



पुर्णा International School
Shree Swaminarayan Gurukul, Zundal

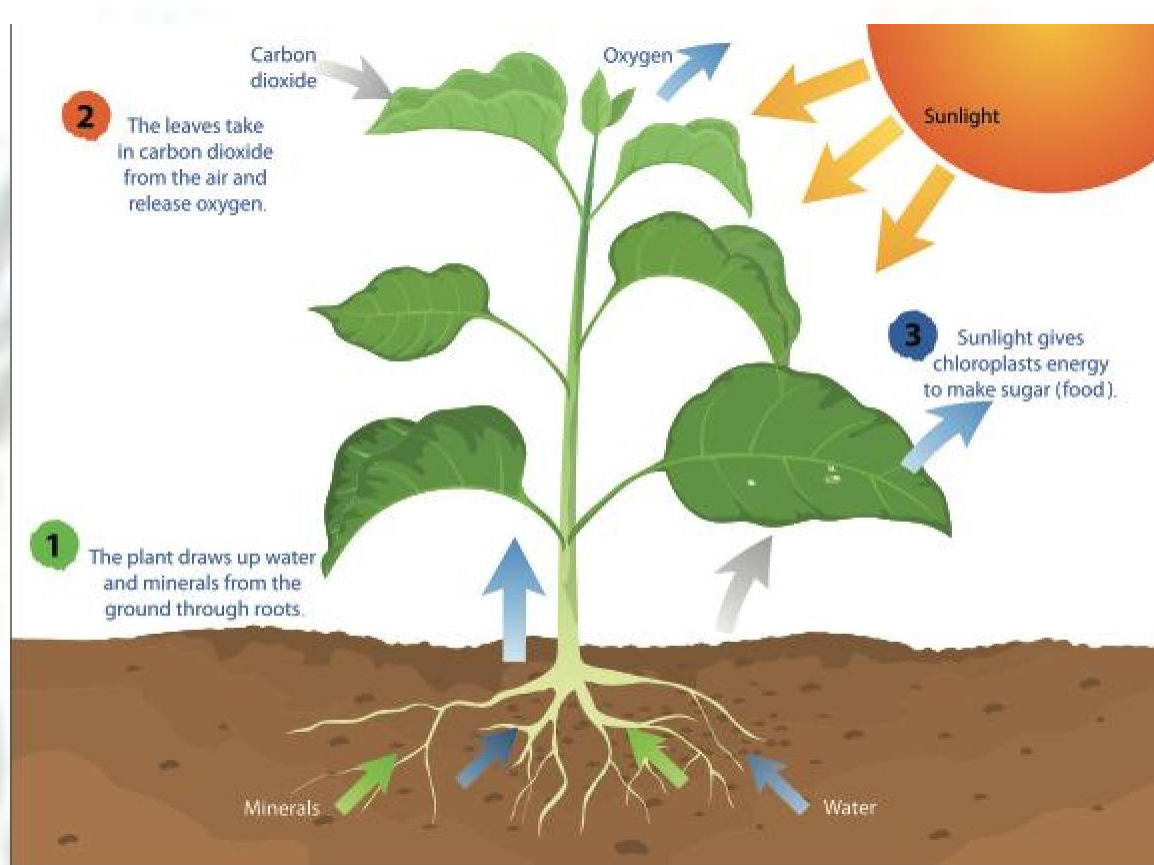
Grade - VII
Science
Specimen copy
Year 22-23

INDEX

Sr. No	Month	Chapter	Remarks
1.	April	1: Nutrition in plants	
2.	April/May	2: Nutrition in animals	
3.	June	3: Fibre to Fabric	
4.	June	4: Heat	
5.	July	5: Acids, Bases and Salts	
6.	July	6: Physical and chemical changes	
7.	July	7: Weather, climate and adaptations of animals to climate	
8.	August	8: Winds, storms and cyclones	
9.	August	9: Soil	

CHAPTER 1

NUTRIENTS IN PLANTS



❖ Key points to remember :

- **Nutrition:** It is the mode of taking food by an organism and its utilization by the body.
- **Nutrients:** The components of food that provide nourishment to the body.
- All organisms take food and utilise it to get energy for the growth and maintenance of their bodies.
- Green plants synthesise their food themselves by the process of **photosynthesis**. They are autotrophs.
- Photosynthesis: Green plants prepare their own food with the help of chlorophyll (found in green plants), carbon dioxide and water taken from the environment in presence of sunlight.
- Plants use simple chemical substances like carbon dioxide, water and minerals for the synthesis of food.
- **Chlorophyll** and sunlight are the essential requirements for photosynthesis. Complex chemical substances such as carbohydrates are the products of photosynthesis.
- Oxygen released in photosynthesis is utilised by living organisms for their survival.
- Fungi derive nutrition from dead, decaying matter. They are **saprotrophs**.

- Plants like *Cuscuta* are parasites. They take food from the host plant. A few plants and all animals are dependent on others for their nutrition and are called **heterotrophs**.
- **Parasitic**: Organisms that live on the body of other organisms. All parasitic plants feed on other plants as either:
 - (i) Partial Parasites: Obtain some of their nutrition from the host, e.g. painted cup
 - (ii) Total Parasites: dependent completely on the host for nutrition, e.g. mistletoe.
- **Saprophytic**: Organisms that obtain nutrition from dead and decaying plant and animal matter.
- Mushrooms, moulds and certain types of fungi and bacteria.
- Insectivorous Plants: Green plants which obtain their nourishment partly from soil and atmosphere and partly from small insects. Example: pitcher plant, bladderwort, and venus fly trap.
- **Symbiosis**: Mode of nutrition in which two different individuals associate with each other to fulfil their requirement of food.
- **Lichens** found on tree trunks are the association between algae and fungus. Algae obtain water from fungus and it in turn obtains food from algae.

❖ **Fill in the blanks:**

1. The food synthesized by plants is stored as **starch**.
2. During photosynthesis plants take in **carbon-dioxide** and release **oxygen**.
3. In lichenes **algae** and **fungus** live in symbiotic association.
4. In photosynthesis solar energy is captured by the pigment called **chlorophyll**.
5. The occurrence of photosynthesis is tested by the presence of **starch** in the leaf.
6. During photosynthesis **light** energy is converted into the **chemical** energy of food.

❖ **Tick the correct answer:**

1. Which of the following is a nutrient?
 - (a) Protein
 - (b) Fat
 - (c) Vitamin
 - (d) **All of these**
2. The food making process in plants is called as:
 - (a) glycolysis
 - (b) **photosynthesis**
 - (c) photolysis
 - (d) chemosynthesis
3. *Cuscuta* is example of :
 - (a) Autotrops
 - (b) **Parasite**
 - (c) Saprotrops

- (d) Host
4. The plants which traps and feeds on insect is:
- (a) Cuscuta
 - (b) China rose
 - (c) Pitcher plant**
 - (d) Rose
5. Which part of the plant produce its food:
- (a) Fruits
 - (b) Seeds
 - (c) Leaves**
 - (d) Flowers

❖ **Write True or False:**

1. Solar energy is converted into chemical energy during photosynthesis.(**T**)
2. The product of photosynthesis is not protein.(**T**)
3. Carbon dioxide is released during photosynthesis.(**F**)
4. Plants which synthesise their food are called saprotrophs.(**F**)
5. In absence of chlorophyll, the process of photosynthesis will take place in plants.(**F**)

❖ **Answer in one word:**

1. The small openings on surface of a leaf are called?
Ans. Stomata
2. The insect-eating plants are called?
Ans. Insectivorous plants
3. Name a plant that is partially autotrophic?
Ans. Insectivorous plant
4. Name a parasitic plant with yellow, slender and branched stem?
Ans. Cuscuta
5. Name the bacterium which can take nitrogen and convert to usable form?
Ans. Rhizobium

❖ **Answer in one two sentences:**

1. Why do organisms take food?
Ans. Organisms require food for their growth, for getting energy for walking, running etc. Food also gives resistance power to fight against disease.
2. Distinguish between a parasite and a saprotroph?
Ans.

Parasite	Saprotrops
Feeds on living organisms	Feed on dead and decaying animals
The organism on which it feeds is called host	They do not feed on living organism
Example: roundworm	Example: Fungi

3. How would you test the presence of starch in leaves?

Ans. The presence of starch in leaves can be tested by Iodine test. When we remove chlorophyll from leaf by boiling it in alcohol and then put 2 drops of iodine solution, its colour change to blue indicates the presence of starch.

4. Wheat dough if left open for some days, release a foul smell. Give reason?

Ans. Carbohydrates in wheat dough encourage growth of yeast and other saprophytic fungi which emit a foul smell.

❖ **Long answer questions:**

1. Give a brief description of the process of synthesis of food in green plants?

Ans. Green plants use a process called as photosynthesis to prepare their food. The process is as follows:

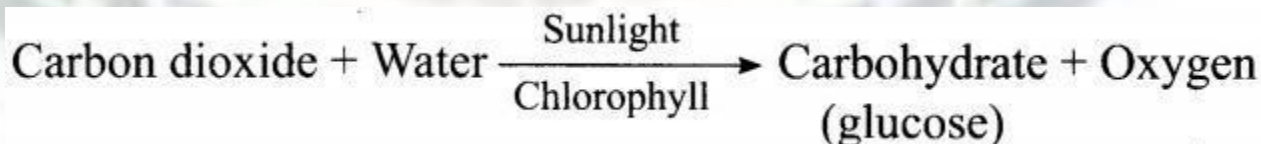
Water is taken from the roots of the plant, and it is transported to leaves of the plant.

Carbon dioxide from air enter the leaves through pores called stomata. This diffuses the cell containing chlorophyll.

Water molecule is broken down into Hydrogen and Oxygen with the help of sunlight.

Hydrogen combines with Oxygen and Hydrogen to form carbohydrates.

Photosynthesis is represented by the following equation:



2. Why do farmers grow many fruits and vegetable crops inside large greenhouses? What are the advantages to the farmers?

Ans. Fruits and vegetable crops are grown in large greenhouses because it protects crops from external climatic condition and to provide suitable temperature for the growth of crops.

Advantages to farmers while growing fruits and vegetable crops inside greenhouses are

- It protects crops from diseases and adverse climatic conditions.
- It protects crops from wind and rodents

3. How Nutrients replenish in the soil ?

Ans. We know that plants absorb nutrients from the soil. Crops require much nitrogen to make protein. After the harvest, the soil becomes deficient in nitrogen. Plants cannot use the nitrogen gas available in the atmosphere directly. The action of rhizobium can convert this nitrogen into a soluble form but that bacteria cannot make its own food. In return, leguminous plants provide food and shelter to the rhizobium bacteria. Thus, they have a symbiotic relationship. This association is significant for the farmer, as they do not need to add nitrogen fertilizers to the soil in which leguminous plants are grown. In this way, you can see that every living organization needs some energy and nutrient materials to ensure that the life-processes go on smoothly.

4. Show with the help of a sketch that plants are the ultimate source of food.

Solution:

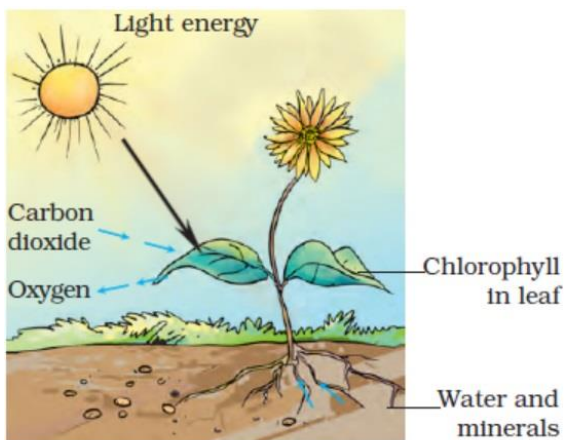


Diagram showing photosynthesis

❖ **HOTS:**

1. Why most of the things are spoiled by fungi during rainy season only?

Ans: Spores of fungi germinate and grow when they get wet and warm conditions. Rainy season provides them the hostile condition, so they grow and spoil most of the things in rainy season only.

2. Potato and ginger are both underground parts that store food. Where is the food prepared in these plants?

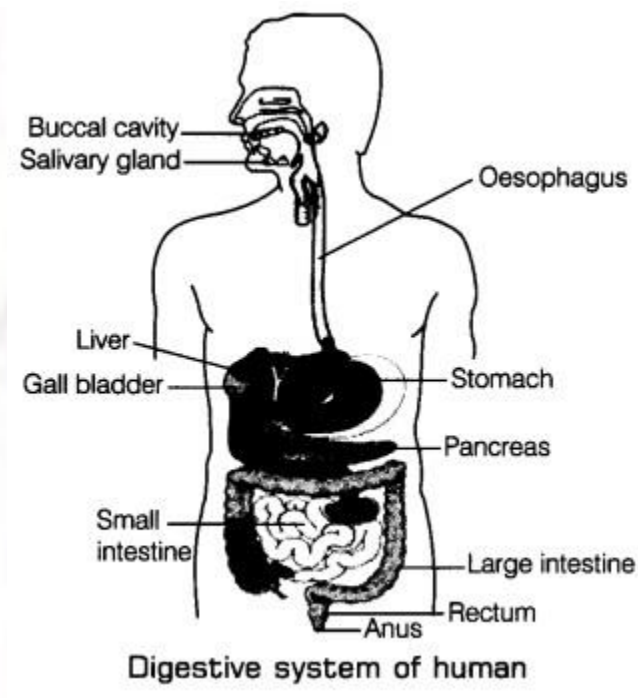
Ans: Food is prepared in the leaves of these plants and then it is transported to underground parts for storage.

❖ **Activity:**

- Name any 5 types of autotrops, heterotrops and saprotrops each, other than given in your textbook and if possible stick the pictures of them. You can take help of internet.

CHAPTER 2

Nutrition in Animals



❖ Keypoints to remember:

- Animals nutrition includes nutrient requirement, mode of intake of food and its utilization.
- Classification based on eating habits:
 - (i) **Herbivorous:** Animals that eat plants or plant products. Example: cow, sheep, goat, deer, elephant, kangaroo, giraffe, etc.
 - (ii) **Carnivorous:** Animals that eat only flesh of other animals. They never eat plants. Example: tiger, lizard, lion, etc.
 - (iii) **Omnivorous :** Animals consume plants as well as other animals as their food. Example: bear, dog, human being, etc.
 - (iv) **Parasites:** Organisms that obtain their food from other animals either by living inside or outside their body. Example: tapeworm and roundworm, tick and lice.
 - (v) **Scavengers:** Animals which feed on the remains of dead animals preyed by predators. Example: vultures, crows, jackals, etc.
- The human digestive system consists of alimentary canal and secretory glands. It consists of
 - (i) Buccal cavity
 - (ii) Oesophagus
 - (iii) Stomach
 - (iv) Small intestine
 - (v) Large intestine ending in rectum
 - (vi) Anus

- Digestion of carbohydrates, like starch, begins in buccal cavity. The digestion of protein starts in stomach. The bile secreted from liver, the pancreatic juice from the pancreas and digestive juice from the intestinal wall complete the digestion of all components of food in small intestine. The digested food is absorbed by blood vessels from small intestine.
- The undigested residues are expelled out of body through anus.
- The grazing animals like cows, buffaloes are known as ruminants. They quickly ingest, swallow their leafy food and store it in the rumen. Later, the food returns to mouth and animal chews it peacefully.
- **Amoeba** ingests its food with help of its false feet or pseudopodia. The food is digested in the food vacuole. It pushes out finger-like pseudopodia which engulf the prey.

❖ **Fill in the blanks:**

1. The main steps of nutrition in humans are **ingestion, digestion, absorption, assimilation** and **egestion**.
2. The largest gland in the human body is **Liver**.
3. The stomach releases hydrochloric acid and **digestive** juices which act on food.
4. The inner wall of the small intestine has many finger-like outgrowths called **villi**.
5. Amoeba digests its food in the **food vacuole**.
6. Large intestine absorbs some of **water** and **salts** from the undigested food.
7. Tongue is attached from **back** with floor of mouth cavity and is free at the **front**.

❖ **Tick the correct answer:**

1. Bile is produced in
(a) **Gall bladder**
(b) Blood
(c) Liver
(d) Spleen
2. The enzymes present in saliva convert
(a) Fats into fatty acids and glycerol
(b) **Starch into simple sugars**
(c) Protein into amino acid
(d) Complex sugars into simple sugars
3. Cud is the name given to the food of ruminants which is:
(a) swallowed and undigested.
(b) **swallowed and partially digested.**
(c) properly chewed and partially digested.
(d) properly chewed and completely digested.

4. How many premolars teeth found in mouth?
 - (a) 2
 - (b) 4
 - (c) 6
 - (d) 8
5. Which of the following pair of teeth differ in structure but are similar in function?
 - (a) **canines and incisors**
 - (b) molars and premolars
 - (c) incisors and molars
 - (d) premolars and canines

❖ **Write true or false:**

1. Digestion of starch starts in the stomach. (F)
2. The tongue helps in mixing food with saliva. (T)
3. The gall bladder temporarily stores bile. (T)
4. The ruminants bring back swallowed grass into their mouth and chew it for some time. (T)
5. Pitcher plant is common example of insectivorous plant. (T)

❖ **Answer in one word:**

1. Which part of digestive canal is involved in chewing of food?
Ans: Buccal cavity
2. The first set of teeth which grows during infancy are termed as what?
Ans: Milk teeth
3. The grass is rich in which type of carbohydrates?
Ans: cellulose
4. What is a sac like structure in rabbit and horse, between oesophagus and small intestine called?
Ans: Caecum

❖ **Answer in one or two sentence:**

1. Where is the bile produced? Which component of the food does it help to digest?
Ans: The bile juice is produced by the liver. It plays an important role in the digestion of fats.
2. Name the type of carbohydrate that can be digested by ruminants but not by humans. Give the reason also.
Ans: The name of the carbohydrate is cellulose. It is digested by ruminants but not by humans because enzymes which digest cellulose are not present in humans.
3. Why do we get instant energy from glucose?

Ans: Glucose is the simplest form of carbohydrates and easily gets absorbed by the blood and hence provides instant energy.

4. Write one similarity and one difference between the nutrition in amoeba and human beings.

Ans:

Similarity: Human and amoeba both need digestive juices for the digestion of food.

Difference: Humans need to chew the food on the other hand amoeba does not need to chew the food.

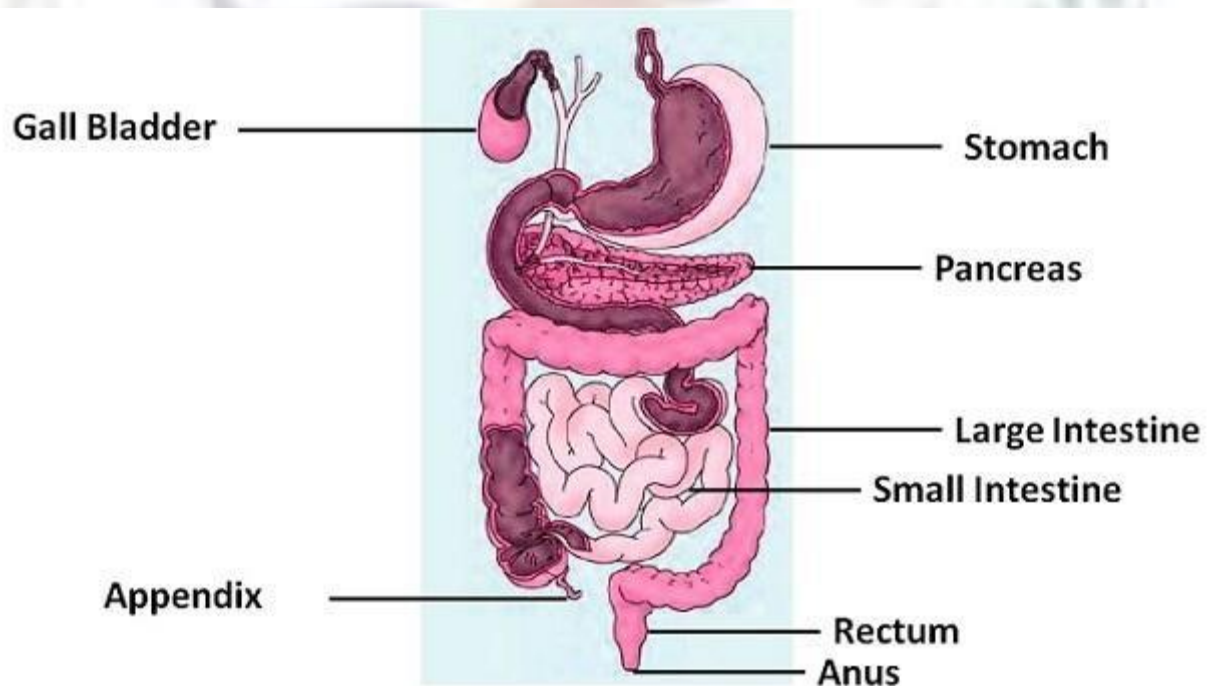
5. Can we survive only on raw, leafy vegetables/grass? Discuss.

Ans: No, we cannot survive for a very long time by only eating leafy and raw vegetables/grass. We need a balance diet to live long and healthy life. Also, the grass contains cellulose which can be digested by the human body.

❖ **Long question answer:**

1. Draw and label the figure of human digestive system? Also write different parts through which food pass.

Ans:



The food passes through a continuous canal which begins at the buccal cavity and ends at the anus. The canal can be divided into various parts:

- (1) the buccal cavity,
- (2) food-pipe or oesophagus,
- (3) stomach,
- (4) small intestine,
- (5) large intestine ending in the rectum and
- (6) the anus.

2. What is role of tongue?

Ans: The tongue is a fleshy muscular organ attached at the back to the floor of the buccal cavity. It is free at the front and can be moved in all directions. We use our tongue for talking. Besides, it mixes saliva with the food during chewing and helps in swallowing food. We also taste food with our tongue. It has taste buds that detect different tastes of food.

3. What is villi. Write role of it in digestive system?

Ans: The inner walls of the small intestine have thousands of finger-like outgrowths. These are called villi (singular villus).

The villi increase the surface area for absorption of the digested food. Each villus has a network of thin and small blood vessels close to its surface. The surface of the villi absorbs the digested food materials. The absorbed substances are transported via the blood vessels to different organs of the body where they are used to build complex substances such as the proteins required by the body.

❖ **HOTS:**

1. Can you tell which kind of food items are not digested easily when gall bladder of a person is removed surgically? Why?

Ans: Food items rich in fats cannot be digested easily when gall bladder of a person is removed. Gall bladder stores bile juice in concentrated form which is secreted in small intestine when needed. Bile juice breaks the larger molecules of fats into smaller one.

2. What is the role of fibrous food in bowel movement?

Ans: Fibrous food increases the stool bulk, so it ease the bowel movement and reduce constipation.

3. How food moves in the opposite direction during vomiting?

Ans: When food is not accepted by our stomach, then the wall of the alimentary canal pushes back the food in upward direction and it is vomited out.

4. Why it is advised not to eat hurriedly and talk or laugh while eating.

Ans: This is because inside the throat, air and food share a common passage. When we talk flap-like valve of wind pipe opens and when we eat or swallow food it remains close. When we eat hurriedly and talk or laugh while eating, the valve of windpipe get open or does not close properly. If, by chance food particles enter the windpipe, we feel choking or get hiccups.

❖ **Activity:**

➤ Find out what vitamins are and get the following information:

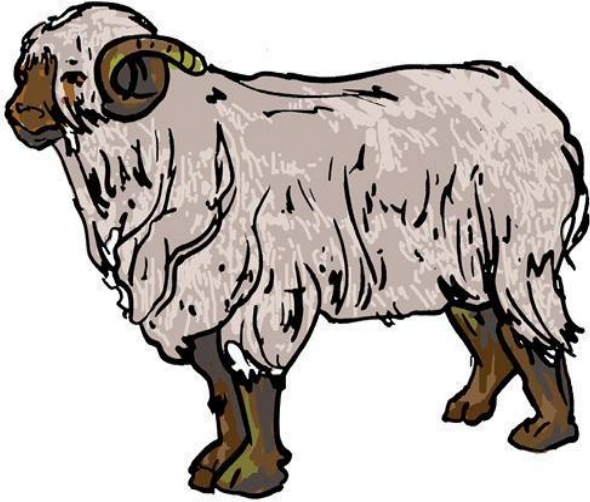
(a) Why are vitamins necessary in diet?

(b) Which fruits or vegetables should be eaten regularly to get vitamins?

Write a one-page note on the information collected by you. You may take help of a doctor, a dietician, your parents, or from any other source

CHAPTER 3

FIBRE TO FABRIC



❖ Keypoint to remember:

- **Fibres:** Long, fine, continuous threads or filaments are obtained from plants and animals.
- Two types of fibres: (i) Animal fibres (ii) Plant fibres
- Silk and Wool are common animal fibres Silk comes from silkworms and wool is obtained from sheep, goat and yak. Hence silk and wool are animal fibres. The hairs of camel, llama and alpaca are also processed to yield wool.
- **Scouring:** Sheared hair is cleaned and washed in tanks to remove grease, dust and dirt.
- **Sorting:** Cleaned hair is sent to a factory where hairs of different textures are separated.
- Weavers weave silk threads into silk cloth.

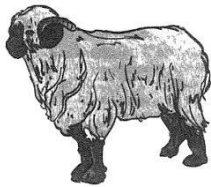


Fig. 3.1. Sheep with thick growth of hair



Fig. 3.2. Shearing a sheep



Fig. 3.3. Scouring in tanks

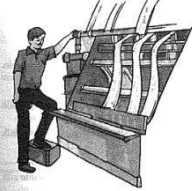


Fig. 3.4. Scouring by machines

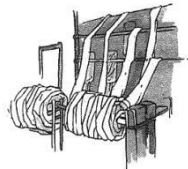


Fig. 3.5. Rolling into yarn

❖ **Fill in the blanks:**

1. Liama and Alpaca also yield **wool** and are found in **South America**.
2. Angora wool is obtained from **Angora goats**
3. Rampur bushair yield **brown fleece**.
4. Lohi and Nali are breeds of **Rajasthan and Punjab**.
5. The process of selecting parent sheep for obtaining special characteristics in their offspring's is called **selective breeding**.

❖ **Tick the correct answer:**

1. Which one of the following is not a breed of sheep?
(a) **Murrah**
(b) Marwari
(c) Lohi
(d) Nali
2. What is the scientific name of mulberry tree?
(a) Magnifera indica
(b) **Morus alba**
(c) Desmodium girence
(d) None of these
3. Silk is derived from
(a) **cocoon**
(b) pupa
(c) egg
(d) moth

4. Selective breeding is a process of
 - (a) selecting the offspring with desired properties.
 - (b) selecting the parents with desired properties.**
 - (c) selecting an area for breeding.
 - (d) selecting fine hair for good quality wool.
5. The general process that takes place at a sheep shearing shed is:
 - (a) removal of fleece.**
 - (b) separating hair of different textures.
 - (c) washing of sheep fibre to remove grease.
 - (d) rolling of sheep fibre into yam.
6. Which of the following is not a type of silk?
 - (a) Mulberry silk
 - (b) Tassar silk
 - (c) Mooga silk
 - (d) Moth silk**
7. Paheli wanted to buy a gift made of animal fibre obtained without killing the animal. Which of the following would be the right gift for her to buy?
 - (a) Woollen shawl**
 - (b) Silk scarf
 - (c) Animal fur cap
 - (d) Leather jacket

❖ **State True or False:**

1. The process of taking out threads from the cocoon for use as silk is called reeling the silk. **(T)**
2. The most common silk moth is mooga silk. **(F)**
3. During processing of Wool sorting is done before scouring. **(F)**
4. The Nali breeds of sheep are found in Rajasthan, Haryana and Punjab. **(T)**
5. Patanwadi breeds of sheep are used in carpet wool. **(F)**

❖ **Answer in one word:**

1. The female silk moth lays eggs, from which hatch larvae which are called?
Ans: Caterpillars
2. What is covering on caterpillar called?
Ans: Cocoon
3. What is the process of rearing of silkworms for obtaining silk called?
Ans: Sericulture
4. Name the bacterium which can cause fatal blood disease called sorter's disease?
Ans: Anthrax

❖ **Answer in one or two sentences:**

1. Which parts of the black sheep have wool?

Ans: The hairy skin called fleece has wool in black sheep.

2. What is meant by the white fleece of the lamb?

Ans: White fleece of the lamb means the white coloured hairy skin.

3. What is meant by Rearing?

Ans: The process of keeping, feeding, breeding and medical care of useful animals is called rearing of animals. These animals produce one or more useful products for human beings.

4. What keeps the wool yielding animals warm?

Ans: The wool yielding animals like sheep, goat, yak, etc., have a thick hair on their body. Hair trap a lot of air. Air is a poor conductor of heat, which does not allow the heat absorbed to release from their body and keeps them warm.

❖ **Long Answer questions:**

1. What are the various steps for processing fibres into wool?

Ans: The processing of fibres into wool involves various steps such as shearing, scouring sorting, dyeing and rolling. They have been discussed below in brief:

Step 1. Shearing: First of all, the woollen coat or fleece from the animals along with a thin layer of skin is removed from their body. The process is called shearing.

Step 2. Scouring: The sheared skin with hair is thoroughly washed in tanks to remove grease, dust and dirt from the wool. This is called scouring.

Step 3. Sorting: It is done after scouring. The hairy skin is sent to a factory where hair of different textures are separated or sorted.

Step 4. The small fluffy fibres called burrs, are picked out from the hair. The fibres are scoured again and dried. Now the wool is ready to be drawn into fibres.

Step 5. The fibres are dyed in various colours because the natural fleece of sheep and goats is black, brown or white.

Step 6. Finally the fibres are straightened, combed and rolled into yarn. The longer fibres are made into wool for sweaters and the shorter ones are spun and woven into the woollen cloth.

2. Describe the life history of a silk moth with the help of figures of each stage?

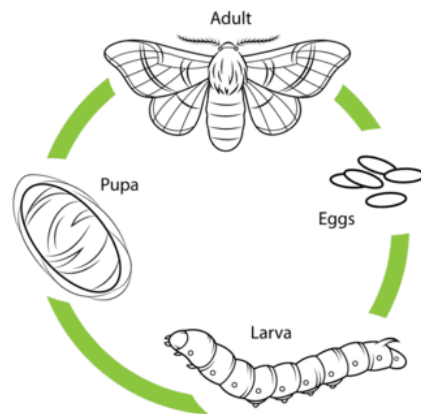
Ans: Silk fibres are also known as animal fibres. They are soft, light in weight and strong. Silk fibres are obtained from the cocoons of the silk moth or silkworm. The life history of silk moth involves mainly four stages:

Eggs → Caterpillars or Silkworms → Pupa → Adult silk moth

The female silk moth lays eggs, from which hatch larvae called caterpillars or silkworms. They grow in size and when they are ready to enter the next stage called pupa, they first weave a net to hold themselves. Then they swing their heads from side to side in the form of the figure 8.

During these movements, they secrete fibres made of a protein which hardens on exposure to air and becomes silk fibre. Soon the caterpillars completely cover themselves by silk fibres and turn into pupae. This covering is known as cocoon. The further development of the pupae into moths continue inside the cocoons. Moths are reared and their cocoons are collected to get silk thread for obtaining silk.

Life Cycle of a Silkworm



3. What are occupational hazards? What occupational hazards are linked with wool and silk production?

Ans: Health risks faced by the workers of a particular occupation or industry are called occupational hazards. In wool industry, wool sorter's can get infected by a bacterium which causes fatal blood disease, called anthrax or sorter's disease. In silk industry workers handling dead worms with bare hands may get infection. Fine hair on caterpillars may cause asthma or conjunctivitis.

❖ **HOTS:**

1. What is silk route?

Ans: The route, the traders and travellers travelled to introduce silk to other countries is called silk route.

2. Why natural fibres are costlier than synthetic fibres?

Ans: Natural fibres are obtained either from plants or animals. The process of obtaining fibres from these natural sources is comparatively labour intensive process than production of synthetic fibres on large scale from other raw materials or chemicals.

3. What are occupational hazards? What occupational hazards are linked with wool and silk production?

Ans: Health risks faced by the workers of a particular occupation or industry are called occupational hazards. In wool industry, wool sorter's can get infected by a bacterium which causes fatal blood disease, called anthrax or sorter's disease. In silk industry workers handling

dead worms with bare hands may get infection. Fine hair on caterpillars may cause asthma or conjunctivitis.

❖ **Activity:**

- Name any 5 types of fabric other than given in your textbook and find how they are made.



CHAPTER 4

HEAT

❖ Key words:

Celsius scale

Insulator

Sea breeze

Conduction

Land breeze

Temperature

Conductor

Radiation

Thermometer

Convection

❖ Keypoints to remember:

- **Heat** is form of energy, which makes any object hot or cold.
- **Temperature** : The degree of hotness of an object is called temperature.
- Our sense of touch is not always reliable to measure temperature.
- Thermometer is a device used for measuring temperatures.
- Heat is cause of temperature.
- Clinical thermometer is used to measure our body temperature. The range of this thermometer is from 35°C to 42°C . For other purposes, we use the laboratory thermometers. The range of these thermometers is usually from -10°C to 110°C .
- The normal temperature of the human body is 37°C .
- The heat flows from a body at a higher temperature to a body at a lower temperature. There are three ways in which heat can flow from one object to another. These are conduction, convection and radiation.
- In solids, generally, the heat is transferred by conduction. In liquids and gases the heat is transferred by convection. No medium is required for transfer of heat by radiation.
- The materials which allow heat to pass through them easily are conductors of heat.
- The materials which do not allow heat to pass through them easily are called insulators.
- Dark-coloured objects absorb radiation better than the light-coloured objects. That is the reason we feel more comfortable in light-coloured clothes in the summer.
- Woolen clothes keep us warm during winter. It is so because wool is a poor conductor of heat and it has air trapped in between the fibres.

❖ **Fill in the blanks:**

1. Temperature is the measure of **hotness** of an object.
2. The normal temperature of human body is **37 °C**.
3. The water and air are **poor** conductors of heat.
4. In coastal areas, cold air flows in the day from sea to land. It is called **sea breeze**.
5. Temperature of boiling water cannot be measured by a **clinical** thermometer.
6. A cold steel spoon is dipped in a cup of hot milk. It transfers heat to its other end by the process of **conduction**.
7. Clothes of **dark** colours absorb heat better than clothes of light colours.

❖ **Tick the correct answer:**

1. Which one of the following is a reliable measure?
(a) Hotness
(b) Coldness
(c) **Temperature**
(d) None of these
2. Which one is filled in the bulb of a thermometer?
(a) **Mercury**
(b) Lead
(c) Copper
(d) Silver
3. Heat always flows
(a) from a colder object to a hotter object
(b) **from a hotter object to a colder object**
(c) in both the directions
(d) heat never flows from one object to other
4. Conduction is the method of transfer of heat in
(a) liquids
(b) **solids**
(c) gases
(d) vacuum
5. A beggar wrapped himself with a few layers of newspaper on a cold winter night. This helped him to keep himself warm because:
(a) friction between the layers of newspaper produces heat.
(b) **air trapped between the layers of newspaper is a bad conductor of heat.**
(c) newspaper is a conductor of heat.
(d) newspaper is at a higher temperature than the temperature of the surrounding.
6. A marble tile would feel cold as compared to a wooden tile on a winter morning, because the marble tile:
(a) **is a better conductor of heat than the wooden tile.**

- (b) is polished while wooden tile is not polished.
- (c) reflects more heat than wooden tile.
- (d) is a poor conductor of heat than the wooden tile.

❖ **State True or False:**

1. Normal temperature of human body is 98.6°C . (F)
2. Water at higher temperature feels more hot.(T)
3. Marking on clinical thermometer is from 0°C to 100°C .(F)
4. Woolen clothes keep us warm during winter.(T)
5. The maximum and minimum temperature of the day is measured by a laboratory thermometer. (F)

❖ **Answer in one word:**

1. How does the transfer of heat take place in water or air?
Ans: Convection
2. Write the range of laboratory thermometer.
Ans: -10°C to 110°C
3. Name the process in which a solid directly changes into gas on heating?
Ans: Sublimation
4. What is the range of a clinical thermometer?
Ans: 35°C to 42°C
5. Give an example of insulator.
Ans: Plastic
6. What is the SI unit of temperature?
Ans: Kelvin (K)

❖ **Answer in one or two sentence:**

1. Why do we wear woollen clothes during winter?
Ans: The wool traps air in it which is a poor conductor of heat and hence it keeps us warm in winter.
2. Define land breeze.
Ans: Land breeze is the movement of cool air from the land towards the sea in coastal areas during night.
3. Write any three precautions to be taken while reading a clinical thermometer.
Ans:
 - Do not hold the thermometer by the bulb.
 - Read the thermometer keeping the level of mercury along the line of sight.

- Ensure that before use the mercury level is below 35°C

❖ **Long question Answer:**

1. State similarities and differences between the laboratory thermometer and the clinical thermometer.

Ans: Similarities:

- (i) Both thermometers consist of long narrow uniform glass tubes.
- (ii) Both have a bulb at one end.
- (iii) Both contain mercury in bulb.
- (iv) Both use Celsius scale on the glass tube.

Differences:

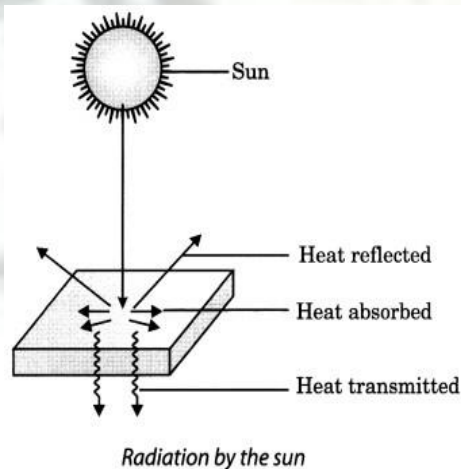
- (i) A clinical thermometer reads temperature 35°C to 45°C while the range of laboratory thermometer is -10°C to 110°C .
- (ii) Clinical thermometer has a kink near the bulb while there is no kink in the laboratory thermometer.

Due to kink mercury does not fall down on its own in clinical thermometer.

2. Explain the term radiation. List any four effects of heat. Explain them.

Ans: The heat from the sun cannot reach us by conduction or convection as there is no medium such as air in most part of the space between the earth and the sun. This is possible through the process of radiation. The mode of transfer of heat energy in which no medium is needed to transfer heat from a hotter body to a colder body is called radiation. It can take place whether a medium is present or not. For example, when we sit in front of a room heater we get heat by this process.

A hot utensil kept away from the flame cools down as it transfers heat to the surroundings by radiation. Our body too, gives heat to the surroundings and receives heat from it by radiation. The figure below show the radiation by the sun. It also shows that when radiation falls on an object a part of it is reflected, a part is absorbed and a part may be transmitted



3. List any four effects of heat. Explain them.

Ans: When heat energy is absorbed by a body various changes can happen. Some of them are:

1. Rise in temperature: When a body absorbs heat, it gains energy. As a result of this, temperature of the body rises and body becomes hot.
2. Change in state of matter: On heating, most of the substances change its state, like solid to liquid, liquid to gas, etc.
3. Expansion: All state of matter i.e., solid, liquid or gas expands on heating and contract on cooling. Expansion is most in gases, less in liquids and least in solids. Expansion due to heat is known as thermal expansion.
4. Combustion: On heating, some of the substance reaches their ignition temperature and starts burning. So heat causes combustion.

❖ **HOTS:**

1. Why the level of mercury rises when its bulb comes in contact with a hot object?
Ans: Mercury expands when it is heated. Hence, it rises in the capillary tube
2. Why are milk vans carrying milk from the factory to the depots painted silver or white?
Ans: Milk vans are painted silver or white because white absorbs minimum light or reflects maximum light and thus keep the milk fresh
3. Shopkeepers selling ice blocks usually cover them with jute sacks or saw dust. Explain why.
Ans: Jute sacks or saw dust act as insulating material and reduces melting of ice. Thus, blocks of ice are covered with jute sacks or saw dust.

❖ **Activity:**

- Stick pictures of different kinds of clothes we wear in summer and different food items we eat specially during summer on a chart paper. Also write few lines on to why do we prefer such clothes and food items specially in summer.
- To demonstrate the convection of heat in water.

CHAPTER 5

ACIDS, BASES AND SALTS

❖ Key words:

Acid

Basic

Neutralisation

Acidic

Indicator

Salt

Base

Neutral

❖ Keypoints to remember:

- Acids are sour in taste. Bases are bitter in taste and soapy to touch.
- Acid turns blue litmus red. Bases turn red litmus blue.
- Substances which are neither acidic nor basic are called neutral.
- Solutions of substances that show different colour in acidic, basic and neutral solutions are called indicators.
- An acid and a base neutralize each other and form a salt. A salt may be acidic, basic or neutral in nature.

❖ Fill in the blanks:

1. A solution of ammonium chloride turns blue litmus to **red**.
2. Ammonium chloride is an example of **acidic salt**.
3. An acid and a base react together forming a new compound, known as **salt**.
4. Corrosion is a **slow** process.
5. Methyl orange is an **indicator**.
6. The gas which escapes out from many aerated soft drinks is **carbon dioxide**.
7. **Neutralisation** is the reaction between an acid and a base to form salt and water.

❖ Tick the correct answer:

1. An oxide is acidic and has a pungent odour. It could be
 - (a) sulphur dioxide
 - (b) carbon dioxide
 - (c) sodium oxide
 - (d) nitrogen dioxide**
2. Out of these gases which one is used in fire extinguishers
 - (a) CO₂**
 - (b) SO₂
 - (c) NO₂
 - (d) H₂S
3. The correct way of making a solution of acid in water is to
 - (a) add water to acid
 - (b) add acid to water**
 - (c) mix acid and water simultaneously
 - (d) add water to acid in a shallow container
4. Turmeric is a natural indicator. On adding its paste to acid and base separately, which colours would be observed.
 - (a) Yellow in both acid and base
 - (b) Yellow in acid and red in base**
 - (c) Pink in acid and yellow in base
 - (d) Red in acid and blue in base
5. Phenolphthalein is a synthetic indicator and its colours in acidic and basic solutions, respectively are:
 - (a) red and blue
 - (b) blue and red
 - (c) pink and colourless
 - (d) colourless and pink**

❖ **State True or False:**

1. Nitric acid turns red litmus blue. **(F)**
2. Sodium hydroxide turns blue litmus red. **(F)**
3. Sodium hydroxide and hydrochloric acid neutralise each other and form salt and water. **(T)**
4. Indicator is a substance which shows different colours in acidic and basic solutions. **(T)**
5. Tooth decay is caused by the presence of a base. **(F)**

❖ **Answer in one word:**

1. Give one examples of acidic substances.
Ans: Lime juice
2. Give one examples of basic substances.
Ans: Baking soda
3. Which base is found in window cleaner?

Ans: Ammonium hydroxide

4. Give an example of an antacid.

Ans: Milk of magnesia

5. Which acid is injected into our skin when an ant bites?

Ans: Formic acid

❖ **Answer in one or two sentences:**

1. What is a neutral substance?

Ans: The substance of solution which does not show any effect on litmus paper is called a neutral substance.

2. Explain the terms acids and acidic.

Ans: The substances that taste sour are called acids, such as curd, lemon juice, orange juice, vinegar, etc. The chemical nature of these substances are acidic.

3. What are bases? What is their nature?

Ans: The substances that taste bitter and feel soapy on touching are called bases; e.g., lime water, baking soda, washing soda, etc. The nature of these substances are basic.

4. What are indicators?

Ans: Indicators are special type of substances that are used to test whether a substance is acidic or basic. They change their colour when added to a solution containing an acidic or a basic substance. For example, turmeric, China rose petals, litmus, etc., are naturally occurring indicators.

5. How are the factory wastes neutralised?

Ans: Many factory waste contain acids which kill fish and other organisms, if allowed to flow into the water bodies untreated. These wastes can be neutralised by adding basic substances to them.

6. Is the distilled water acidic/basic/neutral? How would you verify it?

Ans: Distilled water will be neutral. We can verify it by showing that neither blue nor red litmus paper changes its colour when dipped in it.

❖ **Long question answer:**

1. State difference between acids and bases?

Ans:

<i>Acids</i>	<i>Bases</i>
(i) Acids are sour to taste.	(i) Bases are bitter to taste.
(ii) Acid turns blue litmus to red.	(ii) Base turns red litmus to red.
(iii) Acid is a substance which contains hydrogen ion (H^+).	(iii) Bases are substances which contain hydroxyl ion (OH^-).

2. Dorji has a few bottles of soft drink in his restaurant. But, unfortunately, these are not labelled. He has to serve the drinks on the demand of customers. One customer

wants acidic drink, another wants basic and third one wants neutral drink. How will Dorji decide which drink is to be served to whom?

Ans: .Dorji can decide with the help of litmus paper:

- (i) The drink which would turn a red litmus blue would be basic.
- (ii) If the drink turns a blue litmus to red would be acidic.
- (iii) The drink which would not affect both red and blue litmus would be neutral.

3. Explain the process of neutralisation with the help of an activity.

Ans: When an acidic solution is mixed with a basic solution, both the solutions neutralise the effect of each other. The resulting solution is neither acidic nor basic. We can show the process of neutralisation with the help of an activity.

Fill one-fourth of a test tube with dilute hydrochloric acid. Note down its colour and also the colour of . phenolphthalein solution. Add 2-3 drops of the indicator to the acid. Shake the test tube gently. We observe that solution remains colourless. Add sodium hydroxide solution in the test tube drop by drop with continuous stirring till the pink colour just appears. Appearance of pink colour indicates that the neutralisation reaction has completed.

❖ **HOTS:**

1. Why litmus is better natural indicator than other natural indicator?

Ans: Litmus give wide range of colour change from weak acid to strong acid and from weak base to strong base. Other natural indicator, on the other hand, do not show a wide colour change.

2. Is it advisable to drink lemonade during indigestion? Why?

Ans: No it is not advisable to drink lemonade during indigestion because it is acidic in nature. Too much acidity in stomach causes indigestion. Drinking lemonade may worsen the condition.

❖ **Activity:**

- List out 5 acidic, 5 basic and 5 neutral things you find in your home.
- To observe the effects of various indicators on acidic and basic solutions.

CHAPTER 6

PHYSICAL AND CHEMICAL CHANGES

❖ Key words:

Chemical change

Crystallisation

Physical change

Chemical reaction

Galvanisation

Rusting

❖ Keypoints to remember:

- Changes can be two types, chemical and physical
- Physical changes are changes in the physical properties of substances. No new substances are formed in these changes. These changes may be reversible.
- Chemical changes are changes in which composition and chemical properties of substance get changed. In this new substances are formed. This change is permanent and irreversible.
- Some substances can be formed in pure state from their solutions by crystallization.

❖ Fill in the blanks:

1. Changes that lead to the formation of new substances are called **chemical changes**.
2. Energy is **evolved** in the formation of curd from milk.
3. A brown layer formed when an iron article is left exposed in an open area is called **rust**.
4. Large crystals of pure substance are obtained by **crystallization**.
5. When carbon dioxide is passed through lime water, it turns milky due to the formation of **calcium carbonate**.
6. The chemical name of baking soda is **sodium hydrogen carbonate**.
7. Two methods by which rusting of iron can be prevented are **painting** and **galvanization**.

❖ **Tick the correct answer:**

1. Which among the following is a physical change?
(a) **Cutting a log of wood in small pieces**
(b) Burning of wood
(c) Ripening of fruit
(d) Cooking of food
2. Which of the following is a chemical change?
(a) Bursting of a fire cracker
(b) Germination of seed
(c) Coal formation from buried trees
(d) **All of these**
3. Which is a method to prevent rust?
(a) Crystallization
(b) Sedimentation
(c) **Galvanisation**
(d) None of these
4. What will happen if carbon dioxide gas is passed through lime water ?
(a) Calcium carbonate is formed
(b) The lime water turns milky
(c) **Both of these**
(d) None of these
5. Iron pillar near the Qutub Minar in Delhi is famous for the following facts. Which of these facts is responsible for its long stability?
(a) It is more than 7 metres high
(b) It weighs about 6000 kg
(c) It was built more than 1600 years ago
(d) **It has not rusted after such a long period**

❖ **State True or False:**

1. Formation of manure from leaves is a physical change. (F)
2. Iron pipes coated with zinc do not get rusted easily. (T)
3. Iron and rust are the same substances.(F)
4. Condensation of steam is not a chemical change(T)
5. Both oxygen and water are essential for rusting.(T)

❖ **Answer in one word:**

1. What is the colour of the flame when magnesium is burnt?
Ans: White
2. State one examples of physical changes.
Ans: Melting of ice
3. Which gas is released when baking soda is mixed with vinegar?

Ans: Carbon dioxide

4. Name the ultimate colour of the solution when iron nails are dipped in the solution of copper sulphate.

Ans: Green

❖ **Answer in one or two sentence:**

1. How would you show that setting of a curd is a chemical change?

Ans. We can say that setting of curd is a chemical change because we can not get the original substance, i.e., milk back and a new substance is formed with different taste, smell and other chemical properties

2. What happens when carbon dioxide passes through lime water?

Ans:

When carbon dioxide passes through lime water, calcium carbonate is formed and lime water turns milky.

3. Explain the burning of magnesium ribbon.

Ans:

Take a thin ribbon of magnesium. Gently clean the end of the ribbon with sand paper and bring its tip near a candle flame. It is observed that the ribbon burns with a bright white light. After combustion, white powdery ash is left, which is called magnesium oxide.

4. When a candle burns, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

Ans: When a candle burns, both physical and chemical changes occur:

(i) Physical change: melting of wax, vapourisation of melted wax.

(ii) Chemical change: Burning of vapours of wax to give carbon dioxide, heat and light

❖ **Long question answer:**

1. Describe how crystals of copper sulphate are prepared.

Ans. Take a cupful of water in a beaker and add a few drops of dilute sulphuric acid. Heat the water. When it starts boiling, add copper sulphate powder slowly. Continue to add copper sulphate powder till no more powder can be dissolved. .During this process continuously stir the solution. Filter the solution. Leave it for cooling. Look it after some time, you can see the crystals of copper sulphate.

2. State the differences between chemical and physical changes.

Ans:

Chemical change	Physical change
(i) It is generally a irreversible process.	(i) It is generally a reversible process.
(ii) A new substance is formed.	(ii) No new substance is formed.
(iii) Properties of a substance changes.	(iii) Properties of a substance does not

	changes
(iv) Energy is given out or absorbed during the change.	(iv) No energy is given out or absorbed during the change.

3. Give an example of a chemical reaction for each of the following situations:

- A change in colour is observed.
- A gas is evolved.
- Sound is produced.
- Heat is produced.
- Change in taste is observed.
- Light is produced

Ans: (a) Reaction between copper sulphate solution and iron metal. Blue colour of copper sulphate solution changes to green colour ferrous sulphate solution.

(b) Reaction between baking soda and vinegar evolves carbon dioxide gas.

(c) Burning of crackers produces sound.

(d) Reaction between hydrochloric acid and sodium hydroxide produces heat.

(e) Setting of curd from milk. Taste of milk changes to sour in curd.

(f) Burning of fuel produces light.

❖ **HOTS:**

1. Explain why rusting of iron objects is faster in coastal areas than in deserts

Ans: As content of moisture in the air in coastal areas is higher than in the air in deserts. So, the process of rusting is faster in coastal areas

2. Why iron pillar in Qutub Minar in Delhi famous?

Ans: It is famous because it has not rusted though was built more than 1600 years ago.

❖ **Activity:**

- Collect information about the types of fuels used for cooking in your area. Discuss with your teachers/ parents/ others which fuels are less polluting and why.
- To study the reaction between vinegar and baking soda.

CHAPTER 7

WEATHER, CLIMATE AND ADAPTATIONS OF ANIMALS TO CLIMATE

❖ Key words:

Adaptation	Maximum Temperature	Tropical rainforest
Climate	Migration	Tropical region
Elements of weather	Minimum Temperature	Weather
Humidity	Polar region	

❖ keypoints to remember:

- Weather is the day-to-day condition of atmosphere at a place influenced by factors like humidity, temperature, wind speed etc.
- Humidity is amount of water vapour present in the atmosphere and is measured by hygrometer.
- Climate is average weather condition at a specific place over a longer period of time.
- Factors affecting climate are:
 - (i) Topography: it means the shape of land.
 - (ii) Sea level: Distance from the sea and nearby water bodies are one of the influential factors that affect the climate of a region.
 - (iii) Ocean currents: It can transfer heat energy from land to sea or vice versa thus affecting the temperature of the region.
 - (iv) Human influence: All others are natural factors but we humans are one of the most devastating factors that have triggered the climate change.
- Adaptation in climate : the features and habits that help animals to live in a habitat are called adaptations.
- Three regions are classified according to adaptation:
 - (i) Polar region: They have extreme climate. Sun does not rise at poles for 6 months and does not set for the other 6 months.

- (ii) Tropical rainforest: Having hot summer and plenty of rainfall. Days and nights are almost equal in length throughout the year.
 - (iii) Desert : Have extreme climate. Receives less rainfall and large amount of sunlight.
- Migration: It is mass movement of animals, mostly birds, from colder place to warmer regions to escape the cold, to breed or due to shortage of food.

❖ **Fill in the blanks:**

1. The average weather taken over a long time is called **climate of place**.
2. A place receives very little rainfall and the temperature is high throughout the year, the climate of that place will be **hot and dry**.
3. The two regions of the earth with extreme climatic conditions are **polar and tropical regions**.
4. **Polar bears** have white fur. It protects them from predators.
5. **Birds** must remain warm to survive. They migrate to **warmer** regions when winter sets in.

❖ **Tick the correct answer:**

1. Which among the following is generally not predicted in a daily weather report?
 - (a) Temperature
 - (b) **Pressure**
 - (c) Humidity
 - (d) Rainfall
2. Weather changes
 - (a) week after week
 - (b) day after day
 - (c) within a short period
 - (d) **in any of the above time period**
3. Rainfall is measured by
 - (a) **rain gauge**
 - (b) water level increase in ponds
 - (c) water level increase in water table
 - (d) none of these
4. Which of the following statement is incorrect for penguins?
 - (a) They huddle together
 - (b) **They cannot swim**
 - (c) They have webbed feet
 - (d) They have streamlined body
5. Which of the following is not an adaptive feature in polar bear?
 - (a) White fur
 - (b) Strong sense of smell
 - (c) Long curved and sharp claws
 - (d) **Long tail**

❖ **State True or False:**

1. Monkeys, gorillas, lions are atype of polar animals. (F)
2. Rajasthan shows the highest temperature during most part of year. (T)
3. In polar regions the temperature can be as low as -10° C. (F)
4. Siberian crane comes from Siberia to Baratpur in Rajasthan due to migration. (T)
5. Red-eyed frog has developed stick pads on its feet to help them crawl on land. (F)

❖ **Answer in one word:**

1. Who record the weather everyday?
Ans: Meteorologists
2. The weather pattern of nearly how many years is called the climate of the place?
Ans: 25 years
3. What type of climate is found in mostly North-east India?
Ans: Wet
4. Which of the two changes frequently, weather or climate?
Ans: Weather

❖ **Answer in one or two sentence:**

1. Name the elements that determine the weather of a place.
Ans: The temperature, humidity, rainfall, wind-speed, etc. are called the elements that determine the weather of a place.
2. When is the maximum and minimum temperature likely to occur during the day?
Ans: The maximum temperature of the day occurs generally in the afternoon and the minimum temperature occurs in the early morning.
3. The tropical rainforests has a large population of animals. Explain why it is so.
Ans: Because of continuous warmth and rain, the tropical region supports an enormous number and a wide variety of animals
4. What do you mean by the term adaptation?
Ans: The modifications of the features and the functions of the body of plants and animals according to the climatic condition of a place where they are living is called adaptation.
5. What is a rain gauge?
Ans: Rain gauge is an instrument to measure rainfall. It is basically a measuring cylinder with a funnel on top to collect rainwater.

❖ **Long question answer:**

1. Explain with examples, why we find animals of certain kind living in particular climatic conditions

Ans: Animals are adapted to survive in the conditions in which they live. Features and habits which help them to adapt to their surroundings are the result of evolution. So, to survive in a particular type of climate the animals must have certain adapted features. This is the reason we find animals of certain kind living in particular climatic conditions. For example, animals in the polar region are adapted to the extremely cold climate. They have special characteristics, such as white fur, strong sense of smell, a layer of fat under the skin, wide and large paws for swimming and walking in snow etc

2. How do elephants living in the tropical rainforests adapt themselves?

Ans: The elephant has adapted to the conditions of rainforest in many remarkable ways. It has a trunk that it uses as a nose because of this it has a strong sense of smell. The trunk is also used by it for picking up food. Its tusks are modified teeth. These can tear the bark of trees that an elephant loves to eat. So, the elephant is able to handle the competition for food very well. Large ears of the elephant help it to hear even very soft sounds. They also help the elephant to keep cool in the hot* humid climate of the rainforest.

3. Explain the adaptations of polar bears to live in polar regions

Ans: The adaptations that make the polar bears suitable to live in polar region are:

1. The long curved and sharp claws help polar bear to walk on ice.
 2. They also have a layer of fat under their skin. In fact, they are so well insulated that they have to move slowly and rest, often to avoid getting overheated.
 3. Polar bears have white fur on their body so that they are not easily visible in the snowy background.
 4. The two thick-layers of furs on the body of polar bear protects them from extreme cold.
 5. They have a strong sense of smell so that it can catch its prey for food.
- The flow chart below clearly explain the adaptations of polar bears.

4. Write a short note on migration.

Ans: Migration is physical movement of birds or animals from one area to another for food, space, breeding, escaping harsh condition, etc. Migration is commonly seen in birds living in extreme cold climate to long distances for warmer places during the winter season.

Siberian crane and Arctic tern are some of the migratory birds. Mammals, many types of fish and insects are also known to migrate seasonally in search of more hospitable climates.

❖ **HOTS:**

1. Why is it difficult to predict the weather of a place while it is easy to predict its climate?

Ans: Climate is the average weather pattern taken over a long time, of a place so it is easy to predict. Weather is a complex phenomenon which can vary over a short period of time and thus is difficult to predict.

2. What is huddling? How it keeps penguin warm in extreme cold climate?

Ans: Huddling means to come together closely. When it is very cold, penguins huddle together in groups. Warm air gets trapped between the feathers and they get shielded from the full force of the cold wind outside. The penguins standing at the outside of the group continuously shuffle themselves inside to keep them warm. Thus, all penguins remain warm from extreme cold climate.

❖ **Activity:**

- Collect information about the Indian Meteorological Department. You can visit its website: <http://www.imd.gov.in>
- Write a brief report about things this department does.



CHAPTER 8

WIND, STORMS AND CYCLONES

❖ Key words:

Anemometer

Cyclone

Hurricane

Lightning

Low pressure

Monsoon winds

Pressure

Thunderstorms

Tornado

Typhoon

Wind flow pattern

❖ Keypoints to remember:

- **Air :** The invisible gaseous substance surrounding the earth.
- **Composition of Air:** By volume, dry air contains 78.09% nitrogen, 20.95 % oxygen, 0.93% argon, 0.04% carbon dioxide, and small amounts of other gases. Air also contains a variable amount of water vapour.
- **Properties of Air:**
 - (i) Air around us exerts pressure.
 - (ii) Air expands on heating and contracts on cooling
 - (iii) Warm air rises up, whereas comparatively cooler air tends to sink towards earth's surface
 - (iv) As warm air rises, air pressure at that place is reduced and the cooler air moves to the place
- **Wind:** The moving air is called wind. Air moves from region of high air pressure to region of low air pressure.
- Winds carrying water vapour bring rain
- High –speed winds and air pressure differences can cause cyclones
- It has become easier to monitor cyclones with the help of advance technology like satellites and radars.

❖ Fill in the blanks:

1. Wind is **moving** air.
2. Winds are generated due to **uneven** heating on the earth
3. Near the earth's surface **warm** air rises up whereas **cooler** air comes down
4. Air moves from a region **high** of pressure to a region **low** of pressure
5. Increased wind speed is accompanied by **reduced** air pressure.
6. A dark funnel shaped cloud that reaches from the sky to the ground is called a tornado.
7. Air exerts **pressure**.

❖ **Tick the correct answer:**

1. In which year was Orissa hit by a cyclone?
(a) **1999**
(b) 2000
(c) 2001
(d) 2004
2. Leaves of trees, banner or flags flutter when wind is blowing. Why?
(a) Air occupies space
(b) Air is a mixture of gases
(c) **Air exerts pressure**
(d) Air is colourless
3. A fire alarm usually detects smoke in case of fire. Where should such an alarm be placed in a room? (NCERT Exemplar)
(a) Near the door
(b) On the floor
(c) On any wall
(d) **On the ceiling**
4. The winds from oceans carry water and bring rain. These winds are called
(a) typhoon
(b) **monsoon**
(c) cyclone
(d) none of these
5. A cyclone warning can be issued
(a) 48 hours in advance
(b) 12 hours in advance
(c) 6 hours in advance
(d) **24 hours in advance**

❖ **State True or False:**

1. Cyclones are beneficials to the people living in coastal areas.(F)
2. Tornadoes are very frequent in our country.(F)
3. It has become easier to monitor cyclones with the help of advanced technology like satellites and radars.(T)

4. Air contracts on heating and expands on cooling. (F)
5. Air around us exerts pressure.(T)

❖ **Answer in one word:**

1. What was the speed of wind of cyclone hit in Odisha on 18 October 1999?
Ans: 200 km/hr
2. What do the wind, from the oceans carry?
Ans: Water
3. Name natural disasters.
Ans: Thunderstorm
4. Which instrument is used to measure the air pressure at any place?
Ans: Barometer

❖ **Answer in one or two sentence:**

1. What is natural disaster?
Ans: Natural disaster are extreme, sudden events caused by environmental factors that injure people and damage property.
2. Suggest two methods to find out wind direction at a given place.
Ans: (i) Take a piece of a paper in your hand. Allow it to fall from your hand. It will flow in the direction in which wind is blowing.
(ii) You can also use a wind-pane which helps us to know accurate wind direction.
3. State one experiences that made you think that air exerts pressure.
Ans: Balloons and balls can be used only when they are inflated with air. When balloon is overfilled with air it bursts due to excessive air pressure
4. You want to buy a house. Would you like to buy a house having windows but no ventilators?
Explain your answer.
5. Ans: No, a house which has no ventilators is not a safe or healthy house to live in. The air circulation is not there in such a house. So, it has no fresh air.
6. Name two devices that forecast a cyclone.
Ans: Satellites and Radars

❖ **Long question answer:**

1. What planning is required in advance to deal with the situation created by a cyclone?
Ans: To deal with cyclone, it is important to follow the following points :
 - (i) carefully listening the warnings transmitted on T.V. and radio.
 - (ii) moving to the safer places.
 - (iii) keeping an emergency kit ready.
 - (iv) store food in waterproof bags. .
 - (v) not venturing into sea.
 - (vi) keeping all the emergency numbers.

2. How do cyclones cause destruction?

Ans: Cyclones cause destruction to our life and property. The water waves produced by the wind are so powerful that a person cannot overcome them. The rising water may be as high as 3-12 metres. It moves towards the shore. As a result, the sea-water enters the low-lying coastal areas, causing severe loss of life and property.

It also reduces the fertility of the soil. High-speed winds accompanying a cyclone can damage houses, telephones and other communication systems, trees, etc., causing tremendous loss of life and property. Continuous rainfall may further worsen the flood situation.

3. Explain how are wind currents generated due to uneven heating between the equator and the poles.

Ans: The areas close to the equator get maximum heat from the sun. As a result, the air in these regions gets warm. The warm air moves upwards and the cooler air from the regions in the 0-30° latitudes belt on either side of the equator moves in.

These winds blow from the north and south towards the equator. At the poles the air is colder than that at latitudes about 60 degrees. The warm air at these latitudes rises up and cold wind from the polar regions rushes in, to take its place. In this way, wind circulation is set up between these poles and the warmer latitudes as shown below



*The wind flow pattern
because of uneven heating on the earth*

❖ **HOTS:**

1. Paheli kept an empty bottle made of plastic inside a refrigerator. After few hours, when she opened the refrigerator she found the bottle had collapsed. Explain the possible reason.

Ans: The air inside the bottle contracts due to low temperature. Hence pressure inside the bottle becomes less than the outside and the bottle collapsed.

2. Why an umbrella held upright, at times, gets upturned when high speed wind blows?

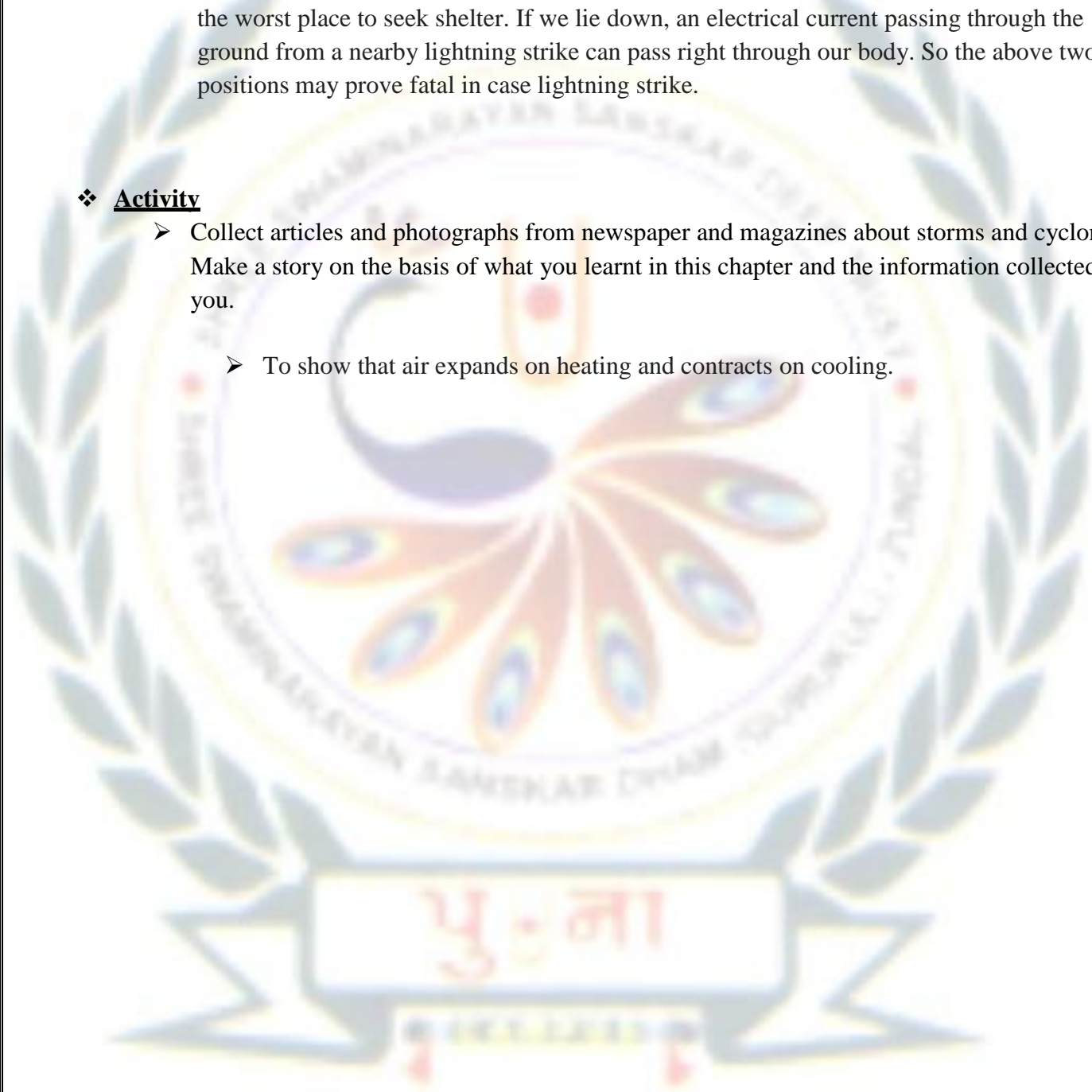
Ans: High speed wind passing over the umbrella creates a low pressure. Thus, the umbrella upturns.

3. During lightning and thunderstorm, one should not take shelter under a tree or lie on the ground. Why?

Ans: Tree may be the tallest object around, making it perfect target of lightning and one of the worst place to seek shelter. If we lie down, an electrical current passing through the ground from a nearby lightning strike can pass right through our body. So the above two positions may prove fatal in case lightning strike.

❖ **Activity**

- Collect articles and photographs from newspaper and magazines about storms and cyclones. Make a story on the basis of what you learnt in this chapter and the information collected by you.
- To show that air expands on heating and contracts on cooling.



CHAPTER 9

SOIL

❖ Key words:

Clayey

Humus

Loamy

Percolation

Moisture

Sandy

Water retention

❖ Keypoints to remember:

- Soil is important for life on earth
- Soil profile is a section through different layers of soil. Various layers are called horizons.
- Soil is of different types: clayey, loamy and sandy.
- Percolation rate of water is different in different types of soil. It is highest in sandy soil and least in clayey soil.
- Different types of soils are used to cultivate different types of crops. Clay and loam are suitable for growing wheat, gram and paddy. Cotton is grown in loamy soil.
- Soil holds water in it, which is called soil moisture. The capacity of a soil to hold water is important for various crops.
- Clayey soil is used to make pots, toys and statues.

❖ Fill in the blanks:

1. Soil is formed by **weathering** of rocks.
2. A dark soil is usually rich in **humus**.
3. Soil erosion can be stopped by **plantation**.
4. **Soil profile** is a section through different layers of the soil.

5. **Clayey** soil is used to make pots, toys and statues.

❖ **Tick the correct answer:**

1. In addition to the rock particles, the soil contains
 - (i) Air and water
 - (ii) Water and plants
 - (iii) Minerals, organic matter, air and water**
 - (iv) Water, air and plants
2. The water holding capacity is the highest in
 - (i) Sandy soil
 - (ii) Clayey soil**
 - (iii) Loamy soil
 - (iv) Mixture of sand and loam
3. Which factor influences soil formation?
 - (i) Climate
 - (ii) Vegetation
 - (iii) Parent rock
 - (iv) All of these**
4. The proportion of sand, silt and clay in a soil sample determines
 - (i) structure
 - (ii) texture**
 - (iii) nutrient potential
 - (iv) fertility level
5. Soil conservation measures are mainly aimed at protecting which of the following?
 - (i) Plants
 - (ii) Topsoil**
 - (iii) Sub soil
 - (iv) Soil organisms

❖ **State True or False:**

1. Percolation rate of water is highest in the clayey soil and least in the sandy soil.(F)
2. Clay and loam are suitable for growing wheat, gram and paddy.(T)
3. Cotton is grown in sandy loam soil.(T)
4. Polythene bags and plastics pollute the soil.(T)
5. Upper portion of soil always contains air.(T)

❖ **Answer in one word:**

1. Name the best soil for growing plants.

Ans: Loamy soil

2. A granular material having size between sand and clay is known as?

Ans: Silt

3. Which soil contains greater proportion of big particles?

Ans: Sandy soil

4. What comes below C' horizon?

Ans: Bedrock

❖ **Answer in one or two sentence:**

1. What is soil erosion?

Ans: The removal of top soil by the action of water and wind is called soil erosion.

2. What do you mean by deforestation?

Ans: The process of cutting of trees on large scale which harms the environment is known as deforestation.

3. What is soil moisture?

Ans: Soil absorbs water and also hold water in it, which is known as soil moisture.

4. What processes does formation of soil involve?

Ans: Formation of soil involves two processes: (a) Breaking of rocks (b) Mixing of soil with organic matter.

5. What is the soft, porous layer of the soil called?

Ans: It is called top soil or the A-horizon.

❖ **Answer in Long:**

1. List the differences between clayey soil and sandy soil.

Ans:

Clayey Soil	Loamy Soil
(i) It has much smaller particles	(i) It has much larger particles.
(ii) It can hold good amount of water.	(ii) It cannot hold water.
(iii) It is fertile.	(iii) It is not fertile.
(iv) Particles are tightly packed	(iv) Particles are loosely packed

2. Explain physical properties of soil.

Ans:

- Soil colour: Soil can be black, red, brown or grey in colour.
- Water-holding capacity: The ability of a particular soil to hold water is called its water holding capacity.

- Soil texture: Roughness, grittiness and smoothness are the properties which gives soil texture. It depends on the amount of sand, silt and clay in a particular soil.
- Acidity or alkalinity: Based on minerals and salts found in a particular area, the soil may be acidic or alkaline. Determining this property of soil is very important to decide which kind of vegetation can be grown in that area.
- Soil structure: Soil structure refers to the way in which soil particles aggregates together. Soil structure modifies the effect of texture in regard of nutrient availability, moisture and air content.

3. Razia conducted an experiment in the field related to the rate of percolation. She observed that it took 40 min for 200 mL of water to percolate through the soil sample. Calculate the rate of percolation.

Ans:

Given amount of water = 200 mL

Percolation time = 40 min

$$\begin{aligned} \text{Therefore, percolation rate} &= \frac{\text{Amount of water (mL)}}{\text{Percolation time (min)}} \\ &= \frac{200\text{mL}}{40\text{ min}} \\ &= 5 \text{ mL/min} \end{aligned}$$

4. Explain how soil pollution could be prevented.

Ans: The persistent build-up of toxic compounds in the soil is defined as soil pollution. To prevent soil pollution, its causes must be controlled.

1. Reduce the use of plastics: Plastics and polythene bags destroy the fertility of soil. Hence, these should be disposed off properly and if possible, their use should be avoided.
2. Industrial pollutants: Some waste products from industries and homes pollute soil. These pollutants should be treated chemically to make them harmless before they are disposed off.
3. Insecticides: Other pollutants of soil include pesticides and insecticides. Therefore, excessive use of these substances should be avoided.

❖ **HOTS:**

1. Is it a good practice to remove grass and small plants from open or unused field? Why?
Ans: No, because roots of grass and small plants bind the soil particles and hold them in place. Thus, they help to prevent soil erosion.

2. In Rajasthan, during rainy season, several rivulets of rainwater is a common scene but stream of water is very rare. Explain.

Ans: Deserts have vast stretches of sand. Sandy soil has high rate of percolation. So it percolates rainwater immediately downwards in the spaces between sand.

3. Why continuously water-logged soils are harmful for standing crops?

Ans: In water-logged soils, water occupies the spaces between soil particles and thus making roots deprive of available air. This affects of growth of the crops and consequently the crops die.

❖ **Activity:**

1. Sketch the cross section of soil and label the various layers. Color it nicely

