**Class IX**

**Chemistry**

***Matter in our surroundings***

**Objectives:**

* **Students will understand the basic concept of Matter and different phase of matter.**
* **Students will differentiate between solid, liquid and gas.**
* **Students will learn the process of Fusion, Condensation, Solidification, Sublimation, and Vaporisation.**
* **Students will learn different terminology related to phase conversion i.e., boiling point, melting point, heat of vaporisation, heat of fusion.**
* **Students will learn the process of Evaporation and factors affecting Evaporation.**
* **They will understand the basic difference between Evaporation and Boiling.**

|  |  |
| --- | --- |
| **Topic** | **Description** |
| **Matter** | **\***Anything that occupies space and has mass. |
| **Physical classification of matter** | **\***Three states:   * Solid. * Liquid. * Gas |
| **Solid** | **\*Characteristics:**   * Rigid (compact structure) * Incompressible. * Interparticle distance smallest. (Distance b/w two particles.) * Force of attraction strongest. * Energy minimum. * Density maximum. * Generally they do not show the property of diffusion.   e.g. wood, iron, ice etc.   * **Definite shape and volume.** |
| **Liquid** | **\*Characteristics:**   * Fluids (They show the property of fluidity i.e., tendency to flow). * Almost incompressible. * Interparticle distance moderate (More than solid and less than gas.) * Force of attraction moderate (more than gas and less than solid.) * Energy moderate. * Density moderate. * Generally they show the property of diffusion.   e.g. water, milk, oil.   * **Definite volume but shape not fixed.** |
| **Gas** | **\*Characteristics:**   * Fluids. * Highly compressible. * Interparticle distance maximum. * Force of attraction minimum. * Energy maximum. * Density minimum(due to large volume ) * Highly diffused.   e.g. air, oxygen, C.N.G.   * **Neither definite volume nor shape.** |
| **Chemical Classification of matter** | * Element * Compound. * Mixture. |
| **Element** | \*Substance made up of same kind of atoms.  e.g. Iron(Fe) |
| **Compound** | \*Substance made up of molecule of same kind.  e.g. H2O |
| **Mixture** | \*Material consists of two or more pure substance in any proportion  e.g. air, soil. |
| **Physical nature of matter** | \*matter is made up of extremely small particles.  \*Particles of matter having interparticle space called voids.  \*Particles of matter are continuously moving due to kinetic energy.  \*Particles of matter attract each other due to force of attraction which keeps them together. |
| **Scales of measuring temperature** | \*Three scales:   * Kelvin (K) * Celsius (oC) * Fahrenheit.( oF)   Relationship :  K= oC + 273  oF= 9/5 (oC + 32) |
| **Conversation of states** | \*Solid Liquid    Gas  Solid Liquid (fusion)  Liquid Solid (Solidification)  Liquid Vapour (Vaporisation)  Vapour Liquid (Condensation)  Solid gas (sublimation) |
| **Melting point** | \*Temperature at which solid melts to become a liquid at atmospheric pressure. |
| **Latent heat of Fusion** | \*Amount of heat energy required to change 1 kg of a solid into liquid at its melting point.  \*latent heat is used up to overcome the force of attraction b/w solid particles.  \*Due to this latent energy temperature not changed during phase conversion.   * For Ice value is 3.3457x 10 5  J/kg. Due to this Ice at 0oC is more effective in cooling a substance than water. |
| **Freezing Point** | \*Temperature at which a liquid freezes to become a solid. |
| **Boiling Point** | \*The temperature at which a liquid starts boiling at atmospheric pressure. |
| **Effect of Impurities** | \*Impurities lower the freezing point of liquid.  \*Impurities increase the boiling point of liquid. |
| **Effect of Pressure** | \*Pressure decreases the freezing point of liquid.  \*Boiling point of a liquid increases when pressure increased.  e.g. Water boils at 373K, where pressure is 1 atm, however on mountains it boils at lower temperature where pressure is less than 1 atm |
| **Volatile and Non volatile liquid** | **\*Non Volatile:** Strong force of attraction i.e., higher boiling point.  E.g. Glycol, Glycerol.  \***Volatile liquid:** weak force of attraction i.e., low boiling point.  e.g. Ether, benzene, Petrol. |
| **Latent heat of Vaporisation** | **\***Amount of heat energy to change 1 kg liquid into vapour.  \*For water 22.59x 105 J/kg i.e., at 1000C both water and steam exist together.  \*Particles of steam at 1000C have more energy than water at the same temperature.  \*Steam is more effective than boiling water for heating purpose. |
| **Sublimation** | **\***Direct conversion ofa solid into gas (vapour) on heating and vice- versa on cooling with no temperature change.  \*During sublimation the substance cannot passed through intervening liquid state.  Solid Vapour  e.g. Anthracene, Naphthalene, NH4Cl, Iodine, Camphor and Benzoic acid. |
| **Application of Sublimation** | **\***Purification of solid containing non volatile impurities.  \*Freeze-dried food prepared by sublimation can be stored for long time. |
| **Evaporation** | **\***Phenomenon of change of a liquid into vapour  at any temperature below its boiling temperature. |
| **Factors affecting Evaporation** | \***Surface Area**: Evaporation is a surface phenomenon.i.e, only surface particle get converted into vapour.  **\*Temperature**: Temperature directly proportional to rate of evaporation.   * As temp. Increases kinetic energy increases. Therefore force of attraction b/w particles become lower hence evaporation increases.   **\*Humidity**: The amount of water vapour present in air is called Humidity.  #Humidity inversely proportional to rate of evaporation  **\*Wind Speed**: Wind speed directly proportional to rate of evaporation.  **\*Nature of a liquid**: Volatile liquid have greater tendency for evaporation as compare to non volatile.   * Boiling point decreases, then evaporation tendency high. |
| **Difference b/w Evaporation and Boiling** | **\***Evaporation is a **surface** phenomenon while boiling is a **bulk** phenomenon.  \*Evaporation occurs at all temperature while boiling takes place at particular temperature.  \*Evaporation causes cooling while no cooling effect in case of boiling. |
| **Evaporation causes cooling** | **\***In evaporation, liquid particle having high kinetic energy leave the surface and convert into vapour.  \*As a result the average kinetic energy of remaining particles decreases. Hence temperature falls. |

**Extra point:**

* **Dry Ice: Solid CO2.**
* CO2 is cooled under high pressure; it can be directly converted into solid CO2.
* Solid CO2 does not wet the surface on which it is kept hence known as Dry Ice.
* It is used as a refrigerant under the name **Dricold**

**Other states of matter:**

* **Plasma:**
* It consists of super energetic and super excited particles.
* Particles are in the form of ionized gases.
* **Sun and stars glow due to pressure of plasma (formed due to high temperature.)**
* **Bose –Einstein:**
* It is formed when a gas has a very low density.

**Activities:**

* To study the factors affecting Evaporation.
* To demonstrate the process of Sublimation.
* To study the Compressibility of solid, liquid and gas.
* To demonstrate the strength of attractive forces b/w particles of different kinds of matter
* To demonstrate that the particles of matter are very small.
* To demonstrate that particles of matter have space b/w them.

**CLASS IX (BIOLOGY)**

**SA- 1**

**Chapter- 6 – (Tissue)**

**Topic:- Plant Tissue**

|  |  |
| --- | --- |
| Main points | Explanation |
| 1. Histology | Study of tissue |
| 2. Tissue | Groups of cell having a common origin and similar structure to perform common function |
| 3. Meristematic tissue | A plant tissue responsible for growth. |
| 4. Apical meristem | It occur at growing tips of stem and root produces growth in length. |
| 5. Intercalary meristem | Present at base of leaves node & internodes and helps in growth of leaves. |
| 6. Lateral meristem | It helps in growth of girth of stem & roots |
| 7. Parenchyma | A simple permanent tissue present at stem & leaves and help in storage, support and gaseous exchange. |
| 8. Collenchyma | Present below leaf epidermis, midrib and herbaceous stem for providing strength & flexibility. |
| 9. sclerenchyma | A dead tissue present in hypodermis monocotstem, covering of seeds & husk of coconut for providing mechanical support and hardness. |
| 10. Xylem | A complex permanent tissue, help in conduction of water & mineral from roots in plants. |
| 11 Tracheid | A long tubular dead cells with tapering and for movement of water in xylem. |
| 12. Vessel | A long tube present in xylem of flowering plants for conducting water. |
| 13 Xylem fibre | Dead thick fibres present in xylem for providing mechanical strength in root. |
| 14. Xylem parenchyma | Leaving cell present in xylem for conduction of water. |
| 15 Translocation | Process by which food prepared in leaves is transported to different parts of plant by phloem tissue |
| 16. Sieve tube | A elongated tubular living channels having degenerated nucleus present in phloem tissue for conduction of food. |
| 17. Companion Cells | A thin wall cells lie on side of sieve tube in phloem. |
| 18. Phloem parenchyma | A living cell of phloem for storage of food |

**Topic:- Animal Tissue**

|  |  |
| --- | --- |
| Main points | Explanation |
| 1.Epithelium tissue | Fundamental closed pack tissue present at internal and external surface of body for protection, absorption, secretion , sensation etc |
| 2. Squamous epithelium | Present in lungs , blood capillary, kidney for protection exchange of gases and filtration. |
| 3. Columnar epithelium | Present in stomach, intestine & glands for secretion. |
| 4. Cuboidal epithelium | Present in thyroid & salivary gland, pancreatic duct for secretion and absorption. |
| 5. Muscular tissue | A contractile tissue present in muscles. |
| 6. Straited muscle fibre | Voluntary muscles, long cylindrical & branch present at arms, legs, feet, neck , tongue etc. & helps in body movement & blinking of eyes. |
| 7. Smooth / unstraited muscle | These are involuntary , visceral muscles present at stomach , intestine blood vessel lungs etc. which work without wheel but as per requirement of body. |
| 8. Cardiac muscle | Involuntary, non-fatigued muscle fibre present at the wall of heart for rhythmic contraction & relaxation of heart. |
| 9. Connective tissue | It helps in connecting, binding, packing & supporting of body. |
| 10. Areolar tissue | Present in between muscle & skin internal organs for packing, binding, covering & repairing of organs in body. |
| 11. Adipose tissue | A connective tissue present at heart , kidney, eyes & blood vessels, which store fat, for absorb shock for providing insulation from temperature. |
| 12. Tendon | White fibrous in elastic connective tissue which joins muscle with bone and helps in movement. |
| 13. Ligament | A yellow fibrous elastic connective tissue which join a bone with another bone and helps in bending of joints. |
| 14. Skeletal tissue | A type of supportive connective tissue. |
| 15. Cartilage | It forms soft endoskeleton of body, present at nose tip, ear pinna , larynx , rings of cartilage and bronchi . |
| 16. Bone | A solid, rigid , strong non-flexible skeletal tissue present in body to give support, frame work & movement |
| 17 Fluid connective tissue | It helps in transportation in body. |
| 18. Blood | A red colour fluid with circulates in body of animals. |
| 19. plasma | Fluid part of blood which consist of nutrients , hormones, and waste products. |
| 20. Erythrocytes | RBC which provide red pigment hemoglobin to blood. |
| 21. Leucocytes | It provides protection to body from pathogens. |
| 22. Thrombocytes | Helps in clotting of blood during injuries |
| 23. Lymph | A light yellow liquid flowing from body tissue to blood circulatory system and provides immunity |
| 24. Nervous tissue | A tissue specialized in reception and transmission of stimuli to various parts of body |
| 25. Neuron | Functional unit of nervous system |
| 26. Synapse | A microscopic gap between a pair of adjacent neurons |
| 27. Dendrites | Small tampering, branched out growth of cell which pick up & transmit the impulses of stumili. |
| 28. Cell body | A polygonal, broad nucleated part of neuron. |
| 29. Axon | A long fibre arise from cell body of neuron. |

**Chapter-15**

**Improvement in food resources**

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| --- | --- |
| Main points | Explanation |
| 1.Green Revolution | Method to increase production of grains |
| 2. White Revolution | Method to increase milk production |
| 3. Yellow Revolution | Method to increase oil production |
| 4. Blue Revolution | Method to increase fish production |
| 5. Golden Revolution | Method to increase pulse production |
| 6. Silver Revolution | Method to increase egg production |
| 7. Sustainable Agriculture | Adoption of various farming and production management techniques to maximize agricultural yield. |
| 8. Organic Farming | Practice for raising crops which have not been polluted with use of manure, bio-fertilizer and bio-pesticides. |
| 9. Horticulture | Growing foods vegetables and flower in large scale. |
| 10. Kharif crops | (June to October) or rainy season crops e.g. Pulses , Maize , Rice and Pumpkin etc. |
| 11. Rabi Crops | (November to April) or winter season e.g. Mango, Mustard , Wheat, Gram etc. |
| 12. Macro Nutrients | Element present in plants in more quantity. Like N, P, K, Ca, Mg, S etc. |
| 13. Micro Nutrients | Element present less in quantity. Like Iron, Mn, B, Zn, Cl. |
| 14. Vermicompost | Degradation of organic waste by consumption of earthworm. |
| 15. Bio-fertilizer | Organism enriches soil with nutrients. |
| 16. Irrigation | Supply water to crop plants by means of canals , wells , reservoir. |
| 17 Mixed Cropping | Practice of growing two or more crops simultaneously in same piece of land. E.g. (Mustard + Wheat), (Ground nut + Sunflower) etc. |
| 18. Inter Cropping | Practice of growing two or more crops simultaneously in some field in definite row pattern with objection of increasing productivity. |
| 19. Crop Rotation | The practice of growing of different crops on land in preplanned succession. |
| 20. Plant Breeding | Science or art of improving genetic make up of plant in relation to their economic use. E.g. Pomato. |
| 21. Hybridization | Crossing between genetically dissimilar plants to produce a new kind of plants. |
| 22. Insecticides | Which kill insects. |
| 23. Pesticides | Which kill pest or rat. |
| 24. Weedicides | Which kill weeds ( unwanted plant) e.g. Isoproturon, 2,4, Dichloro-Phenoxy acetic acid |
| 25. Preventive methods for grain | Cleaning , drying , fumigation , etc. |
| 26. Poultry Breeds | B-77, Aseel, HH-260, ILS-80,82. |
| 27. Psciculture | Rearing , caring and managing fishes for production of its meat. |
| 28. Fishery Breeds | Marine water- pomphrets , Hilsa, salmon, seer  Fresh water- catla, rohu, mrigal, |
| 29. Apiculture | Rearing, caring and managing bees for production of honey and wax. |

**SA-2 Notes**

**Chapter-7 {Diversity in living organisms}**

1. Each **organism** is different from all other organisms.

2. In this activity, we decide which **characteristics** (we can run, but the Banyan tree can’t run is a characteristic) are important in forming the desired **category.**

3. **Greek thinker Aristotle classified animals according to whether they lived on land,**

**in water or in air.** This classification is a landmark in ideology, but has limitations. For example, animals that live in the sea include Corals, Whales, Octopus, Starfish, and Shark. In fact they are different from each other.

4. **Classification and Evolution:** organisms are classified based on body design,

hierarchy in developing, relation to evolution. **Charles Darwin** first described the

idea of evolution in 1859 in his book “ **The Origin of Species**”

5. The Biologists, such as Haeckel, Whittaker & Carl Woese tried to classify all living

organisms into broad Kingdoms. The Whittaker proposed five kingdoms: Monera,

Protista, Fungi, Plantae and Animalia. Carl Woese introduced by dividing Monera

into Archaebacteria and Eubacteria.



6. **Hierarchy of Classification:**



7. **Monera**: They have **unicellular, Prokaryotic organisms** (do not have defined nucleus

or organelles). The cell wall may or may not present. The mode of nutrition is

**autotrophic** (synthesizing food on their own) (**or)heterotrophic** (getting food from

environment). **Ex. Bacteria, Anabaena**.

8. **Protista:** They have **unicellular eukaryotic organisms** (do have well defined nucleus

or organelles). The body is covered by **cilia, flagella for locomotion**. The mode of

nutrition is **autotrophic or heterotrophic**. Ex. Diatoms, protozoans

9. **Fungi:** These are multi-cellular **eukaryotic organisms with cell wall, made up of**

**Chitin.** They do not perform Photosynthesis (**heterotrophic), Saprophytic** (derive

nutrition from decaying material). Ex. Aspergillus, Penicillium, Mushroom, Rhizopus.

The fungi living with algae forms **Lichen** (Symbiotic **Association**)

10. **Plantae:** These are multi-cellular eukaryotic organisms with cell wall, made up of

Cellulose. Able to perform photosynthesis (**autotrophic). Ex. Rice, wheat.**

11. **Animalia: These are multi-cellular eukaryotic organisms without cell wall.** They are

not able to perform photosynthesis **(heterotrophic). Ex Human beings, Peacock.**

**DETAILS OF KINGDOM PLANTAE**

**1. The kingdom Plantae is further classified as Thallophyta, Bryophyta, Pteridophyta,Gymnosperms, Angiosperms .**

**2.Thallophyta:** The plants do not have well defined body design, commonly called as”

**Algae**”, mostly aquatic. Ex. **Spirogyra, Ulothrix.**

3. **Bryophyta:** These are commonly called as the **“Amphibians of Kingdom”.** The plant body

is differentiated into **roots like, stem like and leaf like structures**. No specialized tissues for

the conduction of water and food.Ex. Marchantia, Funaria

4.**Pteridophyta:** These are commonly called as the **“First vascular land plants ”.** The plant

body is differentiated into root, stem and leaf. Specialized tissues for the conduction of

water and food are developed in these plants. The reproductive organs are inconspicuous.

Ex. Marsilea, Fern.

**Special Note:** The reproductive organs are inconspicuous in Thallophyta, Bryophyta,

Pteridophyta are can’t develop seeds. They are together called as” **Cryptogamae (Non-**

**Flowering Plants)**”. The plants with well differentiated reproductive organs and that

ultimately **make seeds** are called**” Phanerogams (Flowering Plants)**”. This group is further classified

**Gymnosperms** (Bear naked Seeds) &**Angiosperms** (Bears seeds inside Fruit).

5. **Gymnosperms:** These are commonly called as “**Naked seed bearing plants”.** They

areusually perennial, evergreen and woody. Ex. Pinus, Cycas etc.

6. **Angiosperms:** These are commonly called as **“Enclosed seed bearing plants**”. Plants with

seeds having a single cotyledon are called as” **Monocotyledons or Monocots”.** Plants with

seeds having two cotyledons are called as “**Dicots”. Ex. Ipomoea, Paphiopedium.**

**DETAILS OF KINGDOM ANIMALIA**

These are Eukaryote, multicultural and hetero-tropic.

They are further classified as **Non- Chordates**( Porifera, Coelenterata, Platyhelminthes ,

Nematoda, Annelida, Arthropoda, Mollusca, Echinodermata) and **Chordates** {

Protochordata, Vertebrata ( Pisces, Amphibians, Reptilia, Aves, Mammalia)} .

**I.Non- Chordates**

1. **Porifera:** The word Porifera” **means organisms with holes**”**.** The **canal system** helps in

circulating water, food, oxygen. They are non-motile with cellular level of organization and

mainly **marine** organisms with hard outer coat called as **Skeleton.** They are commonly called

as **Sponges. Ex. Spongilla, Sycon( Please refer Fig. 7.12, NCERT Text Book Page- 89)**

**2. Coelenterata:** The wordCoelenterata” **means organisms with body cavity**

**calledCoelenteron”** . They are radially symmetrical, **Diploblastic** ( two layers of cells),

commonly called as **Cnidarians (** Stinging cells for protection are present in the body). Ex.

Hydra, Sea Anemone

**3. Platyhelminthes: The** word **Platyhelminthes means organisms with flatworms (**

**dorsocentrally flattened)**”**.**They are bilaterally symmetrical **Triploblastic** ( three layers of

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cells ), **either free-living or parasitic**. **No true Coelom is present - Acoelomates.** Ex. Planaria(

Free living) , Tape worm( Parasitic)**( Please refer Fig. 7.14, NCERT Text Book Page- 90).**

**4. Nematoda:** The word **Nematoda** “means **organisms with roundworms”.** They are

bilaterally symmetrical **Triploblastic** ( three layers of cells ), **familiar with parasitic worms**.

The **false Coelom is called as Pseudocoelome. Ex. Ascaris, Wuchereria (Filarial worm**

**causes elephantiasis**

**5.Annelida:** The word **Annelida** “ **means organisms with metameric-segmented”.** They are

bilaterally symmetrical Triploblastic(three layers of cells) with closed circulatory system,

**familiar with earth worms**. The **Coelom is called as true Coelom. Ex. Neris, Earth worm,**

**Leech**

**6. Arthropoda:** The word **Arthropoda** “means **organisms with jointed legs”** They are

bilaterally symmetrical Triploblastic(three layers of cells ), **familiar with cockroaches**. The

**Coelom is blood filled called as Haemo Coelom. Ex. Prawn, Scorpion, Housefly**

**7. Mollusca:** The word **Mollusca** “means **organisms with soft body”** They are bilaterally

symmetrical, Triploblastic(three layers of cells), **familiar with Octopus, Pila**. Foot is for

moving, kidney like organ for excretion, with open circulatory system. **Ex. Unio, chiton**

**8. Echinodermata:** The word **Echinodermata** “means **organisms with spiny skinned”.**

**Exoskeleton is with calcium carbonate.**

They are radially symmetrical **Triploblastic** ( three layers of cells ) with coelomic cavity, **familiar with Star fish**. They are **exclusively free-living**

**marine animals**. Ex**. Sea Cucumber, Feather Star**

**II.Chordates:** They are further classified as two major groups such as **Protochordata&**

**Vertebrata**

**(A).Protochordata: Notochord present in at least larval forms, but very rudimentary.** It is a

rod like supporting structure, runs along with nervous tissue from the gut of animal. They

75

are bilaterally symmetrical, triploblastc(three layers of cells) with a Coelom, **familiar with**

**Amphioxus**. Ex. **Balanoglossus**

**(B).Vertebrata: Notochord is replaced by vertebral column and internal skeleton. They are**

**bilaterally symmetrical, triploblastic, coelomic and segmented having paired gill pouches.**

**Vertebrates are grouped into five classes.**

**1. Pisces:** These are commonly called as **“fishes”, exclusively aquatic. Body is streamlined**

and a **tail for locomotion. Gills for respiration, heart is two chambered, cold blooded, skin**

**is covered with scales, plates. They are cold-blooded animals. Skeleton of bone ( Rohu) /**

**cartilage( Shark). They lay eggs. Ex. Lion Fish, Dog Fish**

**2. Amphibians:** These are commonly called as **“Amphibians”** because they can **live on land**

**and in water”. Body is streamlined** and a **webbed foot/ foot for locomotion. Gills or lungs**

**or skin for respiration, heart is three chambered, cold blooded, skin is lack of scales,**

**plates. They are cold-blooded animals. They lay eggs. Ex. Rana, Hyla**

**3. Reptilia:** These are commonly called as **“Reptilians”. A lung for respiration, heart is three**

**chambered (Crocodile heart is four chambered), skin have scales. They are cold-blooded**

**animals. They lay eggs. Ex. Snakes, Turtles**

**4**. **Aves :**These are commonly called as **“Birds”. A lung for respiration, heart is four**

**chambered, fore limbs are modified for flight, skin has feathers. They are warm-blooded**

**animals. They lay eggs. Ex. Ostrich (Flightless Bird), Pigeon,**

**5. Mammalia:** These are commonly called as **“animals with mammary glands for producing**

**milk to nourish their young ones”. A lung for respiration, heart is four chambered, skin has hairs, sweat or oil glands. They are warm-blooded animals. They lay eggs (Platypus,**

**Echidna), give birth to young ones poorly developed (Kangaroo) & give birth to developed**

**young ones (Human beings). Ex. Lion, Whale, Bat**

**DETAILS OF NOMENCLATURE**

**NOMENCLATURE**: The system of **scientific naming or nomenclature** was **introduced by**

**Carolus Linnaeus**. It is **unique to identify in the world.** We limit ourselves to writing **the**

**names of the Genus and Species** of that particular organism**.** The world over, it has been

agreed that both these names will be used in **Latin forms**.When **printed** is given in **italics**

and when **written by hand**, the Genus and Species name have to be **underlined separately.**

**Ex. Ostrich** (Common name)**: *Struthiocamelus***(scientific name with two parts namely theGenus and Species).

**Chapter-13 { Why do we fall ill? }**

**1.”Health”** is a state of being well enough to function well physically, mentally, and socially.

**2.”Disease”(** disturbed ease) means being uncomfortable. One or more systems of the body

will change, give rise to “Symptoms” ( Cough, loose motions, pus formation, headache,

fever, breathlessness, vomiting, fits, unconsciousness, inflammation , swelling and general

effects - a Doctor look for the basis of symptoms). Diseases are basically two types- Acute

Disease & Chronic Disease

**3. Acute Disease:** The disease which lasts for only a short period of time is called Acute

Disease Ex. Common Cold.

**4.Chronic Disease:** The disease which lasts for long period of time is called Chronic Disease

Ex. Tuberculosis.

**Acute Disease Chronic Disease**

They are short duration disease They are long lasting disease

Patient recovers completely after the Patient does not recover completely

cure

There is no loss of weight or feeling of tiredness There is often loss of weight of feeling of afterward tiredness

There is short duration loss of work and There is a prolonged loss of work and efficiency efficiency

**5. Causes of Diseases: Most of the diseases have many causes, rather than one single**

**cause, like unclean water, nourishment, genetic differences, genetic abnormalities e.g.**

**Based on the causes diseases are of two types: Non-Infectious Diseases and Infectious**

**Diseases.**

**6. Non-Infectious Diseases:** Not caused by infectious agents, mostly internal and noninfectious

Cause. Ex. Cancer

7. **Infectious Diseases:** Caused by infectious agents.

SN **Type of Disease** Example

1 **Bacterial disease** - Typhoid, Cholera, Tuberculosis, Acne, Anthrax,

2 **Viral diseases** - Common Cold, Influenza, Dengue fever, AIDS, Japanese

encephalitis or brain fever

3 **Fungal diseases** Skin diseases

4 **Protozoan diseases** -Malaria ( Plasmodium), Kalaazar (Leishmania), Sleeping

sickness( Trypanosomes)

5 **Worm diseases** - Ascariosis ( Round worm), Elephantiasis(Wuchereria )

a)The infectious diseases spread by agents are called as **Communicable Diseases.**

SN **Type of Disease** Example

1 **Air born Diseases** - Pneumonia, common cold, Tuberculosis;

2 **Water born diseases** - Cholera, hepatitis

3 **Sexual Diseases** - HIV, Syphilis.

4 **Animal born Disease** - Rabbis.

\*(Vector- the animal carrying infectious agent from a sick person to another potential host without getting affected Ex. Mosquito carrying Malaria Parasite).

**9. Principles of Treatment:**

1. **Antibiotics-** many bacteria make a cell wall to protect themselves, the antibiotic

(Penicillin) blocks the bacterial process that builds cell wall and blocks the biochemical pathways. Antibiotics do not work against viral infections. Antiviral medicine is harder than making Antibacterial medicine because Virus has only few biochemical mechanisms of their own. Other medicines bring down fever, reduce pain or loose motions. We can take bed rest to conserve energy.

**10 Principles of Prevention :** Following three limitation are normally confronted while treating an infectious disease:  Once someone has disease, their body functions are damaged and may never recover completely.

 Treatment will take time, which means that someone suffering from a disease is likely to be bedridden for some time even if we can give proper treatment.

 The person suffering from an infectious disease can serve as the source from where

the infection may spread to other people.

**General ways of preventing infectious disease :**

 Air-borne – We can prevent exposure by providing living condition that are not overcrowded.

 Water-borne – prevent by providing safe drinking water. This is done by treating the water to kill any microbial contamination.

 Vector-borne – We can provide clean environment, which would not allow mosquito breeding.

11. **Immunity:** Even in cells there is repair mechanism called” **Immunity”.** Immune cells manage to kill off the infectious agents. **Smallpox disease** is eliminated by developing memory cells for particular infection by mimics the microbes, called” **Vaccine”**. The **basis of**

**Immunization**- if you had smallpox once, there was no chance of suffering from it again.

Proper nutrition is essential to maintain body immunity. There are vaccines against tetanus, diphtheria, whooping cough, measles, polio and many other diseases.

12. **Prevention of disease is better than cure. Hygiene is the basic key to maintain good Health**

**Chapter- 14**

**{Natural resources}**

1. The” **Biosphere”** is the life supporting zone of the earth with three sub-zones called as

**lithosphere (rock** part**), atmosphere** (air part)and **hydrosphere** (water part)**.**

**Breath of air**

**2. Composition of Air**

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3.The interactions between different components of **the Biosphere** to maintain **the balance**

**between the biotic and a biotic component** makes **“Biogeochemical cycle”. Ex. Water**

**Cycle, Nitrogen Cycle, Carbon cycle, Oxygen Cycle,**

**4. Role of atmosphere in climate control :** atmosphere act as protective blanket for the

earth. Since atmosphere is a bad conductor of heat, it keeps the average temperature of the

earth constant. At night, it slows down the escape of heat into outer space.

5. **The movement of air :** the atmosphere gets heated from the radiation that is reflected

back by the land or water bodies. As a result of heating, convection currents are set up in

the air. Since land gets heated faster than water, the air over land gets heated faster than

air above water bodies.

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6. In coastal regions, during the day, the air above the land gets heated faster and starts

rising. So a region of low pressure is created and air over sea moves into this area of low

pressure. The movement of air from one region to the other region causes **Wind.**

7. During the day, the direction of wind would be from the sea to the land and at night, both

land and sea starts to cool. Since water cools down slower than the land, the air above

water would be warmer than air above land, thus the direction of wind would be from the

land to the sea.

8. **Air pollution** : it is an undesirable change in the physical, chemical or biological

characteristics. It is caused due to an increase in the content of harmful substances

(pollutant) such as oxides of nitrogen and sulphur, etc.

9. **Harmful effect of air pollution:**

 It affects the respiratory system causing breathing difficulties eg; bronchitis, asthma,

lung cancer, tuberculosis, etc.

 Burning of fossil fuels like coal and petroleum releases oxides of nitrogen and

sulphur. Inhalation of these gases is dangerous.

 Combustion of fossil fuel also increases the amount of suspended particles in air. The

presence of high levels of all these pollutants, reduce visibility in cold weather where

water also condenses out of air forming **smog.**

 **Acid rain** formed from the gases like sulphur dioxide and nitrogen oxides present in

polluted air. It causes damage to living and non- living thing.

**3. The Water Cycle:**

**a)** The process in which water evaporates and falls on the land as rain and later flows back

into the sea via rivers is known as the **“Water Cycle”.** Water flows through rocks containing

soluble minerals, some of them get dissolved in the water. Thus the rivers carry many

nutrients from the land to sea and these are used by the marine organisms.

b) When the water vapors condense as water droplets and grow big and heavy, they fall

down in the form of **“rain”.** It ranges from 5 cm to 200 cm of rain fall in a year in our

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country. In large parts of India, rains are mostly brought by the south-west or north-east

monsoons. Depressions in the Bay of Bengal may also cause rains in some areas.

c) **Water is a wonder liquid** because all cellular processes take place in a water medium;

substances are transported in a dissolved form; terrestrial forms require fresh water to

maintain the equilibrium of salts; major resource to determine the life on the earth.

d) The dissolved fertilizers (NPK fertilizers), pesticides (DDT), sewage (Disease causing

Organisms), waste from factories (Mercury) and water released from the dams can affect

the life forms on the earth. The dissolved Oxygen is being used by the animals and plants

that live in water, would adversely affect the aquatic organisms. The change in temperature

would be dangerous for the eggs and larvae of the various animals particularly susceptible

to temperature changes. It leads to “**water pollution”.**

4. **Nitrogen Cycle:**

a) The nitrogen gas makes up 78% of our atmosphere. It is essential for the synthesis of

proteins, DNA, RNA, urea, alkaloids and Vitamins.

b) The simple molecular nitrogen from the atmosphere is converted into more complex

molecules in the living beings and back again to atmosphere is called “**Nitrogen Cycle”.**

**i) Nitrogen fixation by Lightening:** During lightning, the molecular nitrogen is converted into

oxides of nitrogen and dissolves in water to give nitric and nitrous acids and fall on lands

along with rains. These are then utilized by various life forms.

ii) **Nitrogen fixation by Bacteria:** The molecular nitrogen is converted into nitrates and

nitrites, by free living bacteria or the bacteria present in the root nodules of legumes.

iii) The conversion of molecular nitrogen into nitrates and nitrites is called as” **Nitrification”.**

Plants generally covert them into amino acids. The conversion of nitrates and nitrates into

Ammonia is called as” **Ammonification”.** The conversion of Ammonia into molecular

Nitrogen is called as” **Denitrification”. Thereby nitrates and nitrites are converted into**

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**molecular or elemental nitrogen in the nature.** (Please refer Fig. 14.6, NCERT Text Book Page- 198).

5. **The Carbon cycle:**

**i)** The **Carbon dioxide** gas makes up 0.039 % of our atmosphere. Carbon occurs in the

elemental form as **diamonds and graphite** in earth. Carbon is essential **for the synthesis of**

**proteins, carbohydrates, fats, nucleic acids and Vitamins** in living organisms.

ii) The **Carbon dioxide Fixation:** Green plants convert Carbon dioxide into glucose in the

presence of sunlight through Photosynthesis. The glucose molecules are converted into

other biologically important molecules. And many marine animals use carbonates dissolved

in sea water to make shells, exoskeletons.

iii) **The combustion**: The Carbon dioxide in the atmosphere is added by the process of

combustion, where fuels are burnt to provide energy for various needs like heating, cooking,

transportation, and industrial process.

iv) **The Greenhouse Effect**: The percentage of Carbon dioxide in the atmosphere is said to

have doubled since the industrial revolution when human beings stated burning fossil fuels

on a very large scale. The Carbon dioxide is a greenhouse gas. The increase in the Carbon

dioxide content would cause more heat to be retained by the atmosphere and **lead to**

**Global Warming**. It is called” **Greenhouse Effect”**

v) The **carbon cycle is repeated through different physical and biological activities**. (Please refer Fig. 14.7, NCERT Text Book Page- 199).

**6 .Oxygen Cycle:**

**i)** The Oxygen gas makes up 21 % of our atmosphere. Oxygen is essential component **of**

**proteins, carbohydrates, fats, nucleic acids** in living organisms.

ii) Oxygen from our atmosphere is used up in three processes, namely combustion,

respiration and in the formation of oxides of nitrogen. Oxygen is returned to the

atmosphere in only one major process, that is, Photosynthesis, it is called as **Oxygen Cycle.**

iii) The **air is heated faster than water**; the air over land would also be heated faster than the air over water bodies. The movement of air from one region to the other creates winds, during the day the direction of the wind would be from the sea to land. At night, both land and sea start to cool.

iv) The oxides of nitrogen and sulphur gases dissolve in rain to gives rise to **“Acid rains”**.

v) The smog is a visible indication of **Air Pollution**.

The **pollutants** bring respiratory, cardiac problems and **allergies**. The organisms called **Lichens** are found on the bark of trees, they are indicators of pollution free environment. Vi) Three atoms of Oxygen ( O3) is called as **Ozone.**

The Ozone is poisonous but absorbs harmful radiations from the Sun. The Ozone layer

around the earth, if, dwindles further may cause Health hazards including Cancers . Recently discovered the **Ozone hole; in the region of Antarctica.**

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| | Naveen Paliwal |



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| Physical quantity  Types of Physical quantity  Rest  Motion  Distance  Displacement  Uniform motion  Non-uniform motion  Speed  Average speed | The quantity which can measured direct or indirect is called physical quantity  e.g. mass, length ,area force etc.  1.Fundamental Physical quantity  (mass, length, time, current ,temperature ,luminous intensity, amount of substance)  2. Derived Physical quantity  If object does not change its position w.r.t. a fixed point (origin) then object is said to be in rest e.g. tree, blackboard etc.  If object changes its position w.r.t. a fixed point (origin) then object is said to be in motion e.g. moving car , moving bus, earth etc.  **Motion in a straight line**  Length of path travelled by moving object is called distance.  It is scalar quantity. It have only positive value.  The min. distance between initial and final position of object of object is called displacement .  it is a vector quantity. it may be either +ve or –ve or zero.  A B Distance =AB+BC  Displacement = AC  C  If moving object covers equal distance in equal interval of time, howsoever, small these interval may be.  For this motion distance travelled by object is directly proportional to the time taken.  Motion of object is said to be non-uniform If moving object covers unequal distance in equal interval of time, howsoever, small these interval may be.  For this motion distance travelled by object is not directly proportional to the time taken.  **Rate of motion**  It represent the motion is how slow or fast.  “Distance travelled by moving object in unit interval of time is called speed.”  Speed =distance/time  \*its SI unit is m/s  \*It is scalar quantity  \*if speed is constant through out the motion then speed is called uniform speed and motion is called **uniform motion**  If speed of moving object is variable through out its motion then speed of journey is measured as Average speed  It is define as the ratio of total distance travelled to the total time taken by object  Average speed= Total distance/ Total time taken |

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| Chapter | MOTION |
| Topics | Key points |
| Velocity  Acceleration.  Formula & Expression  Retardation -  Graphical Presentation of Motion | Speed with direction  Velocity of object is defined as the displacement of the body per unit time.  Velocity= Displacement/time  It is a vector quantity .  Its SI unit is m/s & in CGS system cm/s .  The change in velocity or speed of moving object is measured in term a physical quantity called acceleration.  Definition –  It definition as the change in velocity of object in unit time .  It is represented as **a.**  **a =change in velocity/time interval**  **its** SI unit is m/s2  it is vector quantity  Expression for Acceleration  Let Initial velocity of moving object =u  Final velocity =v  change in velocity = ∆V  Time taken to change in velocity = ∆t =t-0        Positive Acceleration­­-  \*If V˃U then a=+ve  Negative Acceleration­­─  \* If V ˃U then a= − ve (Retardation)  If acceleration is – Ve (V>U) then it is called Retardation or Deacceleration.  Distance-Time Graph ---  Graphs between Distance travel by moving object at different time is called dis.-time graph.  For stationary object  Y  distance  o X  time |

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| Chapter | MOTION |
| Topics | Key points |
| Use  Velocity –time Graph | For Uni-form motion  y  d  d  Ө slop of line =tanӨ  o t o t x  For Non-Uniform motion---  d    o X  t🡪  Use of d-t graph--  1)- The slop of d-t graph give velocity or speed of moving object.  2)- It predict whether motion is uniform or non-uniform.  V-t graph—  Curve between velocity and time is called V-t graph.  Y A    V  Ө tan Ө = AB/OB  o t🡪 B X  slop of line OA= tan Ө= acc. of motion  Y    v     * x   t🡪 |

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| Use  Equation Of Motion | Use of V-t graph  1.) Slop of v-t graph gives acc. Of moving object.  2.) area under v-t graph gives the distance travelled by moving object.  3.) By graph we can predict the whether motion is uniform accelerated or nonuniform accelerated  I)-First Equation Of Motion- (or Velocity –time Relation)  Let initial velocity of moving object is u and after time t it gain velocity v  And its motion is represented by the graph  v B    u, A ------------------------C -  o I  D  Acceleration = slop of line AB =BC/AC  BC= v-u  AC= t-0  **a =** v-u/t  **at** = v-u  **v=u + at**  II)-Second Equation Of Motion- (or Velocity –time Relation)  Displacement of object= area of qua. ABDO  = area of triangle ABC + area of rectangle OACD  S= 1/2 BC x AC+ AO x OD  S= ½(v-u) at +ut  S=ut +1/2 at2  III)- Third Equation of Motion (OR Displacement- velocity Relation)  Displacement of object= area of qua. ABDO  =1/2(v+u)t ------ (i )  From first equation of motion  t = v-u/a  so, s = (v+u)(v-u) /2a  v2-u2=2as  v2= u2+2as |

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| Chapter | MOTION |
| Topics | Key points |
| Uniform Circular Motion  Note--  Example  Activity | Uniform Circular Motion---  When a body moves in a circular path with a uniform speed, its motion is called uniform circular motion  Speed = circumference/time period   1. In Uniform Circular Motion speed of moving object is constant. 2. Direction of motion is variable at every point of its path.     v  v      v  v  Motion of earth, Motion of artificial satellite ,Motion of electron in an atom, A spin- drier   * To show that the displacement of an object is less than the distance travelled by object . |

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| Chapter | FORCE AND LAWS OF MOTION |
| Topics | Key points |
| Force  Effect of force  Balanced Forces  Unbalance Forces  e.g. | A force is a physical quantity which cause or tends to cause change of state , in direction or in shape and size.  Force can change—   * The state of rest or motion of an object. * Shape & Size of object. * Speed & direction of motion of the object.   If the two or more forces applied on object can not change the state of rest or state of motion of object then the forces are called Balanced Forces .  Net force , F= 0  If the two or more forces applied on object can change the state of rest or state of motion of object then the forces are called Unbalanced Forces.  Net force , F ≠0  F3  F1 F2 F4 F2  F3=F1  ( F1-F2=0 ) F1=F2  F4=F2  F3=F1  F1  Balance Force ( F1-F3+F4-F2=o)    F1    F2  F1  F2  F= F1 + F2 ≠ 0  F1= F2  F= F1+ F2+ F3 ≠ 0  F3  Unbalance Force |
| Chapter | FORCE AND LAWS OF MOTION |
| Topics | Key points |
| Inertia  Types  First law of motion  Momentum  Second law motion  Unit of force  Third law of motion  Note  Example  **Misconception**  Conservation of moment  Example  Activity | The virtue of a body due to which object oppose change of state or change of direction of motion is called inertia .   1. Inertia of rest 2. Inertia of motion 3. Inertia of direction   “ Every object remain in their state ,until an external force does not applied on it.”  Practical Application of First law of motion   1. The carpet is beaten with a stick to remove the dust particles. 2. A person falls forward while getting down from a moving bus   It is impact of motion of object.  It is define as the product of mass and velocity of object.  P = mv  Its SI units is kgms-1  It is vector quantity. (P will be along the direction of V)  “The rate of change of momentum of object is directly proportional to the force applied on object.”  Fα ∆P/∆t    F= ma  SI unit of fore is kgms-2 or newton (N)  “Every action have equal and opposite reaction .”  Action and reaction act on two different bodies.   1. Walking on road. 2. A ball rebound after striking against a floor   Action and reaction act on same bodies.  According to the Law of Conservation of moment  “For an isolated system, total momentum of a system remain constant.”  P = constant (If F is zero )  Total momentum of system before collision = Total momentum of system after collision   * Recoil of gun.  1. Demonstration of balance and unbalance force . 2. To show action and reaction are equal and opposite . |

GRAVITATION

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| Chapter | GRAVITATION |
| Topics | Key points |
| Gravitational Force  Universal law of Gravitations  Acceleration due to gravity  Weight  Activity | The force of attraction between any two particles in universe is called gravitational force.  The force of attraction between any two particles or bodies   1. Directly proportional to the product of their masses (m) 2. Inversely proportional to the square of distance (r) b/w them .   F=  Where G (6.67x 10-11 Nm-2kg-2) is universal gravitational constant.  Acceleration in object due to gravitational force is called acceleration due to gravity .  At surface of earth  g  Gravitational force on any object is called weight.  W = mg  Its SI units is newton.  To demonstrate the spring balance. |