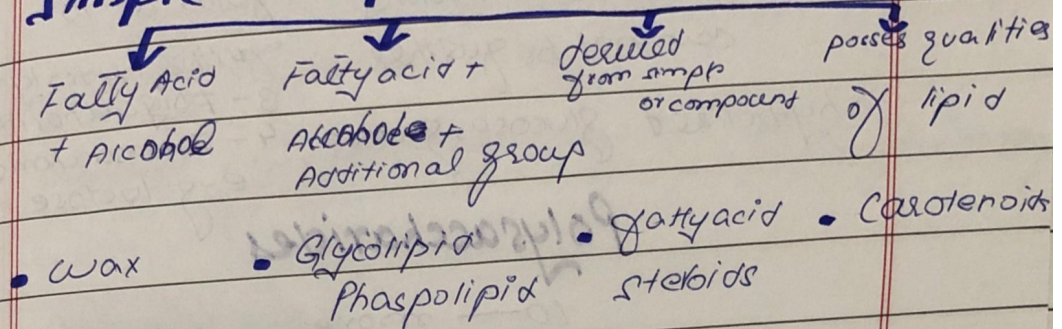


## Lipids

Lipids are the ~~(chemical)~~ organic compounds insoluble in water but soluble in non polar organic solvents.

## Classification

### Simple Compound Drived Miscellaneous



## Functions

insulator, protect body from external environment regulation  
store energy, component of membrane  
Absorption of vitamin, protect vital organs

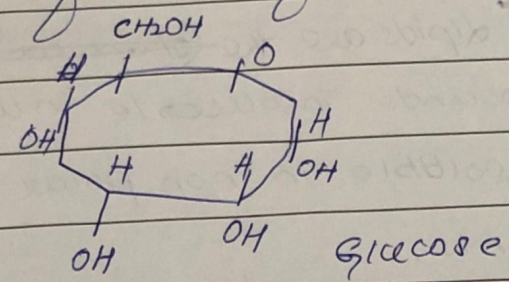
## Diseases

Obesity, fatty liver.

## Carbohydrates

Carbohydrates are organic compound formed of carbon, Hydrogen and oxygen  $C_n(H_2O)_n$  is

the formula of the carbohydrate



### Classification

<b>Monosaccharides</b>	<b>Oligosaccharides</b>
------------------------	-------------------------

simplest carbohydrate	form 2-10
can not be further hydrolyzed	further hydrolyzed
glucose, galactose	3- oligosaccharides
	4- tetrasaccharides
	e-g lactose

### Polysaccharides

10 — more  
 further hydrolyzed  
 starch, glycogen

### Function

store energy, present in cell wall, contains fiber, stored in form of starch in plants  
present in connective tissue

### Source

Potato, sugarcane, beetroot

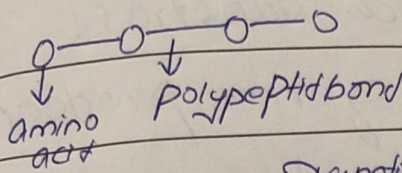
## Proteins

Proteins are the organic molecules consist of the Hydrogen, oxygen and carbon and in addition to that amino acid

# Protein are classified as

## Primary

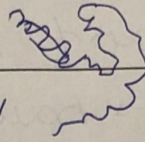
Protein exists as a long chain of amino acid



they are non functional

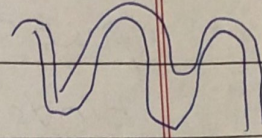
## Tertiary

If the polypeptide chain is folded and coiled held together by ionic bonding  
 globulin in blood



## Secondary

If the polypeptide chain is coiled in form of spiral of helix



keratin hydrogen bonding

## Quaternary

more than one polypeptide bond  
 hemoglobin insulin

### Basis of Function

- |  |  |                           |                          |
|--|--|---------------------------|--------------------------|
| ① Enzymatic<br>catalysis<br>• catalase | ② Nutrient storage<br>nutrient to growing embryo | ③ Transport<br>hemoglobin | ④ Structural<br>collagen |
|--|--|---------------------------|--------------------------|

### Function

- ① Nutrients to growing embryo
  - ② Growth of hair, nail
  - ③ Build new tissues
  - ④ Transport hemoglobin
  - ⑤ Antibodies
- Source: Egg, meat, fish

# Enzymes

Enzymes are the groups of protein that help in speed up the chemical reaction.

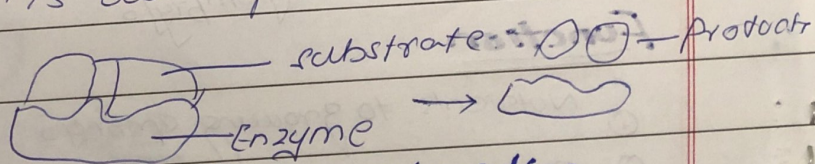
## How enzymes work

Enzymes have a specific part from which substrate binds and it form products. Enzymes have protein part and non protein part together they form holoenzyme.

## Lock and Key model

Lock and key model says that enzymes only binds with special substrate.

It has a shape which fits with special substrate.



muscle movement

Metabolism

Breakdown

large

molecule

## Function and characteristics

Speed up chemical reaction,

Binds with only one type of

substrate

Binds with lock and key model  
e.g. Catalyse.

# Natural Disasters

## Cyclone

Cyclone is a (large scale) weather condition in which there is low pressure at the centre and winds are circulating around that above the ocean.

### Formation of Cyclone

Cyclones are formed in the oceans when the temperature rise the air moves above and to fill the space cold air come in the empty spaces this then rise and cyclone is formed.

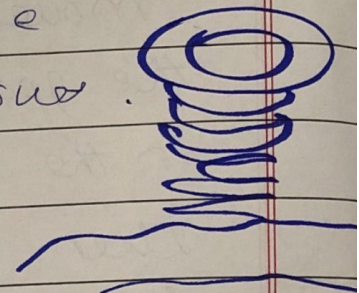
### Types

**Tropical Cyclone** It is formed when the air is move above and to fill the gap cold air comes it. It has eye in centre comparatively most calmest. All above it is eye wall where winds are present.

and above that clouds are present they are called Hurricanes in some area and in some Typhoons Pacific. They are of five types dependent upon the speed of the wind.

### Middle latitude Cyclone

They are formed away from the equator. They are formed at the boundaries of the mid and low pressure.



### Earth Quake

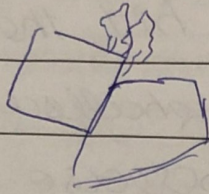
Earthquake occurs due to the movement of tectonic plates. It causes earth to move. The place where earthquake occurs is hypocenter. The place where it occurs on earth is called Episonic

**Types** **Converging - divergent**  
 boundary boundary  
 transformed fault

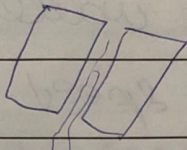
Day: \_\_\_\_\_

Date: \_\_\_\_\_

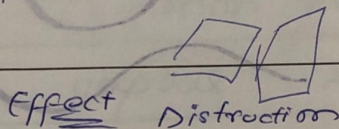
In convergent boundaries one plate is pushed into another and due to that mountains are formed



Divergent these plates are drift apart and give a way for the oceans to move



Transformed form here the plates are moving constantly.

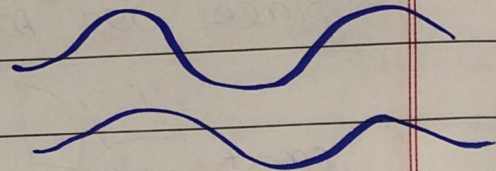


## Tsunami

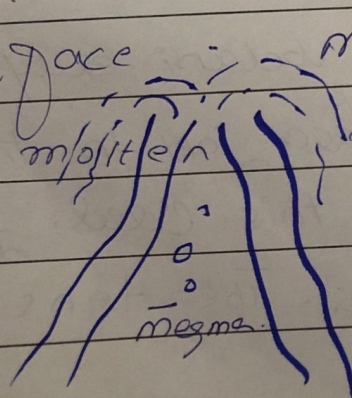
Tsunamis are the ocean movement due to earthquake, volcanic eruption and <sup>meteoroid</sup> they also fold in the ocean and this creates tension in the water. The tension

in the water makes the wave to move in upward direction and gravitational pull push them downwards. When these hit the ground they become shallower and their height increase and create a lot of destruction the first wave is not strong but the successive waves are strong. The waves can travel with the speed of 500 miles per hour. They are called killer waves.

### Volcano



The volcano is a chimney that connect the magma in the earth crust to the surface. Magma is the hot molten rocks.

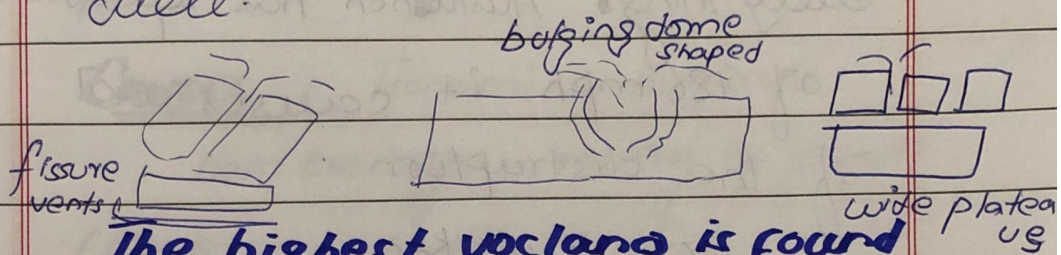




## How it erupts?

When the magma travels upward to the main vent gases expand and <sup>water</sup> in form of <sup>steam</sup> create pressure. The pressure is so much that the magma came out of the mountains.

Volcanos are found in the ocean and in ice caps well.



**The highest volcano is found on the Mars.**

Common gases are  $\text{CO}_2$ , water vapour, sulphur dioxide, hydrogen chloride, hydrogen sulphide and hydrogen fluoride.

## Avalanche

Avalanche occurs in the mountains covered with snow. When the

Day: \_\_\_\_\_

Date: \_\_\_\_\_

large amount of snow comes down together and washed the trees and rocks away this is called avalanche

The snow which is in the floor has potential energy and when it starts moving it has potential energy. once it starts moving it wipes every thing. Avalanche has speed of 186 mph it causes alot of the distraption.

How it works?

The snow when not bonded together when the layers are of thick and thin snow a sudden distraption can cause it. The area which is of  $40^\circ$  to  $30^\circ$  steep usually have high risk of causing avalanche.

# Flood

When the water touches the land it is called flood

↓ ↓ ↓

Slow onset floods    Rapid Flood    Flash Flood

When the banks over flow	It takes 2-3 days to develop	It takes hours or even minutes to develop
It takes days to develop		

Causes : Tsunami , Hurricane

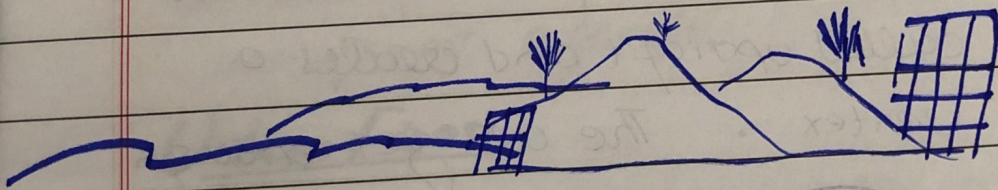
Dam breakage , melting of glaciers

## Effects

Destruction

## Prevention

Plant tree , building dams



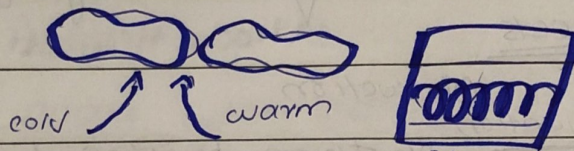
Tornado (Bangladesh destroyed more 20 villages 1989)

Tornados are the most dangerous of all the natural disasters. The ~~destructors~~ destroy every thing

## Formation of Tornado

Tornado's all formed under a powerful and big thunderstorm. ~~water~~ The cold <sup>dry</sup> air from the surrounding and moist warm air creates instability in the environment.

The cold air is denser and it slides down while warm air slide upward creating an invisible spin motion on the ground



the warm air pushes it upward called updraft and creates a vortex. The air get enough

energy to form a tornado when its tip touches the ground from cloud it causes destruction wipes everything. Usually last for minutes but powerful tornado can last for hours and can travel up to 150km.

# Wild Fire

↳ visible part of combustion

Heat + fuel + O<sub>2</sub>

wild fire also called forest fires  
all uncontrolled fires that  
spread rapidly in forest and  
causes destruction

Causes : Thunderstorm, human  
activities, volcanos etc

## Amazon wild fires

conditions Strong winds, dry area  
low humidity abundance of vegetation

effects loss of flora and fauna,  
air pollution, climate change

Prevention Remote sensing, wild fire  
management agencies.

## Urban Fires

Fire that occurs in urban areas

<u>Structural</u>	<u>Wildland</u>	<u>Industrial</u>	<u>Transportation</u>
↓ within the buildings, commercial and industrial facilities	<u>Urban Interface</u> urban areas meet the forest area	hazardous materials flammable	vehicles

# Disaster Management

Pakistan is 18/191 countries  
in disaster pron

## Disasters

↓ Natural    Man Made

Flood, cyclone  
avalanche

Accidents,

Bombing,  
warfare

## Disaster management

**Mitigation** Already prepared, reduce risk  
building code

**Preparation** Training, technology, early warn

**Response** Direct response, emergency health care  
food, water, shelter

**Recovery** destruction

## Collective Responsibility

of people - Educational support

child protection household

security

## Disaster Management in Pakistan

Inadequate measures

Lack of gov inefficiency

## Consequences

### . Economy

- Animal life, plant
- Soil damage

## Pakistan political crisis

lack of planning in addressing  
climate

lack of laws

==